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- History of the Minnesota Shade Tree

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HISTORY OF THE
MINNESOTA
SHADE TREE PROGRAM
1974-1982

HISTORY OF THE MINNESOTA SHADE TREE PROGRAM

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Shade Tree Program
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May, 1982

PREFACE

A great deal of state and local activity has transpired since 1961 when Dutch elm disease was first officially noticed in Minnesota. This summary history reviews key events from the beginning to the formal termination of the program on June 30, 1982. Record sources include the Division of Plant Industry, Shade Tree Program, Legislative Reference Library, newspaper and journal articles, and the verbal accounts and/or records of many individuals involved in the program. They are Robert Flaskerd, John Berends, Milton Marinos, Dharma Sreenivasam, Joseph Sandve, Thomas Berg, Peter Grills, Meg Hanisch, Doree Maser, Gary Currie, Gary Botzek, Don Willeke, Jane Meyer, Walter Eisner, Paul Scherman, Jon Wefald, Amador Frances, Roberta Boelter, William Bulger, Darryl Anderson, David French, Vern Peterson, and Roger Peterson. Their input is gratefully acknowledged.

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May 28, 1982

HISTORY OF THE MINNESOTA SHADE TREE PROGRAM

INTRODUCTION

EUROPEAN ORIGINS.

A lethal disease of elms, previously unknown, abruptly appeared in certain war-torn areas of Europe between 1918 and 1919. Symptoms were easily mistaken for drought or the ravages of chemical warfare but, by 1922, the fungal agent causing the disease was identified in Holland. It was labeled "Dutch" elm disease (DED) although by that time thousands of elms in Holland as well as other European countries were dead or dying of DED. The disease was fast becoming epidemic among all the highly susceptible elm species of Europe. Recognition of the smaller European elm bark beetle as a primary vector did not come until 1934.

How DED got to Europe or where it came from remains a mystery. An Asiatic source is suspected due to characteristically higher DED resistance among the Asiatic elms.

DUTCH ELM DISEASE IN THE UNITED STATES.

Infested elm material (from Europe) in the form of burl logs and crating was shipped regularly to the United States. Many such logs were moved to inland veneer mills by rail from 1926 through 1933 just prior to the beginning of the North American epidemic.

In 1930, five trees found in Cleveland and Cincinnati, Ohio were diagnosed positive for DED. The disease next struck heavily around the port of New York in 1933. Although the European bark beetle had been identified in Cambridge, Massachusetts as early as 1909 and serves as a very efficient carrier of DED, it cannot be held responsible for these isolated and widespread early cases of disease because the vector alone cannot spread the disease; the fungus must also be present. It took both beetles and fungus on the imported logs to pave the way for infection of the nearby and abundant populations of susceptible American elms. Meanwhile, the native American elm bark beetle, although initially discounted as a significant carrier, also picked up and spread the fungus especially in northern regions where the European beetle could not withstand the rigors of winter.

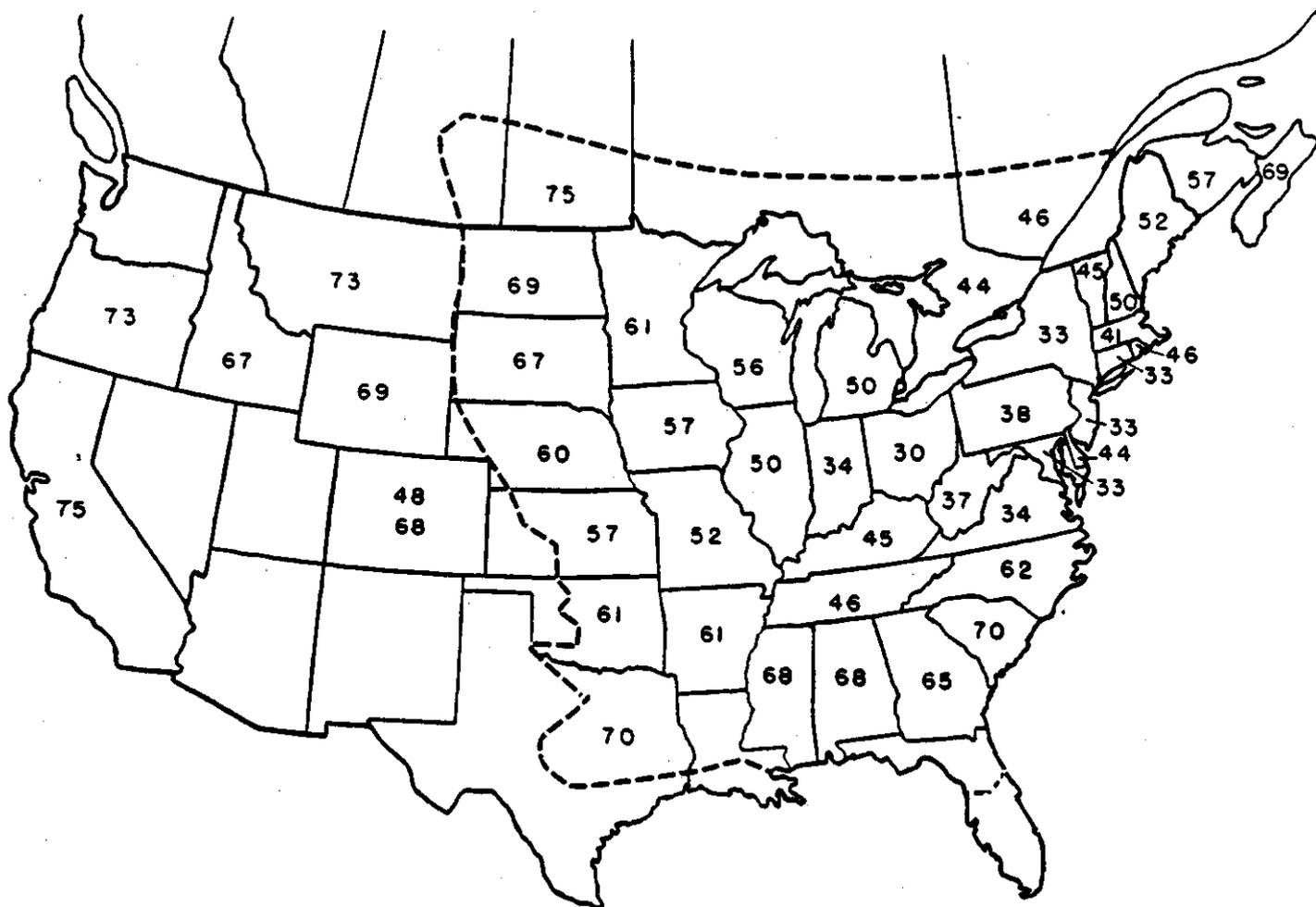


Figure 1. Dutch elm disease in North America. Dates of first discovery in each state and province are indicated. Two dates appear for Colorado because DED was unknown there between 1948 and 1968²⁴⁹. Dashed line indicates limits of natural range of American elm¹³⁴.

INITIAL RESPONSE.

The United States enacted a quarantine in 1933 to restrict entry of infected elm materials. It was too late. A major infection center was quickly established in the greater New York area, Connecticut and New Jersey, and rapidly spread outward eventually affecting 41 states and 5 Canadian provinces--decimating nearly all elm populations encountered along the way. Costly eradication efforts by national and local governments in the United States and Canada were based on faulty techniques and were doomed to failure (See Cornell Bulletin 687 - Dutch Elm Disease Control for State of the Art circa 1945). The eradication program cost an estimated eleven million dollars--the first "drop" in a very large bucket.

Dutch Elm Disease Control

D.S. Welch • W. H. Rankin • P. A. Readie



CORNELL EXTENSION BULLETIN



The present known distribution of the Dutch-elm-disease-European-bark-beetle association in New York State, 1945

REPRINTED JUNE 1948

Dutch Elm Disease Control

D. S. WELCH, W. H. RANKIN, AND P. A. READIN

THE Dutch elm disease has spread over much of eastern New York State. It is a dangerous disease that threatens the elm as a lawn, street, and park tree in city, village, and rural community. Owners of elms and those in charge of trees on public land can protect the elm by employing the simple methods established through research and experience over the past ten years. This bulletin tells how the Dutch elm disease can be controlled and outlines the most efficient methods to suppress its spread in residential areas.

How to Recognize the Diseased Tree

ELM TREES become unhealthy and die from many causes, including unsuitable soil and water relations, insects and fungi that damage the leaves, and several fungous diseases that affect the wood structure of the tree. The Dutch elm disease is one of the internal fungous diseases. The fungus (*Ceratostomella ulmi*) grows profusely in the outer layer of wood and interferes with the movement of water to the leaves. The diseased condition of the wood can be seen by cutting into small branches or by peeling the bark. If the fungus is present, the outer layer of the wood is flecked, mottled, streaked or uniformly discolored with dark tan, brown, gray, or almost black (figure 1). Elms dying or those recently killed by the Dutch elm disease always show these wood symptoms, but other fungous diseases of elm also cause similar wood discolorations. Therefore, no absolute determination of the Dutch elm disease from wood samples is possible except by a laboratory test to determine the presence of the fungus.

External symptoms are equally unreliable in identifying an elm killed by this disease. Since the recognition of the disease is difficult and of little value in applying control measures, only a brief description of the symptoms is given.

The appearance of the diseased tree varies considerably according to the time when the effect is first shown by the leaves. Elms may show

AUTHORS' ACKNOWLEDGMENTS: The information in this bulletin is based largely upon the work done by E. G. Farber, D. L. Collins, L. J. Tyler, and Henry Dietrich of the New York State College of Agriculture in cooperation with W. H. Rankin of the New York State Department of Agriculture and Markets, and associates.

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CORNELL EXTENSION BULLETIN 687

DUTCH ELM DISEASE CONTROL

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FIGURE 1. STREAKS ON TWIG

A. Longitudinal section of twig revealing discolored streaks in the wood; B. twig with portion of bark removed to show streaks on inner surface of the cambium

wilting leaves on one or more branches at any time during June or July. Usually, many of the branches soon become involved and the entire tree may die within a few weeks. The wilted leaves may dry out rapidly, turn dull green and fall from the twigs, or they may turn brown before falling to the ground (figure 2). If the first effects of the disease are not seen until midsummer or later, the symptoms are usually confined to a definite part of the tree or to a few twigs, and the leaves turn brown and fall. Affected trees that show these late-summer symptoms may die during the winter or by the following summer.

In elms that are low in vigor and partially dead or dying from other causes, the disease symptoms are obscured except on the more vigorous parts and on sucker shoots.

The Fungus and Its Carrier

THE fungus (*Ceratostomella ulmi*) that causes Dutch elm disease is largely dependent on certain insects that breed in dead or dying elm wood. It finds favorable living conditions in association with the immature bark beetles. Large numbers of the fungus spores are carried on the bodies of the winged adult bark beetle. When these beetles lay their eggs in suitable dead or dying elm wood, the fungus develops along with the subsequent larval and pupal stages of the beetles and is carried away



FIGURE 2. ELMS SHOWING SYMPTOMS OF DUTCH ELM DISEASE

A. Extreme wilting and partial defoliation; B. many branches dead, some chlorotic twigs or shoot growth; C. wilting on young shoot

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FIGURE 3. THE SMALLER EUROPEAN ELM BARK BEETLE (A) AND LARVA (B)
Much enlarged

again by the new generation of winged adults in their search for more elm wood. Thus from season to season this fungus continues its dependent association with bark beetles and similar insects in dead elm wood. It is evident then that, although the fungus alone causes the death of the elm tree, the behavior of the bark beetle holds the clue to the control of the disease.

The fungus can kill elm trees only if it is placed directly in the large water-conducting tubes of the current season's new wood. Furthermore, it must be placed in these tubes by direct inoculation in the spring or

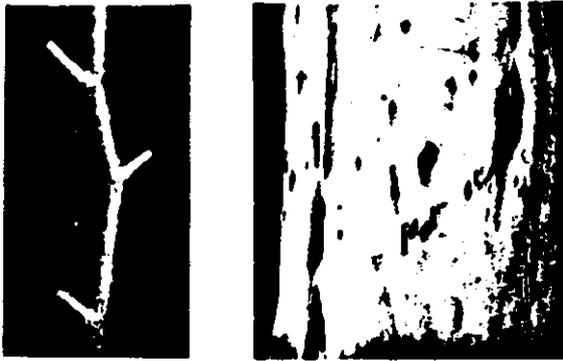


FIGURE 4. DAMAGE TO SAPWOOD BY THE SMALLER EUROPEAN ELM BARK BEETLE.
A. Feeding starts made by burrows in cross-section of healthy elm twig; B. segment of healthy twig with bark removed to show marks made by beetles in an attempt to establish colonies



FIGURE 5. THE WOODPILE, A BREEDING PLACE OF THE BARK BEETLE
Beetles emerging from the elm wood in the woodpile probably infested the elm trees nearby

if there are large numbers of beetles, they fly farther to feed. Individual trees run the chance of infection in proportion to the number of beetles that feed on them. Usually a small amount of dead wood or a small number of beetles will endanger elms within 100 or 200 feet of the source. The chances of infection are greatest within 100 feet from the wood source and diminish rapidly up to 300 feet. Infections seldom occur at distances from 300 to 500 feet, and rarely more than 500 feet, from the source.

After feeding, the beetles seek wood suitable for breeding. Frequently

early summer. The smaller European elm bark beetle, *Scolytus multistriatus*, (figure 3) an imported insect, feeds differently from any other insects on elm in this country. Because of this feeding habit of the beetles, the fungus is inserted in the right place and at the right time to enable it to kill the tree. The beetle visits the twigs and feeds by boring a short tunnel in the soft tissue where the twigs are attached to older wood (figure 4, A). The spores of the fungus clinging to the beetle are rubbed off and left in the tunnel. In the spring and early summer these tunnels may expose the new water-conducting tubes and the fungus can grow into them. Once in these tubes it spreads rapidly throughout the tree, and the tree wilts and dies when the supply of water to the leaves is greatly diminished.

The disease becomes a serious problem only when the fungus and this European elm bark beetle are in the same area. The present distribution of this dangerous fungus-bark-beetle association in New York State is limited to Long Island and to the Hudson River Valley as far north as Washington and Saratoga Counties, and to the lower Mohawk River valley in Schenectady County (page 2).¹ In recent years it has spread slowly into new territory and it may be expected to continue to do so. Because the bark beetle carries the fungus primarily from dead wood to other dead wood, diseased trees may not appear for some time after the fungus is present in a locality. Ways to detect the presence of the fungus and the beetle are available for use where outbreaks are expected and where protective measures are contemplated.

There are two broods of the European elm bark beetle each year, a spring and a summer brood. Since the spring brood is the one that is the immediate cause for the destructiveness of the Dutch elm disease, control measures are largely concerned with this brood. The spring brood passes the winter in the form of partially developed larvae or grubs (figure 3, B) between the bark and the wood of elm that was cut or broken, or that died the previous summer. In early spring the beetles complete their development and emerge in the form of winged adults (figure 3, A) through small holes in the bark. The emergence of these adult beetles begins shortly after May 1 and continues daily over a period of a few weeks.

These beetles feed on twigs of living trees close to the wood from which they emerge (figures 4 and 5). If very few or no elm trees are near-by or

¹The Dutch elm disease fungus in recent years has also become widely established in dead elm wood west of the Catskill Mountains in Brown, Chautauque, Delaware, Madison, and Orange Counties. In that region the fungus is associated with the native elm bark beetle, *Hylurgopinus*, a wide territory in a few years. Fortunately, however, this insect lacks the characteristic feeding habits of the European bark beetle and only rarely inoculates the fungus into healthy elm trees. The damage done to elms in this area has been so insignificant that control measures have not been necessary. If, in the future, the European bark beetle spreads to this region, measures similar to those described for the Hudson Valley will probably be necessary.

they do not find such wood near their place of emergence and must move greater distances. This accounts for the long-distance spread of the fungus into new previously uninvaded areas adjacent to areas where the disease is already present. It is during May and June that the adults from the spring brood seek and enter dead or dying elm wood suitable for egg-laying purposes. Such wood must be of the proper moisture content. Elms dying from the Dutch elm disease are particularly attractive to the beetles at this time. Such trees usually become heavily infested, thereby greatly increasing the bark-beetle population in the area where the disease occurs. The fungus is carried into the egg-laying channels cut in dead wood by the female bark beetle and it thrives in the channels made by developing larvae (figures 6 and 7).

The summer brood begins to mature in late July, and flights of adults from this brood may continue in August and into September. These summer-brood adults carry the fungus with them in flight but there is no evidence to date that they are important in inoculating healthy elms, for few elms are believed to be in a susceptible stage at this season. The fungus apparently does not progress rapidly enough from the feeding wounds to kill more than a few twigs at most. The summer brood of beetles may, however, be of considerable importance in increasing the number of beetles the following spring provided there is suitable wood near-by in which to lay their eggs. It is their larvae that produce the dangerous spring brood of beetles.

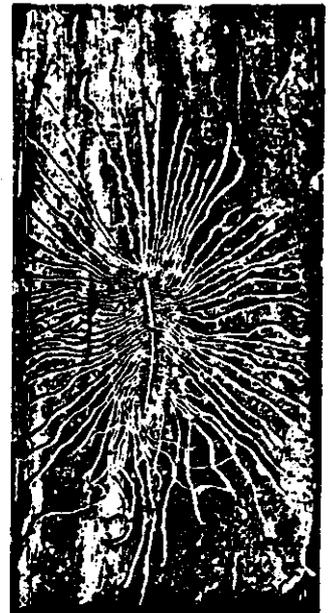


FIGURE 6. ENGRAVING ON SAPWOOD MADE BY THE BEETLE AND ITS LARVAE
A broad gallery



FIGURE 7. NUMEROUS SCRATCHES IN EARLY DEPRESSED WOOD
These have caused the bark to separate.

Control

Objectives

BECAUSE of the behavior of the bark beetle and the fact that the fungus is practically always associated with this insect, the elm wood in which the beetles lay their eggs is fundamentally the source of all the trouble.

As soon the Dutch-elm-disease fungus and the European elm bark beetle are established in a region, all elm trees are continuously in danger of being killed by the disease. When an elm shows symptoms of the disease, it is usually too late to expect to save it. Usually, the owner could have saved the tree had he recognized, one or two years previously, the danger from the dead wood where the infecting beetles bred and had he destroyed the source material. The protection of elms from this disease depends entirely on preventing bark beetles from breeding, or on finding and destroying the bark beetles before they take flight from dead wood near valuable elms.

This principle of control is simple, but unfortunately the application is complicated. One would scarcely expect any community to maintain a month to month clean-up of all dead elm wood. Such a practice except where extreme precautions are desired would be both impractical and more costly than necessary. Also, it is unlikely that most owners of small properties would be able from year to year to foresee and obtain action on hazardous dead wood within 300 to 500 feet of their elm trees. This disease and the methods by which it can be controlled raise many new problems that may be outside the individual's own province.

As a partial solution of these problems the Bureau of Plant Industry, of the New York State Department of Agriculture and Markets, inspects areas where control is necessary; and suggests preventive measures to avoid likely outbreaks or to suppress further spread where outbreaks have occurred. To the extent that funds and personnel are available, trees in all cities, villages, and other residential areas with valuable elms have been inspected regularly. When heavily infested wood was found, the private owners and public officials were urged to take action. Usually they have done so. In such communities losses have been held to less than three or four elms annually to each square mile. Where control measures have been neglected, many elms have been killed. If neglect is continued, the costs of suppressing the disease may easily mount in time to a prohibitive figure. Practically all trees that are allowed to die in residential areas must eventually be removed before they cause property damage or personal injuries; therefore, it is poor economy not to remove and destroy dead elm wood promptly.

Recommendations

Elm trees are not safe from probable infection unless all bark-beetle-infested elm wood within a few hundred feet is destroyed or debarked (and the bark burned) before May 1 each year. Such infested wood may be found in large or small dead standing elms, in dead or broken branches of otherwise healthy elms, or in cut or fallen elm trees, branches, and wood on the ground. Wood piles containing elm wood are particularly dangerous (figure 5). All dead elm wood should be considered as hazardous and it should be destroyed or debarked before May 1 unless it is definitely known not to be infested by bark beetles. If the bark is removed and burned, the elm wood is no longer dangerous and may be kept for future use.

The next most hazardous sources of trouble are the dead or dying branches found in large and valuable elms when the leaves expand in the spring or in those that die during the summer months. Such dead or dying branches encourage bark-beetle visitation and feeding and may lead to occasional infection. Therefore, these branches should be pruned and burned as soon as possible.

Cut or broken elm wood should never be tolerated near elm trees during the late spring and summer months unless it has been debarked. Such wood may be a suitable place for a large summer brood of the bark beetles and may even lead to occasional infections. For the same reason elms killed by the disease early in the spring and heavily infested by bark beetles should be destroyed before the beetles emerge in August.

It would be a wise procedure also to destroy any low value elms that are not to be included in a health maintenance program. Such neglected elms within 300 to 500 feet of valuable elms can easily start trouble far out of proportion to their value. Such trees must be completely destroyed by burning, or the bark must be removed and burned.

Elms in good growing condition are less likely to develop weak branches attractive to bark beetles than are those in poor condition. Among the numerous conditions that contribute to poor growth and lack of vigor in elms and other trees are: (1) lack of fertility of the soil, (2) defoliation or other leaf damage by diseases and insects, (3) insufficient or excessive water supply, (4) mechanical injuries to roots by grading or other operations, (5) leakage from gas mains.

Fertilizing

The amount and composition of fertilizer needed to supplement any soil must of necessity vary with the soil composition. A conservative suggestion for fertilizing elms in closely clipped lawns or along streets is a

formula approximating a 5-10-5 mixture applied at the rate of 2 pounds for each 1 inch of trunk circumference, measured at about 4 feet from the ground.

The application should be made so that the fertilizer will reach the feeding roots of the tree. These extend some distance from the trunk, usually reaching out somewhat farther than the spread of the branches. The fertilizer may be applied evenly over this area, except the region within a few feet of the trunk. The method of application is most important to prevent burning the lawn grass.

A method frequently used is to place the fertilizer in holes about 2 feet apart and distributed over the area covering the feeding roots. Suitable holes may be made with a crowbar or some other implement and should be about 15 inches deep. If many trees are to be fertilized, some type of power drill is of great advantage. The total amount of fertilizer for the trees should be apportioned and distributed equally in the holes. In dry weather water should be poured abundantly into the holes to dissolve and spread the fertilizer so that it becomes effective more quickly.

The time of application is apparently not of great importance, though the greatest benefit with least loss will probably be derived from an early spring application about the time the buds are breaking or just before. A late-summer and an early-fall application might under some circumstances unduly prolong growth in the fall.

Spraying

The numerous leaf spots of elm which frequently cause defoliation, with its accompanying weakening effect, may be controlled by bordeaux mixture (4-4-50), fixed copper sprays or dusts, sulfur dust, wettable sulfur sprays, and the like. To be most effective these sprays should be applied about May 15, or whenever the buds start to open, with repeated applications at intervals of from 10 to 14 days during the first part of the growing season. For elm leaf beetle and other insects destroying the foliage, spraying with arsenate of lead as soon as the insects appear in the spring is recommended. On small trees where complete and thorough coverage can be obtained, sulfur and lead-arsenate sprays applied several times during May and June should lessen the danger of infection with the Dutch elm disease through feeding by bark beetles.² When large trees are involved, it is often impracticable for the home owner to do the work unless he has a power sprayer of considerable capacity. Such spraying may well be carried on by city foresters or other public or private agencies.

² A formula which has been used in experiments consists of about 3 pounds, lead arsenate 1 pound, and wettable sulfur in an amount which will equal about 1 pound, per 100 gallons of water.

Pruning

Weak trees or branches showing suspicious symptoms should receive special attention, and all dead or dying branches should be removed from the trees and burned. This is important. The necessary pruning to eliminate dead and weak branches should be done in the fall, winter, or early spring to destroy beetles before they emerge. Wounds made in pruning should be protected with a covering of wound dressing such as asphalt paint of the Gilsonite type.

Watering

Any condition that tends to restrict the root system of a tree or to lower the level of the ground water may cause injury by cutting down the available water supply. In the construction of sidewalks or buildings, care should be used not to sever or otherwise mutilate the larger tree roots. If these roots have already been cut, the damage cannot be wholly repaired; but the trees can be benefited in time of severe drought by supplying water to the root system that remains. Some street trees have their roots covered in large part by pavement. This may or may not be injurious, depending upon the proportion of the root system covered and upon soil conditions. In times of drought such trees should be watched with particular care for symptoms of injury; if drought conditions become acute, water should be supplied. In grading and drainage operations, the water relations of the elm root system are likely to be upset. In grading, the roots may be left more exposed or buried less deeply in the soil than they were, with the result that in times of drought the water supply to the tree will be inadequate. Such trees should be carefully watched, particularly during the first years following grading, and water should be supplied if drought symptoms become acute. Lowering the level of the ground-water table by drainage may seriously injure or even kill elm trees, particularly those that are old, unless water is supplied for the first few years after the change takes place or until the root system becomes adjusted to the new conditions.

If watering is to be effective, it must wet the soil to a depth of several feet. Casual surface sprinkling is of little or no value because the water does not penetrate the soil to the tree roots. On level land this presents little difficulty, as water applied to the surface will soak in effectively in most soils. On sloping land, however, it may be necessary to apply the water in holes, or to build small temporary dams to prevent surface runoff.

Injury from illuminating gas in the soil

Leaking gas mains sometimes cause injury to, and the death of, elm trees. The symptoms of gas injury are not strikingly different from those

of several other diseases, and the trouble is often difficult to detect with certainty. There is a yellowing of the foliage, generally weak growth, dying of the tops and terminal branches, and scaling of bark from the lower trunk. Final proof that gas is causing the trouble depends upon demonstrating the presence of gas in the nearby soil. Small quantities of gas will injure trees, and gas in sufficient quantity to be detected by odor is positive evidence that nearby trees are in danger. Trees do not recover quickly from gas poisoning. A carefully planned program of feeding, pruning, and watering may save trees if the injury is detected before it has gone too far.

Elms for Future Planting

THE presence of the Dutch elm disease in this country raises the question whether further planting of the American elm is advisable. From the information presented in this bulletin it would appear that where the elm is otherwise the most logical tree to use it may still be planted if provision is made for its protection.

In Brief

ALTHOUGH Dutch Elm disease is caused by a fungus, the bark beetle holds the clue to the control of the disease.

No absolute diagnosis of the disease from wood samples is possible except by a laboratory test to determine the presence of the fungus. External symptoms are equally unreliable in identifying an elm killed by the disease.

Protection of the elm depends entirely on preventing the breeding of bark beetles or on finding and destroying the bark beetles before they take flight from dead wood near valuable elms.

Simple precautions are:

1. Destroy or debark by May 1 all bark-beetle infested elm wood within a few hundred feet of elm trees.
2. Prune or remove all dead or dying elm branches because they encourage bark-beetle visitations and feeding.
3. Never tolerate any cut or broken elm wood near elm trees during the early spring and summer months unless it has been debarked.
4. Destroy any elms of low value.
5. To keep elms in good condition:
 - Apply fertilizer.
 - Spray to control leaf insects and diseases.
 - Prune dead or dying branches.
 - Water to maintain a water supply.

Essential Factors for a Successful DED Control Program

Any community with many elms must develop an effective Dutch elm disease control program or suffer serious aesthetic and financial losses. Therefore, officials of every city, cemetery, golf course, park institution, or organized community in Wisconsin should attempt to control Dutch elm disease if the following requirements can be met:

1. Citizens and officials have an appreciation for the elm in their province, and the effect that the loss of elms would have upon the area.
2. Local leaders are available who understand the requirements of a control program and will keep it operating, and oversee the work with competence.
3. Physical facilities available, i. e. , competent arborists and equipment to apply other chemicals properly and maintain elm tree sanitation. (Or funds to make facilities available.)
4. Reasonable isolation from wild elm areas. A community completely surrounded and penetrated with large wood lots, river and stream banks, or unattended estate areas containing elms where disease control is not possible will find the task more difficult, but control can be achieved.

Common Causes of Failure and Difficulty With DED

1. Failure of citizens to realize that Dutch elm disease is inevitable in any community with a considerable number of elms. Citizens hope that their community somehow can escape the problem.
2. Failure of citizens to realize that expense is inevitable and adequate funds must be provided to protect or remove elms.
3. Failure to realize that a Dutch elm disease control program must take precedence over some other projects. It can not be carried on only when convenient.

4. Failure of municipal officials to recognize that sound professional advice is essential and must be followed.

5. Failure of municipal officials to adopt and carry out a complete control program.

6. Undue reliance on spray programs and disregard to sanitation practices and root graft problems.

7. Lack of enforcement of ordinances.

8. Acceptance of work contracts on a cost basis rather than a quality basis.

9. Undue belief in miracle cures and preventives.

10. Ready acceptance by the public of false and misleading statements concerning the spraying portion of the Dutch elm disease control program.

No complete Dutch elm disease control program has failed. There have only been failures to carry on a control program.

Action in Municipalities Not Following Control Programs

Even municipalities that have failed to follow a complete disease control program should take some action against the disease.

The least any community should do is:

1. Enact an ordinance requiring removal and burning (or burying) of diseased trees and prohibiting the use of elm firewood or the accumulation of elm debris.

(See model ordinance.)

2. Enforce the ordinance.

3. Conduct a continuing educational campaign to keep the citizens aware of the need for following the ordinance, and willingly carrying it out.

Note! This is NOT a control program! It will help prevent an accumulation of dead trees, and, if the sanitation efforts are carried out thoroughly, should have some delaying effect upon the rate of disease spread. But it will not prevent ultimate loss of elms in communities with a high elm population. Nothing is gained by permitting dead trees to remain. Danger to property and man exists when dead trees accumulate.

An additional requirement for any community that desires to preserve the benefit of shade trees is to develop a tree replacement program.

(See sections pertaining to tree replacement.)

INVASION OF THE MIDWEST.

Illinois, Michigan, Iowa, and Wisconsin had confirmed the presence of DED by the 1950's. Confirmation usually means the first official recognition of the disease based on reliable laboratory diagnosis. Unofficially, the disease could have been present earlier either unrecognized, hidden, or ignored. In some urban settings, vigorous programs of diseased tree and wood removal (sanitation) sometimes augmented with spray treatments, significantly reduced elm losses. However, more often it was a story of too little, too late, or premature relaxation of control efforts after initial success (eg., Syracuse, New York). The result is a litany of catastrophe stories across the Midwest. An excerpt from the Wisconsin Dutch Elm Disease Manual nicely summarizes the most common causes for failure and the results. (See Appendix B1 for the more detailed text from which these causes were summarized.) Most of these observations have been validated repeatedly by painful experience in many different communities. Dutch elm disease is nearly irrepressible, and the only real decision left once it has arrived is how to deal with it. A review of the life cycle reveals why this is so.

DUTCH ELM DISEASE: AN OVERVIEW

INITIAL INFECTION.

Elm bark beetles carry DED spores from their contaminated breeding grounds (dead or dying elm wood) passively on their bodies. They feed by gnawing into the living tissue in the crown of healthy elm trees. The exposed living tissues, are then open to invasion by micro-organisms. Such feeding by uncontaminated beetles or other organisms is of little consequence to healthy elms. DED spores dislodged from the beetle into the water conducting vessels, however, will germinate and grow.

ELM RESPONSE.

The elm's response to such growth has been aptly called, "one of the lesser marvels of the Universe." Fungal toxins stimulate the tree to block the invader. The response is neither quick nor complete enough to succeed.

Fungal tissue quickly spreads stimulating more and more elm "defense" and the tree "chokes" off its water supply to affected limbs, producing typical yellowing and wilting of leaves (flagging). Such flagging and brown-grey, streaked staining under the bark of infected limbs are characteristic field symptoms of the disease and are easily read as such by trained workers. Unabated by pruning or chemical treatment, death may follow within weeks or months (seldom longer) depending on such factors as time of year, tree condition, susceptibility, or available moisture.

ROOT GRAFT TRANSMISSION.

Fungal spores may also enter through underground root grafts when healthy and diseased trees are growing next to one another (30 - 50 feet). Because this mode of transmission is very direct, infection is usually massive and wilting occurs in lower branches first, quickly spreading throughout the entire tree.

BEETLE BREEDING.

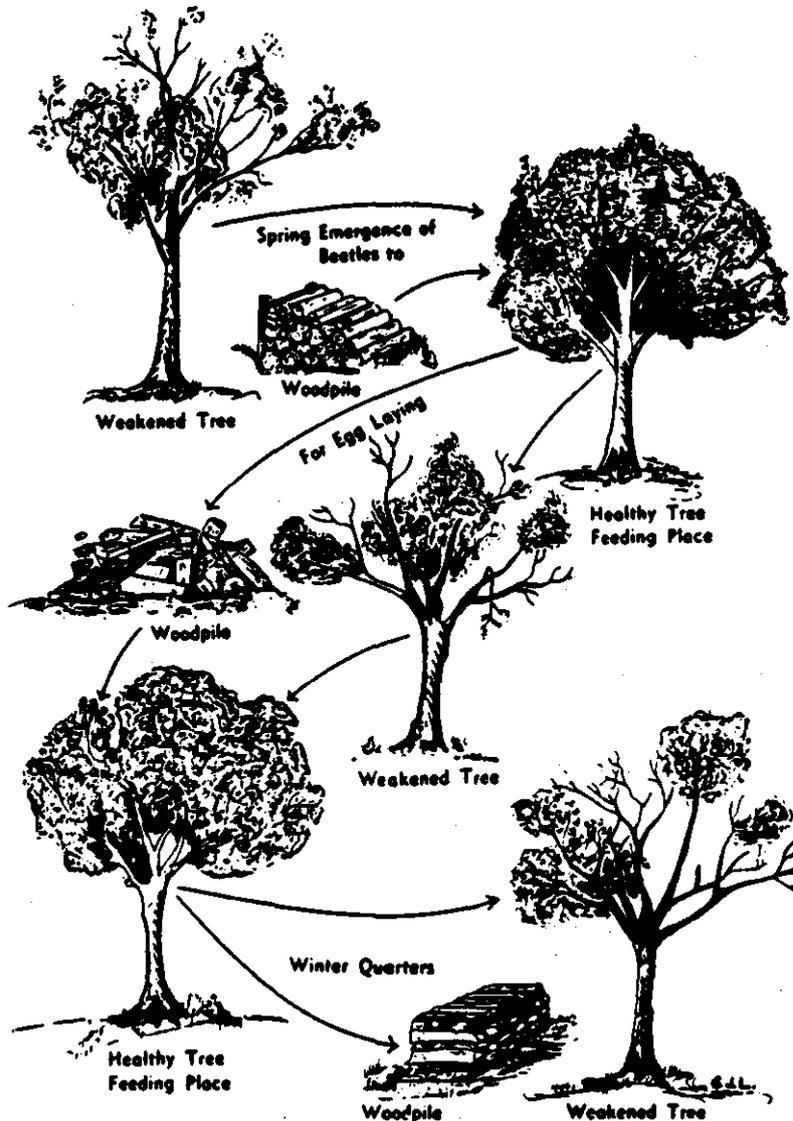
Bark beetles return, to dying trees this time, to breed by laying eggs in channels they excavate between wood and bark. The fungus soon begins to grow out of the sapwood and forms fruiting bodies (spore heads) in the excavated channels between wood and bark. Fungal spores and beetle larvae develop together. Few beetles escape at maturity without a good coating of sticky spores. The fungus is apparently of no particular value or detriment to the bark beetle other than providing them abundant breeding materials.

ELM WOOD HAZARD.

Any dying or recently dead elm wood with sufficient moisture can be used for breeding whether the tree died of DED or not. An average fireplace-sized log can house hundreds of beetle larvae and usually beetles will overwinter as larvae (European) in dead wood or adults (native) at the base of healthy trees. Severe winters with little snow cover can reduce beetle populations, but the European is hardy in about the southern one-third of Minnesota, and the native flourishes throughout the state and into Canada and is well-adapted to northern winters.

OVERLAND SPREAD.

Beetles may fly from three to six miles in search of elms. Prevailing winds may transport them considerably farther. Inadvertent or careless transport of infected wood by humans has been a major factor in spreading the disease (See Minnesota Epidemic). With a typically uncontrolled mix of dead/dying and healthy elms, disease spread is rapid and inevitably catastrophic when no countermeasures are taken. Despite years of effort, there is no cure or chemical intervention either directed at beetles or fungus which is economically feasible on the scale necessary for community-wide control or prevention. Rigorous, prompt removal and destruction (sanitation) to prevent beetle breeding remains the most reliable and often only front line of defense.



Drawing shows how the bark beetles, in their normal cycle, spread Dutch Elm Disease. Spores of the fungus are carried by the beetles as they move from infected wood to feed on the new twig growth at the tops of healthy trees. (Courtesy of New Jersey Department of Agriculture, Circular 346).

THE MINNESOTA EPIDEMIC

DED IN MINNESOTA: FIRST CASES

Minnesota remained free of DED until 1961. Numerous spot checks and samples processed at the University of Minnesota Plant Pathology laboratories during the late 1950's were all false alarms. The false alarms ended abruptly in March of 1961, when one elm at 1237 Juliet Street in the Highland area of St. Paul tested positive for DED. Later that year, the Sherburne County Extension Agent noticed some dying elms across the Mississippi River in Monticello (Wright County). Gerald Beach of the Minnesota Department of Agriculture (MDA), Plant Industry Division diagnosed seven more positive cases. Despite prompt removal and disposal of these trees, later surveys were to reveal that DED had already taken root and was spreading along the river corridor and tributaries around Monticello. It was also established in St. Paul. No European bark beetles were found in Monticello for several years. Native beetles were abundant to serve as ready carriers of DED among these wild elms.

LIKELY FIRST CAUSE.

Human transport of contaminated elm materials is the most likely factor behind Minnesota's epidemic. This unsavory assumption is based on the isolated, wide-spread nature of these initial cases and the many miles of disease-free elms separating Minnesota's elm populations from known infection centers in neighboring Iowa and Wisconsin. It is possible that DED had penetrated state borders to the south or southeast but positive cases were not identified in any of these border counties until 1967 and 1966, respectively, despite regular surveys in prime areas.

MINNESOTA DEPARTMENT OF AGRICULTURE: 1961-1976

EARLY SURVEYS: FAIRMONT TO CHISAGO CITY.

Surveillance of plant pests and countermeasures as necessary are the responsibility of the MDA Division of Plant Industry. DED monitoring and testing began in 1961. A preliminary survey for the bark beetle vectors of

DED in 1960 was negative for both species. However, by 1964, regular surveys in the Twin Cities and the most likely invasion routes to the southeast revealed European bark beetles from Fairmont north through Mankato to Chisago City, with highest population densities apparently centered in the Twin Cities area. The native beetle was generally present throughout the survey area.

DED could not be far behind. Intensified efforts to alert and educate local officials led to steadily increasing numbers of samples for laboratory diagnosis. Survey and regulatory work was largely left to municipal and county officials in 1965 and 1966. New cases in Rochester, Pine Island, and Bloomington required renewed MDA involvement in 1967. (For early University of Minnesota input, see Agricultural Extension Service Special Report 14, Appendix B4.)

For more detailed summaries of MDA activities from 1961 through 1968, see DED Biennial Reports. Reports were consolidated in 1969 and sections dealing with DED control are included through 1980. (See Appendix A1.)

By 1967, 136 positive cases were diagnosed--most in new locations. Note the Forest Pest Newsletter No. 7, October 30, 1967, for beetle and DED locations by county. That year more intensive surveys were conducted and municipal officials in about 260 municipalities were sent questionnaires and/or contacted personally by state personnel to gauge their attitudes, awareness, and needs concerning DED. Plant Industry personnel were on call to provide information and assistance. But as William Ahlberg, Agriculture Lab Technician, concluded in his 1967 report, "...there still appears to be a lackadaisical attitude of most municipal officials about the dangers of Dutch elm disease". (See Dutch Elm Disease Report, 1967 by William Ahlberg. Appendix A2.)

By 1967, DED was off and running setting the stage for much more massive and visible losses to come. Samples submitted for diagnosis continued to increase and diagnostic testing went from a "desk top" function to a regular laboratory operation.

STATE OF MINNESOTA
 DEPARTMENT OF AGRICULTURE
 DIVISION OF PLANT INDUSTRY
 670 STATE OFFICE BUILDING
 St. Paul, Minnesota 55101

October 30, 1967

FOREST PEST NEWSLETTER NO. 7

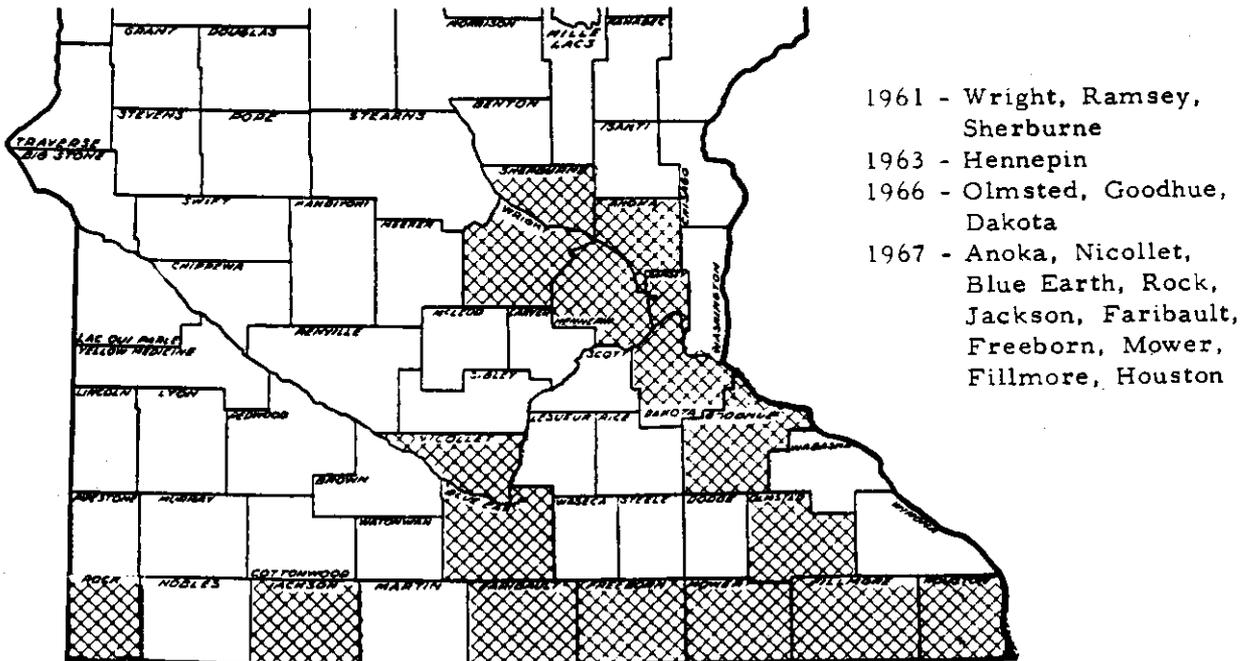
Dutch Elm Disease in Minnesota

The Minnesota Department of Agriculture, Division of Plant Industry, has diagnosed a total of 136 positive cases of Dutch elm disease out of a total of 538 samples submitted to the Dutch Elm Disease Laboratory in 1967. Positive cases of Dutch elm disease were diagnosed in nineteen new locations and in ten new counties as indicated on the following tabulations and maps. The following two maps outline: (1) Dutch elm disease occurrence by county and (2) the distribution of the smaller European elm bark beetle which is the main carrier of the disease.

The Dutch Elm Disease Survey conducted during the summer of 1967 was carried out by a Plant Pathologist and two Entomologists, who were responsible for laboratory diagnosis, general organization and follow up of the survey. Entomologist aides carried on the field survey aspects of the program. The purpose of this year's program was twofold: (1) to make a comprehensive survey of approximately the southern half of the state, and (2) to contact as many municipal officials as possible to inform and explain the advantages of a Dutch Elm Disease Program and to answer any questions which they may have on the subject.

A more extensive survey will be carried out in 1968 due to the expected normal increase of Dutch elm disease in the state.

Dutch Elm Disease Occurrence by County
 Through 1967 Season



Laboratory Diagnosed Cases by Year and City

1961 - 8 Positive Cases

- 1 - St. Paul
- 7 - Monticello

1962 - 2 Positive Cases

- 2 - Monticello

1963 - 43 Positive Cases

- 8 - St. Paul
- 4 - Minneapolis
- 31 - Monticello

1964 - 54 Positive Cases

- 3 - St. Paul
- 4 - Minneapolis
- 47 - Monticello

1965 - 23 Positive Cases

- 2 - St. Paul
- 9 - Minneapolis
- 12 - Monticello

1966 - 49 Positive Cases

- 9 - St. Paul
- 7 - Minneapolis
- 1 - Rochester
- 4 - Pine Island
- 22 - Monticello
- 5 - Bloomington
- 1 - South St. Paul

1967 - 136 Positive Cases

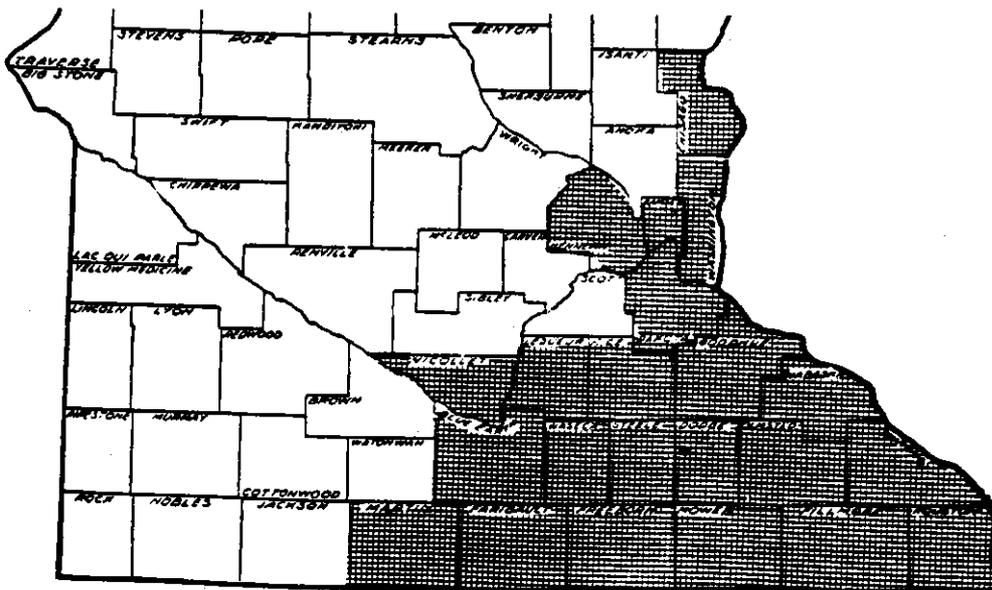
- 3 - Minneapolis
- 8 - St. Paul
- 1 - Bloomington
- *4 - Elk River & vicinity
- *1 - Luverne
- *3 - Albert Lea
- 90 - Monticello & vicinity
- *4 - Austin
- *1 - Canton
- 2 - South St. Paul
- *1 - Anoka
- *1 - North Mankato
- *2 - Rural Lakefield
- *1 - White Bear Lake
- 2 - Rochester area
- *1 - Brooklyn Park
- *1 - Mankato
- *1 - Coon Rapids
- *1 - Vadnais Heights
- *1 - Adams
- *1 - Hokah
- *1 - Zimmerman & vicinity
- *2 - Elmore
- *2 - Buffalo
- *1 - West St. Paul

There have been 311 diagnosed cases of Dutch elm disease in Minnesota since it was found in 1961.

*Indicates new locations for 1967.

Milton G. Marinos, Plant Pathologist

Smaller European Elm Bark Beetle Spread Through 1967
By County



#773

CHANGES IN THE LAW: 1967, CHAPTER 799

The MDA was conducting its DED survey program under the general provisions of Minn. Stat. 18.022. In 1967, Minn. Stat. 18.022 was expanded to include specific provisions to deal with DED. It now defined European and native elm bark beetles as pests, doubled special levy authority for financing control measures, and empowered the commissioner to enforce control programs to prevent recreational and esthetic losses if local units of government failed to do so. (See Appendix C1,2.) Statutory authority under which MDA operated is detailed in the DED Training Manual IIIA. (Appendix 84.) Municipalities were recommended to conduct programs under this statute through 1976.

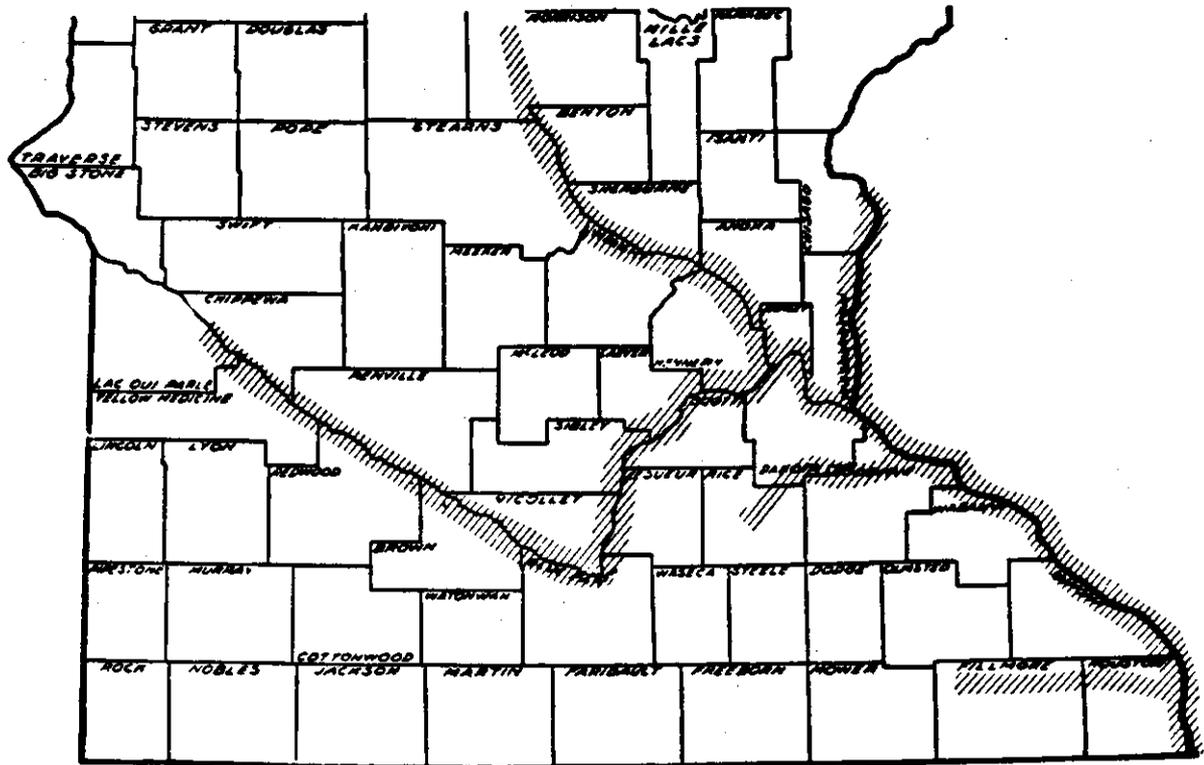
IMPACT OF CHAPTER 799.

Direct state action was implied by these additions. However, with numerous other regulatory functions and a small staff, DED survey and informational programs remained an adjunct program. State mandated programs would have been impossible to enforce and regulate without severe disruption of the other activities and the financial incentives provided by Minn. Stat. 18.022 were not very attractive. The "tip of the iceberg" was visible but not yet apparent enough in most backyards.

AERIAL SURVEYS: 1968.

Adding to the evidence that a stepped up program was necessary if the rampant spread of DED was to be curbed, aerial surveys in southern Minnesota revealed over 1,000 infections along the Mississippi River. (See Map 968 Helicopter Survey.) About 164 communities were contacted and 18 informational meetings were organized in 1968.

1968 HELICOPTER SURVEY OF D.E.D. ALONG SOUTHERN MINNESOTA RIVERS



MDA ACTIVITIES: 1968-73.

Plant Industry maintained surveys, diagnostic testing, and informational programs through 1973 using its own staff and summer, seasonal employees. Survey and control procedures and minimum recommended control strategies used are outlined in Circular 866 (Appendix B2).

St. Paul Pioneer Press

TUESDAY, AUGUST 29, 1972

ELEVEN

Dutch Elm Disease Toll Nearly Double

By 1972, 2,716 positive cases had been diagnosed, up from 1,168 positives the year before. The division's Dutch elm disease report and maps for 1972 summarize results for that year along with MDA's ongoing functions. The brochure "Let's Save Our Elms" was prepared in March, 1972, for general distribution to public and municipal officials. (See Appendix B3.)

The expectation that more municipalities, especially those in central counties, would experience first cases of DED was fulfilled in 1973 as it had been in each of the preceding years. (See 1973 report, Appendix A1.)

DUTCH ELM DISEASE REPORT 1972

The Minnesota Department of Agriculture, Division of Plant Industry submits the following report for 1972 from the Dutch Elm Disease Laboratory. Three thousand one hundred and ninety four samples were submitted between June 1, 1972 and September 20, 1972. Of these, 1,883 were diagnosed as positive for Dutch Elm Disease. The city of Austin laboratory confirmed 187 positive cases, the St. Cloud laboratory 20, and the University of Minnesota Plant Disease Clinic 147. The city of St. Paul has field diagnosed a total of 480 positive cases in addition to 319 trees diagnosed positive by the Dutch Elm Disease laboratory of the Minnesota Department of Agriculture. Cases diagnosed positive for Dutch Elm Disease total 2,717 from all four cooperating control agencies. A total of 5,827 cases of Dutch Elm Disease from mainly municipal areas have been diagnosed since 1961. This does not represent all Dutch Elm Disease in the state, as there is little sampling or surveying for the problem on rural elm trees.

There are two major rural epidemic areas. One is in southeast to south central Minnesota, centered along the Root River, Cedar, and Blue Earth River and their tributaries. The other is along the Mississippi River from Anoka to St. Cloud. Along the Mississippi many thousands of Elms have died from Dutch Elm Disease since 1961.

Positive cases of Dutch Elm Disease were diagnosed in thirty-one new locations and in two new counties as indicated on the following tabulations and maps. Fifty-four of the 87 counties now have Dutch Elm Disease. The following four maps outline: (1) distribution of Dutch Elm Disease in Municipalities (2) Dutch Elm Disease occurrence by county (3) distribution and progression of the smaller European Elm Bark beetle which is the main vector of the disease, and (4) areas of high incidence of Dutch Elm Disease in rural areas.

There continue to be three purposes in the 1972 Dutch Elm Disease program. One, to make a comprehensive survey of the southern and control areas of the state for advances of Dutch Elm Disease; second, to conduct a smaller European Elm Bark beetle survey for beetle distribution; and third to help and counsel with municipal officials in regard to their individual problems in setting up control programs.

The Department will render assistance to any unit of government in its effort to develop effective Dutch Elm Disease control programs.

In general, the Department will offer:

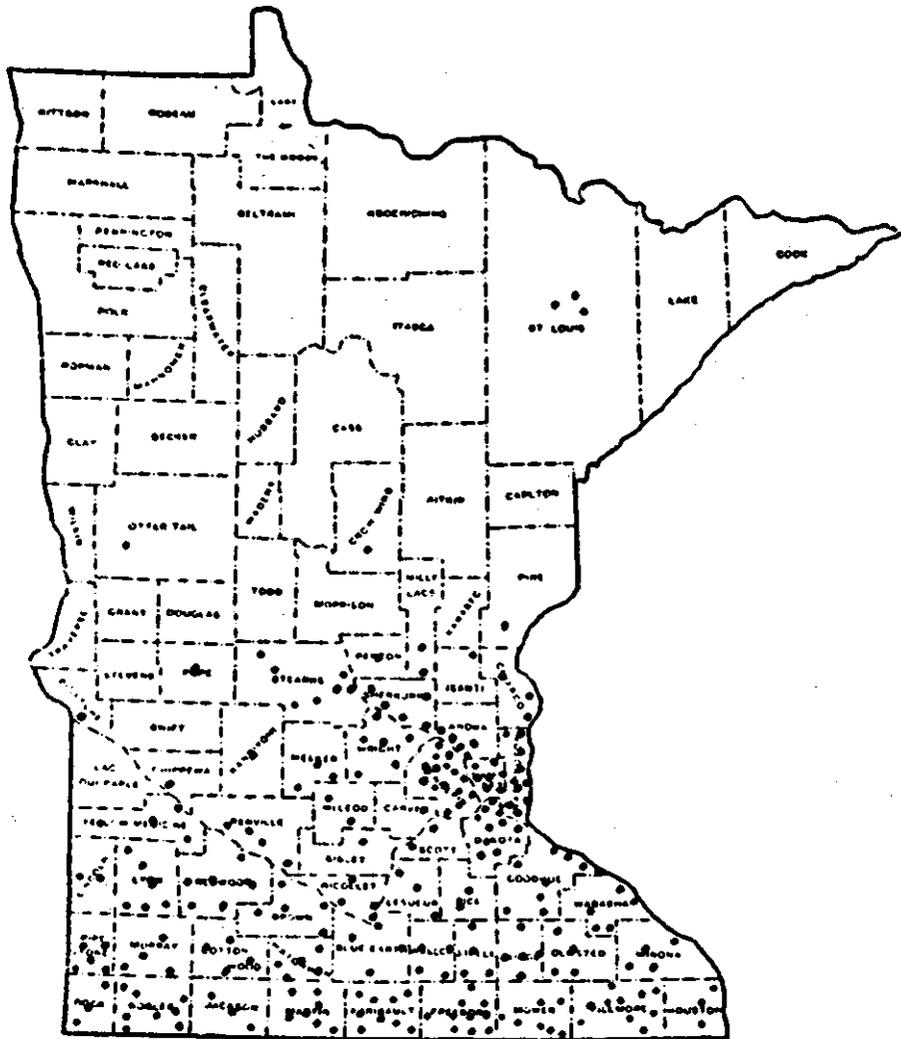
1. General control recommendations
2. Diagnostic laboratory service
3. Assistance in Dutch Elm Disease surveys
4. Educational meetings and display material
5. Assist in development of Municipal Tree Ordinances
6. Protection of public by investigation of alleged cures and preventives with proper curtailment
7. Report on status of control program

Extensive survey and information programs will be continued in 1973. It is expected that Dutch Elm Disease will increase in severity and that many more municipalities in the central counties will be finding their first case of Dutch Elm Disease.

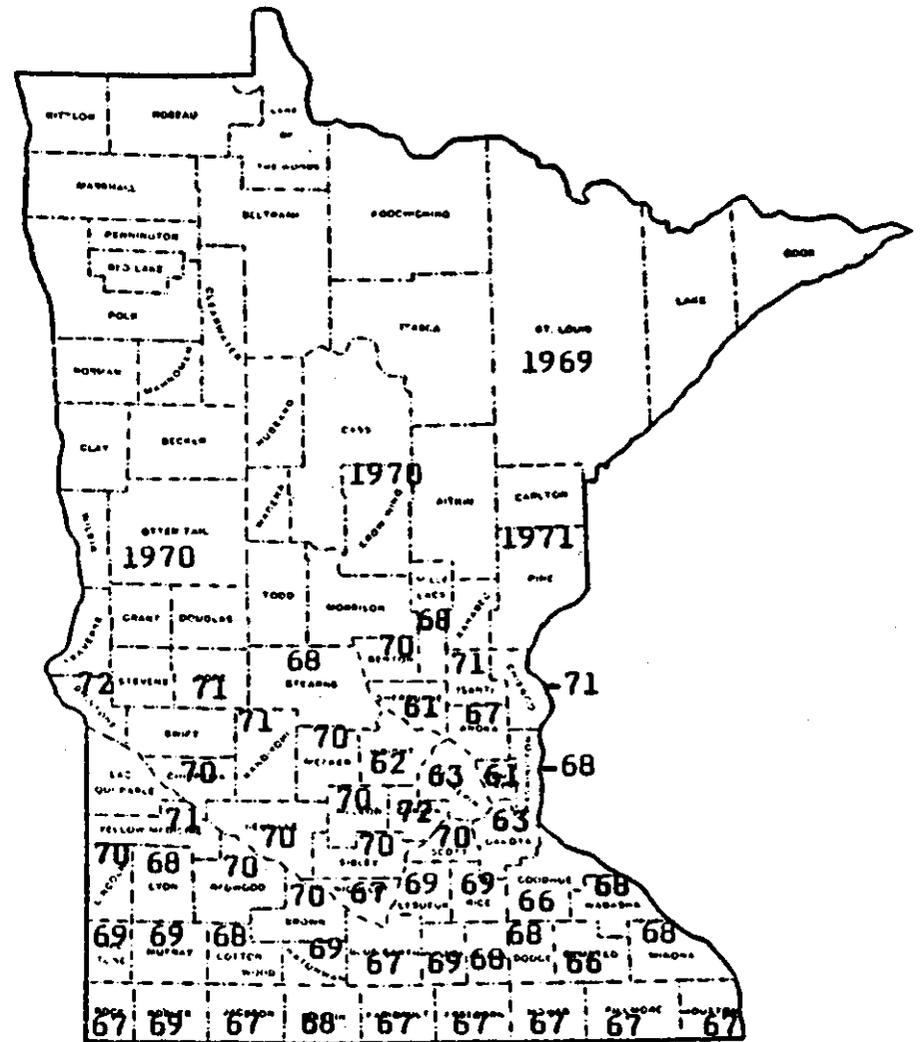
Laboratory Diagnosed Cases by Year Municipal

1961 - 8 positive cases	1967 - 136 positive cases
1962 - 2 positive cases	1968 - 283 positive cases
1963 - 43 positive cases	1969 - 519 positive cases
1964 - 51 positive cases	1970 - 795 positive cases
1965 - 34 positive cases	1971 - 1,168 positive cases
1966 - 49 positive cases	1972 - 2,717 positive cases

TOTAL - 5,287 = 1961-1972



DISTRIBUTION OF DUTCH ELM DISEASE IN MUNICIPALITIES - 1972



ANNUAL DISEASE PROGRESSION BY COUNTIES

A sudden flurry of events in 1973 had far reaching effects on Minnesota's posture toward DED. In May, Plant Industry Director Robert Flaskerd sent a letter to 854 mayors in cities, towns, and villages statewide. (Appendix A3.) His letter stressed the inevitability of DED and its devastating impact. He sought their cooperation in getting control programs started and included an application for authority to utilize the control provisions of Minn. Stat. 18.022. Guidelines were included from Commissioner Jon Wefald for transport and disposal of bark intact elm wood. These guidelines presaged a later quarantine.

Diseased elms need cutting, but there's a money problem

By **BETTY WILSON**

Minneapolis Star Staff Writer

A beautiful old elm tree died of Dutch elm disease in the village of Newport this summer. It would cost \$500 to have it removed.

The problem is the village of about 3,300 people doesn't have money to remove the dead tree or 186 other diseased elms found in Newport last summer.

Newport Mayor B. L. Loveland told a Minnesota House subcommittee yesterday it would cost \$15,790 to remove the trees. If nothing is done, the disease will spread rapidly to other healthy elms.

"We have no way of pulling this money out of our budget," and the village has other priorities, he said.

The situation in Newport is typical of the plight of other communities in the Twin Cities area, according to testimony before the subcommittee on Dutch elm disease and oak wilt.

Loveland said property owners, some of them senior citizens living on fixed incomes, can't afford to pay for the removal of diseased trees on their lots, estimated to cost an average \$80 each. Fifty of the trees are

TREES

Turn to Page 4A

TREES: Cutting costly

Continued from Page 1A

24 inches or greater in diameter, he added.

"It's pretty hard to go up to some of these people for that kind of money. They just won't do it, period," the mayor said.

Even if Newport did remove its diseased trees, he said, it wouldn't do much good, because neighboring municipalities are not doing anything to control the disease.

Another problem, he said, is that there's no place in Washington County to dispose properly of diseased trees. Newport is across the Mississippi River from South St. Paul.

There is no proven cure for Dutch elm disease, speakers said, and in the words of St. Paul park forester Lloyd Burkholder, "Everything from Epsom salts to crude oil" has been suggested. State officials recommend pruning dead tree limbs to prevent Dutch elm disease from entering the tree and removing diseased trees to stop its spread.

Dutch elm and oak wilt disease has become serious, according to speakers yesterday, in areas including:

Dakota County, especially in the northern part of the county, said Charles Lowery, county director of parks and recreation.

Hennepin County, where approximately 800 cases of Dutch elm disease were diagnosed this year. This is more than twice the number diagnosed last year, and probably about half the actual number of diseased trees in the county, said Joe Heigevold, county environmentalist. "We feel that there are more trees in Hennepin County today affected by oak wilt than by Dutch elm disease," but there is no reporting system for oak wilt, he said.

Ramsey County, where 441 cases of Dutch elm disease were reported in 1973, and where the disease has been increasing significantly since 73 cases were found in 1968.

Bloomington, where about 370 cases of Dutch elm disease have been diagnosed so far this year, and where 400 to 500 cases are expected

next year. Oak wilt, said a city spokesman, should be of even greater concern because oaks generally grow in clumps where there are no other trees, and their loss leaves large bare spots, while elms generally grow where there are other trees to fill the void.

Speakers said a county or statewide tree disease program is needed to coordinate and get uniformity in detection, inspection and removal of diseased trees and also help pay the costs. Some municipalities are doing a good job, but others are not, the subcommittee was told.

Anoka County Commissioner Albert Kordiak proposed that the Metropolitan Mosquito Control District should have the responsibility for tree disease control.

Esther Tomljanovich, of the Minnesota House research staff, told the committee a survey of tree-disease control programs showed some communities have good ordinances, "but in actual practices the programs are inadequate." She said lack of money was a major reason for inadequate programs and enforcement.



Minneapolis Star Photo by William Seaman

BARIL LOVELAND AND DISEASED ELM TREE
Newport facing problem of removal

LIMITATIONS: PERSONNEL, STATUTE.

The scope of the impending explosion of disease all too obvious to state personnel was now being noted in other quarters. However, Minn. Stat. 18.022 as constituted, despite its expansion in 1967, had some formidable limitations (Appendix C2.) Subdivision 2 set a dollar/capita ceiling on any special tax levy. Subdivision 3 set conditions for issuing certificates of indebtedness, but since the amounts of these certificates could be applied to debt limits, use of such certificates could be very prohibitive. Penalties under subdivision 5 curiously invests enforcement authority with county agents. This provision confounds authority.

On a more positive note, 18.022 authorized ordinances and resolutions to cover local control programs and authorized municipalities to collect costs for tree removal as liens on affected properties.

The statute further authorizes the commissioner to enforce programs as necessary to meet the requirements of the state and to promulgate rules.

At this time, Plant Industry was attempting to meet program needs with one full time plant pathologist and three summer, seasonal employees.

Given the cities' unattractive financial limitations under the statute and Flaskerd's critically small staff, the commissioner did not enforce 18.022.

Programs were not required and rules were not promulgated. No further legislative action was taken until 1974, when Minn. Statute 18.023 dealing specifically with DED and oak wilt became law. Meanwhile, Flaskerd succinctly outlined the DED problem and the need for three additional staff positions in a memorandum to George Steele prepared for the Governor's annual report on environmental issues. (Appendix A4.) As an environmental issue, DED was a prime candidate for attention. However, 1974 was a recession year and the three positions were denied by the legislature acting on the Governor's recommendation. (See Proposed Program Budget, MDA 1973-75. (Appendix G1.)

ARBOR DAY: 1973

Trees did get their due, if in a small way, at Minnesota's first official, State Arbor Day Celebration. Private arbor day celebrations had dropped in popularity. Plant Industry Director Robert Flaskerd and Walter Trampe, then Supervisor of Nursery Inspection, got approval of species and location from the Capitol Area Architectural and Planning Board and then approached the Minnesota Nurserymen's Association about donating a tree.



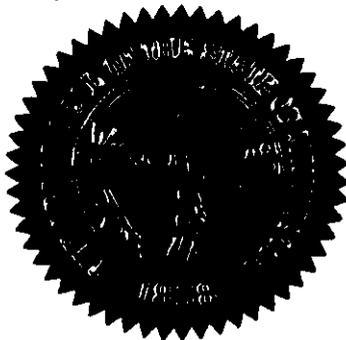
PROCLAMATION

- WHEREAS: *the tree is one of our most valuable living plant resources; and*
- WHEREAS: *the tree provides shade, beauty, protection and benefits the environment -- indeed is an indispensable asset to our ecology as an air filter, as a provider of oxygen, and a shield against noise pollution; and*
- WHEREAS: *the tree has also provided the human race with an amazing array of useful products that have helped improve the general quality of life, from the first primitive agricultural tools to today's almost infinite variety of wood, paper and plastic products; and*
- WHEREAS: *the planting of new trees is desirable and necessary to maintain the environment and provide for the wood product and comfort needs of future generations; and*
- WHEREAS: *an urgent need for new and replacement tree plantings has been created in Minnesota by the destruction already done and still inevitable to the majority of our stately elm trees by the yet unstoppable Dutch Elm disease; and*
- WHEREAS: *it is very appropriate that Minnesotans participate fully in this 101st national observance of Arbor Day;*

NOW, THEREFORE, I, Wendell R. Anderson, Governor of the State of Minnesota, do hereby proclaim Friday, April 27, 1973 as

ARBOR DAY IN MINNESOTA

and urge all citizens to participate in this opportunity to plant appropriate trees and shrubs of mixed varieties that will mutually benefit this and many future generations.



IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Minnesota to be affixed at the State Capitol this twenty-sixth day of April in the year of our Lord one thousand nine hundred and seventy-three and of the State the one hundred and fifteenth.

Wendell R. Anderson

GOVERNOR

Arden J. Erdahl

SECRETARY OF STATE

A greenspire linden was planted April 27, 1973 on the Capitol Mall off Wabasha Street under the official proclamation of Governor Wendell R. Anderson. Nursery industry representative Richard Cross, Gordon Bailey, Jr., and Gordon Swanson joined Flaskerd, Trampe and the Governor for the planting. The linden has since expired but Arbor Day took root and grew into a statewide celebration. In 1977, the MDA unofficially designated May as Arbor Month in Minnesota.

POLITICAL AND DISEASE PRESSURE JOIN FORCES.

A luncheon discussion about trees in 1973 got Representative Thomas Berg (Minneapolis) thinking about DED. He called for research into the problem and once aware of the devastating impact of a run-away epidemic, decided something would have to be done before the problem was totally out-of-hand. In the summer of 1973, as Chairman of the then Metro and Urban Affairs Committee, he activated and chaired a subcommittee on DED and oak wilt. Its purpose was to review the current situations and recommend remedial measures.

The subcommittee was aware that the Department of Agriculture had some authority for control of DED under Minn. Stat. 18.022 and called on Plant Industry Director Robert Flaskerd to testify on behalf of the MDA on November 12, 1973. (For text of this presentation see Appendix A5.) Flaskerd's presentation was not well received. The committee judged that the MDA had been ineffectual and that more had to be done. Committee members considered whether or not existing units of government were equipped to tackle the problem or whether creation of a new unit was necessary. They also met with numerous urban foresters, pathologists, and local government leaders to gauge their problems, attitudes, and awareness.

SUBCOMMITTEE RECOMMENDATIONS.

DED was a real problem and money was crucial. New legislation was needed. The MDA was selected as lead agency to spearhead the counterattack on DED. The seven county metropolitan area was to be the main target area. Sanitation was to be the major thrust of activities. Representative Berg gave warning that legislation which would require enforcement and education was imminent.

NEW STATUTE, RULES, EDUCATION.

Ester Tomljanovich, of the Revisor of Statutes Office, began drafting the legislation in cooperation with Plant Industry. Plant Industry personnel also began drafting rules and regulations to complement the statute and mailed notice to all Minnesota municipalities that DED control programs must be organized and active by July 1, 1974. Assistant Director Joe Sandve compiled a list of agencies and organizations with some interest or involvement in DED control. (Appendix A6.) Contact people from the list were to become the initial nucleus of the State Shade Tree Advisory Committee--a group of interested individuals with many viewpoints. This group was to serve in a key advisory position to the Governor and legislature in nearly all upcoming shade tree matters.

Preparations were also underway for the education, training and certification of local community tree inspectors. Certification would require an ongoing, annual educational experience. (See Appendix E1 for early topic ideas.) A battery of test questions was prepared in cooperation with the University of Minnesota and formed the basis for the subsequent certification examination. (Appendix E.)

PASSAGE OF MINNESOTA STATUTE 18.023.

Shade tree bills were introduced in the House by Representative Thomas Berg and the Senate by Hubert Humphrey III in 1974. It was not an appropriation year and there was little controversy about the content. The shade tree bill was signed into law by Governor Wendell R. Anderson on March 30, 1974. This bill marked the official establishment of the Minnesota Shade Tree Program. It required certification of tree inspectors, authorized a special levy beyond mill levy limits, and allowed municipalities to subsidize tree removal on private property. (See Appendix C1, page 2.) It further mandated that all seven county metropolitan municipalities, including townships with municipal powers, have approved shade tree programs.



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

REQUIRED PROGRAM FOR DUTCH ELM DISEASE February 11, 1974 CONTROL IN MUNICIPALITIES

The following is a required Dutch elm disease program that must be in force and actively pursued by July 1, 1974. In the event of failure to implement a program, the Commissioner of Agriculture is required to act and to enforce a program as provided in Chapter 18.022, Subdivision 7.

A Dutch elm disease program must include controlling the disease on both public and private property. This can be accomplished by the adoption of a tree ordinance or amendment of an existing nuisance ordinance with specific provisions for Dutch elm disease.

TREE INVENTORY

1. A tree inventory must be made to determine number of elms and other species on both public and private property. This should be a permanent record and should be reported to the Department of Agriculture.

SANITATION

Sanitation is the major element in any Dutch elm disease control program because it is needed to eliminate elm bark beetles, diseased trees and dead or weakened elm wood arising from any cause. This must include trees on private property.

1. Prior to April 15, check all alleys and yards for elm wood or logs that could serve as bark beetle breeding sites and require removal, or de-barking if wood is to be retained.
2. Check all elm trees at least twice during the growing season (by July 1 and August 15) to look for Dutch elm disease symptoms.
3. Remove (burn, bury, or chip) diseased or dead elm trees or any above ground parts thereof within 20 days.

ROOT GRAFT CONTROL

1. Use Vapam (SMDC) or trenching to prevent root graft spread of Dutch elm disease. Trees closer than 50 feet are likely to be grafted together.

(Over)

SHADE TREE PROGRAMS: 1974

With the law in place, the MDA went into action immediately. Rules had to be adopted within 60 days and municipalities had to appoint tree inspectors within 75 days. The Shade Tree Advisory Committee held two sessions to review the rules (See Appendix F1.) as one of its first functions and MDA staff were recruited from other projects in Plant Industry to get the program underway. The MDA developed the first, formal tree inspector workshops with the University of Minnesota Extension Service. A well attended State Fair exhibit for information indicated public awareness of DED was keeping pace with accelerated program activity. There was neither time nor money for more organized public information efforts that first year. The MDA made implementation of the law top priority. For a complete summary of 1974 activities see A Summary Report ...1974 (Appendix D1).

Despite these efforts, some communities were slow or reluctant to respond. Special follow-up contacts were made when possible.

UNIVERSITY OF MINNESOTA.

Special Report 14: Dutch Elm Disease and Community Decisions, August 1965, (Appendix B4.) was now replaced by Extension Folder 211, "The Dutch Elm Disease" which became the basic working reference for field workers and new tree inspectors.

ARBOR DAY 1974.

A Scotch pine was planted on the capitol grounds in a celebration similar to that in 1973. Efforts began to move the Arbor Day tree planting to new locations away from the capitol grounds.

1975 SHADE TREE PROGRAM AND RELATED EVENTS. APPROPRIATION YEAR 1975.

Minnesota Statute 18.023 was an important first step. It resulted in some 144 jurisdictional units appointing tree inspectors. Certification examinations were in full swing by fall of 1974. (Appendix E.) Roughly, half of the participating communities were operating at acceptable control levels as judged by the MDA staff. Considering the short time frame and the intensive effort required to get cities started in what was a new situation for most of them, MDA staff felt this was a good beginning. However, the rate of DED in a significant number of metro area cities was rapidly accelerating. Efforts to remove and dispose of rapidly building backlogs of diseased elm trees would have to increase.

STATE SHADE ADVISORY COMMITTEE.

Action to form a State Shade Tree Advisory Committee (S.T.A.C.) began with the Commissioner of Agriculture, Jon Wefald. The Committee solicited and got the active participation of highly competent individuals whose experience ranged from legislative to municipal sanitation program operations.

The University of Minnesota was well-represented by members from Plant Pathology, Entomology, and Horticulture. The members, who worked without recompense, became Minnesota's leaders in the rapidly deteriorating shade tree situation. The Committee served as both organizer and trouble-shooter for nearly all shade tree concerns, but was particularly instrumental in its reports to the Governor and Legislature.

DON WILLEKE, CHAIRMAN.

Don Willeke, a Minneapolis attorney, was appointed and remained the S.T.A.C.'s chairman. An impassioned spokesman with an unquestionable regard for trees and their importance, he became both spokesman and lobbyist for the shade tree cause. (See Willeke's keynote speech to the S.T.A.C. on October 2, 1974, Appendix F2.)

S.T.A.C. REPORT: 1975.

In its February 4, 1975, proposal to the Commissioner of Agriculture, the S.T.A.C. ranked priorities and dollars and provided the fundamental basis for legislative action that year. The report called for an appropriation of \$4,850,000. (Appendix F3.)

CITIZEN ACTIVISM.

Willeke and committee member Janette Haynes made certain all legislators got a copy of the report. Since the proposed MDA Biennial Budget for 1975-76, (Appendix G2) did not include the extra money needed to implement the S.T.A.C.'s recommendations the Governor's recommendation of \$3.2 million became the contested figure. Considerable lobbying by many concerned supporters was necessary to maintain this figure. Very similar bills were introduced into the House by Representative Thomas Berg and the Senate by Skip Humphrey (Hubert H. Humphrey III).

Nearly all who testified before committee members of both houses echoed the contents of the S.T.A.C. report. Public sentiment also was turning toward action.

MDA PREPARATIONS.

MDA representatives were called to testify before Representative Thomas Berg's House Local and Urban Affairs Committee on March 26, 1975, concerning past activities and current position. Answers obtained for questions relating to removal of diseased trees on other state properties were to set a precedent on how this was to be handled (Appendix A7.).

In a subsequent memorandum on March 26, 1975, Wefald called on the Department to start gearing up for an appropriation including selection of a new administrator to handle an expanded program (Appendix A8.).

THE BILL PASSES JUNE 2, 1975.

The amended Shade Tree Bill carried a compromise appropriation of \$1,595,000. (See Laws of Minnesota 1975, Appendix C3.) At the same time, it was compromised in another way by Chapter 437 which recast local government aids and modified local levy limits in effect repealing all "special levies" enacted in other chapters including those permitted under Chapter 355 (the 1974 Metropolitan Shade Tree Disease Control Act). Unaware of this change, some cities special levied in 1976, only to learn afterward they could not. Furthermore, since appropriated monies were specifically earmarked for subsidies to homeowners, there was no particular incentive for cities to participate in the shade tree program since public tree removal was not eligible for assistance. For a discussion of the levy problem, see page 25. Shade Tree Disease Control in Minnesota, A Report to the 1977 Legislature. Pages 25-26. (Appendix D3.)

SHADE TREE PROGRAM 1975-76

A thorough summary of 1975 shade tree activities is provided in the MDA 1975 Report to the Legislature (Appendix D2). On July 14, 1975, Peter Grills was hired to head and coordinate the grants program. Commissioner Wefald wanted a candidate with technical know-how and bureaucratic experience. Grills with a B.S. in biology, Masters Degree in Public Affairs, and grant writing experience from his previous job with the Pollution Control Agency proved a good choice. He shared office space with Plant Industry and worked closely with those staff members already involved with shade tree disease control. (Appendix H.)

GRANT PROGRAM 1975.

The grants program got off to a slow start. Of the \$800,000 available for homeowner subsidies, only \$78,702 was expended in 1975. Most cities had not budgeted for the required matching funds. Much had to be learned about grant-in-aid procedures and cities had to be sold on the program.

Grills was committed to getting cities involved. Metro cities with their grant savvy and greater administrative means were easier to involve. However, non-metro communities who applied for the program under Minn. Statute 18.022 were eligible to participate in the grants program under Minn. Statute 18.023. If the program was not to be seen favoring metro communities, outstate involvement was crucial.

SIMPLICITY/ACCOUNTABILITY.

Grills saw simplicity, accountability, and non-metro involvement as the cornerstones of a successful program and learned a crucial lesson in simplicity from an outstate community. Grills attended a city council meeting in Madison Lake to present the program and explain application procedures. As he began explaining the 12 page application package, he was stopped by the mayor who asked to see it. After one look, the mayor explained that smaller cities were unlikely to consider anything over one page. Grills reduced and simplified application procedures. Commissioner Jon Wefald was in full support of this approach and the commitment to simplicity and flexibility was a important turning point in the program's accessibility to all Minnesota cities.

In 1975, 27 communities participated in the Subsidy Program; 9 of these were outside the metro area. In 1976, 40 metro and 26 non-metro communities came under the provisions of Minn. Statute 18.023 and all of the property owner subsidy appropriation was expended by years end. For a summary report of 1976 activities, see A Report to the 1977 Legislature, Appendix D3.

State Aids Municipalities in Fight Against Dutch Elm Disease

Elm Disease



The summer of '76 saw many elms come down. This was a scene repeated on many Twin Cities streets as total losses for the metropolitan area came to more than 57,000. Photo by Mike Tomczyk.

In March of 1976, Peter Grills, director of the Minnesota Shade Tree Disease Control program, was experiencing some difficulty giving away the \$800,000 appropriated by the 1975 legislature to aid municipalities and individual property owners in their fight against Dutch elm disease. By July, when thousands of elms shading the streets and lawns of Minnesota communities had been marked for removal, the rush for help began, and by October the funds were gone.

The summer of 1976 has been a time of awakening for Minnesotans concerned about the beauty and environmental quality of their cities and towns. In many cases it has been a rude awakening, as individual property owners have not only had to face the loss of a valuable tree, but also to pay for cutting down and removal, the cost of which can range anywhere from \$100 to \$800, depending on the size and location of the tree. The costs of tree disease control traditionally have been the responsibility of local governments, but in view of the crisis created by Dutch elm and oak wilt diseases, in 1975 for the first time state funds were made available to aid indi-

vidual property owners through direct aid to municipalities.

PRESENT STATE ROLE

The state's role in the fight against Dutch elm disease, which is administered by the Department of Agriculture, presently consists of the following:

State grants to aid in the removal of diseased trees from private property. The state legislature appropriated \$800,000 for this part of the program which is actually a subsidy for private property owners administered through municipal governments. The state pays 50 per cent of the municipality's costs for tree removal; the program is flexible in that the municipality can use any formula which fits its resources. The city of Minnetonka, for example, a western Minneapolis suburb, pays for cutting and removal of the tree without any cost to the homeowner; under the state grant program this means that Minnetonka pays half of the costs and the state pays half. Other cities do not pay for cutting down the tree but do pay for its removal; again the state pays half of the cost to the municipal-

ity. Some cities use a sliding scale, with the percentage the city pays to the property owner varying according to the cost of cutting down and removing a particular tree. In all cases, however, the state matches the city's costs. Only municipalities, or townships with municipal powers, can participate in this program. One exception is Washington County which had a subsidy program for tree disease control for some five years and has continued to administer the program using the state aid now available. Sixty-four municipalities participated in the state grant program, with 26 of these cities located outside the metropolitan area.*

State grants for disposal and/or utilization of diseased trees. Under this program the state pays matching funds for construction of a disposal and/or utilization facility. Cities of more than 80,000 population and counties are eligible for these grants for which the legislature appropriated \$700,000. "We're not interested simply in providing burning sites for diseased trees," says Mr. Grills. "We would like to see the emphasis on utilization of waste wood." Under this part of the program, Minneapolis/St. Paul have

received funds to help finance a facility for making wood chips, and Hennepin County has received funds to add equipment to its existing wood chipping operation. The possibility of using wood chips as fuel is being studied.

Public education. The state legislature appropriated \$40,000 for public education which has mainly been directed toward radio and TV public service announcements.

Regulation. The state also plays a regulatory role in the fight against shade tree diseases. It checks to see that municipalities are meeting state requirements regarding employment of tree inspectors and the detection and removal of diseased trees within a specified time.

FUTURE STATE ROLE

The state's future role in fighting Dutch elm and other shade tree diseases will be considered and determined by the 1977 legislature. A Shade Tree Advisory Committee consisting of a cross section of concerned citizens has made a series of recommendations regarding the state's future role. These include:

(1) Changing and expanding the present aid program for removing diseased trees from private property to include removing trees from both private and public property and to provide funds for replanting as well. As it presently does, the state would make its grants on a matching basis to participating municipalities. Funds needed for such a greatly expanded program would also increase dramatically. The committee recommends an appropriation of \$44 million.

(2) Continuing the present grant program for disposal and utilization facilities, increasing the appropriation to \$900,000 for the biennium.

(3) Expanding the state's public education program. The committee recommends that \$260,000 be appropriated for this purpose.

(4) Appropriating \$221,000 to the University of Minnesota for research into shade tree disease control.

Other recommendations of the committee include appropriating funds for administering the grants, for Agricultural Extension to use in train-

ing local personnel, and for regulation by the Department of Agriculture. The committee also recommends enacting legislation that would allow municipalities to levy taxes for shade tree disease control outside their levy limits.

If enacted, the committee recommendations would mark a significant increase in the state's role in Dutch elm and other shade tree diseases. Whether, and to what extent the state should be involved, will be the subject of debate. The current program, for example, has been criticized by some rural residents who point out that while they pay state taxes they do not qualify for aid in removing trees from their property. Mr. Grills feels, however, that many of these critics have been persuaded to support the program when they realized that it would be economically impossible for the state to regulate shade tree disease throughout the countryside. "A definite control area is needed," he says. He also points out that the beauty and well being of the towns which serve their rural communities are important to all the area residents.

Questions of who will pay what and when will be debated, but eventually they must be answered. There will be costs no matter what is done. The total elm losses for this past summer are: 57,588 for the Twin Cities metropolitan area; 460 in Austin; 392 in Albert Lea; 1,162 in Mankato; 250 in Rochester; 800 in Fairmont; and 162 in Littlefork.

*Cities participating in the private property subsidy grant are: Bloomington, Braham, Brooklyn Park, Buffalo, Burnsville, Chanhassen, Chaska, Columbia Heights, Coon Rapids, Cottage Grove, Cottonwood, Crystal, Deephaven, Eden Prairie, Edina, Excelsior, Fairmont, Falcon Heights, Forest Lake, Fridley, Gaylord, Golden Valley, Granite Falls, Hassan Township, Hopkins, Hutchinson, Lauderdale, Lambertson, Lilydale, Little Falls, Littlefork, Madelia, Madison, Madison Lake, Mahtomedi, Maple Grove, Maplewood, Melrose, Minnetonka, Monticello, Northfield, Pipestone, Plymouth, Ramsey, Red Wing, Richfield, Robbinsdale, St. Anthony, St. Charles, St. Cloud, St. Louis Park, St. Paul, Sauk Centre, Shorewood, Spring Valley, South St. Paul, Tonka Bay, Vadnais Heights, Waseca, Washington County, Wayzata, Willmar, Winona, and Woodstock.



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SHADE TREE ACTIVITIES: 1976

The year 1976, saw the confluence of many interrelated events. Individual impacts are impossible to assess but together they pointed the way toward the largest, single purpose appropriation in the history of the state.

Fundamental to all were the elms now dying in massive numbers on boulevards and in backyards. In the prophetic words of Dr. David French, University of Minnesota's foremost authority on the disease from a letter he wrote in 1961, "If sanitation measures are not started immediately and carried out effectively, the devastation will shock the residents of this area. When that happens, it will be too late. Now is the time to do something about the problem."

Residents were shocked as predicted and 1976 was an election year. A memorandum from Nicholas Coleman, Senate Majority leader to Senate Research got Gary Botzek then of the Senate Research involved (Appendix C6) and resulted in Botzek's August 6, 1976, report. (Appendix C7.) Meanwhile, activity was accelerating on many different fronts.

DISEASE INCIDENCE PROJECTIONS.

A massive study commissioned by the Metropolitan Inter-County Council took a long-range view of the impact of DED and oak wilt on the metropolitan area. The report's main thrust was waste wood utilization. The considerable data generated was to provide useful information in analyzing various management strategies.

DED LEADERSHIP CONFERENCE.

On September 10, 1976, the Association of Metropolitan Municipalities and the Metropolitan Chambers of Commerce in cooperation with the Twin Cities Business Community sponsored the first and only metropolitan DED Leadership Conference. It was televised by KTCA and got significant press coverage. The First National Bank of Minneapolis funded the event. (For Agenda and Summary, see Appendix 11.)

ELM WATCH STARTS.

The First Bank of Minneapolis also initiated a volunteer elm "hot line" in cooperation with the Minneapolis Park Board. A elm watch center was set up to serve as a source of information and referral. The center was well-received and continued its services through 1981. (Appendix I2.)

DED ON PARADE.

Every elm in sight had red stripe of death



The Dying Trees

By DAVE DALEY
Minneapolis Star Staff Writer
EDITOR'S NOTE: This is the first of three articles on Dutch elm disease in the Twin Cities.

A bus loaded with members of the Minnesota Shade Tree Advisory Committee and reporters stopped at the corner of Fry St. and Portland Av. in St. Paul one day last month.

Tour members climbed down from the bus and slowly looked

around. To the west, down Portland, were pines of stately elms, arching gracefully over the street.

A red stripe, St. Paul's mark for a diseased elm tree, to be removed, had been painted on the trunks of every elm tree in sight.

"We're standing here in the midst of a street that next year will be naked," Donald Willeke, chairman of the advisory committee, told the group. "That's Dutch elm disease."

8-23-76
YEARS WERE spent warning

the public and city officials, but now it might be too late to do anything but cut the losses the disease is expected to inflict on the more than 300,000 elms in Minneapolis and St. Paul, tree experts say.

When city foresters and state agriculture department tree inspectors finish their 1976 tabulations, they expect to find that more than 50,000 elm trees in the seven-county metropolitan area have been infected by Dutch elm disease this year.

Last year, the figure was 25,000. Next year, at current rates and if nothing is done to slow the spread of the disease, 100,000 elms in the Twin Cities area could become infected, local experts say. And for each year after that, they say, the rate of infected trees will double until there are no elms.

Dutch elm disease has killed an estimated 1 million elm trees each year across the United States since

ELM
Turn to Page 10A

ELMS: It's worse in St. Paul

Continued from Page 1A
1930, when it was brought into the country in a load of logs.

THE DISEASE, called Dutch elm because it was first identified in Holland, spread from the east coast to the west coast and now exists in almost every state.

In the 1950s and 1960s, the disease hit many midwestern cities, wiping out many elm-lined boulevards.

The Twin Cities escaped the epidemic then, some researchers theorize, because the cold winters killed the disease's carrier, the elm bark beetle.

The first case of the disease in the Twin Cities was spotted in St. Paul in 1961. Two years later, Minneapolis had its first case.

By 1966, six cases of Dutch elm disease were reported in Minneapolis and four in St. Paul. That year the Minneapolis Park Board gave the city tree crews the authority to remove infected elms on private property.

The disease steadily spread, even though city crews trimmed infected branches and removed dead trees.

By 1973, Minneapolis had had 35 cases and the number rocketed after that, with 937 in 1974 and 1,688 in 1975.

THIS YEAR, Minneapolis Park

Department officials estimate, about 3,000 elms will be lost to the disease.

The situation in St. Paul is worse. St. Paul tree crews already have taken down about 4,000 diseased trees this year and have marked about 14,000 to be removed before spring.

Both cities require homeowners to remove diseased elms on their property 20 days after the trees have been marked, but the number of infected elms has grown so rapidly this summer that neither city has been able to meet that deadline itself.

Unless detection and removal efforts are increased substantially, Minneapolis will lose more than 95 percent of its elm trees by 1989, and St. Paul will lose a proportionate number by 1983, predicts Dr. David French, a University of Minnesota plant pathologist and a local expert on the disease.

THE DISEASE has spread so fast that local experts doubt most Twin Cities elms can be saved. All that can be hoped for is a program to spread the losses over 20 to 30 years, allowing time for new trees to mature, they say.

Willeke said newspapers and television stations have carried articles about "miracle cure" chemicals and

exotic prevention measures when they should have been stressing that prompt identification and removal of diseased trees is the only proven way to stop the disease.

"Otherwise, it's like trying to catch rats in the basement, without cleaning out the garbage," Willeke said. "The disease comes from dead elmwood and only dead elmwood. It doesn't come out of the sky."

The public, in general, has been apathetic, and diseased trees have been allowed to stand, spreading the infection further, local experts say. City councils have been reluctant to spend money to hire more persons to help already overworked tree inspection and removal crews, they say.

"People weren't listening 10 years ago when the experts were saying immediate removal of diseased trees was the only answer," Willeke said. "Now they're running around grasping at straws."

"Look at Des Moines. Des Moines doesn't have any elm trees because Des Moines officials didn't concentrate on first principles," he said. "You've got to get rid of the damned dead trees."

Tomorrow: A look at Des Moines and Ames, Iowa, two cities that lost the fight against Dutch elm disease.

Don Willeke and the S.T.A.C. took reporters on a tour of devastated areas in September.

GOVERNORS ELM CLEANUP CAMPAIGN.

Governor Wendell R. Anderson took an active interest in DED and announced a statewide elm cleanup campaign. His office coordinated the campaign, and the clean-up involved the National Guard, citizens and numerous local businesses (Appendix I3).

GOVERNOR'S SHADE TREE FOUNDATION.

Governor Anderson also prompted the organization of the Shade Tree Foundation to which corporations could make tax deductible contributions to help fund shade tree efforts. It was active through 1977 (Appendix I4).

ON THE FEDERAL LEVEL.

Senator Walter Mondale prompted U.S. congressional action on DED in 1975. Representative Donald Fraser helped expand this involvement in 1975. The resulting study reaffirmed the value of sanitation. Both Fraser and Wendell R. Anderson, now a U.S. Senator worked to expand federal involvement (Appendix I5). This never resulted in any direct aid to cities statewide, but federal funds financed the Federal Demonstration cities project in Minnesota.

FACT FINDING.

Education and re-education was a never-ending process. In September of 1976, members of the House & Senate Research, a member of the MDA and representatives from Minneapolis, St. Paul, and other agencies flew to Detroit to review removal and disposal techniques and federal beetle survey methods. They went to Illinois to review BenomyI injection techniques and to see an excellent program in action. The trip was planned by Legislative Research for the benefit of the Research staff and Legislature.

EARLY PREPARATIONS.

Legislative committee meetings began, fall of 1976. (For MDA presentation, see Appendix A9.) On October 18, 1987, the S.T.A.C. proposal for Fiscal Years 1978-79 was approved and formed the basis for final legislation. (Appendix F4.) Senator Nicholas (Nick) Coleman announced that a legislative proposal to channel some \$25 million dollars into DED control was imminent. (Appendix I7.)

\$65-million elm cost to state seen

By ROBERT J. O'KEEFE
Staff Writer

182.1
A legislative committee was told Tuesday that the cost of removing and replacing diseased elm trees in Minnesota during 1977-78 could exceed \$65 million.

The estimate came during an afternoon of testimony telling of a dismal future for elm tree survival in Minnesota and pleas for the state to increase the financial aid it gives local government units in combatting Dutch elm disease.

Speakers included Mayor George Latimer of St. Paul, who said the city has a good program of fighting the disease but needs more state assistance.

Gary Botzek, a member of the state Senate research staff, presented a 25-page report concluding with a table showing the 1977-78 cost at \$65.9 million.

During 1977, he said, elm tree losses in the metropolitan area are expected to reach 100,000 trees, with the figure doubling in 1978.

Outside of the metro area, a 17,000-tree loss next year is expected to reach 35,000 in the following year.

Removal and replacement, Botzek said, could be \$21.93 million in 1977 and \$44.05 million in 1978.

Two-thirds of the cost would be for removal, partly because the number of trees destroyed would be greater than the number planted.

A good program of tree removal

and disposal, Botzek said, could cut the cost substantially, especially in the second year.

Latimer proposed a three-point program for St. Paul:

MATCHING FUNDS from the state to pay for half the cost of removing diseased trees from public and private property in the city. He said the cost to the state in 1977 would be \$2.7 million. "Without this money . . . we will have lost the fight against Dutch elm."

MATCHING by the state of \$1.5 million the city has allocated for planting of replacement trees next year.

LEGISLATION to provide a tax credit or a system of reimbursement for residential property owners who incurred expenses for the removal of diseased elm trees prior to this year. The number is estimated at 3,000.

This year, the city is reimbursing property owners for diseased tree removal costs. The Senate staff said research shows no other metropolitan area where total cost of private elm removal is picked up by the city.

The Senate research staff said there are 4.9 million elm trees in the metro area and 140 million elsewhere in the state.

Dutch elm disease was first noticed in Minnesota in 1961 when eight cases were reported. This year the figure is expected to be 60,000.

The total cost of removing and replacing every elm in Minnesota is estimated at \$32.6 billion. "Such an effort is out of the question," Botzek said.

CITIZENS LEAGUE STUDY.

The citizen's League (an independent, non-partisan educational organization organized in 1952 to study issues relating to government planning, finance and organization) studied DED and oak wilt in the metropolitan area. For results of this study see Appendix I6.

MDA INPUT/ACTIVITIES.

Dying trees and election year sensitivities made DED a priority issue. Peter Grills, Program Administrator, made numerous appearances before City councils, community groups, candidate sponsored meetings, schools, clubs, etc., in fall of 1976. He also worked closely with Gary Botzek of Senate Research on plans for the next biennium. The S.T.A.C. reviewed these plans and used them in formulating its Proposal to the Legislature for Fiscal Years 1978-1979. Total dollar recommendation for the biennium was \$45,803,000. (Appendix F4.)

ARBOR DAY 1976.

A celebration Friday, April 30, 1976, in Mears Park, St. Paul featured M.C. Bud Kraehling, WCCO TV, Agriculture Commissioner Jon Wefald, St. Paul Mayor George Latimer, Don Willeke and announcement of the Minnesota Historical Society's Heritage Tree Program. A sugar maple was planted. The program was coordinated through the MDA, by William Bulger, Plant Industry Division. Music was supplied by a local high school drum and bugle corps.

SHADE TREE PROGRAM 1977

1977 LEGISLATIVE SESSION.

Many shade tree bills were introduced in the House and Senate. Ten required Fiscal Notes (impact analyses from the MDA). House File 215 authored by Thomas Berg and Senate File 32 authored by Skip Humphrey, predominated. (See MDA Fiscal Note, Appendix A13.) Peter Grills and S.T.A.C. resource people were available to provide information. (See Appendix A10, 11, 12.) For a mid-session report see House Majority Research Focus on: Shade Tree Disease Control (Appendix C8). Representative Henry Kalis was a firm House supporter particularly concerned with reforestation, but overall House support was not very great. Berg's bill had to hurdle the committees on Local and Urban affairs, Government Operations, House Appropriations, and the Tax Committee. Major questions centered on who would benefit and by how much. Urban versus rural differences emerged and many modifications were made.

3-25-77
Lawmakers add to budget
GOLDEN VALLEY SUN T.P.R. /
for diseased tree control P-1

By JOHN KOSTOUROS

A bill that would appropriate \$35 million over the next two years for diseased tree control and reforestation passed the House Local and Urban Affairs Committee Tuesday.

The bill is \$8 million more than Gov. Rudy Perpich has budgeted for the program and exceeds by a similar amount the appropriation approved by the Senate Agriculture Committee last week.

Rep. Tom Berg, the chairman of the house committee, tried to make the bill passed Tuesday a committee bill, which would have listed all committee members as authors, but was forced to withdraw his offer when several committee members objected.

The House bill would spend \$26 million for diseased tree removal, \$7 million for replanting, \$250,000 for public information, \$120,000 for research at the University of Minnesota on treatment methods, and \$300,000 for administrative costs.

The bill would also set aside \$700,000 for grants to cities having populations over 40,000 which wish to establish wood use recovery plants.

One of the more controversial aspects of the House bill is that it would prohibit cities from charging special assessments to homeowners who have trees removed from public property in their neighborhoods. Instead the cities would have to pay for the tree removal programs through property taxes.

Under the house bill the state would pay up to 25 percent of the cost of removal of diseased trees on public property, but would not contribute to removal of trees from private property.

The committee rejected the idea of using tax credits and tax deductions to help homeowners defray the cost of removing diseased trees, according to Berg, because the plans were "too costly."

Most of the debate on the bill centered around the \$7 million the committee voted to spend for reforestation, with several representatives objecting to what they felt was an unwarranted expense.

Berg said after the meeting that he expects the House bill to be pared down when it reaches a conference committee designed to iron out differences between the House and Senate versions.

Berg predicted that the reforestation appropriation will be reduced by as much as one half in order to make the bill acceptable to the Senate. Berg made it clear throughout Tuesday's meeting that he is not committed to preserving the reforestation section of the bill.

An advisory committee had recommended earlier that the state spend up to \$21 million for replanting. A special subcommittee established specifically to deal with the diseased tree question recommended the \$7 million figure.

The bill will go next to the House Tax committee, where it is expected to pass without major opposition.

Critics and proponents of the bill combined to support a clause in the bill that leaves to local officials the decision of whether to participate in the grants-in-aid disease control program.

Conferees agree on shade-tree bill

By Jack Coffman
Staff Writer

782
Members of a House and Senate conference committee agreed Tuesday to spend \$28.5 million over the next two years to help Minnesota's urban areas cope with rapidly spreading shade-tree diseases.

5-11-77
The agreement is a compromise between bills passed by the two houses earlier. It is aimed at slowing the advance of Dutch elm and oak wilt diseases.

TKid
Rep. Tom Berg, DFL-Minneapolis, chief sponsor of the House version, said the agreement produces the first significant state funds for the shade-tree effort.

The agreement to be voted on later this week by the two houses

provides \$21.7 million to cities for clearing out and trimming diseased trees. This state money would provide 45 percent of the clearing cost, with local money making up the rest.

The appropriation would provide \$4.4 million to communities for replanting; \$550,000 for projects to use the wood from diseased trees; \$225,000 for a public information program; \$400,000 for experimental programs; \$300,000 for administration of the state program; \$100,000 for research by the University of Minnesota; \$250,000 for training by the university agriculture extension, and \$625,000 for the Department of Natural Resources.

The House version of the bill had appropriated \$34.3 million for 32 months. The Senate bill provided \$27.6 million for 18 months.

The conference committee agreement, which cannot be amended by either house, stipulates that no more than two-thirds of the appropriation can be allocated to the Twin Cities area.

The size of the appropriation indicates the rapid increase in the disease. Two years ago the state appropriated \$1.5 million for a shade-tree disease program.

5-11-77 TKid

FINAL PASSAGE.

The Senate bill had strong support from Senators John Chenowith (St. Paul), Steven Keith (Minneapolis), and William Luther (Minneapolis), as well as, Senate Majority Leader Nick Coleman. Rural legislators were not particularly supportive in either house. The bills emerged with major differences. A satisfactory compromise was reached late in the session, passed by a safe margin, and was signed into law by Governor Rudy Perpich on May 18, 1977. For a brief overview of legislation see Gary Botzek's Minnesota Shade Tree Legislation 1977, and Senate Research Papers (Appendix C9).

The Legislature '77

2A *

the minneapolis star

Sat., May 14, 1977

Perpich expected to sign tree-disease bill quickly ^{182.1}

By BLAIR CHARNLEY
Minneapolis Star Staff Writer

About 100 bills passed by the Legislature are to arrive in the governor's office Monday. One that's likely to get quick approval is the shade-tree-disease bill passed yesterday by the House.

Although no time for a signing ceremony has been set, Gov. Rudy Perpich is expected to sign the bill soon because "the beetles are flying."

The House voted 89 to 36 yesterday to accept the conference committee compromise that the Senate

had accepted the day before.

THE FINAL VERSION of the bill provides \$28.5 million to fight Dutch elm disease and oak wilt in 1977 and 1978. The major share, \$21.6 million, is for matching grants to communities for removal and disposal of diseased trees.

The next largest item in the bill is \$4.4 million for matching grants to plant new trees on public property.

The other appropriations include: \$625,000 for the Department of Natural Resources for removing trees on its property near cities and in parks. The House had provided no money for this, saying the department could find the money elsewhere, and the Senate had provided \$1.2 million.

\$350,000 for equipment to make usable wood out of diseased elms, or to dispose of elm wood.

A total of \$500,000 for research. Debate in the conference committee turned into a slugging match between the Senate and House bills. The Senate had provided \$27.6 million over 18 months and the House had provided \$34.2 million over 36 months.

Though the House provided more dollars, the Senate bill actually was more generous because of the shorter time in which the dollars would be spent.

The chief sponsors of the bills were Sen. Hubert H. Humphrey III, DFL-New Hope, and Rep. Tom Berg, DFL-Minneapolis.



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EDITORIAL PAGE

4

Mon., May 16, 1977

State aid for shade trees

182.1

The shade tree disease control bill that came out of a legislative conference committee last week is as responsive and responsible an order for attack as could be expected. It is a compromise between House and Senate bills, of course, and also attempts to find acceptable middle ground between other divergent interests.

Combatting Dutch elm disease and oak wilt was almost an apple pie issue in the legislature this year, although some outstate legislators chose to view it as a "city" problem, like crime in the streets. The big questions were how much money should be spent, and in what ways. In the end, even outstaters were mollified with a provision that no more than two-thirds of the appropriation could be spent in the Twin Cities metropolitan area.

This provision may have been born of spite, but we won't quarrel with it. A statewide effort was called for.

The bill calls for an appropriation of \$28.5 million over the next two years. This is considerably less than the Shade Tree Advisory Committee had recommended, but more than Gov. Perpich asked for. Just for comparison, the current state effort is \$1.5 million.

The bill allocates money in all the right places: sanitation (trimming and removal); replanting; research, education and experimentation, and recycling.

Some of the bills introduced this session called for setting a dollars-per-tree limit on sanitation aid. This approach was opposed by those on the firing line; they argued for an overall 50-50 cost split for tree removal. The conference committee bill sets no dollars-per-tree limit, but the state's \$21.7 million for sanitation is to provide only 45 per cent of each city's local effort.

Various replanting proposals ranged from \$2 million to \$5 million. The conference committee settled on \$4.4 million — a compromise on the high side. Advocates of various treatment programs are most likely to be disappointed. The conference committee bill provides \$400,000 for experimental programs and \$100,000 for research at the University of Minnesota. Treatment, as opposed to an emphasis on removal, is especially important in dealing with oak wilt disease.

All in all, it seems a good — and needed — piece of legislation. We trust the various local programs will be carefully monitored for future review. The ravages of these diseases cause enormous expense, whether communities "fight" or merely sit back and try to absorb their losses. It will be good if future legislative sessions are able to assess the relative effectiveness of various approaches taken in the state in the next two years.

SHADE TREE PROGRAM 1977

EARLY EVENTS.

Peter Grills, Administrator, was heavily involved early in 1977 with in legislation and planning for the much larger grant program the new legislation would allow.

The Shade Tree Division was moved to 600 Bremer Building from the State Office Building headquarters June of 1977.

Four new staff members, Walter Eisner, Mary Davies, Art Meinke, and Richard Zasada, formerly with the Governor's Elm Clean-up Campaign transferred to the Shade Tree Division and began working with the staff on board to prepare for the new program. (See Appendix 14 for LAC notes on position requests and organization chart 1977 Appendix H.)

FIELD REPRESENTATIVE PROGRAM.

Cities began calling the Governor's Manpower Office, which coordinated federal CETA funds, about funding for tree inspectors. The new legislation would require cities to have full-time tree inspectors. The Governor's Manpower Office called the Shade Tree Office to find out what kind of reimbursement would be forthcoming from Shade Tree for tree inspectors. Peter Grills and Walter Eisner seized an opportunity. Shade Tree funds would not apply to tree inspectors salaries but a CETA grant might. They contacted the Governor's Manpower Office about hiring a crew of tree inspectors on CETA funding. The Manpower Office was sold on the idea, guided Eisner through the application process, and some 33 people were hired through local Job Service Offices within 2 weeks. They came to the Twin Cities on their own funding, and underwent a crash course on DED and the Shade Tree Program. All had to pass the certification test before they took up regional, outstate assignments as tree inspectors and regional coordinators. The field representatives helped cities prepare budgets, get organized to operate disease control programs, and apply properly to the Shade Tree Program. Walt Eisner supervised the field representatives through their termination in June of 1978.

PROGRAM CHANGES.

Changes in the law altered the early subsidy grant program substantially (for summary of changes see Appendix C1, page 2). Regional meetings, the first of many, were set up in late May and early June to explain the new program. Grant forms and procedures had to be prepared and in place quickly. Emergency rules were adopted June 30, 1977, and formed the operational base for the new program. See Emergency Rules, Appendix C5.

MISSING COMPLEMENT.

A crucial legislative oversight had to be resolved. Budget allocations were not accompanied by complement authorizations for an administrator, planning grants analyst, information officer, or three clerical positions. Authorization was granted by the Legislative Advisory Commission through June 30, 1979. (Appendix 14.)

NEW LEADERSHIP.

Meanwhile, Jane Meyer, hired in June, took over as Grants Analyst. Her memorandum of July 15, 1977, summarizes program activities to that date, and another dated July 19, 1977, summarizes program organization (Appendix A15, 16). By August 3, 1977, 571 communities had made application, exceeding "anyone's greatest expectations". (Appendix A17, A18.) Not all was smooth sailing. Some cities were disgruntled over the cost sharing aspects of the program, and the misinterpretation of "town" to mean any small city of under 1,000 in population produced a bitter backlash. Legislative intent needed clarification. For a review of these problems, see Peter Grills' memorandum to Tom Kalitowski, Assistant Commissioner and Legislative Liaison. (Appendix A19.)

It was in this milieu that Jane Meyer, now in the midst of the program was appointed Administrator at the end of August. Questions of program accountability had to be addressed, (Appendix A20.) applications for 1978 prepared, and amendments to the 1977 legislation evaluated as to program impact. A contract with Tymshare of Bloomington was started at this time, to utilize computer analysis on program data. However, computers would not solve

the problem of poor base inventories, poor record keeping, biological and other variables which compromised attempts at objective program evaluation. The Federal Demonstration cities were established with a view to clarify these variables. Eventually, the program data did reflect control results, but reliable assessment techniques were a difficult problem.

By the end of 1977, an experimental grant review committee was established (Appendix A21), wood utilization grants were underway, a full-time grants analyst was hired, and the field representatives were actively involved in helping cities.

Lagging tree removals and administrative "loopholes" often centering around the problem of legislative intent were called into question by the news media and public, but by the end of the year program officials could promise an improved 1978 program. For analysis of community reaction see Appendix A23. For a thumbnail summary of program activities see Appendix A22.

ARBOR DAY: 1977.

Governor Rudy Perpich, a firm program supporter put his Aesthetic Environment Program workers behind the 1977 program. (Appendix A24.) Walter Eisner took charge of the project and got the Jaycee's involved in a statewide planting program. Public service announcements were prepared featuring prominent sportsmen, and an Arbor Month booklet designed by Shade Tree was funded by Dairy Queen through the Governor's Shade Tree Foundation.

SHADE TREE PROGRAM 1978

AMENDED LEGISLATION.

MDA reaction was required on a number of proposed amendments to the 1977 Shade Tree law. Many were worthy in principle, but more applicable to well-organized metropolitan area communities. For MDA response see Appendix A25. For final amendments enacted see Laws 1978, Appendix C3, Appendix A14, or MAMA Summary, Appendix A26.

NEW RULES.

New rules required by the 1977 legislation were subjected to exhaustive public hearings. Completion of this process was a major accomplishment in 1978. (See Minnesota Code of Agency Rules 1978, Appendix C5.)

PROGRAM OPERATIONS.

By now administrative procedures were routine. A Program Manual was mailed to cities to facilitate application procedures (Appendix A27). The plant health specialists had been assigned regional and individual administrative functions, application review procedures were standardized, and the program was really in place.

Positions for two new staff members to operate the mobile education trailer and to coordinate Arbor Day were approved by the Legislative Advisory Committee (Appendix A14).

PIGSEYE BURNS.

Open burning of elm wood, a fast and efficient disposal technique, had been opposed by the Pollution Control Agency (PCA) from the start. PCA was under a mandate of the Environmental Protection Agency to lower air pollution. The Pigseye wood utilization site established under the 1975 program was expected to ameliorate the metro area's tree disposal problems, but it was soon mired down with problems. A conflagration on May 12, 1978, ended most of the mounting wood storage problems. For a brief summary from the Shade Tree Grant files, see Appendix A28.

ELM WOOD QUARANTINE.

Significant opposition was encountered when Agriculture Commissioner William Walker announced a quarantine April 24, 1978, severely restricting the movement of elm wood. Questions of enforcement were a major issue. The idea was to further emphasize the dangers of bark intact elm wood. The April 24, 1978, version was amended August 15, 1978 (Appendix A29).

ARBOR MONTH 1978.

Arbor Day and Arbor Month celebrations were big events this year. Clare Rossini was hired December of 1977, and had until April to organize statewide Arbor Day celebrations. Posters, teachers planning guides, community planting guides, flyers, and other materials were utilized to enlist school children and adults into planning and actively participating in tree planting celebrations. Arbor Month was used to promote reforestation.

For a complete overview of calendar years 1977-78, see Minnesota Department of Agriculture Report to the Legislature.

SHADE TREE PROGRAM 1979

LEGISLATION.

Dollars were more controversial this year. Representative Thomas Berg was no longer present to pilot shade tree legislation through the House. House Bill No. 277 was introduced by Representative Ray Pleasant (Minneapolis). The Senate companion bill, Senate File 519, was introduced by Howard Olson (St. James). Senate support remained strong. House support was flagging. The Senate's bill called for about 30 million, the House bill, about 10 million. Once again, the S.T.A.C. Report's recommendations were substantially incorporated into the legislation. That report recommended about 36.5 million. (Appendix F5.) The Shade Tree budget was now a line item on the MDA's budget request set at 27.6 million. The Governor's recommendation reduced this amount to \$25.6 million. The bills went to conference committee and a compromise figure of \$25.6 million was the result. The Shade Tree appropriation was one of the last items settled. The legislation was approved May 29, 1979, well into the next disease control field season.

LATE APPLICATIONS.

Once the bill was signed, applications were mailed and processed throughout the summer of 1979. Regulatory staff were heavily involved in this process and few inspections could be made. Applications for 1980 dovetailed with those for 1979 as preparations for 1980 got underway.

REIMBURSEMENT RATES.

Cities had overestimated on their original budgets and final reimbursement rates were made at 50 percent. The legislation combined sanitation and reforestation funding considerably simplifying payment and municipalities of under 4,000 were eligible to receive 90 percent reimbursement for the first 50 trees planted on a one time basis. Under 1977 laws, reforestation reimbursement was only available up to the number of elms or oaks removed. Reforestation was given added emphasis by the new legislation.

For a summary of 1979 activities, see Shade Tree Program 1979 Report to the Legislature.

SHADE TREE PROGRAM 1980

NEW DIRECTOR.

February of 1980, Richard Haskett took over as Director of the Shade Tree Program. Haskett reorganized the administration and streamlined the operation of the program. Over 400 field inspections were conducted in 1980 and the Shade Tree Program now had a full and stable staff complement.

TREE INSPECTOR WORKSHOPS.

Beginning in 1980, the Shade Tree staff assumed a much greater role in the organization and conduct of the workshops. Their efforts culminated in 1982 with the production of a A Guide to Community Forestry. This notebook will serve as a thorough reference and resource for community tree workers in years to come.

PREPARATIONS FOR 1981.

The S.T.A.C. began preparation for the 1980 Report to the Legislature. Shade Tree Year End Reports indicated tree losses were down and trees planted exceeded trees lost--evidence of a successful program. The S.T.A.C. Report of November 24, 1980, stressed the need for continued vigilance. (Appendix F6.)

SHADE TREE PROGRAM 1981

LEGISLATIVE SESSION.

The MDA budget request was 22.5 million for the biennium. The S.T.A.C. Report recommended \$25.6 million. In January the Governor's recommendation was set at 20 million and dropped to \$10 million in March, as fiscal problems continued to surface. House support dropped to \$0 and the Senate held steady at 10 million. Trees were now pitted against seemingly more urgent budget items, and a compromise was reached at 7 million for the biennium with 4.5 allotted for 1981 and 2.5 million for 1982.

FISCAL CRISIS: 1981.

On March 6, 1981, Governor Albert Quie's Executive Order No. 81-2 went into effect. It restricted spending on all but essential services to help ensure that the fiscal year ending June 30, 1981, would end with a balanced budget.

PROGRAM OPERATIONS.

Preliminary applications had been returned by over 400 communities fall of 1981 based on 50 percent reimbursement. At these levels, Shade Tree reimbursement based on 4.5 million was very low. Cities were asked to revise their budgets based on a more realistic rate of 25 percent. Unexpectedly, many cities revised their budgets upward further complicating Shade Tree's problem.

7 MILLION TO 0.

In subsequent moves to save money all of Shade Tree's unexpended general fund appropriation had been eliminated as part of the MDA's cost reductions. Subsequent Special Sessions of the Legislature made further reductions in the 1981-83 appropriations and the Third Special Session eliminated the program outright. See Appendix A30 for budget reduction summary.

Minneapolis Tribune



Established 1867

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10A.

Monday, February 15, 1982

State's shade-tree program in doubt

The Minnesota Department of Agriculture's 1981 report to the Legislature on the state shade-tree program puts the best possible face on a program with a doubtful future. Despite cutbacks in state support for local efforts to control dutch elm disease and oak wilt, the report notes, tree losses were held down again last year. It was "a good year for Minnesota's community forests," Agriculture Commissioner Mark Seetin wrote.

But how long can the good years last? Since the shade-tree program began in 1975, the state has reimbursed 50 percent of local communities' costs for removing diseased trees and planting new ones. Last year, the reimbursement level dropped to 18 percent.

Some cities — Minneapolis among them — were able to carry on their removal and reforestation programs using reserve funds. Throughout the state, tree losses totaled 112,000 — about the same as in 1980, and far below the record 251,000 trees lost in 1977, when local programs were just getting under way. But funding cuts have had an impact, nonetheless. If cities were to keep on removing diseased trees, they had to reduce other efforts. One major result was a sharp decrease in the number of replacement trees planted — 92,000,

compared to 150,000 the year before.

Keeping up with tree disease is not going to get any easier in the years to come. The state's financial bind makes restoration of state reimbursement funds unlikely. Local governments, also in a bind, must make cuts of their own — such as the 50-percent reduction in tree replanting recommended last week by Minneapolis Mayor Don Fraser. And while a hard winter may temporarily lower the population of elm-bark beetles, Dutch elm disease has already begun moving into new areas of the state.

Serious setbacks in Minnesota's fight against tree disease would mean more than aesthetic losses. A healthy boulevard elm in a city is worth about \$750, the Agriculture Department estimates. In a yard and shading a house, the same tree's value rises to \$810. A similar-sized oak, maple or ash is worth four or five times that amount.

Clearly, Minnesota and its cities cannot afford to fund the shade-tree program at the level of the last few years. But neither can they afford to abandon what has been one of the nation's most successful efforts to control disease and replace lost trees.

CITIZEN SUPPORT.

In a study by the University of Minnesota Center for Urban and Regional Affairs funded under a Shade Tree Program experimental grant, citizens indicated strong support for shade trees. The Shade Tree Program was judged a success by most measures. See CURA Reporter, Volume XI, Number 3, Appendix A31.

For a summary of 1981 activities, see Shade Tree Report to the Legislature 1981.

SHADE TREE PROGRAM 1982

1981 COSTS REIMBURSED.

By February 15, 1982, all requests for payment for 1981 had been received. The reimbursement rate was calculated on actual costs incurred, and amounted to 12.5 percent for metro and 16.35 percent for the non-metro communities. With these payments, all of the \$2,624,600 funds remaining for fiscal year 1982 were expended.

1982 WORKSHOPS.

Despite the bleak outlook for the Shade Tree Program, the Tree Inspector Workshops were well attended and received. Participants were pleased with the notebook and appreciated more active involvement in the workshop program.

ON-GOING PROGRAMS.

Over 430 communities filed intent with the MDA to continue their shade tree programs in 1982.

PUBLIC INFORMATION.

For a summary of the evolving role and mission of the program, see the Public Information Summary, Appendix B5. See Appendix J for Shade Tree Program newsletters 1975-1982.

THE END.

Administrative funding for fiscal year 1983 was cut during the final hours of the last 1982 legislative session, ending all funding by June 30, 1982.

Minneapolis Star and Tribune

Established 1867

Charles W. Bailey Editor
Frank Wright Managing Editor/News
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16A.

Friday, April 30, 1982

Saving Minnesota's urban forest

In fitting recognition of this Arbor Day, more than a score of Minnesota cities have just received 1981 "Tree City" awards. Minneapolis, St. Paul, Hopkins, Robbinsdale and St. Louis Park are among those honored by the National Arbor Day Foundation. One basis for the award is vigilance in the struggle against Dutch elm disease. Slowing the battle, these communities understand, invites disaster. That's why it's hard to believe Minnesota lawmakers are willing to surrender. But they are doing just that: After a five-year effort to fight Dutch elm disease, funding for the state Shade Tree Program ends this summer.

Foresters predict that up to 90 percent of the state's elms will die within five years if cities don't pick up the slack left when the Legislature cut off grants to communities operating disease-control programs. In 1981, the Minnesota Shade Tree Program reimbursed 18 percent of cities' expenses for diseased tree removal and reforestation. Few cities can make up the difference from local taxes.

Minnesota held its ground in the Dutch elm war in 1981, losing about 111,000 elms and oaks — about the same as 1980. That's a far cry from the quarter-million trees lost in 1977, before lawmakers realized the value of a statewide effort. The Dutch elm beetle that carries the fatal fungus doesn't honor political boundaries, and dead elms left standing in just one suburb provide beetle breeding sites that guarantee the spread of the disease to still-healthy trees in surrounding communities.

It's true that once Dutch elm hits a city, nearly all the elms eventually will die: There's no spectacular cure. But, as Don Willeka, chairman of the Minnesota State Shade Tree Advisory Committee, observed Tuesday, the problem is that the thousands of American elms lining urban streets will cost money no matter what. If most die quickly, as disease decimates them, the cost of removing dead

trees is large and sudden. If sanitation slows the spread of Dutch elm, the challenge of removal and replacement can be met over time.

Once losses are curtailed, as they are now throughout the state, it's unwise and uneconomical to cut the program that controls the disease. Minneapolis, for instance, has more than 120,000 elms on its streets. Removing one tree and replacing it with a sapling costs more than \$500; the bill for removal alone could exceed \$48 million. For much less than that, Dutch elm could be controlled and the losses minimized. If the Minneapolis loss rate continues at its current 4 percent, the elm population will last about 30 years, enough time for replacement trees to mature.

Minnesotans want a state shade-tree program — even at the cost of other cuts or higher taxes. That's what readers said when the Minneapolis Tribune invited opinion on proposed shade-tree cuts last year, and a University of Minnesota study released last summer showed that two-thirds of the citizens interviewed would be willing to have their taxes raised somewhat for a shade-tree program.

Lawmakers should respond to that sentiment with imagination. The state's financial bind is real, and local governments suffer as well. Perhaps Minnesota and its cities cannot afford to fund shade-tree programs at past levels. But some kind of state financing should be retained. A voluntary check-off system on the state income tax return — much like the "chickadee check-off" for non-game wildlife — would provide an avenue for citizens to contribute their own money to the preservation of the urban forests.

One way or another, a restoration of the shade-tree program is crucial. Lawmakers must see what their constituents already see: Minnesota can pay to keep its shade trees now — or pay a lot more later.

APPENDIX A

Plant Industry Shade Tree Records 1961-80.

Memoranda and Notes Concerning the Shade Tree Division.

BIENNIAL REPORT
SECTION OF PLANT INDUSTRY - GENERAL
Gerald Leach - Entomologist

Before June, 1931, there was little survey and appraisal of Dutch elm disease in Minnesota, due to the fact that the disease or its principal vector was not suspected to be in this state. In order to ascertain the facts, two surveys for the smaller European Elm Bark Beetle, the main dispersal agent of this disease, were made in 1930 & 1931. One was in southeastern Minnesota, principally along the St. Croix-Mississippi flowage, as this was the area in Minnesota closest to the Dutch elm disease front in Central Iowa and Eastern Wisconsin. The other survey for these beetles was in the St. Paul-Minneapolis vicinity. Neither survey was successful in finding this beetle vector of Dutch elm disease.

Early in 1931, Dutch elm disease was diagnosed from a boulevard tree in the Highland Park area of St. Paul. In June of 1931, a permanent survey program for this disease of elm trees in Minnesota was initiated. The survey started in St. Paul-Minneapolis, and was extended to the southeastern section of the state as well as any other suspected areas. The beetle vector of this disease was located in Ramsey, Winona, and Houston Counties, and several more cases of Dutch elm disease were located in Monticello, Minnesota. The trees were immediately disposed of under direction of the Division of Plant Industry. In addition to survey and control of the fungus disease, municipal departments in charge of tree maintenance were contacted to set up individual programs to combat Dutch elm disease before its introduction and spread. Twenty-eight meetings were held with municipal officers in as many cities to inform them of the facts concerning their duties and their position under Section 18.022 of the Minnesota Statutes. Information and sampling of elm trees was given to all who requested it. There were many samples taken

from elm trees with symptoms indicating possible Dutch elm disease, but after checking stains in the wood, only 63 were sent in for further diagnosis.

The program was intensified in the Spring of 1962, with various sections of the State requesting increased education and help in organizing a program. Three additional men were put under this section to help carry out the various aspects of survey and organization of a state-wide program. Each individual was given a weekly route to survey, sample, and otherwise help out the various communities in present and future Dutch elm disease problems. The number of phone calls coming into the office increased immensely over the previous year, necessitating increased sampling of trees from individual property owners. These calls were appropriately worked into each man's schedule.

In addition to the above, a diagnostic laboratory was set up in this department for proper diagnosis of Dutch elm disease. The basis of this system and the growth media is similar to that used by Wisconsin's Division of Plant Industry, which has been so successful in improving on the speed and accuracy of diagnosing this disease.

The forthcoming summer of 1963 will no doubt show a marked increase of Dutch elm disease, and an increase and spread of the principal vector, the smaller European Elm Bark beetle. Along with this, there will be demands by the public and private landowners to combat this disease, so to handle these problems, this section will need at least three temporary employees for the above mentioned summer. In addition to this, one additional temporary summer employee should be put under this section to survey, sample and otherwise aid in the control of Oak Wilt, which is spreading almost unchecked throughout the southern half of Minnesota.

BIENNIAL REPORT
SECTION OF DUTCH ELM DISEASE CONTROL
GERALD BEACH, ENTOMOLOGIST
July 1, 1962 to June 30, 1964

Dutch elm disease was first found in Minnesota in 1961 and it was expected to increase sharply in this biennial period. The 1962 season produced only two new cases of this disease. There was an increase in 1963 to 43 cases. The season of 1964, to July 1, produced 40 cases of Dutch elm disease, and appeared unlikely that it would go over 60 cases for the entire year. The disease locations, the Twin City area and Monticello, remained the same. Other areas where the disease would be expected to show up, such as the southeast quarter of Minnesota, were intensely scouted, but produced no positive diagnosis.

The breakdown on Dutch elm disease for the period is as follows:

	<u>St. Paul</u>	<u>Minneapolis</u>	<u>Monticello</u>
1962			2
1963	8	4	31
To July 1st-1964	2	4	34

In 1962, three entomologist aides were assigned to this project to survey areas of Minnesota that were threatened by Dutch elm disease and to contact municipalities in these areas to further coordinate a basic education and prevention program. This well accepted and successful seasonal arrangement has been continued since that time. Each of the aides was given a weekly route through suspect areas, and municipalities along each route were notified in advance of the impending visit. The municipalities assembled officials involved in parks and street maintenance at an appointed time, where they were given up-to-date information and literature on this problem, and were informed on the appropriate steps in setting up a basic Dutch elm disease prevention program. In most cases municipalities were advised to

begin a sanitation program, that is, removal of all dead elm material within the community, thereby reducing the population of the beetle vector, which breeds under the bark of dead elm wood.

Suspect trees in the communities were inspected in the company of these officials, where methods of sampling and symptomology were explained in detail. Questions were answered there, or by letter from this office.

On these weekly routes, suspect trees in rural areas were also sampled. Checks were made of dead elm material, whether rural or urban, to survey populations of the vector bark beetles, both the Smaller European, Scolytus multistriatus and the Native, Hylurgopinus rufipes. Follow-up contacts, when necessary, from calls or letters that came through this office regarding Dutch elm disease were handled by aides in this same manner. Besides municipalities and rural areas, State Parks and State Institutions were also contacted enroute.

A Dutch elm disease diagnostic laboratory was established in 1962, in the Division of Plant Industry for testing samples of disease suspect elm submitted by staff members or community officials. A method for testing was devised using salient features of both the Wisconsin and University of Minnesota methods and proved to be rapid and efficient in providing positive determinations of the presence or absence of the disease. Officials of the public agency involved were notified through the Division official notice, circular 484, when tests proved positive. It has been established as a policy of this Division to have local officials, upon receipt of the Division notice 484, formally notify residents of the presence of Dutch elm disease on their properties.

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Laboratory facilities were expanded in 1963 in order to adequately handle the increasing volume of suspect elm samples sent in for testing.

Laboratory testing of samples during the two year period are summarized as follows:

<u>Period</u>	<u>Year</u>	<u>Samples Tested</u>	<u>Dutch Elm Positive Cases</u>
July 1-Dec. 31	1962	112	2
Calendar Year	1963	736	43
Jan. 1-June 30	1964	44*	11

* Major sample testing in July-August

Surveys for both bark beetle and disease, municipal contact programs, and educational meetings and conferences have been carried out in 1962, 1963, and 1964 on an intensive basis in the Twin City and Monticello areas where Dutch elm disease now exists, and in the southeast region of the state which is the most likely area to first receive the disease. Similar actions were carried on to a lesser extent throughout the south central and southwest districts.

Results of beetle vector surveys to July 1, 1964, indicate that the smaller European elm bark beetle, the principal disseminator of the disease, is present in an area including the southeast portion of the state west to Fairmont, north through Mankato and the Twin City area to Chisago City. The highest population is located in St. Paul and its environs. The native elm bark beetle is found generally throughout the surveyed area. The population of native bark beetle is highest in the Monticello area, where it alone has been responsible for spreading the disease.

Particularly close liaison has been maintained with the park and forestry departments and community clubs of the larger municipalities in the survey area by means of meetings with park

boards, municipal councils, Dutch elm disease committees, community clubs, and other citizen groups. Educational material including pamphlets, and specimen mounts have been made available to many organizations to further the knowledge of the Dutch elm disease problem.

Studies were initiated in control of elm bark beetle in relatively inaccessible areas in or near municipalities, such as river bottoms and other heavily wooded sites. This work will continue in cooperation with the University of Minnesota staff members.

Survey of oak wilt infected areas was begun during the biennium as a basis for further study of methods to check or control this disease.

BIENNIAL REPORT
DUTCH ELM DISEASE
July 1, 1964 - June 30, 1966

Since the initial incidence of Dutch elm disease in Minnesota in 1961, the total number of positive identified cases to date is 179. The distribution is shown in the table below.

	St. Paul	Mpls.	Monticello Area	South St. Paul	Rochester	Pine Island	Bloomington	Total
1961	1		7					8
1962			2					2
1963	7	4	31	1				43
1964	3	4	47					54
1965	2	9	12*					23
1966	9	7	22*	1	1	4	5	49
Total	22	24	121	2	1	4	5	179

*The Minnesota Department of Agriculture did not make complete surveys in 1965 and 1966. The survey and regulatory work in that area was left to municipal and county officials.

It is notable that there are three new locations in 1966: Rochester, Pine Island and Bloomington. This necessitates more widespread and intense survey work in 1967.

The Minnesota Department of Agriculture supervises the Dutch elm disease survey, assigning one entomologist and three entomologist aides. This program calls for cooperative technical assistance to Minnesota municipalities, and involves surveys, sampling suspect

elm trees, and advising the municipalities on these methods as well as initiating proper control procedures. This latter aspect is becoming more important with the advance of the disease. Closer supervision of Dutch elm disease control will be necessary in keeping with Sections 18.022 of the Minnesota State Statutes. This will help insure that the proper, recommended methods are used. Lack of proper procedures and the correct recommendations could mean misuse of public funds, and inadequate control of Dutch elm disease.

In addition to detection work of the disease, surveys are made at the same time for the insect vectors; the smaller European elm bark beetle and the native elm bark beetle. This involves debarking dead and dying elm wood to make a population appraisal, and also to indicate the spread of the smaller European, which is established in the southeast quarter of Minnesota.

The Minnesota Department of Agriculture's Dutch Elm Disease Laboratory processed 710 suspect elm samples in 1964, 250 in 1965 and 350 in 1966. The reason for the large number in 1964 is that all communities were sending in all elm samples, whereas, after education on symptomology, most communities were only sending in samples with the indicative stains of Dutch elm disease. With increasing municipal education on this disease, and with more control programming, it is anticipated that there will be a large increase in the number of

-3-

samples processed in the next biennial period. Additions to the staff for this project must be anticipated.

DUTCH ELM DISEASE
BIENNIAL REPORT
July 1, 1966 - June 30, 1968

Dutch elm disease is a fatal disease of elms caused by a fungus, *Ceratocystis ulmi*. It attacks all of our native and most European and Asiatic elm species. Believed to be of Asiatic origin, the disease was introduced into the United States about 1930 and was first reported in Minnesota in 1961.

Since Dutch elm disease was discovered in Ohio in 1930, it has spread to the Northeast and has begun a Western migration across the United States. It was found in Illinois in 1950, Michigan - 1951, Missouri - 1952, Wisconsin - 1956, Iowa in 1957, and Minnesota - 1961.

In 1961, eight cases of Dutch elm disease were discovered in Minnesota. One case was found in Ramsey County, in metropolitan St. Paul, and seven diagnosed in Sherburne County in the Village of Monticello. In 1962, two more cases of Dutch elm disease were found in the vicinity of Monticello. Through 1966, the disease had been found in four additional counties: Hennepin, Dakota, Goodhue, and Olmsted. From 1967 to 1968 twenty new counties were found to be infected: Anoka, Blue Earth, Cottonwood, Dodge, Faribault, Fillmore, Freeborn, Houston, Jackson, Lyon, Martin, Mille Lacs, Mower, Nicollet, Rock, Stearns, Steele, Wabasha, Winona, and Washington.

The total number of positive identified cases of Dutch elm disease to date in Minnesota since the initial incidence in 1961 is 603 cases.

From 1961 to 1966 there were 179 identified cases of Dutch elm disease.

In 1967 - 1968 biennium there were 438 cases of Dutch elm disease identified. These more intensified surveys conducted during this period indicate that Dutch elm disease is gradually getting a foothold and is on the increase.

Section 18.022 of the Minnesota Statutes provides for proper plant disease control recommendations, education of the public and municipal officials in conducting a Dutch Elm Disease program.

The Dutch Elm Disease program in Minnesota is twofold: One aspect has to do with technical assistance to municipalities which also includes conducting surveys. The other aspect is serving in an advisory capacity to such municipal officials concerning proper control procedures, the developing of funding and all aspects of municipal participation. This latter aspect is becoming more important as the disease gains its foothold.

It was proposed that the 1968 program would make a comprehensive survey of the entire southern half of the state to properly appraise the extent of the disease and at the same time, contact municipal officials and advise them of the necessity of developing a program for Dutch Elm Disease. It was advised at this stage to focus principally on sanitation. Field men counselled with mayors and other municipal officials, particularly with regard to their individual problems. Approximately 164 communities were contacted during the surveying; 18 special meetings were held in municipalities. These meetings were held with professional staff present.

The results of this survey indicated the Dutch Elm Disease had advanced to ten new counties in forty-one new municipal locations over the nineteen locations discovered in the previous 1967 season.

The laboratory diagnosed 292 positive cases out of 727 samples received or approximately 40% of all the samples submitted were positive.

In the closing days of the survey it was determined it would be advisable to make some aerial studies of the major elm stands; approximately twenty hours of flying time over the major rivers in southern Minnesota indicated more than 1000 suspected cases, particularly along the Mississippi

-3-

River. A follow-up check by ground crews confirmed that these trees were dying of Dutch elm disease. Very few cases were noted along the Minnesota, St. Croix and Cannon Rivers.

The 1968 surveys indicate a stepped-up program is necessary if we are to curb the spread of this most important pest. Increased municipality participation appears to be necessary. This will call for a greater educational effort on the part of our Division, including work shops and practical demonstrations to help develop and activate programs in the newly affected areas. It is anticipated that our crews will have to be substantially increased. Our laboratory will need to handle more material and possibly other methods will have to be brought into the program if we are to develop more effective methods. One good possibility in this program will be the use of predators as mentioned above. If these wasps can be utilized to curb the development of the beetle which carries the disease, particularly in the heavily treed areas where elms are prevalent, it is quite possible this might retard the spread of Dutch elm disease to new areas.

GRASSHOPPERS - The areas of economic populations of 8 or more grasshoppers per square yard in 1969 are generally the same as in 1968. However, populations in 1969 showed a slight downward trend. An estimated 148,000 acres of forage crops had economic populations. In 1968, this figure was 210,945 acres. Crop damage was not apparent until late in the season when drought conditions restricted plant growth. Damage as a rule was not serious. In October, an egg survey, confined to fields that had economic populations during the adult survey, showed that 68% had grasshopper egg pods present. An average of 0.6 egg pods per square foot was found in these fields. The red-legged grasshopper (Melanoplus femurrubrum) continues to be the dominant species throughout Minnesota. It normally is a problem on alfalfa, red clover, and other small legume crops. The two-striped, (M. bivittatus) differential, (M. differentialis) migratory, (M. sanguinipes) and packard, (M. packardii) grasshoppers were observed in many fields, but were seldom the predominant species. The outlook for the 1970 season is for moderate and abundant infestation areas in central Minnesota. Small areas of moderate populations also are found in the southwest and south central districts. It is expected that infestations will be dispersed throughout these areas. Primary host crops will be alfalfa and other legumes. Areas rated light and non-economic may have very widely scattered infestations that could cause problems in individual fields. Weather conditions at the critical time of egg hatch and early nymphal growth could modify this outlook to some degree.

DUTCH ELM DISEASE - 1969

The Minnesota Department of Agriculture, Division of Plant Industry submits the following report for 1969 from the Dutch Elm Disease Laboratory. Five hundred and fifty positive cases of Dutch Elm Disease were diagnosed out of 1,571 samples or approximately 34% of all samples submitted were positive for Dutch Elm Disease. A total of 1,148 cases of Dutch Elm Disease have been diagnosed since 1961.

Positive cases of Dutch elm disease were found in 8 new counties and in 49 new municipal locations.

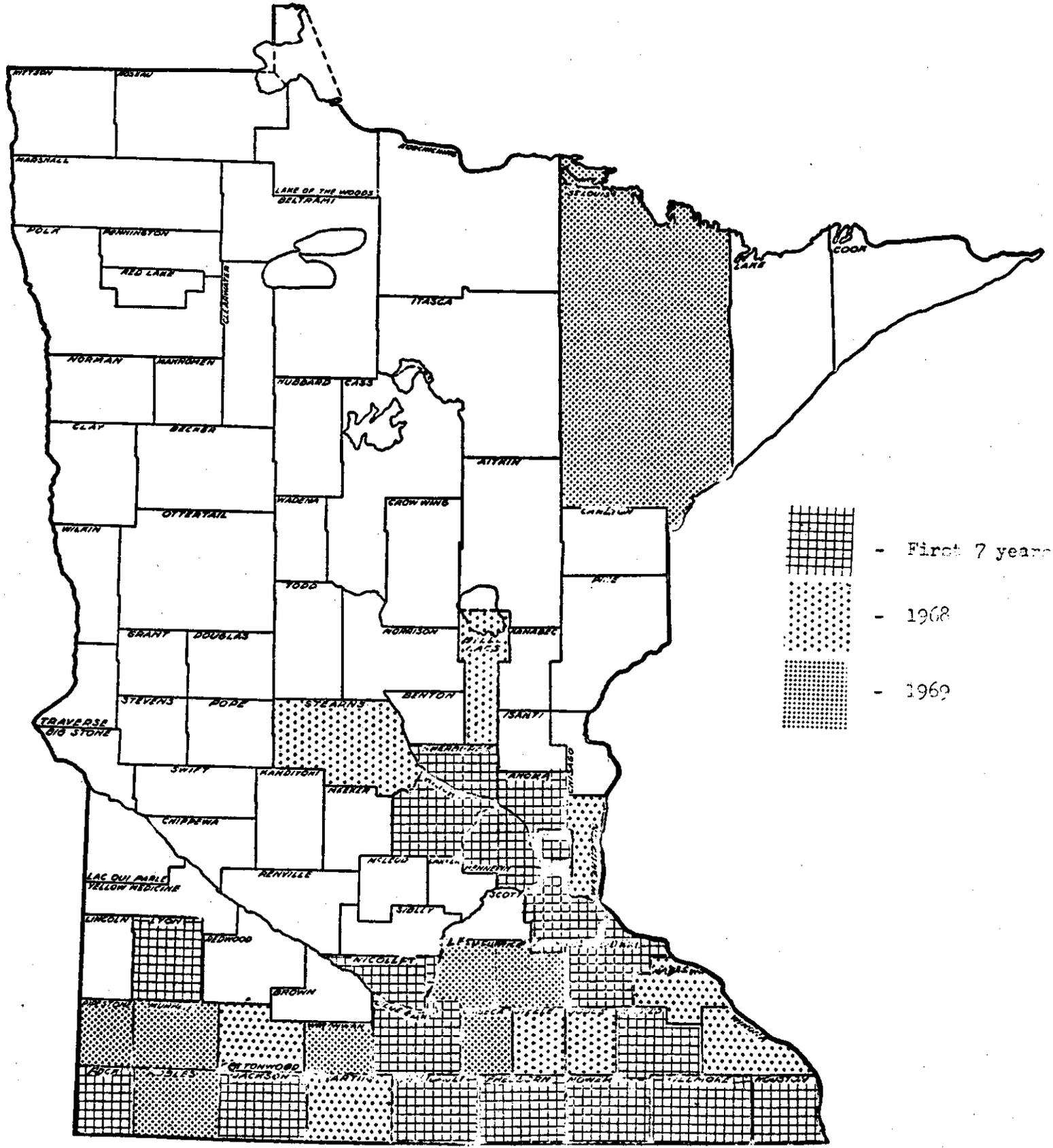
There were three purposes in the 1969 Dutch Elm Disease Program. One, to make a comprehensive survey of the Southern and Central area of the state for advances of Dutch Elm Disease; second, to conduct a Smaller European and Native Elm Bark Beetle Survey for beetle distribution; and third, municipal officials were contacted and advised on the necessity of formulating control programs. Municipal officials were counseled in regard to their individual problems in setting up control programs.

Of the 550 positive cases found to be infected with Dutch Elm Disease in the municipalities, a total of 443, or 83% were removed and destroyed. Removal of infected elm trees is one of the main sanitation procedures in controlling Dutch Elm Disease.

LABORATORY DIAGNOSED CASES BY YEAR AND CITY

1961 - 8 positive cases	1964 - 54 positive cases	1967 - 136 positive ca.
1962 - 2 positive cases	1965 - 23 positive cases	1968 - 283 positive ca.
1963 - 43 positive cases	1966 - 49 positive cases	1969 - 549 positive ca.

PROGRESSION OF DUTCH ELM DISEASE
IN MINNESOTA



* Adrian	Elmore	Minneapolis	St. Paul
Albert Lea	Fairmont	Minnesota	* Sherburn
* Alden & Area	* Faribault	* Montevideo	* Slayton
Anoka	* Frost	Mountain Iron	S. St. Paul
Austin	* Fulda	* New Brighton	* Stewartville
Becker	* Glenville	* New Richland	Stillwater
* Blue Earth	* Grand Meadow	Newport	Truman
* Bricelyn	* Hayward	* N. St. Paul	* Waldorf
Buffalo	Houston County	* Oakland	* Waseca
Caledonia	* Inver Grove	* Ormsby	Washington Co.
Canton	* Jackson	Owatonna & Area	* Welcome
* Central Point	* Kasson	Pine Island	Wells & Area
(Lake City)	* Kenyon	* Plymouth	White Br. Lake
* Claremont	* Kiester	Preston	Windom
* Cottage Grove	Lakefield	Princeton	* Winnebago &
* Currie	* Le Center	* Richfield	Area
* Delavan	* Lewiston	Rochester & Area	Winona
* Dodge Center	* Maplewood	Rushford	* Woodbury
* Ellendale	* Marine on St. Croix	Rushmore	* Woodstock
* Ellsworth	* Melrose	* St. Cloud & Area	* Worthington
		* St. James	

* New locations for 1969

DUTCH ELM DISEASE OCCURRENCE BY COUNTY

1961 Ramsey, Sherburne	1968 Mille Lacs, Stearns, Lyon,
1962 Hennepin	Cottonwood, Dodge, Steele,
1963 Wright, Dakota	Wabasha, Winona, Martin, &
1966 Olmsted, Goodhue	Washington
1967 Nicollet, Anoka, Blue	1969 Murray, Nobles, Le Sueur,
Earth, Rock, Jackson	Waseca, Rice, St. Louis,
Faribault, Freeborn,	Watonwan, Pipestone
Mower, Fillmore, Houston	

INSECTS AFFECTING MAN & ANIMALS - 1969

MOSQUITOES - Reports from the Metropolitan Mosquito Control District indicated that the first hatch of mosquito larvae occurred on April 2nd. By the end of the month 14 species of Aedes larvae had been collected plus Culiseta inornata. Most of the Aedes were the single-brooded kinds that hatch early and in some cases persist as adults well into the summer. First pupae were reported on April 23rd. Small numbers of adult mosquitoes were present by May 9th. By mid-May most single-brooded species had emerged as adults. Both larval and adult populations of mosquitoes remained low during most of May and June. Numbers of Mansonia perturbans, a species that lives in cattail and sedge swamps, began to increase the last half of June and reached a peak about July 15th. Heavy rains the last week in June resulted in a heavy brood of Aedes vexans which emerged generally the first week in July. Adults from this brood caused extensive nuisance. Additional heavy rains and storms in mid-July increased the nuisance to high levels and chemical control of adults by homeowners and municipalities was generally unsuccessful. Peak numbers as judged by light trap collections were reached the week ending July 19th. Mosquito population began to decline in late July and continued to decrease through August. By mid-September egg sampling revealed egg diapause (dormancy) ranging from 25 to 60%.

and differential (Melanoplus differentialis) grasshoppers made population gains in the southern half of the state but were predominant in only a few fields. The migratory, (Melanoplus sanguinipes) packard (Melanoplus packardii) and other grasshopper species were observed in many fields but were of minor economic importance.

The outlook for the 1971 season as indicated in the grasshopper infestation map, shows that moderate and abundant infestation areas lie in central Minnesota. Small areas are also found in southeast and south central counties. It is expected that infestations will be dispersed throughout these areas. Primary host crops will be alfalfa and other forage crops. Field margins and roadsides will be important sources of infestation for other cropland. Light infestation areas indicated on the map may have widely scattered problems in some fields. Weather conditions at the critical time of egg hatch and early nymphal growth could modify this outlook.

DUTCH ELM DISEASE REPORT

The following report for 1970 is from the Division of Plant Industry, Dutch Elm Disease Laboratory. Sixteen hundred and twenty-nine elm twig samples were submitted between June 1, 1970, and September 15, 1970. Of these 795 or 49 percent, were diagnosed as positive for Dutch elm disease. A total of 1,942 cases of Dutch elm disease from municipal areas have been diagnosed since 1961.

Positive cases of Dutch elm disease were diagnosed in fifty-three new locations and in thirteen new counties as indicated on the following tabulations and maps. The following four maps outline: (1) distribution of Dutch elm disease in municipalities (2) Dutch elm disease occurrence by county (3) distribution and progression of the smaller European Elm Bark Beetle which is the main carrier of the disease, and (4) area of high incidence of Dutch elm disease in rural areas.

There continued to be three purposes in the 1970 Dutch elm disease program. One, to make a comprehensive survey of the southern and central area of the state for advances of Dutch elm disease; Second, to conduct a smaller European Elm Bark Beetle Survey for beetle distribution; and Third, to help and counsel with municipal officials in regard to their individual problems in setting up control programs.

Extensive survey and information programs will be continued in 1971. It is expected that Dutch elm disease will increase in severity and that many more municipalities will be finding their first case of Dutch elm disease.

Laboratory diagnosed cases by year -

1961 - 8 positive cases
 1962 - 2 positive cases
 1963 - 43 positive cases
 1964 - 54 positive cases
 1965 - 23 positive cases

1966 - 49 positive cases
 1967 - 136 positive cases
 1968 - 283 positive cases
 1969 - 549 positive cases
 1970 - 795 positive cases

TOTAL - 1,942 positive cases

1970 Laboratory diagnosed cases by city - (Cases & Locations)

1.	Adrian	1	*43.	Hanska	1
2.	Albert Lea	47	*44.	Hayfield	2
3.	Alden	2	*45.	Hendricks	1
4.	Anoka	2	46.	Hills	3
*5.	Arlington	1	*47.	Hollandale	3
6.	Austin	90	48.	Houston	1
7.	Avoca	1	49.	Inver Grove Hts.	1
*8.	Balaton	1	*50.	Ironton	1
*9.	Bayport	4	*51.	Ivanhoe	1
10.	Becker	1	52.	Jackson	3
*11.	Belle Plaine	1	*53.	Janesville	3
*12.	Bethany	1	54.	Kasson	7
13.	Big Lake	1	*55.	Kellogg	1
14.	Blue Earth	3	*56.	Kenneth	1
15.	Breckenridge	1	57.	Kenyon	2
16.	Bricelyn	2	58.	Lake City	1
17.	Buffalo	4	*59.	Lake Elmo	10
18.	Burnsville	2	60.	Lakefield	2
19.	Caledonia	4	61.	Lanesboro	3
*20.	Cannon Falls	1	*62.	Lenora	1
21.	Chandler	2	*63.	Le Roy	1
22.	Chatfield	6	*64.	Leota	2
23.	Coon Rapids	1	65.	LeSueur	1
24.	Delavan	1	66.	Lewiston	1
25.	Dodge Center	6	*67.	Litchfield	1
*26.	Easton	1	68.	Luverne	24
27.	Eden Prairie	1	*69.	Madelia	3
*28.	Edgerton	2	70.	Mankato	11
*29.	Elgin	1	*71.	Maple Plain	1
30.	Elk River	3	*72.	Mapleton	3
31.	Ellendale	1	73.	Maplewood	1
32.	Elmore	6	*74.	Marshall	1
33.	Fairmont	16	*75.	Medford	1
34.	Faribault	7	76.	Mendota Heights	1
*35.	Fairfax	1	*77.	Milaca	1
*36.	Fergus Falls	2	78.	Minneapolis	17
*37.	Foley	1	*79.	Montevideo	1
*38.	Garvin	1	80.	Morristown	2
*39.	Geneva	1	81.	Mountain Iron	10
*40.	Glencoe	1	*82.	Mountain Lake	1
41.	Glenville	4	*83.	Myrtle	1
42.	Guckeen	1	84.	Newport	8

*85.	New Ulm	1	*111.	Trimont	2
86.	Nobles Co. Park	1	112.	Truman.	5
*87.	Northfield.	5	*113.	Waite Park.	2
*88.	No. Mankato	3	*114.	Walnut Grove.	1
89.	North Oaks.	4	115.	Waseca.	6
90.	Oakland	2	*116.	Waterville.	3
*91.	Olivia.	1	117.	Wells	17
*92.	Oronoco	1	*118.	Westbrook	2
93.	Owatonna.	15	*119.	West Concord.	1
94.	Pipestone	5	120.	West St. Paul	1
95.	Preston	7	121.	White Bear Lake	1
96.	Princeton	3	122.	Wilmont	1
97.	Red Wing.	3	123.	Windom.	5
98.	Rochester	39	124.	Winnebago	7
99.	Rushmore.	1	125.	Winona.	3
*100.	St. Clair	1	126.	Woodbury.	4
101.	St. Cloud	5	127.	Worthington	19
102.	St. James	3	128.	Zimmerman	1
103.	St. Paul.	207	*129.	Zumbrota.	1
*104.	Sartell	1	130.	Rural Cottonwood Co.	1
105.	Slayton	2	131.	Rural Goodhue Co.	2
*106.	Sleepy Eye.	2	132.	Rural Faribault Co.	3
107.	South St. Paul.	10	133.	Rural Mower Co.	1
108.	Stewartville.	2	134.	Rural Olmsted Co.	1
109.	Stillwater.	1	135.	Rural Stearns Co.	1
110.	Tracy	2			

TOTAL 795

* New locations for 1970

ANNUAL DISEASE PROGRESSION BY COUNTIES

1961 - Ramsey, Sherburne

1962 - Wright

1963 - Dakota, Hennepin

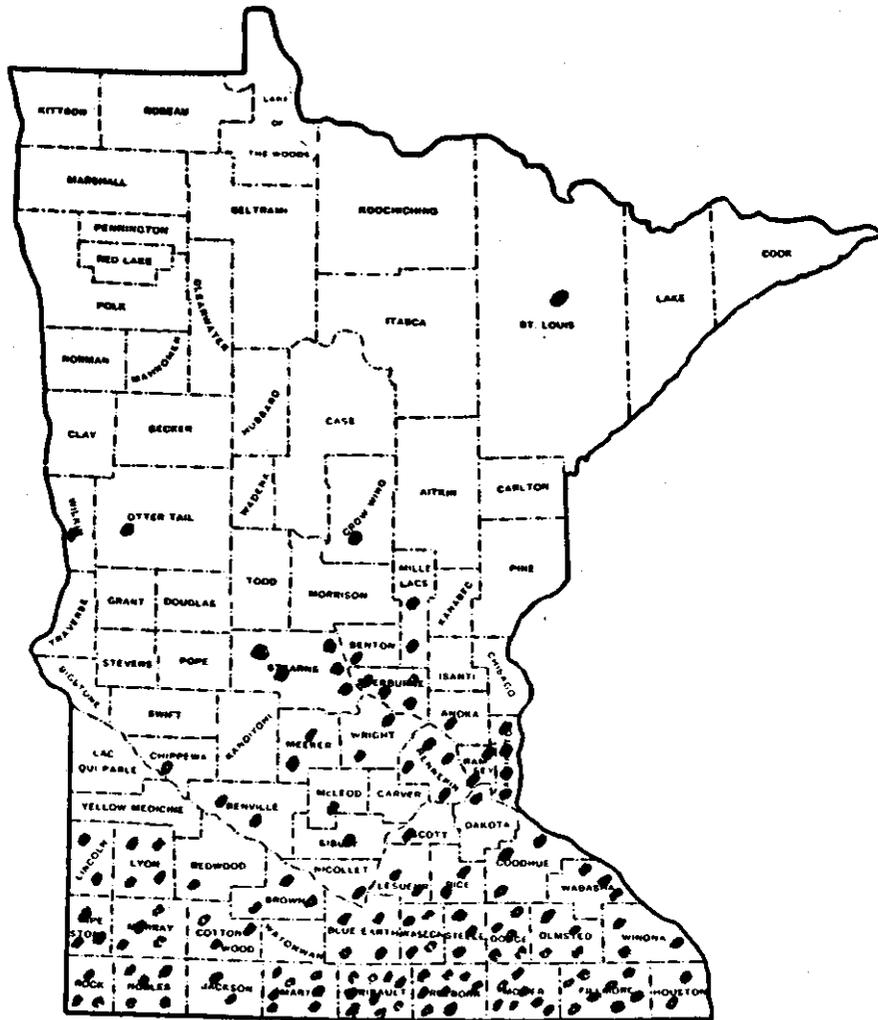
1966 - Olmsted, Goodhue

1967 - Nicollet, Anoka, Blue Earth, Rock, Jackson, Faribault, Freeborn, Mower, Fillmore, Houston

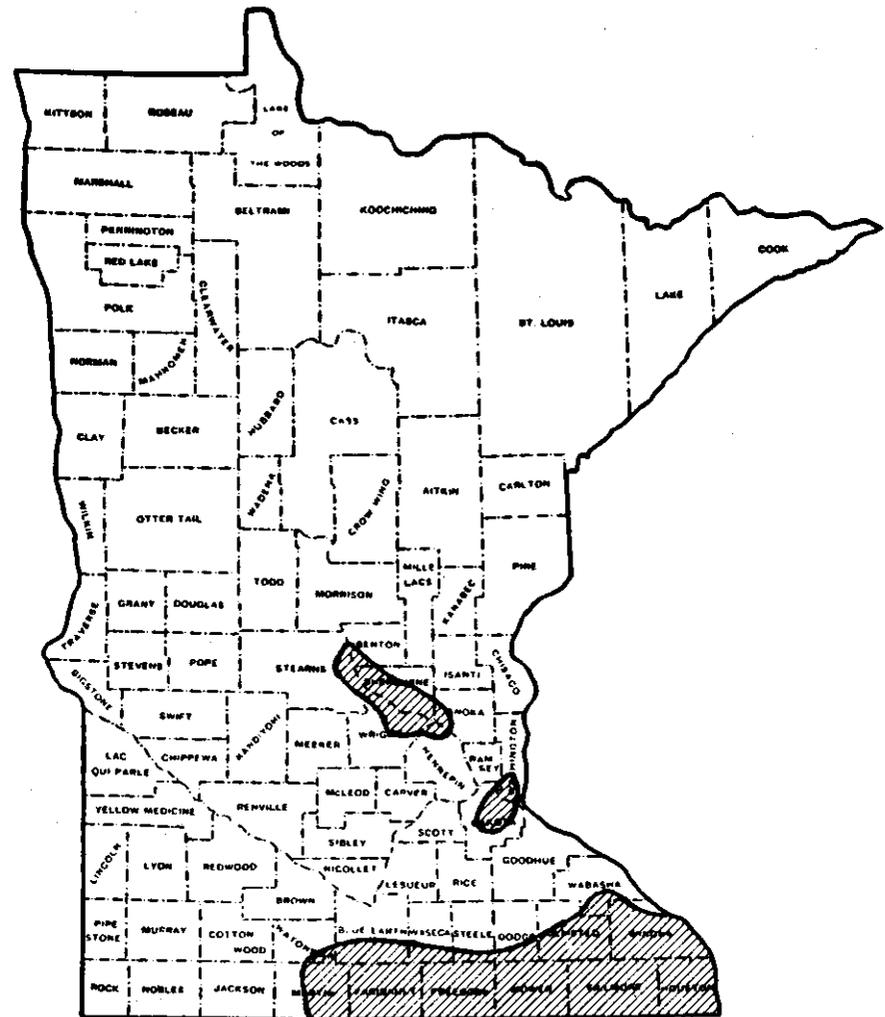
1968 - Mille Lacs, Stearns, Lyon, Cottonwood, Dodge, Steele, Wabasha, Winona, Martin, Washington

1969 - Murray, Nobles, LeSueur, Waseca, Rice, St. Louis, Watonwan

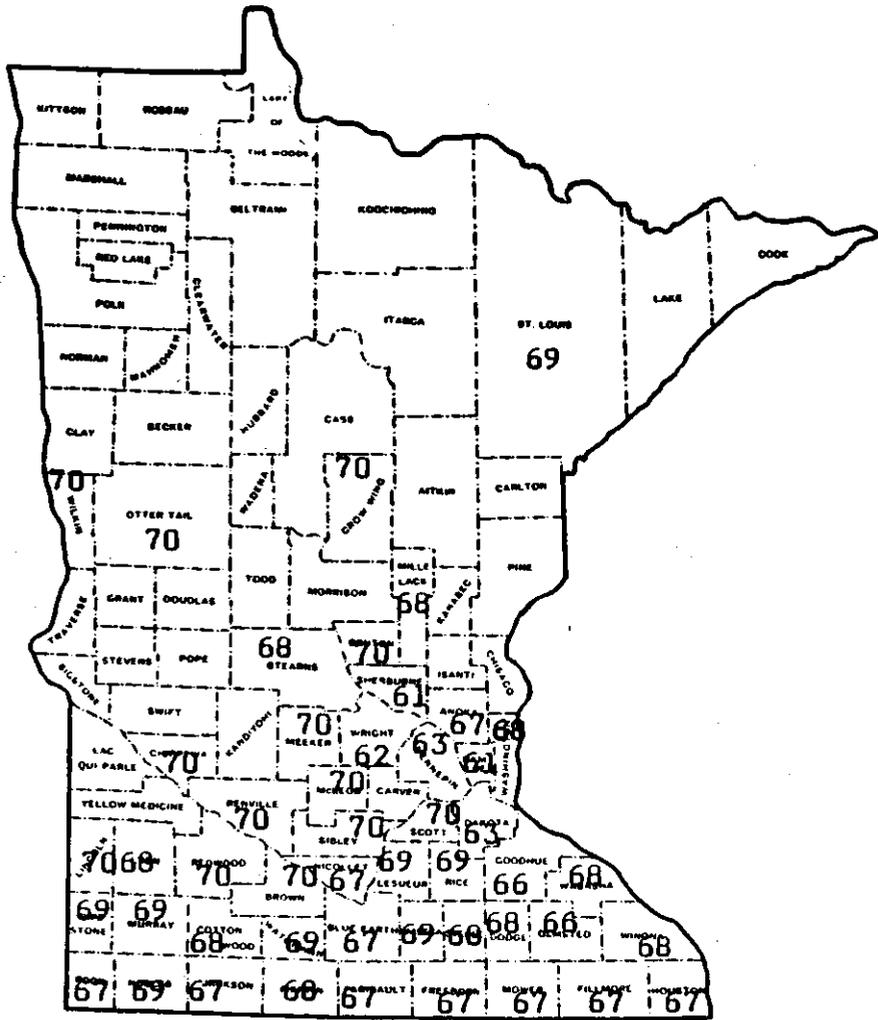
1970 - Lincoln, Redwood, Renville, Chippewa, Wilkin, Ottertail, Benton, Meeker, McLeod, Sibley, Scott, Brown, Crow Wing



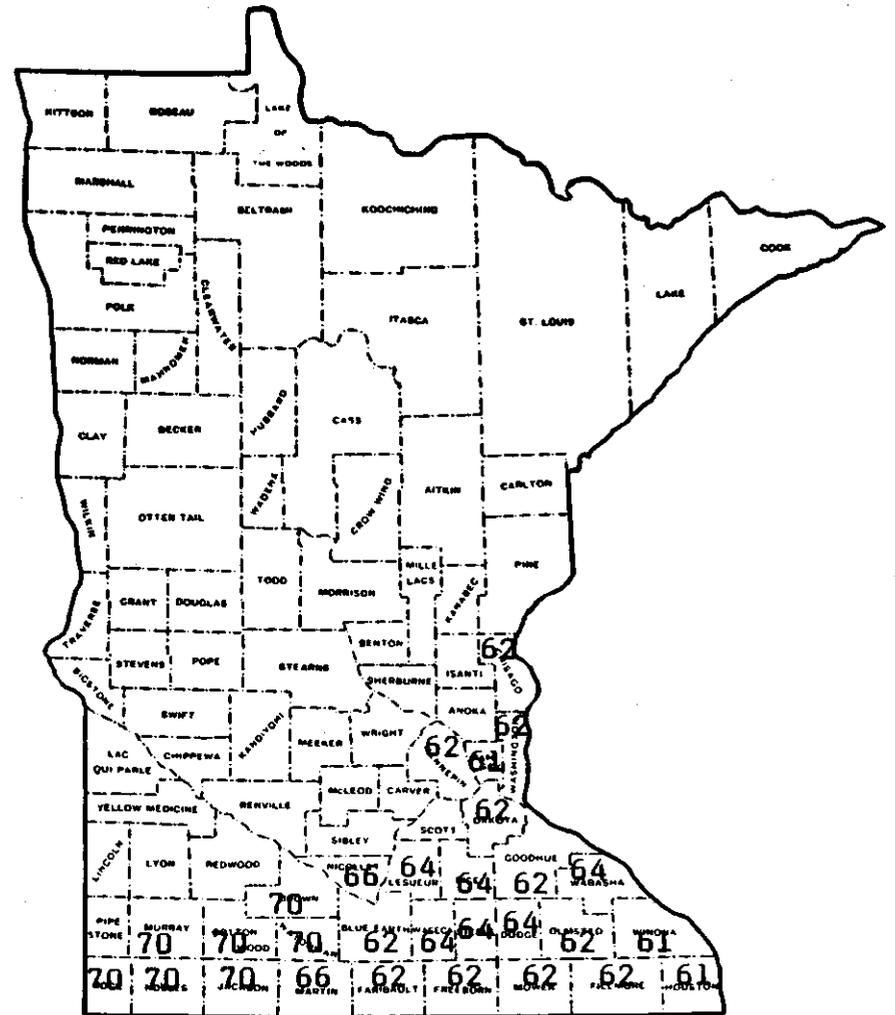
DISTRIBUTION OF DUTCH ELM DISEASE
IN MUNICIPALITIES



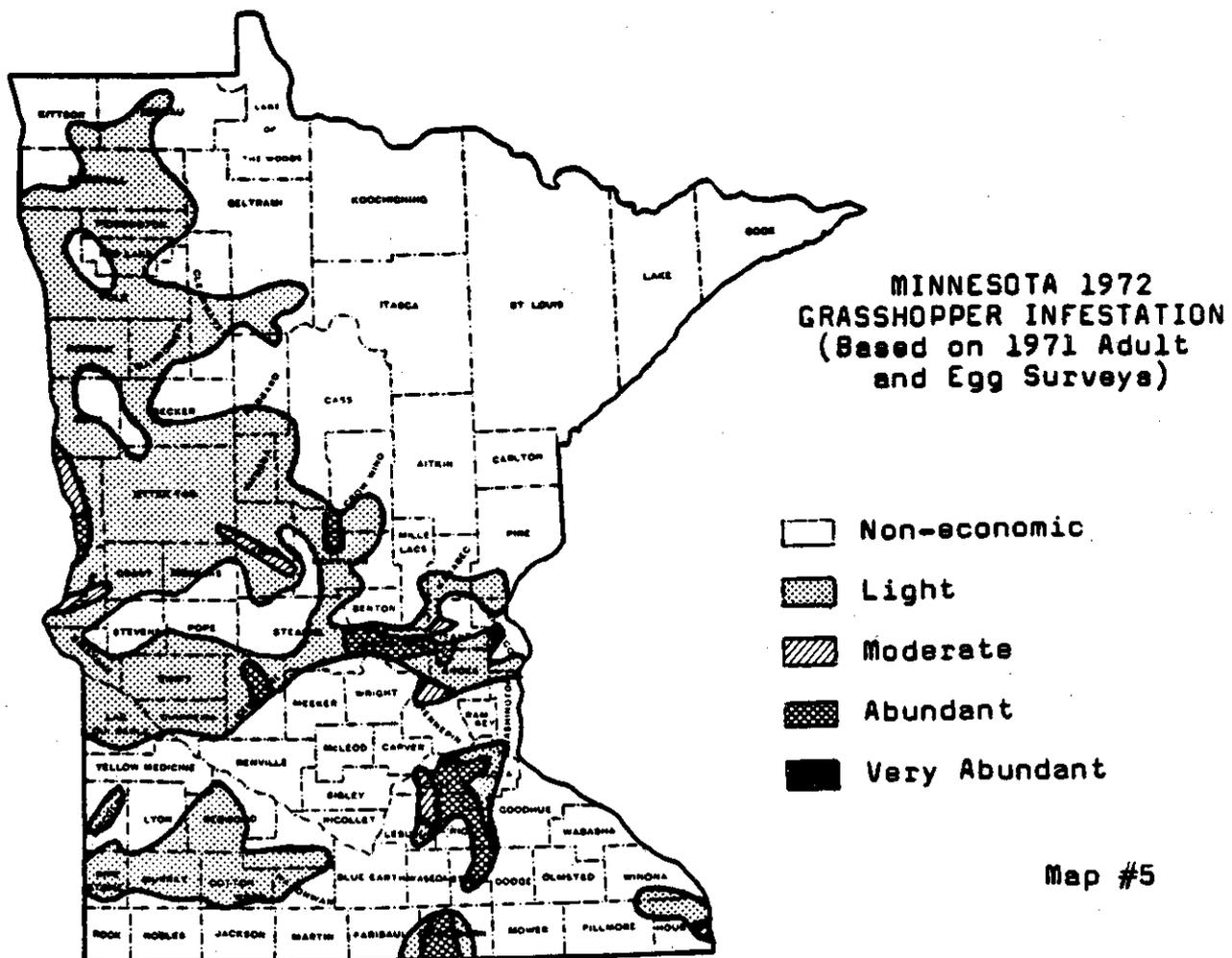
HIGH INCIDENCE OF DUTCH ELM DISEASE
IN RURAL AREAS



ANNUAL DISEASE PROGRESSION BY COUNTIES



SMALLER EUROPEAN BARK BEETLE PROGRESSION BY COUNTIES



widely scattered problems in some fields. Weather conditions at the critical time of egg hatch and early nymphal growth could modify this outlook.

JAPANESE BEETLE TRAPPING PROGRAM - No beetles were found in Minnesota this past year. A total of 1145 traps were operated throughout Minnesota in 1971. Trapping emphasis was placed on transportation centers, such as railroad and truck terminals, and airports. State parks and roadside parks, also were trapped for this insect.

DUTCH ELM DISEASE REPORT - 1971

The following report for 1971 is from the Division of Plant Industry, Dutch Elm Disease Laboratory. Two thousand two hundred and twenty three samples were submitted between June 1, 1971 and September 15, 1971. Of these 873 were diagnosed as positive for Dutch elm disease. The city of Austin laboratory confirmed 116 positive cases, and the University of Minnesota Plant Disease Clinic 89. The city of St. Paul has field diagnosed a total of 90 positive cases in addition to 244 trees diagnosed positive by the Minnesota Department of Agriculture. Cases diagnosed positive for Dutch elm disease total 1,168 from all four cooperating control agencies. A total of 3,110

cases of Dutch elm disease from municipal areas have been diagnosed since 1961.

Positive cases of Dutch elm disease were diagnosed in 24 new locations and in 5 new counties as indicated on the following tabulations and maps. Fifty-two of the 87 counties now have Dutch elm disease. The following four maps outline: (1) Distribution of Dutch elm disease in municipalities; (2) Dutch elm disease occurrence by county; (3) Distribution and progression of the smaller European Elm Bark Beetle which is the main carrier of the disease, and (4) area of high incidence of Dutch elm disease in rural areas.

There continued to be three purposes in the 1971 Dutch elm disease program. First, to make comprehensive survey of the southern and central areas of the state for advances of Dutch elm disease; second, to conduct a smaller European Elm Bark Beetle Survey for beetle distribution; and third, to help and counsel with municipal officials in regard to their individual problems in setting up control programs.

Extensive survey and information programs will be continued in 1972. It is expected that Dutch elm disease will increase in severity and that many more municipalities in the west central counties will be finding their first case of Dutch elm disease.

Laboratory Diagnosed Cases by Year

1961 - 8 positive cases	1967 - 136 positive cases
1962 - 2 positive cases	1968 - 283 positive cases
1963 - 43 positive cases	1969 - 549 positive cases
1964 - 54 positive cases	1970 - 795 positive cases
1965 - 34 positive cases	1971 - 1168 positive cases
1966 - 49 positive cases	

TOTAL - 3110 positive cases

Positive Cases Diagnosed by Minnesota

Department of Agriculture, Dutch Elm Disease Laboratory - 1971

Adrian - 4	*Butterfield - 3
Albert Lea - 56	Caledonia - 1
Alden - 5	Chatfield - 6
*Annandale - 1	*Circle Pines - 1
Anoka - 5	*Clements (Rural) - 1
Avoca - 1	*Cokato - 1
Bayport - 8	Currie - 2
Becker - 1	Delavan - 1
*Blaine - 4	*Deephaven - 1
*Blooming Prairie - 9	Dodge Center - 9
Bloomington - 14	Edgerton - 1
Blue Earth - 2	Elk River - 1
*Braham - 1	Ellsworth - 1
*Brewster - 2	Elmore - 4
Buffalo - 1	Fairmont - 28

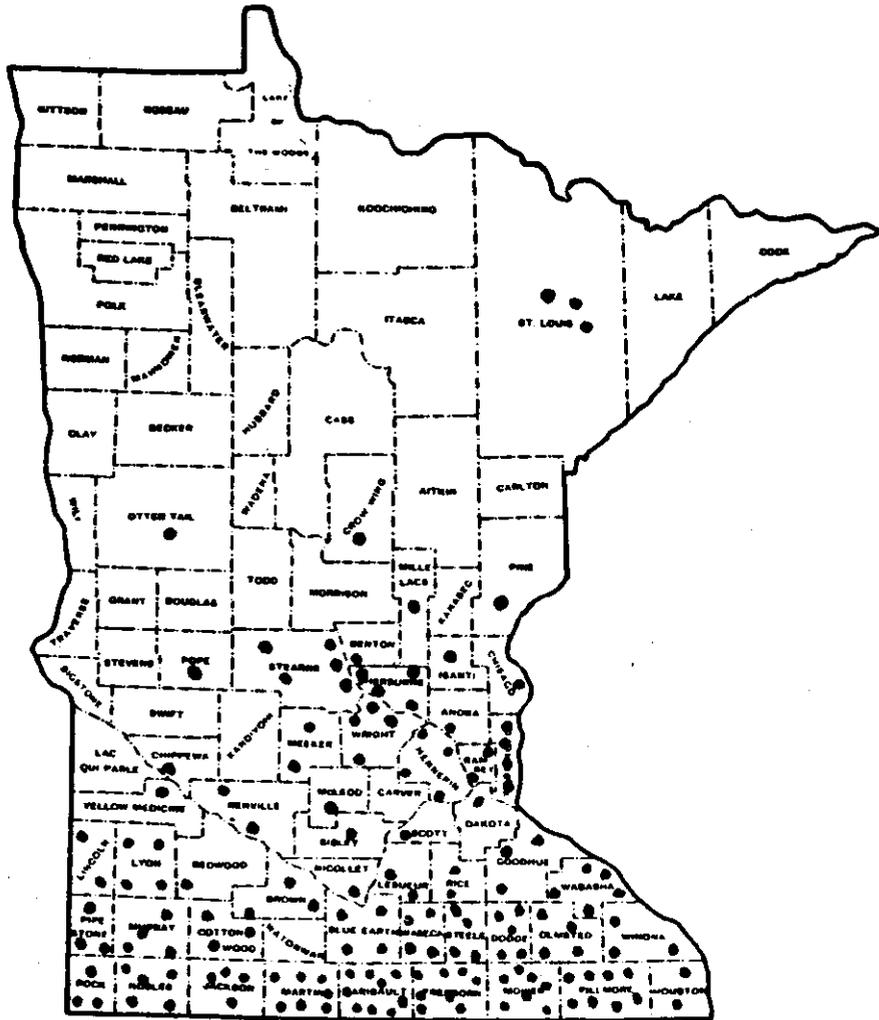
- Falcon Heights - 1
- Faribault - 4
- Faribault Co. (Rural) - 1
- Foley - 1
- Forest City - 1
- *Forest Lake (Rural) - 1
- *Frontenac - 1
- Fulda - 5
- Garvin - 1
- *Gilbert - 1
- Glencoe - 1
- *Glenwood - 1
- Hastings - 1
- Hayfield - 1
- Hayward - 1
- *Heron Lake - 5
- Hills - 2
- *Hutchinson - 2
- Ivanhoe - 1
- Jackson - 3
- Lake City - 3
- Lake Elmo - 8
- Leota - 1
- LeSueur - 1
- *Lewisville - 1
- Lincoln County (Rural) - 1
- Luverne - 18
- Madelia - 7
- Mankato - 15
- Marshall - 7
- Mendota Heights - 3
- * Millville - 1
- Minneapolis - 82
- Minnesota - 3
- New Brighton - 2
- New Richland - 1
- New Ulm - 1
- Newport - 1
- Nicollet Co. (Rural) - 1
- Northfield - 5
- North Mankato - 2
- Oronoco - 1
- Owatonna - 14
- *Pine City (rural) - 3
- Pipestone - 18
- *Plainview - 1
- Preston - 7
- Princeton - 1
- Reading - 1
- Red Wing - 2
- Rice - 2
- Richfield - 2
- Rochester - 67
- Rushford - 1
- Rushmore - 3
- St. Cloud (Rural) - 2
- St. James - 4
- St. James (Rural) - 2
- St. Paul - 244
- St. Peter - 1
- *Sauk Rapids - 1
- *Scandia - 2
- Sherburne Co. (Rural) - 2
- *Silver Creek - 1
- South St. Paul - 4
- Stewartville - 5
- Stillwater - 16
- Tracy - 2
- Trimont - 2
- Truman - 8
- *Virginia - 2
- Walnut Grove - 6
- Waseca - 5
- Watonwan Co. (Rural) - 1
- Wells - 8
- Westbrook - 1
- West St. Paul - 4
- White Bear Lake - 3
- Wilmont - 2
- Winnebago - 4
- Winona - 6
- Woodbury - 14
- Worthington - 25
- Wright Co. (Rural) - 1

* - New 1971 DED locations

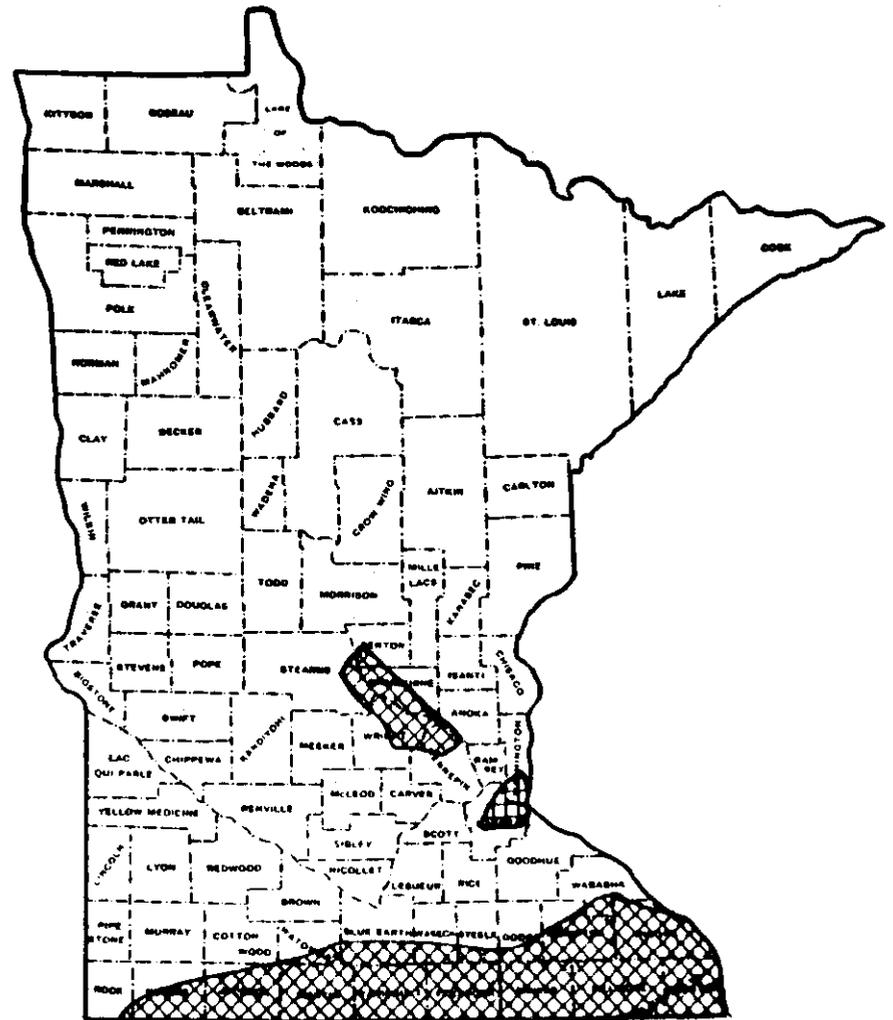
Total cases from Dutch Elm Disease Laboratory - 873
 Austin Laboratory - 116
 Plant Disease Clinic - 89
 St. Paul (field diagnosed) - 90
 OVERALL TOTAL - 1168 Positive Cases DED

Annual Disease Progression by Counties

- 1961 - Ramsey, Sherburne
- 1962 - Wright
- 1963 - Dakota, Hennepin
- 1966 - Olmsted, Goodhue



DISTRIBUTION OF DUTCH ELM DISEASE
IN MUNICIPALITIES



HIGH INCIDENCE OF DUTCH ELM DISEASE
IN RURAL AREAS

- 15 1967 - Nicollet, Anoka, Blue Earth, Rock, Jackson, Faribault, Freeborn, Mower, Fillmore, Houston
- 16 1968 - Mille Lacs, Stearns, Lyon, Cottonwood, Dodge, Steele, Wabasha, Winona, Martin, Washington
- 7 1969 - Murray, Nobles, LeSueur, Waseca, Rice, St. Louis, Watonwan
- 12 1970 - Lincoln, Redwood, Renville, Chippewa, Ottertail, Benton, Meeker, McLeod, Sibley, Scott, Brown, Crow Wing
- 1 1971 - Pine, Yellow Medicine, Isanti, Chisago, Pope

INSECTS AFFECTING MAN & ANIMALS

MOSQUITOES - First mosquito larvae were observed in the Minneapolis-St. Paul metropolitan area on March 31st but 1st pupation did not occur until April 26. By May 1, Aedes pupae were common but cool weather delayed adult emergence. The first hatch of Aedes vexans eggs occurred during the third week in May. This brood emerged about June 7 and light trap catches increased sharply by June 11 as did nuisance levels. A. vexans accounted for over 90% of the trap collections. Several single-brooded species were important in bite collections. Heavy rains the fourth week in June brought on another general hatch of A. vexans eggs. Mansonia perturbans in significant numbers were present in trap collections by June 20 with peak populations occurring about July 10. The largest brood of A. vexans hatched on July 7 with heavy emergence starting about 10 days later. Culex tarsalis were common during July but never in large numbers. Special surveys were made for Aedes triseriatus and many tree-hole breeding sites were treated. Several spring Aedes such as fitchi, stimulans and excrucians were commonly being taken in daytime bite collections as late as August 6.

DEER FLIES reported very annoying in early July.

WOOD TICKS reported to be very numerous during May. Many complains from Minneapolis-St. Paul suburbs.

PORT OF DULUTH ACTIVITIES

During the 1971 foreign shipping season, 288 salt water vessels called at the Port of Duluth. The breakdown of arrivals is as follows:

April	9	September	33
May	53	October	30
June	31	November	49
July	31	December	8
August	44		

This shipping season equaled 1970 in duration as the last ship left port on December 9. However, a new record was set in late arrivals when the last two ships arrived here on December 7. Ships calling at Duluth-Superior totaled a 51% increase over the 1970 season which totaled 186. Reasons for this are varied

DUTCH ELM DISEASE REPORT - 1972

Dutch elm disease continued to increase in severity and spread during the 1972 season. Thirty-one municipalities found their first positive case in 1972 as did two counties. Two hundred sixty municipalities now have DED - this represents 30% of the 854 incorporated cities and villages in Minnesota. Fifty-five of the 87 counties are infested. Outside of the Twin City metropolitan area the hardest hit cities were Rochester, Austin, Albert Lea and Mankato. Austin appeared to have the highest rate of infection. Many of the larger cities and villages are carrying on sanitation programs to control DED.

Diseased trees are required to be removed promptly, and generally, compliance has been good. Disposal of elm wood is becoming an increasingly difficult problem. Disposal of large volumes of wood in sanitary landfills is not a practical solution. The use of large chippers appears to be feasible where there is a market for the chips. Hennepin County has one such chipper in operation now. Conservation of resources and recycling is receiving increased emphasis in many areas of our economy. The utilization of elm wood seems to be an attractive possibility; however, the cost of collection and transportation likely will be the limiting factors. There is a definite need for research concerning the feasibility of elm wood utilization.

During the period June 1, 1972 to October 5, 1972 three thousand one hundred and ninety-four elm samples were submitted to the Minnesota Department of Agriculture Dutch Elm Disease Laboratory. Of these 1882 were diagnosed as positive for Dutch elm disease. The City of Austin laboratory confirmed 187 positive cases, the St. Cloud laboratory 20, and the University of Minnesota Plant Disease Clinic 147. The City of St. Paul field diagnosed 480 positive cases in addition to the 319 diagnosed by our laboratory. The total of diagnosed cases in 1972 from all agencies was 2716. This represents 47% of the 5826 cases that have been diagnosed since Dutch elm disease was first discovered in St. Paul in 1961.

DED is becoming increasingly evident in rural areas especially along rivers and their tributaries. The Root, Cedar and Blue Earth River valleys in southern Minnesota have many diseased and dead elm. Thousands of dead elm are found along the Mississippi River from Anoka to St. Cloud. An epidemic area exists along the St. Croix river from Bayport to Marine-on-the-St. Croix. Undoubtedly there are other undiscovered foci of infection especially in southeast and south central Minnesota.

LABORATORY DIAGNOSED CASES BY YEAR

1961 - 8 positive cases	1967 - 136 positive cases
1962 - 2 positive cases	1968 - 283 positive cases
1963 - 43 positive cases	1969 - 549 positive cases
1964 - 54 positive cases	1970 - 795 positive cases
1965 - 23 positive cases	1971 - 1,168 positive cases
1966 - 49 positive cases	1972 - 2,236 positive cases

TOTAL - 5,346

1972 Season Positive Cases
Diagnosed by the Dutch Elm Disease Laboratory,
Minnesota Department of Agriculture

ANOKA	Anoka	22	FARIBAULT	Blue Earth	
	Coon Rapids	1		rural	1
	Fridley	5		Delavan	2
BENTON	Foley	2		Elmore	5
				Wells	10
BIG STONE	Ortonville*	1		Winnebago	4
BLUE EARTH	Mankato	77	FILLMORE	Fountain*	1
	Garden City	2		Harmony*	3
BROWN	Evan*	1		Lanesboro	1
	New Ulm	4		Preston	9
	Sleepy Eye	1	FREEBORN	Albert Lea	81
	Springfield*	7		Alden	12
CARVER	Chanhassen*	1		Clarke Grove*	1
CHISAGO	Wyoming	1		Glenville	3
			GOODHUE	Cannon Falls	2
COTTONWOOD	Windom	2		Frontenac	2
	Jeffers*	2		Pine Island	1
CROW WING	Crow Wing			Red Wing	3
	rural	1		Wanamingo	1
				Zumbrota	1
DAKOTA	Farmington	1	HOUSTON	LaCrescent*	4
	Hastings	1		Spring Grove	3
	Inver Grove	5	JACKSON	Heron Lake	1
	Mendota Hts.	4		Jackson	16
	So. St. Paul	31	HENNEPIN	Bloomington	73
	Sunfish Lake	2		Brooklyn Center-	3
	W. St. Paul	2		Brooklyn Park	15
DODGE	Dodge Center	10		Champlin*	12
	Hayfield	1		Crystal	2
				Dayton	4
				Deephaven	1

HENNEPIN (continued)		OLMSTED	Rochester	111
	Eden Prairie		Byron	1
	Edina		Chatfield	2
	Golden Valley		Rural	2
	Hopkins	PIPESTONE	Edgerton	1
	Maple Grove		Ihlen*	1
	Minneapolis		Jasper*	1
	New Hope		Pipestone	4
	Plymouth			
	Richfield	RAMSEY	Falcon Heights	4
	Rogers*		Lauderdale	1
	Robbinsdale		Maplewood	24
	St. Louis Park		New Brighton	2
KANDIYOHI	Willmar		No. St. Paul	8
			Roseville	8
LESUEUR	Waterville		St. Paul	319
	Rural		Shoreview	4
			White Bear Lake	10
LINCOLN	Lake Benton	REDWOOD	Lamberton*	10
			Milroy	1
LYON	Marshall	RENVILLE	Sacred Heart	1
	Minnesota			
	Rural	RICE	Faribault	1
	Tauton		Northfield	5
	Tracy		Rural	1
MARTIN	Fairmont	ROCK	Hills	9
	Northrop*		Luverne	17
	Ormsby	ST. LOUIS	Virginia	1
	Trimont	SCOTT	Savage	2
	Truman			
	Welcome	STEARNS	Albany	1
	Galiva Twp.		Cold Spring*	2
MEEKER	Darwin*		Melrose	1
	Litchfield		St. Cloud	23
MILLE LACS	Milaca		Rural	1
			Waite Park	4
MOWER	Austin		Rural	1
	rural			
	Grand Meadow	STEELE	Owatonna	16
MURRAY	Currie			
	Slayton	WABASHA	Lake City	4
			Plainview	2
NICOLLET	Courtland*	WASECA	Janesville	2
	Lafayette*		New Richland	1
	North Mankato		Waseca	6
Nobles	Adrian			
	Round Lake*			
	Rushmore			
	Worthington			

WASHINGTON	Bayport	16
	Lake Elmo	5
	Lakeland	8
	Marine on St. Croix	8
	May Twnsp.	1
	Newport	29
	Stillwater	11
	Rural	2
	Woodbury	77
WATONWAN	St. James	11
WINONA	St. Charles*	3
	Winone	31
WRIGHT	Buffalo	2
	Clearwater	1
YELLOW MEDICINE	Canby*	9
	Wood Lake*	2

TOTAL - 1882

Summary Tabulation

Total cases confirmed thru October 5, 1972 by the State Dutch Elm Disease Laboratory of the Minnesota Department of Agriculture, Plant Industry Division. . .	1,882
Confirmed by field diagnoses - City of St. Paul	480
Confirmed by the Plant Disease Clinic of the University of Minnesota.	147
Confirmed by the City of Austin Laboratory.	187
Confirmed by the St. Cloud City Laboratory.	20
Total confirmed cases for Minnesota	2,716

DUTCH ELM DISEASE REPORT - 1974

Dutch elm disease continued to increase in severity during the 1974 season. Public awareness of Dutch elm disease has led to increased programs of detection and control by local municipalities. Forty-four municipalities found their first positive case in 1974, as did two counties. Three hundred twenty-eight municipalities now have Dutch elm disease. This represents 38% of the 854 incorporated cities in Minnesota. Sixty-four of the eighty-seven counties are infested. Outside of the Twin City metropolitan area, the hardest hit cities were Austin, Albert Lea, and Mankato.

During the period June 1st to October 21, 1974, 5,877 elm samples were submitted to the Minnesota Department of Agriculture, Tree Disease Laboratory. Of these, 3,167 were diagnosed as positive for Dutch elm disease. The City of Austin laboratory confirmed 172 positive cases, and the St. Cloud laboratory - 20. The total of positive diagnosed cases in 1974 from all agencies was 3,359. This total represents an increase of nearly 1/3 over last year's positive cases. These cases are only a small percentage of the actual number of cases in the state, but they do reflect the statewide trend. If this trend continues or even worsens, there will be a sharp increase in 1975, possibly as much as 50%. Since 1961, a total of 11,250 cases of Dutch elm disease have been diagnosed, mainly from municipal areas.

Dutch elm disease is becoming increasingly evident in rural areas in wood lots and especially along rivers and their tributaries. Thousands of dead elms are evident along the rivers in southeastern Minnesota.

It is expected that Dutch elm disease will be found in many more municipalities in central Minnesota in 1975. The future increase of Dutch elm disease in municipalities will be determined by the effectiveness of their control program. Unless there is an increased control effort for Dutch elm disease, each municipality will see a rapid and drastic change in its shade tree environment. Intensified control measures will slow down the spread of this disease, and allow an orderly transition to a more diversified tree population.

LABORATORY DIAGNOSED CASES BY YEAR

1961 - 8 positive cases	1968 - 283 positive cases
1962 - 2 positive cases	1969 - 549 positive cases
1963 - 43 positive cases	1970 - 795 positive cases
1964 - 54 positive cases	1971 - 1,158 positive cases
1965 - 23 positive cases	1972 - 2,236 positive cases
1966 - 49 positive cases	1973 - 2,545 positive cases
1967 - 136 positive cases	1974 - 3,359 positive cases

TOTAL - 11,250

SUMMARY TABULATION

Total cases confirmed through October 21, 1974 by the Shade Tree Disease	
Laboratory of the Minnesota Department of Agriculture.....	3,167
Confirmed cases by the City of Austin Laboratory.....	172
Confirmed cases by the City of St. Cloud Laboratory.....	20
Total confirmed cases for Minnesota.....	3,359

1974 Season Positive Cases
 Diagnosed by the Shade Tree Disease Laboratory
 Minnesota Department of Agriculture

ANOKA

Anoka.....16
 *Bethel.....1
 Blaine.....2
 *Columbia Heights.....2
 Coon Rapids.....13
 *East Bethel.....3
 Fridley.....11
 *Spring Lake Park.....1

BENTON

Foley.....4
 *Gilman.....1
 Sauk Rapids.....1

BLUE EARTH

Mankato.....225

BROWN

Evan.....1
 New Ulm.....18
 Sleepy Eye.....12
 Springfield.....17

CARVER

*Carver.....2
 Chaska.....3

CHIPPEWA

Montevideo.....4

CHISAGO

*Harris.....1
 *Lindstrom.....7
 North Branch.....2
 Wyoming.....4

COTTONWOOD

Windom.....4

CROW WING

Brainerd.....2

DAKOTA

*Apple Valley.....1
 Burnsville.....32
 *Eagan.....2
 Inver Grove Heights...2
 *Lakeville.....2
 Lilydale.....1
 *Mendota.....1
 Mendota Heights.....2
 Rosemount.....3
 South St. Paul.....24
 Sunfish Lake.....1
 *Vermillion.....1
 West St. Paul.....5

DODGE

Dodge Center.....22
 Hayfield.....10
 Kasson.....3

FARIBAUT

Wells.....14
 Winnebago.....14

FILLMORE

Chatfield.....2
 Preston.....10

FREEBORN

Albert Lea.....71
 Clarks Grove.....2

GOODHUE

Cannon Falls.....2
 Red Wing.....6
 Zumbrota.....1

HENNEPIN

Bloomington.....413
 Brooklyn Center.....34
 Brooklyn Park.....16
 Champlin.....8
 Coorcoran.....3

HENNEPIN (con't)

Dayton.....2
 Eden Prairie.....95
 Edina.....8
 Excelsior.....1
 Golden Valley.....9
 *Greenfield.....3
 *Greenwood.....2
 *Hanover.....1
 Hopkins.....2
 *Independence.....1
 Maple Grove.....11
 Maple Plain.....1
 *Medicine Lake.....3
 Medina.....5
 Minneapolis.....305
 Minnetonka.....18
 *Mound.....6
 New Hope.....5
 Osseo.....4
 Plymouth.....30
 Richfield.....6
 Robbinsdale.....7
 St. Anthony.....1
 St. Louis Park.....27
 Shorewood.....7

HOUSTON

Caledonia.....1

ISANTI

Braham.....3
 Cambridge.....4

JACKSON

Jackson.....9

*KANABEC

*Mora.....1

KANDIYOH

Spicer.....2
 Willmar.....3

LAC QUI PARLE

Dawson.....1
 *Madison.....1

LE SUEUR

*Montgomery.....1
 Waterville.....1

LINCOLN

Lake Benton.....12

LYON

Cottonwood.....1
 Marshall.....34
 Minneota.....5
 Tracy.....5

MARTIN

Fairmont.....5
 Trimont.....2
 Truman.....5

MC LEOD

Glencoe.....2
 Hutchinson.....2
 *Winsted.....1

MEEKER

*Grove City.....1

MILLE LACS

*Foreston.....2
 Milaca.....2
 Princeton.....9

MORRISON

Little Falls.....1

NICOLLET

Lafayette.....3
 St. Peter.....1

NOBLES

Adrian.....4
 Ellsworth.....6
 Wilmont.....2
 Worthington.....29

OLMSTED

Rochester.....141

OTTERTAIL

Fergus Falls.....1

PIPESTONE

Pipestone.....4

RAMSEY

*Arden Hills.....1
 Falcon Heights.....1
 *Gem Lake.....8
 Little Canada.....15
 Maplewood.....20
 New Brighton.....1
 North Oaks.....1
 North St. Paul.....12
 Roseville.....10
 St. Paul.....455
 Shoreview.....1
 Vadnais Heights.....4
 White Bear Lake.....55

REDWOOD

*Belview.....1
 *Milroy.....2
 Morgan.....2
 Redwood Falls.....8

RENVILLE

Olivia.....1

RICE

Faribault.....16
 Northfield.....5

ST. LOUIS

*Aurora.....	1
Biwabik.....	1
*Cook.....	1
Duluth.....	1
Gilbert.....	2
*Hibbing.....	1
Virginia.....	1

SCOTT

*Prior Lake.....	28
Savage.....	2
Shakopee.....	6

SHERBURNE

Elk River.....	2
Zimmerman.....	1

SIBLEY

Arlington.....	1
*Gaylord.....	2
*Gibbon.....	1
Green Isle.....	1

STEARNS

Cold Spring.....	1
Melrose.....	8
St. Cloud.....	4
Sauk Centre.....	1
Waite Park.....	2

STEELE

Medford.....	2
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SWIFT

*Benson.....	1
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WABASHA

Lake City.....	5
Wabasha.....	4

WASECA

New Richland.....	2
Waseca.....	2

WASHINGTON

Afton.....	3
Bayport.....	13
*Birchwood.....	4
Cottage Grove.....	6
*Dellwood.....	1
*Forest Lake.....	2
*Hugo.....	1
Lake Elmo.....	24
Lakeland.....	3
Mahtomedi.....	12
Marine on St. Croix..	17
Oakdale.....	30
*Oak Park Heights.....	1
*Pine Springs.....	1
St. Paul Park.....	12
Stillwater.....	20
*Willernie.....	6
Woodbury.....	69

WATONWAN

Madelia.....	3
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WINONA

*Goodview.....	2
St. Charles.....	2
Winona.....	65

WRIGHT

Buffalo.....	7
Maple Lake.....	1

YELLOW MEDICINE

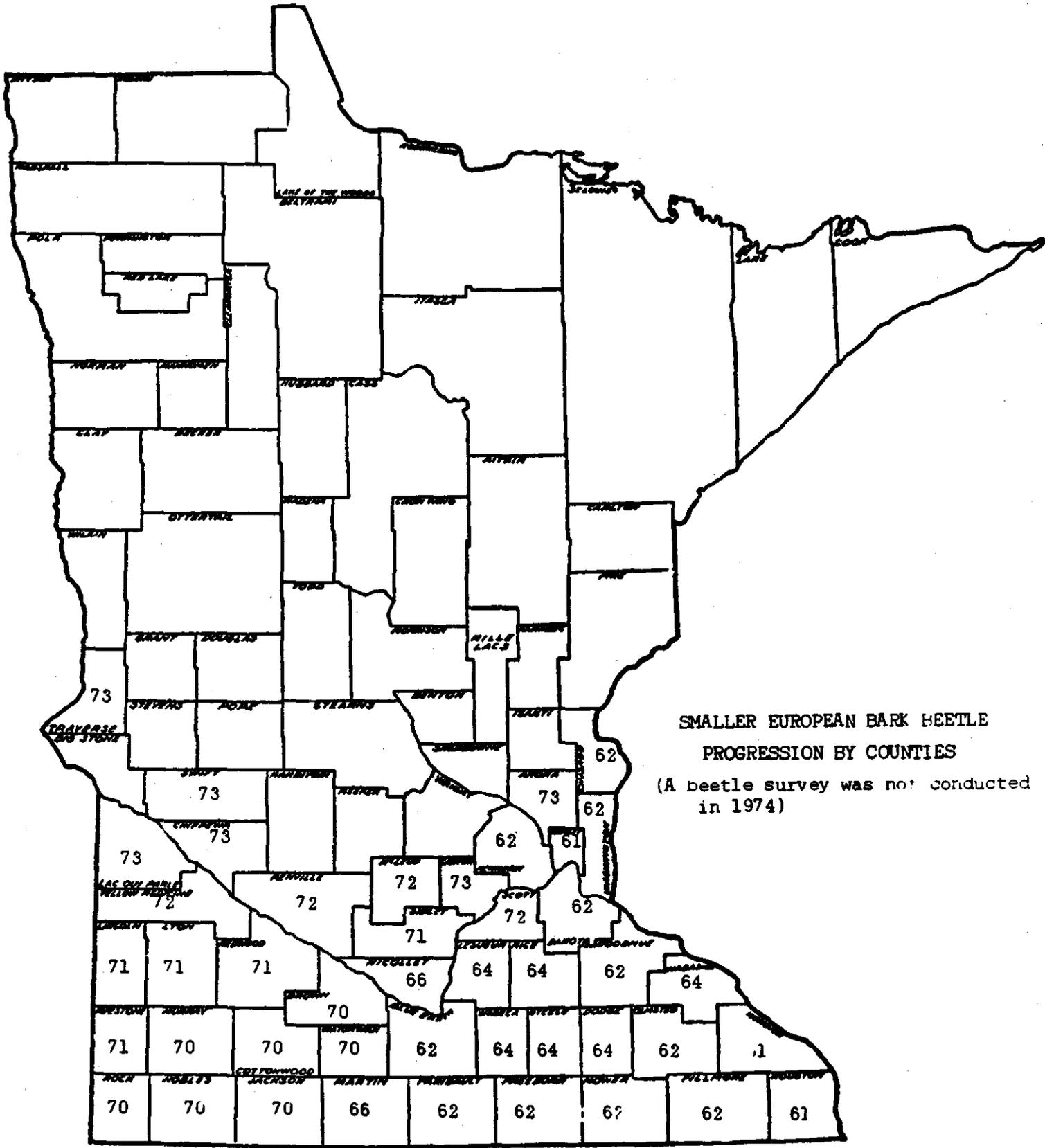
Canby.....	2
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RURAL LOCATIONS

*AITKIN rural.....	1
ANOKA rural.....	2
BENTON rural.....	3
CARVER rural.....	1
CHISAGO rural.....	4
DAKOTA rural.....	7
HENNEPIN rural.....	6
KANDIYOHI rural.....	4
LE SUEUR rural.....	1
LINCOLN rural.....	2
LYON rural.....	1
MC LEOD rural.....	1
MILLE LACS rural.....	1
MOWER rural.....	1
MURRAY rural.....	1
NICOLLET rural.....	3
OLMSTED rural.....	3
PINE rural.....	1
POPE rural.....	1
RAMSEY rural.....	2
RICE rural.....	2
SCOTT rural.....	11
STEARNS rural.....	2
SWIFT rural.....	1
TODD rural.....	1
WABASHA rural.....	2
WASECA rural.....	1
WASHINGTON rural.....	94
WATONWAN rural.....	1
WINONA rural.....	1
WRIGHT rural.....	1
YELLOW MEDICINE rural.	2

* indicates new location for 1974

Two new counties were infected in 1974; they are Aitkin and Kanabec.



SHADE TREE DISEASES

DUTCH ELM DISEASE - Dutch elm disease continued its steady advance through the state's elm tree populations. The increase appears to be substantial based on reports from municipalities and the Department of Agriculture's Shade Tree Disease Laboratory. The reporting municipalities listed 31,851 elms lost to Dutch elm disease. This is 18,311 elms more than in 1974. Four more counties; Carlton, Koochiching, Roseau, and Stevens confirmed Dutch elm disease in 1975 raising the total of affected counties to sixty-eight (Fig. 1). Nine more municipalities reported their first case of Dutch elm disease in 1975. This raises the total of Minnesota municipalities with confirmed Dutch elm disease to 332 (Fig. 2).

Dutch elm disease remains a serious threat to all elms of the State, especially along rivers and their tributaries. By all indications, there is a very real possibility that municipal losses in 1976 will double to well over 50,000 elms. Intensified municipal control programs could reduce this estimated loss.

OAK WILT DISEASE - Reports reveal only a slight increase in the total loss of oaks. In the metropolitan municipalities 6,787 oaks were lost in 1974 and 6,981 in 1975. Presently, the oak wilt disease is limited to the eastern two-thirds of southern and central Minnesota and is reported to be active in 36 counties (Fig. 3).

From all available information, oak wilt disease is controllable in the state. The increased control efforts applied in 1975 should help municipalities to minimize 1976 losses.

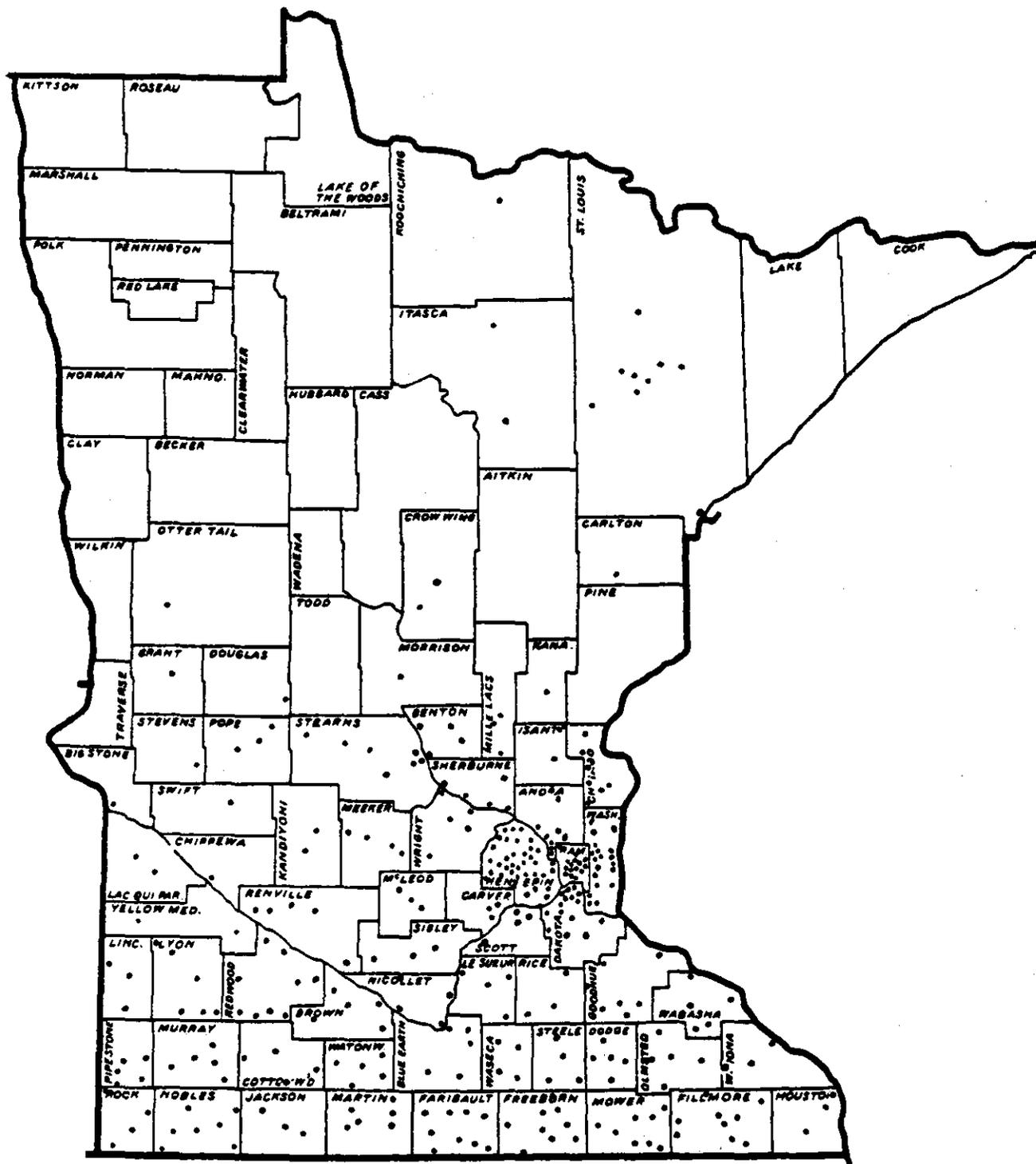
DIAGNOSTIC LABORATORY - The Shade Tree Disease Laboratory received 6,395 elm samples between June and September, 1975. Of these, 4,460 samples were positive for Dutch elm disease. The City of Austin laboratory confirmed 200 and the City of St. Cloud laboratory confirmed 64 positive cases of Dutch elm disease. The total positive diagnosed cases in 1975 was 4,724. This is an increase of 1,365 over 1974.

LABORATORY DIAGNOSED DUTCH ELM DISEASE CASES

	<u>Number</u> <u>Positive</u>		<u>Number</u> <u>Positive</u>		<u>Number</u> <u>Positive</u>
1961	8	1966	49	1971	1158
1962	2	1967	136	1972	2236
1963	43	1968	283	1973	2545
1964	54	1969	549	1974	3359
1965	23	1970	795	1975	4724

(Cumulative) Total . . . 15,964

The state laboratory also received 739 oak samples of which 453 were positive for oak wilt disease. This is an increase of 139 over 1974.



DISTRIBUTION OF DUTCH ELM DISEASE BY MUNICIPALITIES
 Based on positive diagnosis by the Shade Tree Laboratory

1961 - 1975

(Figure 2)

The following amounts (in thousand bushels) of grain were loaded for export at the Duluth-Superior port. Barley, 22,123; corn, 11,104; durum, 8,521; flaxseed, 215; oats, 5,895; and wheat, 19,749. Also the following commodities (short tons - 2,000 pounds) were exported: beet pulp pellets, 47,673; canary seeds, 5,846; millet, 564; soybean meal, 6,020; and sunflower seeds, 297,818. The above shipments went to 22 different countries.

Forty-seven planes, as compared to 13 in 1975, landed at Duluth and discharged 6,413 passengers and 326 crew. These aircraft originated from Austria, Denmark, Finland, Germany, Greece, Hong Kong, Italy, Netherlands, Norway, Trinidad, and the United Kingdom. A variety of 240 items was inspected including fruit, flowers, house plants, wild plants, potatoes, snails and meats that could carry pests and pose a potential threat to agriculture. These were seized and destroyed. Refuse removed from the aircraft and incinerated amounted to 10,470 pounds. Two of the most interesting seizures were approximately four pounds of meat in a factory sealed can labeled "Extra concentrated tomato paste," and ten pounds of edible snails from Italy.

LOOSE SMUT OF BARLEY - 1975-76 TESTS

The Barley Smut Laboratory processed 598 barley samples from the 1975 barley crop. Loose smut infection was low and only a few samples had high infection.

The following table is a summary of this year's embryo tests:

<u>PERCENT INFECTED EMBRYOS</u>	<u>NUMBER OF SAMPLES</u>	<u>PERCENT OF TOTAL</u>
0.0 - 1.0	280	46.8%
1.1 - 2.0	99	16.6
2.1 - 3.0	69	11.5
3.1 - 4.0	45	7.5
4.1 - 5.0	27	4.5
5.1 - 6.0	19	3.3
6.1 - 7.0	18	3.0
7.1 - 8.0	8	1.3
8.1 - 9.0	8	1.3
9.1 - 10.0	7	1.2
over 10.0	<u>18</u>	<u>3.0</u>
TOTAL:	598	100.0%

The smut infection in the test results ran from a low of 0.0% to a high of 21.9%. The statewide average infection was 2.3% in 1976 compared to 1.9% in 1975. Of the 598 samples tested, 82.4% were below the 4.0% infection level considered the maximum allowable for desirable planting seed. Approximately 15% of the seed tested in 1976 would therefore be undesirable for planting.

SHADE TREE DISEASES

DUTCH ELM DISEASE - Reports from 145 municipalities show that a total of 75,460 elms were lost to Dutch elm disease in 1976 in the metropolitan area. The Department of Natural Resources reported 1,600 elms were lost

on park lands raising the total loss to 77,060 in the metro area. Adding the 9,514 elms reported lost by 124 out-state communities brings the total loss for the state to 86,574. Wilkin County confirmed its first case of Dutch elm disease bringing the total affected counties to 69 (Fig. 5). Eight more municipalities confirmed their first case of Dutch elm disease in 1976. There are now 354 municipalities with confirmed Dutch elm disease (Fig. 6).

OAK WILT DISEASE - Reports from municipalities in the seven county metropolitan area indicate 7,891 oaks were lost in 1976 which is approximately a thousand more oaks than were reported in 1975.

DIAGNOSTIC LABORATORY - The Shade Tree Disease Laboratory processed 8,260 elm and 427 oak samples during the 1976 season. Samples positive for Dutch elm disease totaled 5,997. The City of Austin laboratory confirmed 465 and the City of St. Cloud laboratory confirmed 186 positive cases of Dutch elm disease. The total positive laboratory diagnosed cases in 1976 was 6,648. Of the 427 oak samples, 190 were positive for oak wilt disease.

LABORATORY DIAGNOSED DUTCH ELM DISEASE CASES

Cumulative Totals	
1961 - 65	130
1966 - 70	1,812
1971 - 75	14,022
1976	<u>6,648</u>
1961 - 76	22,612

During the summer of 1976, the Shade Tree Disease Laboratory personnel collected data on the prevalence of aggressive and non-aggressive strains of Ceratocystis ulmi, the causative organism of Dutch elm disease. With sufficient data over a period of time, disease patterns should be discernible. Such information should prove helpful in directing control efforts. The survey in 1976 covered only the greater metropolitan area. (Fig. 7)

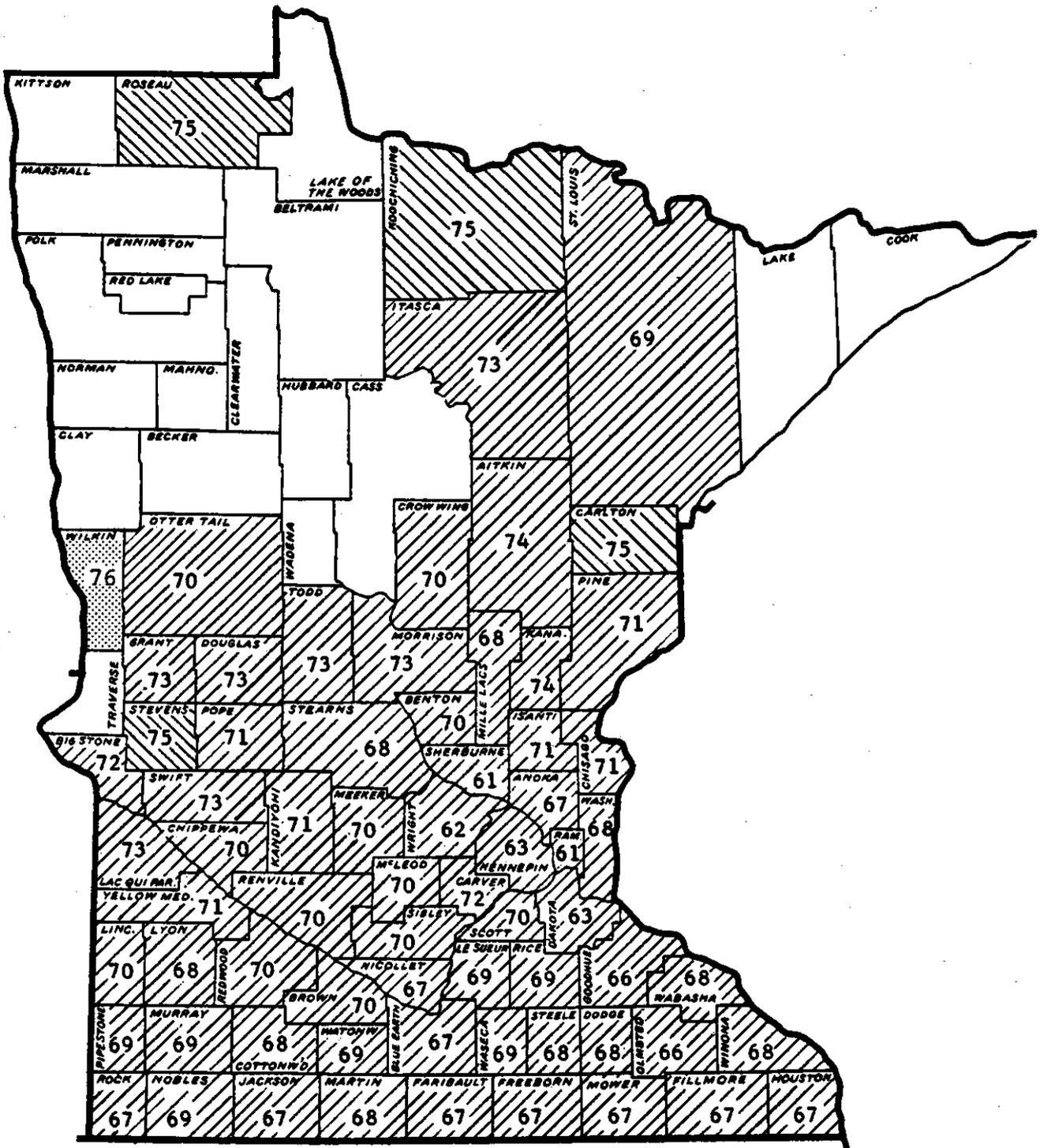


Fig. 5. Distribution of Dutch elm disease based on year of positive diagnosis by the Shade Tree Laboratory 1961-1976

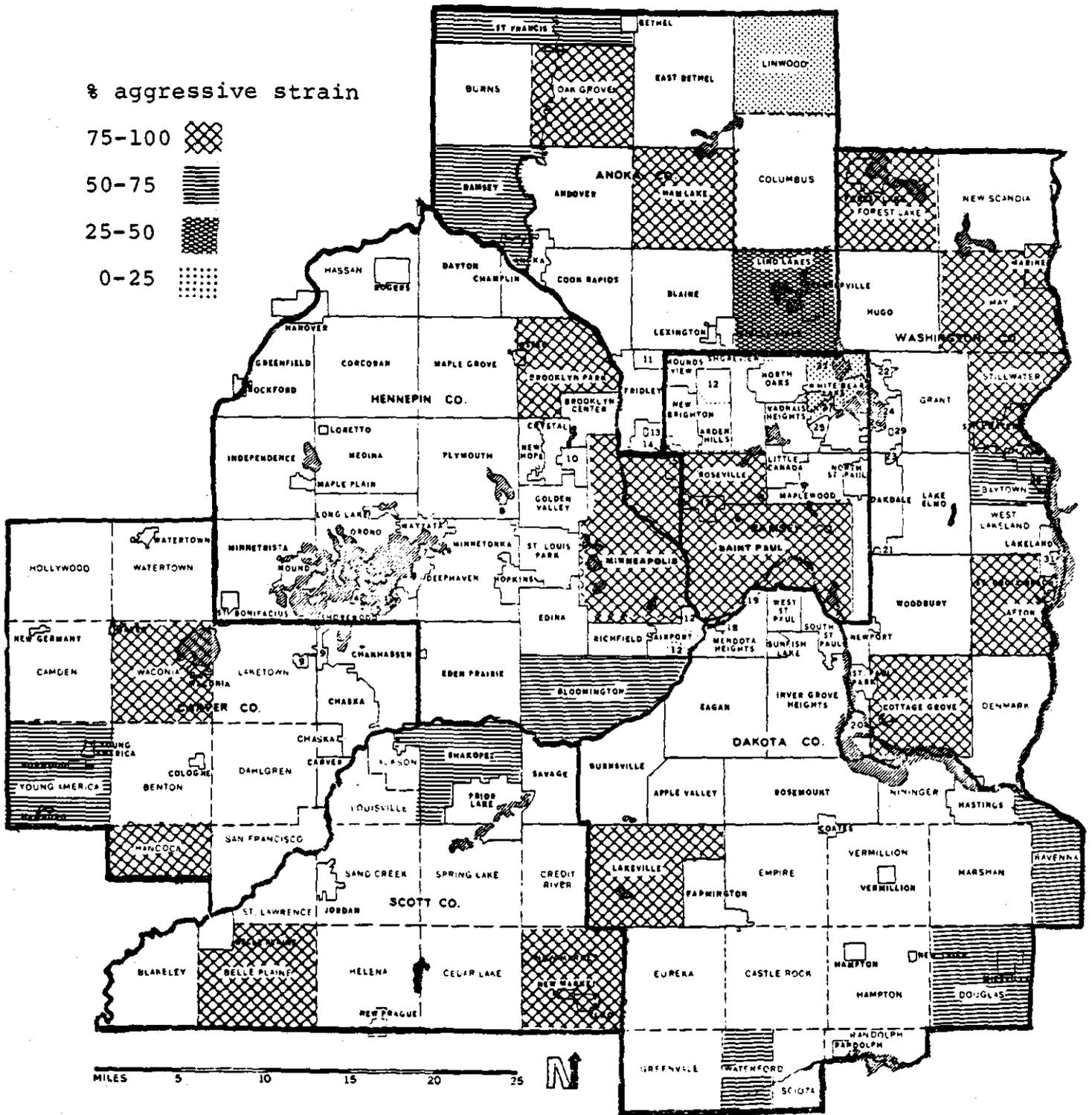


Fig. 7. The incidence of aggressive strains of Ceratocystis ulmi in metropolitan townships - 1976.

PORT OF DULUTH ACTIVITIES

Inspections for plant pests were conducted in 274 ships from 16 countries that entered the Duluth Harbor from April through December, 1977.

The Bayfront Marine Sanitary Service incinerated 250 tons of garbage and 492 tons of dunnage from these foreign vessels.

Twenty planes, as compared to 47 in 1976, landed at the Duluth airport and discharged 3,082 passengers and 346 crew. These aircraft originated from Austria, Finland, Israel, Spain, and The United Kingdom. A total of 112 items such as fruits, flowers, houseplants and meat were seized and destroyed. Refuse removed from these aircraft weighed 7,450 pounds which was incinerated. No plant pest interceptions were made in 1977 from these aircraft.

MOSQUITOES

Our division is responsible for approving mosquito control programs for outstate communities and providing technical assistance and guidance. In 1977, 33 cities obtained permits to engage in local mosquito control. Mosquito populations, however, were considerably lower in 1977, as well as in 1976, from other years and did not warrant chemical sprays in most communities.

The Metropolitan Mosquito Control District has been monitoring mosquito populations since its establishment in 1958. In 1977, mosquito population in the district was the second lowest recorded (the lowest on record was in 1976). This drop in population was attributed to a combined carry-over effect of the drought in 1976 and the influence of the pre-hatch control program.

Heavy rainfall at the end of August caused a large, unexpected brood of Aedes vexans, the most numerous species caught in light traps and bite collections. The second most numerous species in light trap collections were the marsh-breeding Coquillettidia perturbans. Aedes abserratus was third in light trap collections. In daytime biting collections, Aedes vexans was number one, A. stimulans second, and A. excrucians third. A. vexans was first also in larval collections with A. cinereus second, and A. excrucians third.

Culex tarsalis populations were above normal this summer. Eight confirmed human cases of western equine encephalitis were reported in Minnesota in 1977 -- 115 cases were reported in horses. Aedes triseriatus, which breeds in tree holes and in artificial containers, was responsible for ten cases of California (La Crosse strain) encephalitis in the following counties: Dakota-1, Goodhue-1, Hennepin-2, Houston-1, Ramsey-1, and Winona-4.

SHADE TREE DISEASES

DIAGNOSTIC LABORATORY - The Shade Tree Disease Laboratory operated by our division processed 5,948 elm and 1,759 oak samples during the 1977 season. Dutch elm disease was positive in 4,302 samples, and Oak wilt disease in 358 samples.

The laboratory confirmed Dutch elm disease in six new counties: Becker, Hubbard, Norman, Polk, Traverse, and Wadena in 1977. This brings the total affected Minnesota counties to 75 (Fig. 5). Also, Dutch elm disease was confirmed in 13 more municipalities which brings the total affected municipalities to 379.

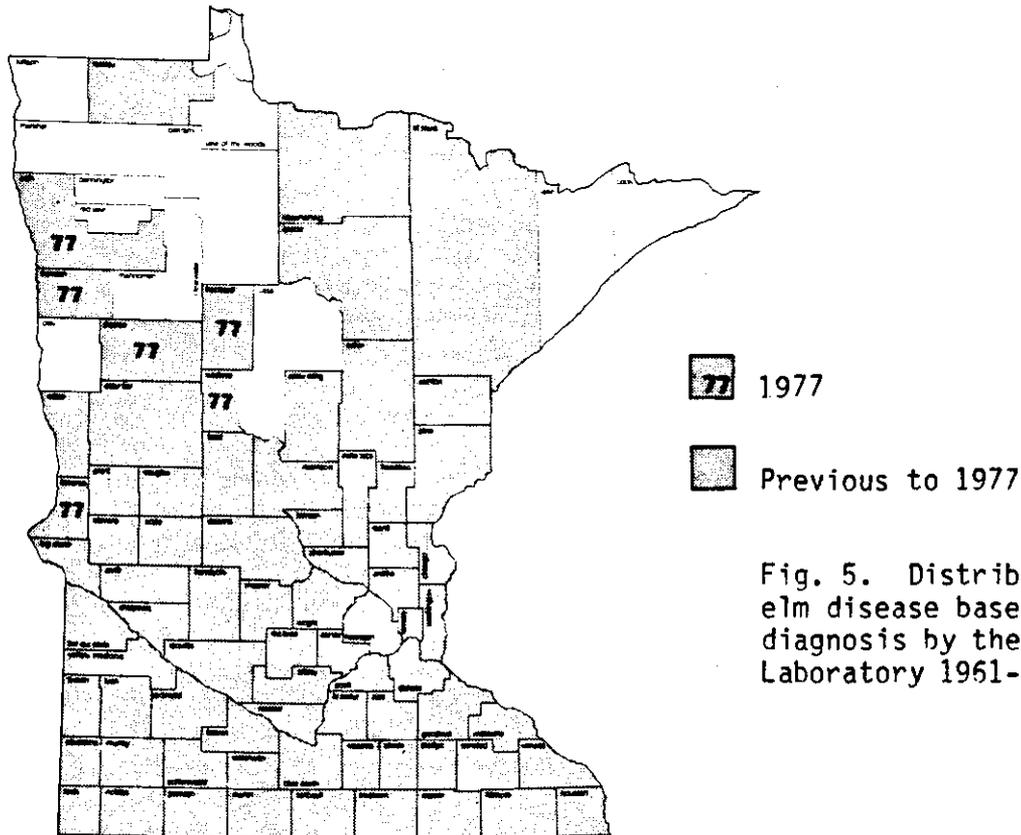


Fig. 5. Distribution of Dutch elm disease based on positive diagnosis by the Shade Tree Laboratory 1961-77.

DUTCH ELM DISEASE MONITORING PLOTS - Our division has continued to monitor the incidence and rate of spread of Dutch elm disease in the state. Fifty-three plots were established in 1975 including 31 urban, 13 rural, and 9 river valley locations. The size of each plot is 0.10 hectare (approximately 1/4 acre) containing an average of 23 elm trees.

Field data gathered from all plots for the three years 1975-77 showed, respectively, the following: Dutch elm disease affected 2.3 percent, 9.3 percent, and 21.2 percent of the elm population -- a four-fold increase between 1975-76, and over two-fold increase between 1976-77. Of these, Dutch elm disease in urban plots averaged 2.4 percent, 7.8 percent, and 15.3 percent; in rural plots 3.4 percent, 13.3 percent, and 34.6 percent; and in river valley plots 0.5 percent, 9.3 percent, and 23.3 percent. Rural and river valley losses were higher because of denser stands, and minimal to no sanitation efforts.

Dutch elm disease incidence has been the heaviest in the southern third of the state (22 plots) and averaged 3.6 percent, 11.4 percent, and 34.6 percent for the three years 1975-77. This is approximately a three-fold increase every year.

SHADE TREE LOSSES - The Shade Tree Program Office provided the following information gathered from questionnaires received from 306 out of 439 municipalities. The metropolitan seven county area lost 100,717 elms to Dutch elm disease compared to 75,460 in 1976. Communities reporting from outstate areas estimate elm losses at 37,137 compared to 9,434 in 1976. Outstate loss estimates are incomplete. The metropolitan area lost 8,480 oaks from oak wilt disease compared to 7,891 a year ago. Partial data available for the outstate municipal areas projected the oak losses at 3,294 in 1977. For more details contact the Shade Tree Program Office.

Nosema Test

Nosema is a serious disease of adult honeybees. The disease is nearly impossible to detect in a colony by a visual inspection, but can be detected through a laboratory analysis. If detected in a colony the disease can be controlled with a chemical treatment. The division provides this service to Minnesota beekeepers.

The Nosema Lab processed 272 samples from 123 individuals. Significant levels of Nosema infection (over 1 million spores/bee) requiring Fumadil B treatment were found in 48.6 percent of the samples tested. Without treatment the probable consequences in an apiary would include reduced honey yields, winter and spring colony losses, and supersedures and queen losses in package colonies.

Shade Tree Laboratory

The Shade Tree Lab processed 2,532 oak and elm samples this season for municipalities and some individuals. The following table summarizes the results:

<u>DISEASE</u>	<u>POSITIVE</u>	<u>NEGATIVE</u>	<u>TOTAL</u>
Dutch Elm	1,208	721	1,929
Oak Wilt	<u>210</u>	<u>393</u>	<u>608</u>
Total	1,418	1,114	2,532

Beltrami County reported its first confirmed case of Dutch Elm disease in 1978. The sample was from the city of Bemidji.

No new areas of Oak Wilt infestation were identified.

The number of samples received by the lab showed a sharp decline from 1977 when 7,707 samples were processed. Local tree inspectors are now relying more on field diagnosis rather than lab analysis to determine diseased trees. Additional information can be found in the Department of Agriculture Shade Tree Program's annual report for 1978.

Soybean Cyst Nematode Lab

The Soybean Cyst Nematode is a serious pest of soybeans, capable of significantly reducing yields when established. Soybean Cyst Nematodes were found in Minnesota for the first time in 1978 (See Crop Pest Surveys, page 8). A total of 500 soil samples from 45 counties and 12 nurseries were processed by the Soybean Cyst Lab, with assistance from the University of Minnesota. Thirteen additional fields in Faribault County were found to be infested with Soybean Cyst Nematodes.

Seed Potato Projects and Labs

Ring Rot is a bacterial disease organism that destroys potato tubers. The bacteria is spread by the process of cutting seed potatoes at the time of planting. All certified seed potatoes must be free of Ring Rot. Starting with the 1978 crop, Technical Support began confirming all

The results show an increase in the amount of smut found in the 1978 samples compared to 1977. The average percent smut increased from 3.1% to 3.6%. The percentage of samples with less than 4.0% smut (the maximum allowed for desirable planting seed) dropped slightly from 68.7% in the 1977 crop to 67.3% in the 1978 crop.

The number of samples processed by the lab continued to decline from the peak year, 1971 when 1,000 samples were examined. During this same period the average percent smut infection decreased from 5.1% in 1971 to 1.2% in 1976. However, the average percent smut for 1977 was 3.1% and in 1978, 3.6%. In the past, an increase in the average percent smut coincided with an increase in the number of samples submitted. The reason for a decrease in samples while the amount of smut increased is not known.

NOSEMA

Nosema is a serious disease of adult honeybees caused by the protozoan Nosema apis. The disease is virtually impossible to detect in a colony by visual inspection, but can be detected through laboratory analysis of the adult honeybee. If detected in a colony, the disease can be controlled with a chemical treatment. The division provides a laboratory test for Minnesota beekeepers in an attempt to minimize Nosema disease.

The Nosema Lab processed 123 samples in 1979. Significant levels of Nosema infection (over 1 million spores/bee) requiring Fumadil B treatment were found in 41.5% of the samples tested. Without treatment the probable consequences in an apiary would include reduced honey yields, winter and spring colony losses and supercedures and queen losses in package colonies.

SHADE TREE DISEASE LABORATORY

Dutch elm disease and oak wilt are vascular wilts of elm and oak caused by fungi from the genus Ceratocystis. Over the last ten years, these tree diseases have had a significant impact on the elm and oak populations. As an aid in identifying trees infected with either of these diseases the division has operated the Shade Tree Disease Laboratory.

The Shade Tree Laboratory processed 1,512 oak and elm samples this season for municipalities and homeowners. The following table summarizes the results:

<u>Disease</u>	<u>Positive</u>	<u>Negative</u>	<u>Total</u>
Dutch Elm	619	481	1,100
Oak Wilt	171	241	412
Total	<u>790</u>	<u>722</u>	<u>1,512</u>

No new areas of Dutch elm disease or oak wilt infestation were identified.

The number of samples received by the lab declined again in 1979. In 1977, 7,707 samples were processed; in 1978, 2,532 samples were submitted. Local tree inspectors are now relying more on field diagnosis rather than lab analysis to determine diseased trees. Additional information can be found in the Department of Agriculture Shade Tree Program's annual report for 1979.

SHADE TREE DISEASE IDENTIFICATION SERVICE

Dutch elm disease and oak wilt are vascular wilts of elm and oak caused by fungi from the genus Ceratocystis. Over the past ten years, these tree diseases have had a significant impact on the elm and oak populations. As an aid in identifying trees infected with either of these diseases, the Division has provided the Shade Tree Disease Identification Service.

The laboratory processed 1,272 elm and oak samples this season for municipalities and homeowners. The following table summarizes the results:

<u>Disease</u>	<u>Positive</u>	<u>Negative</u>	<u>Total</u>
Dutch elm	684	381	1,065
Oak wilt	94	113	207
	<u>778</u>	<u>494</u>	<u>1,272</u>

No new areas of Dutch elm or oak wilt infestations were identified.

The number of samples received by the lab declined again in 1980 (1979 - 1,512 samples submitted). Additional information can be found in the Department of Agriculture Shade Tree Program's Annual Report for 1980.

SOYBEAN CYST NEMATODE PROJECT

The soybean cyst nematode, Heterodera glycines, is a serious pest of soybeans capable of significantly reducing yields when it becomes established in a field. Soybean cyst nematodes were found for the first time in Minnesota in Faribault county, in 1978. Last year as a result of an intensive field survey and lab screening it was found in six additional counties. (See SCN, Crop Pest Survey, page 7.)

A follow-up survey was conducted in 1980 in the southern half of the state, and 915 soil samples were collected. These samples were processed during the winter of 1980-1981. Blue Earth county was added to the seven previously confirmed infested counties.

SEED POTATO PROJECTS

Ring rot induced by the bacterium Corynebacterium sepedonicum is a disease that destroys potato tubers. The bacterium is spread principally by the process of cutting seed potatoes during planting. All certified seed potatoes must be free of Bacterial Ring Rot. Starting with the 1978 crop, Technical Support began using the Gram Stain test to confirm all suspected Bacterial Ring Rot-infested fields and lots. In 1980, ten seed potato lots were tested and found positive for Bacterial Ring Rot. This resulted in the rejection of 1,187 acres of seed potatoes.

Field-testing for Potato Virus X (PVX) was again conducted in the Red River Valley. Three growers submitted samples from six seed potato lots. In addition, eight special seed potato plots were tested. A total of 89.15 acres were tested for PVX. Of the tested acres, 87.15 acres passed the PVX test with readings of three percent or less.

DUTCH ELM DISEASE REPORT, 1967

by

William Ahlberg

In cooperation with Milton G. Marinos

MINNESOTA DEPARTMENT OF AGRICULTURE
DIVISION OF PLANT INDUSTRY
DUTCH ELM DISEASE LABORATORY
670 State Office Building
St. Paul, Minnesota 55101

September 14, 1967

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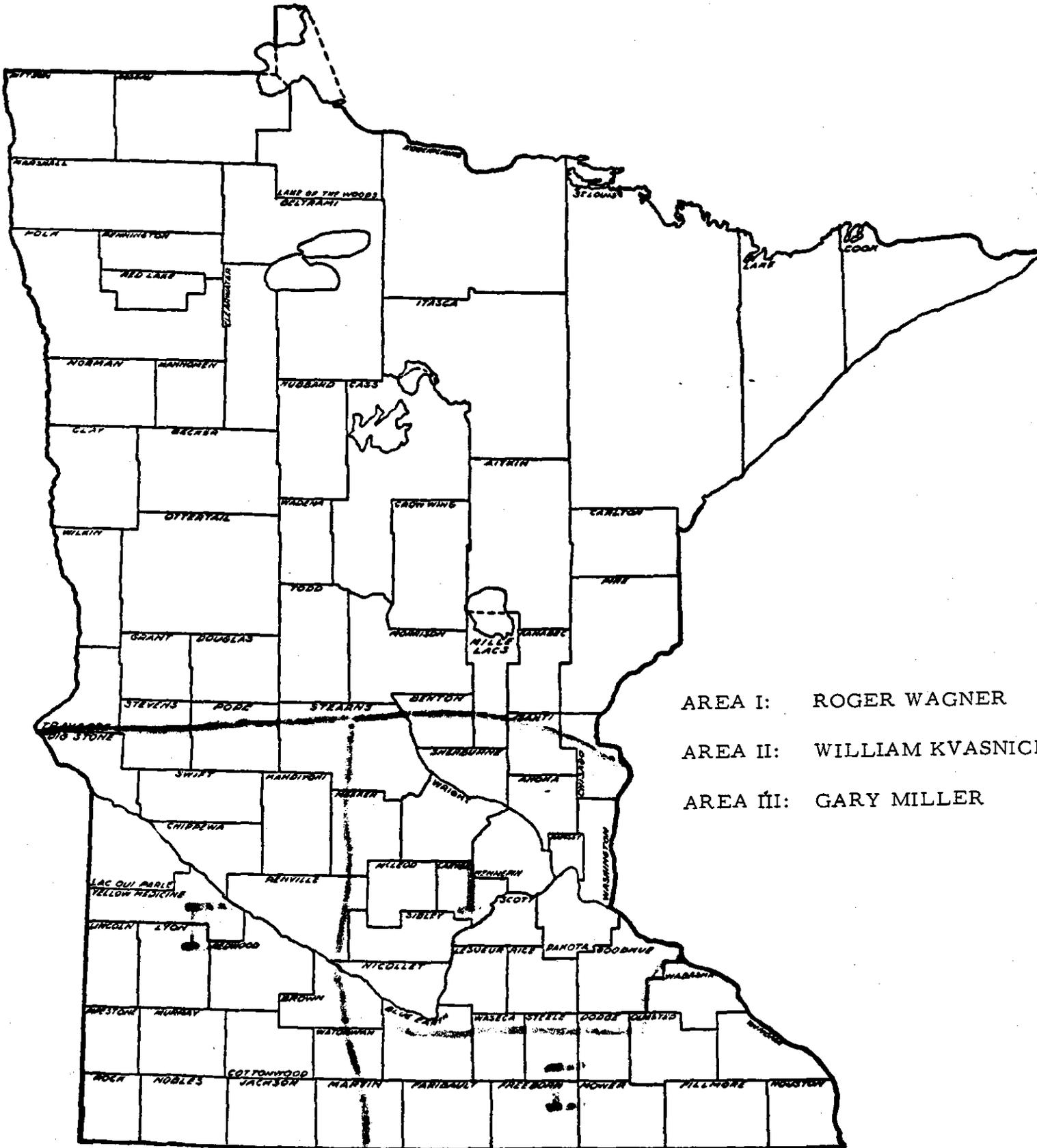
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Laboratory Diagnosis	45
Bark Beetle Survey	50
Conclusion	55

DUTCH ELM DISEASE SURVEY and LABORATORY DIAGNOSIS, 1967

DUTCH ELM DISEASE SURVEY

During the summer of 1967, the Dutch elm disease program in Minnesota was again conducted by the Minnesota Department of Agriculture, the Division of Plant Industry. Personnel included a plant pathologist and two entomologists, who were responsible for laboratory diagnosis, and three entomologists aides, who were responsible for the field survey aspect of the program. Field survey included two aspects: (1) checking elm trees which were reported to the laboratory by letters and telephone calls, and (2) checking elm trees in cities where appointments had been prearranged. The purpose of this year's survey was twofold: (1) to make a comprehensive survey of approximately the southern half of the state, and (2) to contact as many municipal officials as possible with the purpose being to inform, to explain the advantages of a Dutch elm disease control program and to answer any questions which they may have had on this subject.

The survey began July 3 and was completed around September 1. The following schedules (Week of July 3 through August 28) are included to exemplify the comprehensiveness of this survey. The southern half of the state of Minnesota was divided into three areas; each inspector being assigned to one area (see Exhibit 1 - 2). These schedules were always prepared a week in advance with each Monday morning being devoted to office time whereby the inspectors would file a report on the cities they had visited and the people they had contacted. This record will be used in future year's surveys (Exhibit 3).



AREA I: ROGER WAGNER
AREA II: WILLIAM KVASNICK
AREA III: GARY MILLER

- 3 -

EXHIBIT 2

FIELD SURVEY, 1967

DUTCH ELM DISEASE

AREA I: ROGER WAGNER

AREA II: WILLIAM KVASNICKA

AREA III: GARY MILLER

DUTCH ELN DISEASE

FIELD SURVEY

WEEK OF JULY 3, 1967

ROGER WAGNER

BILL KWASNICKA

APPOINTMENTS

MONDAY

TUESDAY

WEDNESDAY

ST. PETER

THURSDAY

ALBERT LIA

FRIDAY

ROCHESTER

NO CONTACT NECESSARY IN CITIES AND TOWNS OF POPULATIONS 500 OR LESS
FOLLOW UP WITH LETTER TO MAYOR.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 10

ROGER WAGNER:

AREA I

APPOINTMENTS

IF TIME PERMITS

MONDAY	10:00 A.M.	Faribault (16,926)	Kenyon, Medford,
	2:00 P.M.	Owatonna (14,776)	West Concord
	(OVERNIGHT)		
TUESDAY	10:00 A.M.	Kasson (1,732) Mantorville (498)	Zumbrota
	2:00 P.M.	Pine Island (1,308) Wanamingo (540)	Zumbro Falls
	(HOME)		
WEDNESDAY	10:00 A.M.	Farmington (2,300)	Cannon Falls
	2:00 P.M.	Northfield (6,707)	Lakeville, Hampton
	(OVERNIGHT)		
THURSDAY	10:00 A.M.	Mankato (28,454) North Mankato (6,614)	Janesville, Waterville
	2:00 P.M.	Waseca (6,102)	Madison Lake
	(HOME)		
FRIDAY	10:00 A.M.	Lake City (3,494)	Hastings (Resample)
	1:00 P.M.	Red Wing (10,528)	
	4:00 P.M.	OFFICE	

No contact necessary in cities and towns of populations 500 or less - follow up with letter to Mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 10

BILL KVASNICKA: AREA II

APPOINTMENTS

IF TIME PERMITS

MONDAY	10:00 A.M.	Wabasha (2,500)	Kellogg, Elgin,
	2:00 P.M.	Plainview (1,833)	Eyota, Dover
	(OVERNIGHT)		
TUESDAY	10:00 A.M.	St. Charles (1,882)	Troy, Pilot Mound,
	2:00 P.M.	Lanesboro (1,068)	Fountain, Arendahl
	(OVERNIGHT)		
WEDNESDAY	10:00 A.M.	Rushford (1,335)	Houston, Stockton,
	2:00 P.M.	Winona (26,771)	Lewiston, Wyattville
	(OVERNIGHT)		
THURSDAY	10:00 A.M.	LaCrescent (2,624)	Spring Grove, Mabel,
	2:00 P.M.	Caledonia (2,563)	Canton, Harmony
	(OVERNIGHT)		
FRIDAY	10:00 A.M.	Preston (1,491)	Spring Valley
	1:00 P.M.	Chatfield (1,841)	
	4:00 P.M.	OFFICE	

No contact necessary in cities and towns of populations 500 or less - follow up with letter to Mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 10

GARY MILLER: AREA III

APPOINTMENTS

IF TIME PERMITS

MONDAY	2:00 P.M.	Jackson (3,370)	Brewster, Rushmore, Bigelow, Round Lake, Lakefield
	(EVENING)		
TUESDAY	10:00 A.M.	Edgerton	Ellsworth, Steen, Manley, Hardwick,
	2:00 P.M.	Pipestone (5,324)	Jasper, Beaver Creek
	(MORNING)		
WEDNESDAY	10:00 A.M.	Slayton (2,487)	Lake Wilson, Fulda, Dundee, Heron Lake,
	2:00 P.M.	Windom (3,691)	Bingham Lake, Mountain Lake
	(EVENING)		
THURSDAY	Morning	Darfur, Jeffers, Storden, Westbrook, Dorvay, Currie	
	Afternoon	Garvin, Balaton, Florence, Lake Benton, Tyler, Ivanhoe	
	(MORNING)		
FRIDAY	9:00 A.M.	Marshall (7,693)	
	1:00 P.M.	Redwood Falls	
	4:00 P.M.	OFFICE	

No contact necessary in cities and towns of populations 500 or less - follow up with letter to Mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 17

ROBERT WAGNER: AREA I

APPOINTMENTS

IF TIME PERMITS

MONDAY

O F F I C E: D. E. D. Calls

TUESDAY

10:00 A.M. St. Cloud (37,746)

Sartell, Waite Park,

2:30 P.M. Sauk Rapids (4,570)

Pleasant Lake

WEDNESDAY

9:00 A.M. Princeton (2,353)

Lake Fremont, Isanti,

2:00 P.M. Cambridge (2,728)

Wyanett, Pine Brook

THURSDAY

10:00 A.M. Taylors Falls (546)

Center City, Shafer,
Chisago City

2:00 P.M. Lindstrom (835)

Stacy, North Branch,
Wyoming

FRIDAY

Morning Scandia, Forest Lake,
Bethel, East Bethel

Lino Lakes, Sodererville,
St. Francis

2:00 P.M. Anoka (11,529)

Champlin, Rogers, Dayton

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 17, 1937

BILL KWASNICKA: AREA II

APPOINTMENTS

IF TIME PERMITS

MONDAY	10:00 A.M.	Stewartville (2,186)	Racine, Wyhoff
	2:00 P.M.	Grand Meadow (837)	Spring Valley
TUESDAY	Morning	LeRoy, Taopi, Adams, Rose Creek	Hayfield, Waltham, Brownsdale,
	2:00 P.M.	Austin (27,908)	Mapleview, Lyle
WEDNESDAY	Morning	Byron, Steele , Dodge Center	Claremont, Pratt, Hayward, Hollandale,
	2:00 P.M.	Blooming Prairie (1,778)	Ellendale, Geneva, Clarks Grove
THURSDAY	9:00 A.M.	Wells (2,897)	Elmore, Winnebago
	2:00 P.M.	Blue Earth (4,200)	Brush Creek, Frost
FRIDAY	9:00 A.M.	Fairmont (9,745)	Ceylon, Dunnell, Welcome
	2:00 P.M.	St. James (4,174)	Sherburn, Trimont, Ormsby

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 17, 1957

GARY HILLER: AREA III

APPOINTMENTS

IF TIME PERMITS

MONDAY	11:00 A.M.	Springfield (2,701)	Revere, Walnut Grove,
	2:30 P.M.	Lamberton (1,141)	Sanborn, Wanda
TUESDAY	9:00 A.M.	Tracy (2,862)	Ghent, Minneota, Porter,
	2:00 P.M.	Canby (2,146)	Tauntan, Clarkfield
WEDNESDAY	9:00 A.M.	Granite Falls (3,171)	Sacred Heart, Renville,
	2:00 P.M.	Olivia (2,355)	Danube, Bird Island, Harbor
THURSDAY	10:00 A.M.	Montevideo (5,693)	Dawson, Watson, Milan,
	2:00 P.M.	Madison (2,380)	Bellingham, Correll
FRIDAY	9:00 A.M.	Appleton (2,172)	Holloway, Danvers,
	2:00 P.M.	Benson (3,676)	DeGraft, Murdock, Kerkhoven, Pennock

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 14

WORKER NUMBER: AREA I

APPOINTMENTS

IF THE RESULTS

MONDAY	Morning	Office	
	Afternoon	Monticello	
TUESDAY		Monticello Area	
WEDNESDAY		Monticello Area	
THURSDAY	10:00 A.M.	Buffalo (2,322)	St. Michael, Albertville,
	2:00 P.M.	Cokato (1,356)	Maple Lake, Rockford
FRIDAY	Morning	Howard Lake, Waverly, Delano Montrose, Independence	
	2:00 P.M.	Watertown	
	4:00 P.M.	Office	

No contact necessary in cities and towns of populations of 500 or less - follow up with letter to mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 24

BILL KVASHICKA: AREA II

APPOINTMENTS

IF THE PERMITS

	APPOINTMENTS	IF THE PERMITS
MONDAY	Morning Office	Ostisco, Hartland
	2:30 P.M. New Richland (1,046)	Waldorf, Pemberton, St. Clair
TUESDAY	9:00 A.M. Mapleton (1,107)	Amboy, Sterling Center, Vernon Center,
	2:00 P.M. Medelia (2,190)	Good Thunder, Skyline, Garden City
WEDNESDAY	9:00 A.M. Lake Crystal (12,587)	Lewisville, Truman
	2:00 P.M. Sleepy Eye (3,492)	Hanska
THURSDAY	9:00 A.M. New Ulm (12,587)	Courtland, Nicollet,
	2:00 P.M. Fairfax (1,489)	Lafayette, Winthrop Gibbon
FRIDAY	9:00 A.M. Hector (1,297)	Buffalo Lake, Stewart, Brownston
	4:00 P.M. Office	

No contact necessary in cities and towns of populations of 500 or less - follow up with letter to mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 24

GARY MILLER:

AREA III

APPOINTMENT

IF TIME PERMITS

MONDAY

Morning Office

Clara City, Maynard,

2:30 Willmar (10,471)

Prinsburg, Blomhest,
Lake Lillian, Cosmos

TUESDAY

OFFICE

WEDNESDAY

THURSDAY

- - - - -NURSERY INSPECTION - - - - -

FRIDAY

FIELD SURVEY

DUTCH BLK DISEASE

WEEK OF JULY 31

ROGER WIGNER: Area 1

APPOINTMENTS

MONDAY

Morning Office

2:00 P.M. Zumbrota

TUESDAY

Monticello

WEDNESDAY

9:00 P.M. White Bear Lake

2:00 P.M. North St. Paul

THURSDAY

9:00 P.M. Maplewood

2:00 P.M. Newport

Friday

9:00 P.M. South St. Paul

2:00 P.M. West St. Paul

No contact necessary in cities and towns of populations of 500 or less - follow up with letter to Mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 31

BILL KWASHNICKA: AREA 11

APPOINTMENTS

MONDAY

Morning Office

St. Paul - Minneapolis: D.E.D. and Oak Wilt Calls

TUESDAY

St. Paul - Minneapolis: D.E.D. and Oak Wilt Calls

WEDNESDAY

St. Paul - Minneapolis: D.E.D. and Oak Wilt Calls

THURSDAY

Possibly Austin, Albert Lea, Blue Earth,
Fairmont, or Preston, Rochester,
& Caledonia

FRIDAY

No contact necessary in cities and towns of populations of 500 or less - follow up with letter to Mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF JULY 21

GARY MILLER: AREA III

APPOINTMENTS

IF TIME PERMITS

MONDAY

Morning Office

2:30 P. M. Benson

TUESDAY

Morning Kandiyohi, Atwater,
Grove City, Spicer

2:00 P. M. Paynesville (1,754) . New London

WEDNESDAY

9:00 A. M. Litchfield (5,078)

Eden Valley-Cold Spring

2:00 P. M. Richmond (791)

Rockville, Pleasant Lak

THURSDAY

Morning Kimball, Kingston, Darwin, Dassel, Cedar Mills

2:30 P. M. Hutchinson (6,207)

FRIDAY

9:00 A. M. Glencoe (3,216)

1:30 P. M. Gaylord (1,631)

4:00 P. M. Office

No contact necessary in cities and towns of populations of 500 or less - follow up with letter to Mayor.

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF AUGUST 7

Peter Wagner:

Area 1

MONDAY	Morning: 1:00 P.M. 3:00 P.M.	Office Mendota Heights Lilydale
TUESDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	Inver Grove Heights - Sunfish Lake Cottage Grove St. Paul Park
WEDNESDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	Little Canada Vadnais Heights Shoreview
THURSDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	Roseville Falcon Heights St. Anthony
FRIDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	Columbia Heights New Brighton Arden Hills

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF AUGUST 7, 1967

BILL KVASNICKA :

Area II

MONDAY

O F F I C E

TUESDAY

MORNING WEST ST. PAUL

AFTERNOON D. E. D. CALLS - OAK WILT CALLS

WEDNESDAY

D. E. D. & OAK WILT CALLS

THURSDAY

MORNING FOREST LAKE

AFTERNOON D. E. D. CALLS - OAK WILT CALLS

FRIDAY

NORTH MANKATO

MANKATO

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF AUGUST ~~X~~⁷

Gary Miller:

Area III

MONDAY

TUESDAY

WEDNESDAY

Minneapolis
Possibly St. Paul

THURSDAY

FRIDAY

MINNEAPOLIS AREA BOUNDARY
FROM EAST HENNEPIN AND HENNEPIN AVENUES
TO EAST LAKE STREET AND EAST CITY LIMITS

<u>Location</u>	<u>Description</u>
1027-27th Avenue South East	Elm Stumps
914-26th Avenue South East	Splintered beyond recall
1100-24th Avenue South East	Splintered beyond recall
1049-22nd Avenue South East	Weak tree; Slime flux
901-21st Avenue South East	Very weak tree; bark on trunk missing
845-20th Avenue South East	Elm brush pile
1038-19th Avenue South East (across the street)	Boulevard tree dead
1019-19th Avenue South East	Very large elm wood pile behind house
Stinson Boulevard-North East by Land O' Lakes fertilizer plants	Two dead elms
14th & Rollins Avenue South East	Leaf pruning necessary
1717 Rollins South East	Very weak tree on other side of alley
13th & Brook Street Hallet & Carey by parking lot	Boulevard tree very poor and weak
1063-17th Street South East on Talmage	Very weak tree; dead branches three-fourths of tree
801 University South East Side of apartment	Weak tree; three-fourths dead
South East corner of Washington avenue bridge	Trees dying along the bank
Patterson Dental Supply Union and Delaware	Dying elm; two-thirds dead
501 Ontario on Essex	Dead tree
117-27th Avenue South East parking lot of Smith Sharpe Co.	Three-fourth dying tree

[August 11 1954] [Ray Miller]

Location

Description

80th Malcolm Avenue South East
on side of house

Upper one-fourth of tree dying

230 Beford Street South East

Large dead elm

2556 Seabury Avenue South

90% dead elm

Butler Square by Augsburg College

50% dead elm

2012-7th Street South

Dead tree

2524-35th Avenue South

50% dead

2442 Seabury Avenue South

Weak tree; storm split

2520-38th Avenue South

Weak tree; storm split

2920-43rd Avenue South

Girdled elm weakened

2921-42nd Avenue South

Badly damaged

2015-28th Avenue South

Severe Damage

2514-24th Avenue South

75% dead *elm*

2312-24th Avenue South

Heavy damaged

2112 Minnehaha
by building

Dead *elm*

2846-30th Avenue South

Two trees on 29th need dead limb
removal

2511 Cedar Avenue South

Three-fourths dead elm in rear

Laymans Cemetery North West
Corner-Cedar & Falk Street South

Fourth-fifth dead elm

2801-18th Avenue South

One-third dead and dying

2744-13th Avenue South

One tree severe dieback on top
branches; Needs pruning

3433-16th Avenue South
across street from Powder Horn Park

Two elms nine-tenths dead

3450-11th Avenue South

Dead tree; boulevard tree one-third
dead

<u>Location</u>	<u>Description</u>
26th-10th Avenue South Stewart Field Northcentral part of public park	Weakened
1106-East 26th Street	Dead elm in parking lot
2636 Portland	Die back on upper branches
East 27th between Oakland and Park	Boulevard tree dead
1708 Oakland across the street	Dead boulevard tree
East 27th Street behind house 218	elm tree dead
28th-4th Honeywell	Weak elms along free way
2115 Stevens Avenue front of building	Dead tree
2014-3rd Street	Dead elm
2747-1st Avenue South	Dead boulevard tree
2520 Pillsbury	Storm damage tree; must be removed
2219 Pillsbury	Dead elm
2115 Pillsbury	Dead elm
2711 Grand Avenue	Elm tree needs pruning
2551 Grand Avenue	Dead Elm
2320 Grand Avenue	Dead elm
2405 Harriet Avenue	Dead elm
2727 Lyndale	Two dead elms
2312 Lyndale	very weak tree
South East corner of Franklin and Bryant Avenue South	Dead tree
2550 Dupont	Dead tree
24th & Dupont North East corner	Very weak tree

<u>Location</u>	<u>Description</u>
2836 Girard Avenue South	Weak tree
1206 West 28th Street	Dead tree
27th between Dupont & Emerson	Weak tree
1900 Park Avenue South	Severe pruning in rear
410 Groveland "Summit House"	Elm log pile
Ridgewood & Lyndale	Tree weakened by construction
Loring Park: South East corner near pond	Topping necessary; two trees
Loring Park: North East corner of big pond	Weak and dying
East center of park	Dead <i>elm</i>
North Center of Loring Park by base ball diamond	Dead <i>elm</i>
Loring Park: Horse shoe courts near lagoon bridge	Severe Storm damage
West 14th & Spruce Place Eittle Hospital Parking lot	One dead; one dying
West 14th & Lasalle in parking lot	Weak
West 14th	Several could be removed due to deformity
120 Grant Naulhaka Apartments	Weak
1505 Clinton across street	Dead Elm
East 15th & Elliot Avenue	Brush piles & storm damage tree
Elliot Park West end	Small dead elm
Elliot Park South	Elm logs
16th street South & Cedar	Brushpile
5th Street & 11th	Storm damage
16th & 7th Street South Senior Citizen Hi Rise	Dead <i>elm</i>

FIELD SURVEY

DUTCH ELK DISEASE

WEEK OF AUGUST 14

Roger Wagner:

Area 1

MONDAY	Morning: 1:00 P.M. 3:00 P.M.	Office Brooklyn Center Crystal
TUESDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	New Hope Robbinsdale Golden Valley
WEDNESDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	St. Louis Park Wayzata Hopkins
THURSDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	Minnetonka Edina Richfield
FRIDAY	9:00 A.M. 1:00 P.M. 3:00 P.M.	Bloomington Eden Prairie Burnsville

FIELD SURVEY

DUTCH ELM DISEASE
&
BEETLE SURVEY

WEEK OF AUGUST 14

BILL KVASNICKA

MONDAY	10:00	Bayport
	Afternoon	Office
TUESDAY		Forest Lake
WEDNESDAY		Roger's Calls
THURSDAY		Blue Earth Area - (Elmore)
FRIDAY		Winona - Caledonia Area (Canton)
		Survey - Sample

FIELD SURVEY

DUTCH ELM DISEASE

WEEK OF AUGUST 14

GARY MILLER

MONDAY

Morning: Office

Afternoon: D. E. D. Calls & Oak Wilt Calls

TUESDAY

D. E. D. Calls & Oak Wilt Calls

WEDNESDAY

THURSDAY

----- FREE -----

FRIDAY

NORTH EAST MINNEAPOLIS
CENTRAL AND EAST HENNINGIN
EAST CITY LIMITS

<u>Address</u>	<u>Description</u>
36th & Fillmore North East tree to the west on 36th	Major pruning
1033-36th	Branch remaining
3570 Polk	Wood pile
35th and Lincoln North East corner	Weak
32nd and Buchanan North West corner	Stump
3109 Fillmore	Branch
3121 Fillmore	Branch
3206 Lincoln	Storm damage
3318 Buchanan	Stump
3314 Buchanan	Branch
3319 Buchanan	Branch
3311 Buchanan	Severe storm damage and Logs
3143 Pierce	Stump
3226 Pierce	Branch
3246 Pierce	Pruning
3326 Fillmore	Stump, peel back
3210 Fillmore	Dead elm
3036 Fillmore	Storm damaged
3325 Polk Street North East	Stump
3238 Tyler	Pruning
2814 Polk	Stump

<u>Address</u>	<u>Description</u>
3353 Garfield North East	90% dead
3131 Benjamin	Weak
3154 Benjamin	Weak
33rd and Benjamin North west corner	Severe storm damage
3300 Benjamin	Elm stump
3359 Benjamin	Topping necessary
2900 Brighton Avenue	Storm damage; severe pruning
2910 McKinley	Three trees severe storm damage
2926 McKinley	Branch
30th and McKinley Gloria Dei Lutheran Church	Topping
3050 McKinley	Severe pruning
3122 McKinley	Storm weakened
3126 McKinley	Pruning, topping
3209 Cleveland	Pruning
3123 Cleveland	Branch
3118 Arthur	Stump
3127 Arthur	Severe damage
3232 Arthur Scene of house fire	Topping
3254 Hayes	Branch
3414 Ulysses across street	Weak
3510 Ulysses	Stump

<u>Address</u>	<u>Description</u>
3431 Ulysses	Stump
3454 Ulysses	Stump
3218 Ulysses	Severe storm damage
2815 McKinley	Branch
2838 Brighton Avenue	Severe storm damage
2907 Benjamin	Limb
2945 Benjamin	Branches
3034 Benjamin	Stump
3010 Cleveland North East	Stump
2062 St. Anthony Boulevard	Severe damage
2819 Hayes	Stump
2811 Hayes	Stump
2724 Hayes	Stump
2710 Hayes	Stump
2622 Hayes	Stump
1705 Lowry Avenue North East	Limb
2748 Ulysses	Pruning
2836 Ulysses	Stump
2953 Ulysses	Severe damage
2656 Garfield	Stump & wood
2626 Garfield	Four stumps in vicinity
2532 Brighton Avenue	Two stumps in vicinity
2508 Garfield	Stumps

<u>Address</u>	<u>Description</u>
2611 Arthur	Stump
2738 Arthur	Stump
2846 Arthur	Stump and wood
2654 Cleveland	Stump
2518 Cleveland	Stump
2501 Benjamin	Two stumps
2558 Benjamin	Six stumps in vicinity
2619 Benjamin	Stump
2630 Benjamin	Six stumps in vicinity
2731 Benjamin	Five stumps in vicinity
2751 Benjamin	Two stumps in vicinity
2742 McKinley	Four stumps in vicinity
2708 McKinley	Three stumps in vicinity
2618 McKinley	Stump
2530 McKinley	Four stumps in vicinity
2506 Stinson Boulevard	Pruning
1509-26th Avenue North East	Pruning
1310-26th Avenue North East	Branch
2800 Arthur	Weak
28th Between Johnson and Lincoln	Pruning
2814 Polk	Stump
2611 Polk	Two stump
2539 Polk	Four Stump

<u>Address</u>	<u>Description</u>
2500 Arthur	Wood pile and stump
2715 Fillmore	Stump
2641 Fillmore	Stump
2548 Pierce	Stump
2629 Pierce	Pruning
2649 Pierce	Topping
2750 Pierce	Severe storm damage
2510 Buchanan	Branch and Stump
2528 Lincoln	Pruning
23rd and Folk	Stumps in vicinity
1706 Tyler	Pruning
1711 Lincoln	Blown down
1721 Lincoln	Stump
1025-23rd Avenue North East	Two stumps
North East Athletic Field by Tennis Courts	Storm damage
1624-23rd Avenue across street	Pruning
1955 Cleveland in back	Stump
1926 Ulysses	Severe damage
1914 Ulysses in yard	Severe damage
1839 Johnson	Branch
19th and Johnson Standard Station	Topping necessary

<u>Address</u>	<u>Description</u>
Winton Park	Branches and few trees to be removed
Ridge Way Road East of parking area	Weak tree
2211 Broadway	Many branches in vicinity
1104 Lincoln in yard	80% dead,
1226 Lincoln	Stump
1314 Lincoln	Severe storm damage
1339 Lincoln	Branches
1218 Buchanan	Branches
1219 Pierce	Pruning
742 Buchanan	Log and severe damage
734 Buchanan	Branches
710 Buchanan	Pruning trees in vicinity
615 Buchanan	Branches
454 Buchanan	Topping
430 Buchanan	Major branch
740 Pierce	Branches
435 Fillmore	Dead
Beltrami Park North East corner	Dead
754 Polk	Severe Damage
1163-16th Avenue South East	Elm wood pile

- 33 -

EXHIBIT 3

Record of Municipalities and Municipal Officials
With Inspector's Comment on D. E. D. Program

<u>Municipality</u>	<u>Official (s)</u>	<u>Comment</u>
Adams	Dan Gillis, Councilman	None
Albert Lea	Amos Christianson, Pk. Supt.	General sanitation program, fair program
Amboy	Duayne Boesch, Clerk	None
Anoka	Mel Joslyn, Pk. Supt. & City Manager	Well aware of program
Austin	James Haben, Pk. Supt. Robert Auer	Well informed
Bayport	Gunnar Hogberg, Str. Comm.	Well aware of problem
Benson	Richard Hartzell, Mayor Ken Ross, City Manager	None
Blooming Prairie	Robert Becker, Clerk	Somewhat interested
Bloomington	Eugene Kelly, Park Director	Good program
Blue Earth	Julius Enger, Clerk Roland Gartzke, Main. Supt.	Cooperative & interested
Brownsdale	Glen Stanton, Mayor	Not particularly interested
Brownton	Mr. Hagedorn, Clerk	Not particularly interested
Buffalo	H. G. VanErp, Light Supt.	Very interested
Buffalo Lake	LeRoy Scharmer, Mayor	Interested & cooperative
Burnsville	Patrick McInnis	Interested
Byron	Elmer Ward, Clerk	Little action
Caledonia	Clerk	No interest

<u>Municipality</u>	<u>Official (s)</u>	<u>Comment</u>
Cambridge	Eval Larsen, Str. Comm.	Interested & concerned
Chatfield	Lloyd Kivell, Mayor Clarence Mitchell, Clerk	Very interested
Claremount	Mrs. Lloyd Rand, Clerk	None
Cokato	C. C. East	Little concern
Cold Spring	Harry Weidner, Mayor Bill Ficher, Clerk	Enthusiastic
Columbia Heights	John Murzyn, Pk. Supt. Malcolm Watson, Mayor	None
Cottage Grove	Willmar Holtz, Pk. Supt.	None
Crystal	Curt Lundquist, Asst. Manager	Informed & interested
Danube	G. J. Frank	None
Dodge Center	Earl Weckerring, Clerk	Interested
Dover	George Urkee	None
Eden Prairie	Dave Osterhalt, City Manager	Interested
Edina	Bob Kotine, Asst. Pk. Supt.	Complete set up excellent
Elgin	Lowell Sigrud, Mayor	Somewhat interested
Ellendale	Dale Mower, Clerk	Interested
Elmore	Ted Ekleberry, Main. Supt.	Very cooperative and interested
Eyota	Ted Steinmitz, Mayor	None
Faribault	Clarence Miller, Mayor Francis Pemrick, Pk. Supt.	Interested
Fairfax	R. J. Dickmeyer, Clerk	Interested & cooperative

<u>Municipality</u>	<u>Official (s)</u>	<u>Comment</u>
Fairmont	LeRoy Schultze, Clerk	Unaware
Falcon Heights	Dr. Gus Hart, U. of M.	None
Farmington	Mr. Hince, Str. Comm.	Interested
Forest Lake	Norton Taylor, Weed Inspector	Not particularly interested
Gaylord	C. H. Sohre, Mayor Wilbur Olson, Pk. Comm.	General lack of enthusiasm
Gibbon	Joe Dietl, Clerk	Interested
Golden Valley	John Brenna, Pk. Supt.	Excellent program
Grand Meadow	Albert Temanson, Clerk	Interested
Harmony	Richard Moorman, Clerk	None
Hastings	Donald Lauden, Pk. Supt.	Well informed
Hayfield	Arnold Fredrickson, Mayor	Very interested
Hector	Carroll Koehler, Clerk	Not too interested
Hopkins	John Strogon, City Engineer Hugh Henkol	Interested
Houston	Maintenance Superintendent	Not aware
Hutchinson	Mr. Robert	None
Inver Grove Heights	Ed Karth, Main. Supt.	None
Jackson	James Farris, Deputy Clerk	Very concerned
Kasson	Bud Poffenberger, Str. Comm.	Enthusiastic
Kenyon	- - - - -	None
Kiester	Dwain Challgron, Mayor	None
Kimball	Monroe Abbott, Clerk	None

<u>Municipality</u>	<u>Official (s)</u>	<u>Comment</u>
LeCenter	Edward J. Brezina, Agr. Insp.	None
LaCrescent	Harold Vetsch, Main. Supt.	Not very interested
LeSueur	Mr. Chamberlain	Very interested
Lake Crystal	Alden Sutherland, Clerk	Interested & cooperative
Lanesboro	Mr. Mordall	Interested
LeRoy	Mr. Chesborough, Mayor	Interested
Litchfield	Roy J. Ross, Clerk	None
Little Canada	Carl Spenner, Mayor	None
Madelia	Willis Owen, Clerk	Interested & cooperative
Madison	Theodore Sleng, Pk. Board	Enthusiastic
Mankato	Chuck Lowery, Pk. Supt.	Competent
Maplewood	Frank Sailer	None
Mapleton	Maurice Van Rossoun	Interested & cooperative
Minnetonka	Roy Swenson, Clerk	Not particularly cooperative
Monticello	Dr. C. W. Erlandson, Mayor	Indifferent
New Brighton	Ed Hudoba, Pk. Supt.	None
New Richland	Gehard Streng, Clerk	Somewhat concerned
New Hope	Martin Michalski, Pk. Main. Harvey Feldman, Pk. Supt.	None
New Ulm	Myron Medin, City Manager Farry Kobs, City Forester	None
Northfield	Clint Bosshardt, Pk. Supt.	Aware
North St. Paul	Gerry Bell, Pk. Supt.	Experienced

<u>Municipality</u>	<u>Official (s)</u>	<u>Comment</u>
Owatonna	Robert Pecore, Str. Engineer Chuck Thomas, City Forester Lowell King, Str. Comm.	Fair program
Pine Island	Ed Koperski, City Forester	Aware
Plainview	Glenn Hasse, Mayor	Little interest
Preston	Francis Shanaham, Str. Comm.	Interested & cooperative
Princeton	Dolly Fairchild	None
Red Wing	Fred Johnson, Str. Comm.	Experienced
Renville	Street Commissioner	None
Richfield	Mr. Jolly, City Engineer	Complete program
Richmond	Gregor Heyning, Mayor	None
Robbinsdale	Pat Murphy, City Engineer	None
Rochester	William VanHook Don Untiedt, County Agent	None
Roseville	Lester Johnson, Str. Comm.	None
Rushford	Mr. Hatleli	Not very interested
Sauk Rapids	Harry Scott, Str. Comm.	Interest among individual council members
Shoreview	Mr. Schleppegrin	90% oak
St. Anthony	Norbert F. Maher, Public Works Director	None
St. Charles	Don Hankerson, Mayor	Low elm population, interested & cooperative
St. James	Bob Banks, Light Supt.	Good sanitation program going for some time
St. Cloud	Henry Niebolte, City Forester	Good program, intereste and cooperative

<u>Municipality</u>	<u>Official (s)</u>	<u>Comment</u>
St. Louis Park	Richard Wilson, Pk. Supt.	Interested in D. E. D. well informed
St. Paul Park	Paul Cichy, Str. & Pk. Supt.	None
St. Peter	Silas Getty, Pk. Supt.	Well informed - cooperative & responsive
Sherburn	W. W. Hecht, Str. Comm.	None
Sleepy Eye	Sherman Carstensen, Clerk	Interested, works close with Brown County Agent
South St. Paul	Mr. McMorrow, Str. Comm.	Interested, well informed
Spring Grove	- - - - -	Low elm population
Spring Valley	Duane Koebke, Mayor	Low interest, let fall back on Agricultural Instructor and County Agent
Stillwater	K. G. Neumeier, Park Board Member	Extreme lack of interest
Sunfish Lake	Mrs. Lindeke, Council Member	None
Taylor's Falls	Carl W. Nygren, Mayor	Interested & cooperative
Truman	Max Bosshat, Mayor	Interested & concerned
Wabasha	Ray Young, Mayor	Most calls left to County Agent
Wayzata	Wayne Fadden, City Manager	None
Wells	A. C. Brummer, Clerk	Lack of interest
West St. Paul	Tom Clawson, Pk. Supt.	Interested & cooperative
Waseca	Dalys Neidt, Park Custodian	Not well informed at the time

<u>Municipality</u>	<u>Official (s)</u>	<u>Comment</u>
Watkins	Otto Brick, Mayor	Lack of interest
White Bear Lake	Steve Bernard, City Manager	Well aware of D. E. D. and interested
Winnebago	- - - - -	Lack of interest on part of Street Commissioner
Winona	Bruce Reed, Pk. Supt.	Interested and well informed
Winthrop	Harry Rannow, Councilman	Semi-interest
Zumbrota	Mr. Goplin, City Forester	Very interested and well informed

During early July, a Dutch elm disease questionnaire (Exhibit 4) was sent to approximately two hundred and sixty municipalities along with a letter by Rober Wagner (Exhibit 5) and an outline for a municipal Dutch elm disease control program (Exhibit 6). At the present time the following communities have returned the questionnaire:

Adams	Frost	Raymond
Afton	Good Thunder	Redwood Falls
Balaton	Grand Meadow	Rosemount
Bayport	Granite Falls	St. Charles
Buffalo	Hokah	St. James
Buffalo Lake	Kilkenny	Silver Lake
Burnsville	Lake City	Spring Valley
Ceylon	Lamberton	Vernon Center
Chanhasson	Lanesboro	Wanamingo
Coates	Lewiston	Watertown
Cokato	Medelia	Wells
Cold Springs	Mantorville	Westbrook
Edgerton	Maple Lake	Willmar
Elkton	Mapleview	Winona
Elmore	New Prague	Winthrop
Eyota	Nicollet	Worthington

The information provided by this questionnaire will be used in assessing the extent of municipal involvement in the fight against Dutch elm disease as soon as we receive the majority of the questionnaires sent out.

MINNESOTA DEPARTMENT OF AGRICULTURE

DUTCH ELM DISEASE QUESTIONNAIRE

1. What is the approximate percentage of elm trees in your municipality?

0% - 25%

25% - 50%

50% - 75%

75% - 100%

2. To your knowledge has there been or is there now a significant incidence of elm tree mortality in your community?

Yes No

3. Do you have municipal personnel responsible for removing, trimming, disposing of, and general maintenance of trees in your community?

Yes No

4. Do you have municipal personnel that are aware of the basic symptoms of tree diseases?

Yes No

5. Do you at present have a Dutch elm disease control program?

Yes No

6. Who is your area or district forester?

Name _____

Address _____

7. Has there been contact between your forester and your municipality concerning the subject of Dutch elm disease?

Yes No

8. If so, state briefly the results of this contact: _____

9. Are you aware of the threat of Dutch elm disease in Minnesota?

Yes No

10. If not, would you desire information concerning this subject?

Yes No

11. Do you feel that such a threat warrants a Dutch elm disease program in your municipality?

Yes No

12. If not, explain why: _____

13. Would your constituents be sufficiently aware and concerned about Dutch elm disease to support such a program?

Yes No

14. Do you wish for advice and assistance from the Department of Agriculture concerning the initiation of such a program?

Yes No

15. If so, in what form?

Phone Calls:
Your telephone No. _____

Mail correspondence:
Your address. _____

Personal visit

Other (Specify)

Comments: _____

Please complete and return this form within 5 days:

Dutch Elm Disease Laboratory
670 State Office Building
St. Paul, Minnesota 55101

Thank you for your assistance.



STATE OF MINNESOTA
DEPARTMENT OF AGRICULTURE
STATE OFFICE BUILDING
SAINT PAUL 55101

June 28, 1967

Dear Sir:

The Minnesota Department of Agriculture is again this year surveying for the spread of Dutch elm disease in our state. This fungus disease has recently taken deadly tolls in our neighboring states of Iowa, Illinois and Wisconsin. The following is a rundown of all the official cases of Dutch elm disease in Minnesota.

1961 - 8 Positive Cases	1964 - 54 Positive Cases	1966 - 49 Positive Cases
1 - St. Paul	3 - St. Paul	9 - St. Paul
7 - Monticello	4 - Minneapolis	7 - Minneapolis
	47 - Monticello	1 - Rochester
1962 - 2 Positive Cases		4 - Pine Island
2 - Monticello	1965 - 23 Positive Cases	22 - Monticello
	2 - St. Paul	5 - Bloomington
1963 - 43 Positive Cases	9 - Minneapolis	1 - South St. Paul
8 - St. Paul	12 - Monticello	
4 - Minneapolis		
31 - Monticello		

This may represent only a small percentage of the actual amount of Dutch elm disease in Minnesota and every undiagnosed case contributes to the threat of an epidemic.

Due to the immensity of the task of surveying and our limited personnel, we need the help of community officials and conscientious individuals. We therefore ask for your cooperation in aiding us in this survey.

Would you please fill out this questionnaire as well as you are able and return it to the Dutch elm disease lab as soon as possible.

Thank you for your cooperation,

MINNESOTA DEPARTMENT OF AGRICULTURE

Roger C. Wagner, State Inspector
Division of Plant Industry

OUTLINE FOR MUNICIPAL DUTCH ELM DISEASE CONTROL PROGRAM

1. Hold public meetings to inform public and private citizens of the problem.
2. Elect or appoint a Dutch elm disease committee with a chairman responsible for the control of Dutch elm disease.
3. Adopt a municipal tree and Dutch elm disease ordinance.
4. Conduct an inventory of municipal trees for species, size, condition, value and location.
5. Conduct an elm sanitation survey and program.
6. Spray highly valued elms -- those in parks, on boulevards and at institutions.
7. Conduct a survey for Dutch elm disease symptoms of all elms, both public and private, at least once between July 1 and August 15 of each year. Urge citizens to report suspected cases.
8. Send specimens of suspected trees to the Dutch Elm Disease Laboratory, 670 State Office Building, St. Paul, Minnesota for positive cases.
9. Apply vapam to prevent Dutch elm disease from spreading from healthy trees to infected trees through root grafts whenever possible.
10. Remove and destroy by burning all confirmed cases.
11. Apply dormant spray when disease has been found in the community.

Minnesota Department of Agriculture
Division of Plant Industry
670 State Office Building
St. Paul, Minnesota 55101

LABORATORY DIAGNOSIS

The laboratory was operated primarily by an entomologist and plant pathologist with some help provided by the entomologist aides. Between the months of May and September, the laboratory received four hundred and seventy-four samples for examination. As of September 13, 1967, the positive cases included twenty-one different locations of which fifteen are new locations this year (Exhibit 7 - 8). The total number of positive cases for 1967 is 132.

EXHIBIT 7

Positive Cases of Dutch Elm Disease, 1967

As of September 13, 1967

Eight cases in St. Paul:

- | | | | |
|---|-----------------------|---|-----------------------|
| 1 | 1990 Como Avenue | 1 | 1709 Hampshire Avenue |
| 1 | 668 Greenbriar Avenue | 1 | 1171 East Hawthorne |
| 1 | 137 East Page | 1 | Battle Creek Park |
| 1 | 828 Mound | 1 | 815 Pederson South |

Three cases in Minneapolis:

- 1 City Water Department, Pumping Station No. 4
- 1 City Water Department, Pumping Station No. 2
- 1 Waterworks

One case in Bloomington:

- 1 Ladd residence, 9637 Upton Road

One case in Luverne:

- 1 Address not yet received from LaVerne Forest

Three cases in Albert Lea:

- 1 821 Jefferson Street
- 1 205 North First Avenue
- 1 Across from 441 Lakeview, on boulevard

Four cases in Austin:

- 1 400 13th Street N. E.
- 1 1413 9th Avenue N. W.
- 1 714 8th Avenue S. E.
- 1 112 8th Street N. E.

Two cases in Elmore:

- 1 Carr property in Elmore (Sample taken by B. Kvasnicka)
- 1 Carr property

Two cases in Rochester vicinity:

- 1 On the Robert Badger property, Route 1
- 1 Lowell Campbell, 1708 4th Avenue S. W.

Four cases in the Elk River vicinity:

- 1 In park off of Hwy. 10 across from Rural Cooperative Power Association
- 1 Mrs. Martin's Cabins - Hwy. 10 - West of Elk River (left side of road)
- 1 Near little red house with sign marked "Otsego" on Hwy. 39 to Monticello
- 1 Mrs. Flora Martin residence

One case in Zimmerman vicinity:

- 1 Near Zimmerman on Highway 169, left side of road going north towards Zimmerman from Elk River

One case in Canton:

- 1 Fillmore County Nursery (Sample taken by G. Miller)

One case in Anoka:

- 1 Greenhaven Country Club, 200 feet east of clubhouse

Two cases in Buffalo:

- 1 Jerry Speck - 402 Second Street - Sample No. 1
- 1 Jerry Speck - 402 Second Street - Sample No. 2

Ninety cases in Monticello vicinity:

This includes Monticello city limits, Wright County and Sherburne County - break-down as follows:

Sixteen cases in Monticello proper:

- 1 Dead tree infected with bark beetles directly north of hospital on south bank of the river
- 1 Large infected elm directly across the street from 312 East River Road
- 1 Infected elm on Linn Street side of G. S. Utterson residence, 825 West River Road
- 2 Infected elms in backyard of Mrs. Alice Mitchell residence, 8 North Linn Street
- 1 Infected elm at 800 West River Road, corner of Linn Street and West River Road
- 1 Infected elm on the Dr. M. B. Smorstolk property
- 9 Infected elm trees with beetles east of the D. J. Pitts residence on West River Road (south bank)

Sixty-four cases in Wright County:

- 6 Infected trees with bark beetles east of town on County Hwy. 39 (south bank) on Lindberg and Krautbauer property
- 10 Infected trees one-half mile east of Krautbauer's County Hwy. 39 (south bank)
- 1 Infected tree on Virgil Lafond residence, 1219 West River Street (backyard)
- 34 Infected trees in the County Park (Montissippi County Park) west of town (south bank) and on Starr Hall's property

Ten cases in Sherburne County:

- 2 Infected trees on Harry M. Swanberg residence, northwest corner of bridge
- 8 Infected trees east of Dr. Brenney's on East River Road, County Road 14 (north bank)

Two cases in South St. Paul:

- 1 Near Municipal Building, 3rd Avenue North
- 1 Near Municipal Building, 3rd Avenue North

One case in North Mankato:

- 1 Marie Lane to left of entrance into farmer's yard

Two cases in rural Lakefield:

- 1 George Tusa, rural Lakefield
- 1 George Tusa, rural Lakefield

One case in West St. Paul:

- 1 342 East Haskell

One case in White Bear Lake:

- 1 Mrs. Ed Miller, 124 Banning Avenue

One case in Brooklyn Park:

- 1 8726 West River Road

One case in Mankato:

- 1 In parking lot behind Carlson's welding service (Ray Busch)

As of September 30, 1967 three more positive cases of Dutch elm disease have been reported, there locations are as follows:

One case in Vadnais Heights

- 1 894 East County Road E

One case in Coon Rapids

- 1 2409 110th Avenue

One case in Adams, Minnesota

- 1 Mr. Kloeckner residence

This brings the total positive cases to 135 for 1967.

- 50 -

BARK BEETLE SURVEY

The week of August 28 was devoted primarily to the search for the smaller European elm bark beetle. Two inspectors were used on this project. Their week was scheduled in a similar manner as was the case on Dutch elm disease survey (Exhibit 9). After the survey, Miller and Kvasnicka wrote reports as to their findings (Exhibit 10 - 11).

TO: GARY MILLER, WILLIAM KVASNICKA

WEEK OF AUGUST 28

BARK BEETLE SURVEY, 1967

PURPOSE: To determine the extent of the movement of the smaller European elm bark beetle and also the location of the native elm bark beetle with observation as to concentration of infestations. Note the locations in the same manner as was done for the file on municipal control program.

METHOD: Survey will be made in the usual depositories for elm wood; in other words, the city dumping areas. If you are in question as to identification, collect a few beetles in the round mailing cans and bring them back to the office. Do not forget to mark the cans with their proper location.

The following is your assignments for the week of August 28.

GARY MILLER

BILL KVASNICKA

MONDAY

Anoka, Elk River, Princeton
Cambridge and area

Stillwater, Chisago City,
Lindstrom, Center City
Taylors Falls and area

TUESDAY

Foley, St. Cloud (extensive)
and area

Buffalo, Maple Lake, Cokato
Litchfield and area

WEDNESDAY

Worthington, Windom, Jackson
and area

Mankato, North Mankato,
St. Peter and area

OVERNIGHT

THURSDAY

St. James, New Ulm, Sleepy Eye,
Gaylord and area

LeCenter, LeSueur, Shakopee
and area

FRIDAY

Buffalo Lake, Hutchinson,
Glencoe and area

Run D. E. D. office calls

BARK BEETLE SURVEY, 1967

Bayport

Near King Power Plant - Native

Stillwater

South edge of city, along highway - Native

Rest areas along Highway 95, near St. Croix River - Native

Taylor's Falls

N. W. Section of town, west of Purina Feed Mill - Native

Sampled one tree recently cut down, looks like dumping grounds for old logs - Native

Lindstrom

Dump area - Native

Rockford

Area south of town, along river - Native

Buffalo

City Dump, west of town - Native

Belle Plaine

City Dump, N. W. part of town - Native

Center City

East side of town, small wood pile - Native

Cleveland

Small park west side of town - Native

Delano

East side of town - Native

Eagle Lake

Dump area, east of town - Native

Jordan

Park south of town - 3-4 dead elms standing plus wood pile - Native

LeCenter

Dump, south of town - no elm logs, trees west of town - Native

LeSueur

Dump, west of town - large wood piles around town - Native

Madison Lake

Small wood pile, east of town - Native

Maple Plain

West edge of city - Native

New Prague

Dump area, N. W. of city - Native

Nicollet

Dump, about 3 miles N. E. of city - small number of logs - Native

St. Peter

Dump area, about 1½ miles S. E. of city - Native and European beetle found

Bill Kvasnicka

BARK BEETLE SURVEY, 1967St. Cloud

1. Sanitary Landfill - 3 miles south on 152. Heavy native population with strong stain of Dutch elm disease.
2. 4201 3rd Street North - Woodlot with 40 dead and dying elms and a heavy native population.
3. 3rd Avenue & 7th Street South - Dead elm with high population of native.

Anoka

Private gravel pit dump - 1.3 mile west on Anoka County 57 from Junction Minnesota 47 - Minor populations present, native.

Champlin

210 Curtis - Large windfall with high population.

Sleepy Eye

Dump ground - Small population of native present.

Gaylord

Woodlot south of dump - High population of native present.

Windom

City dump - One log with low population of native.

Jackson

Ashley Road - One dead elm with native population present.

In no location were smaller elm bark beetle populations found.

Gary Miller

CONCLUSION

This year's Dutch elm disease program may have been more complete than any other year's survey, as Dutch elm disease was discovered for the first time along the Minnesota-Iowa border. Also, this summer's survey revealed a higher number of positive cases than was discovered in 1964 (132 cases this year as compared to 54 in 1964), but it must not be concluded that all the diseased trees were found.

According to the general consensus of those people directly involved with this year's Dutch elm disease program, there still appears to be a lackadaisical attitude of most municipal officials about the dangers of Dutch elm disease with most officials feeling that they will wait until they find "a diseased tree in their backyard."

The material found in this report will provide an excellent basis for next year's survey.

William Ahlberg



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

RECOMMENDED BOULEVARD TREES

FOR MINNESOTA

1. Sugar Maple (Acer saccharum) Native maple that does well in sheltered areas on fertile loam soils. Brilliant fall colors. (All maples are subject to sunscald.)
2. Red Maple (Acer rubrum) Native maple that does well on sandy soils where there is sufficient moisture. Red flowers in early spring. Autumn leaves: yellow or brilliant scarlet. Cultivars include "Autumn Flame," "Bowhall," "Columnare," "Scanlon," and "Schlesinger."
3. Cleveland Norway Maple (Acer platanoides "Cleveland") This tree has a dense, compact, conical form, and a good dark green foliage.
4. Summershade Norway Maple (Acer platanoides "Summershade") This tree has heavy textured green leaves. Has upright habit and is reported to be resistant to windburn.
5. Emerald Queen Maple (Acer platanoides "Emerald Queen") This is a vigorous growing tree with beautiful form and foliage.
6. Schwedler Maple (Acer platanoides "Schwedler") Leaves are bright red when young and turn dark green after a few weeks.
7. Hackberry (Celtis occidentalis) This tree is one of the hardiest and most drought-resistant of the larger trees. Symmetrical form, corky bark and light green foliage help to distinguish this tree. Subject to nipple galls on the leaves and witches broom on the twigs.
8. Summit Green Ash (Fraxinus Pennsylvanica "Summit") Cultivar of native green ash. Known for its straight trunk, symmetrical form, and is seedless.
9. Marshall Seedless Ash (Fraxinus Pennsylvanica "Marshall") Cultivar of native green ash. Seedless, with slightly broader growing habit than "Summit." Excellent foliage.
10. Imperial Locust (Gleditsia triacanthos "Imperial") A thornless and seedless selection of native honey locust. Has graceful, spreading branches that form a broad symmetrical tree.



 ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

11. Skyline Locust (Gleditsia triacanthos "Skyline") A thornless and seedless cultivar of honey locust, pyramidal form with uniformly spaced wide angled branches with dark green foliage.
12. Moraine Locust (Gleditsia triacanthos "Moraine") Thornless and seedless cultivar of honey locust. Wide spreading, fast growing and rather vase shaped.
13. Sunburst Locust (Gleditsia triacanthos "Sunburst") Distinctive and attractive with growing tips of golden color. For lawn specimen and light shade. Seedless and thornless.
14. Shademaster Locust (Gleditsia triacanthos "Shademaster") Straight strong trunk. Symmetrical form. Rapid growing, drought resistant, thrives under all conditions.
15. Basswood (Tilia americana) Native tree that is adapted to a variety of city conditions. Large leaves and fast growing.
16. Littleleaf Linden (Tilia cordata) Dense headed, pyramidal tree. Small heart shaped leaves, lustrous above, pale beneath.
17. Greenspire Linden (Tilia cordata "Greenspire") This selection of the littleleaf linden has a straight trunk and a uniform, oval crown with small dark green leaves and a spicy fragrance when in bloom.
18. Redmond Linden (Tilia euchlora "Redmond") Cultivar of the Crimean linden. The tree has a symmetrical, pyramidal form when young and develops into a sturdy tree with a compact crown. Glossy, bright green foliage.
19. Ironwood (Ostrya virginiana) Native tree which forms a symmetrical medium sized tree with dark green foliage that turns yellow in the fall and clings to the tree well into winter. The hop-like fruits add further interest to the tree.
20. Ginkgo (Ginkgo biloba) Usually narrow and upright, sometimes spreading, leaves fan-shaped, two-lobed; fruit plum-like and ill-smelling; plant the male tree only.
21. Pin Oak (Quercus palustris) Upright tree with slender drooping branches. The leaves are many lobed, sharply pointed, and turn red in the fall.

Contact your local nurseryman for recommendations pertaining to your local area. He is acquainted with specific problems that could exist there.



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

May 1, 1973

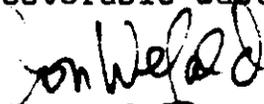
GUIDELINES FOR THE MOVEMENT AND DISPOSAL OF ELM WOOD

Pursuant to the provisions of the Plant Pest Act, Minnesota Statutes 18.44-18.58, and the Local Pest Control Law, Minnesota Statute 18.022, and in consultation with various state agencies including the Division of Lands and Forestry and the University of Minnesota particularly the Departments of Plant Pathology, Entomology, Fisheries and Wildlife, and Forestry, the following guidelines for the movement and disposal of elm wood are proposed for this season. The purpose of these guidelines is to minimize or prevent the spread of Dutch elm disease thru the movement and disposal of elm wood.

Guidelines:

1. Elm wood from healthy, weakened, dead, or damaged trees with no bark beetle galleries apparent may be moved at anytime of the year to disposal or chipping sites.
2. Elm wood from weakened, dead, or damaged trees with bark beetle galleries should be chipped, burned, buried the same day or within 24 hours of the time it is delivered to the disposal site.
3. Elm wood from tree diagnosed with DED and with or without bark beetle galleries should be moved promptly to disposal sites for processing the same day or within 24 hours.
4. It is considered that elm wood chipped or shredded constitutes no hazard to the spread of DED.
5. Completely debarked logs are safe for shipment without threat of spreading Dutch elm disease.
6. Diseased elm logs without bark sawed into lumber is safe for local use or shipment without the possibility of spreading Dutch elm disease.
7. Stock piling of elm logs with bark intact during the months of May, June or July is inadvisable and should not be permitted.

The Minnesota Department of Agriculture would encourage the salvage and utilization of elm wood as a recoverable waste under the above conditions.


Jan Wefald
Commissioner



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS





LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

May 1, 1973

Dear Mayor:

The Minnesota Department of Agriculture wants you, as a community leader, to consider the devastating effect that Dutch elm disease could have in your municipality. If you have not already started, we urge that you take action and institute a control program to preserve your elm trees. Dutch elm disease may be inevitable, but if we establish good control programs, the losses can be held to less than 2% a year. No action will result in large tree losses, unsightliness, and tree removal costs that could be a real financial burden.

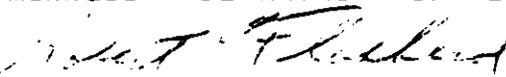
The Minnesota Department of Agriculture is involved in the area of Dutch elm disease control by reason of Minnesota Statute 18.022, the Local Pest Control Law. This statute pertains to not only Dutch elm disease but also to other municipal pest programs such as mosquito control.

We are here to help and assist you in developing sound community pest control programs. Authorization or approval of such programs based on technical and expert opinion is our responsibility. We offer our services to you and your community. There is an abundance of information and technical assistance available from our staff, other government agencies, and education institutions.

Dutch elm disease can be slowed and regulated, allowing your community the time to replace lost trees and spread removal and disposal costs over a number of years. It is well worth the effort. We urge you to study the enclosed informational material and make it available to all members of your council. Please complete the Dutch elm disease application form included and return it to this office. A separate application form is available for those municipalities anticipating mosquito or other pest control programs.

Your cooperation will be appreciated.

Yours very truly,
MINNESOTA DEPARTMENT OF AGRICULTURE


Robert Flaskard, Director
Division of Plant Industry

RF:jml
Encs.



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

MINNESOTA DEPARTMENT OF AGRICULTURE

Division of Plant Industry
670 State Office Building
St. Paul, Minnesota 55155

APPLICATION FOR AUTHORITY TO ENGAGE IN DUTCH ELM DISEASE CONTROL*

Town or municipality _____ Telephone _____

Mayor or Chairman _____ Population _____

Person in charge of Dutch elm disease control:

Name _____ Title _____

Dutch Elm Disease Control Program - 19____

In order to evaluate your control program we are asking that you answer the following questions as completely as possible:

Inventory

Has a tree inventory been made? _____

Number of elms on public property (boulevards) parks, etc.)? _____

Number of elms on private property? _____

Sanitation

Does your community have an elm tree sanitation program? _____

How often do you prune your city trees? _____

Ordinance

Does your community have a Dutch elm disease control ordinance? _____

When was it adopted? _____

Does the ordinance apply to both public and private trees? _____

Does the ordinance provide for removal of weakened, diseased and dead trees? _____

Does the ordinance regulate the disposal of all elm wood _____

Chemical control

Is any chemical control planned? _____

If so, what material will be used? _____

At what rate? _____

Method and time of application _____

Who will apply the chemicals:

Name of Private operator? _____ or

Name of Municipal employee? _____

Tree Planting

Do you have a tree replanting program with mixed species?

I would like to receive Dutch elm disease report forms Yes No

Signed

Mayor, Clerk, Engineer, Etc.

For Office Use only - Leave Blank

Number of Dutch Elm Disease Samples Submitted for laboratory
diagnosis _____

Positive _____

Negative _____

*A separate application form is available for those municipalities anticipating mosquito or other pest control programs.

Agriculture
Division of Plant Industry

George Steele

October 2, 1973

Robert Flaskerd

Environmental Policy Act Report

Attached is our report on Dutch Elm disease.using the approved format.

There is some doubt as to what Environmental category Dutch Elm should be under - No. 17 Urban Land or No. 18 Solid Wastes. After reading the report you can place it in one or the other.

A 4

DUTCH ELM DISEASE

During the 1972 season Dutch elm disease continued to increase in severity and spread. Two hundred sixty municipalities now have DED--this represents 30% of the 854 incorporated cities and villages in Minnesota. This disease can only be controlled in cities, towns and villages. Control programs in rural areas are both scientifically and economically unsound. As in other states, rural control should not be attempted in Minnesota. DED is becoming increasingly evident in rural areas, especially along rivers and their tributaries. The Root, Cedar, and Blue Earth River valleys in southern Minnesota have many diseased and dead elm. Thousands of dead elm are found along the Mississippi River from Anoka to St. Cloud. An epidemic area exists along the St. Croix River from Bayport to Marine-on-the-St. Croix. Undoubtedly there are other undiscovered foci of infection, especially in southeast and south central Minnesota.

Again, it is important to emphasize that control of the disease in rural areas is not feasible. Our major efforts should be focused on municipal programs. Past history has shown us that this is the only area where we can be successful.

Dutch elm disease in Minnesota has not progressed as rapidly as in other states such as Illinois or Iowa, due perhaps to our colder winters. The spread and number of diseased trees has now reached a point in Minnesota where we can expect an epidemic and rapid loss of our elm trees unless action is taken soon.

	Positive cases Diagnosed in our DED Laboratory	Occurrence by County	No. Towns & Villages with Confirmed Cases
1962	2	3	2
1967	136	17	24
1971	1,168	52	191

The impact of Dutch elm disease is both environmental and economic. This disease is and will place a burden on all Minnesota communities. All towns and villages will have to deal with this tree disease problem. Tree removal and replacement will be costly averaging over \$200-\$300 per tree.

A sound, municipal control program under the guidance of scientists in the Minnesota Department of Agriculture can keep elm tree losses to 2 or 3% annually. This will buy time for a town or village to spread the cost of removal and replacement of trees over many years and still maintain the environmental character of our tree-shaded urban areas. Another benefit derived from an effective program is the utilization of elm wood by such industries as pulp and paper, roofing, veneer, and sawmills. If tree losses are not kept in check, these industries will not be able to utilize the enormous volume of wood. Disposal systems throughout the state would then be strained to the utmost. Minneapolis alone has over 400,000 elm trees, and St. Paul over 200,000. Elm is the major urban tree species throughout most of Minnesota.

There are no miracle cures for this disease. We hope that research can provide a breakthrough in the near future. Until then, we have much to offer in controlling this disease using present technology.

The Department of Agriculture is responsible under State Statutes 18.022, the Local Pest Control Law, to work with and authorize municipal pest control programs such as Dutch elm disease. We have only one full-time Plant Pathologist working on this immense problem. In the summer season, we employ 3 part-time college students to help operate our Dutch Elm Disease Laboratory which services and diagnoses elm specimens

for our communities and private citizens. Additional manpower and money is needed to meet our responsibilities as assigned to us by statute and provide the vital service necessary to control DED in our 854 towns and villages. To repeat, we have much to offer in controlling this disease. It is important that we begin now. Once Dutch elm disease becomes rampant we can not play a catch up game. Only large cities are able to employ a professional horticulturist or a city forester with the expertize to conduct a Dutch elm disease program. Smaller towns and villages need our help in starting and maintaining a sound control program. Their employees need the training and guidance of our specialists. They need the protection from quack "cures" that are of no value, or in some cases, may be dangerous to public health. Our towns, villages, and cities will not be able to ignore Dutch elm disease. They will have to do something even if it is just tree removal. The cost in any case will be high.

The Department of Agriculture needs 3 additional positions to provide this service and meet its responsibilities.** We are unable during the critical growing season to divert and train other staff members to work on the Dutch elm disease program.

Our work program in 1973 will place continued emphasis on alerting communities to ways of controlling the disease, training of personnel, and increasing the output of our diagnostic laboratory. Alerting industries to possible utilization of elm wood and reviewing rules and regulations on moving diseased and beetle-infested wood are additional activities planned. Cooperation with other governmental agencies to complement each other in related activities will eliminate duplication and also strengthen our program.

** Cost of additional personnel for DED program -- Minnesota Department
of Agriculture Program Budget 1973-1975.

\$28,569	Personnel
8,000	Expense
<u>510</u>	Capital outlays
\$37,079	

I would add \$1,500 more to this to make a total of \$38,579.



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

November 12, 1973

Presentation on the role of the Minnesota Department of Agriculture in Dutch elm disease control made to the House Subcommittee on Dutch elm and oak wilt. November 12, 1973.

The Department of Agriculture is responsible under State Statutes 18.022, the Local Pest Control Law, to work with and authorize municipal pest control programs such as Dutch elm disease. Historically, we have been involved in municipal pest control programs about 20 years. These have included mosquito and nuisance animal control activities. When Dutch elm disease first came into the State in 1962, this was added to this activity.

A related Statute 18.44, the Plant Pest Act, also plays a part in Dutch elm disease control. The purpose of this act is to prevent the introduction into and the propagation and dissemination within the State of plant pests and to provide for their suppression and control. This law provides us with the authority to regulate the movement and disposal of diseased or infested elm wood.

Presently the Department of Agriculture is involved in three types of activities related to Dutch elm disease. These are: 1. The development and approval of municipal programs, 2. Operating a Dutch elm disease diagnostic laboratory, and, 3. Providing for the safe movement and disposal of elm wood.

First and most important is working with municipalities in developing sound control programs. We encourage the adoption of local programs based on the guidelines developed by our Department. An important aspect of these



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

guidelines includes tree inventory. No definite plans can be made for a control program if it is not known whether a community has 1000 or 5000 elms. The inventory should include all elms, public and private. Another aspect is the adoption of a local tree ordinance. This ordinance will provide the legal authority to act and will establish policy in regard to Dutch elm disease control. Sanitation is the major element in any Dutch elm disease control program because it is needed to eliminate elm bark beetle, diseased trees and dead or weakened elm wood arising from any cause. To allow beetle breeding material to accumulate is an invitation for the disease to develop and spread.

The judicious use of chemicals may be justified on a limited basis. Large scale use is presently not recommended.

Tree planting or replacement is often an overlooked aspect of a municipal tree program. Mixed tree populations that are not dominated by any single species are much less subject to disease and insect epidemics. We should be planting trees now and not wait until we lose our elms.

The second activity is the free diagnostic service provided by our Dutch elm disease laboratory to communities and private citizens. In 1973, 4114 elm samples were submitted for analysis.

The third and last activity is the development of plans and programs for the safe movement and disposal of elm wood. This aspect is becoming increasingly important as the disease progresses. It is our aim to make possible full utilization of elm wood with the least possible pest risk.

It should be noted that all of our Department activities have been directed to the control of Dutch elm disease in municipalities. It is important to emphasize that control in rural areas is not feasible. Past history of this disease in the United States has shown us that successful control has been achieved only in municipalities.

Two hundred and ninety-four Minnesota cities and villages now have Dutch elm disease. Sixty-one of our 87 counties are infected. The disease is extensive and well entrenched in our State. It appears that we are now on the threshold of large-scale losses. Now is the time when we in Minnesota must act.

We in the Minnesota Department of Agriculture believe that a sound municipal program vigorously applied can keep elm tree losses to 2 or 3% annually. This will buy time for a town or village to spread the cost of removal and replacement of trees over many years and still maintain the environmental character of our tree-shaded urban areas. Another benefit derived from an effective program is the utilization of elm wood by such industries as pulp and paper, roofing, veneer, and sawmills. If tree losses are not kept in check, these industries will not be able to utilize the enormous volume of wood. Disposal systems throughout the state would then be strained to the utmost. Minneapolis alone has over 400,000 elm trees, and St. Paul over 200,000. Elm is the major urban tree species throughout most of Minnesota.

There are no miracle cures for this disease. We hope that research can provide a breakthrough in the near future. Until then, we have much to offer in controlling this disease using present technology.

In order to fulfill our role and obligation in controlling this devastating disease, the Department needs additional manpower and funds. Presently we are trying to meet our responsibilities in this immense program with only one full-time plant pathologist and three seasonal college students to work in the laboratory. Our Department's last Program Budget asked for additional positions and funds to support this activity. This was not granted. The Department needs 5 additional positions and funds to support our Dutch Elm Disease program that could involve most Minnesota communities. This would require a Department complement increase of five positions, two plant pathologists and three entomologists. Funds to support the increase personnel and their activities would total roughly \$60,000 annually.

<u>Position</u>	<u>Salary 12 mo.</u>	<u>Fringe 12 mo.</u>	<u>Travel 12 mo.</u>	<u>Total</u>
Plant Pathologist	8832	1086	1500	11,418
Plant Pathologist	8832	1086	1500	11,418
Entomologist	8832	1086	1500	11,418
Entomologist	8832	1086	1500	11,418
Entomologist	8832	1086	1500	11,418
$\frac{1}{2}$ Clerk Steno	2640	368	-	<u>3,008</u>
				60,098

To repeat, we have much to offer in controlling this disease. Once Dutch elm disease becomes rampant we can not play a catch up game. Only large cities are able to employ a professional horticulturist or city forester with the expertise to conduct a Dutch elm disease program. Smaller towns and villages need our help in starting and maintaining a sound control program. Their employees need the training and guidance of our specialists. They need protection from quack "cures" that are of no value, or in some cases, may be dangerous to public health. Our towns, villages, and cities will not be able to ignore Dutch elm disease. They will have to do something even if it is just tree removal. The cost in any case will be high.

The limitation imposed by Chapter 18.022, Subdivision 2, does not provide smaller communities with enough funds to carry on adequate programs. Perhaps this limitation should be removed or other funds made available. However, money alone will not solve this disease problem. Money wisely spent for effective disease control programs will. Funds should not be spent merely to remove trees, but to prevent tree losses. This is the goal of the Department.

PRELIMINARY DRAFT
3-14-74

AGENCIES AND ORGANIZATIONS HAVING AN INTEREST IN
DUTCH ELM DISEASE

STATE OF MINNESOTA

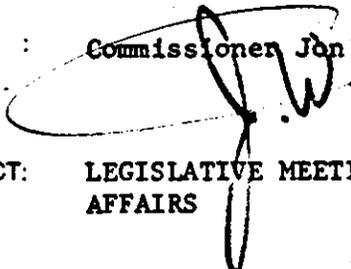
- 1. Department of Agriculture
 - A. Division of Plant Industry
 - (1) Regulatory functions
 - (2) Educational efforts
 - (3) Laboratory
 - B. Division of Agronomy Services
 - (1) Registration of pesticides
 - (2) Registration of commercial pesticide applicators
- 2. Department of Natural Resources
 - A. Lands and Forestry
 - (1) Forest management
 - (2) Pest control
 - (3) Utilization
 - B. State Parks
 - (1) Disease control and tree removal, especially in public use areas
- 3. Highway Department
 - A. Environmental Services
 - (1) Tree planting
 - (2) Right of way tree removal and disposal
- 4. Pollution Control Agency
 - A. Solid Waste Division
 - (1) Disposal regulations - sanitary landfills
 - B. Air Quality Division
 - (1) Burning regulations
- 5. University of Minnesota
 - A. Plant Pathology Department
 - (1) Research - test methods of control, evaluation of new chemicals
 - (2) Extension - education - meetings, bulletins, training programs
 - B. Entomology, Fisheries & Wildlife
 - (1) Research - bark beetles, parasitism, chemical control of beetles, etc.
 - (2) Extension educational program training
 - C. Horticultural Science
 - (1) Research - testing tree hardiness and testing substitute species

- (2) Extension - educational materials in tree planting, hardiness training - arborists
 - D. School of Forestry.
 - (1) Research - forest products research, basic research
 - (2) Extension - Utilization, tree planting, windbreaks, etc.
- 6. U. S. Forest Service
 - A. State and private forestry - Forest pest management
 - B. North Central Forest Experiment Station
 - (1) Basic research - insect and disease pests
- 7. Municipalities
 - A. Local municipalities
 - (1) Park and street department responsible for local DED control programs
 - B. League of Minnesota Municipalities
 - (1) Serves as clearing house for information on laws, rules and regulations, ordinances, etc. Makes information available through various publications.
- 8. Counties
 - A. Metropolitan Inter-County Council
 - (1) Matters concerning 7 county metropolitan area, i.e. legislation, etc.
 - B. Association of Minnesota Counties
 - Various - disposal sites could be one
 - C. County Parks
 - (1) Control and disposal especially in high use areas.
 - D. County board - Appropriators of funds and assignment of personnel for Dutch elm disease control
- 9. Minnesota Association of Nurserymen
 - A. Members - concerned with the growing and sale of suitable shade trees to replace elms.

DEPARTMENT AGRICULTURE**Office Memorandum**

TO : Rollin Dennistoun John Berends
 Tom Kalitowski Joe Sandve
 ~~Robert Flaskerd~~

DATE: March 14, 1975

FROM :  Commissioner Jon Wefald

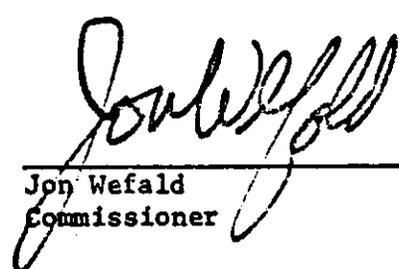
SUBJECT: LEGISLATIVE MEETING OF THE HOUSE COMMITTEE ON LOCAL AND URBAN AFFAIRS

Representative Tom Berg, Chairman of the House Local and Urban Affairs Committee, has called a committee hearing of his Local and Urban Affairs Committee on the proposed \$3-million Shade Tree Bill for Wednesday, March 26, 1975, at 10 A.M., in the State Office Building Auditorium (Room 83).

I want all of you to start preparing for that meeting now so we will be fully prepared for that day. Tom Berg has asked me to give a 10-minute recapitulation of our 1975 position paper on what our department has done in the past year regarding shade tree disease control.

I understand also that our department has been asked by Representative Tom Berg's committee about what we are doing regarding state lands with the Department of Natural Resources. Let's make sure that we have the answers on this for the committee by March 26th.

Please plan on attending this committee meeting on March 26th.



Jon Wefald
Commissioner

JW/jb

DEPARTMENT AGRICULTURE*Office Memorandum*

TO : Rollin Dennistoun John Berends
 Tom Kalitowski Joe Sandve
 ~~Robert Flaskerd~~

DATE: March 26, 1975

FROM : Commissioner Jon Wefald

SUBJECT: THE PROPOSED \$3-MILLION SHADE TREE DISEASE BILL

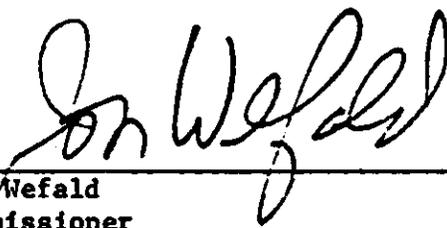
First, I think we can assume that the \$3-million proposed Shade Tree Disease Bill will pass.

Second, I think we have to start gearing up for that in our department right away.

Third, I propose that we start drawing up right now--even though tentative--some proposed rules as to what criteria we are going to use in judging requests that we are going to get from various quarters later on this spring and early summer.

Fourth, I think we should also start preparing--along with Harold Frank's help--the qualifications and criteria we are looking for in the selection of a new administrator to head up this program. Even though the bill has not yet been passed, I think that Harold Frank should be setting up the examination and the qualifications for the administrator position right now.

Let's start working on all of these projects right away.



Jon Wefald
Commissioner

JW/jb

cc: Harold Frank, Department Personnel Manager

612-296-2856

March 25, 1975

Al Durand, Administrative Assistant
Committee on Local and Urban Affairs
House of Representatives
Room 366, State Office Building
St. Paul, Minnesota 55155

Dear Mr. Durand:

The following is in response to your attached letter of March 24, 1975.

Question #1 - Are state owned lands presently included in shade tree programs?

Answer - Yes, state owned lands are included, but some municipalities are perhaps reluctant to act because of the exclusion of state land in the present statute.

Question #2 - Do adjoining municipalities do the removing of diseased trees for state owned lands?

Answer - It depends on the local arrangements between a municipality and the state agency involved. The following are some examples:

CITY OF ST. PAUL

St. Paul crosses survey all trees within St. Paul city limits or control zones. They mark and condemn all diseased trees and send removal notification to the appropriate agency. They will remove trees for public agencies if such removal is requested.

Examples:

Metro Sewer Board - St. Paul will survey, mark and remove trees.
- Send bill and are reimbursed.

Fish Hatchery, DNR - St. Paul will survey and mark, Department of Natural Resources will remove.

Port Authority - St. Paul does the whole job and is reimbursed for tree removal.

Capitol Complex - St. Paul surveys, marks, and takes down trees
- sends bill for removal to Commissioner of Administration.

Public Schools - St. Paul surveys and removes
- bills school administration.

State Highway - within St. Paul, the city takes care of boulevard trees on streets designated as highways
- Highway Department takes care of trees on freeways.

Fairgrounds - cooperates with Fair Board in making surveys
- Fair Board will contract removal

University of Minnesota - University does their own
- St. Paul will notify University if they see diseased trees.

Adjacent Municipality - will notify adjacent municipality if a dividing street has diseased trees.

CITY OF MINNEAPOLIS

Minneapolis surveys all properties. They remove trees on boulevards and park property with their own crews. Also, they remove trees for Minneapolis Housing Authority and the public school system and bill those agencies for costs involved. All other property owners must contract with private tree removers.

STATE AGENCIES

State Community Colleges and Capitol Complex - pay tree removal costs from their general maintenance budget.

Highway Department - the Highway Department has training for their maintenance men who are to report diseased trees. Also, district offices are notified by citizens or municipalities and the district office will check out ownership, etc. and remove the tree if it belongs to them. Costs come out of general maintenance budget.

Parks and Recreation Department - in forested areas all pest problems are left to the district foresters. In public use areas, the Division will remove all diseased, weakened, or dead trees primarily from the safety standpoint. There are three State parks in the seven-county area.

St. Peter State Hospital (Public Welfare) - state forester from Markato does survey work.
- cuts and burns trees themselves.

Faribault State Hospital (Public Welfare) - People on the grounds crew do their own survey work (they have attended University of Minnesota short course).

- all trimming and removal is done themselves.

Anoka State Hospital (Public Welfare) - Someone outside the institution comes in and does the survey work.

- they cut their own trees and dump at local landfill.

Question #3 - Who is responsible for paying for the removal of diseased trees?

Answer - The cost of tree removal should be the responsibility of the state agency controlling the state owned land. In practice this has generally been the case, but it is not required by statute. We are aware of only one situation where the entire cost of tree removal on state owned land was paid by a municipality. It involved a tree on a tax forfeited lot located in Princeton, Minnesota. We recommended the city remove the tree rather than endangering their control program by delays in trying to establish who is responsible for that land and who shall pay the costs.

Question #4 - If the State of Minnesota is responsible for payment, what monies does it draw from for this purpose?

Answer - Individual state departments can answer this better, but we have determined that most do not budget for removing trees. Funds usually come from general maintenance or if public buildings are involved money for buildings and grounds. Apparently money has been available to meet removal costs. How long this can continue is questionable. As the incidence of Dutch elm disease and Oak Wilt increases, and control efforts increase, tree removal costs will burden many state agencies.

Question #5 - What legal language would be required to insure compliance to shade tree programs by state departments?

Answer - The following wording is suggested: A municipality or other authorized authority shall act in accordance with the provisions of Minnesota Statute 18.023 and Rules and Regulations adopted pursuant thereto, to control shade tree disease on state owned lands, or lands under control of semi-state agencies or special purpose districts, that are located within the territorial limits of the municipality or other authorized authority if the agency responsible for support and maintenance of the land fails to comply with the laws and regulations relating to Shade Tree Disease Control after proper notification from the authorized authority. A city, municipality or authorized authority that acts to control shade tree diseases as authorized by this section shall be reimbursed upon demand from the operating budget of the agency responsible for the land.

Comments:

If state owned land is included in either Dutch elm or Oak Wilt control programs, money should be made available through a special fund established by the legislature. State agencies can draw from this fund when required to comply with a local municipal shade tree control program. This would eliminate individual state agencies trying to budget for tree removal. Funds should be directed toward tree removal cost, not increased personnel or large equipment purchases.

The special fund approach would allow greater flexibility to direct funds where needed. An appropriation of \$200,000 should be made to this fund to supplement existing methods of state agency tree removal funding. Increases in this special fund would be required in the future. Any unused funds can be retained or reverted back to general revenue if desired.

If you need further information, please contact me.

Yours very truly,

Jon Wefald
Commissioner

JW:dw

Enc.

DEPARTMENT AGRICULTURE*Office Memorandum*

TO : Tom Kalitowski

DATE: March 17, 1975

FROM : Rollin M. Dennistoun, Ph.D.
Department Administrator

SUBJECT: DUTCH ELM DISEASE PROGRAM ON STATE CONTROL LANDS

All state-owned land that is a control area should be subject to the same controls as the rest of the control area. (A control area is a specified area that has an approved Dutch elm disease control program.) Cost for such supervision would be by city or control authority, thus the Department of Agriculture would have minimal added cost or supervision as it is already exercising supervision of the control authority for the control area.

The local control authority could have added costs relating to the program if the state agency in charge of the state-owned land does not comply and the local control authority is thus required to do control work.

At this point the local control authority should be able to collect for the work done from the appropriate state agency. Thus, the added cost will be to those state or semi-state agencies such as DNR, Highway, Welfare (state hospitals), Corrections and the St. Paul Port Authority that control or manage land where Dutch elm disease is a problem.

We would suggest that those agencies might be better able to estimate their dollar costs than we can because they know the amount of land and have some ideas of the number of trees involved.

RMD:hk

cc: Bob Flaskerd ✓

DEPARTMENT AGRICULTURE

Office Memorandum

TO : Rollin Dennistoun John Berends
 Tom Kalitowski Joe Sandve
 ~~Robert Flaskerd~~

DATE: March 26, 1975

FROM : Commissioner Jon Wefald

SUBJECT: THE PROPOSED \$3-MILLION SHADE TREE DISEASE BILL

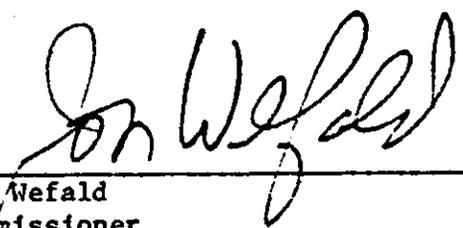
First, I think we can assume that the \$3-million proposed Shade Tree Disease Bill will pass.

Second, I think we have to start gearing up for that in our department right away.

Third, I propose that we start drawing up right now--even though tentative--some proposed rules as to what criteria we are going to use in judging requests that we are going to get from various quarters later on this spring and early summer.

Fourth, I think we should also start preparing--along with Harold Frank's help--the qualifications and criteria we are looking for in the selection of a new administrator to head up this program. Even though the bill has not yet been passed, I think that Harold Frank should be setting up the examination and the qualifications for the administrator position right now.

Let's start working on all of these projects right away.



Jon Wefald
Commissioner

JW/jb

cc: Harold Frank, Department Personnel Manager



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

TELEPHONE: (612) 296- 3347

Committee Hearing
October 12, 1976
Senate Natural Resource and Agriculture Committee
Roger D. Moe, Chairman

Shade Tree Disease Control Program Minnesota Department of Agriculture

TREE LOSSES

Tree losses in the metropolitan area has exceeded even the most pessimistic projections. Total losses of elm within cities in the metropolitan area are 57,588. Twenty-four cities have yet to report. Reports outside the seven (7) metropolitan counties appear to reveal an equally sharp increase in the loss of elms: Austin, 460; Albert Lea, 392; Mankato, 1162; Rochester, 250; Fairmont, 800; and, Littlefork, 162.

SHADE TREE DISEASE CONTROL ACT - Minn. Statutes 18.023

Legislation passed in 1975 appropriated 1.6 million dollars for shade tree disease control. Funds were earmarked for various program elements; public education (\$45,000); tree waste disposal/utilization (\$700,000); private property subsidies (\$800,000); and, administration (\$50,000). The Department's law enforcement activities are funded from the Departmental budget appropriation.

PUBLIC EDUCATION

The public education program was implemented by contracting for a comprehensive public education package. The contract price was \$38,700 and all services contracted for have been completed. Six radio spots, four T.V. spots, and a multimedia slide show have been produced. The contractor has arranged nine major media events. Eleven 16mm movies have been made from the slide show at an additional cost of \$1,300.00. A balance of \$5,000 remains in the public education fund.

Public education efforts were notably successful in the area of news media exposure. The public service announcements produced were of high quality, with the sixty-second T.V. spot winning an award as one of Minnesota's best public service announcements. It is difficult, however, to measure the actual air time received by the public service announcements. The 16mm movie has proven an invaluable tool to the Department, local units of government and other organizations when presenting their case of shade tree disease control to the public.



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EQUAL OPPORTUNITY EMPLOYER



WOODWASTE UTILIZATION/DISPOSAL

The Department has awarded \$313,500 from the disposal/utilization fund for two separate wood chipping facilities in the metropolitan area. Hennepin County has received \$83,500 to augment their existing chipping operation. The county has purchased a new 22 inch mobile chipper and a chip screen to improve the marketability of their chips.

St. Paul and Minneapolis have been awarded \$230,000 for a large capacity chipping facility to be located in the Pigs Eye area. Implementation of the Pigs Eye project has evolved slowly. Approval of the site by various levels of government took several months. The St. Paul and Minneapolis Park Board procurement divisions have also experienced difficulties in receiving acceptable bids on the project. Notwithstanding these difficulties, the facility is expected to become operational by February 1977.

The balance of the disposal/utilization fund is expected to be awarded by the end of the fiscal year. Additional applications for funds are expected from metropolitan counties following the completion of the Metropolitan Inter-County Council study on tree waste. As of this time, the Department has not received an application for disposal/utilization funds from outside the seven county metropolitan area. Attached is a list of the municipalities and counties who have been awarded grants under the disposal program.

PRIVATE PROPERTY SUBSIDIES

All \$800,000 of the funds provided for grants to cities for subsidies to private property owners for tree removal have been committed. Sixty-four (64) communities are participating in the grant program. Twenty-six (26) of these communities are outside the metropolitan area.

The subsidy program has been received well by municipalities. Administration of the program has run smoothly, allowing flexibility and emphasizing simplicity. It is expected that interest in the program will increase substantially during the next biennium. Attached is a list of municipalities participating in the subsidy program and the amounts awarded to each.

SURVEILLANCE AND ENFORCEMENT

The Department is presently in the process of implementing revised surveillance and enforcement procedures. All municipalities subject to the provision of Minnesota Statute 18.023 have employed a qualified tree inspector. Each of the 164 municipalities in the metropolitan area were inspected by July 1, 1975. Twelve cities were found to have inadequate disease detection programs. A second round of inspections of metropolitan communities revealed that all metropolitan municipalities were marking and removing diseased trees, but many were having difficulty in removing trees within the twenty day limit set by the Department's regulations.

In May, inspections were made of sixty-six (66) communities outside the metropolitan area. Inspectors were unable to ascertain the quality of these programs because of the time of year. Personal contacts, however, indicated an awareness of the problem and the ability to deal with it.

At this time, the Department has not felt it necessary to pursue available legal remedies. It is hoped that such action can be avoided. If it is determined, however, that communities are failing to remove diseased trees, the Department will recommend that the necessary legal measures be taken to insure compliance with the law.

<u>PROGRAM ELEMENT</u>	<u>APPROPRIATION</u>	<u>EXPENDITURES</u>	<u>BALANCE A</u>
Public Education	\$ 45,000	\$ 40,000	\$ 5,000
Disposal/Utilization Grant	700,000	313,500	386,500
Private Property Subsidy	800,000	772,505	27,495

DISPOSAL/UTILIZATION GRANT AWARDS

<u>Grantee</u>	<u>Amount</u>
Hennepin County	\$ 81,500
St. Paul/Minneapolis	230,000

PRIVATE PROPERTY SUBSIDY GRANT AWARD

<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>	<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>
Bloomington	9,603.55	16,000	Madison Lake		11,000
Braham		2,000	Mahtomedi	4,405.20	21,000
Brooklyn Park		20,000	Maple Grove	2,017.75	11,250
Buffalo		4,000	Maplewood	6,000.00	
Burnsville	4,524.45	20,600	Melrose	2,269.44	2,500
Chanhassen	1,844.50	18,000	Minnetonka	21,769.79	32,500
Chaska		2,500	Monticello	3,202.50	3,203
Columbia Hts.		3,000	Northfield		1,000
Coon Rapids	1,639.35	30,000	Pipestone	750.00	2,025
Cottage Grove	469.75	3,000	Plymouth		40,000
Cottonwood		2,750	Ramsey		2,000
Crystal		3,000	Red Wing	607.20	2,000
Deephaven	853.01	12,000	Richfield	392.62	7,500
Eden Prairie	2,653.86	4,000	Robbinsdale		15,000
Edina	364.31	15,000	St. Anthony		4,000
Excelsior		2,500	St. Charles		3,100
Fairmont	3,993.58	5,500	St. Cloud		4,500
Falcon Hts.	25.00	750	St. Louis Park		5,000
Forest Lake		1,500	St. Paul		250,000
Fridley		15,000	Sauk Centre		2,000
Gaylord		1,500	Shorewood		10,000
Golden Valley		7,500	Spring Valley	547.91	2,500
Granite Falls	925.00	1,250	S. St. Paul	367.00	2,000
Hassan Twsp.		1,000	Tonka Bay		3,000
Hopkins		31,875	Vadnais Hts.		2,000
Hutchinson		2,500	Waseca		250
Lauderdale	510.25	2,000	Washington Cty.	6,130.01	20,000
Lamberton	1,259.00	2,783	Wayzata		1,000
Lilydale	272.00	400	Willmar	2,000.00	2,000
Little Falls		1,800	Winona		5,000
Littlefork		500	Woodstock		300
Madelia		2,000			
Madison		500			



LAND OF QUALITY FOODS

February 3, 1977

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

TELEPHONE: (612) 296- 3347

The Honorable Thomas Berg, Chairman
 Committee on Local and Urban Affairs
 368 State Office Building
 St. Paul, Minnesota 55155

Dear Representative Berg:

As your committee will be considering a number of bills relating to shade tree diseases in Minnesota, I want to take this opportunity to introduce myself and to offer any assistance I may be able to provide the Committee while these bills are being considered. I presently administer the State Shade Tree Disease Program for the Department of Agriculture and am familiar with the past and present shade tree program.

For the Committee's information, I have enclosed ten (10) copies of "Looking Towards Minnesota's Future by Insuring An Orderly Transition of Our Urban Forests," a report prepared by the State Shade Tree Advisory Committee. The Committee advises the Commissioner of Agriculture on matters relating to shade trees in Minnesota. Its members are appointed by the Commissioner and include municipal officials, representatives of public interest groups, and private citizens.

The enclosed report contains the Advisory Committee's recommendations to the Commissioner, for the 1977 program, based on their recent consideration of the present status of shade tree diseases in Minnesota. I think it may be of some value to your Committee as you consider legislation relating to shade tree diseases.

I also am enclosing a list of persons who would be willing to provide the Committee with further information on the status of shade tree diseases and existing programs. Many, though not all, of those listed are members of the Shade Tree Advisory Committee and would welcome the opportunity to discuss the enclosed report and related matters.

If I can be of any further assistance to committee members, I hope that they will feel free to contact me at 296-3347.

Sincerely,

Peter H. Grills, Administrator
 Shade Tree Disease Control Program
 Division of Plant Industry

PHG:kb

Enclosures



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EQUAL OPPORTUNITY EMPLOYER



CONTACTS FOR SHADE TREE LEGISLATION

Mr. Donald C. Willeke, Chairman of
the Committee
O'Connor & Hannan
Attorneys at Law
38th Floor, IDS Tower
80 South Ninth Street
Minneapolis, MN 55402
(612) 341-3800

Mr. Earl Adams, Director
Department of Natural Resources
Division of Forestry
330 Centennial Building
St. Paul, MN 55155
(612) 296-4484

Mr. Gordon Bailey, Jr.
Bailey Nurseries
1325 Bailey Road
St. Paul, MN 55119
(612) 459-9744

Mr. Lewis Bloom
Spokesman, Save Our Elms
601 Peavey Building
730 2nd Avenue S.
Minneapolis, MN 55402
(612) 332-4467

Mr. John Boland
Metropolitan Council
Suite 300, Metro Square Bldg.
Seventh and Robert Street
St. Paul, MN 55101
(612) 291-6359

Mr. Larry Brokke
1640 West Highway 36
St. Paul, MN 55113

Mr. Lloyd Burkholder
City Forester
1224 North Lexington Parkway
St. Paul, MN 55103
(612) 488-7291

Mr. Ray Carson
City Forester
Park & Recreation Dept.
City of Duluth
Duluth, MN 55802

Mr. David Devoto
Park Forester
38th Street & Bryant Avenue S.
Minneapolis, MN 55409
(612) 822-2126

Mr. Ted Freeman
P.O. Box 186
Chisago City, Minnesota 55103

Dr. David French
Department of Plant Pathology
University of Minn., St. Paul
Campus
St. Paul, MN 55108
(612) 437-3191

Ms. Janet Haynes
2220 Seabury Avenue S.
Minneapolis, MN 55406
(612) 339-8117

Mr. David Kreager
3025 Harbor Lane
Plymouth, MN 55441
(612) 559-2800

Mr. Keith Kuckler, Farmer
Rural Route #1, Box 38
Jordan, MN 55352

Mr. Basil Loveland, Mayor
City of Newport
182 Tenth Street
Newport, MN 55055

Mr. Chuck Lowery
Dakota County Parks
401 Vermillion Street
Hastings, MN 55033
(612) 437-3191

Mr. Dean Lund, Executive Director
League of Minnesota Municipalities
300 Hanover Building
480 Cedar Street
St. Paul, MN 55101

Mr. Luther Nelson
Hennepin County Public Works
Department
320 Washington Avenue S.
Hopkins, MN 55343
(612) 935-3381

CONTACTS FOR SHADE TREE LEGISLATION CONT.

Mr. Dave Noetzel, Extension Entomologist
Dept. of Entomology, Fisheries & Wildlife
University of Minn., St. Paul Campus
1395 Arlington Avenue West
St. Paul, MN 55108
(612) 373-1044

Mr. Vern Peterson, Executive Director
League of Minnesota Municipalities
300 Hanover Building
480 Cedar Street
St. Paul, MN 55101

Mr. Glenn H. Ray, Exec. Secretary
Minnesota State Horticultural Soc.
161 Horticulture Science Building
University of Minn., St. Paul Campus
St. Paul, MN 55108

Mr. Richard Sandberg
Pollution Control Agency, Solid Waste
1935 West County Road B2
Roseville, MN 55113

Mr. Clarence Seefert
Seefert's Hudson Road Nursery
3622 Hudson Road
St. Paul, MN

Mr. James Shipman, Exec. Director
Metropolitan Inter-County Council
55 Sherburne Avenue
St. Paul, MN 55155
(612) 222-5823

Mr. Glenn Shirley, City Forester
2215 Old Shakopee Road West
Bloomington, MN 55431
(612) 881-5811 Ext. 225

Mr. Ken Simons
Ramsey County Open Space
316 Commerce Building
St. Paul, MN 55101
(612) 298-5566



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

TELEPHONE: (612) 296-3347

Committee Hearing

March 10, 1977

Senate Committee on Finance

Senator Roger Moe, Chairman

Shade Tree Disease Control Program
Minnesota Department of Agriculture

TREE LOSSES

Tree losses for 1976 have exceeded even the most pessimistic projections. Total losses of elm within municipal boundaries in the metropolitan area are in excess of 75,000. Reports outside the seven (7) metropolitan counties reveal an equally sharp increase in the loss of elms: Albert Lea 364; Fairmont 655; Mankato 1446; Rochester 250; St. Cloud 243; and Littlefork 240.

SHADE TREE DISEASE CONTROL ACT - Minn. Statutes 18.023

The Shade Tree Disease law as amended in 1975 appropriated 1.6 million dollars for disease control. Funds were earmarked for various program elements: public education (\$45,000); tree waste disposal/utilization (\$700,000); private property subsidies (\$800,000); and, administration (\$50,000). The Department's law enforcement activities are funded by the Department's Municipal Pest Control activity.

PUBLIC EDUCATION

A major portion of the public education funds was expended in the production and distribution of television and radio public service announcements. Five (5) television and six (6) radio spots were produced. It is worthy of mention that one of the sixty (60) second television spots was honored as one of Minnesota's best public service announcements. A ten minute slide presentation was also produced to be used in distributing the announcements to public service representatives of the media. The slide show was later put on 16mm film and eleven (11) copies of the film were circulated among community groups and other public interest organizations throughout the state.

Emphasis was also placed upon increasing the exposure of the shade tree disease problem through the news media. Eleven (11) major media events were organized in the effort. These special media events included Arbor Day 1976, a bus tour for state legislators, press conferences held throughout the state, and State Shade Tree Advisory Committee meetings. An essential part of every media event was the preparation and distribution of press packages to television, radio and newspapers throughout Minnesota.

An equally important aspect of the public education program was the community group contact made by Department staff. With the onset of the growing season, department staff was kept busy with public appearances before community and civic groups. The number of people who can be reached through this approach is, of course, limited. However, the personal contact is highly effective in communicating the message and also enhances the credibility of the state program. There presently, remains a balance of \$2,000 in the public education fund.



 ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

EQUAL OPPORTUNITY EMPLOYER



WOODWASTE UTILIZATION/SHADE TREE
The Department has awarded \$313,500 from the disposal/utilization fund for two separate wood chipping facilities in the metropolitan area. Hennepin County has received \$83,500 to augment their existing chipping operation. The county has purchased a new 22 inch mobile chipper and a chip screen which is used to improve the marketability of their chips.

St. Paul and Minneapolis have been awarded \$310,000 for a large volume chipping facility to be located in the Pigs Eye Lake area. Implementation of the Pigs Eye project has evolved slowly. Approval of the site by various levels of government took several months. The St. Paul and Minneapolis Park Board procurement divisions have also experienced difficulties in receiving acceptable bids on the project. However, the facility is expected to be operational by April 15, 1977.

The balance of the woodwaste utilization fund is expected to be committed to projects by the end of the 1977 fiscal year. An application from Dakota County for a portable sawmill is presently under review. The county is requesting \$43,000 for the sawmill operation which is expected to provide rough lumber from diseased trees taken from County parks for use by the County parks and highway departments. Several other projects are being developed and applications for funds are expected. Attached is a list of municipalities and counties who have been awarded grants under the utilization program.

PRIVATE PROPERTY SUBSIDIES

All \$800,000 of the funds provided for grants to cities for subsidies to private property owners for tree removal have been committed. Sixty-seven (67) communities are participating in the grant program. Twenty-seven (27) of these communities are outside the metropolitan area.

The subsidy program has been received well by municipalities. Administration of the program has run smoothly, allowing flexibility and emphasizing simplicity. It is expected that interest in the program will increase substantially during the next biennium. Attached is a list of municipalities participating in the subsidy program and the amounts awarded to each.

SURVEILLANCE AND ENFORCEMENT

All municipalities subject to the provision of Minnesota Statute 18.023 had a qualified tree inspector in their employment by the beginning of the 1976 growing season. Each of the 164 municipalities in the metropolitan area were field inspected by July 1, 1975. Twelve cities were found to have inadequate disease detection programs. A second round of inspections of metropolitan communities revealed that all metropolitan municipalities were marking and removing diseased trees, but many were experiencing difficulty in removing trees within the twenty day limit set by the Department's regulations.

In May, inspections were made of sixty-six (66) communities outside the metropolitan area. Contracts made with these cities indicated a substantial awareness of the problem. Many cities outside the metropolitan area have had and continue to administer effective shade tree disease control programs.

At this time, the Department has not found it necessary to pursue available legal remedies. It is hoped that such action can be avoided. If it is determined, however, that communities are failing to remove diseased trees, the Department will recommend that the necessary legal measures be taken to insure compliance with the shade tree disease control law.

<u>PROGRAM ELEMENT</u>	<u>APPROPRIATION</u>	<u>EXPENDITURES</u>	<u>BALANCE</u>
Public Education	\$ 45,000	\$ 43,000	\$ 5,000
Disposal/Utilization Grant	700,000	393,500	306,500
Private Property Subsidy	800,000	800,000	-0-

DISPOSAL/UTILIZATION GRANT AWARD

<u>Grantee</u>	<u>Amount</u>
Hennepin County	\$ 83,500
St. Paul/Minneapolis	310,000

PRIVATE PROPERTY SUBSIDY GRANT AWARD

<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>	<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>
Baytown Twsp.		1,000	Madison Lake		11,000
Bloomington	\$9,603.55	16,000	Mahtomedi	\$ 4,405.20	21,000
Braham		2,000	Maple Grove	2,017.75	11,250
Brooklyn Park		20,000	Maplewood	6,000.00	
Buffalo		4,000	Melrose	2,269.44	2,500
Burnsville	4,524.45	20,600	Minnetonka	21,769.79	32,500
Butterfield		1,475	Monticello	3,202.50	3,203
Chanhassen	1,844.50	18,000	Northfield		1,000
Chaska		2,500	Pipestone	750.00	2,025
Columbia Hts.		3,000	Plymouth		40,000
Coon Rapids	1,639.35	30,000	Ramsey		2,000
Cottage Grove	469.75	3,000	Red Wing	607.20	2,000
Cottonwood		2,750	Richfield	392.62	7,500
Crystal		3,000	Robbinsdale		15,000
Deephaven	853.01	12,000	St. Anthony		4,000
Eden Prairie	2,653.86	4,000	St. Charles		3,100
Edina	364.31	15,000	St. Cloud		4,500
Excelsior		2,500	St. Louis Park		5,000
Fairmont	3,993.58	5,500	St. Paul		250,000
Falcon Hts.	25.00	750	Sauk Centre		2,000
Forest Lake		1,500	Shorewood		10,000
Fridley		15,000	Spring Valley	547.91	2,500
Gaylord		1,500	S. St. Paul	367.00	2,000
Golden Valley		7,500	Tonka Bay		3,000
Granite Falls	925.00	1,250	Vadnais Hts.		2,000
Hassan Twsp.		1,000	Waseca		250
Hopkins		31,875	Washington Cty.	6,130.01	20,000
Hutchinson		2,500	Wayzata		1,000
Lauderdale	510.25	2,000	Willmar	2,000.00	2,000
Lamberton	1,259.00	2,783	Winona		5,000
Lilydale	272.00	400	Woodstock		300
Little Canada		10,000			
Little Falls		1,800			
Littlefork		500			
Madelia		2,000			
Madison		500			

Senator Roger Moe
Page 3
March 10, 1977

*Non-Salary Support	\$ 29,607
*Shade Tree Disease Laboratory	27,870
*Program evaluation	<u>100,000</u>
TOTAL	\$321,432



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

TELEPHONE: (612) 296-3347

A 12

March 22, 1977

TO: Representative Thomas Berg, Chairman
House Committee on Local and Urban Affairs

FROM: Peter Grills, Department of Agriculture
David French, University of Minnesota
Ward Stinstra, University of Minnesota
James Brooks, Department of Natural Resources

SUBJECT: 1977 Shade Tree Disease Control Legislation

Peter Grills

This memorandum has been prepared as a cooperative effort among the Department of Agriculture, the Department of Natural Resources, and the University of Minnesota. Its purpose is to assist the House Committee on Local and Urban Affairs in their consideration of 1977 shade tree legislation.

The memorandum is organized into four sections. First, there is a comparison of the amounts recommended for each program activity by the State Shade Tree Advisory Committee, the State Departments involved, and the Committee Bill itself.

Second, a short explanation of each program activity and the amounts appropriated by the Committee Bill is given.

Third, all other appropriations directly relating to shade tree diseases are identified.

And lastly, an explanation of the division of responsibilities and how activities will be coordinated between the Department of Agriculture and the University is provided.



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EQUAL OPPORTUNITY EMPLOYER

COMPARISON
OF RECOMMENDED
SHADE TREE APPROPRIATIONS

	<u>SHADE TREE (1)</u> <u>ADVISORY COMMITTEE</u>	<u>(1)</u> <u>STATE DEPARTMENT</u>	<u>(2)</u> <u>COMMITTEE BILL</u>
Sanitation Grants (D of A)	\$23,100,000	\$24,131,250 (4)	\$24,687,500
Reforestation Grants (D of A)	\$21,000,000 (3)	\$ 7,312,500	\$ 7,312,500
Utilization/Disposal Grants (D of A)	\$ 900,000	\$ 900,000	\$ 700,000
Public Information (D of A)	\$ 260,000	\$ 260,000	\$ 250,000
Experimental Programs (D of A)		\$ 337,100	\$ 337,100
Administration (D of A)	\$ 267,425	\$ 321,432	\$ 300,000
Research (U of M)	\$ 221,000	\$ 221,000	\$ 120,000
Education (U of M)	\$ 441,900	\$ 441,900	\$ 300,000
Disease Control/Replanting - State Lands (DNR)	\$ <u>1,200,000</u>	\$ <u>1,200,000</u>	\$ <u>1,000,000</u>
TOTALS	\$47,490,325	\$35,125,182	\$35,007,100
	(24 mo.)	(24 mo.)	(30 mo.)

- (1) Recommended appropriations cover a twenty-four (24) month period July 1, 1977, through June 30, 1979.
- (2) Appropriations cover a thirty (30) month period from January 1, 1977, through June 30, 1979.
- (3) This figure is based upon planting two (2) trees for every tree lost, both on public and private lands.
- (4) This figure is based upon tree loss figures which are substantially higher than those figures used by the State Shade Tree Advisory Committee.

COMMITTEE BILL APPROPRIATIONS

SANITATION GRANTS:

\$24,687,500

Grants will be made to municipalities for up to one-half (1/2) the cost of their sanitation program. Sanitation includes inspection, root graft control, removal and disposal on both public and private property.

390,000 trees x 125/tree = \$49,375,000

One-half (1/2) State share = \$24,687,500

REFORESTATION GRANTS:

\$ 7,312,500

Grants will be made to municipalities for up to one-half (1/2) the cost of planting trees on public property. No replanting grant shall exceed an amount equal to \$40 multiplied by the number of trees planted.

195,000 trees x \$75/tree = \$14,625,000

One-half (1/2) State share = \$17,312,500

UTILIZATION/DISPOSAL GRANTS:

\$ 700,000

Grants will be made to eligible municipalities for up to one-half (1/2) the cost of establishing woodwaste utilization/disposal facilities.

2 facilities (metro) @ \$500,000 \$1,000,000

10 facilities (outstate) @ \$40,000 \$ 400,000

TOTAL \$1,400,000

PUBLIC INFORMATION:

\$ 250,000

Public information funds will be used to inform municipal and county officials of the grant program and its procedures. The major portion of funds, however, will be committed to alerting the general public to the dangers of storing elm wood; the needs for prompt tree removal and proper disposal; and the need to cooperate with local authorities in identifying all diseased trees.

Production (Radio/TV public service announcements; brochures; billboards; busboards; newspaper ads; displays; slide shows; films). \$ 26,000

Media Time (Radio; TV; billboard; newspaper). \$214,000

Public Relations (Press conferences; news media features; special news events) \$ 10,000

TOTAL \$250,000

EXPERIMENTAL PROGRAMS:

\$ 337,000

There are many economic, political, and administrative realities within a community which bear heavily upon the successful implementation of new control technology. The experimental program will allow for comprehensive field testing of new technology and the evaluation of existing technology within the municipal control program setting. This type of applied experimentation will narrow the gap between basic control research and actual day-to-day implementation of the ideas and methods which result from research. It also will allow for intensive on-site cost studies to determine the cost effectiveness of various control measures, and thereby help reduce the overall cost of sanitation.

Evaluation of management strategies \$ 42,125

Evaluation of existing control measures \$ 126,375

Field testing of new technology \$ 168,500

TOTAL \$ 337,000

Staff of 12
for two years

ADMINISTRATION:

\$ 300,000

Salaries

1 Administrator ^{24 months}	\$ 42,789
1 Planning Grants "	\$ 33,838
1 Information Officer "	\$ 33,838
3 Clerical "	\$ <u>53,490</u>

House,

SUBTOTAL \$ 163,955

Non-Salary Support

Shade Tree Disease Laboratory	\$ 29,607
Program Evaluation	\$ 27,870
	\$ <u>78,568</u>

TOTAL \$ 300,000

RESEARCH:

\$ 120,000

Funds will be used to develop improved methods of control which will help people in Minnesota to slow the disease and save a portion of the elms. There is no reason to become enmeshed in a long-term research. It is believed the research must be concentrated in the areas of survey, sanitation, and disruption of common root systems. These efforts involve the Remote Sensing Laboratory, the Forest Products Department, the Department of Entomology, and the Department of Plant Pathology.

Oak wilt continues to cause extensive losses in Minnesota and, in some areas, is responsible for almost total destruction of oak forests. This disease can be controlled. The research effort needs to be directed toward better methods of survey, prevention of sporulation by the fungus, and primarily at disruption of common root systems. This program is mainly in the Department of Plant Pathology.

Salaries

Forest Pathologist	\$ 32,000
Forest Entomologist	\$ 32,000
Graduate Assistants	\$ 55,000
Undergraduate Assistants	\$ <u>15,000</u>

SUBTOTAL \$ 134,000

Non-Salary Support

Field Expense	\$ 44,000
Aerial Photography	\$ 10,000
Equipment and Supplies	\$ 26,000
Publication Costs	\$ <u>6,000</u>

SUBTOTAL \$ 86,000

TOTAL \$ 220,000

EDUCATION:

\$ 300,000

Dutch elm disease curtailment and shade tree management is biologic in its subject matter. The decisions to be made for effective private and community shade tree programs are, however, made by people who have varying levels of understanding and attitudes toward the problem.

An effective Dutch elm disease curtailment program will depend on a sound understanding of all aspects of the disease and intelligent application of curtailment and management measures. As a community program evolves, the citizens of Minnesota, their elected officials, their public agency representatives, and private firms need current research and technical information as well as assistance in organizing for an effective program.

Existing University of Minnesota resources in staff time and support materials do not permit mounting a comprehensive educational, informational, and training effort commensurate with present and emerging Dutch elm disease and shade tree management program needs.

Professional Staff	\$ 180,000
Plant Pathology	
Horticulture	
Entomology	
Ag Information	
Project Assistants	\$ 40,000
Plant Pathology	
Horticulture	
Forestry and Products	
Printing	\$ 60,000
TV, film cassettes, equipment	\$ <u>20,000</u>
	TOTAL \$ 300,000

CONTROL ON STATE-OWNED LANDS:

\$1,000,000

The Department of Natural Resources is responsible for managing large areas of state land which lie adjacent or within municipal control areas. Funds provided by this provision would be used to implement a disease control program on state lands which have the potential of adversely effecting local programs.

Buffer Zones	\$ 294,280
State lands within municipalities	\$ 316,800
DNR public use areas	\$ <u>388,920</u>
	TOTAL \$1,000,000

OTHER RELATED SHADE TREE APPROPRIATIONSDEPARTMENT OF AGRICULTURE:

The Department's regulatory activities are funded through the on-going Municipal Pest Control Program. The Department's budget request for this program for the 1978-79 biennium was \$268,157. The majority of these funds will be spent on activities relating to the regulation of local shade tree disease control programs.

UNIVERSITY OF MINNESOTA:

The University of Minnesota, through the Agricultural Experiment Station, has requested \$50,000 for each year of the biennium for a total of \$100,000. Considering the magnitude of the research responsibilities for Dutch elm disease and oak wilt, the four departments at the University concerned with this program will need this \$100,000 plus the \$120,000 for the Committee Bill.

COORDINATION BETWEEN STATE DEPARTMENTS

RESEARCH AND EXPERIMENTAL PROGRAMS:

The Department of Plant Pathology and other departments in the Agricultural Experiment Station will cooperate with the State Department of Agriculture in planning the experimental programs, in the monitoring of these programs in the field, and in the evaluation of the data obtained.

EDUCATION AND PUBLIC INFORMATION:

The public information program to be administered by the Department of Agriculture is a promotional effort to make the general public aware of the problems of shade tree disease. Its effect will be to create a greater demand for educational programs.

The education effort to be conducted by the University of Minnesota Extension is a technical education program aimed at local program managers and personnel. It will also meet the increasing demands for materials relating to the biological and other more technical aspects of shade tree disease control.

Revisor's No. _____

Change in Costs*

S.F. No. 32

Source of Funding	1977	1978	1979
General Fund		27,065,594 (Biennium) ¹	
Less amount agency can absorb within existing funding		1,869,432 (Biennium)	
TOTAL		25,196,162	

If any portion absorbed indicate activity(s) affected _____

Change in Income*

Increase/(Decrease)	1977	1978	1979
From which Fund:	_____		

Additional Personnel Required: Type; and Estimated Annual Cost:

1 Planning Grants Analyst	\$16,919
1 Information Officer	16,919
2½ Clerical	22,280
	<u>\$56,118</u>

Purpose of New Program and Intended Impact on Clientele:

To expand the State's role in the areas of financing disease control programs; education of the general public; training local program personnel; research; and, regulation of local program performance.

Criteria for Evaluation of Program:

Number of tree losses from Dutch elm and oak wilt disease; the rate of loss should stabilize.

Statutory Provisions Affected: Minnesota Statutes 18.023

Long Range Financial and Program Implications:

(If Federal Funding is included, discuss probability of continued Federal support.)

By expanding its role in financing local control programs, the State encourages local government dependency on state resources for control effort. If the State in subsequent years decides to reduce its financial role, its decision will have serious implications for the quality of local programs ensuing.

Reviewed by Controller James Watson

Signature of Department Head John [Signature]

Date 2/7/77

*Attach a copy of the methodology and computations used to arrive at these numbers. ¹\$25,000,000 of this amount is proposed by the bill for expenditure between January 1, 1977 and June 30, 1978 (18 months). Other costs listed are for the 78/79 biennium (24 months).

A COMPARISON OF FUNDING

Budgeted FY 78/79 AND S.F. No. 32

<u>PROGRAM ACTIVITY</u>	<u>AGENCY REQUEST FY 78/79 (1)</u>	<u>S.F. No. 32 (2) ADVISORY COMMITTEE RECOMMENDATIONS (3)</u>	<u>DIFFERENCE</u>
Sanitation grants	\$800,000	\$20,000,000	\$19,200,000
Reforestation grants	- 0 -	<u>5,000,000</u>	5,000,000
Utilization grants	700,000	900,000	200,000
Public education	45,000	260,000	215,000
Experimental programs	- 0 -	338,000	338,000
Administration	50,000	293,162	243,162
Regulatory	<u>274,432 (4)</u>	<u>274,432 (4)</u>	<u>- 0 -</u>
TOTAL	\$1,869,432	\$27,065,594	\$25,196,162

- Figures for the activities, sanitation grants; utilization grants, public education; and administration are equal to the amount appropriated in FY 76/77. These figures were submitted as the Agency Request for FY 78/79. However, the Governor's Department budget recommendation is currently zero, pending consideration of shade tree legislation. Funding for the regulatory activity has been budgeted under the Municipal Pest Control Activity.
- Figures in this column above the dotted lines are set by S.F. No. 32 and cover only the period from January 1, 1977 to June 30, 1978 (18 months).
- Figures in this column below the dotted lines are recommendations of the Shade Tree Advisory Committee with the exception of the figure for experimental programs. The committee recommendations cover a period from July 1, 1977 to June 30, 1979 (24 months).
- The funding for regulatory activities will be absorbed by the Municipal Pest Control Activity.

CALCULATIONS FOR PROJECTED COSTS

BY PROGRAM ACTIVITY

Sanitation grants \$20,000,000

* This figure is provided by S.F. No. 32 and covers the period from January 1, 1977 to July, 1978. The figure represents grants for identification, removal, and disposal of diseased trees on both public and private lands. The present grant program provides for only removal and disposal of diseased trees on private property.

Reforestation grants \$ 5,000,000

* This figure is provided by S.F. No. 32 and covers the period from January 1, 1977 to July 1, 1978. The grants would constitute a new program beyond the present program effort.

Utilization grants \$ 900,000

* This figure was recommended by the Shade Tree Advisory Committee and covers the period from July 1, 1977 to June 30, 1979. The grants would be a continuation of the present program. The basis of the figure is as follows:

- 2 facilities (metro) @ \$600,000 = \$1,200,000
- 10 facilities (out-state)
 - @ \$60,000 = \$ 600,000
- TOTAL \$1,800,000
- State Share = $\frac{1}{2} \times \$1,800,000 = \$ 900,000$

Public Education \$ 260,000

* This figure was recommended by the Shade Tree Advisory Committee and covers the period from July 1, 1977 to June 30, 1979. The public education program would be a continuation of the existing program at an increased level of effort. The basis for the figure is as follows:

- Production \$100,000
 - television spots, radio spots;
 - billboards, busboards; pamphlets
- Media time \$140,000
 - outdoor advertising; newspaper advertising; television time; radio time
- Public relations \$ 20,000
 - production of press material; communications/maillings; organization of media events
- TOTAL \$260,000

Experimental Programs

\$338,000

* This figure was discussed initially by Senate Research staff in the drafting of S.F. No. 32.

Administration

\$293,162

* This figure is based upon the recommendation of the Shade Tree Advisory Committee and covers the period from July 1, 1977 to June 30, 1979. The Committee's figure has been adjusted upward to reflect certain personnel requirements. The basis for the figure is as follows:

• Salaries	
1 Administrator	\$42,789
1 Planning Grants Analyst	33,638
1 Information Officer	33,838
3 Clerical	<u>53,490</u>
	SUB TOTAL \$163,555
• Non-Salary Support	\$29,607
• Specialized Planning	<u>\$100,000</u>
	TOTAL \$293,162

In developing their recommendations, the Committee recognized a need for specialized planning to evaluate the effectiveness of state expenditures and to review the overall intergovernmental disease control management framework. Planning could be accomplished with either Department staff or could be contracted out.

Regulatory

\$274,432

* This figure was recommended by the Shade Tree Advisory Committee and covers the period from July 1, 1977 to June 30, 1979. Funding of the regulatory activity accomplished through the municipal pest activity. The basis of the figure is as follows:

Salaries (8 staff)	\$217,796
Non-Salary Support	<u>50,360</u>
	TOTAL \$268,156

* * * * *

NOTE: The provisions involving "research" and "training" do not directly impact upon the Department and have not been included in the fiscal analysis. However, the Shade Tree Advisory Committee's recommendations are worthy of note. The Committee recommends that the "research" and "training" responsibility be delegated to the University of Minnesota:

Research (Institute of Agriculture, Forestry and Home Economics)	\$221,000
Training (Continuing Education and Extension)	\$441,000

Introduced by Humphrey, Vega, Staples
January 13th, 1977

S.F. No. 32

A 13

Ref. to Com. on Agriculture & Natural Resources

Companion H.F. 215
Ref. to H. Com. on

Reproduced by PHILLIPS LEGISLATIVE SERVICE

1 A bill for an act

2 relating to shade tree disease control; providing
3 for municipal shade tree removal and reforestation
4 programs; providing an appropriation; amending
5 Minnesota Statutes 1976, Sections 18.023,
6 Subdivisions 1, 1a, 2, 3a, 4, 7 and 11, and adding
7 subdivisions; and 275.50, by adding a subdivision;
8 repealing Minnesota Statutes 1976, Section 18.023,
9 Subdivision 6.

10

11 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

12 Section 1, Minnesota Statutes 1976, Section 18.023,
13 Subdivision 1, is amended to read:

14 18.023 (SHADE TREE DISEASE CONTROL.) Subdivision 1.
15 (DEFINITIONS.) As used in subdivisions 1 to 12 the terms
16 defined in this subdivision shall have the meanings given
17 them.

18 (a) "Metropolitan area" means the area comprising the
19 counties of Hennepin, Ramsey, Anoka, Dakota, Washington,
20 Scott and Carver.

21 (b) "Commissioner" means the commissioner of
22 agriculture.

23 (c) "Municipality" means any city or any town
24 exercising municipal powers pursuant to section 368.01, or

1 any general or special law, located in the metropolitan area
2 or any special park district as organized under chapter 398,
3 or any special purpose park district organized under the
4 city charter of a city of the first class located in the
5 metropolitan area, or any county in the metropolitan area
6 for the purposes of county owned property or any portion of
7 a county located outside the geographic boundaries of a city
8 or town exercising municipal powers and any municipality or
9 county located outside the metropolitan area which makes
10 request to and has consent of the commissioner to come
11 within the provisions of this section.

12 (d) "Shade tree disease" means Dutch elm disease or oak
13 wilt disease.

14 (e) "Wood utilization or disposal system" means a
15 system used for the removal and disposal of diseased shade
16 trees which includes the collection, transportation,
17 processing or storage of wood and which aids in the recovery
18 of materials or energy from wood.

19 ~~(f) "Subsidy program" means a municipal program of~~
20 ~~financial assistance to private property owners for the~~
21 ~~removal of diseased elm and/or oak shade trees.~~

22 ~~(f)~~ (f) "Disease control program" means the municipal
23 plan as approved by the commissioner to control shade tree
24 disease.

25 ~~(g)~~ (g) "Disease control area" means an area approved
26 by the commissioner within which a municipality will conduct
27 a shade tree disease control program.

28 (h) "Sanftation" means the identification, removal and
29 disposal of diseased elm or oak shade trees from public or
30 private property within a disease control area, including
31 trees removed under a municipal program of financial
32 assistance to owners of private residential property

1 pursuant to subdivision 4,

2 (1) "Reforestation" means the replacement of shade
3 trees removed from public property as part of a disease
4 control program.

5 Sec. 2. Minnesota Statutes 1976, Section 18.023,
6 Subdivision 1a, is amended to read:

7 Subd. 1a. [METROPOLITAN SHADE TREE DISEASE CONTROL
8 PROGRAM; PURPOSE.] The legislature finds that an epidemic of
9 Dutch elm disease and oak wilt disease is occurring in
10 Minnesota which threatens the natural environment,
11 Immediate action is therefore necessary to provide funds to
12 assist local units of government in the implementation of
13 shade tree disease control programs by conducting sanitation
14 and reforestation programs, expanding diseased wood
15 destruction programs, increasing public awareness of shade
16 tree disease, accelerating training of tree inspectors and
17 research for disease prevention and subsidizing private
18 property owners for the removal of diseased elm and oak
19 trees,

20 Sec. 3. Minnesota Statutes 1976, Section 18.023,
21 Subdivision 2, is amended to read:

22 Subd. 2. [COMMISSIONER TO ADOPT RULES.] The
23 commissioner shall adopt and from time to time may amend,
24 rules and regulations relating to shade tree disease control
25 in the metropolitan area in accordance with sections 15.0411
26 to 15.0422. Such rules and regulations shall prescribe
27 control measures to be used to prevent the spread of shade
28 tree diseases and shall include the following: (a) A
29 definition of shade tree, (b) qualifications for tree
30 inspectors, (c) methods of identifying diseased shade trees,
31 (d) procedures for giving reasonable notice of inspection of
32 private real property, (e) measures for the ~~treatment of~~

1 removal of any shade tree which may contribute to the spread
2 of shade tree disease and for reforestation of disease
3 control areas, (f) approved methods of treatment of shade
4 trees, and (g) such other matters as shall be determined to
5 be necessary by the commissioner to prevent the spread of
6 shade tree disease and enforce the provisions of this
7 section. In accordance with the rules and regulations
8 adopted by the commissioner, and reasonable notice of
9 inspection having been given to the owner of the real
10 property, diseased shade trees shall be removed ~~or treated~~
11 by the owner of the real property on which such diseased
12 shade trees are located within a period of time as may be
13 established by the commissioner. In the case of the expense
14 of removing ~~or treating~~ diseased shade trees located on
15 street terraces or boulevards, not more than 50 percent of
16 such expense may be assessed to the abutting properties by
17 the municipality which expense shall become a lien on the
18 property. Trees which are not removed ~~or treated~~ shall be
19 declared a public nuisance and removed by the municipality
20 which may assess the total expense or any part thereof to
21 the property which expense shall become a lien on the
22 property.

23 Sec. 4. Minnesota Statutes 1976, Section 18.023,
24 Subdivision 3a, is amended to read:

25 Subd. 3a. [GRANTS TO MUNICIPALITIES.] (a) The
26 commissioner may, in the name of the state and within the
27 limit of appropriations provided, make grants-in-aid to a
28 municipality with an approved shade tree disease control
29 program for the partial funding of municipal ~~subsidy~~
30 ~~programs for the removal of diseased shade trees by owners~~
31 ~~of residential property pursuant to subdivision 4~~
32 sanitation and reforestation programs. The commissioner

1 may make grants-in-aid to any city of more than 80,000
 2 population or any special purpose park district organized
 3 under the charter of a city of the first class or any
 4 non-profit corporation serving a city of the first class or
 5 any county having a disease control program approved by the
 6 commissioner for the acquisition of wood utilization or
 7 disposal facilities or equipment or the implementation of
 8 wood utilization or disposal systems.

9 (b) The commissioner shall promulgate rules for the
 10 administration of grants authorized by this subdivision.

11 The rules shall establish and contain as a minimum:

12 (1) Procedures for grant applications;

13 (2) Conditions and procedures for the administration of
 14 grants;

15 (3) Criteria of eligibility for grants including, but
 16 not limited to, those specified in this subdivision; and

17 (4) Such other matters as the commissioner may find
 18 necessary to the proper administration of the grant program.

19 (c) Grants-in-aid payments for wood utilization and
 20 disposal facilities, equipment and systems ~~and grants for~~
 21 ~~public subsidy programs~~ made by the commissioner pursuant to
 22 this subdivision shall not exceed 50 percent of the total
 23 cost of the facility equipment or system ~~or municipal~~
 24 ~~subsidy program~~ or both. Grants to municipalities for
 25 sanitation shall not exceed 50 percent of the cost for each
 26 tree up to \$65 per tree. Grants to municipalities for
 27 reforestation shall not exceed 50 percent of the cost for
 28 each tree up to \$50 per tree and shall be limited for any
 29 municipality in any year to grants for not more than one
 30 half the number of trees removed in the sanitation program
 31 in the previous year.

32 (d) Based upon estimates submitted by the municipality

1 to the commissioner, which shall state the estimated number
2 of trees to be removed or reforested in the succeeding
3 quarter under an approved program, the commissioner shall
4 direct quarterly advance payments to be made by the state to
5 the municipality commencing March 1, 1977. The commissioner
6 shall direct adjustment of any overestimate in a succeeding
7 quarter.

8 (e) The commission shall give priority to programs for
9 sanitation and reforestation of trees located on street
10 terraces or boulevards in making grants of the funds
11 appropriated to implement this subdivision.

12 (f) A municipality or county which has received the
13 consent of the commissioner to come within the provisions of
14 Laws 1975, Chapter 253 may receive grants authorized by this
15 subdivision, and may submit an application for a grant
16 concurrently with its request for inclusion.

17 Sec. 5. Minnesota Statutes 1976, Section 18.023,
18 Subdivision 4, is amended to read:

19 Subd. 4. (SUBSIDIES TO PRIVATE PROPERTY OWNERS.) ~~(e)~~ A
20 municipality may provide subsidies to owners of private
21 residential property owners for the ~~treatment or~~ removal of
22 ~~diseased shade trees provided, however, that the cost to the~~
23 ~~municipality for providing such subsidies shall be within~~
24 ~~the limitations set forth in sections 275.50 to 275.56 .~~

25 ~~(e)~~ Notwithstanding any law to the contrary, an owner
26 of property on which shade trees are located may contract
27 with a municipality to provide protection against the cost
28 ~~of treatment or~~ removal of diseased shade trees or shade
29 trees that will contribute to the spread of shade tree
30 diseases. Under such contracts, the municipality shall pay
31 for the ~~removal or treatment~~ under such terms and conditions
32 as may be determined by the governing body of the

1 municipality.

2 Sec. 6, Minnesota Statutes 1976, Section 18.023,
3 Subdivision 7, is amended to read:

4 Subd. 7. [FINANCING.] (a) A municipality may collect
5 the amount assessed against the property under subdivision 4
6 as a special assessment and may issue obligations as
7 provided in section 429.101, subdivision 1, provided that a
8 municipality as its option make any assessment levied
9 payable with interest in installments not to exceed five
10 years from the date of the assessment.

11 (b) After a contract for the removal or treatment of
12 trees on private property has been let, or the work
13 commenced, the municipality may issue obligations to defray
14 the expense of any such work financed by special assessments
15 imposed upon private property. Section 429.091 shall apply
16 to such obligations with the following modifications:

17 (1) Such obligations shall be payable not more than
18 five years from the date of issuance; and

19 (2) No election shall be required.

20 Obligations issued under the provisions of this clause
21 shall not be considered bonded indebtedness for the purposes
22 of section 273.13, subdivisions 6 and 7. The certificates
23 shall not be included in the net debt of the issuing
24 municipality.

25 Sec. 7, Minnesota Statutes 1976, Section 18.023, is
26 amended by adding a subdivision to read:

27 Subd. 7a. The sanitation and reforestation of shade
28 trees on public property under disease control programs
29 approved by the commissioner shall be a permissible purpose
30 for the issuance of bonds under chapter 475 and shall be
31 outside the net debt limitation of section 475.53. Bonds
32 issued to match grants from the state under subdivision 3a

1 may be issued without an election.

2 Sec. 8, Minnesota Statutes 1976, Section 18.023, is
3 amended by adding a subdivision to read:

4 Subd. 10a. The commissioner may establish experimental
5 programs for sanitation, reforestation, or treatment of
6 shade tree diseases. The commissioner may make grants to
7 municipalities, or enter into contracts with municipal,
8 state or federal agencies in connection with experimental
9 shade tree programs.

10 Sec. 9, Minnesota Statutes 1976, Section 18.023,
11 Subdivision 11, is amended to read:

12 Subd. 11. [REPORT TO THE LEGISLATURE.] On or before
13 ~~January 31~~ November 15 of each ~~succeeding~~ year, the
14 commissioner shall report to the legislature on the
15 preceding year's plans and control programs which have been
16 implemented for shade tree ~~diseases in the metropolitan area~~
17 disease control including any experimental programs carried
18 out pursuant to subdivision 10a .

19 Sec. 10, Minnesota Statutes 1976, Section 275.50, is
20 amended by adding a subdivision to read:

21 Subd. 6. The cost to a governmental unit of
22 implementing section 18.023, including sanitation for trees
23 on public or private property and reforestation of public
24 property, is a "special levy" and is not subject to tax levy
25 limitations including those contained in sections 275.50 to
26 275.56, commencing with the levy made in 1976, payable in
27 1977. A municipality may make a supplementary levy in 1977,
28 payable in 1978, for all costs of implementing section
29 18.023 incurred in calendar year 1977 for which a levy was
30 not made in 1976, payable in 1977. For the purpose of
31 calculating the tax levy limit base in section 275.51, there
32 shall be subtracted from a municipality's levy base an

1 amount equal to 112 percent of the amount expended in
 2 implementing section 18,023 in calendar year 1975 and
 3 included in the levy limit base of the municipality as a
 4 result of Laws 1975, Chapter 437.

5 Sec. 11. [APPROPRIATIONS.] Subdivision 1. There is
 6 appropriated from the general fund to the commissioner of
 7 agriculture the following amounts for the following
 8 purposes, for the period from January 1, 1977 to June 30,
 9 1978:

10 (a) For grants for sanitation programs
 11 pursuant to Minnesota Statutes, Section
 12 18,023, Subdivision 3a \$20,000,000

13 (b) For grants for reforestation programs
 14 pursuant to Minnesota Statutes, Section
 15 18,023, Subdivision 3a 5,000,000

16 (c) For grants-in-aid for wood utilization
 17 and disposal equipment and systems pursuant
 18 to Minnesota Statutes, Section 18,023,
 19 Subdivision 3a

20 (d) For public information

21 (e) For experimental programs pursuant
 22 to Minnesota Statutes, Section 18,023,
 23 Subdivision 10a

24 (f) For administration

25 (g) For regulation of local programs

26 Subd. 2. There is appropriated from the general fund
 27 to the university of Minnesota the following amounts for the
 28 following purposes, for the period from January 1, 1977 to
 29 June 30, 1978:

30 (a) For research by the agricultural
 31 experimental station, pursuant to
 32 Minnesota Statutes, Section 18,023,

MINNESOTA DEPARTMENT OF AGRICULTURE
History
LAC Requests

<u>Submitted Date</u>	<u>Hearing Date</u>	<u>Request</u>	<u>Amount</u>	<u>Personnel</u>	<u>Action</u>
04-30-76	05-27-76	Hearing Examiners costs	\$ 23,496	-0-	Approved \$18,000
08-26-76	10-24-76	Shipping Point Inspections	53,221	.15	Approved \$47,500
01-20-77	03-15-77	Governor's Elm Clean Up Program	65,297	5.0	Instructed to handle through legis.
02-18-77	03-15-77	Grain Standards Act of 1976	241,000	-0-	Instructed to handle through legis.
05-25-77	06-30-77	Promotion Councils	78,000	3.0	Approved \$50,000 and 2.0 positions
06-13-77	06-30-77	Shade Tree, Weather Mod & Water Pos.	-0-	10.5	Approved 10.5 positions
04-28-78	05-25-78	ARFA positions	-0-	2.0	Approved 2.0 positions
04-28-78	05-25-78	CETA positions	166,206	24.0	Terry Montgomery vetoed
05-17-78	05-25-78	Food & Nutrition Conference	17,850	2.0	Terry Montgomery vetoed
06-11-79	06-28-79	MN Agric. Exper. Stat. Annual Trans.	70,000	-0-	Approved \$35,000
06-13-79	06-28-79	Rural Crime Prevention Project	22,568	-0-	Removed from agenda
06-13-79	06-28-79	Crop and Livestock Postage - Federal	16,000	-0-	Removed from agenda
06-13-79	06-28-79	Shade Tree-DNR sub-grant	36,000	1.0	Approved \$18,000 and 1.0 position
06-13-79	06-22-79	Pesticide Enforcement-Federal	988,842	12.5	Approved \$988,842 and 12.5 positions
06-13-79	06-28-79	Gypsy Moth-Federal	24,000	6.0	Approved \$24,000 and 6.0 positions
06-13-79	06-28-79	Pesticide 77 & Pesticide 78	10,000	-0-	Approved \$10,000
11-28-79	12-19-79	Grain Inspection Division	1,100,000	-0-	Approved \$1,100,000
11-28-79	12-19-79	Grade A Inspection	-0-	1.0	Approved 1.0 position
11-28-79	12-19-79	Canning Inspection	-0-	.4	Approved .4 position
11-28-79	12-19-79	Pesticide Enforcement	34,342	1.5	Approved \$34,342 and 1.5 positions
11-28-79	12-19-79	Commodity Promotion Councils	23,369	1.0	Not on Agenda
11-28-79	12-19-79	Family Farm Administration	-0-	1.0	Not on Agenda
03-13-80	05-28-80	Livestock Compensation	5,000	-0-	Not on Agenda
03-13-80	05-28-80	Grain Inspection	906,000	-0-	Approved \$906,000
03-13-80	05-28-80	Annual transfer to Agric Exper Stat	35,000	-0-	Approved \$35,000
03-13-80	05-28-80	Grain and General Storage Warehouse	18,000	-0-	Not on Agenda
03-25-80	05-28-80	Gypsy Moth-Federal	26,000	6.0	Approved \$26,000 and 6.0 positions
04-14-80	05-28-80	USABE 81	35,000	-0-	Approved \$35,000

MINNESOTA DEPARTMENT OF FINANCE

*File
Legislative
Advisory
Committee*

LEGISLATIVE ADVISORY COMMITTEE REQUEST

Department or Agency Agriculture/Plant Industry Date 1/20/77

Amount Requested 65,297.00 Number of Personnel Requested Five

Description and Justification (attach additional sheets if necessary)

The requested funds are needed to support the transition of six staff members from the Governor's office to the Department of Agriculture. The staff involved were formerly part of the Governor's Elm Clean-Up Program. Staff is necessary to stage a major public education campaign in an attempt to curb the rapid spread of Dutch elm disease in our cities. Because of the unexpected and substantial rise in the loss of our cities residential elms, the 1977 control effort is more critical than ever. The public's educated support and cooperation is essential to maximizing the effectiveness of public expenditures by both local and state governments.

The staff will be utilized to increase the visibility of the problem and to educate and instruct citizens, community groups and public officials as to what can be done to postpone the devastation of our elm lined streets. Salaries and support funds are included in the request so the staff can take the campaign throughout the entire State; to small and large communities alike.

The objective is to alert the general public of the immediacy of the problem. The campaign will include a major attempt to solicit the active support of public interest groups, community groups, civic groups, schools, businesses and other organizations. The campaign will educate public officials to the availability of state and federal programs to assist local units of government in conducting disease control programs.

Public education funds appropriated in 1975 under the Shade Tree Disease Control Law (Minn. Stat. 18.023) have been exhausted. Expenditure of the funds early in the biennium was a tactical decision as well as dictated by demands from the general public for information on Dutch elm disease. Even though the 1975 funds have been expended, the need and demand for more public information continues with even greater intensity.

It is planned that Arbor Day will play a major part in the overall campaign. Arbor Day will be the kick-off to a continuous and enthusiastic effort by citizens all over the state and all levels of government to maintain the aesthetic integrity of Minnesota communities. Nature and its biology dictate that we act now, or it may be too late.

SHADE TREE DISEASE

LAC ESTIMATES

PERSONNEL - 5 unclassified positions

L. Pollari @ 1804 x 5 months	= \$ 9,020.00
W. Eisner @ 529 x 5 months	= 2,645.00
M. Davis @ 844 x 5 months	= 4,220.00
A. Meinke @ 987 x 5 months	= 4,935.00
M. Mjry @ 1289 x 5 months	= <u>6,445.00</u>

\$27,265.00

Fringe Benefits	<u>4,090.00</u>
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\$31,355.00

RENTS AND LEASES

State Office Building 250 Square Feet @ 2.90	302.00
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PRINTING AND BINDING

3,500.00

Target Groups:

- 1) General Public -
 - . general awareness materials (pamphlets, flyers, posters, etc.)
 - . instructive materials (pamphlets, flyers)
 - . materials for Arbor Day (flyers, posters, notices, letters, etc.)
- 2) Community Groups -
 - . instructive materials (brochures, flyers, letters, etc.)
- 3) Municipal Officials -
 - . instructive materials (notices, flyers, newsletters, etc.)
- 4) Tree Inspectors -
 - . instructive materials (notices, flyers, newsletters, etc.)
 - . technical materials (pamphlets, tests, etc.)

NON-STATE EMPLOYEE SERVICE

15,000.00

Outside contract for production of public education and information materials (art, design, set-up); Special public relations support (Arbor Day, press conferences, etc.); and Special meetings and luncheon for media;

COMMUNICATIONS

Postage - 10,000 pieces @ 13¢	1300.00
Telephone - two lines - 4 telephones installation charges	129.00
monthly charge 58.90 @ 5 months	294.00
WATS and toll charges	<u>375.00</u>

2,098.00

TRAVEL AND SUBSISTENCE - IN-STATE

Mileage - 4 employees	
- 240 person days @ 150 miles = 36,000 miles	
24,000 miles for State vehicles	2440.00
12,000 miles for private vehicles	1920.00
Lodging - 4 employees (2 nights) = 8 nights for 20 weeks = 160 nights	
160 nights @ \$20.00	3200.00
Meals - 4 employees (2 days @ 11.30 @ 20 weeks)	1808.00
(1 days of breakfast & lunch @ 5.25 @ 20 weeks)	<u>420.00</u>

9,788.00

SUPPLIES AND MATERIALS

Office Supplies	
Xeroxing	
Word Processing	2,000.00

CAPITAL EQUIPMENT

6 - executive chairs @ 87.00	=	522.00
3 - side chairs @ 36.00	=	108.00
2 - filing cabinets @ 112.00	=	224.00
2 - printing calculators @ 200.00	=	<u>400.00</u>

1,254.00

TOTAL REQUEST

\$65,297.00

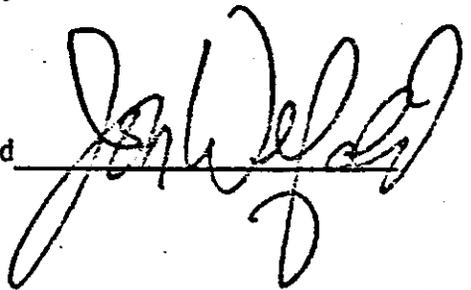
This appropriation request will be assigned to No. 30001:11-10

REQUESTS TO THE LEGISLATIVE ADVISORY COMMISSION (LAC)

I certify that the attached request for funds from the designated contingent account appropriation meets the following LAC guidelines:

1. This request describes an urgent situation for which there is no other remedy.
2. This is being submitted according to the time deadline provided.
3. This is a matter that has not previously been rejected by either the House Appropriations Committee or the Senate Finance Committee.

Date: June 8, 1977

Agency Head 

LEGISLATIVE ADVISORY COMMITTEE RECOMMENDATIONS

Concerning Legislative Advisory Committee Request by

Department or Agency AGRICULTURE Date June 13, 1977

Amount Requested -0- Number of Personnel Requested 10.5

1977 Legislation Complement

Controller's Recommendations

The request of the Department of Agriculture for 10.5 positions is recommended for approval by the LAC. During the biennial budget process, the complement established for the department in the Governor's Recommendation eliminated many positions which had been in the agency complement in the 1975 appropriation bill, i.e. 540 to 483. This reduction was almost entirely in positions which were less than full-time. Had this complement over-haul not been accomplished, the agency would have been able to use those extra positions. The requested positions should be approved only to the extent that they remain for the duration of the specific project or June 30, 1979 whichever comes first. The positions by project or activity are the following:

Shade Tree Control Program-

The appropriation accompanying Chapter 90, Laws of 1977 provided funds to finance 6 positions---Director, Grants Analyst, Information Officer, and 3 clerical. Any positions which existed in the 1975-1977 biennium and financed by the original Shade Tree Control Program were eliminated from the agency budget for the 1977-1979 biennium. This authorization should extend through December 31, 1978.

Weather Modification Program-

Laws of Minnesota 1977, Chapter 426 provides appropriation for 1.5 positions commencing January 1, 1978 for the balance of the biennium. The positions---director and part-time stenographer--- were not contained in the bill.

Framework Water and Related Land Resources Plan(LCMR)-

The Natural Resources Acceleration section of the State Departments Appropriation bill provided appropriation to the department to finance 3 positions which were not included in the department complement.

Controller

SUMMARY:

Shade Tree Disease Control	6.0 positions	18 months thru 12-31-78
Weather Modification	1.5 positions	18 months beginning 1-1-78
Water Resources Plan	3.0 positions	/biennium, or until funds/ project ends.
	<u>10.5 positions</u>	

Dept. of Finance
FIN 1937

[Handwritten signature]

L. 77 Ch. 452
S 33. Sub. 2

MINNESOTA DEPARTMENT OF FINANCE

LEGISLATIVE ADVISORY COMMISSION REQUEST

Department or Agency Agriculture Date June 8, 1977

Amount Requested -0- Number of Personnel Requested 10½

TITLE: Complement Changes to Reflect Recent Legislation

Description and Justification (attach additional sheets if necessary)

A request for an increase of ten and one-half positions in the Department of Agriculture is necessary because budget allocations of the 1977 legislature were not accompanied by complement authorizations for the Shade Tree Control Program, the weather modification regulation program, or for the Department's involvement in the framework water and related land resources planning project funded by the Legislative Commission on Minnesota Resources. No additional funds are required. The request results from an oversight during the legislative process.

Minnesota Laws 1977, Chapter 90 appropriates funds for the Shade Tree Control Program. Funds for six positions were included in the appropriation. The funds were for three clerical positions, a planning grants analyst, an information officer, and a program administrator. Due to an oversight, the Department did not receive an increase in its authorized complement to accommodate the staff for whom funds were appropriated. Therefore, an increase in complement is requested.

Minnesota Laws 1977, Chapter 426 appropriates funds to the Commissioner of Agriculture to administer a program regulating persons involved in weather modification activities. Included in the appropriation is money for a program administrator and a half-time clerical. Due to an oversight, the Department did not receive an increase in its authorized complement to accommodate these persons for whom funds were appropriated.

The state departments appropriation bill includes an appropriation in the natural resources acceleration section for the Department of Agriculture to carry out Phase II of the framework water and related land resources plan. As approved by the Legislative Commission on Minnesota Resources, the funds included amounts for three staff positions---a research analyst I, a research analyst II, and a clerk typist. Two of these positions are existing staff. Due to an oversight, the Department did not receive an increase in its authorized complement which would allow the Department to retain present personnel working on Phase I of the project and an additional staff person for Phase II for whom funds were appropriated.

In summary, the Department of Agriculture requests that ten and one-half budgetary authorized positions be added to the Department's complement for the biennium ending June 30, 1979. These ten and one-half positions will terminate with the expiration of the appropriated funds.

MINNESOTA DEPARTMENT OF FINANCE

LEGISLATIVE ADVISORY COMMITTEE REQUEST

Department or Agency Agriculture Date April 28, 1978

Amount Requested None Number of Personnel Requested 2

Approved Temporary positions 5/25/78

Description and Justification (attach additional sheets if necessary)

The Department of Agriculture respectfully requests budgetary authorization for 2 positions for the period June 1, 1978 through June 30, 1979. Sufficient funds are available from the Shade Tree Program Administration and Public Information budgets to fund these 2 positions. These positions would be utilized to carry out the functions currently funded through Federal Anti-Recessional Fiscal Assistance budgetary authorized positions for which funding expires on about May 30, 1978.

One position would be used to staff the Program's truck-drawn Mobile Education Trailer. This trailer is a primary vehicle for the dissemination of information to the public about shade tree diseases and reforestation in Minnesota. The trailer contains mini-slide shows and graphic displays about oak wilt and Dutch elm disease - how and where the diseases spread, how to slow the spread and what to plant in place of diseased elms and oaks. Thousands of individuals have gone through the trailer since August 1977. It is essential to the effectiveness of this Program's public information campaign that the trailer be kept on the road and made available to as many groups, schools and organizations as possible. The staff person in charge not only drives and schedules the trailer, but also provides technical information about the Program, tree diseases and reforestation. Funding for this position is available from the Public Information budget.

The second position would be used to continue and expand Minnesota Arbor Celebration '78 and to coordinate the campaign for 1979. A concerted effort must be made to remind and educate Minnesotans about the importance of shade trees. To do so effectively on a statewide basis requires the full-time attention of at least one person. The devastation caused by Dutch elm disease and oak wilt has lent a special urgency to reforesting Minnesota. Serious replanting efforts must be made now and for the next several years if the effects of these diseases are to be mitigated. Funding for this position is available from the Shade Tree Program Administration budget.

DEPARTMENT Finance

Office Memorandum

TO : Joseph G. Komro, Jr., Director
Accounting Division

DATE: April 19, 1978

FROM : Richard G. Krueger, Controller

PHONE: 6-1583

SUBJECT: Request For Budgetary Authorized Positions-Shade Tree Program

I believe the only alternative we have with this proposal is to go back to the LAC for proper authorization.

All of the positions supporting the Shade Tree Program (Shade Tree Administration account and ARFA) as you know are LAC approved. Any transferring of these positions between accounts (appropriations) at this time should be reviewed and approved by the LAC.

The next LAC meeting is Thursday, May 25th. Requests should be submitted to the Department of Finance no later than April 28, 1978.

RGK:dw

Legislative Advisory Committee
Minnesota Department of Agriculture
April 28, 1978
Page Two

Approval for these positions by the Legislative Advisory
Committee is respectfully requested.

Date: April 28, 1978

A handwritten signature in cursive script, reading "Bill Walker", written in dark ink. The signature is fluid and extends across the width of the printed name below it.

Bill Walker, Commissioner
MINNESOTA DEPARTMENT OF AGRICULTURE

of Agriculture

Richard Krueger
Agency Controller

April 17, 1978

Joseph G. Komro, Jr., Director
Accounting Division

6-6187

Request for Budgetary Authorized Positions

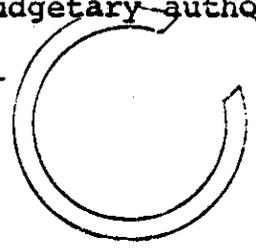
As you are aware ARFA funding being utilized for additional positions in the Shade Tree Program will expire in May.

It is the Commission's desire to continue the employment of two of these positions by using the Shade Tree Administration account or the Shade Tree Public Information account.

One position will be utilized to continue the present program of delivering and setting up the Shade Tree Program Exhibit Trailer as scheduled throughout the state. The other position to be retained would encompass the department's interest in the involvement of ARBOR Month activities and the replanting of trees. The best period for replanting in Minnesota is in the spring and fall. Both of these areas relate directly to the Public Information function for which funds were appropriated. Sufficient positions are not authorized presently to carry out both the information and localized coordination of the Shade Tree Program. This is why the department utilized both CETA and ARFA funding.

Please advise me of your decision and what additional information is necessary to move two of the ARFA positions to budgetary authorized under the Shade Tree Program.

JK:rl



MINNESOTA DEPARTMENT OF FINANCE

1000
Municipalities
Vet

LEGISLATIVE ADVISORY COMMITTEE REQUEST

check 55

Department or Agency Agriculture Date April 28, 1978

Amount Requested \$166,206 Number of Personnel Requested _____
18 for May 31, 1978-September 30, 1978
6 for October 1, 1978 - June 30, 1979

Description and Justification (attach additional sheets if necessary)

The Department of Agriculture respectfully requests funding and authorization for 1) 16 field representatives and 2 supervisors for the period May 31, 1978 through September 30, 1978, and 2) 5 field representatives and 1 supervisor for the period October 1, 1978 through June 30, 1979. The total amount of the request is \$166,206.

The Department has employed field representatives since June 1977 to assist municipalities and the Shade Tree Program in the implementation of the Shade Tree Law passed that year. Their efforts contributed significantly to the participation of over 500 municipalities in shade tree disease control and reforestation programs. Initially, 34 field representatives were employed for this purpose and were funded by CETA Title VI. As these cities have become more familiar with and proficient with the program, the Department has gradually reduced the number of field staff employed. In December, only 24 field representatives were retained when additional funding was obtained through Federal Anti-Recessional Fiscal Assistance Funds. This funding terminates May 30, 1978.

However, the need for such field staff continues in many parts of the state and in a number of municipalities. The personnel complement funded by the Shade Tree Law of 1977 is not sufficient to provide the level of assistance required. The period June through September is most critical for participating municipalities. During this time inspections must be completed and trees marked, removed, and disposed of in accordance with the Department's rules and regulations. The 3 regulatory persons in the Shade Tree Program office cannot provide assistance to all 500 municipalities during this period. The requested 16 field representatives and 2 supervisors would serve as an extension of that staff, regulating and monitoring these municipal programs. In addition, many of these field representatives would be able to continue to serve as tree inspectors for these municipalities.

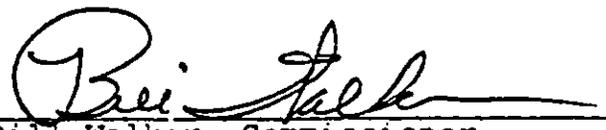
Legislative Advisory Committee Request
Minnesota Department of Agriculture
April 28, 1978
Page Two

After September, the need for such assistance will be substantially reduced. Most municipalities will have essentially completed their inspections and tree removal by that time. The remaining five representatives and one supervisor would assist those communities that have not yet completed their programs for the year. These six employees would then concentrate their efforts on certifying additional municipal tree inspectors, organizing public information meetings, and helping cities gear up for programs in 1979.

Because financial assistance from the state is not assured for municipal shade tree activities in 1979, many cities might be inclined to adopt a wait-and-see attitude before implementing such programs. The Department must do whatever is necessary to prevent this from happening. To successfully control the spread of shade tree diseases, cities must be convinced to conduct effective and aggressive programs for years to come.

Approval of this request is respectfully requested of the Legislative Advisory Committee.

Date: April 28, 1978



Bill Walker, Commissioner
MINNESOTA DEPARTMENT OF AGRICULTURE

LAC REQUEST FOR PERIOD:

May 31, 1978 thru Sept. 30, 1978

	<u>Supervisors (2)</u>	<u>Field Representatives (16)</u>	<u>Total</u>
Salary/Fringe	\$11,700	\$64,192	\$75,892
Travel In-State	1,024	12,288	13,312
Communications	<u>400</u>	<u>3,712</u>	<u>4,112</u>
TOTAL	\$13,124	\$80,192	\$93,316

Oct. 1, 1978 thru June 30, 1979

	<u>Supervisors (1)</u>	<u>Field Representatives (5)</u>	<u>Total</u>
Salary/Fringe	\$12,350	\$44,025	\$56,375
Travel In State	1,440	11,250	12,690
Communications	<u>450</u>	<u>3,375</u>	<u>3,825</u>
TOTAL	\$14,240	\$58,650	\$72,890

TOTAL LAC Request
May 31, 1978 thru June 30, 1979:

Salary/Fringe	\$132,267
Travel In State	26,002
Communications	<u>7,937</u>
TOTAL Request	\$166,206

GUIDELINES FOR SUBMISSION OF REQUESTS TO THE LEGISLATIVE ADVISORY COMMISSION (LAC)

- 1) Contingent appropriation funds and transfers requiring LAC approval should be requested only for matters of an urgent nature and only after the requesting department has exhausted all other possible remedies. An example of an exception is the Criminal Justice Contingent account, which was designed for a different purpose.
- 2) Normally, LAC meetings will be scheduled six weeks in advance and department heads given two weeks for preparation of their requests. All requests must be submitted to the Secretary four weeks before the proposed meeting unless a different time period is specifically established. Submit 10 copies of each request to the Commissioner of Finance. Any requests that are not in by the deadline will not be considered.
- 3) Matters that have previously been considered by the Legislature are discouraged from being presented to the LAC and matters that have been previously considered by either the House Appropriations Committee or the Senate Finance Committee, but rejected by one of the Committees, will not be considered for action by LAC.
- 4) The final LAC agenda must be provided to the Governor and the LAC members seven days prior to the meeting date. No matter will be considered that is not included on the agenda.
- 5) The LAC charges the Secretary (Commissioner of Finance) with the responsibility for carefully reviewing requests and rejecting those that do not meet the guidelines established by the LAC. Rejected requests will not be included on the agenda for consideration at the LAC meeting.
- 6) Any matter that is tabled or for which consideration is postponed until a subsequent meeting must be formally resubmitted to be considered.

ITEMS TO BE INCLUDED IN DETAILED DESCRIPTION AND JUSTIFICATION

All Information Must Be Included In The Order That Follows)

- 1) **NATURE OF THE EMERGENCY/PROBLEM:** This item should include a clear and concise explanation of the problem or emergency, whether it is temporary or long term (if it is long term, the estimated cost for the next two years), how it came about, why it could not be anticipated.
- 2) **ALTERNATIVES CONSIDERED:** This item should include a clear and concise statement of what alternative funding sources have been explored.
- 3) **DETAILED JUSTIFICATION:** This item should include: (a) summary of request by two (2) digit object of expenditure category, (b) narrative justification and methodology used in arriving at requested amount, (c) specific justification and workload indicators for any additional positions.

MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

CENTENNIAL OFFICE BUILDING • ST. PAUL, MINNESOTA • 55155
File No. 6500-2-5

DNR INFORMATION
(612) 296-6157

January 26, 1979

Ms. Jane Meyer, Administrator
Minnesota Shade Tree Program
Department of Agriculture
600 Bremer Building
St. Paul, Minnesota 55101

Dear Jane:

The United States Forest Service has confirmed that funds totalling approximately \$768,000 have been appropriated to Minnesota in order that its federal Dutch Elm Disease Demonstration Project can continue into and through 1979. The Department of Natural Resources will again be responsible for the distribution of the appropriation. In 1979, for its participation in this project, the Department of Agriculture will receive \$18,000. This sum was budgeted so as to include \$15,000 in salary and \$3,000 in travelling expenses for Roger Rutt.

Due to the time element required to process the federal forms which will make the appropriation "free" for the program's use, the money will not be available for at least another few months. Hopefully, the Department of Agriculture will be able to carry Roger through this interim period. I will certainly contact you as soon as the funds are "freed" for the program's use.

Sincerely,

Meg Hanisch

Meg Hanisch
Dutch Elm Disease Program Coordinator
Division of Forestry

MAH:am

xerox copy: Harold Frank, Personnel
Department of Agriculture

RECEIVED

JAN 26 1979

AGRICULTURE-ACCOUNTING

<u>FTE Position</u>	<u>Salary</u>	<u>Fringe</u>	<u>Annual Costs</u>
1.0 Plant Health Specialist	\$12,612	\$ 2,388	\$15,000
Travel In-State to 6 Minnesota municipalities (Hutchinson, Litchfield, Granite Falls, Little Falls, Fergus Falls, and Wadena)			\$ 3,000

C) 1.0 FTE positions requested.

Provide monthly reports to Minnesota Department of Natural Resources on status of experimental programs. Assist and provide input to Minnesota Department of Natural Resources in compilation of yearly report on status/results of experimental programs. Assist cities and provide expertise where possible, ensuring compliance to Minnesota Department of Agriculture Shade Tree Program rules and regulations.



STATE OF
MINNESOTA

DEPARTMENT OF NATURAL RESOURCES

CENTENNIAL OFFICE BUILDING • ST. PAUL, MINNESOTA • 55155

1660

A 14

NOV 2 1977

October 31, 1977

DNR INFORMATION
(612) 296-6157

RECEIVED
MAR 15 1978
AGRICULTURE-ACCOUNTING

Kenneth Knauer, Staff Director
Forest Insect and Disease Management
U.S. Forest Service
State and Private Forestry
6816 Market Street
Upper Darby, Pa. 19082

Dear Ken:

Enclosed please find two proposals from the State of Minnesota for demonstration and utilization projects as related to Dutch elm disease control in this state.

The first is a project entitled, "Utilization of Elm Trees as Fuel Source." This is a large scale operation to convert fuel supply for the heating plant at the Stillwater State Prison, to an elm utilization system using wood from the Metropolitan Twin Cities area.

The conversion of the State Prison to a wood burning system would be a highly visible project which would be well accepted by the general public. The project could be completed in a relatively short period of time and the lack of sulphur emissions by burning wood has positive environmental effects.

The burning of wood at the prison is compatible with the state's 28 million dollar Dutch Elm Disease Program as stated in the enclosed letter, and the project is supported by the Governor's Manpower Office.

This proposed project consists of two options - A and B. Option "A" uses Agnew Environmental Products Company equipment to briquette wood for use in the prison boiler plant. This option would require \$732,305 of General Forestry Assistance (G.F.A.) funding - \$712,305 for equipment and \$20,000 for Extension Service public education component of project.

Option "A" would use approximately 40,000 tons of green chip per year to produce approximately 15,000 tons of dry briquettes. Possibly production in excess of prison requirements could be produced and the excess briquettes would be sold on the open market as fireplace logs.

Option "B" is a pelletizing plant which would be installed as a "turnkey operation" by a private company. The total cost of this plant is \$1,400,000 but the private company, Guaranteed Fuels, Inc. would contribute \$750,000 toward the cost of the plant which leaves \$650,000 of equipment and the \$20,000 extension component to be funded by G.F.A.

Option "B" is not fully developed at this time because the contact with Guaranteed Fuels was made within the last two weeks. Additional information concerning Option "B" is being collected at this time. The pelletized fuel is a more versatile and marketable product than the briquettes.

The Minnesota Corrections Department is arranging to conduct a test burn in late November of a railcar load of wood briquettes which were manufactured by the Agnew equipment. A test burn will also be conducted with the wood pellets. These tests are financed by the Corrections Department and are not included in the Project Proposal.

The second project is a cooperative proposal from the University of Minnesota Cooperative Extension Service, the Department of Agriculture-Shade Tree Disease Control Program and the Department of Natural Resources. This project is designed to show the best management programs for two situations. The first type is what we will call a simple situation. This municipality has an approximate population of 5-15,000 people. It covers an area of 1-2 square miles and elms make up 60-70% of the total tree population. The number of elms in the town is approximately 6-10,000. This town is well isolated from all other wild elm populations (5 miles). This town has approximately 1-3% of its elm trees diseased at the present time. This situation to be replicated three times.

The second site, a complex situation, consists of a municipality of 5-15,000 people covering an area of 1-2 square miles. The number of elms ranges from 5-15,000 and elms comprise at least 60-70% of the total tree population. This demonstration site has a wild elm population in and adjacent to the control area. One-5% of the elms are presently diseased.

Plans of work are outlined in general terms and would become more specific following selection of the cooperative municipalities. The state agency primarily responsible for the actual establishment and maintenance of the demonstration areas and the collecting of data from these demonstration areas is the Department of Natural Resources. Municipal officials in the selected demonstration sites will cooperate with the State Lead Agency in the establishment and operation of the demonstration site.

The Agricultural Extension Service will provide the training and educational programs as needed to support the demonstration sites.

The Department of Agriculture will cooperate with the Lead Agency and the municipalities through the State Grant-in-Aid Program and as needed, provide regulatory authority.

This type of demonstration program must be of a longer duration to allow for display of the impact of the effort. Five years would be the shortest period of time for measurement of this impact.

The attached budget shows a yearly expenditure of \$100,000 to the Extension Service for the public information and educational aspects of this program. Funding for the Department of Natural Resources for provision of overall coordination of the program is estimated to be \$101,500 for personnel and support. Funding for one position for the Department of Agriculture for the regulatory aspects of the programs are estimated to be \$14,500.

Additional sanitation funding for the project are estimated to be \$170,000.00 per year. This would include removal of wild elms, root graft work, additional surveys, etc.

The utilization aspects of this program are estimated to be \$130,000 for the first year and \$170,000, \$210,000, \$140,000 and \$140,000 respectively for the succeeding four years.

These funds are designed to fund a portable sawmill, chipper, and debarker for each of three sites in the first three years and the operation costs for all five years.

In addition, \$25,000 is added the first year for Extension Service to study and make final utilization proposals for the project.

Thus, the first year costs are estimated at \$541,000. Succeeding years are estimated at: \$556,000, \$595,000, \$526,000 and \$526,000.

We feel that the project outlines enclosed are viable and in light of the strength of commitment that the State of Minnesota has made to manage Dutch elm disease should be considered for funding.

If you need additional input, please feel free to call.

Sincerely,

Wayne Hanson acting for
James L. Brooks, Acting Director
Division of Forestry

JLB/es

Enclosures

cc: Donald M. Carlson
Ward C. Stienstra
J. B. Hanson
Jane Meyer
David French
Stan Wood

DEPARTMENT Agriculture - Shade Tree Program

Office Memorandum

TO : Darryl Anderson
Assistant Commissioner

DATE: July 15, 1977

FROM : Jane Meyer, Grants Analyst *jm*
Minnesota Shade Tree Program

*Shade Tree
Program
Summary
-1977*

PHONE: 296-8580

SUBJECT: Program Outline

The Minnesota Shade Tree Law provides 28.5 million dollars to be applied to shade tree disease control activities within the period January 1, 1977 to December 31, 1978. Of this total, \$27,525,000.00 has been appropriated to the Department of Agriculture for the following purposes:

- grants for sanitation programs \$21,650,000.00
- grants for reforestation programs \$ 4,400,000.00
- grants-in-aid for wood utilization and disposal systems \$ 550,000.00
- public information \$ 225,000.00
- experimental programs \$ 400,000.00
- administration \$ 300,000.00

One-half of this amount, \$13,762,500.00 is available for expenditure in the first calendar year, January 1, 1977 to December 31, 1977, with the remainder available for expenditure in the period January 1, 1978 to December 31, 1978. Two-thirds of the monies available for grants for sanitation and reforestation programs is to be applied to municipalities within the metropolitan area; the remaining one-third is to be applied to municipalities in the out-state areas.

The remaining \$975,000.00 was appropriated to the University of Minnesota and the Department of Natural Resources. The monies to the University of Minnesota are to be applied as follows:

- for research by the agricultural experimental station \$ 100,000.00
- for continuing education and training by the agricultural extension service \$ 250,000.00

The \$625,000.00 appropriated to the Department of Natural Resources is for expenses incurred in the sanitation of diseased trees on lands administered by the Department within 1,000 feet of any municipality with an approved disease control program and within camp sites, picnic areas, waysides and parking areas.

Sanitation and Reforestation Program

Any municipality or county is eligible to receive sanitation and reforestation grants upon completion of a program application. An approved disease control plan must be submitted with the application. According to the emergency rules of the Department, all applications must have been submitted to the Department by July 1, 1977. Applications submitted after that deadline may be considered and accepted if the governmental unit can show good cause for the delay.

After an application has been received and the control program approved, the governmental unit is sent an award letter indicating the percent of state reimbursement for total costs incurred by the governmental unit in conducting sanitation and reforestation activities. We had hoped to have those letters sent this week. However, the large number of applications has resulted in an extension of that deadline of several days.

To receive payments from the state for sanitation and reforestation costs, the governmental unit must submit request for payment forms to the Department within 15 days of the close of the preceding payment period. The payment periods are January 1 through March 31; April 1 through June 30; July 1 through September 30; and, October 1 through December 31 of each calendar year. For this period only, governmental units may submit requests for payments for costs incurred since January 1, 1977. We anticipate many governmental units will have difficulty completing these forms given the short lead time and the newness of the procedure. Therefore, we are allowing the deadline to slip by several days.

Conceivably, the first payments can be made within the next two weeks. The speed with which these requests are processed will depend greatly on the accuracy and adequacy of the information provided on the form. We anticipate that additional information will be required on a large number of these first request for payment forms.

All governmental units must reapply for participation in the state assistance program for calendar year 1978. Information to this effect will be released in late November.

Wood Waste Disposal and Utilization Program

The purpose of this program is to financially assist governmental units in the acquisition or implementation of wood utilization and disposal systems. This includes the collection, transportation, processing or storage of wood, as well as that which aids in the recovery of materials or energy from wood. The Department may make grants-in-aid payments to interested governmental units for 50 percent of the total cost of the system.

This aid may be made to a statutory city or combination of such cities in the metropolitan area with a total population exceeding 40,000. Similarly, grants-in-aid may be extended to a city or combination of cities in the out-state area with a total population exceeding 20,000. In addition, certain special purpose park and recreation boards, non-profit corporations and counties may receive assistance under this program.

To date, no activity has been undertaken in this regard. We have only recently closed the books on the old program. However, since most of the funds appropriated for this purpose in the old program were expended in the metropolitan area, we intend to concentrate our efforts in making the current funds available to eligible cities in the out-state area. There are no predetermined dollar limits on the cost of a system for which a city may receive financial assistance. Moreover, no time limits have been set for submitting requests for such assistance.

Experimental Funds Program

This is the first year funds have been appropriated for experimental programs. Any activity in the sanitation or replanting areas is eligible for funds through this program. The Department is requesting that all interested parties submit a complete description of the experimental program, including estimated budget costs. All cities and counties are eligible to participate. The University of Minnesota can also submit proposals to the state. Instead of submitting separate proposals, it is hoped the University will work with these governmental units in preparing and/or carrying-out experimental programs.

No deadline has been set for submitting experimental program proposals. Interested parties are encouraged to submit their proposals to our office by the end of July, but any proposals received later will be accepted. These proposals will be examined by a subcommittee of the Shade Tree Advisory Committee which will include Dr. French, representing the University of Minnesota and Meg Hanisch of our staff. This body will only make recommendations on the proposals; the final decision will rest with the state. Approval of the experimental proposals will be based primarily on the benefits to be derived from the program for all the cities and counties in the state. There have been no suggestions that a dollar limit be set on the proposed program budgets.

To date only a few definite proposals have been submitted. However, many inquiries about the program have been received. A letter explaining the type of information needed is being prepared for transmittal to all interested parties.

Public Information

For a public information program over the two year period January 1, 1977 through December 31, 1978 a total budget of \$225,000.00 is available. At the present time a two phase program is envisioned. Phase one calls for the immediate development and production of a pamphlet for distribution at local fairs and festivals, implementation of a mobile information unit which would travel to public gatherings, production of a film or video tape for use in schools and at community meetings, and design and utilization of a program logo.

Phase two will focus on obtaining exposure for the program through newspapers, television and radio and by involving the private sector. Media exposure will be supplemented by and coordinated with extensive community contact by the program staff. Greater utilization of the items produced during phase one will also be emphasized.

Estimated costs of phase one are as follows:

Media Consultants:	\$10,000 through January, 1978
Logo	: 300
Pamphlets	: 10,000 first run (August, 1977) subsequent printing not to exceed \$20,000 for 1977.
Film/Video Tape	: 45,000 through January, 1978
Mobile Unit	: 60,000 production costs 10,000 operating costs from September, 1977 through September, 1978
TOTAL	\$155,300

The estimated costs of phase two are less easily projected as a major thrust will be to solicit private sector involvement (monetary support, display space) and free media time and space. The following costs are anticipated:

Printed matter:	\$30,000
Posters, stickers, buttons if necessary:	\$ 5,000
Possible educational TV documentary:	\$ 5,000

If these anticipated expenditures are actually made, a balance of \$30,000 would remain for costs which are not readily apparent at this time.

On July 8, 1977 requests for proposals were sent to all parties who had expressed an interest in contracting with the program for production or to provide consultant services. Proposals must be submitted to the Department by Monday, July 18, 1977 and decisions on the proposals will be made by Friday, July 22, 1977.

DEPARTMENT AGRICULTURE

Office Memorandum

TO : Commissioner Bill Walker

DATE: July 19, 1977

FROM : Darryl Anderson, Assistant Commissioner *Darryl*
Jane Meyer, Grants Analyst *JM*

PHONE: _____

SUBJECT: Overview of the Shade Tree Program

The Minnesota Department of Agriculture Shade Tree Program is roughly organized into five separate areas reporting centrally to the Administrator. These areas are:

- 1) Sanitation and reforestation grants.
- 2) Wood waste disposal and utilization grants.
- 3) Regulatory responsibilities and experimental program grants.
- 4) Informational responsibilities.
- 5) CETA involvement.

A listing of the employees involved in the program are as follows:

PROGRAM EMPLOYEES

<u>Name</u>	<u>Position Title</u>	<u>Area of Responsibility</u>
Peter Grills	Administrator-Class	Administrate the Shade Tree Program.
Jane Meyer	Grants Analyst-Unc.	Grants Administration including sanitation and reforestation.
Andrea Bockman	Information Officer-Unc.	Informational responsibilities.
Mary Davies	CETA-Unc.	Grants Administration, CETA supervisor and clerical supervisor.
Art Meincke	CETA-Unc.	Grants Administration, problem application calls and general information calls.
Dick Zasada	CETA-Unc.	Wood waste disposal and utilization.
Walter Eisner	CETA-Unc.	CETA supervisor.
34 CETA employees	CETA Fld Insp-Unc.	CETA employees are responsible for all field operations.

<u>Name</u>	<u>Position Title</u>	<u>Area of Responsibility</u>
Meg Hanisch	Plant Health Spec.-Class	Regulatory supervisor.
Doree Maser	Plant Health Spec.-Class	Regulatory staff.
Amador Frances	Plant Health Spec.-Class	Regulatory staff.
Deanna Hudella	Clerk Typist-Class	Clerical assistance to Shade Tree Program.
Diana Johnson	Clerk Typist-Class	
Marly Baxter	Clerk Typist-Class	"

PROGRAM OUTLINE

Appropriations

The Minnesota Shade Tree Law provides 28.5 million dollars to be applied to shade tree disease control activities within the period January 1, 1977 to December 31, 1978. Of this total, \$27,525,000 has been appropriated to the Department of Agriculture for the following purposes:

-- grants for sanitation programs	\$21,650,000
-- grants for reforestation programs	4,400,000
-- grants-in-aid for wood utilization and disposal systems	550,000
-- public information	225,000
-- experimental programs	400,000
-- administration	300,000

One-half of this amount, \$13,762,500 is available for expenditure in the first calendar year, January 1, 1977 to December 31, 1977, with the remainder available for expenditure in the period January 1, 1978 to December 31, 1978. No more than two-thirds of the monies available for grants for sanitation and reforestation programs is to be applied to municipalities within the metropolitan area; the remainder is to be applied to municipalities in the out-state areas.

The remaining \$975,000 was appropriated to the University of Minnesota and the Department of Natural Resources. The monies to the University of Minnesota are to be applied as follows:

-- for research by the agricultural experimental station	\$100,000
-- for continuing education and training by the agricultural extension service	250,000

The \$625,000 appropriated to the Department of Natural Resources is for expenses incurred in the sanitation of diseased trees on lands administered by the Department within 1,000 feet of any municipality with an approved disease control program and within camp sites, picnic areas, wayside and parking areas.

Sanitation and Reforestation Program

Any municipality or county is eligible to receive sanitation and reforestation grants upon completion of a program application. A disease control plan must be submitted with the application for approval. According to the emergency rules (permanent rules must be in effect by September 1, 1977) of the Department, all applications must be submitted to the Department by July 1, 1977. Applications submitted after that deadline may be considered and accepted if the governmental unit can show good cause for the delay.

After an application has been received and the control plan approved, the governmental unit will be sent an award letter indicating the percent of state reimbursement for total costs incurred by the governmental unit in conducting sanitation and reforestation activities. It is hoped that these letters will be sent during the week of July 25-29, 1977.

To receive payments from the state for sanitation and reforestation costs, the governmental unit must submit request for payment forms to the Department within 15 days of the close of the preceding payment period. The payment periods are January 1 through March 31; April 1 through June 30; July 1 through September 30; and, October 1 through December 31 of each calendar year. For the current period only, governmental units may submit requests for payments for costs incurred since January 1, 1977. We anticipate many governmental units will have difficulty completing these forms given the short lead time and the newness of the procedure. Therefore, we are allowing the deadline to slip for several days.

Conceivably, the first payments can be made within the next two weeks. The speed with which these requests are processed will depend greatly on the accuracy and adequacy of the information provided on the form. We anticipate that additional information will be required on a large number of these first request for payment forms.

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Wood Waste Disposal and Utilization Program (cont)

To date, no activity has been undertaken in this regard. We have only recently closed the books on last year's program. Since most of the funds appropriated for this purpose in last year's program were expended in the metropolitan area, we intend to concentrate our efforts in making the current funds available to eligible cities in the out-state area. There are no predetermined dollar limits on the cost of a system for which a city may receive financial assistance. Moreover, no time limits have been set for submitting requests for such assistance.

Experimental Funds Program

This is the first year funds have been appropriated for experimental programs. Any activity in the sanitation or replanting area is eligible for funds through this program. The Department is requesting that all interested parties submit a complete description of the experimental program they are proposing, including an estimated budget. All cities and counties are eligible to participate. The University of Minnesota and other research organizations such as the U.S. Forest Service can also submit proposals to the state. Instead of submitting separate proposals, it is hoped that research agencies will work with these governmental units in preparing and/or carrying-out experimental programs.

No deadline has been set for submitting experimental program proposals. Interested parties are encouraged to submit their proposals to our office by the end of July, but any proposals received later will be accepted. These proposals will be examined by a subcommittee of the Shade Tree Advisory Committee. This body will only make recommendations on the proposals; the final decision will rest with the State. Approval of the experimental proposals will be based primarily on the benefits to be derived from the program for all the cities and counties in the state. There have been no suggestions that a dollar limit be set on the proposed program budgets.

To date only a few definite proposals have been submitted. However, many inquiries about the program have been received. A letter explaining the type of information needed is being prepared for transmittal to all interested parties.

Public Information

For a public information program over the two year period January 1, 1977 through December 31, 1978 a total budget of \$225,000 is available. At the present time a two phase program is envisioned. Phase One calls for the immediate development and production of a pamphlet for distribution at local fairs and festivals, implementation of a mobile information unit which would travel to public gatherings, production of a film or video tape for use in schools and at community meetings, and design and utilization of a program logo.

Phase Two will focus on obtaining exposure for the program through newspapers, television and radio and by involving the private sector. Media exposure will be supplemented by and coordinated with extensive community contact by the program staff. Greater utilization of the items produced during Phase One will also be emphasized.

Public Information (cont)

Estimated costs of Phase One are as follows:

Media Consultants:	\$ 10,000	through January, 1978
Logo :	300	
Pamphlets :	10,000	first run (August, 1977) subsequent printing not to exceed \$20,000 for 1977.
Film/Video Tape :	45,000	through January, 1978
Mobile Unit :	60,000	production costs
Operating Costs :	<u>10,000</u>	September, 1977 through September, 1978
TOTAL		\$155,300

The estimated costs of Phase Two are less easily projected as a major thrust will be to solicit private sector involvement (monetary support, display space) and free media time and space. The following costs are anticipated:

Printed matter :	\$ 30,000
Posters, stickers, buttons (if necessary) :	5,000
Possible educational TV documentary :	5,000

If these anticipated expenditures are actually made, a balance of \$30,000 would remain for costs which are not readily apparent at this time.

On July 8, 1977 requests for proposals were sent to all parties who had expressed an interest in contracting with the program for production or to provide consultant services. Proposals must be submitted to the Department by Monday, July 18, 1977 and decisions on the proposals will be made by Friday, July 22, 1977.

Recommendations

Other than the already initiated process of involving municipalities in the program and starting the flow of sanitation and reforestation grants money, the two most immediate concerns of the program are:

- 1) selection of the new Administrator to succeed Peter Grills. Ideally the new Administrator should possess a multiplicity of talents which include administrative abilities, knowledge and experience of state government procedures, technical expertise in the area of shade tree diseases, technical experience in municipal government, legislative experience, and a good public profile. In all likelihood it is doubtful that any one individual will be found that possesses all of these abilities and experiences to any significant degree.

Recommendations (cont)

Given the fact that the shade tree disease situation is now obvious to all concerned Minnesota citizens and that the Legislature has acted with an appropriate program it is felt that the need for a highly visible front person is somewhat diminished--at least in comparison to the real need for an Administrator who has a sound conception of what the program is designed to do, has administrative instincts to see that the dollars and the people are appropriately utilized in meeting the goals of the program and who can adequately articulate the successes and failures of the program before the Minnesota State Legislature.

It is anticipated that Peter Grills will resign the first week in August. It is recommended that a low key intensive search take place for a suitable successor, such that there will be little or no interim between the departure of Peter Grills and his successor. It is further recommended that in the last few weeks of Peter Grills' employment that his major emphasis be in the area of fully informing his staff of all the knowledge he possesses.

- 2) the promulgation of permanent rules. The sanitation and reforestation grant program is currently operating under emergency rules adopted by the Department June 30, 1977. Statutory language requires permanent rules be established by September 1, 1977 or earlier. It is vital that the Department begin action to adopt permanent rules within this time frame. The temporary rules will form the framework upon which the permanent rules can be established.

It is recommended the Shade Tree Program and the Planning Division of the Department give the development of rules a high priority in the coming month.

In addition to the two primary concerns listed above the following thoughts should be considered. The rapid adoption and implementation of the greatly expanded program has placed many pressures upon individuals involved in the Program. This has resulted in some short term administrative inefficiencies, which we have full confidence can be corrected given time, an active administrator, and the concern of the Commissioner's Office.

It appears that the different functional areas of the program are operating somewhat autonomously from each other. It is felt that it would be highly desirable for there to be a great deal of internal communication and coordination between the different areas of the program in order to meet the overall legislative intent. Selection of a permanent Administrator will go a long way toward meeting this concern. For the interim it is suggested that Mary Davies act as supervisor of the clerical staff. A well trained, well informed clerical staff is vital to the success of the program. It is felt that Mary Davies has the necessary experience and instincts to see that this role is adequately performed.

Recommendations (cont)

It is recommended that the Department and the Program formulate a realistic regulatory posture. By statutory authority it is required that participating governmental units have a certified Shade Tree Program, meaning they have a shade tree Inspector and they fulfill all the requirements of the Department's rules and regulations. This is obviously an immense task given a Regulatory staff comprised of three Plant Health Specialists. In order for there to be an effective Regulatory Program at all it is felt that it is essential that the Department establish a realistic posture whereby these regulatory inspectors can contribute to the overall success of the program.

It is felt that the Shade Tree Program has evolved somewhat autonomously from the rest of the Minnesota Department of Agriculture. Part of this is obviously due to the very different nature of the Program and its somewhat lack of continuity with other ongoing department activities. However, it is felt that it must be continually stressed to the personnel of the Shade Tree Program that they are part of the Minnesota Department of Agriculture and the State of Minnesota, and they must adhere to the same policies and procedures that are required of other agencies within the state. This is necessary because undoubtedly the Shade Tree Law and its administration will come under close scrutiny by the Legislature and the Legislative Audit Commission. It should be considered to be a strong advantage that the Shade Tree Program is a part of the Minnesota Department of Agriculture. It is felt that given the high priority the Department has established for this Program that the other ongoing personnel and functions of the Department can be a vital and necessary aid to the Shade Tree staff.

An evaluation of the roles and performance of the CETA personnel participating in the program would be desirable. Currently the Department has four CETA or Governor's Manpower employees in the central office of the program and 34 CETA personnel in the out-state area. It is imperative that if these personnel are to successfully contribute to the goals of the Program and that they be fully informed and be held fully accountable for their actions.

The wood waste disposal and utilization program should be more fully integrated into the overall Shade Tree Program. This program must be viewed as part of a total package in dealing with the disease. Further, efforts should be made to focus on providing assistance to communities in identifying alternative methods of using trees removed as a result of Dutch elm disease or Oak wilt. This assistance might consist of suggesting innovative approaches in the private sector which use elm or oak wood, as opposed to concentrating primarily on giving out state grant funds.

An account clerk from the Accounting Division should be assigned to the Shade Tree Program on a regular and ongoing basis. A cooperative agreement between the Administrator of the Shade Tree Program and the Director of the Accounting Division should be formalized and the duties, responsibilities and hours assigned clearly delineated. It is anticipated that approximately one week per quarter will be required, although more assistance may be necessary in the first few quarters of program operation.

Commissioner Bill Walker

July 19, 1977

Page Eight

Finally, it has been the policy of the Department for the last month and a half and it is recommended that it be a future policy of the Department to give the Shade Tree Program the highest priority within the overall management of the Department's resources. This is not to imply that other activities of the Department are not important but merely means that at this point in time the Shade Tree Program is the most visible function of the Department and has the greatest potential impact on the citizens of the State of Minnesota. Being the highest priority program should mean that the Program is given the highest level of scrutiny by the Commissioner's Office and is given whatever aid and/or support other activities can furnish.

DLA/JM/cc



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
600 BREMER BLDG.
SAINT PAUL, MINN. 55101

DEPARTMENT OF AGRICULTURE
ANNOUNCES SHADE TREE
GRANTS TO 571 CITIES

FOR RELEASE TUESDAY
AUGUST 2, 1977
10 A.M.

SAINT PAUL-- Five hundred seventy-one (571) local Minnesota governments will share in over 12 million state dollars for shade tree disease control programs in 1977, announced Peter Grills, Administrator of the State Department of Agriculture's Shade Tree Program.

In making the announcement Tuesday with Senator Hubert H. (Skip) Humphrey, III (DFL-New Hope) and Representative Thomas K. Berg (DFL-Minneapolis), Grills noted that the high level of participation in the new program exceeded "anyone's greatest expectations."

(Humphrey and Berg were major authors of the \$28 million Shade Tree bill passed by the Legislature this year. The bill authorizes the State to make grants to municipalities for shade tree disease control programs.)

Of the 571 communities eligible to receive state funds for dutch elm and oak wilt control programs, one hundred thirty-six (136) are within the seven county metropolitan area and four hundred thirty-five (435) are out-state municipalities.

"What's remarkable is that two hundred eighty-two (282) communities with populations under 1,000 have prepared local shade tree programs and will benefit from this year's new program," said Humphrey. "Two hundred fifty (250) of those small communities are located outside the metro area. That's what I call statewide involvement."

(more)



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EQUAL OPPORTUNITY EMPLOYER



In making application to the Shade Tree Program for state funds, the out-state communities submitted budgets totalling \$7,726,760 for diseased tree identification, removal and disposal. These communities will receive the maximum reimbursement allowed by law for sanitation programs (45%) and will share 3,473,250 state dollars.

Communities within the seven county metro area submitted sanitation budgets totalling \$18,982,511 and will receive 37% reimbursement for their sanitation costs.

"Dutch elm disease is at a peak in the Twin Cities area and sanitation costs are naturally going to be very high," said Representative Berg. "The \$7,051,750 that the metro area will receive from the state should ease the burden of the high cost of controlling shade tree disease."

Saint Paul submitted the largest sanitation budget in the state and is scheduled to receive over \$2 million from the Shade Tree Program.

Saint Paul also submitted the largest reforestation budget (\$1,639,788) and will be reimbursed for 48% of its eligible reforestation costs, as will all other metropolitan area municipalities participating in the state program. Metropolitan area reforestation budgets totalled \$2,784,012 and communities will share \$1,340,130.

"We had a tremendous reforestation response from the out-state area," said program Administrator Grills. "Those people really want to keep their towns looking green and healthy and they've budgeted nearly two million dollars for replanting."

Grills said that the out-state communities will receive a total of \$666,064 from the state for reforestation. "As it stands now, that's a 33% reimbursement. We're receiving many amended reforestation budgets and I anticipate that by

(more)

year's end, we'll have reimbursed these communities at a rate a bit higher than that," said Grills.

Berg, Humphrey and Grills each expressed their satisfaction that Minnesota communities from border to border are implementing shade tree disease control programs.

"With the State helping cities pay for their programs, we may begin to get a handle on preserving Minnesota's rural and urban forests," said Grills.

Humphrey added that especially in communities where oak wilt and Dutch elm diseases have just made their appearance, an immediately implemented, effective sanitation and reforestation program can mean the difference between "woodland and wasteland."

The State will continue to make shade tree grants to municipalities through next year, with another \$12 million available for sanitation and reforestation programs in 1978.

--30--

For further information, contact Andrea Bockman (612) 296-8580.

SHADE TREE PROGRAM STATEMENT BY COMMISSIONER OF AGRICULTURE
BILL WALKER BEFORE THE ENVIRONMENTAL PROTECTION SUBCOMMITTEE
(SENATE AGRICULTURE AND NATURAL RESOURCES COMMITTEE)

AUGUST 23, 1977

There's an old proverb that says, "to get money is difficult, to keep it more difficult, but to spend it wisely most difficult of all."

The Department of Agriculture's Shade Tree Program has the responsibility of not only spending millions wisely, but spending millions quickly. That truly is the most difficult of all, yet that is what the Shade Tree Program has done.

When Senate File 32 was signed into law by Governor Perpich last May 18, the Shade Tree Program set as its initial goals enlisting border to border participation and ensuring involvement of Minnesota's small communities. These goals have been attained through speed of operation and simplicity of form.

Within two weeks of becoming law, every community in the state was notified that shade tree funds were available and that they could apply for a percentage of these funds by filling out a simple, one-page form.

Within six weeks of becoming law, five hundred seventy-one (571) communities had submitted applications and would be eligible for state funds. Four hundred thirty-five (435) of these were out-state communities. Two hundred eighty-two (282) had populations under 1,000. The Shade Tree Program had become, in six short weeks, the state grants program with the largest number of participants.

This kind of success cannot be attributed simply to the work of one state agency. Those 571 communities assured the success of the program by committing themselves to local shade tree disease control programs. The willingness of those communities to assume initial program costs and to design programs that take advantage of the financing options

STATEMENT BY COMMISSIONER BILL WALKER
AUGUST 23, 1977
PAGE TWO

available under the new law, is what has made the Shade Tree Program work.

For three months now, the Shade Tree Program has been the Department of Agriculture's top priority. The high level of participation in the program indicates that shade tree programs are top priorities on the local level as well. In response to this clear mandate from the people throughout the state, as well as from the Legislature, the Department of Agriculture will continue to give full, unqualified support to the Shade Tree Program.

Such support must be indicated not only in word, but in deed. The program has had, and will continue to have, full and rapid access to the Department's available resources. The Department has placed thirty-four trained tree inspectors in various locations throughout the state to assist local officials in developing strong shade tree disease control programs. With the prompt and personal attention of these Department personnel, the program has been able to proceed rapidly while being able to respond to the individual concerns of many of the local communities.

Now that the sanitation and reforestation grants programs are on their feet, equally successful progress will become evident in other aspects of the program. The program's watchwords will continue to be simplicity, flexibility, and accountability as the overall Shade Tree law is implemented for the benefit of all Minnesotans.

STATISTICAL OVERVIEW -- SHADE TREE PROGRAM

PARTICIPATION

Metro area applications received, processed, and approved	136
Out-state area applications received, processed and approved	435
Total number of participants	<u>571</u>
Participants with populations under 1,000 (metro)	32
Participants with populations under 1,000 (out-state)	<u>250</u>
Total number of participants with populations under 1,000	282
Metro area county-wide programs	9
Out-state area county-wide programs	<u>37</u>
Total number of county-wide programs	46

ALLOCATIONS - SANITATION

Available in 1977	
Metro area.....	\$7,051,750.00
Out-state area.....	<u>\$3,473,250.00</u>
Total for 1977	\$10,525,000.00
Metro Sanitation Budgets Submitted.....	\$18,982,511.85
Metro Sanitation Reimbursement.....	7,051,750.00
Metro Sanitation Reimbursement Percentage	37%
Out-state Sanitation Budgets Submitted.....	\$7,726,760.45
Out-state Sanitation Reimbursement.....	<u>3,473,250.00</u>
Out-state Sanitation Reimbursement Percentage	45%

ALLOCATIONS - REFORESTATION

Available in 1977	
Metro area.....	\$1,340,130.65
Out-state area.....	<u>660,064.35</u>
Total for 1977	\$2,000,195.00
Metro Reforestation Budgets Submitted.....	\$2,784,012.57
Metro Reforestation Reimbursement.....	1,340,130.65
Metro Reforestation Reimbursement Percentage	48%
Out-state Reforestation Budgets Submitted.....	\$1,982,001.64
Out-state Reforestation Reimbursement.....	<u>660,064.35</u>
Out-state Reforestation Reimbursement Percentage	33%



LAND OF QUALITY FOODS

STATE OF MINNESOTA

File Legislative
Proposals

DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
600 BREMER BLDG.
SAINT PAUL, MINN. 55101
(612) 296-8580

TO : Tom Kalitowski
FROM : Peter Grills
Shade Tree Program

File

SUBJECT: Legislature Proposals

There are various subdivisions of Minnesota Statutes, section 18.023 which do not clearly manifest legislative intent. The Shade Tree Program legislative proposals deal with these ambiguities. Rather than presenting specific legislative proposals, I have organized this memorandum in substantive areas which deal with specific problems. In each area I have attempted to state the problems and offer possible solutions which would require legislative action. I hope this approach will assist the department in making specific legislative proposals. Please call if you want to discuss any of these problem areas.

I. Sanitation Grants

Sanitation grants are based upon expenses incurred in conducting sanitation programs. Many questions have arisen which concern the costs which may be included in the cost basis for the grant.

A. Municipal Costs Versus Other Sanitation Costs

Many cities would like to collect tree removal contractor receipts from their citizens and submit these as part of the cost basis upon which a grant could be made. The effect of this approach is to allow the municipality to escape any cost of tree removal on private property and still provide the property owner financial relief via the state grant.



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

EQUAL OPPORTUNITY EMPLOYER

The Department has ruled that costs incurred solely by the property owner, with no assistance from the municipality may not be included as a cost upon which a state may make grant-in-aid. The reasons for this ruling are set out in the memorandum addressed to Commissioner Walker from myself dated August 9, 1977.

Not all cities are happy with the ruling. The confusion arises from subdivision 3(c) which provides:

Grants to any municipality for sanitation shall not exceed 45 percent (45%) of sanitation costs approved by the commissioner including any amount of sanitation costs paid by special assessments, ad valorem taxes, federal grants or other funds.

Municipal officials argue that grants may be based upon any sanitation cost, not just those costs incurred by the municipality itself. The weight of their argument hinges on the language "including any amount of sanitation cost paid by other funds." Adopting this interpretation would allow the municipality to submit contractor receipts held by individual property owners and receive grant-in-aid based upon the costs incurred by the property owner.

The Department has chosen to construe the words "sanitation cost" within subdivision 3a(c) to mean sanitation expenses incurred by the municipality and to be paid by municipal revenues set out in subdivision 3a(c). It is my belief that a reading of the entire section in its entirety, the legislative history, and strong policy arguments support the Departments position. (For a more complete discussion of the problem refer to the Brooklyn Center memorandum)

Since the issue does go to the basic policy of administering the grant

funds and involves substantial sums of money, it may be appropriate for the legislature to clarify the extent and nature of the cost-sharing contemplated by the statute. Legislative changes in support of the Department's position on the issue would be minimal. Clarifying language needs to be inserted to clearly indicate that grants are to be based upon costs incurred by the municipality. The language of subdivision 3a(c) referring to revenues which cover sanitation costs can remain unchanged, as long as it is clear that the language refers to revenues accruing to the municipality for purposes of paying municipal sanitation costs.

B. Administrative Costs

In the Department's emergency regulations, local program administration costs have been excluded from the cost basis upon which grant-in-aid may be received. Only costs incurred in the direct physical performance of allowable sanitation activities may be submitted as a basis for grant-in-aid. Denying administrative costs effectively excludes clerical and office support, salaries of program administrators and supervisors who are not involved with actual physical performance of the sanitation activity, and other indirect program costs. This position is likely to be attacked vigorously by the larger municipalities at the hearings on our permanent regulations.

If this Department wishes to continue this policy in the permanent regulations, it may be appropriate to seek a clear legislative authorization by inserting statutory language which excludes all administrative costs from the grant program. I believe the Department can find considerable legislative support for this approach to administering the grant funds. There are strong policy arguments for the exclusion. Excluding administrative costs provides a healthy incentive for local

units of government to keep administrative costs at a minimum. Paying the high administrative costs of the larger municipalities takes away funds which could otherwise be expended on actual tree removal. It spreads already scarce state funds even thinner.

C. Tree Removal Subsidies For Residential Property Owners

Under the existing statutory language, the state may share the cost of subsidies for tree removal made by the municipality to "owners of private residential property of five acres or less." The intent of the 5 acres limitation was to exclude land developers from the benefits of the subsidy. The effect of the acreage limitation has been to exclude many owners of private residential property of five acres or more which are not land developers. There appears to large members of such property owners in the newly developed suburbs of the metropolitan area. (i.e. Maplewood, Eden Prairie)

The legislature may want to reconsider the 5 acre limitation in light of the impact upon the developing suburbs. Alternative language for the qualifying property must be devised if the legislature wishes to avoid the exclusion of residential property owners who are not land developers, but who own 5 acres or more.

D. In-Kind Contributions

One of the most difficult provisions to administer under the new grant program is the provision providing for grants based upon "in-kind services or voluntary work for municipalities with a population of less than 1000 according to the 1970 census." The intent is to provide financial assistance to smaller cities who often use local private efforts to carry out the work rather than municipal crews or municipal contractors.

The problem with the in-kind provision is one of accountability. It is very difficult to cost account for private efforts. For this reason, the Department has attempted to limit reimbursement for in-kind contributions to documented out-of-pocket expenditures. In practice, this means the municipality may include only in-kind contributions for which there is physical evidence of the expenditure (i.e. receipts, invoices, etc.). The municipality submitting in-kind contributions must pass on the grant received for the in-kind expense to the contributor.

The Department has excluded from the cost basis worked performed by local citizens not in the business of providing the services contributed. It would be almost impossible to insure the requisite accountability for work performed by private citizens. Further, it would be difficult to devise a uniform rate of reimbursement for the local citizen effort.

The statutory language does, however, refer to "documented in-kind services and voluntary work." It is certainly arguable that the language requires the State to make grant-in-aid for local citizen effort which has been recorded by local officials. Because of the weighty policy arguments against administering grant funds based on this type of expense, I believe it would be in the best interest of the State to clearly limit by statutory language the allowable in-kind contributions to the documented out-of-pocket expenditures of the contributor. Any new language added should also clearly indicate that the municipality must pass on to the contributor any grant based upon the contributor's in-kind expenses.

II. Reforestation Grant

A. Reforestation Grants - Towns Under 1000 Population

One of the biggest problems encountered in getting this shade tree program underway was the result of my own misinterpretation of the statutory language authorizing 90% funding of the first fifty trees planted in towns of less than 1000 population. In the initial implementation of the program, I was under the mistaken impression that subdivision 3a(c) authorized funding of the planting of the first fifty trees at the 90% level in municipalities with populations less than 1000. This, however, is not the case.

The statutory language refers to only "towns as described in subdivision 1." The language effectively limits the 90% grants to townships with municipal powers and whose population is less than 1000. Of the 571 applicants, there were only four such townships.

My own interpretation was based upon committee discussions of the bill. Much of the debate appeared to assume that statutory cities would be eligible for the increased funding. I have contacted the authors and those rural legislators connected with the 90% amendment. They too were under the impression that statutory cities meeting the population qualification would be eligible for the 90% funding. The League of Minnesota Cities has also indicated that they had thought the provision applied to statutory cities.

Because of the confusion as to the actual legislative intent, it would be appropriate for the legislature to address the problem in the 1978 session. I believe the matter will be addressed whether or not the initiative comes from the Department. It might be more appropriate that any proposed change come from an interested party such as the League of Minnesota Cities or a rural legislator. In any event, the change can easily be effected with alternative language clearly including

home rule charter and statutory cities within the provision.

B. Applicability of \$40 Tree Ceiling to First Fifty Trees Planted

Grants to municipalities for reforestation is subject to the ceiling of \$40 per tree planted. It is not clear if this per tree ceiling applies to the special 90% funding of the first fifty trees by eligible towns. The Department has ruled that the ceiling does not apply.

There has been some indication by chief author Humphrey that there should be a per tree ceiling placed upon the 90% grants. I am not sure whether the Department has the authority to create such a ceiling by administrative regulation. Since the legislature deemed it appropriate to place a statutory ceiling on general reforestation grants, it may also be appropriate to provide a per tree ceiling for the 90% grants. The change can easily be made by inserting the limiting language into subdivision 3a(c).

C. Continous Nature of the 90% Grant Provision

Subdivision 3a(c) provides that grants can be made to eligible towns for up to 90% of the cost of planting the first fifty trees. The question arises as to whether the language refers to the first fifty trees planted in each calendar year, or whether it refers to the planting of the first fifty trees after the municipality first acquires an approved program.

The Department has construed the language to mean that 90% funding is available for the first fifty trees planted after the municipality has acquired an approved program. Since the issue is arguable and since substantial sums of money are involved, it may be appropriate to clearly indicate by statute the extent of the 90% funding provision.

✓ Clarifying language in support of the Department's position can

easily be inserted in subdivision 3a(c).

D. Municipal Nurseries

Existing statutory language authorizes the Department to make grants for municipal reforestation programs. This includes grants for the cost of acquiring nursery stock to be planted on public lands. Some municipalities operate their own nurseries. This gives rise to the question of whether the state should make grants to municipalities for the cost of operating municipal nurseries.

The Department has ruled it will make grants for the cost of trees taken from a municipal nursery. The municipality must first document for the Department the method used to calculate the cost per tree to the municipality to produce the stock for which grant-in-aid is requested. The municipality may not simply submit nursery operating expenses as a basis for a reforestation grant.

Reforestation grants for nursery stock produced in a municipal nursery creates the problem of government competition with local private nurseries. It is not clear from the face of the shade tree law whether the legislature intended to encourage this type of competition via state funding of government owned nurseries.

It is my understanding that the Governor has publicly supported and encouraged municipal and county nurseries through his Aesthetic Environment Program. If this is the case, the Department may not want to make an issue of the municipal nursery problem. However, since funding of government nurseries is basic to the policy of reforestation grants and may ultimately involve large sums of money, it may be appropriate for the legislature to clarify their intent as to making

grants for the operation of public nurseries. Clarifying language could be inserted in subdivision 3a(c).

E. Financing Reforestation Programs

Subdivision 3a(c) expressly authorizes the state to make grants for sanitation costs to be paid by special assessments. The language authorizing grants for local reforestation programs does not directly address the sources of revenue which may be used as a basis for reforestation grants. In other words, can the state make grants for the costs of planting trees on the public boulevard when the cost is to be assessed against the abutting property?

The Department has extended the policy of allowing grants for sanitation costs to be paid by special assessment to grants for reforestation. The effect is to allow grants for reforestation on the boulevard when the cost of planting is to be assessed against the abutting property. Since a great deal of confusion has arisen because of the special assessment language as applied to sanitation grants, it may be advisable for the legislature to clarify their intent as to the financing of reforestation programs on public boulevards. Statutory language, either supporting the Department's present position, or restricting grants to reforestation costs paid by ad valorem taxes could be inserted in subdivision 3a(c).

III. Experimental Grant Program

The new law authorizes state grants to local, state, and federal agencies for the purpose of conducting experimental shade tree disease control programs. The statutory language does not provide any guidelines as to the level of funding for these experimental programs.

The Department, through its regulations, may provide a level of funding which will be the same for all grant recipients; or, it may leave the level of funding for each recipient to the discretion of the Department. If the Department takes the latter approach, the regulations should include reasonable guidelines for deciding the level of funding for grant recipients. This will be difficult, and problems concerning the level of funding will be inevitable even with good guidelines.

The Department may want to seek legislative direction as to the level of funding for experimental programs. Language clarifying the level of funding for experimental programs could be inserted in subdivision 10a.

IV. Requirements For Separate Accounting

Subdivision 8 requires that all revenues acquired for purposes of the shade tree disease control "be deposited in the municipal treasury in a separate fund." It is not clear whether subdivision 8 requires a deposit in a separate physical fund, or whether the provision requires only the separate accounting for such funds by using acceptable "fund accounting" practices. The Department has construed the language to require separate accounting and not the creation of a separate physical depository.

The Shade Tree Program staff will be meeting with the State Auditors' Office to discuss the accounting practices which are required by subdivision 8. Depending upon these discussions, the Department may want to seek clarifying language for subdivision 8.

V. Retroactive Application of Department Regulations

Section 12 of Chapter 90, Laws of 1977 authorized the Department to

adopt emergency rules pursuant to section 15.0412, subdivision 5, for purposes of administering grants for sanitation and reforestation. The emergency rules are to be effective until September 1, 1977, or until the effective date of the amended permanent rules, whichever occurs first.

Permanent rules will not be adopted until sometime after September 1, 1977 because of the time required to draft the rules and the time required for publication and notice. This means that the program will be operating without rules during the period between September 1, 1977 and the time at which the permanent rules become effective.

It may be advisable for the Department to seek retroactive authorization from the legislature to administer the grant program during the period for which no rules exist.

VI. Effective Term of Appropriation

Subdivision 1 of the appropriation section (section 14) of Chapter 90, Laws of 1977 provides that \$13,762,500 shall be available for expenditure during the period of January 1, 1977 to December 31, 1977, and a like amount for the period of January 1, 1978 to December 31, 1978.

Subdivision 4 of the appropriation section provides that appropriations shall not cancel but shall remain available until expended.

There appears to be a conflict between the two subdivisions with regard to the effective term of the appropriation. It would be most difficult for the Department to continue smooth administration of the program if administrative funding was discontinued on December 31, 1978 and later renewed upon passage of an appropriation for the 1979/1980 biennium. To avoid any problems which might arise because of the

✓ ambiguity, it may be necessary to clarify the effective term of the appropriation by statutory language supplied during the 1978 session.

* * * * *

I hope that this discussion of the problems relating to legislative intent of the shade tree law will assist you in preparing legislative proposals for the 1978 session. If you have any questions, please call.

DEPARTMENT OF AGRICULTURE**Office Memorandum**

TO : Peter Grills, Administrator
Shade Tree Disease Control Program

DATE: August 25, 1977

FROM : Division of Planning and Development 

PHONE: 296-7686

SUBJECT: Thoughts on Evaluation Design for the Minnesota
Shade Tree Disease Control Program

This memorandum addresses two items we have previously discussed: (1) review of the Shade Tree Disease Control Program for the upcoming report to the Legislature and (2) longer-term program planning. We agreed to provide you with some thoughts on how to accomplish these tasks.

Please remember these are only thoughts. Nothing is in concrete. The shape of the design is your decision to make. We think the next step is to discuss our thoughts with you and your staff. We can then firm everything up, gather the information, synthesize it, and meet the program's obligations.

Program Evaluation

For the report to the Legislature, the Department is basically charged with evaluating the existing program. In talking about "program evaluation" we mean the assessment of the impact of the program as a whole and of its component parts (i.e., the "treatments" applied to attain the state's objective in funding the program). Program evaluation attempts to determine what the public and the people have been getting for their money: what works? what doesn't work? what have been the past and present effects? what factors appear to be associated with success or failure of the program or parts of the program?

A large number of government programs should really be viewed as quasi-experiments. For example, the Shade Tree Disease Control Program was built on the assumption that a certain course of action (sanitation) would hold tree losses to a manageable level. Generally, however, the government has made no real attempt to evaluate the effectiveness of its programs. Too often relevant "output measures", in terms of which programs could be evaluated in a meaningful manner, remain unidentified. Often "evaluation" has meant only internal program monitoring or the preparation of self-justifying progress reports.

What the Department should avoid is just internal monitoring and, especially, self-justification. We (i.e., the Department) want to be able to identify relevant measures which show what the program is accomplishing (i.e., output measures). With these measures and a good evaluation of them, an even better program can be built. Your staff is the best group to identify the final measures to be used, Planning can only provide some thoughts and guides.

Basically, four things need to be accomplished. First, explicit objectives for the program and its component parts must be established. Second, appropriate output measures indicating how the program is operating must be identified. Third, the effectiveness of the current program must be examined in terms of what the information gathered indicates about how well the program is fulfilling its objectives. Fourth, the costs of meeting the objectives through new or expanded activities should be estimated.

Program Objective

In our view, the objective of the Shade Tree Disease Control Program is to hold tree losses to a manageable level through conducting sanitation and reforestation programs, expanding diseased wood destruction and utilization programs, increasing public awareness of shade tree diseases, and carrying out regulatory activities.

There are four distinct program elements included in this objective. They are (1) grants for sanitation and reforestation; (2) wood utilization and disposal; (3) public education activities; and (4) regulatory functions. (Not included here are the CETA employee management function or the experimental program function). Each element should be reviewed.

Sanitation and Reforestation

The objectives of the sanitation and reforestation grants programs might be stated in terms of striving (1) to provide financial assistance to communities for costs incurred by the communities in sanitation and reforestation activities related to their shade tree removal and replanting programs and (2) to allocate funds in the most efficient and effective manner. Potential output measures for the first objective of this segment of the program include:

- (1) Costs per tree removed and number of trees removed;
- (2) Costs per tree replanted and number of trees replanted;
- (3) Geographic distributions by numbers and costs of trees removed and replanted;
- (4) Number of diseased trees compared to number of trees removed;
- (5) Staff number and man-hours employed by communities;
- (6) Total expenditures, state, local, and homeowner shares;
- (7) Ratio of trees lost to trees replanted; and
- (8) Comparison of tree losses to expected tree loss curve.

Output measures, to the extent possible, should be gathered by community so that the largest number of possibilities for aggregation are maintained.

The second objective is largely internal management analysis. Measures of effort might include:

- (1) Time required to process applications;
- (2) Accountability for funds expended;
- (3) Problems associated with forms used; and
- (4) Administrative costs.

Based on the suggested output measures (and an analysis of them), a statement might be made on how well the program segment is meeting its objectives and necessary changes examined.

Wood Utilization and Disposal

The primary objective of the wood utilization and disposal segment of the program might be stated in terms of providing support to the Shade Tree Disease Control Program through development and promotion of a comprehensive system of wood disposal and/or utilization techniques in the communities of the state. A second objective might be to promote and develop a system which will incorporate cost-effective resource conversion operations as a means of wood disposal or utilization. A third objective is to make the most efficient and effective use of grant-in-aid funds.

Potential output measures for this segment of the program include:

- (1) Information provided on wood disposal techniques available;
- (2) Information provided on wood utilization techniques available;
- (3) Wood disposed of and wood utilized as a ration to total volume;
- (4) Impacts of disposal or utilization techniques in reducing direct costs to landowners;
- (5) Cost-effectiveness of conversion systems employed; and
- (6) Number of grants projects approved.

Potential internal management analysis measures include:

- (1) Number of contacts on disposal or utilization and types and results of follow-up;
- (2) Accountability for funds expended; and
- (3) Administrative costs.

The wood utilization and disposal program segment might be analyzed using information developed in response to the suggested output measures and potential alterations examined.

Public Education

The objectives of the public education program might be said to be (1) to increase citizen awareness of the nature and seriousness of the threat to shade trees as a result of oak wilt and Dutch elm disease; (2) to encourage citizen organizations to join in the effort to control and combat the diseases; (3) to educate the public as to specific steps to be taken to control and combat diseases; and (4) to increase awareness of the importance of individual and community effort to control and combat diseases and to replant a variety of shade tree species.

The measurement problems for this segment of the program are different from those of other parts of the program. While information on grants, disposal and utilization, and regulatory activities can be gathered largely from the communities, public education activities cover a much broader population. "Before" and "after" data appear to be necessary for measuring some types of output in this area. Therefore, output measures might include:

- (1) Comparison of the present degree of citizen awareness to awareness after implementation of the public education component;
- (2) Comparison of citizen participation at the present to citizen participation after public education activities commence;
- (3) Comparison of the knowledge of the public about shade tree diseases both before and after the program; and
- (4) Comparison of the importance placed on individual and community efforts at disease control both before and after the public education effort.

In each case, it is necessary to determine what element (i.e., film, newspaper ad, TV spot, etc.) of the public education efforts is most effective in eliciting the desired response. In addition, information should be gathered on number of people reached by the elements of the program (i.e., the van, films, etc.).

Internal management measures might include (1) unit costs of elements of the public education effort (e.g., the cost per viewing person for film); (2) accountability for funds expended; and (3) total administrative costs.

Regulatory Program

The first objective of the regulatory program might be to insure that all municipalities employ a qualified tree inspector who has been certified by the Department of Agriculture. The second objective might be said to be to insure that each municipality is conducting their control program in conformance with the control standards set out in the Department's rules.

Output measures for this element of the Shade Tree Disease Control Program might include:

- (1) The number of municipalities with a certified tree inspector;
- (2) Qualifications of tree inspectors (test scores, backgrounds, etc.);
- (3) Number of diseased trees identified, number of trees removed, and percentage of diseased trees removed within 20 days;
- (4) Percentage of removed trees disposed of within 72 hours;
- (5) Complaints or reported violations of Department control standards and results of follow-ups; and
- (6) Conformity of municipalities with other Department rules.

Importantly, the outputs of the regulatory program can be related to those of other parts of the program. For example, it would be instructive if a community was not disposing of trees within the 72 hour limit and had not received much information or assistance in wood utilization or disposal.

Internal management output measures might include (1) number of municipalities inspected for conformity with state rules; (2) tests administered and effectiveness of test instrument; (3) time required to certify municipal inspectors; and (4) administrative costs.

Analysis

The information gathered on the output measures must be examined for what it reveals about how well the program is fulfilling its objectives. Therefore, hypotheses about what direction indicators should lead must be formulated; output data must be examined in terms of its conformity with expectations; and any divergencies must be explained. For example, if tree removal is being effectively employed to "hold down" the disease, we should expect tree losses to be less than the loss rate predicted in the absence of removal and disposal program. If data fails to support this result, we must ask and determine why. Answers to the "why" question suggest future program directions and needs.

Actual analysis of data gathered by the Shade Tree staff might be performed by the Shade Tree staff with assistance from the Planning Division.

The final product of this effort would be the report to the Legislature.

Longer-Term Program Planning

Laws of Minnesota, 1977, Chapter 90 provides funds for program planning. It appears that these funds are to be used for contractual services, as no personnel positions are included with them. However, in-house use need not be rejected out-of-hand.

No matter what form is used to spend the funds, the primary problem is identifying on what issues they should be spent. One option is to hire a consultant firm to evaluate the operation of the entire program and provide recommendations on future action and funding. However, the Legislature may not look favorably on such an action.

A second option is to identify issues which need to be addressed to improve program operation and to fund studies on these issues. A prime example is the impact of public education efforts and identification of the most effective medium. Such an issue requires detailed survey work which the Department is not capable of carrying out with its current staff. Similar issues might include:

- (1) An analysis of the grants process. To assure that funds are expended in the most efficient and effective manner, criteria and checks must be developed. Adequate, but uncomplicated, forms must be developed. An internal audit machinery and an audit trail must be developed.
- (2) Development of a predicted loss curve. Essentially, to evaluate the program, we must know what might have happened in the absence of the program. Predicted loss curves could be developed to provide such baseline information. In addition, present program approaches might be modeled to estimate future needs.
- (3) An evaluation of the tree inspector testing. Is the present certification system actually yielding "qualified" tree inspectors?
- (4) Analysis of various types of community programs. The issue to be examined could be how community programs work and whether incentives should be created to adopt proven programs.

These issues might be developed through a series of contracts spaced throughout the biennium.

JCD:vf

DEPARTMENT OF AGRICULTURE

Office Memorandum

TO : Darryl L. Anderson
Assistant Commissioner

THROUGH: Jane R. Meyer, Administrator
Shade Tree Disease Control Program

FROM : Jack Ditmore
Planning

SUBJECT: Shade Tree Experimental Grant Program

DATE: September 12, 1977

PHONE: 296-7686

This note provides suggestions for making grants under the "Experimental Programs" section of the Shade Tree Disease Control Act.

Background

Section 8 of Laws 1977, Chapter 90 provides that "the commissioner may establish experimental programs for sanitation or treatment of shade tree diseases". Grants may be made to municipalities, or the Department of Agriculture may enter into contracts with municipal, state or federal agencies in connection with experimental programs. Activities under experimental program designations may include research to assist municipalities in establishing priority designation areas in an approved disease control program. A total of \$400,000 is appropriated for experimental programs.

The statute does not provide guidelines for the experimental program outside those noted in the preceding paragraph. The objective of the experimental program must be identified and guidelines consistent with the objective set forth for use in developing program activities. In addition, the actual grant mechanism requires definition.

Objective

A potential statement of the objective of the Department's experimental grant program is:

To establish and evaluate the effectiveness of various types of shade tree disease sanitation and treatment programs and combinations of control practices for use in Minnesota, including research to assist municipalities in establishing priority designation areas in an approved disease control program.

The objective focuses on control programs (i.e., sanitation and treatment) because that is what appears to be required by the statute. However, the statute also suggests that the experimental program should have a policy basis (i.e., assist communities in establishing priority designation areas).

It does not appear that the legislature intended for the Department to use experimental programs for tree replacement subsidies to communities. Likewise, it appears the legislature intended something more than a mere subsidization of a community practice. That is, an experimental program should have application to more than a limited area.

ATTACHMENT B.

Guidelines

The following guidelines might be used in assessing proposed experimental programs:

- (1) General applicability. Proposed programs should not be limited in their application to a single community or county, but should provide controls which may be used in other areas of the state.
- (2) Control program. The experimental program proposed must involve a sanitation or treatment practice, or some combination of controls. Such controls might include chemical injection, sanitation, insecticides, root graft interference, combinations of controls, and other potentially effective means. However, this guideline shall not foreclose grants or contracts designed to use information to assist municipalities in establishing priority designation areas in an approved disease control program.
- (3) Contribution to overall state program. Proposed programs will be considered in light of other proposals for their potential contribution to an overall shade tree disease control program. That is, attempts will be made to select proposals which appear to complement one another. Proposed programs which integrate experimentation with community needs are encouraged.
- (4) Cost-effectiveness. Proposals will be evaluated for their potential cost-effectiveness. That is, the purchase of single use expensive machines which are not widely transferrable are likely to be viewed less favorably than a less expensive chemical treatment program which can be used by many municipalities.
- (5) Ability of the proposer to provide necessary evaluation. As the results of the experimental programs must be transferred to communities, evaluation of the experimental program must be well done. The capability of the proposer to reliably interpret the results of the experiment will be considered.
- (6) Existing staff. Proposed programs should attempt to minimize the number of additional staff required for the project. Those programs requiring lesser hiring will be favored over those requiring greater hiring, all other factors being equal.

Grant Mechanism

It does not appear that the Department is obligated to adopt rules to implement the experimental program. However, the Department may wish to publish information on the availability of funds and its guidelines in the State Register for everyone's information.

Internally, it is necessary to establish a procedure for reviewing experimental program proposals. The following procedure might be employed:

- (1) The Department would review proposals at four announced times during the year (e.g., the end of September, December, March, and June).
- (2) A review panel made up of the Shade Tree program administrator, a plant health specialist, the Shade Tree program grants analyst, and a member of the Planning Division staff would review available proposals and make recommendations on acceptance, rejection, or revision of proposals.

- (3) Recommendations should be submitted to the Assistant Commissioner responsible for the Shade Tree program by the program administrator for final approval.

All contracting procedures will follow state practices. The Accounting Division should provide assistance in the contracting process.

A person in the Shade Tree Program should be charged by the program administrator with monitoring each contract. In addition, a contact person for experimental program information should be designated.

JD:vf

Total number of applications received & processed.....571
 Total number of Metro-area applications.....136
 Total number of Outstate applications.....435

Total number of applications w/population under 1000.....282
 Metro communities w/population under 1000.....32
 Outstate communities w/population under 1000.....250

Total number of applications w/population over 1000.....289
 Metro communities w/populations over 1000.....95
 Outstate communities w/population over 1000.....148
 Counties w/populations over 1000.....46

Counties: Metro.....9
 Outstate.....37

OUTSTATE - TOTAL

Total of Outstate Sanitation Budgets.....\$7,726,760.45
 Total appropriation available.....\$3,473,250.00
 Resulting Percent Reimbursement.....45%

Total of Outstate Reforestation Budgets.....\$1,982,001.64
 Total appropriation available.....\$660,064.35
 Resulting Percent Reimbursement.....33%

METRO - TOTAL

Total of Metro Sanitation Budgets.....\$18,982,511.85
 Total appropriation.....\$7,051,750.00
 Resulting Percent Reimbursement.....37%

Total of Metro Reforestation Budgets.....\$2,784,012.57
 Appropriation Available.....\$1,340,130.65
 Resulting Percent Reimbursement.....48%

Smallest Community: Henriette, Pine County Population 56
 Largest Community : Minneapolis, Hennepin County Population 434,400

Henriette: Sanitation encumbrance.....\$1,611.00
 Reforestation.....none

Minneapolis: Sanitation.....\$1,800,448.12
 Reforestation.....\$174,021.60

St. Paul: Sanitation.....\$2,509,740.71
 Reforestation.....\$787,098.55

Minnesota
Shade Tree Program • Department of Agriculture • 600 Bremer Building • St. Paul, MN 55101 • 612/296 8580

MEMORANDUM

TO : Subcommittee on Environmental Protection
William Luther, Chair

FROM : Jane Meyer, Administrator
Shade Tree Program

SUBJECT: Community Reaction to 1977 Shade Tree Program

DATE : February 14, 1978

I. CONCERNS

On Tuesday, February 7, 1978 the Senate Subcommittee on Environmental Protection charged the Shade Tree Program to list and assess concerns expressed by the Program's 1977 participants.

The major areas of concern, in order of frequency of expression, are:

1. the speed with which communities were required to implement their 1977 programs due to the retroactivity clause of the Legislation;
2. the inconsistency in the Program's interpretation;
3. the amount of paperwork;
4. the lack of emphasis on reforestation and wood utilization;
5. the lack of reimbursement for administrative costs;
6. the lack of removal assistance to farmers or large property owners;
7. the lack of special consideration on the part of the State for Senior Citizens;
8. the 20-day removal requirement;
9. the lack of television time given to Shade Tree Disease;
10. the lack of public information about the Program.

The first three concerns have been expressed by a huge percentage of the non-metropolitan area participants. The other concerns have been expressed by Program participants throughout the state.

The following is a representative sample of the reactions recorded by local Program Managers on their year-end reports to the Shade Tree Program:

Retroactivity, Interpretation

"The entire program was initiated too late to be of real benefit for the 1977 season." (Waseca County)

"Poor timing for 1977 implementation." (Brown County)

"Thirty-three percent for a program when 90% was promised to start with--very misleading." (Wright County)

"Get your rules straight." (Watsonwan County)

"If the Minnesota Legislature makes any changes in the tree program next year, I hope they write the law so you get a clear understanding of the law." (Martin County)

Paperwork

"Reduce the paperwork or reimburse for part of it." (Stearns County)

"Simplify." (Lyon, Lincoln Counties)

"Shade Tree Program is fine, but please not so much paperwork." (Sibley County)

"Program was good (but the paper king has taken over the operation)." (Benton County)

Other

"People are not concerned--because of lack of elm trees." (Freeborn County)

II. PROGRAM RESPONSE

A. Implementation

The Program expects that complaints about the rapidity of local program implementation will be greatly reduced in the second year of the Program. Many communities have expressed satisfaction with the amount of time they had to plan their 1978 programs.

B. 90% Reimbursement

At the start of the Program in late May, 1977, small cities had

Subcommittee on Environmental Protection
 February 14, 1978
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(mistakenly) been informed that they, along with townships with populations under 1,000, would be eligible for 90% reimbursement for planting the first fifty trees on public property. When the legal decision had been made that only townships were eligible, the wrath of many small cities was incurred and many, receiving less state money than they had anticipated, completely eliminated their reforestation programs. It is thought that this problem might be eliminated by deleting the "townships" language in the law and inserting "cities". This change would enable cities (populations under 1,000) to receive 90% reimbursement. Or would it? As the law now reads, townships with populations under 1,000 can receive 90% reimbursement for planting the first fifty trees on public property. If in 1977 a city (population under 1,000) had planted fifty or more trees on public property, then the question arises—is that city eligible for 90% reimbursement for any trees planted in 1978? The Shade Tree Program and the Legislature are closely examining the 90% situation and hope to arrive at a satisfactory solution.

C. Paperwork

The complaint that there is too much is a difficult one to solve. The Program has a one-page application form and a one-page Request for Payment form. The year-end report form is necessarily lengthy in order that the Program may obtain sufficient information for cost-benefit analyses and for a comprehensive report to the Legislature. In addition, the Program has twenty-three Field Representatives covering fifty-five non-metropolitan counties to help local program managers deal with the paperwork. They are trained and certified tree inspectors who know the ins and outs of the State Program. The funding of the Field Representatives has been tenuous, but the overwhelmingly enthusiastic endorsement of the Representatives by the communities with which they work has kept the funding mechanism alive. The Field Representatives will continue until June, unless their funding is extended, to offer small communities as much assistance as they request in filling out forms and dealing with the intricacies of a state program.

D. Reforestation, Wood Utilization

As you know, the Program does not require that a community implement a reforestation plan in order to receive state funds for a sanitation plan. This system has made the Program vulnerable to charges that reforestation is not a Program priority. Communities have also expressed concern that a state Shade Tree Program will be in effect only long enough to remove all diseased trees and that reforestation costs will be borne entirely by the local community. In response, the Program has stressed the need for effective, well-run local programs during these two years of the statewide shade tree assistance program in order that proof be available to legislators of the value of the program. To require that a city simultaneously implement a sanitation and reforestation program might reduce the effectiveness of one or both programs.

To date, the majority of wood utilization efforts have been concentrated in the metropolitan area (Pig's Eye). In 1978, Saint Cloud and several northern communities will most likely receive state funding for

their wood utilization programs. Still, wood chipping and sawing is not the way most communities would like to see wood utilized--most would like to be able to use diseased elm wood for firewood. They can. However, the rules and regulations of the Program stipulate that no elm wood with bark intact may be stockpiled beyond April 15 (April 1 in the new rules and regulations) due to the fact that such wood is a breeding ground for the beetle. Elm wood can be stored forever if the bark is removed. If the wood is not disposed of properly before beetle emergence in the spring, then the beetle population is drastically and dangerously augmented by those beetles bred over winter in stockpiled elm wood (bark intact). Nonetheless, many consider it a waste of the wood resource to make storage requirements as stringent as they are. The biological facts alone support the continued enforcement of these requirements, regardless of criticism.

E. Administrative Costs

Early in the Shade Tree Program, an administrative decision was made to declare ineligible for reimbursement those local program costs not incurred in the direct physical act of tree sanitation and planting. The ineligibility for reimbursement of administrative costs has angered some program managers. If those costs were included in the local program budget, the reimbursement percentages would decrease significantly. In order to have any chance of maintaining a beneficial reimbursement rate, the policy of excluding administrative costs has been upheld.

F. Removal Assistance

It has been determined by plant pathologists that the control of Dutch elm disease in wild or vast areas is largely ineffective and very costly. For these reasons, disease "control" on county rights-of-ways and farmsteads has by and large been ineligible for state funds. The stipulation in the Shade Tree law that residential property larger than five acres be ineligible for inclusion in a state funded control program has been heavily criticized. The provision was meant to deter commercial developers from receiving state assistance for land clearing. The Program has been informed that the provision also deters senior citizens and suburban property owners from receiving assistance for elm and oak removal. It is generally felt that senior citizens on fixed incomes get the rawest shade tree deal of all. These people simply don't have the resources to pay for tree removal and often, since they have held property for so many years, they have the oldest, largest and most expensive trees to remove. Any community can incorporate into its local program tree removal subsidies for senior citizens. Still, this is a costly procedure and communities would like additional state funding to cover the cost of subsidies for senior citizens.

G. 20-day Removal

Many communities found the 20-day removal requirement untenable. The revised rules and regulations proposed by the Department make an effort to accommodate extenuating removal circumstances while remaining biologically sound. Under the new rules, trees would be designated as high risk (50% or more wilted) or low risk and be removed according to a biological timetable.

H. Television

In 1977, television coverage of the Shade Tree Program and of shade tree disease was minimal. On the state level, the Program did offer staff members for interviews although television producers did not always find this situation suited to their purposes. Nonetheless, the Public Information Coordinator did make a number of radio and television appearances. With the production of a professional, original 10-minute film on Dutch elm disease and oak wilt, community involvement and reforestation, television coverage has increased. The film and film clips have been or will be aired on two Duluth television stations, the stations in Fargo, Alexandria, Austin, Mankato and Rochester. Airing in the Twin Cities is being scheduled.

I. Information

It has been difficult to effectively inform the public of what the Shade Tree Program is about. Due to the fact that the Program funds cities which in turn develop and run their own individual local programs, the public cannot be expected to fully grasp the abstract concept of the Program. Public information efforts have thus emphasized education of the public about tree diseases and replanting and although we are not heavily involved in Program promotion, the effort is made to inform citizens that state dollars are available to their communities.

The Shade Tree Program, in the ten months of its existence, has been acutely aware of and responsive to its critics. While problems have not always been solved to a complainant's satisfaction, they have always been investigated. Fortunately, the program's benefits far outweigh its problems.

The following is a representative sample of the reactions recorded by local Program Managers on their year-end reports to the Shade Tree Program.

"The 1977 program served a very good purpose. Our city is a better place to live because of it and will improve as the new trees grow."
(Dakota County)

"The fact that the state gives a subsidy, which we will pass on to the people who cut down their diseased trees, gave us almost 100% cooperation of the populace." (Lincoln County)

"Generally a good program. One very good idea was to allow small cities (under 1,000) to have in-kind contributions from homeowners--our city has no equipment or personnel to remove the trees." (Pipestone County)

"The Shade Tree Program is a tremendous financial help to a municipality." (St. Louis County)

"This was my first year as a full-time inspector and I think the program went well." (Anoka County)



STATE OF MINNESOTA
OFFICE OF THE GOVERNOR
SAINT PAUL

February 25, 1977

RUDY PERPICH
GOVERNOR

Dear Superintendent:

April 29th and the month of May will be officially proclaimed as Arbor Day and Arbor Month in Minnesota. It will also mark the kick-off project for your county's participation in the Governor's Aesthetic Environment Program.

A county coordinator has been appointed in your county who may be of some assistance to you. You may obtain the county coordinator's name along with further details about the program through the Governor's Aesthetic Environment Program, State Capitol, St. Paul, Mn. 55155. The telephone number is (612) 296-3391.

Arbor Day and Arbor Month in Minnesota are serving a particularly important role this year because of the destruction of our urban forests by Dutch Elm disease and other shade tree diseases. If we replant wisely now, we can insure an orderly transition of our urban forests.

I am formally requesting that your elementary schools take appropriate steps to become an official Aesthetic Environment - Arbor Month school. Your participation will qualify you to obtain materials that can be used to make your program highly visible in your community.

Enclosed you will find copies of planting stock and application forms from the Department of Natural Resources. As you will notice, in order to receive the seedlings at no cost to your school, you must order at least 500. There will be a minimal shipping charge which should not exceed \$2.00. In order to use these seedlings wisely, you may wish to share with neighboring school districts. Please move quickly on this pilot program as March 15 is the deadline to insure seedlings will be available in April and May.

We ask that you approach your teachers and charge them with the coordination and educational methods needed to begin this program. Please complete the applications and return them to:

Walter Eisner
Division Plant Industry
Department of Agriculture
St. Paul, Minnesota 55155

Upon your reply, my Aesthetic Environment office will send to your district, materials and an official Governor's pronouncement of your visible participation as an official Aesthetic Environment - Arbor Month school.

Your prompt attention will be greatly appreciated and your participation in improving the visual environment of our state will serve, not only to educate students about our environment, but to improve the natural beauty of Minnesota.

Sincerely,



Rudy Perpich
Governor

Minnesota
Shade Tree Program • Department of Agriculture • 600 Bremer Building • St. Paul, MN 55101 • 612/296 8580

MEMORANDUM

TO : Subcommittee on Environmental Protection
William Luther, Chair

FROM : Jane Meyer, Administrator *JEM*
Shade Tree Program

SUBJECT: Proposed Legislation

DATE : February 14, 1978

Senate File 1476: Establishes priority control areas, provides for neighborhood participation, etc.

The Program has provided the Subcommittee Chairman with a section-by-section analysis of this bill. In brief, it is felt that many of the bill's provisions might be biologically and financially unsound, create increased paperwork (thus costs) for the participating communities and complicate administration and regulation of the Program to such a degree that it could not be handled by the current small number of Program staff.

House *2044*
~~Senate~~ File 1755: Clarifies appropriation language; extends effective date of temporary rules and regulations

Section 1 of this bill would allow administrative work of the Program to continue into 1979. Such work would include making final payments to communities, preparing for new legislation, preparing the year-end report to the Legislature and continuing public education. Section 1 would also allow the Program to fund wood utilization and experimental programs as they arise.

Section 2 allows the Program's temporary rules to remain in effect until the permanent rules are adopted. The present promulgation schedule indicates that permanent rules will be implemented in time for spring beetle emergence (June).

The Department fully supports this Legislation.

Senate File 1814: Provides tax credit for removal, replanting

This bill would not affect administration of or grants made by the Shade Tree Program. The Shade Tree Program would be interested in learning how this bill conflicts, if at all, with H. R. 10218, proposed by Congressman Fraser. Undoubtedly, any direct financial relief to homeowners will be well received.

2 ~~House File~~ 1957
Senate File 1815: Repeals "five acre" language

As the Program understands it, the five acre limitation was included in the original legislation in order to exclude commercial developers from receiving government subsidies for land clearing. This is sound policy. Many communities, however, feel that this limitation imposes a hardship on large property owners on a fixed income, and others in the moderate income range.

Repeal of the five acre limitation does not insure that five acre property owners would receive financial assistance from their cities for tree removal. Local program subsidy decisions are made on the local level.

If a municipality decides to retroactively reimburse the property owners affected by the language of this bill, the state's reimbursement dollars to that municipality would not change. What would change is the way in which that municipality's dollars would be apportioned.

However, should a local unit of government decide to subsidize removal from or replacement on residential property regardless of size, the program costs of that unit of government would increase. Thus, budgets submitted to the Program by these governments would be higher and, under the present system and allocation, reimbursement rates would be lower. This year's reimbursement rate would not be affected because the percentages have already been determined.

3. House File 1840: Applies the 90% reforestation reimbursement to municipalities, not simply towns, with populations under 1,000.

Extending the 90% eligibility to cities of less than 1,000 population might necessitate an additional appropriation. Without an additional appropriation, reimbursement rates for larger cities would drop significantly. If this year's participating cities with populations under 1,000 were reimbursed for 90% of the cost of planting the first 50 trees on public property, the reforestation reimbursement for other cities in the metro area would drop from 28% to 27%, in the nonmetro area from 44% to 26%.

The following, based on reforestation budgets submitted in 1978, is a table showing the number of dollars needed to raise the reforestation reimbursement to larger cities to the indicated percentages. The additional appropriation would offset the effect of 90% reimbursement to cities with populations under 1,000.

Additional Dollars needed to raise reimbursement to:

	<u>Non Metro</u>	<u>Metro</u>
30%	\$ 34,564.80	\$ 115,982.90
35%	\$ 89,760.06	\$ 376,222.80
40%	\$144,955.31	\$ 636,462.84
45%	\$200,150.56	\$ 896,702.81
50%	\$255,345.82	\$1,156,942.00

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It should be borne in mind that many small cities, anticipating the higher reimbursement, might wish to increase their budgets. This, too, would necessitate a larger appropriation.

The Subcommittee Chairman has received from the Program a detailed analysis of this proposal.

4B House File 1959: Extends the assessment of special levies and increases appropriation

Special levies are generally assessed in times of unanticipated or special fiscal need. If indeed the financial requirements of a local shade tree disease control program are considered special, then to allow continued use of special levies seems a sound policy. At this time, the Program does not know how many cities use the special levy. Such a policy would have no direct impact on the grants made by and administration of the Shade Tree Program.

Below is a table indicating reimbursement percentages for 1977 and 1978:

<u>Metro Area</u>		<u>Non-Metro Area</u>	
1977 Sanitation	37%	1977 Sanitation	45%
1977 Reforestation	48%	1977 Reforestation	33%
1978 Sanitation	28%	1978 Sanitation	44%
1978 Reforestation	28%	1978 Reforestation	44%

(By law, the maximum reimbursement percentage is 45% for sanitation and 50% for reforestation)

The cost of shade tree disease control is soaring. In the metro area sanitation budgets increased 34% over the 1977 budgets; 1978 reforestation budgets are 88% higher than last year's.

In order to boost this year's reimbursements to their maximum percentages, approximately an additional 5.7 million dollars would be needed (\$5.5 in the metro area, \$200,000 in the non-metro).

The Twin Cities area would be the primary beneficiary of an additional appropriation. The non-metropolitan area is already close to the legal maximum.. The Program has worked long and hard to earn the trust of the non-metropolitan communities in this state who feel Shade Tree legislation is aimed to assist the Twin Cities area. The charge "you didn't boost our money when we got only a 33% reimbursement for reforestation in 1977" would certainly be leveled.

An additional appropriation, while of obvious benefit to many of its recipients, carries with it potential legal and administrative ramifications.

Here's some background. Before any money is expended, the state and the receiving community enter into a contract which specifies the reim-

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bursement percentage which the state is obligated to pay and a dollar amount that cannot be exceeded. The communities are aware of their awards and contracts are being processed. Increased funding would necessitate extensive legal review of each contract and further negotiation with each participating community.

Meanwhile, the encumbrance and payment mechanisms would be delayed. New accounts for each of the five hundred forty-one participants would have to be set up; payments to communities would be delayed by weeks, if not months.

I. Legislative update

The following changes and additions were made to the Shade Tree Law of 1977 by the 1978 Legislature:

A. Municipalities may provide subsidies to an additional group of people and be reimbursed by the State. In addition to owners of private residential property of five acres or less, municipalities may provide subsidies to owners of property used for a homestead of more than five acres but less than 20 acres.

B. The special levy authority was extended, enabling municipalities to exceed the tax levy limitations for shade tree disease control activities. The extension allows cities to levy in 1978, payable in 1979.

C. The Department of Agriculture, in cooperation with the Minnesota Energy Agency, will report to the Legislature on the potential uses of diseased elm and oak wood, including its use as an alternate energy source.

D. The Department's temporary rules for the Shade Tree Program were extended until permanent rules are promulgated later this spring.

E. The appropriations language was clarified so that only the monies for sanitation and reforestation grants need be divided evenly between calendar years 1977 and 1978.

II. Proposed changes in the rules

The major changes in the rules as proposed are as follows:

A. Elm trees infected with Dutch elm disease will be categorized as either "high risk" or "low risk" trees. Each category is specifically defined and treated as follows:

1. A high risk tree is one that is dead, barren or has extensive wilt (30% or more of the tree is wilted).
2. High risk trees must be marked in a distinctive manner no later than June 25.
3. All high risk trees on public property must be removed within 20 days of identification; such trees on private property must be removed within 20 days of notification of the property owner.

4. A low risk tree is one that at no time during the growing season becomes dead, barren or more than 30% wilted.
 5. Low risk trees shall be removed after the removal of all high risk trees.
 6. Such removal shall be conducted according to a schedule submitted to the Commissioner and shall be completed prior to April 1 of the following year.
- C. Elm logs with bark intact may only be stored during the period September 15 through April 1 of the following year and only at locations specifically approved by permit or ordinance of the municipality.
- D. Request for payment forms are due 45 days after the close of the preceding payment period unless an extension of time has been requested and received.
- E. Municipalities may receive reimbursement for personnel funded by CETA.



minnesota
Shade Tree Program • Department of Agriculture

SHADE TREE PROGRAM MANUAL

OCTOBER, 1977

INTRODUCTION

In 1978, the Shade Tree Program encouraged and received widespread participation in its new grants-in-aid program for shade tree disease control.

Reimbursements totalling thirteen million state dollars were made to 571 Minnesota communities throughout the state.

In the upcoming second year of the program, we hope to increase the number of participating communities. Control programs run within state guidelines are highly effective. The more Minnesota communities implementing such programs, the better chance we have to preserve the beauty of Minnesota's environment.

This program manual is designed to help you formulate your community's shade tree disease control program in order to be eligible for state funds.

It should be noted that the official, permanent rules and regulations of the Shade Tree Program have not yet been promulgated. That process should be complete by January. At that time, we will provide you with your copy of the permanent rules. Until then, you may request a copy of the emergency rules (under which we are now operating) or you may feel free to call this office for any clarification of the regulations.

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THE SHADE TREE GRANTS-IN-AID PROGRAM OVERVIEW

What the Shade Tree Program is

The Shade Tree Program is a \$26 million grants-in-aid program to assist Minnesota municipalities in paying for their local shade tree disease control programs. The Program is administered by the Minnesota Department of Agriculture (MnDA) and will be in effect until December 31, 1978.

Why it is

During the past several years, oak wilt and Dutch elm diseases have been spreading rampantly throughout most of the State of Minnesota. As the diseases spread, the number of trees that die increases. With the loss of the trees comes the loss of natural sources of air filtration, noise abatement and temperature regulation, not to mention environmental beauty.

Removal of dead, dying and diseased trees is the surest, most cost-effective means of slowing the spread of shade tree diseases and thus preserving the benefits of shade trees.

Dead, dying and diseased elms must be removed because they provide a breeding site for the beetles that spread the disease. By removing a breeding site, we reduce the beetle population. A smaller beetle population lowers the incidence of the disease.

Dead, dying and diseased trees left standing pose a threat to life and property. Unless these are removed promptly, dead, dying and diseased trees become weakened and may fall.

While it is true that most of our elms are going to die eventually, studies have shown that when removal costs are spread over a number of years, these costs are lower than when mass removal is undertaken when all the trees are dead. Inflation alone would account for higher costs in later years.

Even though an on-going removal program is less expensive than a delayed one, it still costs money.

The 1977 Minnesota Legislature decided that due to the fact that shade trees are one of the state's great natural resources and that shade tree diseases strike a community regardless of its wealth, the state should help local governments defray the costs of municipal shade tree disease control programs. For the years 1977-1978, the Legislature has made available nearly \$22 million for diseased tree identification, removal and disposal efforts.

In order to ensure that once removed, trees are replaced, the Legislature allocated state funds to help local governments defray the costs of reforestation. For this purpose, there is over \$4 million available over the two-year period 1977-1978.

Where the Shade Tree Program is in effect

Any township, city or county within the State of Minnesota may implement a shade tree disease control program and may be eligible for state funds.

In 1977, the first year of the statewide program, 571 Minnesota communities from Rochester to Roseau participated in the Program.

Who benefits from the Shade Tree Program

Everyone can benefit from the dollars available through the Shade Tree Program from the individual, to the small town, to the county. It should be remembered that shade tree diseases are a shared problem to be dealt with on a cooperative basis. Therefore, the Shade Tree Program is a cost-sharing program stressing local initiative.

The available state funds help local communities run more comprehensive shade tree programs than might have been possible without state aid. This is especially true of those towns with populations under 1,000 which receive special financial considerations under the law.

The state money directly benefits the local unit of government responsible for removal and disposal of trees on public property. The state will pay the unit of government a percentage of the costs incurred by that unit of government in the removal and disposal of diseased, dying and dead shade trees. Although the state money goes directly to the local unit of government managing the program, the private property owner can benefit, too.

Homeowners, private property owners, senior citizens on fixed incomes can benefit from the state dollars when the local unit of government includes in its program budget one or more of the assistance options available under the state shade tree law. The local government can be reimbursed by the state for a portion of the assistance it gives its residents. In this fashion, everyone benefits.

GRANTS FOR SANITATION AND REFORESTATION

What is available

Thirteen million dollars (\$13) in grant funds is available in calendar year 1977 and thirteen million dollars (\$13) in grant funds is available in calendar year 1978. Two thirds of the available dollars must be spent in the seven county metropolitan area and one-third of the available dollars is to be spent in the non-metropolitan regions.

The Shade Tree law authorizes the MnDA to pay a percentage of the total sanitation (removal, disposal) costs of each program participant, not to exceed 45%. The law also authorizes payment of no more than 50% of each participant's reforestation costs. The percentages to be paid each participant in 1978 will be determined by ADDING the total budgets and then DIVIDING that sum into the total available state dollars. Each participant will receive the same percentage reimbursement.

Who may participate

Local governmental units having municipal powers may participate in the grant program, as may county governments. Townships lacking municipal powers may participate as part of the county's program, with the county designating the townships as part of the county's control area.

What you need to participate

In order to be eligible to receive grant funds, a governmental unit must:

- (1) HAVE A CERTIFIED TREE INSPECTOR (any city/county official or other resident may be provisionally appointed by the appropriate city official as a local tree inspector. Once appointed, an inspector must take, within six (6) months, the Minnesota Department of Agriculture's Tree Inspector Test and become certified by the Department.)
- (2) HAVE A WELL-DEFINED CONTROL AREA (local control area may be defined as any property within the local government's boundaries though not necessarily the entire area within the government's bounds. River bottoms or islands, wood lots and farmsteads are customarily excluded from control areas. See Regulations, page).
- (3) HAVE AN APPROVED CONTROL PROGRAM (See Regulations, page).

How to apply

Each applicant must submit to the Shade Tree Program office a program description which shall include who is responsible for tree removal and disposal, how these activities are being financed, etc. (More details, see Regulations, page).

Once a governmental unit has met the requirements outlined above and detailed in the Regulations Section (Appendix A) of this manual, it must submit a completed application form to the Shade Tree Program by a specified date. This year, applications must be submitted by November 15, 1977 in order to qualify for the grant funds available in 1978.

The applicant must supply the following information on side one of the

application form:

- (1) Name and address of the Program Manager, Fiscal Agent (person to whom grant funds should be mailed) and Tree Inspector.
- (2) An estimate of the number of elms and oaks on public and private property within the boundaries of the control area.
- (3) An estimated budget for the community's 1978 sanitation program (marking, removal and disposal of diseased trees) and reforestation program (planting shade trees on public property). The budget projection must be for the entire calendar year and must include the anticipated state dollars. Note: Itemized accounts of city/county expenses incurred in carrying out shade tree disease control and reforestation activities should be kept separate from regular accounting records. By law, these records must be made readily available to state auditors.
- (4) A description, in detail, of the community's 1978 control and reforestation program.

Side two of the application form contains a contract that must be signed by two officials who are authorized to enter into contract. It is preferable that the contract be signed by the mayor and city clerk of a municipality. The contract, between the applicant and the MnDA's Shade Tree Program, authorizes the Department to establish an account in the applicant's name and provides that the applicant shall conform to the pertinent rules and regulations of the Department.

Application review and approval

The Shade Tree Program's Grants Analyst and Regulatory Staff will review each application.

- If the community's proposed program is approved,
- If the estimated budget is reasonable,
- If all appropriate authorities have been named, and
- If appropriate signatures are affixed,

then final approval is given and an account is established in the applicant's (local governmental unit's) name. Once the account is established a notice of the amount of the grants (awards) is sent to each participant. The notice advises each participant of the reimbursement percentages for sanitation and reforestation and of the total dollar amount in the account. The amount in the account is the sum available for reimbursement of costs incurred. Any portion of this sum not expended in the calendar year will not carry over for use in the next year.

The participating unit of government receives, on a quarterly basis, reimbursement funds for the actual costs it incurs in that period. The funds are paid from the participants established account. The reimbursement funds are payable upon receipt by the Shade Tree Program of a REQUEST FOR PAYMENT (RFP) FORM.

When and how to fill out the RFP

RFP's submitted for 1978 funds are due on the 15th of the month following the end of each quarterly payment period. Payment from the MnDA Shade Tree Program can be expected within three to four weeks.

For 1978 funds, RFP's are due on:

April 15, 1978
July 15, 1978
October 15, 1978
January 15, 1979

The following information must be supplied with each RFP:

(Direct salary reimbursement)
LABOR: List only city/county employees engaged in the direct physical - at going performance of approved shade tree disease control or replanting % activities. It is not necessary to list employees by name. List individual job titles or activities performed. For example: Tree inspector, tree trimmer.

Do not list clerical or administrative personnel as these salaries are not eligible for reimbursement. NO ADMINISTRATIVE costs are allowable for REIMBURSEMENT. No salaries, no clerical equipment costs, no postage costs, no administrative fees, no publications costs, etc. are allowable. Do not list labor costs incurred by an outside contractor as these costs should be reflected in the contract amount.

EQUIPMENT USE: List only city/county equipment engaged in the direct physical performance of approved shade tree disease control or replanting activities. List each type of unit used, the hourly or per mile allowance as specified on the EQUIPMENT ALLOWANCE SCHEDULE (see Appendix B), and the total hours or miles the unit was engaged in the shade tree activities during the quarter.

Do not list equipment used by a private contractor hired by the city/county as these costs should be reflected in the contract amount under OUTSIDE CONTRACTS. Do not list equipment rented by the city/county. Rental equipment should be listed as an outside contract.

OUTSIDE CONTRACTS: List all contracts between city/county and parties other than the city/county for the direct physical performance of shade tree activities such as tree trimming, tree removal, tree disposal and tree planting. List all contracts for equipment rented by the city/county. List any contracts with nurseries for the purchase and/or planting of trees.

Contracts between private homeowners and private contractors should NOT be listed under outside contracts. In cities of less than 1,000 population, contracts between contractor and homeowner are listed as IN-KIND CONTRIBUTIONS.

IN-KIND CONTRIBUTIONS: In-kind Contributions are out-of-pocket expenses incurred by persons or parties other than the city/county in the performance of approved shade tree disease control or replanting activities. In-Kind Contributions listed must be documented by actual receipts obtained from persons or parties actively engaged in the provision of specific goods and services related to shade tree disease control and replanting.

* In-Kind Contributions may be part of a municipality's shade tree program only if that municipality's population is less than 1,000 (by the 1970 census).

ALLOWABLE MISCELLANEOUS EXPENSES: Allowable expenses which should be listed under miscellaneous are those for expendable supplies such as Vapam, chain saw chains, chain saw blades, shovel handles, paint, stakes, twine and any other supplies actually used in the direct physical performance of shade tree disease control and replanting activities.

If a municipality has a policy of providing payments to private homeowners to help defray their tree removal costs, these subsidy payments are eligible miscellaneous costs of the shade tree program. A statement of the subsidy policy should be provided, together with the total amount of subsidy payments made. Complete records should be kept on file by the city/county listing properties, total costs of work done and amount of subsidy provided in each case.

A municipality may finance a portion of its costs through special assessments. Special assessment is the process by which (1) the city/county incurs the initial cost of removal of trees on private property or boulevard property and (2) applies to the State for reimbursement of a portion of total costs. The city/county may then assess the remaining cost or a portion of the remaining cost against the property owner. A statement of the assessment policy must be provided together with the total costs against which assessments will be made and the total amount of the assessments. Complete records should be kept on file by the city/county listing properties, total cost of work done on each property, amount assessed against the property owner in each case.

Statements of the subsidy policy and/or assessment policy should be attached to the REQUEST FOR PAYMENT form. The total amount of SUBSIDY payments should be INCLUDED in the MISCELLANEOUS total. Total costs to be financed through assessment should be listed BELOW MISCELLANEOUS on the sanitation side of the form.

ADVANCE PAYMENT: The same form may be used to report actual costs for the payment period just completed and estimated costs for the new period, if an advance payment is requested. Communities which request advance payment will receive the designated percentage of actual costs AND the same percentage of estimated costs. To request an advance payment indicate "yes" on the form and make an estimate of total costs for the quarter. Any overpayment by the state for a single quarter will be adjusted on the following quarter. Overpayment made in the final quarter of the year must be paid back to the state as soon as possible.

TREES PLANTED: Please indicate the number of trees planted in each quarter. this number should be listed on the replanting side of the form below MISCELLANEOUS.

7

NOTARIZATION: It is imperative that the costs claimed on the REQUEST FOR PAYMENT form be certified to be eligible for reimbursement. Please have the form notarized before submitting it to the Department.

SPECIAL INFORMATION FOR COMMUNITIES WITH
A POPULATION UNDER 1,000

- Townships with a population under 1,000 that participate in the program can be reimbursed for 90% of the cost of planting the first fifty (50) trees on public property.
- If a governmental unit under 1,000 does not have municipal powers, it can participate in the Shade Tree Program if it's county designates it as part of the county's control area.
- Any governmental unit with a population under 1,000 participating in the Program can be reimbursed for "in-kind contributions." These "in-kind contributions" are the out-of-pocket expenses incurred by persons or parties other than the unit of government or the county in performing shade tree disease control and/or replanting activities. Bona fide receipts certifying the cost of such activities must be kept on file and available for review.

Purpose of Regulatory Program

Rules and regulations adopted by the Commissioner of Agriculture (Minnesota Statutes 18.023, Regulations AGR 101-106) provide guidelines by which diseased shade trees must be removed or treated (root graft elimination, specifically) within an established period of time. Failure to comply with these rules and regulations will bring about recommended legal action against those violators of this program.

Duties of Regulatory Personnel

Those people who constitute the regulatory staff of the Minnesota Department of Agriculture's Shade Tree Program will be responsible for enforcing the rules and regulations which pertain to the treatment and/or removal of diseased shade trees. Regulatory personnel will work closely with the certified tree inspectors within their appointed territories. It will be the duty of this regulatory staff to determine whether or not the municipality is upholding the diseased shade tree rules and regulations, and to recommend whether or not legal action should be taken against the violators of these rules and regulations.

In carrying-out their duties, the regulatory personnel refer to terms which need to be defined if they are to be understood by representatives of the municipality.

Disease Control Program

This term refers to the plan that each municipality submits to the Shade Tree Program, describing in detail the ways in which the shade tree diseases are handled in their area. This program description includes the designated disease control area of the municipality, how the municipal tree inspector handles disease tree surveys, how diseased trees are being removed within the municipality - whether city crews are used or whether private contractors are hired - the method of tree disposal which is being used, and where and how new trees are being replanted. Information on whether or not the municipality has initiated a program to disrupt root grafts, or whether or not the municipality has initiated a program to trim out infections caused by Dutch elm disease or oak wilt disease should also be included in the program description. The manner in which the municipality is arranging to finance the removal of diseased shade trees is an essential part of a complete control program and should be included in the program description. It is not necessary that these control program descriptions be long, but they should be as concise and complete as possible.

Shade Tree Disease

Dutch elm disease caused by Ceratocystis ulmi, or oak wilt disease caused by Ceratocystis Fagacearum.

Disease Control Area

An area designated by a municipality in which it will conduct a shade tree disease control program according to the rules and regulations of Minnesota Statutes 18.023. The extent of this control area will be determined by the municipality with final approval being given by the

Commissioner of Agriculture.

Tree Inspector

A person who has the necessary qualifications to properly plan, direct, and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the limits set by the Commissioner of Agriculture.

Disease Tree Survey

Each municipality shall make and record a reasonable estimate of diseased elm and oak trees within their control area at least twice during the growing season (by June 15 and August 15). These records will be reported to the Minnesota Department of Agriculture's Shade Tree Program.

GRANTS FOR WOOD WASTE UTILIZATION AND DISPOSAL

What is available

Five hundred fifty thousand dollars (\$550,000) is available through 1978 for grants to municipalities and counties for wood waste utilization projects.

What it is for

Grants for wood utilization may be less than but shall not exceed 50% of the cost of the wood utilization or disposal system, the wood waste facility or the wood waste equipment.

The purpose of the wood waste utilization and disposal program is to assist interested parties in Minnesota to identify potential uses of elm and oak wood and to financially assist eligible units of government in the acquisition or implementation of systems for utilizing or disposing of wood.

A wood utilization or disposal system is one used for the removal and disposal of diseased shade trees. This includes the collection, transportation, processing or storage of wood. The system aids in the recovery of materials or energy from diseased wood.

Wood waste utilization and disposal systems require equipment. "Equipment" means machinery or devices which singly or in combination are designed, constructed and operated for the purposes of wood utilization and/or disposal. Such equipment, along with all machinery, tools and devices ancillary to the use of it, is part of the total system and, under the law, an expense that may be partially paid by the state.

The lands, buildings and other appurtenances necessary or useful to the operation of wood waste utilization or disposal equipment (the "facility") are also part of the total system.

Who may apply

A municipality having an approved disease control program may apply. Any governmental unit or combination of units in the metropolitan area having more than 40,000 population may apply. Any special purpose park or recreation area organized under the charter of a city of the first class or any non-profit corporation serving a city of the first class may also be eligible to receive wood waste funds.

In the non-metropolitan area a city of more than 20,000 population or a combination of governmental units having a combined population of more than 20,000 under a joint powers agreement, may be eligible to receive grant funds under this program.

How to apply

Interested units of government may write or telephone the Program staff regarding the possibility of receiving state funds for wood waste utilization projects.

Those interested will receive appropriate forms and instructions for applying for the state funds. The Program's utilization specialist is available to assist applicants in making preliminary application for funds. Preliminary applications are reviewed and the grantee is advised, in writing, of any changes or further information which may be required before the grant can receive final approval.

Once the application is approved, the grantee is notified of the grant award by letter. A formal contract between the State of Minnesota Department of Agriculture and the Grantee is sent along with the award letter. This contract must be signed by the appropriate authorities, on behalf of the Grantee and the State of Minnesota. The Grantee is then obligated to fulfill the terms of the application which are binding under the contract.

Application review and approval

The utilization specialist makes constant review of the specific requests or grantees and consults with experts in the field to determine whether requests are feasible and/or justified under the program.

The Grant Award

To receive the actual grant award, a grantee must submit to the State a) a request for payment, b) an itemized list of the total expenditures for qualifying equipment and/or site acquisition paid by the Grantee, and c) such additional supporting documentation as purchase orders, invoices, warrants, or other information deemed important by the Department. Grants-in-aid shall not be paid until certified evidence of actual costs is received by the Department. Provided these conditions are met, reimbursement of not more than 50% of total expenditures shall be made to the Grantee.

Record keeping

Applicants receiving grants-in-aid under this program must keep detailed records concerning the operation of the wood disposal and utilization project. These records must be made available to the State Auditor or Commissioner of Agriculture on request, and must include relevant information regarding operation of the facility, facility clientele, volume of wood handled, and any other information deemed relevant by the Commissioner.

Annual report

An annual report must be filed with the Minnesota Department of Agriculture on or before December 1 of each year. This report must contain information regarding hours of operation, clientele served, volume of wood handled, and any other information deemed relevant.

EXPERIMENTAL GRANTS PROGRAM

What is available

The shade tree legislation provides \$400,000.00 to be expended by the Shade Tree Program for "...experimental programs for sanitation or treatment of shade tree diseases."

What is it for

The objective of the experimental grant program is to establish and evaluate the effectiveness of various types of shade tree disease sanitation methods and treatment programs and combinations of control practices for use in Minnesota. This includes research to assist municipalities in establishing priority areas in an approved disease control program.

Who may apply

All Minnesota municipalities and counties may submit proposals for experimental program grants. In addition, the Department of Agriculture may enter into contracts with municipal, state or federal agencies. The University of Minnesota is also eligible to submit proposals to the state for these funds.

How to apply

Any city/county/agency with an idea or suggestion must submit to the Shade Tree Program a proposal outlining the intended experimental program. The proposal must include detailed information on all aspects of the experimental program, such as how the experiment is to be conducted, how the results are to be evaluated, and what the estimated costs will be.

Proposal Reviewal Procedures

All proposals will be evaluated using the following criteria:

- (1) General applicability - proposed sanitation and treatment programs should not be limited in their application to a single community or county, but should be applicable in other parts of the state;
- (2) Contribution to the overall State Shade Tree Program - proposed programs will be considered for their ability to enhance those shade tree disease control programs already established;
- (3) Cost-effectiveness - proposed programs will be evaluated for their potential effectiveness given the cost of implementing the program;
- (4) Ability of the "proposer" to provide the necessary evaluation - the capability of the "proposer" to reliably interpret and evaluate the results of the experiment will be considered.
- (5) The proposed program must lend itself to experimental design and evaluation;
- (6) Use of existing staff - proposed programs should operate with a minimum number of additional staff required for the project;
- (7) Limited purchase of equipment - program proposals should involve limited equipment purchases.

Each experimental proposal will be reviewed by a panel whose members have biological, administrative and/or program evaluation backgrounds. The proposing city/county/agency will present its program before the review panel to answer specific questions regarding the project. The review panel will make recommendations to accept, reject or to solicit additional information. The final decision concerning experimental program grants rests with the Commissioner of Agriculture or his designee.

PUBLIC EDUCATIONWhat it is

It is generally agreed that a well-informed citizenry is an essential element of a successful shade tree disease control program.

Therefore, the public education section of the Shade Tree Program aims to provide the citizens of Minnesota with information about Dutch elm and oak wilt diseases and their control. The information which stresses, but is not limited to, the citizens' role and responsibility in shade tree disease control, is available in a variety of forms in order to appeal to the greatest number of people.

What is available

Shade tree information materials available from the Shade Tree Program office include:

Print Material

- Ag Extension Service pamphlet #310, "Oak Wilt Disease"
- Ag Extension Service pamphlet #211, "The Dutch Elm Disease"
- Ag Extension Service Tree Line No. 6 "Dutch Elm Disease Detection"
- Ag Extension Service Tree Line No. 2 "Shade Trees East Central Minnesota"
- Ag Extension Service Tree Line No. 7 "Shade Trees for Southeastern Minnesota"
- Shade Tree Program pamphlet "Watch out for Shady Characters... And We Don't Mean Your Trees": a service to consumers warning of get-rich-quick schemes.

Your county Agricultural Extension Service Agent has the same materials and more on the scientific and technical aspects of the diseases, their control, wood disposal and utilization.

Visual Material

- Numerous slides depicting disease symptoms, elm bark beetles
- By December, a 12 minute film on oak wilt and Dutch elm diseases and community involvement

The Mobile Education Trailer

- The trailer is 30 feet long and 8 feet wide and contains mini-slide shows depicting the spread of shade tree diseases throughout the state, the devastating effect of the diseases, the symptoms of the diseases, effective control measures. There is also a display of recommended trees for replanting in Minnesota.
- The trailer is scheduled to appear in a few localities but many dates are still open. If you would like the trailer to appear in your community, contact the Program office.

Whenever possible, Shade Tree Program representatives will participate in community meetings and school programs on shade trees at your request. The Program will, from time to time, hold regional information meetings. Staff members will also be making appearances on local radio and television programs in hopes of spreading the word about shade tree

disease control and reforestation.

Whom to Contact and How

Inquiries relating to the mobile educational trailer, film, slides, pamphlets and public education in general should go to:
Public Information Coordinator, 600 Bremer Building, St. Paul, Minnesota
55105, 612-296-8580.

The coordinator should be contacted when you wish a speaker for a local event. The Shade Tree Program staff includes grants analysts who are available to speak to groups of local officials who wish to participate or are participating in the Program, and a plant pathologist and two entomologists who are available to speak to groups on the more technical aspects of shade tree diseases. The public information coordinator is available to speak about community involvement in shade tree disease control and most other aspects of the state's Shade Tree Program.

RULES AND REGULATIONS OF THE DEPARTMENT OF AGRICULTURE
PART A, CHAPTER 4, REGULATIONS AGR 101 - 106

Agr 101 Purpose: It is the purpose of the rules and regulations contained herein to carry out and enforce the provisions of Minnesota Statutes 1974, Section 18.023, as amended by Laws 1975, Chapter 253. The rules relate to the control of Dutch elm disease and oak wilt by local units of government and include procedures and criteria for two grants-in-aid programs.

Agr 102 Definitions: As used in this regulation, the following words and terms shall have the meaning given.

(a) "Shade tree" means any oak or elm tree situated in a disease control area approved by the commissioner.

(b) "Shade tree disease" means Dutch elm disease caused by Ceratocystis ulmi, or oak wilt disease caused by Ceratocystis fagacearum.

(c) "Commissioner" means the commissioner of agriculture. (Minn. Stat. Sec. 18.023, Subd. 1)

(d) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver. (Minn. Stat. Sec. 18.023, Subd. 1)

(e) "Municipality" means any city or any town exercising municipal powers pursuant to Minnesota Statutes, Section 368.01, or any general or special law, located in the metropolitan area, or any special park district as organized under Minnesota Statutes, Chapter 398, or any special purpose park district organized under the city charter of a city of the first class located in the metropolitan area, or any county in the metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers and any municipality or county located outside the metropolitan area which makes request to and has consent of the commissioner to come within the provisions of this section. (Minn. Stat. Sec. 18.023, Subd. 1)

from estimates of tree numbers outside of control areas. These records shall be permanent and shall be reported to the Department of Agriculture.

(2) Dutch elm disease control shall include the following:

(aa) Sanitation. Sanitation is the major element in any Dutch elm disease control program and is essential for the elimination of elm bark beetles, diseased trees, and dead or weakened elm wood arising from any cause. This must include trees on private property.

(i) Prior to April 15, each municipality shall annually inspect all public and private properties for elm wood or logs that could serve as bark beetle breeding sites and require removal, or debarking if wood is to be retained. Before making any inspections on private property within a municipality, it shall be the duty of the municipality to attempt to give notice of said inspection to all affected residents either through individual, oral or written notice or by publishing said notice in a local newspaper.

(ii) Each municipality shall inspect all elm trees within a control area at least twice during the growing season (by July 1 and August 15) for Dutch elm disease symptoms.

(iii) After notification by the municipality, private property owners shall remove and properly dispose of diseased or dead elm trees or any above ground parts thereof within 20 days in accordance with prescribed methods approved by the commissioner and consistent with applicable air quality and solid waste regulations.

(iv) Trees or parts thereof not removed within 20 days of such notification shall be removed by the municipality and the costs thereof shall be assessed against the property.

(bb) To control overland spread of the disease, a municipality shall do the following:

(i) Avoid pruning or other mechanical damage during the most susceptible period in May and June. Use tree wound dressings if wounding is unavoidable during susceptible period.

(f) "Tree inspector" means a person who has the necessary qualifications to properly plan, direct and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the limits of all tree disease in one or more governmental subdivisions within the limit of all commissioner.

(g) "Disease control area" means an area approved by the commissioner within which a municipality will conduct a shade tree disease control program. (Minn. Stat. Sec. 18.023, Subd. 1)

(h) "Disease control program" means the municipal plan as approved by the commissioner to control shade tree disease. (Minn. Stat. Sec. 18.023, Subd. 1)

(i) "Subsidy Program" means a municipal program of financial assistance to private, residential property owners for the removal of diseased elm and/or oak shade trees.

(j) "Wood utilization or disposal system" means a system used for the removal and disposal of diseased shade trees which includes the collection, transportation, processing or storage of wood and which aids in the recovery of materials or energy from wood. (Minn. Stat. Sec. 18.023, Subd. 1)

(k) "Equipment" means machinery or devices which singly or in combination are designed, constructed and operated for the purposes of wood utilization and/or disposal and shall include all machinery, tools and devices ancillary to the use of such machinery or devices.

(l) "Facility" means land, buildings, and other appurtenances which are necessary or useful in the operation of wood utilization or disposal equipment.

Ag 103 Tree Inspector Employment and Qualifications

(a) A municipality will employ or retain on a continuing basis a tree inspector as provided by Minnesota Statutes, Section 471.59.

(b) Provisional appointments

(1) A municipality may provisionally appoint a tree inspector for a period of not more than six (6) months.

(2) This appointment is dependent on approval by the commissioner after determining the competence of the appointee.

(3) The provisional appointment cannot be extended and the appointee must either pass the tree inspector examination or successfully complete the next training course approved by the commissioner to be certified as a tree inspector.

(4) The provisional appointment may be withdrawn for cause by the commissioner upon notice and hearing.

(c) A tree inspector must be able to demonstrate the following qualifications:

(1) Identify all native tree species common to his work area, with or without leaves, and all felled or down trees with bark intact.

(2) Distinguish oak wilt and Dutch elm disease from all other tree problems of oak and elm.

(3) Know the proper method of collecting samples for disease diagnosis.

(4) Know and understand the biology of oak wilt and Dutch elm disease.

(5) Know the appropriate Minnesota laws and rules and regulations relative to oak wilt and Dutch elm disease.

(6) Know the approved control methods for oak wilt and Dutch elm disease.

(d) If a municipality fails to appoint a tree inspector an appointment may be made by the commissioner pursuant to Minnesota Statutes 1974, Section 18.023. Ten working days prior to such appointment, the commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the commissioner shall be paid by the municipality for a minimum of 90 days even though the municipality may appoint their own inspector prior to the expiration of 90 days. This provision shall not apply to an inspector whose employment is suspended or terminated for cause.

Agr 104 Certification of Tree Inspector:

(a) Certification of tree inspectors shall be accomplished by their

passing an examination prescribed by the commissioner for the purposes of determining that the applicant possesses the necessary qualifications. Each applicant shall be notified by the commissioner by mail of the time and date of such examination. The applicant and the employing municipality will be notified of the results of the examination within 15 days.

(b) After certification, a tree inspector shall be required to attend annually at least one program of continuing education as approved by the commissioner. Failure to attend such programs as required may be grounds for revocation, Termination, or suspension of certification.

Agr 105 Decertification of Tree Inspectors The commissioner may upon notice and hearing decertify any tree inspector for cause as provided in the law.

Agr 106 Shade Tree Disease Control Program The tree disease control program of all municipalities affected by these regulations shall include as a minimum the following elements:

(a) Control area. Each municipality shall designate and submit for approval by the commissioner a disease control area.

(b) Program plan. Each municipality shall prepare a tree disease control program plan that details the manner in which these regulations will be fulfilled.

(c) Methods of identifying diseased shade trees. Diseased shade trees will be identified by generally accepted field symptoms such as wilting, or yellowing of leaves, or staining of wood under bark. Confirmation when determined to be necessary, will be made by the Minnesota Department of Agriculture tree disease laboratory, or other laboratory recognized by the commissioner.

(d) Dutch elm disease and oak wilt control:

(1) Tree inventory. Each municipality shall make a record a reasonable estimate of elms, oaks, and other tree species on both public and private property within the municipality. Estimates of tree numbers may be made by acceptable forest inventory procedures. Control areas shall be designated with estimates of tree numbers within control areas recorded separately

(ii) Girdle diseased trees as soon as they are detected to reduce spore mat formation. Chemical or mechanical root disruption shall precede girdling if root graft spread is likely to occur.

(iii) Eradicate or destroy the following diseased oaks: northern red oak, Quercus rubra northern pin oak, Quercus ellipsoidalis; black oak, Quercus velutina; and scarlet oak, Quercus Coccinea; in accordance with prescribed methods approved by the commissioner and consistent with applicable air quality and solid waste regulations.

(e) Records. Shade tree disease program records shall be kept by each municipality and be available for examination at any time by the commissioner. A yearly report of the summation of these records shall be made to the commissioner by December 1 and this report shall include the following:

- (1) Monies expended on personnel, equipment, and contracts, listed separately.
- (2) Man hours spent on tree inventory, sanitation, and any chemical control measures.
- (3) An initial inventory of trees.
- (4) Number of samples submitted for diagnosis and the results.
- (5) Number of diseased trees identified.
- (6) Number of removal notices issued for the diseased trees located on private property.
- (7) Number of trees removed, both diseased and others.
- (8) Number of notices issued for removal of wood which may be a hazard in the spread of a shade tree disease.

(f) Program review.

(1) By January 1 of each year, municipalities shall submit their shade tree disease control program plan to the commissioner for review to determine if it meets the requirements of the law and any applicable rules and regulations.

(2) The commissioner shall complete this review and notify the

(3) Final determination of municipal program compliance with these rules and regulations shall rest with the commissioner.

(4) The commissioner may require changes or improvements anytime he determines such changes or improvements are needed to any municipal program to comply with these rules and regulations.

APPROVED REMOVAL AND WOOD DISPOSAL PRACTICES

Agr 106 (d), (2), (iii) - Elm wood removal and disposal.

1. Elm trees, public and private, diagnosed positive for Dutch elm disease by either field or laboratory methods should be promptly marked and removed within twenty (20) days after notification. This twenty (20) day period applies equally to elm trees marked for removal on public property.
2. Elm trees on public and private property that are dead, dying or weakened, with bark intact, pose a threat to healthy elms by providing breeding places for elm bark beetles. Such trees should be marked and removed within twenty (20) days after notification. This twenty (20) day period applies equally to elm trees marked for removal on public property.
3. If there are healthy elms within fifty (50) feet or less of an elm diagnosed positive for Dutch elm disease, a Vapam treatment to prevent disease spread through root grafts should be applied as soon as possible. It is advisable to apply Vapam treatment to suspect trees that show typical Dutch elm disease symptoms without waiting for laboratory confirmation. Trenching is also an acceptable method for root graft control.
4. Tree stumps should be removed or debarked to the ground line to eliminate elm bark beetle breeding sites.
5. Elm wood (logs, branches, bursh, etc.) must be removed to disposal sites promptly for processing to render the wood pest-risk free. Acceptable methods include debarking, chipping, burying, or burning consistent with applicable air quality or solid waste regulations. Such processing must be completed within 72 hours of delivery to the disposal site. Processing should be done preferably within 24 hours.
6. Completely debarked elm logs or lumber are safe for local use or shipment.
7. Diseased elm wood chipped or shredded constitutes no hazard to the spread of Dutch elm disease.
8. Buried elm wood should be covered with at least six (6) inches of compacted soil at the disposal site.

9. Stockpiling of elm logs with bark intact is not permitted for longer than 72 hours during the period April 15 through September 15.

Agr 106 (d), (2), (bb) - Dutch elm disease root graft control.

1. Refer to mechanical or chemical means given in Agricultural Extension Service, University of Minnesota Extension Folder 211 - Revised 1974, "The Dutch Elm Disease", pp. 8-12.

Agr 106 (d), (3), (aa) - Oak wilt root graft control.

1. Since oak wilt spread is primarily by root grafts, it is important to properly disrupt root grafts between diseased and healthy trees. Refer to mechanical or chemical means given in Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".

Agr 106 (d), (3), (bb), (iii) - Oak wood removal and disposal.

The main purpose of requiring special handling of diseased oaks is to prevent spore formation under the bark. These spores can be carried overland by insects and other vectors to wounds on healthy trees.

1. Since the oak wilt fungus seldom produces spores on bur oak and rarely if ever on white oak, these species may be used for firewood or other purposes at any time.
2. Red oaks (includes northern red oak, northern pin oak, black oak, and scarlet oak) that have been dead for over one year can be utilized for firewood without danger of spreading spores of the oak wilt fungus.
3. The appropriate handling of red oaks (includes northern red oak, northern pin oak, black oak and scarlet oak) will depend on when the diseased tree is detected and treatment undertaken. Trees wilting and treated during June should choose one of the "alternative treatments" for the period July 1 - September 1.

PERIOD OF TREATMENT

ALTERNATIVE TREATMENTS (use one)

July 1 - September 1

- a) removal and disposal of the tree by burning, burying, chipping, or debarking
- b) the tree may be deeply girdled around its base and left standing in place for at least one year (Note: Girdling may seriously weaken a tree and should not be performed where a hazard to life and property would result from the tree falling down.)
- c) Splitting the wood into firewood((see "Oak Firewood" below)

September 1 - September 15

- a) removal and disposal of the tree by burning, burying, chipping, or debarking
- b) splitting the wood into firewood (See "Oak Firewood" below)

September 15 - July 1
(following year)

- A 27
- a) removal and disposal of the tree by burning, burying, chipping, or debarking
 - b) the logs or firewood may be kept if it is wrapped in 4 mil plastic during the period April 15 to July 1 (This is necessary only within one year of when the tree wilted.)

"Oak Firewood" means oak wood with bark intact which has been cut into lengths not to exceed 24 inches and having been at least cut or split into quarter sections. Oak wood greater than 16 inches in diameter should be split further into smaller sections.

** The rules and regulations Agr 101-106 are to be presented before hearing examiners, and will be subject to change.

PIGSEYE SUMMARY
(Assembled From Shade Tree Grant File)
Prepared May 1980

The city of St. Paul first recognized the need for utilization in 1972 and submitted a proposal for a demonstration project.

The cities of St. Paul and Minneapolis agreed in February 1975 to a joint venture to establish the wood recycling center.

Initial operation and management was to be assumed by OTC (occupational training center).

Application was made for grant on November 7, 1975 by City of St. Paul, as lead agency, on behalf of Minneapolis and OTC. Initial application called for \$460,000 project (\$230,000 state share).

The initial project was designed for 100% recovery. Logs from 4" to 48" would be chipped, smaller sized material would be chipped by St. Paul's own chipper.

OTC was to do the marketing - initial markets were NSP and E.J. Anderson Associates of Wausau, WI (type of business?) and Hoerner Waldorf Corp.

In November 1975 Philip Vieth of the DNR pointed out that it would be unlikely that the operation would be profitable until at least the 3rd year of operation.

Formal grant contract was entered into between City of St. Paul and State of Minnesota Department of Agriculture on February 18, 1976. The grant was for \$310,000 not the original \$230,000.

On March 29, 1976 (that is 1½ months after the grant award), Mayor Cohen informed the MDA that it was too costly to operate a disease control program and therefore, would no longer participate in any state program including the Pigseye disposal site.

During the first bidding only one bidder submitted a proposal and this was deemed inadequate. An amended application was filed for \$390,000 (an \$80,000 increase) on October 15, 1976.

The department approved the amended contract on June 14, 1977.

A letter dated June 6, 1977 indicates that the cities of St. Paul and Minneapolis will be responsible for the operation of the facility - somewhere along the line OTC dropped out of sight.

Facility was scheduled to begin operation on June 15, 1977 then changed to July 20 then to September 1.

Letter dated July 12, 1977 says Guarantee Fuels to be the operator of the facility. This is 3rd operator and it hasn't begun operation yet.

Suddenly, in a letter dated November 7, 1977 - Northland Pulp Inc. has appeared as the operator.

A report by D. Zasada, MDA and Phil Vieth, DNR, indicated that during October 1977 Northland Pulp was only processing 15% of incoming volume. This low amount was due partially to inexperience and inefficiency. However, even after major adjustments were made the incoming volume of tree waste was over 2 times the maximum 24 hour capacity of the equipment.

This tremendous build up of material reached its peak when St. Paul's "First forest fire" burned most of the stockpiled wood on May 12, 1978.

July 20, 1978, St. Paul applied for the purchase of an additional chipper to augment existing facility and use up the remaining funds of the grant. It was to be a Nicholson 18".

Northland operated the site until August 1978 (9/77 - 8/78). The operation reverted back to the City of St. Paul. The parks department operated it during the 1979 season during this time only wood from City of St. Paul was permitted.

L.A. Industries began operation of the site in November of 1979. They have operated the site since. Presently the facility is operating at a much lower capacity than originally anticipated. The debarker is seldom used and the large 48" green chipper does most of the chipping. This is fed by the claw on the Nicholson even though the Nicholson isn't used to chip. Although this is rather a waste of equipment a certain degree of stability and equilibrium seems to have been established. Presently only material from City of St. Paul and Minneapolis forestry crews is accepted.

MINNESOTA DEPARTMENT OF AGRICULTURE

PLANT QUARANTINE NO. 78-1 ELM WOOD

April 24, 1978

WHEREAS, it has been determined by the Commissioner of the Minnesota Department of Agriculture that a seriously injurious disease commonly known as Dutch elm disease, is present in the State of Minnesota, and that transportation of elm wood into and through cities and designated disease control areas, will contribute to serious loss and damage to the general welfare, economy, and aesthetics of the state and enhance the further spread of Dutch elm disease:

THEREFORE, under the authority conferred by Minnesota Statutes 1976, Section 18.022, subd. 7 and Section 18.48, subds. 1-4, 1, Bill Walker, Commissioner of Agriculture for the State of Minnesota do hereby establish a quarantine hereinafter setting forth the name of the pest, the disease control areas, the products regulated, the procedures governing movement of elm wood and the penalties:

PESTS: Ceratocystis ulmi (Dutch elm disease fungus), Scolytus multistriatus (smaller European elm bark beetle), Hylurgopinus rufipes (native elm bark beetle)

DISEASE CONTROL AREA: Home rule charter or statutory cities and designated shade tree disease control areas in the unincorporated areas of any county in the State of Minnesota.

REGULATED PRODUCTS: Elm wood of all species with bark intact. This includes all elm logs, branches, brush, and firewood.

ELM PRODUCTS NOT REGULATED: Elm wood products without bark, elm wood chips, or shredded elm wood.

REGULATIONS GOVERNING MOVEMENT: The following movement of all elm wood, including elm firewood, with bark intact, is prohibited: (a) into or through any home rule charter or statutory city as defined by Minnesota Statutes 1976, Section 410.015, and (b) into or through any designated disease control areas as defined by Minnesota Statutes Section 18.023, subd. 1(g) (Supp. 1977) in the unincorporated areas of any county. This prohibition shall not apply to movement of such wood pursuant to an approved wood disposal or utilization program authorized by Minnesota Statutes Section 18.023 (Supp. 1977).

PENALTY: 1. Any elm wood product or material transported into and through said cities and said designated disease control areas in violation of this quarantine is subject to destruction or to being returned to the point of origin at the discretion of the Commissioner of Agriculture and at the owner's expense.

2. Any common carrier, firm, corporation, or person who shall transport such products or materials into and through said cities and said designated disease control areas in violation of these quarantine regulations is subject to the misdemeanor penalties set forth in Minnesota Statutes 1976, Section 18.60.

This notice and quarantine effective Monday, April 24, 1978. Done in the State Office Building, St. Paul, Minnesota on Monday, April 24, 1978.


Bill Walker
Commissioner of Agriculture

MINNESOTA DEPARTMENT OF AGRICULTURE
PLANT QUARANTINE NO. 73-1 ELM WOOD
AMENDED AUGUST 15, 1978

WHEREAS, it has been determined by the Commissioner of the Minnesota Department of Agriculture that a seriously injurious disease commonly known as Dutch elm disease, is present in the State of Minnesota, and that transportation of elm wood into and through cities and designated disease control areas, will contribute to serious loss and damage to the general welfare, economy, and aesthetics of the state and enhance the further spread of Dutch elm disease:

THEREFORE, under the authority conferred by Minnesota Statutes 1976, Section 18.022, subd. 7 and Section 18.48, subds. 1-4, 1, Bill Walker, Commissioner of Agriculture for the State of Minnesota do hereby establish a quarantine hereinafter setting forth the name of the pest, the disease control areas, the products regulated, the procedures governing movement of elm wood and the penalties:

PESTS: Ceratocystis ulmi (Dutch elm disease fungus), Scolytus multistriatus (smaller European elm bark beetle), Hylurgopinus rufipes (native elm bark beetle)

DISEASE CONTROL AREA: Home rule charter or statutory cities and designated shade tree disease control areas in the unincorporated areas of any county in the State of Minnesota.

REGULATED PRODUCTS: Elm wood of all species with bark intact. This includes all elm logs, branches, brush, and firewood.

ELM PRODUCTS NOT REGULATED: Elm wood products without bark, elm wood chips, or shredded elm wood.

REGULATIONS GOVERNING MOVEMENT: The following movement of all elm wood, including elm firewood, with bark intact, is prohibited: (a) into or through any home rule charter or statutory city as defined by Minnesota Statutes 1976, Section 410.015, and (b) into or through any designated disease control areas as defined by Minnesota Statutes Section 18.023, subd. 1(g) (Supp. 1977) in the unincorporated areas of any county. This prohibition shall not apply to movement of such wood pursuant to an approved wood disposal or utilization program authorized by Minnesota Statutes Section 18.023 (Supp. 1977) or to transportation of elm wood intended for industrial use not to include firewood, provided such transportation of elm logs for industrial use continues without interruption through said cities or disease control areas to their intended destination lying outside said cities and disease control areas.

PENALTY: 1. Any elm wood product or material transported into and through said cities and said designated disease control areas in violation of this quarantine is subject to destruction or to being returned to the point of origin at the discretion of the Commissioner of Agriculture and at the owner's expense.

2. Any common carrier, firm, corporation, or person who shall transport such products or materials into and through said cities and said designated disease control areas in violation of these quarantine regulations is subject to the misdemeanor penalties set forth in Minnesota Statutes 1976, Section 18.60.

This notice and quarantine effective Tuesday, August 15, 1978. Done in the State Office Building, St. Paul, Minnesota on Tuesday, August 15, 1978.



Bill Walker
Commissioner of Agriculture

SHADE TREE PROGRAM BUDGET
1982-83 BIENNIUM

	APPROPRIATION	REDUCTION	BALANCE
FY 1982			
ADMINISTRATION	\$ 336,300	\$ 24,200	\$ 312,100
EXPERIMENTAL GRANTS	200,000	82,460	117,540
SAN/REF GRANTS-CY 1981	4,000,000	1,375,340	2,624,660
SUBTOTAL	<u>\$4,536,300</u>	<u>\$1,482,000</u>	<u>\$3,054,300</u>
FY 1983			
ADMINISTRATION	\$ 330,300	\$ 48,300	\$ 282,000
SAN/REF GRANTS-CY 1982	2,133,400	2,133,400	0
SUBTOTAL	<u>\$2,463,700</u>	<u>\$2,181,700</u>	<u>\$ 282,000</u>
BIENNIUM TOTALS	<u>\$7,000,000</u>	<u>\$3,663,700</u>	<u>\$3,336,300</u>

CALCULATION OF SANITATION AND REFORESTATION
REIMBURSEMENT RATE FOR CALENDAR YEAR 1981

Appropriation for Biennium for Sanitation and Reforestation	\$ 2,624,660.00
Amount Available for 1981	\$ 2,624,660.00

Metropolitan Area

Allocation (.67 X \$2,624,660.00)	\$ 1,758,522.20				
Reforestation Costs to be Reimbursed at 90 percent (Sum of proposed budgets submitted by metro municipalities with populations of less than 4,000.)	\$ 10,669.95				
Allocation for 90 percent Reimbursement (.9 X \$10,669.95)	\$ 9,602.96				
Allocation Available for Sanitation and Reforestation (\$1,758,522.20 - \$9,602.96)	\$ 1,748,919.24				
Costs for Sanitation and Reforestation	\$13,990,286.79				
Reimbursement Rate Based on 1981 Allocation	<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="text-align: right; padding-right: 10px;">\$ 1,748,919.24</td> <td></td> </tr> <tr> <td style="text-align: right; border-top: 1px solid black; padding-top: 2px;">\$13,990,286.79</td> <td style="text-align: right; vertical-align: bottom;">12.5%</td> </tr> </table>	\$ 1,748,919.24		\$13,990,286.79	12.5%
\$ 1,748,919.24					
\$13,990,286.79	12.5%				

Non-Metropolitan Area

Allocation (.33 X \$2,624,660.00)	\$ 866,137.80				
Reforestation Costs to be Reimbursed at 90 percent (Sum of proposed budgets submitted by metro municipalities with populations for less than 4,000.)	\$ 55,052.43				
Allocation for 90 percent Reimbursement (.9 X \$55,052.43)	\$ 49,547.19				
Allocation Available for Sanitation and Reforestation (\$866,137.80 - \$49,547.19)	\$ 816,590.61				
Costs for Sanitation and Reforestation	\$ 4,992,899.42				
Reimbursement Rate Based on 1981 Allocation	<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="text-align: right; padding-right: 10px;">\$ 816,590.61</td> <td></td> </tr> <tr> <td style="text-align: right; border-top: 1px solid black; padding-top: 2px;">\$4,992,899.42</td> <td style="text-align: right; vertical-align: bottom;">16.35%</td> </tr> </table>	\$ 816,590.61		\$4,992,899.42	16.35%
\$ 816,590.61					
\$4,992,899.42	16.35%				



reporter

PUBLISHED BY THE UNIVERSITY OF MINNESOTA, CENTER FOR URBAN AND REGIONAL AFFAIRS

Twin City Conversions of the Real Estate Kind

by Barbara Lukermann



The ads are enticing:

"Average appreciation at resale—35%.
Average yearly appreciation—18%.
SURE BEATS THE MONEY MARKET!"

"Quick! Condos at \$27,900, limited grand opening offer..."

"Sheer pleasure for \$46,900!...one bedroom, 5% down..."

Then there is the other side of the coin. Tenant displacement in a tightening rental market; loss of rental stock for moderate income households; speculation in apartment conversion that raises building prices beyond their level as rental property; and a growing constituency seeing these negative factors as far outweighing the strong market demand for this entrée into the benefits of home ownership.

An overview study of conversions in the Twin Cities market between 1970 and 1980 was supported by CURA and begun in a year of intense activity, 1979, when 31 percent of the decade's total conversions took place. The objective was to document how demand and supply forces were operating to fuel this type of real estate activity, and in the process, to analyze the legitimate public policy issues and arguments for further public intervention in the marketplace. A series of surveys was conducted with developers, buyers, and those forced to move by conversion, supplemented with case studies of typical conversion projects. An innovative housing ownership program of the City of Minneapolis (HOP IV) that uses revenue bonds to reduce interest rates and includes condominiums as eligible purchases for low and moderate income buyers was also evaluated as a possible precedent for expanding ownership at affordable prices.

How Much Activity Has There Been?

While less than 3 percent of the multifamily stock had been converted into cooperatives (coops) and condominiums (condos) by the end of 1979 (7,636 units in total), this was still enough to make the Twin Cities the fifth most highly impacted metro area ac-

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Preserving Our Shade Trees— Minnesota's Experience

Minnesota has the most successful shade tree disease control program in the country. Nearly 500 cities across the state participate in the Shade Tree Program, which is administered through the Minnesota Department of Agriculture. The state program provides expertise and matching grants to participating cities for quick removal of diseased trees from public and private property as well as matching grants for replanting on public property. Since 1977, losses to Dutch elm disease have been cut from 250,000 trees annually to 100,000. Similar success has occurred in the battle against oak wilt. Many lost trees have been replaced.

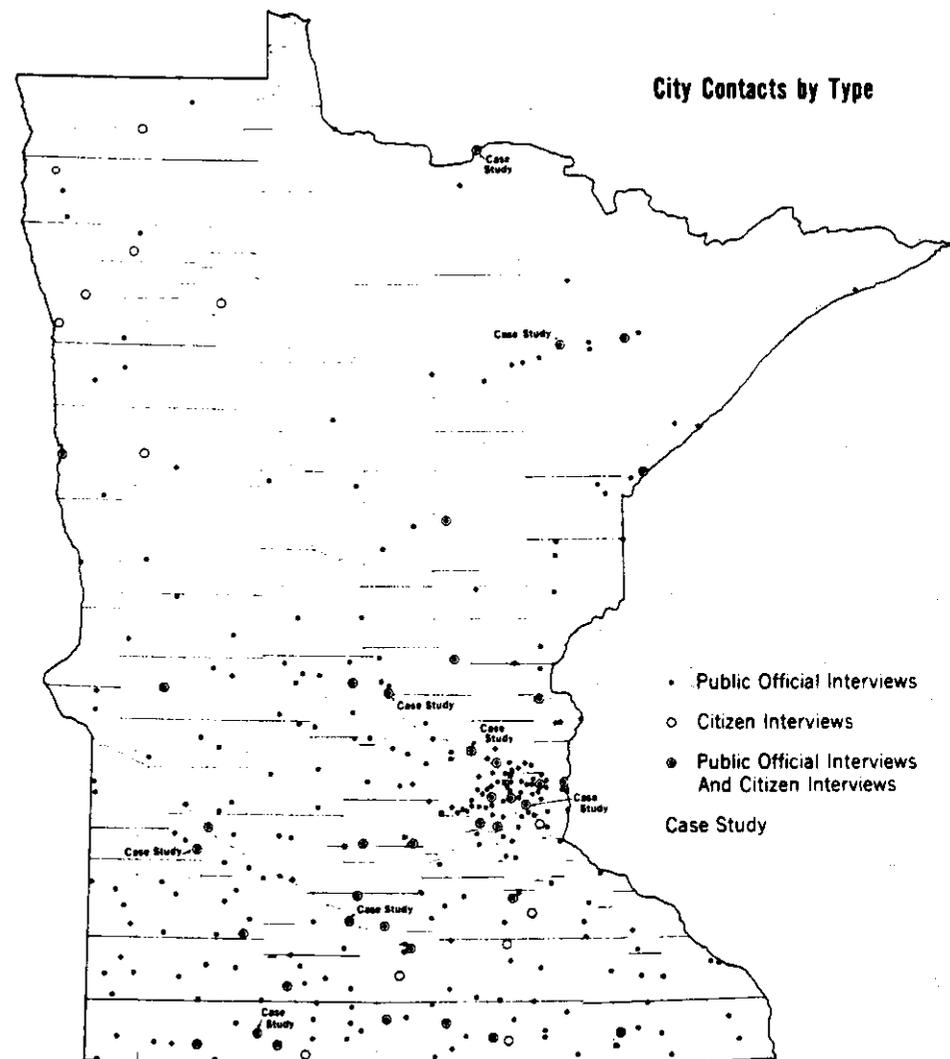
While the basic problems of combating shade tree diseases are financial and technical, it is clear that other problems are involved, problems that are social, political, and environmental. Over 360 cities have not participated in the program and success in individual participating cities varies greatly.

Do the citizens of the state care enough about trees to make this effort worthwhile? How do cities feel about the state program? Can the state program be made more effective? Can less successful cities learn something from more successful ones about how to run a good local program?

The CURA Study

With these questions in mind, the director of the state Shade Tree Program approached the University in late winter of 1980. CURA assembled a team of researchers to answer the questions. Included were faculty members from political science (Virginia Gray) and sociology (Paul Reynolds), CURA's assistant director (Will Craig), and the project assistant (Lois Geer).

The study's methodology included collecting data from a wide variety of sources. State program records and staff were able to provide data on the reported characteristics of each local program and its effectiveness. Other government records provided information on the demographic, physical, and political structure of each city. Three major surveys were undertaken during the summer of 1980 to complete the necessary information base (see map). Telephone interviews were obtained with over 300 city officials. Eighteen hundred citizens living in fifty-three cities were also interviewed by telephone. Finally, detailed case studies were made in eight cities. In all surveys,



cities were selected at random, but with an eye to providing the broadest possible range of geographic location, city size, and program success. In all but the case studies, cities were also selected which were not participating in the state program.

Survey Results

The citizen survey found that support for shade trees was very broad and not restricted to a few elite. About 90 percent of the citizens of Minnesota considered shade trees very or extremely important for their

appearance, property value, effect on micro-climate, and general intrinsic value. Matching this concern, a relatively high proportion of Minnesotans had actually taken some action to promote or protect their urban forests: 18 percent had reported one or more diseased trees; on their own property, 27 percent had removed and 31 percent had planted at least one tree; and 25 percent had provided care for new trees on their boulevards. A great majority of people (85 percent) in participating cities thought their local program was operating at average or above average efficiency.

Consistent with these feelings, over two-thirds of the people said they would be willing to have their taxes raised to some extent to support an adequate shade tree program.

Local officials were equally enthusiastic in their support for shade trees and local shade tree programs. When asked to rank city problems in order of importance, there were only two other areas (fire and crime) that a larger percentage of officials thought required a great deal of attention. Most cities were running their shade tree program according to state guidelines and felt that it was operating effectively. In addition, they had favorable comments about the state program. They found the grant process operated smoothly and funds were adequate for their needs. For some cities, unfortunately, the state program was instituted too late, after they had already lost their shade trees. A current problem mentioned was their inability, under current law, to control the disease beyond city limits. Thus infection could come from areas outside their control.

Study Findings

Answers to the questions on how the state Shade Tree Program might be improved were attained through analysis of combined data sets. Three major areas of inquiry were addressed: reasons for participation, explanations of success in retaining trees, and explanations of replanting success. The case studies were used to help understand statistical results throughout.

Participation in the state program can be explained by two major factors: city size and degree of problem. The study found that every city of over 5,000 people was participating in the state program, but that participation rates fell off below that threshold; only half the cities with about 450 people were in the state program. Itasca County had solved this problem by offering to administer local programs for its smaller cities. Whether looking at the 288 cities that had never participated in the state program, or the 76 that had dropped out since 1977-78, the major reason for non-participation was lack of a current threat. These cities had either yet to encounter a problem or had already passed through the problem.

Success in retaining trees was measured by both Shade Tree Program staff and numerical rates of loss. Multiple regression techniques were used to identify explanations of relative success. Where communities are more southerly or where any adjacent wild elms were healthy, tree losses were lower. Where local programs operated efficiently, with timely and complete inspections and with adequate equipment, elm losses were also low. Citizens accounted for a large part of local program success. Losses were lower where citizens:



Minnesota's shade tree program promotes local tree inspection, careful disposal of diseased trees, planning for reforestation, replanting, and care and maintenance of new trees.

- expected local governments to handle community problems (of any kind).
- knew about the local shade tree program and its operation,
- restricted their use of elm firewood.

Replanting success was measured in a similar manner and a similar approach was taken to explain this success. The major limitation on success was participation in that aspect of the state program. Forty percent of the cities in the general state program did not participate in the replanting program. Of those which did, success varied widely. Yet our ability to explain this variation was reduced by the fact that a local replanting program can be stretched out over many years. Associated with replanting success were: well maintained

neighborhoods, northern location, emphasis on informing the citizens about the local program, citizen rating of the local program, and the use of elm firewood.

Conclusions

The state Shade Tree Program has been effective by any measure. It has saved money and the quality of life associated with these trees. These goals are supported by the cities and citizens of the state.

The University study did find a number of areas where improvements could be made. Individual cities should conduct their programs according to state guidelines, promote citizen awareness, and join in the replanting programs. For the state program, recommendations include promoting the replanting program and fostering sup-

port mechanisms for smaller cities similar to these developed by Itasca County. Finally, the study made a number of recommendations to the state legislature which would make the Shade Tree Program more effective, including allowing creation of a buffer zone around each city, continued research and education, and paying attention to unique or new situations.

These legislative recommendations were based on the premise that the current program was invaluable and inviolate. The Shade Tree Program is effective, extremely popular, and economically sound. Yet the 1981 legislature funded the program at only \$7 million for the biennium: one-third of what was recommended and one-half of what is required to continue it in its present form. Given the decentralized nature of the program and the uncertainties of nature, it is impossible to predict the implications of this cut. But they could be environmentally, politically, and economically disastrous.

Copies of the University report, *Community Shade Tree Programs in Minnesota: A Study of Participation and Effectiveness* are available for reading in the CURA library, 316 Walter Library. Copies of the 109 page report (and 123 page appendix) are available for the cost of copying (5c per page) and postage. Those with further questions may contact the Shade Tree Program at 612/296-8580.

New CURA Publications

Energy From Peatlands: Options and Impacts. CURA Peat Policy Project. CURA 81-2. 183 pp. \$5.

A major report from CURA's Peat Policy Project, this publication was designed to help Minnesotans understand the energy potential that our peatlands offer and the impact that their development would have on the state. It presents background on Minnesota's peat resources; details the options open to Minnesota (direct mining of peat, use of peat as a medium for growing energy crops, or preservation of peatlands); analyzes the economic viability of these different approaches; studies the impact that peat development would have on local economies, communities, and the environment; and explains the legal and regulatory options that Minnesota has if a decision to develop peat is made. The report concludes with the recommendations that the panel developed during their nine-month study. An extensive bibliography is also included.

Executive Summary—Energy from Peatlands: Options and Impacts. CURA Peat Policy Project. CURA 81-1. 20 pp. Free.

This is a summary of the full peat report noted above and includes the complete recommendations of the peat panel.

Indochinese Refugee Settlement Patterns in Minnesota, Glenn Hendricks. CURA 81-3. 7 pp. and 3 maps. Free.

The impact of escalating numbers of Indochinese refugees settling in Minnesota is being felt in a number of ways. In recent months a particular issue coming to the forefront in some residential areas of the Twin Cities has been the large number of refugees moving into the neighborhood. Yet concrete data on how many refugees live where has not been available. This report presents maps that roughly locate Indochinese settlements in Minnesota and in the Twin Cities along with a text which explains some of the factors involved in refugee decisions about where to live.

What is Happening to Farmland in Minnesota? William J. Craig. CURA 81-4. 11 pp. Free.

The loss of agricultural land in Minnesota, though less than in most states, is reported to be significant. The amount involved is in dispute. This report looks at how calculations of farmland losses are made and also at the indicators of just where in the state we are losing farmland. It appears that statewide farmland losses may be half what they have been publicized to be. No reliable estimate exists of changes in farmland in various parts of the state.

Photo credits:

photos on page 1, 4, and 6 by Henry Hall
photo on page 11 courtesy of Minnesota Department of Natural Resources
drawing on page 14 courtesy of the Minnesota Shade Tree Program

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, creed, color, sex, national origin, or handicap.

APPENDIX B

Early Educational Materials:
Public Information Program Summary.

Growth in Champaign-Urbana

One case of Dutch elm disease was found in Champaign-Urbana in 1951, 11 in 1952, 164 in 1953, 694 in 1954, 1,805 in 1955, 1,836 in 1956, 2,116 in 1957, and 1,770 in 1958. To give these figures more meaning, let me point out that the loss of 1,836 elms in 1956 and of 2,116 elms in 1957 each surpassed the loss of 1,832 elms in the entire state of Wisconsin in 1958. In the last 8 years, Champaign-Urbana have lost 8,397 elms, or 57% of its original elm population. Contrary to popular belief, then, it should be obvious that Champaign-Urbana never had an organized program to control the disease, this in spite of the proximity of these cities to the University of Illinois.

Rockford Experience

In the northern part of Illinois, in the areas with which I am most familiar, Dutch elm disease early became a major problem in Rockford and in cities of the Fox River valley. The first diseased tree was found in the Rockford area in 1954. The next year, 1955, revealed only two additional cases, but disease momentum was building up swiftly in the vast reservoir of dead elm wood in the 47,000 elms of Rockford. 1956 found 128 cases followed by 528 in 1957, and an estimated 4,000 in 1958. Again, to add significance to these statistics, let me point out that the 4,000 estimated cases in Rockford alone in 1958 is over twice the 1,832 diseased elms found in the state of Wisconsin in the same year. To project the Rockford picture ahead a few years so that you may appreciate the gravity of the situation there, I am estimating a loss of 10,000 in Rockford in 1959, another 10,000 in 1960, and still another 10,000 in 1961. Thus we see the usual relentless pattern followed by the disease in the absence of an adequate control program: the first few years we find only scattered infections and the unwary city official may be lulled into thinking it will not become serious in his community, and then suddenly and silently the city may lose 50% to 70% of its elms in the next few years.

Assistance Was Available

From the first appearance of the disease in Illinois in 1950, the Illinois Natural History Survey in Urbana was given the responsibility of studying and reporting the progress of Dutch elm disease in Illinois and of making available complete and accurate information to communities and individuals interested in controlling the disease. This is similar, as I understand it, to the type of work being handled so capably in Wisconsin by your Dutch Elm Disease Control Committee.

The Illinois State Chamber of Commerce in cooperation with the Illinois Natural History Survey sponsored two state-wide conferences in Chicago on Dutch elm disease where city officials and others interested in learning about the nature of the disease and its control could hear authorities discuss their specialized fields in helpful, non-technical language. These meetings were very similar to the one which you are attending here today. The Illinois Municipal League, with the Illinois Natural History Survey participating, held informal discussions on Dutch elm disease at its last two annual meetings in the state capital. Dr. J. C. Carter and Dr. R. J. Campana, members of the

Illinois Natural History Survey staff, spent endless hours in traveling over the state to meet with interested officials and groups and extending to them the latest information on the disease. Dr. Campana also served as chairman of a committee of the Midwestern Chapter of the National Shade Tree Conference which published an excellent 35-page booklet entitled "A Guide of Community-Wide Control of Dutch Elm Disease."

Why then with all the best advice available to them did many communities in Illinois fail to adopt a control program of any type, while many others adopted what they assumed to be an effective control program only to find later that it lacked the basic recognized requirements for adequate control? Why do we face the irony in Illinois of witnessing the failure to adopt control programs in Champaign-Urbana, the two cities embracing the University of Illinois, the very center of learning in our state? Why, according to the best estimates, should only about 50 cities in Illinois have adopted an acceptable control program at this late date, some 8 years after the discovery of Dutch elm disease in Illinois?

Reasons for Failure

Let us analyze now some of the reasons why, in my opinion, many Illinois communities either failed entirely to adopt a control program or started a control program which later proved unsuccessful.

1. Failure to realize that Dutch elm disease is inevitable and that it will invade every community containing substantial numbers of elms. This illusion of escapism can be attributed only to a failure to recognize the well established facts concerning the disease and perhaps the conviction that foresters become hysterical about Dutch elm disease and oversell the problem. The responsibility for elm losses in these communities can be attributed to apathy of the municipal officials and citizens who do not take the time, have the interest to obtain full command of the pertinent facts.

2. Failure to recognize that the expense relative to Dutch elm disease is inevitable. A community either spends money to control Dutch elm disease or it spends more money to cut down dead trees and replant. The city official who thinks dead trees can be left standing on city streets and parks is not facing the facts. A dead tree soon becomes a liability to lives and property and lawsuits can be expensive reminders.

3. Failure to recognize that Dutch elm disease control requires adequate funds and sometimes emergency funds for proper control. In spite of the intense competition for community funds found in most cities, it is necessary to recognize that prompt, vigorous, initial action may be necessary to gain and hold the advantage over Dutch elm disease because of the nature of the disease and that any belt tightening or advancement of emergency funds is a good investment by reason of the savings inherent in a long-range control program, not to mention the preservation of the trees themselves. At this point, it should be emphasized that the alternative to a thorough, adequately financed control program is greater expenditure at a later date. There is no escape.

4. Failure to give the Dutch elm disease control program priority over short-term politically popular projects. It takes men of resolute vision and intense community pride to recognize Dutch elm disease as a long range program providing for the preservation of a valuable community asset and extending beyond the usual tenure of political office.

5. Improper use of municipal forestry funds. Rockford furnishes a good example of the improper use of municipal forestry funds, a situation usually created by the failure of municipal officials to fully comprehend the problem. In 1956, Rockford made a good beginning in its control program, which was soon implemented with excellent equipment for executing the sanitation and spraying work recognized as fundamental to a good program. The forestry department operated on a small budget and was faced with a task of enormous magnitude in its sanitation work, the removal of a vast backlog of dead elm wood which had accumulated over the period of years in the absence of any previous forestry program. The prospect of spraying the elms in the city of 110,000 residents with just two sprayers also caused no little apprehension, but the department was determined to do it. In spite of the obvious need for Dutch elm disease control with the precious small funds available, by early 1957 and continuing to the present, the program was sabotaged with requests and orders to the forestry department by city officials for forestry work which, no matter how desirable was generally of less importance than the primary objective, the long range control of Dutch elm disease. In spite of the fact that the forestry department had been created for the control of Dutch elm disease, control gave way all too often to routine tree removals and trimming operations as well as removals for street widening and sidewalk construction. This drain on available funds and manpower, coupled with a cut in the budget requested for 1957, created an obviously impossible situation which prompted the resignation of the professional adviser and resulted in the collapse of the program with consequences described by one forestry authority as "deplorable." When such a program fails, it means double expense to the taxpayer. He pays once for a futile, misguided control program, and he pays a second time to remove the dead elms supposedly being protected.

6. Failure of municipal officials to recognize Dutch elm disease as a technical problem requiring professional direction. According to Dr. R. J. Campana in a recent publication, "Probably the major reason why community programs may not be successful is the absence of direct professional advice and administration. The most outstanding successful programs are those directed by professionally trained and competent foresters.... The reliance by community officials on incompetent, untrained or unscrupulous commercial tree experts is often a major cause of failure of a control program.

"In addition, there are well intentioned but misguided 'experts' (so called) of long experience and creditable reputation as arborists, who make recommendations of dubious merit; the recommendations are based on casual observations only and lack confirmation by qualified, scientific research. Community officials should insist on using methods and materials exclusively recommended on the basis of evidence obtained through genuine scientific procedure."

7. Failure of municipal officials to adopt a complete, systematic, technical control program with well-defined objectives and acceptable methods for achieving optimum control. Many communities and city officials are under the illusion

that they have a control program when actually they haven't even made a sound beginning. One community of northern Illinois is very enthusiastic and confident of its program, and yet an objective analysis reveals it to be woefully inadequate. The responsible officials have consistently disregarded the advice of recognized state authorities on the disease; there is no systematic scouting for diseased elms in the summer; too much reliance has been placed on spraying; and too little emphasis has been placed on sanitation. At one time in the summer of 1958, this city maintained it had 3 diseased elms in the entire city at a time when two recognized authorities on Dutch elm disease detected 20 to 25 diseased elm while driving across town on a highway.

Some cities think a control program consists only of collecting samples of suspected elms and sending them to a laboratory. Only bitter disillusion can result when a community thinks it has a good control program but actually does not. It is extremely important to adopt a program complete in every respect and designed to afford efficient use of municipal funds by providing maximum protection at a minimum of cost.

8. Undue reliance on spraying as a control measure for Dutch elm disease. Spraying can be done quickly--it is spectacular to observe--and tends to lend a feeling of comfort and security to those not acquainted with the elm bark beetle. Spraying may control flies and mosquitoes, but it offers only partial control of the elm bark beetle. Since authorities tell us it is virtually impossible to cover 100% of the bark surface of an elm when spraying, it should be obvious that even the best spraying job can be overcome by sheer weight of numbers if elm bark beetles are allowed to build up tremendous populations of beetles in dead elm wood. It is essential to remember that a good Dutch elm disease control program must stand squarely on two legs--sanitation and spraying. One without the other will usually fail to give satisfactory control.

Unfortunately, the undue emphasis on spraying has often originated in Illinois with irresponsible sales pressure applied by some commercial suppliers is in an excellent position to render a distinct service to communities if he acquaints himself with the essentials of Dutch elm disease control and tempers his enthusiasm for his product with accurate facts and recognizes the limitations of his product in representing usually one of several necessary aspects of disease control.

9. Selection of irresponsible supervision and labor for key control jobs. The success of a complete and adequate control program, all other things being equal, varies almost directly with the capability, the interest, and the character of the man in charge of the program and of the key workmen under him. If this be true of many jobs, it is particularly true in controlling Dutch elm disease. The tree climber who is acquainted with the habits of the elm bark beetle and knows why he is engaged in sanitation work will do a better, more thorough job than the man who is just sawing dead limbs. The sprayer who knows why he is concentrating on the small twigs in the periphery of the crown will do a better job of spraying an elm than the sprayer who does not understand the habits of the beetle and does not care. And perhaps, more important, a conscientious employee who can be trusted to go out night spraying and actually spray the elms he reports sprayed, rather than chalking up sprayed trees in a coffee-shop can mean the difference between success and failure in an otherwise comprehensive program.

The importance of selecting responsible supervisors and responsible employees for key control jobs can not be overemphasized.

10. The lack of a state law in Illinois requiring the prompt removal of diseased elms. You are very fortunate in Wisconsin to have a state law which can lend effective support to the important sanitation aspects of a Dutch elm disease program. The lack of such a state law in Illinois has created considerable confusion and loss of valuable time in many communities as legal advisers ponder the proper course to follow in effecting prompt removal of diseased elms on private property. Many cities of Illinois have passed some sort of mandatory ordinance requiring removal of diseased elms on private property, but there is some question as to their legality.

Failure to dispose of diseased elms on private property will usually make protection of elms on adjacent city property difficult, if not impossible.

Your state law here in Wisconsin, if properly used and enforced, can be an extremely effective weapon in the state-wide fight against Dutch elm disease. Michigan affords a good example of a state in which a similar law is playing an important role in their 9-year battle against the disease.

11. Inadequate education of the public. The successful control of Dutch elm disease depends not only on interested and informed municipal officials but on interested and informed private property owners as well. A well-informed public will pay big dividends in cooperation and continued support of a long range control program. All too often the educational effort in some Illinois cities consisted of a sensational, initial flurry of activity in the local press and radio and was soon abandoned. In order to be successful, an educational program must be sustained throughout the year and must be accurate and timely.

The foregoing discussion of some of the reasons why Dutch elm disease control, on a municipal basis, was not attempted or was not successful in the majority of Illinois cities should not be construed to mean that good examples of effective control programs do not exist in the state. On the contrary, several cities of northern Illinois show promise of "accentuating the positive, eliminating the negative," and proving what cities like Greenwich, Connecticut; Brookline, Massachusetts; and Detroit, Michigan, have already conclusively proven—that it is possible to effectively control Dutch elm disease and keep tree losses to a minimum.

Five municipalities and one park district in the suburban Chicago area, for example, report small losses in 1958.

The average loss of elms reported for these communities was three-tenths of one per cent of the entire elm population. It should be made clear that control programs in most of these communities have been in effect for only three years. While such figures cannot be considered conclusive, they offer a striking contrast to losses in other nearby communities where no control exists. Winnetka, Des Plaines, and Batavia are other Illinois cities which have also made outstanding starts on effective control programs.

We have been discussing "What Happened in Illinois." On the whole, we are not proud of the poor record made by so many cities in Illinois relative to control of Dutch elm disease. It is my hope, however, that this discussion has given you some insight as to the speed with which Dutch elm disease can travel

across a state and the thoroughness with which it eventually eradicates most of the elms in an affected community. It is my further hope that this treatise of the many dead elms of Illinois has perhaps stimulated some thinking and afforded some practical assistance to your proposed or existing control program.

In most of your communities, you have inherited a vast legacy of tree wealth from generations past. A large portion of this wealth is now being threatened by a serious tree disease. Much of the responsibility for action lies in your hands. Timeliness is important. With prompt, decisive action based on an accurate knowledge of the disease, you can avoid a disastrous epidemic before the disease becomes well established.

Many cities of Illinois would like you to profit from their bitter experience and remind you—you will not be given a second chance to save your elms.

MINNESOTA DEPARTMENT OF AGRICULTURE

Plant Industry Division
670 State Office Building
St. Paul 55101

1969 PROCEDURES TO SURVEY AND CONTROL DUTCH ELM DISEASE IN MINNESOTA

A complete and effective control program in a community includes these considerations:

1. Inventory the total tree population to be protected. Classify as follows:
 - a. Public parkways and streets
 - b. Private property
 - c. Community parks

2. Sanitation - Destroy sources of elm wood material which might spread the disease. The purpose is to detect actual or potential sources of breeding sites of elm bark beetles and trees suspected of Dutch elm disease.
 - a. Examine the community systematically on a lot-by-lot basis for piles of elm wood.
 - b. Complete this examination before May 1.
 - c. Record the exact location of elm wood and make arrangements for immediate destruction.
 - d. It may be necessary to pass a local ordinance to control the sanitation phase of the program.
 - e. Check such sites as:
 - (1) City dumps or disposal areas.
 - (2) Low lying areas, construction areas where elms have recently been razed and piled.
 - (3) Recently dead, dying or weak elms anywhere.
 - (4) Piles of elm wood anywhere.
 - (5) Weak, dying or broken branches from living elms.

f. Treat stumps in one of these ways:

- (1) Saw off at ground level
- (2) Strip bark to ground level at time of tree removal
- (3) Destroy with stump removing machinery

Communities where Dutch elm disease has not been found should not wait until the disease arrives before undertaking a sanitation program. Sanitation should be carried on throughout the year, but must destroy bark beetle breeding material before May 1 of each year.

3. Conduct symptom surveys to detect diseased trees:

- a. Examine foliage of all elms in the area systematically on a street-by-street basis at least once each season, twice preferably.
- b. Do this between mid-June and early August, timed to detect earliest appearance of the largest number of infections.
- c. Make surveys by vehicle or on foot. The observer, when riding, should not be the driver of the vehicle.

4. Place effective root graft barriers between diseased and healthy elms, where necessary. This should be planned and discussed with a specialist from the Minnesota Department of Agriculture.

5. As a complement to a good sanitation program, a chemical spray may be necessary to prevent beetle feeding and breeding after the disease is found in a community. Use of insecticides by a municipality requires authorization from the Minnesota Department of Agriculture by law, in accordance with statute 18.022.

6. Survey operations should be done by professionally trained arborists, foresters, or by personnel under their direct supervision who have been trained for this work.

Qualifications of personnel should include:

- a. A thorough knowledge of the symptoms of Dutch elm disease and its transmission, including the life cycle and habitat of the elm bark beetles.
- b. Ability to identify certain elm disease or troubles with which Dutch elm disease can easily be confused.
- c. Ability to identify other diseases (excluding wilts), insect damage, and environmental troubles.

- d. A knowledge of materials in which elm bark beetles may develop.
 - e. A recognition of symptoms arising from root graft spread and of the situations where root graft spread is likely to occur.
7. Pruning of living trees required for Dutch elm disease control:
- a. Beetle-infested branches over one inch in diameter.
 - b. Weak, recently killed, dying, or broken branches with diameters exceeding two inches.
 - c. Dead branches that have lightly adhering bark and diameters exceeding two inches.
 - d. Live branches that may interfere with a spray program such as those hanging over buildings, against windows, etc.
 - e. Wind or storm damaged branches.
8. Pruning that is unnecessary for Dutch elm disease control:
- a. Dead branches with cracked or loosened bark or with bark gone.
 - b. Weak or dying branches less than one inch in diameter.
 - c. Healthy branches pruned to stimulate growth.
 - d. Healthy branches pruned to shape the tree.
 - e. Line clearance or pruning for street light efficiency.

Priority of control measures:

1. First destroy diseased trees and beetle breeding material.
2. Always practice sanitation of dead and dying elm wood as the basic control program. Chemical control may complement this when Dutch elm disease is present in a community.
3. Root graft spread should be considered.
4. When D. E. D. becomes prevalent and widespread in a community, sanitation should always be emphasized as the basic control program. Chemical control must be worked out and comply with recommendations set up by the Minnesota Department of Agriculture.



Unslightly victims of Dutch elm disease

Minnesota developed culture technique for rapid processing of a large number of samples. Findings are published in the weekly Plant Industry Reporting Service Bulletin and map records are kept showing where the disease or its vectors have been found.

The Division is prepared to work with municipalities in development of control programs under Section 18:022. It can be of assistance, too, under its authority (Section 18:48) to insist on removal or treatment of material harboring insect pests on either public or private land.

THE COMMUNITY PROGRAM

In your own community, this procedure is recommended:

PHASE ONE consists of a tree census, preferably taken by a qualified forester. This will determine the size, condition and location of the elm population to be protected. A map should be prepared indicating whether the trees are in good health or need pruning or removal. Woodpiles and dumps containing dead elm wood in which beetles could breed should also be located.

PHASE TWO, an elm sanitation program. This involves regular pruning of living trees to remove and burn dead or dying trees or branches, and the removal and destruction or treatment of elm wood in piles and dumps.

PHASE THREE becomes necessary when the presence of Dutch elm disease in your community has been confirmed by qualified technicians. Trees in areas of high infection can then be sprayed with approved insecticide. Authorization for spraying should be obtained from the Minnesota Department of Agriculture, Division of Plant Industry.

It is important to remember that where the disease is absent or scarce, sanitation should take precedence over spraying.

PHASE FOUR calls for removal of all dead elm trees caused by Dutch elm disease. This phase includes areas that did not set up a prevention program until after the disease was well established. The dead trees are not only a reservoir for further spread of the disease, but are a public menace and an eyesore to residents and visitors.

SUGGESTED LEGISLATION

When your community undertakes a Dutch elm disease control program it is advisable to work with the League of Minnesota Municipalities and the Minnesota Department of Agriculture to develop an ordinance covering the care and planting of trees on municipal property. This could include a system of alternate tree species selections to avoid dependence on elms alone.

Ordinances should include sections covering qualifications of arborists, tree removers and spray operators and to establish standards for equipment and insurance coverage. Tree removal alone can be a fertile field for operators with questionable ethics who might overcharge for poor work or carry insufficient insurance.

BENEFITS VS. COSTS

The arrival of Dutch elm disease poses new problems for municipal officials. But benefits of soundly conceived control programs outweigh the costs. It has been estimated a healthy elm can be protected 50 years for the cost of removing one dead tree. Proper tree care pays off, too, in added beauty, reduced wind breakage and resistance to diseases other than Dutch elm.

CHEMICAL CONTROL

It should be emphatically pointed out that any control program must first have a basic sanitation program, as undue reliance on chemicals has not solved the problems in many areas. When Dutch elm disease is established in a municipal area, there may be a need for insecticide spraying in addition to dead elm wood removal. For more specific information on chemicals and spraying, contact the Minnesota Department of Agriculture, Division of Plant Industry, 670 State Office Building, St. Paul, Minnesota 55155

Let's Save Our Elms!

How Minnesota Can Fight Dutch Elm Disease



After Dutch elm disease struck in a midwestern city

Circ. #529 R/72

Revised March 1972

Issued by
Minnesota Department of Agriculture

State Office Building
St. Paul, Minnesota 55101

DUTCH elm disease, the dread blight which has killed millions of the nation's most popular shade trees, is a resident of Minnesota. The first case was diagnosed in St. Paul in the spring of 1961, the second along the Mississippi at Monticello in Wright county. Since then, much more Dutch elm disease has been found in Minneapolis, St. Paul, and other Minnesota communities.

The native elm bark beetle and the smaller European elm bark beetle, which transmit the disease from dead to living elms, are being found in increasing numbers over an ever-widening area. It should be emphasized that the beetles spread the disease. They do not cause it.

The disease has followed the pattern established since it arrived on the Atlantic coast from the Netherlands in 1930 and has spread rapidly throughout the eastern United States and has been found as far west as Colorado, Wyoming and Idaho.

LOSSES COULD BE HEAVY

The economic consequences of the Minnesota penetration could be staggering. Elms represent close to 90 per cent of the St. Paul and Minneapolis tree population. They beautify and shade the streets of most other communities in the state.

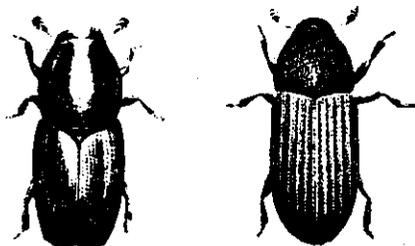
Contrary to claims of unscrupulous peddlers, there is no cure for Dutch elm disease and no American variety is known to be immune. Research with systemic fungicides is under way, but results thus far are inconclusive. Once a tree is infected it dies. Average cost of removal runs from \$100 to \$400 per tree. Additional sums must be spent to buy and plant replacements for the victims.

Still, there is no need to press the panic button. Dutch elm disease can be kept under control. This has been demonstrated conclusively in the East where communities within infected areas elected to fight back. There are instances of loss reduction to 1 per cent or less per year.

Your community can do as well, provided control measures are put into effect promptly.

IDENTIFYING THE FOE

Dutch elm disease is caused by a virulent fungus which spreads quickly through the water conducting tubes of the elm tree. A toxin given off by the



European elm bark beetle (left) and native elm bark beetle enlarged 15 times. Actual length of the beetles is less than 1/8".

fungus causes the tree to manufacture gums that plug the tubes. Leaves on entire branches suddenly wilt and the tree dies of thirst, usually within weeks or months.

Brown streaks in the sapwood of infected branches are characteristic symptoms of Dutch elm disease, but **LABORATORY EXAMINATION IS NECESSARY FOR POSITIVE IDENTIFICATION.**

The carrier beetles (vectors) breed and multiply beneath the bark of dead or dying elms. If the tree is diseased, young beetles carry spores of the fungus with them when they go out to feed on living elms.

Because the European beetle feeds in small twig crotches it can introduce the spores directly into the tree's circulatory system. The native beetle innoculates its victim by the slower method of boring into the elm bark to build feeding and over-wintering tunnels.

THE DEFENSE ORGANIZATION

Minnesota, fortunately, has a Pest Control Law (Section 18:022 of Minnesota Statutes) under which every city, village or county may set up a Dutch elm disease control program with public funds.

The money may be appropriated from general funds or raised by levying a tax not to exceed 4 mills or one dollar per capita, whichever is smaller. A city of 4,000 population and \$600,000 valuation may levy a maximum of \$2,000. If the same size city has

more than \$1,000,000 valuation, however, it may raise no more than \$4,000.

The law also provides that each program must be approved by the Minnesota Commissioner of Agriculture. This assures statewide coordination and expert technical advice from entomologists and plant pathologists of the Department's Division of Plant Industry.

HOW THE STATE HELPS

In the Minnesota Dutch elm disease defense set up, municipal officials can count on the Minnesota Department of Agriculture for laboratory isolation and identification work. Samples should be sent to: Minnesota Department of Agriculture, Dutch Elm Disease Laboratory, 670 State Office Building, St. Paul, Minnesota 55155. Forms and sampling procedures will be sent on request.

It is recommended that Minnesota state foresters and county agricultural extension agents be called to confirm suspected symptoms of Dutch elm disease in semi-rural areas and smaller towns. They are qualified to take proper samples for submission to the Department laboratory. Larger towns should work through their park or street departments. All final identifications of Dutch elm disease must be based on laboratory determinations by qualified technicians.



Cross section of branch showing stains caused by Dutch elm disease.

Area scouting, in keeping with available funds, for the presence of Dutch elm disease or its carrier beetles is handled by survey teams of the Minnesota Department of Agriculture's Division of Plant Industry. To facilitate the work, the Division conducts its own laboratory identification, using a

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I. DUTCH ELM DISEASE IN MINNESOTA

Dutch elm disease has become a serious disease problem on elms in Minnesota since 1961, and as a consequence, the Minnesota Department of Agriculture has developed this training manual for the purpose of aiding County Agricultural Weed Inspectors and other county and municipal personnel in identifying and sampling elm trees suspected to be infected with Dutch elm disease and to familiarize them with the regulations and guidelines adopted by the Minnesota Department of Agriculture.

The Minnesota Department of Agriculture is authorized by law (Minnesota Statute, Chapter 18.022, Subdivision 7), to initiate a Dutch elm disease control program. This program can only achieve success if we maintain cooperation among all agencies concerned with the control of this disease including: the Minnesota Department of Agriculture, the University of Minnesota, the League of Minnesota Municipalities, the Department of Natural Resources and all other city and county agencies.

II. OBJECTIVES

This manual has been designed to provide information regarding recognition and identification of Dutch elm disease in the field; to provide information regarding aspects of sanitation and eradication, to provide information regarding chemical control especially the use of Vapam and to provide a source of regulations and Minnesota Department of Agriculture guidelines regarding Dutch elm disease.

III. STATE STATUTES

The following are excerpts from Minnesota State Statutes - 1965, and provide the legal background for the required program adopted by the Minnesota Department of Agriculture for Dutch elm disease control in municipalities. It is advised that the County Weed Inspectors and all other concerned officials thoroughly familiarize themselves with these regulations especially the information regarding the required program.

A. Excerpts from Minnesota Statutes - 1965, Section 18.022

18.022 INSECT PESTS, PLANT DISEASES, BEE DISEASES, AND DESTRUCTIVE OR NUISANCE ANIMALS. Subdivision 1. Control. When recommended so to do by the commissioner of agriculture, the governing body of any county, city, ~~village, borough,~~ or town of this state is hereby authorized and empowered to appropriate money for the control of insect pests, plant diseases, bee diseases or destructive or nuisance animals. Such money shall be expended according to technical and expert opinions and plans as shall be designated by the commissioner and the work shall be carried on under the direction of the commissioner.

Subd. 2. Cost. (a) In order to defray the cost of such activities, the governing body of any such political subdivision may levy a special tax of not to exceed two mills in any year in excess of charter or statutory millage limitations, but not in any event more than 50 cents per capita, and may make such a levy, where necessary, separate from the general levy and at any time of the year. (b) If, because of the prevalence of Dutch elm disease, the governing body of such a political subdivision is unable to defray the cost of control activities authorized by this section of the Minnesota statutes within the limits set by this subdivision, the limits set by this subdivision are increased to four

mills, but not in any event more than one dollar per capita.

Subd. 3. Certificates of indebtedness. To provide funds for such activities in advance of collection of the tax levies under subdivision 2, the governing body may, at any time after the tax has been levied and certified to the county auditor for collection, issue certificates of indebtedness in anticipation of the collection and payment of such tax. The total amount of such certificates, including principal and interest, shall not exceed 90 percent of the amount of such levy and shall be payable from the proceeds of such levy and not later than two years from date of issuance. They shall be issued on such terms and conditions as the governing body may determine and shall be sold as provided in Minnesota Statutes, Section 475.60. If the governing body determines that an emergency exists, it may make appropriations from the proceeds of such certificates for authorized purposes without complying with statutory or charter provisions requiring that expenditures be based on a prior budget authorization or other budgeting requirement.

Subd. 4. Deposit of proceeds in separate fund. The proceeds of any tax levied under subdivision 2 or of any issue of certificates of indebtedness under subdivision 3 shall be deposited in the municipal treasury in a separate fund and expended only for purposes authorized by this section. If no disbursement is made from the fund for a period of five years, any moneys remaining therein may be transferred to the general fund.

Subd. 5. Penalty. Any person who shall prevent, obstruct, or in any manner interfere with the county authorities or their agents in carrying out the provisions of subdivision 1 to 4, or neglects to comply with the rules and regulations of the county commissioners promulgated under authority thereof, shall be guilty of a misdemeanor.

Subd. 6. Regulations, scope. The council of any city, village, or borough by ordinance and the board of county commissioners of any county and the town board of any town by resolution may adopt and enforce regulations to control and prevent the spread of plant pests and diseases. Such regulations may authorize appropriate officers and employees to enter and inspect any public or private place which might harbor plant pests, as defined in Section 18.46, Subdivision 13, may provide for the summary removal of diseased trees from public or private places where deemed necessary to prevent the spread of the disease, may require the owner to destroy or treat plant pests, diseased plants or other disease bearing material and in default thereof to provide for such work at the expense of the owner, which expense shall be a lien upon the property and may be collected as a special assessment as provided by Section 429.101 or by charter. In this subdivision, the term private place means every place except a private home.

Subd. 7. Failure of political subdivision to act; commissioner's duties. If the governing body of a political subdivision does not appropriate money for the control of Dutch elm disease pursuant to subdivision 1, or does not adopt and enforce regulations to control and prevent the spread of Dutch elm disease pursuant to Subdivision 6, and if the commissioner determines that economic, recreational, or aesthetic losses will result, the commissioner shall proceed as provided in Minnesota Statutes, Section 18.48, Subdivision 1 and 4, to control the spread of Dutch elm disease. However, the expense of these control activities performed on land owned by a county, city, village, borough or town is a charge upon the county, city, village, borough, or town owning the land and shall be paid by the governing body from money which it shall appropriate pursuant to Subdivision 1 and, if necessary, for which it shall levy taxes pursuant to Subdivision 2.

The purpose of this subdivision and of the increased maximum tax levies authorized by subdivision 2, clause (b), is to protect elm trees from Dutch elm disease and thus prevent the economic, recreational, and aesthetic losses which occur when elm trees are killed by Dutch elm disease.

III. A. (con't)

Tentative Model Ordinance For Dutch Elm Disease Control

Introduction

The model ordinance draft contained in this memorandum is intended to provide the basis for a minimum Dutch elm disease control ordinance for cities and villages. As with all model ordinances, it should not be copied blindly but rather should be reviewed in the light of existing conditions within the municipality and modified where necessary.

Main Features of the Ordinance

The ordinance contemplates the inauguration of a Dutch elm disease program, utilizing both municipal resources and those of the Division of Plant Industry of the Department of Agriculture. Under the Plant Pest Control Act, M.S.A. 18.022 and 18.48, as amended by laws 1965, C. 323, municipalities are authorized to levy taxes and expend funds for this purpose upon recommendation of the Commissioner of Agriculture. Such a program should be carried out under the general supervision of the Commissioner exercised through the Division of Plant Industry. The ordinance, therefore, requires close cooperation between the municipality and the department.

The ordinance treats Dutch elm infestations as public nuisances and provides for their abatement in a number of ways ranging from summary abatement to abatement under the normal special assessment procedure. Procedures for protective spraying are also included.

The responsibility for administering the program is placed on a municipal forester (who may be any existing officer or employee) who performs necessary inspection, testing, and treatment. In this connection, municipalities may wish to combine the provisions of this ordinance with

existing nuisance ordinances or with already existing and on-going programs of street tree care and maintenance.

Financing the Dutch elm program is left quite flexible by the ordinance. The cost of removal, trimming and spraying may be assessed, in the case of street trees, against abutting property owners, paid from general revenue or from special funds produced by the 4 mill tax authorized by M.S.A. 18.022 or from any combination of these sources.

Technical help in setting up a Dutch elm disease program may be obtained from the Division of Plant Industry, Department of Agriculture, 670 State Office Building, St. Paul, MN 55155.

III. A. (con't)

An Ordinance Relating to the Control and Prevention of Dutch Elm Disease Within the (City) (Village) Of _____.

Section 1. The (village) (city) council of _____ ordains:¹

Section 2. Declaration of Policy. The (city) (village) council of _____ has determined that the health of the elm trees within the municipal limits is threatened by a fatal disease known as Dutch elm disease. It has further determined that the loss of elm trees growing upon public and private property would substantially depreciate the value of property within the (city) (village) and impair the safety, good order, general welfare and convenience of the public. It is declared to be the intention of the council to control and prevent the spread of this disease and this ordinance is enacted for that purpose.²

Section 3. Forester. Subd. 1. Position Created.

(Alternate #1) The position of forester is hereby created within the _____ department of the (city) (village).

(Alternate #2) Position Created. The powers and duties of the (City) (village) forester as set forth in this ordinance are hereby conferred upon the _____ (street commissioner, engineer, park superintendent, etc.).³

Subd. 2. Duties of Forester. It is the duty of the forester to coordinate, under the direction and control of the council, all activities of the municipality relating to the control and prevention of Dutch elm disease. He shall recommend to the council the details of a program for the control of Dutch elm disease, and perform the duties incident to such a program adopted by the council.

Section 4. Dutch Elm Disease Program. Subd. 1. It is the intention of the council of _____ to conduct a program of plant

III A. (con't)

pest control pursuant to the authority granted by Minnesota Statutes 1961, Section 18.022, as amended.

This program is directed specifically at the control and elimination of Dutch elm disease fungus and elm bark beetles and is undertaken at the recommendation of the Commissioner of Agriculture. The (village) (city) forester shall act as coordinator between the Commissioner of Agriculture and the council in the conduct of this program.⁴

Section 5. Nuisances Declared. Subd. 1. The following things are public nuisances whenever they may be found within the (city) (village) of _____:

A. Any living or standing elm tree or part thereof infected to any degree with the Dutch elm disease fungus Ceratocystis Ulmi (buisman) Moreau or which harbors any of the elm bark beetles Scolytus Multistriatus (Eichh.) or Hylurgopinus Rufipes (Marsh).

B. Any dead elm tree or part thereof, including legs, branches, stumps, firewood or other elm material from which the bark has not been removed and burned or sprayed with an effective elm bark beetle insecticide.

Subd. 2. Abatement. It is unlawful for any person to permit any public nuisance as defined in subdivision 1 to remain on any premises owned or controlled by him within the (city) (village) of _____. Such nuisances may be abated in the manner prescribed by this ordinance.⁵

Section 6. Inspection and Investigation. Subd. 1. Annual Inspection. The forester shall inspect all premises and places within the (city) (village) as often as practicable to determine whether any condition described in Section 5 of this ordinance exists thereon. He shall investigate all reported incidents of infestation by Dutch elm fungus or elm

III. A. (con't)

bark beetles.

Subd. 2. Entry on Private Premises. The forester or his duly authorized agents may enter upon private premises at any reasonable time for the purpose of carrying out any of the duties assigned him under this ordinance.⁶

Subd. 3. Diagnosis. The forester shall, upon finding conditions indicating Dutch elm infestation, immediately send appropriate specimens or samples to the Commissioner of Agriculture for analysis, or take such other steps for diagnosis as may be recommended by the Commissioner. Except as provided in Section 8 no action to remove infected trees or wood shall be taken until positive diagnosis of the disease has been made.⁷

Section 7. Abatement of Dutch Elm Disease Nuisances. Subd. 1. In abating the nuisances defined in Section 5, the forester shall cause the infected tree or wood to be sprayed, removed, burned, or otherwise effectively treated so as to destroy and prevent as fully as possible the spread of Dutch elm disease fungus and elm bark beetles. Such abatement procedures shall be carried out in accordance with current technical and expert opinions and plans as may be designated by the Commissioner of Agriculture.⁸

Section 8. Procedure for Removal of Infected Trees and Wood. Subd. 1. Whenever the forester finds with reasonable certainty that the infestation defined in Section 5 exists in any tree or wood in any public or private place in the (village) (city), he shall proceed as follows:

A. If the forester finds that the danger of infestation of other elm trees is not imminent because of elm dormancy, he shall make a written report of his finding to the council which shall proceed by (1) abating the nuisance as a public improvement under Minnesota Statutes Chapter 429

III. A. (con't)

or (2) abating the nuisance as provided in Subd. 2 of this Section.

B. If the forester finds that danger of infestation of other elm trees is imminent, he shall notify the abutting property owner by certified mail that the nuisance will be abated within a specified time, not less than 5 days from the date of mailing of such notice. The forester shall immediately report such action to the council, and after the expiration of the time limited by the notice he may abate the nuisance.

Subd. 2. Upon receipt of the forester's report required by Subd. 1, part A, the council shall by resolution order the nuisance abated. Before action is taken on such resolution, the council shall publish notice of its intention to meet to consider taking action to abate the nuisance. This notice shall be mailed to affected property owners and published once no less than one week prior to such meeting. The notice shall state the time and place of the meeting, the streets affected, action proposed, the estimated cost of the abatement, and the proposed bases of assessment, if any, of costs. At such hearing or adjournment thereof, the council shall hear property owners with reference to the scope and desirability of the proposed project. The council shall thereafter adopt a resolution confirming the original resolution with such modifications as it considers desirable and provide for the doing of the work by day labor or by contract.

Subd. 3. The forester shall keep a record of the costs of abatements done under this section and shall report monthly to the (city) (village) clerk (or other appropriate officer) all work done for which assessments are to be made stating and certifying the description of the land, lots, parcels involved and the amount chargeable to each.⁹

III. A. (con't)

Subd. 4. On or before September 1 of each year the clerk shall list the total unpaid charges for each abatement against each separate lot or parcel to which they are attributable under this ordinance. The council may then spread the charges or any portion thereof against the property involved as a special assessment under Minnesota Statutes Sec. 429.101 and other pertinent statutes for certification to the county auditor and collection the following year along with current taxes.¹⁰

Section 9. Spraying Elm Trees. Subd. 1. Whenever the forester determines that any elm tree or elm wood within (city) (village) is infected with Dutch elm fungus, he may spray all nearby high value elm trees, with an effective elm bark beetle destroying concentrate. Spraying activities authorized by this Section shall be conducted in accordance with technical and expert opinions and plans of the Commissioner of Agriculture and under the supervision of the Commissioner and his agents whenever possible.

Subd. 2. The notice provisions of Section 8 apply to spraying operations conducted under this Section.

Section 10. Transporting Elm Wood Prohibited. Subd. 1. It is unlawful for any person to transport within the (city) (village) any bark-bearing elm wood without having obtained a permit from the forester. The forester shall grant such permits only when the purposes of this ordinance will be served thereby.

Section 11. Interference Prohibited. It is unlawful for any person to prevent, delay or interfere with the forester or his agents while they are engaged in the performance of duties imposed by this ordinance.

Section 12. Penalty. Any person, firm or corporation who violates Sections 11 or 12 of this ordinance is guilty of a misdemeanor and may be punished by a fine of not to exceed \$100 or imprisonment for 90 days.¹¹

Section 13. This ordinance is effective from and after its passage and publication.¹²

Adopted by the Council this _____ day of _____, 19____.

Mayor _____

Attest:

Clerk

Published in _____ on the _____ day of _____, 19____.

NOTES:

1. This ordaining clause is specified for villages; charters should be consulted for variations in particular cities.

2. A policy declaration of this sort adds nothing of legal significance to an ordinance. It is useful, however, in calling the attention of the public and the courts to the underlying consideration motivating the council.

3. The exact location of the forester in the municipality's administrative framework is a matter for determination of individual councils. In most cases, the duties of the forester could be imposed on some present municipal employee or officer, such as a street commissioner, engineer, inspector, etc., or someone already having responsibility for tree planting and maintenance programs. One of the alternatives suggested here may be used by most smaller municipalities.

4. This section is necessary to clearly authorize the expenditure of municipal funds for this purpose and also to make available the special financing provisions of the Plant Pest Control Act. See M. S. A. 18.022, Subd. 2, 3, and 4. It may be broadened to include other plant pests, such as oak wilt.

5. The basis for proceeding against Dutch elm disease under this ordinance is that the existence of the disease constitutes a public nuisance. The regulations embodied in the ordinance are specifically authorized by Laws 1965, C. 323.

6. Such inspections are authorized by Laws 1965, C. 323. A "private place" is defined by that statute as "any place other than a private home".

7. It is contemplated here that the Division of Plant Industry will be able to diagnose the disease relatively quickly and report back to the municipality. It may be that the Commissioner in serious cases, may wish to take action himself under M.S.A. 18.48. If this happens no further municipal action is needed since the statute provides machinery for complete action by the Commissioner anywhere in the state, on both private and public property. Some ordinances of this type give the responsible official the authority to proceed in serious cases without notice to the property owner. There is some risk in the procedure in that the forester may not make a correct diagnosis. Hence, the ordinance requires confirmation of the disease by the Commissioner. If this summary power of abatement is desired, the following phrase may be added to Section 8, Subd. 1:

C. If the forester finds with reasonable certainty that immediate action is required to prevent the spread of the disease, he may proceed to abate the nuisance forthwith. He shall report such action immediately to the (city) (village) council and to the abutting property owner (or to the owner of the property where the nuisance is located).

8. This Section is intended to insure not only that abatement procedure are adequate but that they comply with the latest technical requirements of the Commission. See M.S.A. 18.022.

9. This Section is designed to utilize the "current services" section of the Local Improvement Code, M.S.A. 429.101, as amended by Laws 1965, C. 323.

10. The council may wish to establish a policy for sharing the cost of abatement with the abutting owner, e.g. municipal share 50%, property owner, 50%. This would be an appropriate place for such a statement. Also, the council may feel that no assessment of costs should be made. This should be expressed in a general policy statement embodied in this or a separate ordinance.

11. No penalty is attached to Section 4 (making the presence of the infected tree a nuisance) since it is probably not desirable to invoke a criminal sanction to correct a condition over which the property owner has no control. There is ample authority in the ordinance to remove the nuisance.

12. This section states what is in effect the law for villages. The council may wish to delay the effective date for a period after publication. Also, some city charters may require a number of readings and a delay in the effective date. If the charter provides for emergency enactments where such formalities are dispensed with, appropriate language should be added here.

REQUIRED PROGRAM FOR DUTCH ELM DISEASE CONTROL IN MUNICIPALITIES

The following is a required Dutch elm disease program that must be in force and actively pursued by July 1, 1974. In the event of failure to implement a program, the Commissioner of Agriculture is required to act and to enforce a program as provided in Chapter 18.022, Subd. 7.

A Dutch elm disease program must include controlling the disease on both public and private property. This can be accomplished by the adoption of a tree ordinance or amendment of an existing nuisance ordinance with specific provisions for Dutch elm disease.

TREE INVENTORY

1. A tree inventory must be made to determine number of elms and other species on both public and private property. This should be a permanent record and should be reported to the Department of Agriculture.

SANITATION

Sanitation is the major element in any Dutch elm disease control program because it is needed to eliminate elm bark beetles, diseased trees and dead or weakened elm wood arising from any cause. This must include trees on private property.

1. Prior to April 15, check all alleys and yards for elm wood or logs that could serve as bark beetle breeding sites and require removal, or de-barking if wood is to be retained.

2. Check all elm trees at least twice during the growing season (by July 1 and August 15) to look for Dutch elm disease symptoms.

3. Remove (burn, bury, or chip) diseased or dead elm trees or any above ground parts thereof within 20 days.

ROOT GRAFT CONTROL

1. Use Vapam (SMDU) or trenching to prevent root graft spread of Dutch elm disease. Trees closer than 50 feet are likely to be grafted together.

RECORDS

1. Keep records of the number of diseased trees and trees removed. Also, records of samples sent in for diagnosis and results whether positive or negative. Records are essential to the evaluation, follow-up and enforcement of control measures.

SUGGESTIONS

1. Keep local citizens informed about status of control program, number of cases, etc. Ask their cooperation in reporting the disease.

III. B. (con't)

2. Provide information on proper methods of disposal -- where wood can be dumped, buried, burned and chipped.

3. Request citizens not to keep elm for firewood since it can harbor elm bark beetles. Only de-barked elm wood is safe to store.

4. Prepare brief annual summary and make it available to citizens and news media.

5. Sources of information - Detailed information and recommendation on tree planting, chemical application and use of Vapam are available from the University of Minnesota, county extension offices, and Minnesota Department of Agriculture. Specific details concerning the required programs for Dutch elm disease are available from the Minnesota Department of Agriculture.

IV. A. GUIDELINES FOR THE MOVEMENT AND DISPOSAL OF ELM WOOD

Pursuant to the provisions of the Plant Pest Act, Minnesota Statutes 18.44-18.58, and the Local Pest Control Law, Minnesota Statutes 18.022, and in consultation with various state agencies including the Division of Lands and Forestry and the University of Minnesota particularly the Departments of Plant Pathology, Entomology, and Forestry, the following guidelines for the movement and disposal of elm wood are proposed for this season. The purpose of these guidelines is to minimize or prevent the spread of Dutch elm disease through the movement and disposal of elm wood.

Guidelines:

1. Elm wood from healthy, weakened, dead, or damaged trees with no bark beetle galleries apparent may be moved at anytime of the year to disposal or chipping sites.
2. Elm wood from weakened, dead, or damaged trees with bark beetle galleries should be chipped, burned, buried the same day or within 24 hours of the time it is delivered to the disposal site.
3. Elm wood from trees diagnosed with Dutch elm disease or with bark beetle galleries should be moved promptly to disposal sites for processing the same day or within 24 hours.
4. It is considered that elm wood chipped or shredded constitutes no hazard to the spread of DED.
5. Completely debarked logs are safe for shipment without threat of spreading Dutch elm disease.
6. Diseased elm logs without bark sawed into lumber is safe for local use or shipment without the possibility of spreading Dutch elm disease.
7. Stock piling of elm logs with bark intact during the months of May, June, and July should not be permitted.

The Minnesota Department of Agriculture would encourage the salvage and utilization of elm wood as a recoverable waste under the above conditions.

IV. B. PROCEDURES TO SURVEY AND CONTROL DUTCH ELM DISEASE IN MINNESOTA

A. Complete and effective control program in a community includes these considerations:

1. Inventory the total tree population to be protected. Classify as follows:

- a. Public parkways and streets
- b. Private property
- c. Community parks

2. Sanitation - Destroy sources of elm wood material which might spread the disease. The purpose is to detect actual or potential sources of breeding sites of elm bark beetles and trees suspected of Dutch elm disease.

a. Examine the community systematically on a lot-by-lot basis for piles of elm wood.

b. Complete this examination before April 15.

c. Record the exact location of elm wood and make arrangements for immediate destruction.

d. It may be necessary to pass a local ordinance to control the sanitation phase of the program.

e. Check sites such as:

(i) City dumps or disposal areas.

(ii) Low lying areas, construction areas where elms have recently been razed and piled.

(iii) Recently dead, dying or weak elms anywhere.

(iv) Piles of elm wood anywhere.

(v) Weak, dying or broken branches from living elms.

f. Treat stumps in one of these ways:

(i) Saw off at ground level

(ii) Strip bark to ground level at time of tree removal

(iii) Destroy with stump removing machinery.

Communities where Dutch elm disease has not been found should not wait until the disease arrives before undertaking a sanitation program. Sanitation should be carried on throughout the year, but must destroy bark beetle breeding material before May 1 of each year.

IV. B. (con't)

3. Conduct symptom surveys to detect diseased trees:

- a. Examine foliage of all elms in the area systematically on a street-by-street basis at least once each season, twice preferably.
- b. Do this between mid-June and early August, timed to detect earliest appearance of the largest number of infections.
- c. Make surveys by vehicle or on foot. The observer, when riding, should not be the driver of the vehicle.

4. Break root grafts between diseased and healthy elms when necessary. This should be planned and discussed with a specialist from the Minnesota Department of Agriculture.

5. As a complement to a good sanitation program, a chemical spray may be necessary to prevent beetle feeding and breeding after the disease is found in a community. Use of insecticides by a municipality requires authorization from the Minnesota Department of Agriculture by law, in accordance with statute 18.022.

6. Survey operations should be done by professionally trained arborists, foresters, or by personnel under their direct supervision who have been trained for this work.

Qualifications of personnel should include:

- a. A thorough knowledge of the symptoms of Dutch elm disease and it's transmission, including the life cycle and habitat of the elm bark beetles.
- b. Ability to identify certain elm disease or troubles with which Dutch elm disease can easily be confused.
- c. Ability to identify certain elm disease (excluding wilts), insect damage, and environmental troubles.
- d. A knowledge of materials in which elm bark beetles may develop.
- e. A recognition of symptoms arising from root graft spread and of the situations where root graft spread is likely to occur.

7. Pruning of living trees required for Dutch elm disease control:

- a. Beetle-infested branches over one inch in diameter.
- b. Weak, recently killed, dying, or broken branches with diameters exceeding two inches.
- c. Dead branches that have lightly adhering bark and diameters exceeding two inches.

IV. B. (con't)

7. d. Live branches that may interfere with a spray program such as those hanging over buildings, against windows, etc.

e. Wind or storm damaged branches.

8. Pruning that is unnecessary for Dutch elm disease control:

a. Dead branches with cracked or loosened bark or with bark gone.

b. Weak or dying branches less than one inch in diameter.

c. Healthy branches pruned to stimulate growth.

d. Healthy branches pruned to shape the tree.

e. Line clearance or pruning for street light efficiency.

Priority of control measures:

1. First destroy diseased trees and beetle breeding material.

2. Always practice sanitation of dead and dying elm wood as the basic control program. Chemical control may complement this when Dutch elm disease is present in a community.

3. Root graft spread should be considered when a diseased tree is surrounded by healthy trees.

4. When DED becomes prevalent and widespread in a community, sanitation should always be emphasized as the basic control program. Chemical control must be worked out and comply with recommendations set up by the Minnesota Department of Agriculture.

MINNESOTA DEPARTMENT OF AGRICULTURE
Division of Plant Industry
670 State Office Building
St. Paul, Minnesota 55155

QUESTIONNAIRE: DUTCH ELM DISEASE CONTROL PROGRAM

Date _____
Municipality and County _____ Telephone _____

Mayor or Chairman _____ Population _____

Person in charge of Dutch elm disease control:

Name _____ Title _____

How many other people are assigned to this program, full time, part time and seasonal? _____

What is your annual budget for Dutch elm disease control? _____

ORDINANCE

Do you have an ordinance that deals with Dutch elm disease and other tree problems? _____ Include copy of ordinance with this questionnaire.

Does your ordinance apply to both public and private trees? _____

Does your ordinance provide for removal of weakened, diseased, and dead trees or portions thereof? _____

Does the ordinance regulate all elm wood disposal? _____

INVENTORY

Indicate number and percentage of elm and other tree species on public property (boulevards, parks, etc.) _____

Number of elms on private property? _____

Is this an actual count or estimate? _____

If elm trees already have been removed because of Dutch elm disease please indicate the number _____

Were samples from the above trees submitted to the Minnesota Department of Agriculture, Dutch elm disease laboratory for diagnosis? _____

If diagnosed elsewhere indicate which laboratory _____

SANITATION

Prior to April 15 does the municipality check public and private property for elm wood which can serve as bark beetle breeding sites? _____

If elm wood is found on private property in what manner is the owner notified to remove it and how soon? _____

How many times during the growing season are the elm trees checked for Dutch elm disease symptoms? _____

At the time of pruning operations are weakened trees or dead portions of them removed? _____

In what manner does the municipality dispose of elm wood, etc.
Burn _____ Bury _____ Chip _____ Other _____

Does the municipality keep records of diseased trees; trees removed, samples sent in for diagnosis and the results? _____

CHEMICAL CONTROL

Other than Vapam (SMDC), is any chemical control planned for 197_? _____

If so, what material will be used? _____

At what rate? _____

Method and time of application _____

Chemical application will be made by whom:

Name of Municipal employee? _____

Name of private contractor? _____

TREE PLANTING

Do you have a tree replanting program with mixed species? _____

Signed _____

Send this completed questionnaire and a copy of your tree ordinance to:

Minnesota Department of Agriculture
Division of Plant Industry
670 State Office Building
St. Paul, Minnesota 55155

V. UNIVERSITY OF MINNESOTA BULLETIN - Dutch Elm Disease

This bulletin deals with the biology of the Dutch elm disease fungus and the insects that cause its spread. It also provides descriptions of disease symptoms and should be used for reference when identifying trees suspected to be infected with Dutch elm disease.

VI. CHEMICAL CONTROL OF DUTCH ELM DISEASE - Recommendations

Vapam is a soil sterilant that will kill elm roots and thus destroy root grafts that might permit the disease to spread to an adjoining tree, especially when trees are within 50 feet of each other. Vapam is recommended to be diluted at 1 part Vapam to 3 parts water using 2 to 8 ounces of this solution per hole depending upon soil type: sand - 3 ounces, silt - 6 ounces, clay - 8 ounces. Holes are all 12" apart in sand and silt and 6" in clay.

The holes are spaced 6-12 inches apart in a line that separates healthy and diseased trees. In general, the line should extend beyond the width of the tree branches and all holes should be filled in to seal in the solution.

The following table indicates the quantity of Vapam that would be used to completely encircle trees at 15, 20 and 25 feet on a sandy, silty or clay type soil.

RATES OF VAPAM USAGE

RADIUS	Vapam used per tree (Actual Vapam in ounces)		
	15'	20'	25'
SAND	35	47	58
SILT	70	94	116
CLAY	94	126	156

TREES TREATED PER GALLON OF VAPAM

RADIUS	15'	20'	25'
SAND	3.6	2.7	2.2
SILT	1.8	1.4	1.1
CLAY	1.4	1.0	.8

COST OF VAPAM PER TREE IN DOLLARS (Vapam at \$3.10 per gallon)

RADIUS	15'	20'	25'
SAND	.86	1.14	1.41
SILT	1.76	2.28	2.82
CLAY	2.21	3.10	3.82

VI. (con't)

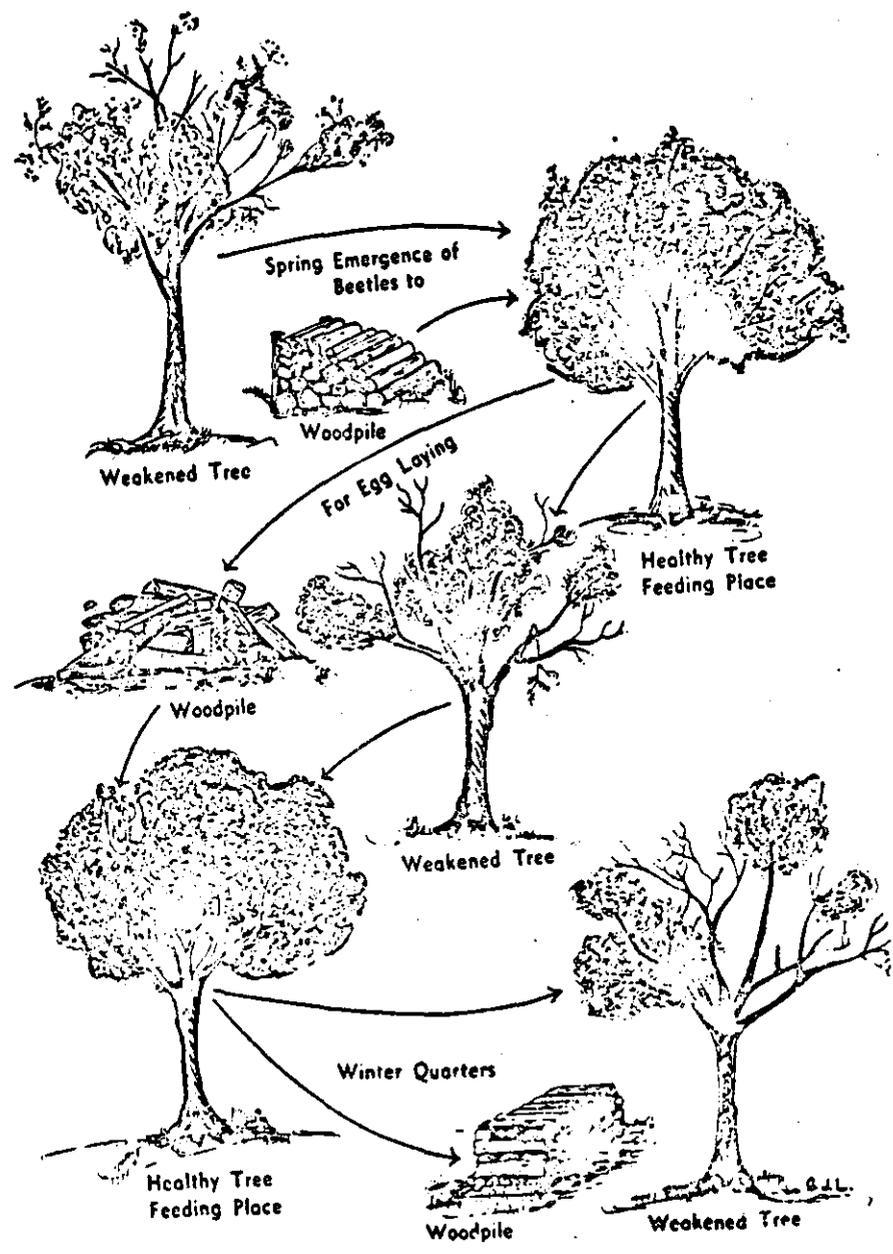
The Minnesota Department of Agriculture does not recommend the use of methoxychlor for bark beetle control because of its higher cost and short period of effectiveness.

It may be feasible at times to protect some high value trees in parks, cemeteries, or golf courses. Methoxychlor may be applied once in the spring when the temperature reaches 40° or higher. Application should be applied as close to bud swelling as possible to insure residual protection through peak activity in June. Use an emulsion preparation especially manufactured for Dutch elm disease control.

Method: Mist-blower application is preferred to hydraulic spraying when possible. For mist blower application, a 12½ percent concentration spray is prepared - mix 1 part methoxychlor 25 percent emulsifiable concentrate with 1 part water. Use 2-3 gallons of the mixture per 40 foot tree. Only a thoroughly sprayed tree will be protected from beetle feeding.

The ultimate role of Benomyl (benlate), a new systemic fungicide, is yet to be determined. At the present time, only those persons especially trained in its application should use Benomyl. The cost is high, but in some situations where private trees are on estates costs may not be important. This new fungicide is used as a treatment to prevent infection or it may be applied as a therapeutic agent to arrest an infection that is already established, but only when the infection is very limited. At present, the Minnesota Department of Agriculture does not recommend the use of Benomyl for control of DED in Minnesota.

VII. DUTCH ELM DISEASE REPORT - 1973



Dutch elm disease continued to increase in severity and spread during the 1973 season. Forty-five municipalities found their first positive case in 1973 as did seven counties. Three hundred and two municipalities now have Dutch elm disease and sixty-two of the 87 counties.

Factors favorable for the increase of the disease were probably the mild winters of 1972-73 that were conducive to the overwintering of the elm bark beetles, and the rapid increase of the elm bark beetles in the rural areas due to many dying elm trees. The relatively cool, wet spring also was a factor in increasing the disease, in that it prolonged the susceptibility of the elms to the disease at the time of inoculation.

During the period June 1, 1973 to October 15, 1973 - 4,116 elm samples were submitted to the Minnesota Department of Agriculture Dutch Elm Disease Laboratory. Of these 2,378 were diagnosed as positive for Dutch elm disease. The City-of-Austin Laboratory confirmed 120 positive cases, and the St. Cloud Laboratory 47. The total of diagnosed cases in 1973 from all agencies was 2,545. Since 1961, a total of 7,891 cases of Dutch elm disease has been diagnosed, mainly from municipal areas.

Dutch elm disease is continuing to increase in the Twin City Metropolitan area and in southern Minnesota. In the rural areas Dutch elm disease is increasing especially along the rivers and their tributaries. The Cedar, Root, and Blue Earth River valleys in southern Minnesota have many diseased and dead trees.

It is expected that Dutch elm disease will continue to increase in severity and that many more municipalities will find their first case of Dutch elm disease in 1974. Dutch elm disease has increased by 363% in the past five years. The future increase of Dutch elm disease in the municipalities will be determined by the effectiveness of their control program.

A 1 to 2% elm tree loss a year in a municipality which is surrounded by a high incidence of the disease in the rural areas is considered a good control program. In the rural areas neither sanitation or chemical control is justified and a 15-30% loss a year can be expected. The increase of Dutch elm disease in the years ahead will be determined largely by three factors: the effectiveness of a good sanitation program to reduce elm bark beetle populations; the climatic conditions which affect their survival; and the susceptibility of the elm trees to the disease at the time of beetle inoculation.

LABORATORY DIAGNOSED CASES BY YEAR

1961 - 8 positive cases	1968 - 283 positive cases
1962 - 2 positive cases	1969 - 549 positive cases
1963 - 43 positive cases	1970 - 795 positive cases
1964 - 54 positive cases	1971 - 1,168 positive cases
1965 - 23 positive cases	1972 - 2,236 positive cases
1966 - 49 positive cases	1973 - 2,545 positive cases
1967 - 136 positive cases	

TOTAL - 7,891

1973 Season Positive Cases Diagnosed by the Dutch Elm Disease Laboratory Minnesota Department of Agriculture

ANOKA	Anoka	37	BLUE EARTH	Madison Lake	
	rural	1		rural	3
	Circle Pines	1		*Cambria	
	Fridley	6		rural	1
				*Eagle Lake	1
BENTON	Foley			Mankato	72
	rural	3		rural	4
	*Oak Park			*Vernon Center	3
	rural	2			
	Sauk Rapids	2			

BROWN	*Comfrey rural	2	*DOUGLAS	*Alexandria rural	1		
	*Essig	1		FARIBAULT	Blue Earth	24	
	Hanska rural	6			Wells	11	
	New Ulm rural	7			Winnebago rural	8	
	Sleepy Eye	3			FILLMORE	Canton	1
	Springfield rural	7				Chatfield rural	2
		1					7
							3
CARVER	Chanhassen	2	FREEBORN			Albert Lea rural	75
	*Chaska	2		Alden rural		2	
	*Watertown rural	1				1	
CHIPPEWA	Montevideo	4	GOODHUE	Cannon Falls		5	
CHISAGO	*Chisago City	1		Pine Island rural	2		
	*Harris rural	2		Red Wing rural	1		
	*Lindstrom rural	1		Zumbrota	2		
	*North Branch rural	5		*GRANT	*Elbow Lake rural Grant County	1	
	*Rush City	1				1	
	*Stacy	2			HENNEPIN	Bloomington	364
	*Sunrise rural	1				Brooklyn Center	9
	rural Chisago County	3	Brooklyn Park			93	
COTTONWOOD	Mountain Lake	3	Champlin			6	
	CROW WING	*Brainerd	1			*Corcoran	1
		Ironton	1			Crystal	1
*Pequot Lakes rural		2	Dayton	1			
DAKOTA	Burnsville	3	Eden Prairie	12			
	Farmington	8	Edina	5			
	Hastings	2	*Excelsior	1			
	Inver Grove Heights	4	Fort Snelling	6			
	Mendota Hts.	22	Hopkins	1			
	*Rosemount rural	1	*Long Lake	2			
	South St. Paul	34	Maple Grove	10			
	West St. Paul	4	Maple Plain	2			
	DODGE	Dodge Center	10	Minneapolis	242		
		Kasson	3	*Minnetonka	4		
		West Concord	1	*Minnetonka Mills	1		
			*Minnetrista	1			
			New Hope	2			
		*Osseo	1				
		Plymouth	6				
		Richfield	4				
		Rogers	1				
		St. Anthony	5				
		*St. Bonifacius	4				
		St. Louis Park	10				
		*Shorewood	7				
		*Wayzata	1				

HOUSTON	Caledonia	2	MARTIN	Fairmont	44
	rural	1		Northrop	1
	LaCrescent	1		Trimont	2
	rural	1			
ISANTI	*Cambridge	8	MC LEOD	*Biscay	1
	rural	2		Glencoe	
	*Stanchfield	1		rural	2
	rural Isanti			Hutchinson	8
	County	1		rural	2
*ITASCA	rural Itasca			*Plato	
	County	5		rural	1
				*Stewart	
				rural	1
JACKSON	Heron Lake	5	MEEKER	*Dassel	2
	rural	1		rural	1
	Jackson	7		Litchfield	2
	Lakefield			rural	1
	rural	1			
KANDIYOHI	*New London	1	MILLE LACS	*Foreston	
	*Sibley State			rural	1
	Park	1		*Isle	
	*Spicer	2		rural	1
	Willmar	4		Milaca	7
	rural	2	*MORRISON	*Little Falls	1
	rural				
	Kandiyohi Co.	1	MOWER	Austin	3
				rural	1
*LAC QUI PARLE	*Dawson	5		Dexter	
	*Lac Qui Parle			rural	1
	State Park	1			
LESUEUR	LeSueur		MURRAY	*Lake Shetek	
	rural	1		State Park	2
	*Montgomery			Slayton	1
	rural	1		rural Murray Co.	1
	*New Prague		NICOLLET	Courtland	1
	rural	1		Lafayette	
	Waterville			rural	1
	rural	1		St. Peter	2
				rural Nicollet Co	3
LINCOLN	Hendricks		NOBLES	Leota	
	rural	1		rural	3
	Hole-in-the			Wilmont	1
	Mountain			Worthington	10
	County Park	11		rural	3
LYON	*Camden State		OLMSTED	*Eyota	1
	Park	3		rural	1
	*Cottonwood			Oronoco	1
	rural	1		Rochester	139
	Marshall	1		rural	2
	Minneota	3		Stewartville	3
	Tracy	4		rural	3
	rural Lyon Co.	1			

PINE	rural Pine Co.	1	SCOTT	Belle Plaine rural	2			
PIPESTONE	Pipestone	2		*Jordan rural	1			
	rural	2		*Prior Lake rural	3			
	*Verdi rural	1		Savage	3			
POPE	*Villard	1	*Shakopee rural	1	4			
RAMSEY	Little Canada	1	SHERBURNE	Becker rural	1			
	Maplewood	27		Elk River rural	3			
	*Moundsview	1		Zimmerman rural	1			
	New Brighton	5		STEARNS	Albany rural	1		
	North St. Paul	64			Cold Spring	1		
	Roseville	6			*Kimball rural	1		
	St. Paul	283			Melrose	3		
	Shoreview	1			St. Cloud rural	1		
	*White Bear (town)	10			*St. Joseph rural	1		
	White Bear Lk	44			Sauk Centre	2		
REDWOOD	Clements rural	2	STEELE		Owatonna rural	8		
	Lamberton	6				1		
	*Morgan	2			*SWIFT	*DeGraff rural	1	
	*North Redwood rural	1		*TODD		*Grey Eagle rural	3	
	*Redwood Falls	2				*Little Sauk rural	1	
	*Revere	2				WABASHA	Elgin	1
	*Sanborn	2					Lake City	5
	RENVILLE	*Bird Island rural					1	Plainview	1
*Emmet		1	Wabasha				3	
Olivia		1	rural Wabasha Co.				5	
RICE	*Dundas rural	2	WASECA		Janesville		1	
	Faribault rural	72		New Richland	3			
	*Morristown rural	2		Waseca	1			
	Northfield rural	2		rural	1			
	*Warsaw rural	1		WASHINGTON	*Afton	2		
	ROCK	Hills			1	Bayport	9	
		ST. LOUIS			*Biwabik	1	Cottage Grove	8
*Duluth			1		Lake Elmo	6		
*Eveleth	1		*Mahtomedi		2			
Gilbert	3		Marine-on-the St. Croix		1			
Virginia rural	5							
	2							

WASHINGTON (continued)	*Oakdale	1
	*St. Paul Park	2
	Scandia	2
	Stillwater	8
	rural	5
	Woodbury	20
WINONA	*Dresbach	
	rural	1
	*Homer	
	rural	1
	Lewiston	2
	*Rollingstone	
	rural	1
	St. Charles	
	rural	1
*Stockton		
rural	1	
	Winona	43
WRIGHT	Buffalo	12
	rural	2
YELLOW MEDICINE	Canby	5
	rural	1
	Wood Lake	1
	rural Yellow Medicine Co.	2

TOTAL - 2,378

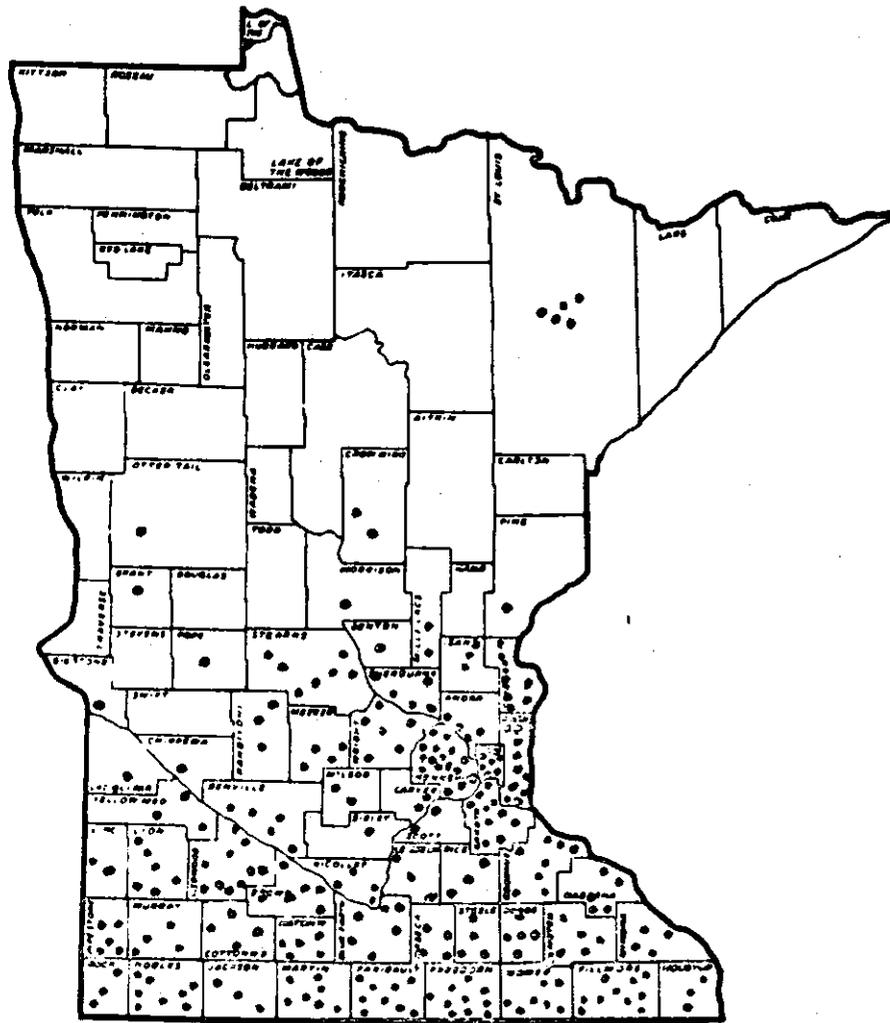
(* indicates new location for 1973)

7 new counties infected in 1973. They are: Douglas, Grant, Itasca, Lac Qui Parle, Morrison, Swift, and Todd.

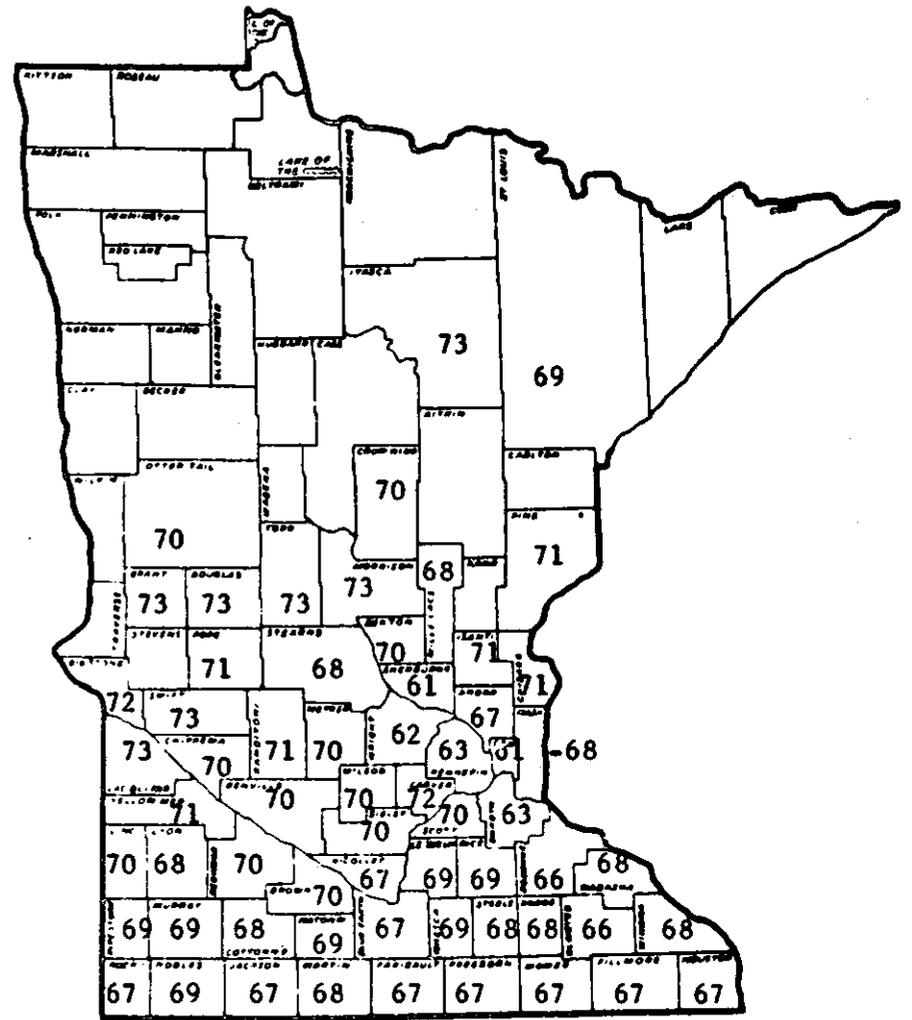
SUMMARY TABULATION

Total cases confirmed thru October 15, 1973 by the Dutch Elm Disease Laboratory of the Minnesota Department of Agriculture	2,378
Confirmed by the City of Austin Laboratory	120
Confirmed by the St. Cloud City Laboratory	47
Total confirmed cases for Minnesota	2,545

The following four maps outline: (1) distribution of Dutch elm disease in Municipalities, (2) Dutch elm disease occurrence by counties, (3) distribution and progression of the smaller European elm bark beetle which is the main carrier of the disease, and (4) area of high incidence of Dutch elm disease in rural areas.



DISTRIBUTION OF DUTCH ELM
DISEASE IN MUNICIPALITIES - 1973



ANNUAL DISEASE PROGRESSION BY
COUNTIES

SPECIAL REPORT 14

DUTCH ELM DISEASE AND COMMUNITY DECISIONS



Elms are one of the most common shade trees in Minnesota. They beautify many Minnesota communities, provide shade, and lower the temperature on hot sunny days. The presence of these beautiful trees increases property values, whether in cities, suburbs, towns, or villages. But unless communities take action to protect their elms, populations of these trees may be seriously depleted or even wiped out entirely by Dutch elm disease.

THE FACTS

Dutch elm disease was first identified in Minnesota in 1961. Through 1964, 87 cases had been identified in Monticello, 11 in St. Paul, 8 in Minneapolis, and 1 in South St. Paul. To the south, in Iowa, Dutch elm disease was first found in 1957. Spread there has been so rapid that the rate of confirmed county infestation has increased each year.

Experiences in states to the east indicate that it is not possible to escape an invasion of this disease.

This report is not intended to give the reader complete details about Dutch elm disease and its carriers. This information may be found in Extension Folder 211, "The Dutch Elm Disease."

THE CHOICES

With Dutch elm disease on the way, the valuable elm trees which beautify a community represent a liability as well as an asset. It will cost money if no protective measures are taken and elm trees are allowed to die. It will also cost money to fight Dutch elm disease with a sanitation and chemical protection program. Such a program, however, will protect our elms and maintain the value of real estate.

Based on the experiences of some midwestern cities, it has been shown that over a 10-year period, a

Adapted by Herbert G. Johnson, professor and extension plant pathologist, by permission of the Cooperative Extension Service, Iowa State University, Ames, from Pamphlet 308 (revised), June 1965.

sanitation and chemical protection program need cost but little more than doing nothing except removing diseased trees as they die. Such a program can save up to 80 percent of the elms. And the community can budget this program at a steady rate. The cost of tree removal is small at the beginning when the disease is just starting, and at the end when only a few elms are left. During the middle 5 of the 10 years, costs are very high (table 8).

At the end of 10 years, it is believed that all unprotected elms surrounding the community will be dead. Therefore, the principal source of disease inoculum would be nonexistent. When this occurs, chemical protection can be discontinued and only sanitation practiced. The possibility does exist that continued chemical protection and sanitation may be the only way to maintain protection after this period. There is also a possibility that a much lower cost type of control may be developed during this period of time.

In View of the Problem, City Governments Have These Alternatives:

- 1) Remove the dead elms and replant to a variety of species.
- 2) Control the disease by sanitation and chemical protection.

FIRST, each community concerned should make a thorough, accurate tree survey to determine the number of elms and other trees, their condition and value.

THEN,

If You Simply Remove Dead Elms and Replant

Virtually all elms will die in communities which take no action. Losses of about 15 percent per year can be expected after Dutch elm disease becomes well established. Experience indicates that nearly all elms will probably be dead within 10 years. Data shown below are figures compiled from surveys taken in one Illinois community without a control program in which records of its losses were maintained.

Table 1. Percent of elms killed by Dutch elm disease

Year	Percent loss	
1951	.01	Champaign-Urbana, Ill.
1952	.10	14,768 elms—89 remain.
1953	1.10	78.09 percent or 11,243
1954	4.90	trees killed by Dutch elm
1955	12.70	disease. 3,436 killed by
1956	13.00	other factors.
1957	15.00	
1958	12.50	
1959	12.80	
1960	4.90	
1961	.80	
1962	.22	
1963	.06	

Elms in this community also suffered from another disease, phloem necrosis. The trees dead from phloem necrosis may have increased the momentum of Dutch elm disease. However, losses in other communities without phloem necrosis have occurred at virtually the same rate.

How will the loss of elms affect wildlife?

Where elms are allowed to die from Dutch elm disease, we can speculate that the relative effect on birds will be as follows:

Percent of trees dead that are standing elms	Effects
25	No measurable effect.
50	Some apparent increase in woodpeckers attracted by dead elms still standing, and starlings attracted by nesting sites. Little or no measurable effect on other birds or squirrels.
75	Some apparent increase in woodpeckers. A decrease in tree-nesting species, such as robins, Baltimore orioles and mourning doves. No effect on squirrels.

In 10 years, as dead trees fall, woodpecker populations return to normal (an apparent decrease); populations of tree-nesting birds are reduced, and there is an apparent reduction in squirrel populations.

Actually, no community can forever follow a policy of doing nothing about Dutch elm disease. Dead elms will litter the streets and parks with falling branches, threatening life and property until they are removed. Property values will be reduced even further.

REMOVING DISEASED TREES IS A MINIMUM COMMUNITY PLAN

This is not a control program. Losses will occur at nearly the same rate as in those communities where the dead trees are left standing. However, this plan has two advantages: Property values will not decline to the same degree, and hazards to life and property will not persist. A city can require removal of diseased elms from private property.

Tree losses in a community will likely reach a peak during the fourth through the eighth year following attack. In order to meet the high cost of removal during these years, some infested cities have passed special forestry taxes through referendums voted upon by the people. Another approach is to issue bonds which provide money immediately for tree removal but postpone the cost to later years.

Wildlife is involved, too.

There are no data available, but we may assume that there would be a sharp decrease in woodpecker and starling numbers. There would be a gradual decrease in populations of robins, mourning doves, orioles, migrating warblers, bluejays and titmice as tree numbers, nesting sites and food supplies decline. Fox squirrels will also decrease as nesting sites are reduced and hazards of travel across open areas increase.

REPLANTING A VARIETY OF TREES WILL HELP

A community with Dutch elm disease and no positive control program should visualize its appearance after the elms are gone. Unless the citizens want a nearly treeless community, desirable species of trees should be planted according to a well-thought-out plan. Trees planted now may develop several years' growth before all elms are lost, thus cushioning the shock of their removal.

It would be wise to use a variety of trees and landscaping plans to minimize the likelihood of some future malady wiping out a large percentage of a community's trees.

Obviously, tree removal and planting programs can be carried out simultaneously. Indeed, this is desirable as a phase of any plan of operation.

The effect on wildlife

If elms are few in number, there will be no obvious change in bird or wildlife populations. If elms are dominant, birds and squirrels will decrease at first, then return as the replacement trees reach 20 to 25 feet high.

Control Programs Available to the City

The only control program which has proved successful in the Midwest requires a thorough and persistent community effort in the removal and burning of dead and dying elm wood, supplemented by dormant applications of residual insecticides or spring treatment with systemic insecticides as soon as the disease is found. Trees in close proximity to each other may be infected through root grafts. Either trenching or soil fumigants may be used to sever these connections. Questions frequently arise concerning the effectiveness of either the sanitation program or the spray program when used alone, and why their chances for success are minimal at best.

IF SANITATION-ONLY IS PRACTICED

In areas where the elms are well scattered and do not exceed 30 percent of the total tree population, it is probable that a rigidly enforced routine of elm sanitation could substantially reduce the impact of Dutch elm disease. Some New England reports indicate success under these conditions. Sanitation is also being used effectively by some eastern cities after sanitation-chemical protection programs have protected the trees for several years while surrounding wild elms were destroyed. In effect, such communities are isolated from reinfection by diseased wild elms because elm bark beetles will not breed and the disease organism cannot live in dead trees which have lost their bark. This happens in 1 to 3 years.

No data are available concerning communities in the Midwest which have successfully defended their elms using sanitation alone. Some have tried and failed. Some indication of the protection given by insecticides can be seen from the figures in tables 2 and 3, taken from five Illinois communities which dropped the spraying operation from their control program while dying trees still prevailed in unprotected areas.

Table 2. Percent of unsprayed elms killed in five selected cities with incomplete programs in 1960

City	Percent of original population
H	6.88
I	9.76
J	11.65
K	16.18
L	29.20

Table 3. Percent of original elm population killed in two Illinois cities which discontinued spraying, but maintained a sanitation program

City	Percent of original population				
	1956	1957	1958*	1959	1960
F (street)	.07	.83	.97	.59	1.41
F (private property)	.07	1.05	1.03	1.88	6.88
G (street)		.53	.72	1.32	4.43
G (private property)		.98	1.87	1.81	9.76

* 1958 was last year sprayed. Some carryover effect was likely in 1959.

A 1962 report (table 4) of Illinois cities grouped according to disease losses gives further indication of the failure of sanitation only.

Table 4. Illinois cities grouped according to disease loss classes in 1962

Level of losses	Number of cities	
	Spraying and sanitation	Spraying discontinued
Below 1 percent	20	1
1 to 2 percent	11	0
2 to 3 percent	4	0
3 to 4 percent	2	1
Above 4 percent	3	3
Average loss in 1962	1.48 percent	8.98 percent

Losses above 2 percent, where both chemical protection and sanitation procedures are followed, indicate the possibility that natural root grafts exist between trees. Root grafting may occur where trees are located within 50 feet of each other. There is a 30 percent chance of root grafts between trees 30 feet apart. The closer trees are together, the higher the incidence of root grafts. Trenching between trees or the injection of sodium N-methyl dithiocarbamate (SMDC)* to break the grafts is the only control.

To prepare SMDC, mix one part chemical with four parts water. Punch or drill holes 3/4 inch in diameter 3 feet deep at 6- to 9-inch intervals in a line between the diseased and adjacent healthy elms. Apply 1 cup of mixture to each hole and immediately tamp shut with your heel to prevent loss of fumes.

This barrier should extend well beyond the drip lines of adjoining trees and around walks, shrubs or other plants. Treatment should not be made within 3 feet of these plantings.

A series of barriers may be necessary. SMDC will kill the lawn about 1 foot wide along the barrier. This area can be repaired after 2 weeks.

The sudden surge of losses occurring in 1960 (table 3), in addition to data shown in table 4, and other observations in the Midwest leave very much in doubt the possibility that sanitation alone can control Dutch elm disease.

* Sold under the trade names Vapam and VPM.

Table 8. Cost figures applied to Champaign-Urbana data in table 1 (original number of elms was 14,768)

	Removal of Dutch elm diseased trees only (\$70/tree)	Cost of complete control program (Table 7)
1951	\$ 140	\$ 88,608
1952	1,050	88,608
1953	11,340	88,608
1954	50,610	88,608
1955	131,320	88,608
1956	134,400	88,608
1957	155,050	88,608
1958	129,220	88,608
1959	132,300	88,608
1960	50,610	88,608
1961	8,260	50,213
1962	2,240	50,213
1963	630	50,213
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13-year total removal costs for Dutch elm disease	\$807,170	13-yr. total costs to be budgeted \$1,036,719
Removal cost of trees dead from other causes (3,436)	\$240,520	\$ 240,520
Total removal costs for all causes	\$1,047,690	Total costs to be budgeted \$1,277,239
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Number of trees left	89	7,787

anticipating costs. The information has been provided by cities in Iowa with control programs now in operation and cities without control programs where the disease has caused major losses.

These figures should not be considered absolute, however, for costs vary considerably, depending upon the availability of labor, number of trees involved, their size and location, and other factors. Furthermore, these are costs to municipalities only. Expenses of private tree owners will likely be about twice as high for each item. *No figure* is included for the esthetic value or real estate value of trees which are lost.

These figures show that a control program using DDT is slightly less expensive than tree removal alone and that a program using methoxychlor or Bidrin is more expensive, but the cost is distributed rather uniformly each year (see table 8). Removals are expensive over just a short period and leave nothing for the community after the money is expended. Locally prepared brochures, service organizations, Boy and Girl Scouts and other agencies can be used to inform the people about the choices available to them and the results to be expected

Acknowledgment is given to Dr. Dan Neely, Illinois Natural History Survey, Urbana, Illinois, for much of the data used in this publication.

The use of trade names in this publication is solely for the purpose of providing information. Mention of trade names does not constitute guaranty or warranty of the products named and does not signify that any one product is approved to the exclusion of other comparable products.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture. Luther J. Pickrel, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101. 2M-8-65

How will sanitation affect wildlife?

The effects on bird and other wildlife populations would be the same as for "removal only," since trees will continue to die.

CHEMICAL PROTECTION ONLY

No successful control program is known to be in operation any place in the United States in which chemical protection is practiced without adequate sanitation procedures. Many cities, realizing too late the overpowering nature of Dutch elm disease, have resorted to "last-ditch" attempts to save their elms from destruction with a chemical protection program. One of the communities attempted to turn the tide by spraying, after the disease losses began to mount, but did so without success.

Efforts to control Dutch elm disease by using only chemical protection practices do not take into account the fact that the disease-carrying beetles develop in tremendous hordes in dead elm wood. Satisfactory control would require 100 percent coverage of every elm twig, which is an impossibility. Spray-only practices cannot be recommended.

SANITATION-CHEMICAL PROTECTION PROGRAM

By removing the beetle-breeding trees and the source of the disease fungus (dead and dying elm wood), the number of carriers and the chances for disease spread are substantially reduced. Good applications of insecticide will protect about 95 percent of the tree surface. This is sufficient to keep losses at a very low level when good sanitation is also followed.

Table 4 contains data which show that losses can be kept well below the 2 percent level. Table 5 shows further detailed information concerning the percentage of elms affected annually by Dutch elm disease in Illinois communities with comprehensive disease control programs. These cities are located near communities which have not accepted control programs and which have lost their trees.

These data should be compared with those in table 1. Such communities as these in Illinois and in other

midwestern states, where the disease has been serious or several years, have demonstrated conclusively that the disease can be controlled.

Is it necessary to protect chemically all the trees in a community?

It would be unusual if every desirable elm was protected. All public elms (streets, parks and cemeteries) should be included in a chemical protection program, and private citizens should be encouraged to have their elms treated to the extent possible. Unprotected trees in communities with comprehensive programs will be more susceptible to infestation than protected trees, as table 6 indicates. But losses will likely be far less than those experienced in localities without complete programs.

Table 6. A comparison of the value of sanitation alone and sanitation with spraying in five Illinois cities

City	Percent of original population killed	
	Sanitation without spraying (private trees)	Sanitation and spraying (public trees)
A	1.16	.64
B	1.80	.50
C	4.13	.43
D	.80	.54
E	2.30	.70

The trees belonging to private citizens benefit from the public control programs. However, individuals should be strongly encouraged to cooperate to make the coverage as complete as possible.

Systemic insecticides: An organophosphorus insecticide called Bidrin has been injected into elms to control bark beetles feeding in the twig crotches. The chemical travels in the sap stream and is deposited in leaves and bark. It has an effective life of 30 days after injection, then breaks down to nontoxic materials. Bidrin is quite toxic and must be applied only by trained workers wearing approved protective equipment. Use of Bidrin eliminates the residue problem and minimizes the hazard to wildlife. Properly applied, it gives about the same degree of protection as DDT and methoxychlor.

Table 5. Percent of original elm populations affected annually by Dutch elm disease in northern Illinois communities with comprehensive disease control programs

City	1956	1957	1958	1959	1960	1961	1962	1963
Glencoe	.55	.49	.45	.33	.27	.51	.47	.29
Glenview		.35	.34	.26	.94	.94	.72	1.16
Kenilworth	.14	.18	.36	.24	.20	.34	.30	.20
Mt. Prospect	.05	.09	.11	.18	1.46	.74	.37	.48
Oak Park		.01	.06	.14	.31	.32	.24	.34
Riverside		.15	.27	.15	1.33	.58	.55	.65
Western Springs	.11	.27	.28	.33	.95	2.16	.54	.67
Winnetka	.31	.32	.31	.20	.39	.95	.88	.83

* Street tree data

Wildlife effects

When DDT is properly applied as a dormant spray, some of the chemical does not remain on the bark but falls back to the ground, where it settles on dead leaves and grass. Whether spraying is done in the fall or spring, DDT will still be present in the spring when earthworms emerge out of dormancy, come to the surface and eat the dead vegetation and the DDT. The DDT is stored in their bodies. Before the earthworms die, they may be picked up and eaten by robins. If the robins have just arrived in migration and are thin, Michigan State University studies show that up to 95 percent of the returning robins may die. However, if the robins are in good condition, University of Wisconsin studies indicate that DDT-loaded earthworms can be eaten by robins with no apparent effect. DDT-loaded earthworms will be lethal if fed to nesting young of robins, grackles, starlings, sparrows of all kinds, and brown thrashers.

Birds poisoned by DDT lose coordination and are unable to fly. They suffer violent tremors and attempt

to hide in shrubbery. The average citizen observing these symptoms in a number of birds is apt to react strongly against the use of DDT. Birds may show similar symptoms, however, as a result of parasites or disease.

DDT, as used in Dutch elm disease control programs, has no effect on the squirrel population. If spraying is careless and DDT drifts into lakes, ponds or streams, there can be nearly complete fish kill.

Methoxychlor is less toxic to earthworm-eating birds, but it is about three times more expensive than DDT and has less residual properties on elm bark. There is no guarantee that robins or other birds will be completely safe in methoxychlor-treated areas, but losses will probably be reduced. As with careless application of DDT, contamination of water with methoxychlor will also kill fish.

COST CONSIDERATIONS

Dutch elm disease costs money. This is true whether the trees are allowed to die or are protected with a control program. Table 7 provides some basis for

Table 7. Estimates of cost of Dutch elm disease alternatives for 10 years, per 1,000 trees

Cost item	Cost per tree	Type of program		
		Removal only	Removal & replacement	Complete program (Sanitation & spray)
Pruning	\$12/4 years			\$27,000*
Dormant spraying				
DDT	1.75			17,500
Methoxychlor	3.75			(37,500)
Bidrin	3.75			(37,500)
Removal	70.00	\$63,000	\$63,000	14,000
Replacement	7.50		6,750	1,500
Total after 10 years		\$63,000	\$69,750	\$60,000 (-\$80,000)
Effects upon elm population				
Initial population		1,000	1,000	1,000
Elms lost		900	900	200
Elms remaining		100	100	800

Assumptions

Pruning and maintenance	Involves only removal of dead and weak wood and low-hanging branches; trees pruned every 4 years. Some cities have a 5-year system.
Dormant spraying	Spraying with DDT costs \$1.75 per tree. Spraying with methoxychlor costs \$3.75 per tree. Both figures include \$15 per hour machine operation.
Spring application of Bidrin	This insecticide should be injected in the spring, beginning when the first pupa of the smaller European elm bark beetle is seen. On the average, this date is about May 15 in southern Minnesota to June 5 in northern Minnesota. Each town should make its own observations on pupation and emergence. Injection should stop when the first adult beetles emerge. Cost is about \$3.75 per tree.
Removal	Costs range from \$40 to \$100 or more, depending on size and location of tree, and help available.
Replacement	Includes wholesale cost of trees, planting, staking, fertilizing and watering for the first 2 years, with 20 percent death loss.

*The sanitation-chemical protection program includes some pruning costs which are required regardless of Dutch elm disease. The spray program can possibly be dropped 10 years after the first diseased tree is found.

PUBLIC INFORMATION SUPPORT
FOR LOCAL URBAN FOREST PEST MANAGEMENT PROGRAMS

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ABSTRACT

The Minnesota Department of Agriculture conducts a public information program as part of its effort to assist communities that wish to control oak wilt and Dutch elm disease. One employee plus approximately \$40,000 per year are involved in the effort which has two objectives: first, to generate and maintain a statewide awareness of the presence, the danger, and the control of the diseases; and second, to provide local officials with training and information that will be useful in informing local citizens of local disease control activities.

The first of these objectives is accomplished by creation of film, audio and video tapes, brochures, posters, news releases, and annual reports. All of this material is directed at the general public and is non-technical in tone and content. Providing local officials with training, a statewide urban forestry newsletter, artwork and core copy for generation of local press releases, and with announcements of when local media will receive statewide releases accomplishes the second objective. Examples of the various materials produced are presented.

INTRODUCTION

The sentiment, "I work with trees--not people," will never work in the field of urban forestry.

In an urban forest, trees and people are inseparable. A city forester's responsibilities extend beyond caring for trees to encompass public relations.

Why? Because it is people who will determine the ultimate success or failure of a municipal urban forestry program. No matter how well the city forester cares for the city's trees, no local program can work for long without public support, understanding, and financing.

MINNESOTA'S EXPERIENCE

From the very beginning, Minnesota recognized the importance of public relations in its efforts to control Dutch elm disease. When the Minnesota Legislature responded in 1975 to a growing epidemic of Dutch elm disease, it recognized the need for an informed and supportive public.

The state Shade Tree Program was established within the Minnesota Department of Agriculture with the enactment of Minnesota Statute 18.023. This statute makes reference to "increasing public awareness of shade tree diseases," as it also calls for funding for Dutch elm disease control and reforestation, wood utilization, and research.

In other words, public information was an integral part of the program from the start.

Just as disease control and wood utilization efforts changed over the years, so did the public information component of Shade Tree Program.

Public relations is a problem solving process. Since the problems did not remain static, neither could the public information solutions. One of the keys to the success of the state's public information campaign was its ability to listen to the general public as well as local officials, and then adapt its information efforts to changing needs.

Initially, the public information program was similar to most public information efforts--i.e., news releases, films, public service announcements, etc. Most of these information efforts were generated at the state office level and relied on the mass media to reach as many citizens as possible. News releases were issued and press conferences called. Public service announcements for both radio and television were used. Additionally, a film was produced that was sent to interested citizen groups, schools, etc.

Initial brochures, fliers, and other handout materials were aimed at a broad audience. They ranged from consumer alerts about unscrupulous tree trimming practices to the need to plant new trees.

These informational efforts were aimed largely at alerting citizens to the urgency of action on Dutch elm disease and the need to plant replacement trees. Efforts were made to teach citizens how to spot disease symptoms and then call a local official. Much of the tone was alarmist in nature. These initial efforts were responding directly to citizens' outcry at seeing lovely boulevards rapidly denuded. The general public was hungry for any information about Dutch elm disease and what was being done. It was an urgent issue.

The mass media efforts appear to have been highly successful. Today many Minnesotans are acquainted with what Dutch elm disease is. For example, when survey interviewers asked citizens whether Dutch elm disease was a threat in their neighborhoods, only three percent said they did not know. The rest could answer definitely. (Source: "Community Shade Tree Programs in Minnesota," 1981, a study conducted by the Center for Urban and Regional Affairs, University of Minnesota.)

Other efforts were not so successful. The Shade Tree Program constructed a trailer exhibit that was meant to be a portable source of information about Dutch elm disease and suitable species for replacement planting. However, the trailer proved to be unwieldy on the road, required too much time to staff, and reached too few people.

Clearly, the best public information response was one that utilized the mass media. Necessarily, such a campaign requires that the message(s) be frequently repeated so that large numbers of individuals are exposed to the message often enough to retain the information.

When Dutch elm disease first hit Minnesota, it was an alarming problem that affected most citizens. The ideal response utilized the mass media because this media is most effective when handling an issue that is timely, affects many people, and is urgent. Clearly, Dutch elm disease was a newsworthy issue.

However, even Dutch elm disease eventually becomes yesterday's news. The problem that public information needed to address began to change. Effective state and local disease control programs were cutting losses to Dutch elm disease in half, so the issue was becoming less urgent.

And, by this time, citizens had a basic knowledge of Dutch elm disease, so education was no longer as necessary. (Although reinforcement was still needed.)

With knowledge about Dutch elm disease reasonably high and with losses declining, news media attention naturally began to wane. Concurrently, the danger of public apathy began to emerge.

Simply issuing more news releases or more public service announcements would not address these new issues. Another public information approach was needed.

No public information or advertising campaign can be carried out in the same manner for an indefinite period of time. The focus must be changed to maintain interest and pertinence. It was time to expand the public information focus to new areas, change the tone of the messages, and shift the source of information dissemination from state government to local government.

What was changed? Public information efforts began to focus on different topics. Early brochures were consumer warnings about unscrupulous tree removal practices, while later brochures had practical "how to" information on selecting and planting new trees.

The concept of "my tree" began to be replaced with the concept of "our urban forest." With the working knowledge of Dutch elm disease and a recent memory of the devastating effects of not maintaining a community's tree resource, citizens were ready to be told that they were heirs not to just "their tree", but to an "urban forest"--a community resource that needs management. Many newspaper headlines changed from references to "elms" to "urban forest." This new effort began to introduce a broader responsibility for a community's trees--beyond reacting to a single disease.

Rather than alarmist public service announcements with the buzz of chain saws in the background, announcements began to utilize a "softer sell." Minnesotans heard announcements with the sounds of birds and children in the background. These announcements reminded them that their efforts to control Dutch elm disease were working, but continued efforts were still needed if this success was to be continued.

Separate announcements on the wisdom and personal gain of planting trees were issued and Arbor Month posters and graphics became more colorful and optimistic in tone.

Most importantly, the responsibility for creating awareness and providing information began to shift. Previously, the state office had taken the major responsibility for public information dissemination, leaving communities to tackle disease control and reforestation.

Now, as communities had Dutch elm disease under control, it was time to strengthen their public relations capabilities.

The logical place to introduce this change was at the annual Tree Inspector Workshops. The Shade Tree Program--charged by law with certifying and recertifying tree inspectors--holds annual certification workshops in eight locations throughout Minnesota in late winter. In previous years, the topics discussed were solely biological aspects of Dutch elm disease and oak wilt. This changed at the 1981 series of workshops.

Among the new workshop topics was a required session on public relations. Of course, every dealing a tree inspector has with a citizen has a public relations/public opinion ramification--so inspectors had public relations programs all along. However, its importance had never been discussed. Neither had we ever discussed specific actions inspectors could take to improve public relations.

Often, just raising the issue helps improve public relations. Creating awareness of public relations often brings significant improvement in person-to-person dealings. This session pointed out how citizen's perceptions differ from inspectors' perceptions of their duties, how the manner of the service is as important as the service itself in terms of public opinion, and the need for inspectors to provide prompt, technically correct information to citizens to reduce distorted information and increase citizen support and understanding.

The primary focus of the workshop session was on the ramifications of face-to-face or day-to-day dealings with citizens and how to improve them. Without this base, no further public relations activities could be added. Effective face-to-face communication is the single most important determiner of public opinion, support, and understanding. It is crucial.

The timing for this presentation proved ideal. As citizen apathy became more likely and citizens began to wonder, "Whatever happened to Dutch elm disease?", the need for ensuring public understanding of local efforts was never greater. Tree inspectors needed to provide more information about "why" things were done. Answering "why" is always best accomplished on a one-to-one basis by the person who is actually performing the service. No amount of advertisements, newspaper articles, or public service announcements could be as effective as sound person-to-person communication.

Tree inspectors and city foresters agreed. This session was the most highly rated of all sessions presented at the workshops. Many commented that the discussion was "long overdue," "absolutely essential," and "very valuable."

At this session, inspectors who were attending to renew their certification received materials that offered suggestions on supplemental public relations activities such as news releases and handout materials that could be used while the forester was on the job inspecting, removing, or planting trees. This handout included drafts of news releases and handouts that were nearly ready to be used--all inspectors had to do was "fill in the blanks" to personalize the release to their needs.

This effort was described to inspectors as supplemental, and little instruction on how to use the materials was presented. These "fill-in-the-blanks" or "ready-made" public information items were used, most often, by inspectors who were already sophisticated public relations practitioners.

The shift in information distribution was dramatized in another way. In past years, the state office distributed information on tree disease and planting directly to individual citizens through special events, displays, the State Fair, and in response to individual requests.

In 1981, the state staff brought brochures and handout materials in bulk to the workshops. Tree inspectors were instructed to take large numbers of the materials and distribute them to citizens directly. The state was no longer the intermediary. Citizens were to receive information from their local expert--not the state office.

In 1981, at eight workshops more than 140,000 items left the workshops with local officials.

Not only did this turn out to be a more cost-effective information distribution system, but it gave the information more credibility since it now came to the citizen from a local source.

The state was no longer in the primary role of information provider. Now the state's role was to support local programs by providing the expertise and money needed to print large quantities of materials for cities.

It is a partnership that serves all parties. Now cities--no matter how small--had sufficient quantities of brochures that were professionally designed and written. Local officials, who most often don't have the time or money to create, design and print these items, now got the results without the work or cost. Citizens benefitted because they now received the information at a timely moment, when the inspector is condemning a diseased elm or planting a new tree. Therefore, better audience reach and information retention was ensured.

As the State of Minnesota faced an increasing budget deficit, it became apparent that matching grants from the state to local units of government would soon be drastically reduced or eliminated entirely.

Given this scenario, the Shade Tree Program decided in mid-1981 that it was time to make plans to ensure the effectiveness of local programs by making them more self-sufficient. The Shade Tree Program began creating a "legacy" it could leave behind to local programs should the state program be eliminated.

This legacy is a 200-page notebook entitled, "Community Forestry." Its ten sections were written to provide a basic outline of all components of an urban forestry program. Its section include: urban forest management, tree maintenance, tree pests, chemicals, wood utilization and disposal, tree planting, community relations, arbor celebrations, administering a program, and experiences of other communities.

Such a notebook cannot possibly address all urban forestry needs, nor can it replace a well-trained and experienced staff of foresters. However, it does serve as a guide to small and mid-size communities that previously had relied on state guidance.

Considering its goal of making communities more self-reliant, the notebook's section on public relations provides a nearly "ready made" beginning public information program.

Besides outlining basic public relations concepts, the notebook provides ready-to-use materials. There are five nearly complete handouts that inspectors can use when inspecting for firewood, inspecting for Dutch elm disease (diagnosis: healthy tree), inspecting for Dutch elm disease (diagnosis: diseased tree), how homeowners can care for a newly planted boulevard tree, and a notice of an upcoming tree trimming project. Inspectors can complete these handouts by simply filling in their own town's name and their office phone number and having it retyped for duplication. These handouts come with clip art--professional artwork that illustrates each topic. This original artwork was created so it can be cut from the notebook, pasted onto a master, and taken to a local printer.

The same kind of ready-to-use materials are available so that inspectors can create their own news releases, public service announcements, advertisements, etc. In addition, other public relations projects are suggested and a logo for a city forester or tree inspector identification patch or hard hat decal are included.

In short, this section of the notebook contains a ready-to-use public relations program that can be tailored for local use with minimal cost and effort by local officials.

The notebook was distributed at the 1982 series of Tree Inspector Workshops and was supplemented by a special workshop session "Do-It-Yourself Public Relations" that taught inspectors how to use all the materials.

SUMMARY:

By July 1, 1982, the state Shade Tree Program will be eliminated in order to help the state solve its budget problems.

Although the state office will soon be gone, Minnesota's legacy is a state Shade Tree Program that has worked and more than 450 local shade tree programs that have the potential to continue to function.

Our citizens have a renewed awareness of the value of their urban trees, an understanding of the need to control Dutch elm disease, and a concern for not just their own tree, but for the entire urban forest.

Local officials have experience in conducting an effective local shade tree program. They have an informed public to work with and ready-to-use materials to keep citizen awareness and understanding high.

Such success in public information comes from broadening the traditional role of public relations. Effective public relations is more than simply issuing news releases and distributing attractive brochures. It should also train local officials to maintain their own complete public relations program.

APPENDIX C

Summary of Shade Tree Disease Legislation Minnesota
Statute 18.022.

Minnesota Statute 18.023 With Revisions Through 1981.

Rules and Regulations 1974-1981.

HISTORY OF SHADE TREE DISEASE CONTROL LEGISLATION IN MINNESOTA

Laws 1927 Chapter 108

Provides "... for the protection of horticulture and agriculture against injurious infestation or infection and preventing the introduction into this State of insect or animal pests or plant disease..."

Laws 1935 Chapter 29

"When recommended to do so by the State Commissioner of Agriculture...the board of commissioners of any county...are...empowered to appropriate money for the control of insect pests, plant diseases, bee diseases, or rodents."

Laws 1953 Chapter 641

Added that the governing body of any, "...city, village, borough, or town..." could also appropriate funds for plant and animal pest control. Allowed special tax levies beyond mill levy limits, not to exceed two mills, but no more than fifty cents per capita. Authorized issuance of bonds in anticipation of the collection of taxes. Amended the definition of insect pest to include not only those dangerous to crops but also to the "...welfare of the people."

Laws of 1957 Chapter 552

Authorized that the commissioner, "...may, for the purpose of preventing the spreading of such organism or insect, cause such tree, plant, or shrub, not itself so diseased or infected to be destroyed..." And further that, "No damages shall be awarded to the owner for the loss or destruction of plants... such plants shall be deemed to be a public nuisance." Also, "The expense of enforcing (this) provision shall be a lien upon the owners of such land." A separate section of the same law authorizes the commissioner to, "...promulgate and enforce by appropriate rules and regulations a quarantine prohibiting or restricting the transportation into or through the state of any.. plant...or other article of any character capable of carrying such plant disease or insect infestation."

Laws of 1965 Chapter 323

Allows the council of any city, village, or borough and the commissioner of any county to "...adopt and enforce regulations to control and prevent the spread of plant pests and diseases...provide for the summary removal of diseased trees...require the owner to destroy or treat...diseased plants...and in default thereof to provide for such work at the expense of the owner, which expense shall be a lien upon the property and may be collected by special assessment..."

Laws of 1967 Chapter 799

Defined European elm bark beetles and native elm bark beetles as "insect pests", doubled the special levy authorized by Laws of 1953 Chapter 641 to four mills, not to exceed one dollar per capita if Dutch elm disease were prevalent in the community. Required the Commissioner to proceed with control of Dutch elm disease if a political subdivision failed to do so and his action will prevent economic, recreational and esthetic loss.

Laws of 1974 Chapter 355

Established the present Shade Tree Program in the Department of Agriculture. Required the Commissioner to adopt rules and to test and certify tree inspectors. Authorized special levy beyond mill levy limits. Allowed municipalities to subsidize removal of trees on private property. Required the Commissioner to operate a diagnostic laboratory. Required the University of Minnesota to research Dutch elm disease, its identification and control methods, and to develop utilization methods. Appropriated \$35,000 to the University and \$65,000 to the Commissioner.

Laws of 1975 Chapter 253

Declared oak wilt and Dutch elm disease as epidemics. Provided grants to communities to partially fund subsidies to owners of residential property who remove diseased trees. Provided up to 50 percent utilization grants to cities, and non-profit corporations for acquisition and implementation of wood utilization systems. Required that local programs be at least as stringent as the rules and regulations of the Commissioner and required that the rules or more stringent local regulations be applied to adjacent state and special purpose district lands.
Appropriated:

\$ 800,000	for grants-in-aid for local subsidies
700,000	for utilization grants-in-aid
45,000	for public education
<u>50,000</u>	for administration

\$1,595,000

Laws of 1977 Chapter 90

Deleted subsidy reimbursement and added separate sanitation and reforestation grants. Declared trees not properly removed to be public nuisances and allowed removal costs to be a lien on the property. Prohibited municipalities from assessing more than 50 percent of boulevard tree removal cost against the adjoining property owner. Reduced utilization grant eligibility to 40,000 population in metro area and 20,000 outstate and added counties and larger park districts. Restricted sanitation grants to 45 percent. Restricted reforestation grants to 50 percent (up to \$40 per tree) for no more than the number of trees lost in the previous year. Allowed 90 percent reforestation grants to fund 50 trees in cities with a population of less than 1,000. Allowed advance grant payments. Authorized the Commissioner to establish experimental programs. Provided for special levy beyond levy limitations only until taxes payable in 1978. Authorized the Commissioner to adopt emergency rules. Authorized Commissioner to hire three classified employees. Prohibited granting more than 67 percent of any appropriation for sanitation, reforestation, and utilization grants to metro area. Declared appropriations shall not cancel.

Appropriated to the Commissioner of Agriculture:

\$21,650,000	for sanitation grants
4,400,000	for reforestation grants
550,000	for utilization grants
225,000	for public information
400,000	for experimental program
<u>300,000</u>	for administration

\$27,525,000

To the Agricultural Experiment Station:

\$ 100,000	for research
<u>\$ 250,000</u>	for education and training

\$ 350,000

To the Commissioner of Natural Resources:

<u>\$ 625,000</u>	for sanitation
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\$28,500,000

Laws of 1978 Chapter 773

Allowed homesteaded property up to 20 acres to receive local subsidies. Requires the Commissioner and Energy Agency to investigate and evaluate uses for diseased wood.

Laws of 1979 Chapter 257

Removed all population restrictions on eligibility for utilization grants. Combined sanitation and reforestation grants into one grant. Increased maximum grant for reforestation from \$40 to \$50 per tree. Eliminated restriction on planting only the number of trees lost in the previous year. Allowed on the first 50 trees planted, 90 percent reimbursement (up to \$60 per tree) for unincorporated towns up to 1,000 in population and cities up to 4,000 population. Required local Reforestation Advisory Committee. Allowed voluntary and documented in-kind contributions in cities of less than 1,000 population. Extended special levy authorization to 1981. Allowed funds not used in the first fiscal year to carry over into the second year or the biennium.

Laws of 1979 Chapter 333

Appropriated for development and protection of agricultural resources-- \$21,582,000 for Fiscal Year 1980 and \$18,543,900 for Fiscal Year 1981. The Shade Tree Appropriation was included in this amount and was as follows:

\$24,050,900	reforestation sanitation grants
550,000	utilization grants
400,000	experimental grants
199,600	public information
<u>357,400</u>	administration

\$25,557,900

C 2

STATE OF MINNESOTA
DEPARTMENT OF AGRICULTURE - PLANT INDUSTRY
670 STATE OFFICE BUILDING, ST. PAUL, MINNESOTA 55155

CHAPTER 18
PLANT AND ANIMAL PEST CONTROL

18.011 DEFINITION. Subdivision 1. Except where the context otherwise indicates, for the purposes of this chapter, the terms defined in this section have the meanings given them.

Subd. 2. "Commissioner" means the commissioner of the department of agriculture.

LOCAL PEST CONTROL

18.021 DEFINITIONS. Subdivision 1. Terms. Unless the language or context clearly indicates that a different meaning is intended, the following terms shall, for the purpose of section 18.022, be given the meanings subjoined to them.

Subd. 2. Pest control; Dutch elm disease. "Insect pest" includes grasshoppers, cutworms, armyworms, European corn borers, Japanese beetles, European elm bark beetles, native elm bark beetles, forest tent caterpillars, bee diseases, and any other insects which the commissioner may designate as dangerous to crops or the welfare of the people.

Subd. 3. Destructive or nuisance animals. "Destructive or nuisance animals" includes such animals as rats, gophers, mice, and other unprotected wild animals as defined in Minnesota Statutes 1961, Section 100.26, and acts amendatory thereof, which the commissioner may designate as dangerous to the welfare of the people.

Subd. 4. Diseases. The term "Diseases" refers to such dangerous plant diseases and bee diseases as the commissioner may designate as dangerous to agriculture, horticulture, and forestry.

18.022 INSECT PESTS, PLANT DISEASES, BEE DISEASES, AND DESTRUCTIVE OR NUISANCE ANIMALS. Subdivision 1. Control. When recommended so to do by the commissioner of agriculture, the governing body of any county, city, village, borough, or town of this state is hereby authorized and empowered to appropriate money for the control of insect pests, plant diseases, bee diseases, or destructive or nuisance animals. Such money shall be expended according to technical and expert opinions and plans as shall be designated by the commissioner and the work shall be carried on under the direction of the commissioner.

Subd. 2. Cost. (a) In order to defray the cost of such activities, the governing body of any such political subdivision may levy a special tax of not to exceed two mills in any year in excess of charter or statutory millage limitations, but not in any event more than 50 cents per capita, and may make such a levy, where necessary, separate from the general levy and at any time of the year.

(b) If because of the prevalence of Dutch elm disease, the governing body of such a political subdivision is unable to defray the cost of control activities authorized by this section of Minnesota Statutes within the limits set by this subdivision, the limits set by this subdivision are increased to four mills, but not in any event more than one dollar per capita.

Subd. 3. Certificates of indebtedness. To provide funds for such activities in advance of collection of the tax levied under subdivision 2, the governing body may, at any time after the tax has been levied and certified to the county auditor for collection, issue certificates of indebtedness in anticipation of the collection and payment of such tax. The total amount of such certificates, including principal and interest, shall not exceed 90 per cent of the amount of such levy and shall be payable from the proceeds of such levy and not later than two years from the date of issuance. They shall be issued on such terms and conditions as the governing body may determine and shall be sold as provided in Minnesota Statutes, Section 475.60. If the governing body determines that an emergency exists, it may make appropriations from the proceeds of such certificates for authorized purposes without complying the statutory or charter provisions requiring that expenditures be based on a prior budget authorization or other budgeting requirement.

Subd. 4. Deposit of proceeds in separate fund. The proceeds of any tax levied under subdivision 2 or of any issue of certificates of indebtedness under subdivision 3 shall be deposited in the municipal treasury in a separate fund and expended only for purposes authorized by this section. If no disbursement is made from the fund for a period of five years, any moneys remaining therein may be transferred to the general fund.

Subd. 5. Penalty. Any person who shall prevent, obstruct, or in any manner interfere with the county authorities or their agents in carrying out the provisions of subdivision 1 to 4, or neglects to comply with the rules and regulations of the county commissioners promulgated under authority thereof, shall be guilty of a misdemeanor.

Subd. 6. Regulations, scope. The council of any city, village, or borough by ordinance and the board of county commissioners of any county and the town board of any town by resolution may adopt and enforce regulations to control and prevent the spread of plant pests and diseases. Such regulations may authorize appropriate officers and employees to enter and inspect any public or private place which might harbor plant pests, as defined in section 18.46, subdivision 13, may provide for the summary removal of diseased trees from public or private places where deemed necessary to prevent the spread of the disease, may require the owner to destroy or treat plant pests, diseased plants or other disease bearing material and in default thereof to provide for such work at the expense of the owner, which expense shall be a lien upon the property and may be collected as a special assessment as provided by section 429.101 or by charter. In this subdivision, the term private place means every place except a private home.

Subd. 7. Failure of political subdivision to act; commissioner's duties. If the governing body of a political subdivision does not appropriate money for the control of Dutch elm disease pursuant to subdivision 1, or does not adopt and enforce regulations to control and prevent the spread of Dutch elm disease pursuant to subdivision 6, and if the commissioner determines that economic, recreational, or esthetic losses will result, the commissioner shall proceed as provided in Minnesota Statutes, Section 18.48, Subdivision 1 and 4, to control the spread of Dutch elm disease. However, the expense of these control activities performed on land owned by a county, city, village, borough, or town is a charge upon the county, city, village, borough, or town owning the land and shall be paid by the governing body from money which it shall appropriate pursuant to subdivision 1 and, if necessary, for which it shall levy taxes pursuant to subdivision 2. The purpose of this subdivision and of the increased maximum tax levies authorized by subdivision 2, clause (b), is to protect elm trees from Dutch elm disease and thus prevent the economic, recreational, and esthetic losses which occur when elm trees are killed by Dutch elm disease.

CHAPTER 100 QUADRUPEDS, BIRDS

100.26 UNPROTECTED ANIMALS. Subdivision 1. Weasel, wild cat, lynx, wolves, foxes, bears, gophers, porcupines, badgers, and all other quadrupeds for which no closed season or other protection is accorded by chapters 97 to 102, are unprotected animals and may be taken either in the daytime or at night, and in any manner, except with the aid of artificial lights, and possessed, bought, sold or transported in any quantity, provided that for the safety of humans and domestic stock, poison may not be used in the taking thereof, except in the manner authorized by Minnesota Statutes 1961, Sections 18.021 to 18.035, and acts amendatory thereof, and steel traps may not be used in the taking of bear, except when and in the manner prescribed by the commissioner. The taking of bear may be prohibited by order of the commissioner in such areas of the state and during such periods as he may deem necessary. Raccoon are unprotected animals on May 21, 1965, and all of the provisions of this subdivision are applicable to such animals except that they may be taken with the aid of artificial lights in the manner provided by law under section 100.29, subdivision 10.

Subd. 2. The English sparrow, blackbird, crow, starling, magpie, cormorant, common pigeon and the great horned owl are unprotected wild animals, but all other birds, including their nests and eggs, shall be taken only as authorized by Chapters 97 to 102.

Subd. 3. Skunk and civet cats are unprotected wild animals and may be taken either in the daytime or at night and in any manner except with the aid of artificial lights and may be possessed, bought, sold or transported in any quantity, provided that for the safety of humans and domestic stock, poison may not be used in the taking thereof, except in the manner authorized by Minnesota Statutes 1961, Sections 18.021 to 18.035, and acts amendatory thereof.

Sec. 66. [18.023] **SHADE TREE DISEASE CONTROL.** Subdivision 1. **DEFINITIONS.** As used in subdivisions 1 to 12 the terms defined in this subdivision shall have the meanings given them.

(a) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver. (b) "Commissioner" means the commissioner of agriculture. (c) "Municipality" means any city or any town exercising municipal powers pursuant to Minnesota Statutes, Section 368.01, or any general or special law, located in the metropolitan area or any special park district as organized under Minnesota Statutes, Chapter 398, or any special purpose park district organized under the city charter of a city of the first class located in the metropolitan area, or any portion of a county in such metropolitan area located outside the geographic boundaries of a city or town exercising municipal powers and any municipality located outside the metropolitan area which petitions to and has consent of the commissioner to come within the provisions of this section.

(d) "Shade tree disease" means Dutch elm disease or oak wilt disease.

Subd. 2. **COMMISSIONER TO ADOPT RULES.** The commissioner shall adopt and from time to time may amend, rules and regulations relating to shade tree disease control in the metropolitan area in accordance with Minnesota Statutes, Sections 15.0411 to 15.0422. Such rules and regulations shall prescribe control measures to be used to prevent the spread of shade tree diseases and shall include the following: (a) a definition of shade tree, (b) qualifications for tree inspectors, (c) methods of identifying diseased shade trees, (d) procedures for giving reasonable notice of inspection of private real property, (e) measures for the treatment and removal of any shade tree which may contribute to the spread of shade tree disease, and (f) such other matters as shall be determined to be necessary by the commissioner to prevent the spread of shade tree disease and enforce the provisions of this section. In accordance with the rules and regulations adopted by the commissioner, and reasonable notice of inspection having been given to the owner of the real property, diseased shade trees shall be removed or treated by the owner of the real property on which such diseased shade trees are located within a period of time as may be established by the commissioner. In the case of the expense of removing or treating diseased shade trees located on street terraces or boulevards, not more than 50 percent of such expense may be assessed to the abutting properties by the municipality which expense shall become a lien on the property. Trees which are not removed or treated shall be declared a public nuisance and removed by the municipality which may assess the total expense or any part thereof to the property which expense shall become a lien on the property.

Subd. 3. **RULES AND REGULATIONS, APPLICABILITY TO MUNICIPALITIES.** The rules and regulations of the commissioner shall apply in a municipality unless the municipality adopts an ordinance which is determined by the commissioner to be more stringent than the rules and regulations of the commissioner. The rules and regulations of the commissioner or the more stringent ordinance of the municipality shall be in effect 60 days from the effective date of this section.

Subd. 4. **SUBSIDIES TO PRIVATE PROPERTY OWNERS.** (a) A municipality may provide subsidies to private property owners for the treatment or removal of diseased shade trees provided, however, that the cost to the municipality for providing such subsidies shall be within the limitations set forth in Minnesota Statutes, 1973 Supplement, Sections 275.50 to 275.56.

(b) Notwithstanding any law to the contrary, an owner of property on which shade trees are located may contract with a municipality to provide protection against the cost of treatment or removal of diseased shade trees or shade trees that will contribute to the spread of shade tree diseases. Under such contracts, the municipality shall pay for the removal or treatment under such terms and conditions as may be determined by the governing body of the municipality.

Subd. 5. TREE INSPECTOR. (a) Within 75 days from the effective date of this act, the governing body of each municipality shall appoint a qualified person to administer the rules and regulations of the commissioner or the more stringent shade tree disease control ordinance who shall be known as the tree inspector. In accordance with the provisions of Minnesota Statutes, 1973 Supplement, Section 471.59, two or more municipalities may jointly appoint a tree inspector for the purpose of administering the regulations or ordinance within their communities. In those municipalities which have not appointed a tree inspector upon the expiration of 75 days from the effective date of this section, the commissioner may appoint a tree inspector to serve the municipality until the municipality has made an appointment. If the commissioner is unable to make such appointment he may assign a qualified employee of the department of agriculture to perform the duties of the tree inspector. The expense of a tree inspector appointed by the commissioner shall be paid by the municipality. If an employee of the department of agriculture performs such duties the expense shall be billed to the municipality and paid into the state treasury and credited to the general fund.

(b) Upon a determination by the commissioner that a candidate for the position of the inspector is qualified, he shall issue a certificate to the tree inspector that he is so qualified. Any person certified as a tree inspector by the commissioner is authorized upon prior notification to enter and inspect any public or private property which might harbor diseased shade trees.

(c) The commissioner may upon notice and hearing, decertify any tree inspector when it appears to him that said tree inspector has failed to act competently or in the public interest in the performance of his duties. Such notice shall be provided and the hearing conducted in accordance with the provisions of Minnesota Statutes, Chapter 15, governing contested case proceedings. Nothing in this clause shall limit or otherwise affect the authority of a municipality to dismiss or suspend a tree inspector at its discretion; except as otherwise provided by law.

Subd. 6. TAX LEVIES. Except as provided in subdivision 4, the costs to a municipality implementing this act including removal or treatment of trees from municipally or privately owned property shall be deemed a "special levy" and may be outside all existing tax levy limitations including those contained in Minnesota Statutes, 1973 Supplement, Sections 275.50 to 275.56.

Subd. 7. FINANCING. (a) A municipality may collect the amount assessed against the property as a special assessment and may issue obligations as provided in Minnesota Statutes, 1973 Supplement, Section 429.101, Subdivision 1, provided that a municipality as its option make any assessment levied payable with interest in installments not to exceed five years from the date of the assessment.

(b) After a contract for the removal or treatment of trees on private property has been let, or the work commenced, the municipality may issue obligations to defray the expense of any such work financed by special assessments imposed upon private property. Minnesota Statutes, Section 429.091 shall apply to such obligations with the following modifications:

(1) Such obligations shall be payable not more than five years from the date of issuance; and

(2) No election shall be required.

Changes or additions indicated by underline deletions by ~~strikeout~~

CHAPTER 253—H.F.No.1288

[Coded in Part]

An act relating to the operation of shade tree disease control programs by local governments; providing funds for the control of shade tree disease; establishing a grant-in-aid program under the department of agriculture; appropriating money; amending Minnesota Statutes 1974, Sections 18.022, by adding a subdivision; 18.023, Subdivisions 1 and 3, and by adding subdivisions.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 1974, Section 18.023, is amended by adding a subdivision to read:

Subd. 1a. MUNICIPALITIES; METROPOLITAN SHADE TREE DISEASE CONTROL PROGRAM; PURPOSE. The legislature finds that an epidemic of dutch elm disease and oak wilt disease is occurring in Minnesota which threatens the natural environment. Immediate action is therefore necessary to provide funds to assist local units of government in the implementation of shade tree disease control programs by expanding diseased wood destruction programs, increasing public awareness of shade tree disease, accelerating training of tree inspectors and research for disease prevention and subsidizing private property owners for the removal of diseased elm and oak trees.

Sec. 2. Minnesota Statutes 1974, Section 18.023, Subdivision 1, is amended to read:

18.023 SHADE TREE DISEASE CONTROL. Subdivision 1. DEFINITIONS. As used in subdivisions 1 to 12 the terms defined in this subdivision shall have the meanings given them.

(a) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver.

(b) "Commissioner" means the commissioner of agriculture.

(c) "Municipality" means any city or any town exercising municipal powers pursuant to section 368.01, or any general or special law, located in the metropolitan area or any special park district as organized under chapter 398, or any special purpose park district organized under the city charter of a city of the first class located in the metropolitan area, or any portion of a county in such ~~the~~ metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers and any municipality or county located outside the metropolitan area which petitions-makes request to and has consent of the commissioner to come within the provisions of this section.

(d) "Shade tree disease" means Dutch elm disease or oak wilt disease.

(e) "Wood utilization or disposal system" means a system used for the removal and disposal of diseased shade trees which includes the collection, transportation, processing or storage of wood and which aids in the recovery of materials or energy from wood.

(D) "Subsidy program" means a municipal program of financial assistance to private property owners for the removal of diseased elm and or oak shade trees.

(E) "Disease control program" means the municipal plan as approved by the commissioner to control shade tree disease.

(H) "Disease control area" means an area approved by the commissioner within which a municipality will conduct a shade tree disease control program.

Sec. 3. Minnesota Statutes 1974, Section 18.023, is amended by adding a subdivision to read:

Subd. 3a. GRANTS TO MUNICIPALITIES. (a) The commissioner may, in the name of the state and within the limit of appropriations provided, make grants-in-aid to a municipality with an approved shade tree disease control program for the partial funding of municipal subsidy programs for the removal of diseased shade trees by owners of residential property pursuant to subdivision 4. The commissioner may make grants-in-aid to any city of more than 80,000 population or any special purpose park district organized under the charter of a city of the first class or any non-profit corporation serving a city of the first class or any county having a disease control program approved by the commissioner for the acquisition of wood utilization or disposal facilities or equipment or the implementation of wood utilization or disposal systems.

(b) The commissioner shall promulgate rules for the administration of grants authorized by this subdivision. The rules shall establish and contain as a minimum:

- (1) Procedures for grant applications;
- (2) Conditions and procedures for the administration of grants;
- (3) Criteria of eligibility for grants including, but not limited to, those specified in this subdivision; and
- (4) Such other matters as the commissioner may find necessary to the proper administration of the grant program.

(c) Grants-in-aid payments for wood utilization and disposal facilities, equipment and systems and grants for public subsidy programs made by the commissioner pursuant to this subdivision shall not exceed 50 percent of the total cost of the facility equipment or system or municipal subsidy program, or both.

(d) A municipality or county which has received the consent of the commissioner to come within the provisions of this act may receive grants authorized by this subdivision, and may submit an application for a grant concurrently with its request for inclusion.

Sec. 4. APPROPRIATIONS. There is appropriated to the commissioner of agriculture from the general fund the sum of \$1,395,000 or so much thereof as may be necessary, for the period beginning July 1, 1975 and ending June 30, 1977 for the purpose of carrying out the terms and provisions of sections 1 and 3 of this act. All expenses of the commissioner in administering the appropriation by this section are payable therefrom. Not more than \$700,000 of the money appropriated by this section shall be spent on grant-in-aid payments for wood utilization and disposal facilities, equipment and systems; not more than \$800,000 of the money appropriated by this section shall be spent on grant-in-aid payments for municipal subsidy programs; not more than \$45,000 of the money appropriated by this section shall be spent on programs of public education regarding shade tree disease, and not more than \$50,000 of the money appropriated by this section shall be spent for administering the appropriations made by this section.

Sec. 5. Minnesota Statutes 1974, Section 18.023, Subdivision 3, is amended to read:

Subd. 3. RULES AND REGULATIONS; APPLICABILITY TO MUNICIPALITIES. The rules and regulations of the commissioner shall apply in a municipality unless the municipality adopts an ordinance which is determined by the commissioner to be more stringent than the rules and regulations of the commissioner. The rules and regulations of the commissioner or the more stringent ordinance of the municipality shall be in effect 60 days from March 31, 1974. The rules and regulations of the commissioner or the municipality shall apply to all state agencies, special purpose districts and metropolitan commissions as defined in Laws 1975, Chapter 13, Section 1, Subdivision 7, which own or control land adjacent to or within a shade tree disease control area in this act.

Sec. 6. Minnesota Statutes 1974, Section 18.022, is amended by adding a subdivision to read:

Subd. 9. RULES AND REGULATIONS. The commissioner may adopt rules and regulations in accordance with sections 15.0411 to 15.0422 prescribing control measures to be used to prevent the spread of shade tree diseases and shall include the following: (a) a definition of shade tree, (b) qualifications for inspectors, (c) methods of identifying diseased shade trees, (d) procedures for giving reasonable notice of inspection of private real property, (e) measures for the treatment and removal of any shade tree which may contribute to the spread of shade tree disease, and (f) such other matters as shall be determined to be necessary by the commissioner to prevent the spread of shade tree disease and enforce the provisions of this section. The rules and regulations of the commissioner shall apply in a county, city or town unless the county, city or town adopts an ordinance or resolution pursuant to subdivision 6 which is determined by the commissioner to be more stringent than the rules and regulations of the commissioner. The rules and regulations of the commissioner or the more stringent ordinance or resolution of the city, county or town shall apply to all state agencies and special purpose districts which own or control land within any county, city or town exercising the powers granted in section 18.022.

Sec. 7. This act shall take effect the day following enactment.

Approved June 2, 1975.

Changes or additions indicated by underline deletions by ~~strikeout~~

LAWS of MINNESOTA for 1977

CHAPTER 90—S.F.No.32

[Coded in Part]

An act relating to shade tree disease control; authorizing grants for municipal shade tree removal and reforestation programs; authorizing a shade tree disease control research program; appropriating money; amending Minnesota Statutes 1976, Sections 18.023, Subdivisions 1, 1a, 2, 3a, 4, 7, 8 and 11, and adding a subdivision; 116.07, Subdivision 4; and 275.50, by adding a subdivision; repealing Minnesota Statutes 1976, Section 18.023, Subdivision 6.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 1976, Section 18.023, Subdivision 1, is amended to read:

18.023 MUNICIPALITIES; SHADE TREE DISEASE CONTROL. Subdivision 1. **DEFINITIONS.** As used in subdivisions 1 to 12 the terms defined in this subdivision shall have the meanings given them.

(a) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver.

(b) "Commissioner" means the commissioner of agriculture.

(c) "Municipality" means any home rule charter or statutory city or any town exercising municipal powers pursuant to section 368.01, or any general or special law, located in the metropolitan area; or any special park district as organized under chapter 398; or any special purpose park district and recreation board organized under the city charter of a city of the first class located in the metropolitan area; or any county in the metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers; and any municipality or county located outside the metropolitan area which makes request to and has consent of the commissioner to come within the provisions of this section with an approved disease control program.

(d) "Shade tree disease" means Dutch elm disease or oak wilt disease.

(e) "Wood utilization or disposal system" means a system facilities, equipment or systems used for the removal and disposal of diseased shade trees which includes the collection, transportation, processing or storage of wood and which aids in the recovery of materials or energy from wood.

(f) "Subsidy program" means a municipal program of financial assistance to private property owners for the removal of diseased elm and or oak shade trees.

(g) "Approved disease control program" means the municipal plan as approved by the commissioner to control shade tree disease.

(h) "Disease control area" means an area approved by the commissioner within which a municipality will conduct a shade tree an approved disease control program.

(i) "Sanitation" means the identification, inspection, disruption of a common root system, girdling, trimming, removal and disposal of dead or diseased wood of elm or oak shade trees, including subsidies for trees removed pursuant to subdivision 4, on public or private property within a disease control area.

(j) "Reforestation" means the replacement of shade trees removed from public property as part of an approved disease control program. For purposes of this clause, "public property" shall include private property within five feet of the boulevard or street terrace in any city which has enacted an ordinance on or before January 1, 1977, that prohibits or requires a permit for the planting of trees in the public right of way.

Sec. 2. Minnesota Statutes 1976, Section 18.023, Subdivision 1a, is amended to read:

Subd. 1a. **METROPOLITAN SHADE TREE DISEASE CONTROL PROGRAM; PURPOSE.** The legislature finds that an epidemic of Dutch elm disease and oak wilt disease is occurring in Minnesota which threatens the natural environment. Immediate action is therefore necessary to provide funds to assist local units of government in the implementation of shade tree disease control programs by conducting sanitation and reforestation programs, expanding diseased wood destruction programs, increasing public awareness of shade tree disease, accelerating training of tree inspectors and research for disease prevention and subsidizing private property owners for the removal of diseased elm and oak trees.

Sec. 3. Minnesota Statutes 1976, Section 18.023, Subdivision 2, is amended to read:

Subd. 2. **COMMISSIONER TO ADOPT RULES.** The commissioner shall adopt and from time to time may amend; rules and regulations relating to shade tree disease control in the metropolitan area in accordance with sections 15-0411 to 15-0422 any municipality, as defined in subdivision 1. Such ~~The~~ rules and regulations shall prescribe control measures to be used to prevent the spread of shade tree diseases and shall include the following: (a) A definition of shade tree, (b) qualifications for tree inspectors, (c) methods of identifying diseased shade trees, (d) procedures for giving reasonable notice of inspection of private real property, (e) measures for the treatment and removal of any shade tree which may contribute to the spread of shade tree disease, and for reforestation of disease control areas, (f) approved methods of treatment of shade trees, (g) criteria for priority designation areas in an approved disease control program, and (h) such any other matters as shall be determined to be necessary by the commissioner to prevent the spread of shade tree disease and enforce the provisions of this section. In accordance with the rules and regulations adopted by the commissioner; and After reasonable notice of inspection having been given to the an owner of the real property; diseased shade trees shall be removed or treated by the owner of the real property on which such a diseased shade trees are tree is located shall remove or treat the tree within a the period of time as may be and in the manner established by the commissioner. In the case of the expense of removing or treating diseased shade trees located on street terraces or boulevards; not more than 50 percent of such expense may be assessed to the abutting properties by the municipality which expense shall become a lien on the property. Trees which are not removed or treated shall be declared a public nuisance and removed by the municipality which may assess the total expense or any part thereof to the property which expense shall become a lien on the property. Diseased shade trees which are not removed or treated in compliance with the commissioner's rules shall be declared a public nuisance and removed or treated by approved methods by the municipality which may assess the total expense, which shall be limited to the lowest contract rates available, provided said rates include wage levels which meet Minnesota minimum wage standards, or any part thereof to the property and the expense shall become a lien on the property. A municipality may assess not more than 50 percent of the expense of treating with an approved method or removing diseased shade trees located on street terraces or boulevards to the abutting properties and the assessment shall become a lien on the property.

Sec. 4. Minnesota Statutes 1976, Section 18.023, Subdivision 3a, is amended to read:

Subd. 3a. **GRANTS TO MUNICIPALITIES.** (a) The commissioner may, in the name of the state and within the limit of appropriations provided, make grants-in-aid to a municipality with an approved shade tree disease control program for the partial funding of municipal subsidy programs for the removal of diseased shade trees by owners of residential property pursuant to subdivision 4 sanitation and reforestation programs. The commissioner may make grants-in-aid to any city of more than 80,000 population or any special purpose park district organized under the charter of a city of the first class or any non-profit corporation serving a city of the first class or any county having a disease control program approved by the commissioner home rule charter or statutory city of

more than 40,000 population in the metropolitan area as defined in subdivision 1 or a combination of such cities of 40,000 combined population under a joint powers agreement pursuant to section 471.59, or a home rule charter or statutory city of more than 20,000 population outside the metropolitan area or a combination of such cities of 20,000 combined population under a joint powers agreement pursuant to section 471.59 any special purpose park and recreation board organized under a charter of a city of the first class or any non-profit corporation serving a city of the first class or any county having an approved disease control program for the acquisition or implementation of a wood utilization or disposal facilities or equipment or the implementation of wood utilization or disposal systems system.

(b) The commissioner shall promulgate rules for the administration of grants authorized by this subdivision. The rules shall establish and contain as a minimum:

- (1) Procedures for grant applications;
- (2) Conditions and procedures for the administration of grants;
- (3) Criteria of eligibility for grants including, but not limited to, those specified in this subdivision; and
- (4) Such other matters as the commissioner may find necessary to the proper administration of the grant program.

(c) Grants-in-aid payments for wood utilization and disposal facilities, equipment and systems and grants for public subsidy programs made by the commissioner pursuant to this subdivision shall not exceed 50 percent of the total cost of the facility equipment or system or municipal subsidy program, or both. Grants to any municipality for sanitation shall not exceed 45 percent of sanitation costs approved by the commissioner including any amount of sanitation costs paid by special assessments, ad valorem taxes, federal grants or other funds. A municipality shall not specially assess a property owner any amount greater than the amount of the tree's sanitation cost minus the amount of the tree's sanitation cost reimbursed by the commissioner. Grants to municipalities for reforestation shall not exceed the lesser of 50 percent of the cost or \$40 multiplied by the number of trees planted pursuant to the reforestation program and shall be limited for any municipality in any year to grants for not more than the number of trees removed on public property in the sanitation program in the previous year, except during the first year of any approved disease control program; provided that a reforestation grant to any county may include up to 90 percent of the cost of the first 50 trees planted on public property in a town not described in subdivision 1 and of less than 1,000 population upon the town's application to the county. Reforestation grants to towns as described in subdivision 1 of less than 1,000 population with an approved disease control program may include up to 90 percent of the first 50 trees planted on public property. For the purpose of this subdivision, "cost" shall not include the value of a gift or dedication of trees required by a municipal ordinance but shall include documented "in kind" services or voluntary work for municipalities with a population of less than 1,000 according to the 1970 census.

(d) Based upon estimates submitted by the municipality to the commissioner, which shall state the estimated costs of sanitation and reforestation in the succeeding quarter under an approved program, the commissioner shall direct quarterly advance payments to be made by the state to the municipality commencing April 1, 1977. The commissioner shall direct adjustment of any overestimate in a succeeding quarter. A municipality may elect to receive the proceeds of its sanitation and reforestation grants on a periodic cost reimbursement basis.

(e) A municipality home rule charter or statutory city, or county outside the metropolitan area or any municipality, as defined in subdivision 1, which has received the consent of the commissioner to come within the provisions of Laws 1975, Chapter 253 may receive grants authorized by this subdivision; and may submit an application for a grant authorized by this subdivision concurrently with its request for inclusion approval of a disease control program.

Sec. 5. Minnesota Statutes 1976, Section 18.023, Subdivision 4, is amended to read:

Subd. 4. **SUBSIDIES TO PRIVATE PROPERTY OWNERS.** (a) A municipality may provide subsidies to nonprofit organizations, owners of private residential property owners of five acres or less and to nonprofit cemeteries, however organized, for the approved treatment or removal of diseased shade trees ~~provided, however, that the cost to the municipality for providing such subsidies shall be within the limitations set forth in sections 275.50 to 275.56.~~

(b) Notwithstanding any law to the contrary, an owner of property on which shade trees are located may contract with a municipality to provide protection against the cost of approved treatment or removal of diseased shade trees or shade trees that will contribute to the spread of shade tree diseases. Under such contracts, the municipality shall pay for the removal or approved treatment under such terms and conditions as may be determined by the governing body of the municipality.

Sec. 6. Minnesota Statutes 1976, Section 18.023, Subdivision 7, is amended to read:

Subd. 7. **FINANCING.** (a) A municipality may collect the amount assessed against the property under subdivision 2 as a special assessment and may issue obligations as provided in section 429.101, subdivision 1, provided that a municipality as at its option make any assessment levied payable with interest in installments not to exceed five years from the date of the assessment.

(b) After a contract for the removal or sanitation or approved treatment of trees on private property has been let, or the work commenced, the municipality may issue obligations to defray the expense of any such work financed by special assessments imposed upon private property. Section 429.091 shall apply to such obligations with the following modifications:

(1) Such obligations shall be payable not more than five years from the date of issuance; and

(2) No election shall be required.

Obligations issued under the provisions of this clause shall not be considered bonded indebtedness for the purposes of section 273.13, subdivisions 6 and 7. The certificates shall not be included in the net debt of the issuing municipality.

Sec. 7. Minnesota Statutes 1976, Section 18.023, Subdivision 8, is amended to read:

Subd. 8. **DEPOSIT OF PROCEEDS IN SEPARATE FUND.** The proceeds of any tax levied, assessments and interest collected, or any bonds or certificates of indebtedness issued under subdivisions 6 and subdivision 7 and section 11 of this act, and any grants received under subdivision 3a, shall be deposited in the municipal treasury in a separate fund and expended only for the purposes authorized by this section.

Sec. 8. Minnesota Statutes 1976, Section 18.023, is amended by adding a subdivision to read:

Subd. 10a. The commissioner may establish experimental programs for sanitation or treatment of shade tree diseases. The commissioner may make grants to municipalities, or enter into contracts with municipal, state or federal agencies in connection with experimental shade tree programs including research to assist municipalities in establishing priority designation areas in an approved disease control program.

Sec. 9. Minnesota Statutes 1976, Section 18.023, Subdivision 11, is amended to read:

Subd. 11. **REPORT TO THE LEGISLATURE.** On or before January 31 of each succeeding year, the commissioner shall report to the legislature on the preceding year's plans and approved disease control programs which have been implemented for shade tree diseases in the metropolitan area and any experimental programs conducted pursuant to subdivision 10a.

Sec. 10. Minnesota Statutes 1976, Section 116.07, Subdivision 4, is amended to read:

Subd. 4. **REGULATIONS AND STANDARDS.** Pursuant and subject to the provisions of chapter 15, and the provisions hereof, the pollution control agency may adopt, amend and rescind regulations and standards having the force of law relating to any purpose within the provisions of Laws 1969, Chapter 1046, for the prevention, abatement, or control of air pollution. Any such regulation or standard may be of general application throughout the state, or may be limited as to times, places, circumstances, or conditions in order to make due allowance for variations therein. Without limitation, regulations or standards may relate to sources or emissions of air contamination or air pollution, to the quality or composition of such emissions, or to the quality of or composition of the ambient air or outdoor atmosphere or to any other matter relevant to the prevention, abatement, or control of air pollution.

Pursuant and subject to the provisions of chapter 15, and the provisions hereof, the pollution control agency may adopt, amend, and rescind regulations and standards having the force of law relating to any purpose within the provisions of Laws 1969, Chapter 1046, for the collection, transportation, storage, and disposal of solid waste and the prevention, abatement, or control of water, air, and land pollution which may be related thereto, and the deposit in or on land of any other material that may tend to cause pollution. Any such regulation or standard may be of general application throughout the state or may be limited as to times, places, circumstances, or conditions in order to make due allowance for variations therein. Without limitation, regulations or standards may relate to collection, transportation, disposal, equipment, location, procedures, methods, systems or techniques or to any other matter relevant to the prevention, abatement or control of water, air, and land pollution which may be advised through the control of collection, transportation, and disposal of solid waste, and the deposit in or on land of any other material that may tend to cause pollution.

Pursuant and subject to the provisions of chapter 15, and the provisions hereof, the pollution control agency may adopt, amend and rescind regulations and standards having the force of law relating to any purpose within the provisions of Laws 1971, Chapter 727, for the prevention, abatement, or control of noise pollution. Any such regulation or standard may be of general application throughout the state, or may be limited as to times, places, circumstances or conditions in order to make due allowances for variations therein. Without limitation, regulations or standards may relate to sources or emissions of noise or noise pollution, to the quality or composition of noises in the natural environment, or to any other matter relevant to the prevention, abatement, or control of noise pollution.

As to any matters subject to this chapter, local units of government may set emission regulations with respect to stationary sources which are more stringent than those set by the pollution control agency.

Pursuant to chapter 15, the pollution control agency may adopt, amend, and rescind regulations and standards having the force of law relating to any purpose within the provisions of this chapter for the identification, labeling, classification, storage, collection, treatment, and disposal of hazardous waste and location of hazardous waste disposal facilities. A regulation or standard may be of general application throughout the state or may be limited as to time, places, circumstances, or conditions. The public service commission, in cooperation with the pollution control agency, shall set standards for the transportation of hazardous waste in accordance with chapter 221.

The pollution control agency shall give highest priority in the consideration of permits to authorize disposal of diseased shade trees by open burning at designated sites to evidence concerning economic costs of transportation and disposal of diseased shade trees by alternative methods.

Sec. 11. Minnesota Statutes 1976, Section 275.50, is amended by adding a subdivision to read:

Subd. 6. The cost to a governmental unit of implementing section 18.023, including sanitation and reforestation, as defined in section 18.023, subdivision 1, is a "special levy"

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and is not subject to tax levy limitations including those contained in sections 275.50 to 275.56 and in Laws 1969, Chapter 593, as amended by Laws 1974, Chapter 108, commencing with the levy made in 1976, payable in 1977, and terminating with the levy made in 1977, payable in 1978. A governmental subdivision may make a supplementary levy in 1977, payable in 1978, for all costs of implementing section 18.023 incurred in calendar year 1977 for which a levy was not made in 1976, payable in 1977. For the purpose of calculating the tax levy limit base under section 275.51, for levy year 1977, taxes payable 1978, there shall be subtracted from the levy limit base of any governmental subdivision an amount equal to 112 percent of the amount levied under section 18.023 in levy year 1974, taxes payable 1975, and included in the levy limit base of the governmental subdivision as a result of Laws 1975, Chapter 437.

Sec. 12. The commissioner of agriculture shall adopt emergency rules pursuant to section 15.0412, subdivision 2, concerning grants to municipalities for reforestation and sanitation which shall be effective until either September 1, 1977, or the effective date of the amended permanent rules to be promulgated pursuant to section 3 of this act, whichever occurs first.

Sec. 13. The commissioner may employ and prescribe the duties of three permanent employees in the unclassified service as may be necessary to administer the provisions of section 18.023, subject to appropriation, until June 30, 1978. Thereafter, the three positions shall be in the classified service.

Sec. 14. APPROPRIATIONS. Subdivision 1. There is appropriated from the general fund to the commissioner of agriculture the following amounts for the following purposes, for the period from January 1, 1977 to December 31, 1978. The sum of \$13,762,500 shall be available for expenditure from January 1, 1977 to December 31, 1977 and \$13,762,500 shall be available for expenditure from January 1, 1978 to December 31, 1978:

(a) For grants for sanitation programs pursuant to Minnesota Statutes, Section 18.023, Subdivision 3a.	\$21,650,000
(b) For grants for reforestation programs pursuant to Minnesota Statutes, Section 18.023, Subdivision 3a.	\$ 4,400,000
(c) For grants-in-aid for wood utilization and disposal systems pursuant to Minnesota Statutes, Section 18.023, Subdivision 3a.	\$ 550,000
(d) For public information	\$ 225,000
(e) For experimental programs pursuant to Minnesota Statutes, Section 18.023, Subdivision 10a.	\$ 400,000
(f) For administration	\$ 300,000

The commissioner shall not make grants for sanitation and reforestation for wood utilization and disposal systems in excess of 67 percent of the amounts specified in clauses (a) to (c) to the municipalities located within the metropolitan area, as defined in section 18.023, subdivision 1.

Subd. 2. There is appropriated from the general fund to the university of Minnesota the following amounts for the following purposes, for the period from January 1, 1977, to December 31, 1978:

(a) For research by the agricultural experimental station, pursuant to Minnesota Statutes, Section 18.023, Subdivision 10.	\$ 100,000
(b) For continuing education and training by the agricultural extension service, pursuant to Minnesota Statutes, Section 18.023, Subdivision 10.	\$ 250,000

Subd. 3. The sum of \$625,000 is appropriated from the general fund to the commissioner of natural resources for the expenses of sanitation of diseased shade trees on lands which the commissioner administers within 1,000 feet of any municipality with an approved disease control program and within camp sites, picnic areas, waysides and parking areas.

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This appropriation is in lieu of all other appropriations to the commissioner of natural resources for the same purposes for the period from January 1, 1977 to December 31, 1978.

Subd. 4. The appropriations in this section shall not cancel but shall remain available until expended.

Sec. 15. REPEALER. Minnesota Statutes 1976, Section 18.023, Subdivision 6, is repealed.

Sec. 16. EFFECTIVE DATE. This act is effective January 1, 1977.

Approved May 18, 1977.

Changes or additions indicated by underline deletions by strikeout

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CHAPTER 773-H.F.No.2044

An act relating to trees; authorizing municipal subsidies to certain persons; requiring an investigation of uses of diseased wood; authorizing the transfer of certain trees purchased from the state; extending the special levy authority for sanitation and reforestation; clarifying utilization of appropriations for shade tree disease control; authorizing extension of temporary rules; amending Minnesota Statutes 1976, Sections 89.38 and 89.391; and Minnesota Statutes, 1977 Supplement, Sections 18.023, Subdivisions 4 and 11; and 275.50, Subdivision 6.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes, 1977 Supplement, Section 18.023, Subdivision 4, is amended to read:

Subd. 4. **SUBSIDIES TO CERTAIN OWNERS.** A municipality may provide subsidies to nonprofit organizations, to owners of private residential property of five acres or less, to owners of property used for a homestead of more than five acres but less than 20 acres and to nonprofit cemeteries, however organized, for the approved treatment or removal of diseased shade trees.

Notwithstanding any law to the contrary, an owner of property on which shade trees are located may contract with a municipality to provide protection against the cost of approved treatment or removal of diseased shade trees or shade trees that will contribute to the spread of shade tree diseases. Under such contracts, the municipality shall pay for the removal or approved treatment under such terms and conditions as may be determined by the governing body of the municipality.

Sec. 2. Minnesota Statutes, 1977 Supplement, Section 18.023, Subdivision 11, is amended to read:

Subd. 11. **REPORT TO THE LEGISLATURE.** On or before January 31 of each year, the commissioner shall report to the legislature on the preceding year's approved disease control programs and any experimental programs conducted pursuant to subdivision 10a. The commissioner, with the assistance of the Minnesota energy agency, shall investigate and evaluate the potential uses of wood infected with shade tree disease, including the uses as an alternative energy source and as a component in the construction or manufacture of new products. The commissioner shall include the results of the investigation and any recommendations for proposed relevant legislation in the report to the legislature due on or before January 31, 1979.

Sec. 3. Minnesota Statutes 1976, Section 89.38, is amended to read:

89.38 PROHIBITION; PENALTIES. It shall be unlawful for a period of ten years from the date of purchase for any person who purchases trees from the commissioner to use or permit the use of planting stock furnished hereunder for any purpose not authorized hereunder, or to sell, give, remove, or permit the removal with roots attached of any tree previously planted from stock furnished hereunder for replanting on any ground other than his own or for any purpose not authorized hereunder. Any violation of this section shall be a misdemeanor.

Sec. 4. Minnesota Statutes 1976, Section 89.391, is amended to read:

89.391 NURSERY INSPECTION CERTIFICATES; LIMITATIONS ON ISSUANCE. No certificate of inspection shall be issued pursuant to section 18.51 by the commissioner of agriculture to a person who is determined by the commissioner of natural resources to have purchased trees from him pursuant to sections 89.35 to 89.39 and who is selling, giving, removing, or permitting the removal of the trees with roots attached, in violation of section 89.38.

Sec. 5. Minnesota Statutes, 1977 Supplement, Section 275.50, Subdivision 6, is amended to read:

Subd. 6. The cost to a governmental unit of implementing section 18.023, including sanitation and reforestation, as defined in section 18.023, subdivision 1, is a "special levy" and is not subject to tax levy limitations including those contained in sections 275.50 to 275.56 and in Laws 1969, Chapter 593, as amended by Laws 1974, Chapter 108, commencing with the levy made in 1976, payable in 1977, and terminating with the levy made in ~~1977~~, payable in ~~1978~~ 1978, payable in 1979. A governmental subdivision may

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make a supplementary levy in 1977, payable in 1978, for all costs of implementing section 18.023 incurred in calendar year 1977 for which a levy was not made in 1976, payable in 1977. For the purpose of calculating the tax levy limit base under section 275.51, for levy year 1977, taxes payable 1978, there shall be subtracted from the levy limit base of any governmental subdivision an amount equal to 112 percent of the amount levied under section 18.023 in levy year 1974, taxes payable 1975, and included in the levy limit base of the governmental subdivision as a result of Laws 1975, Chapter 437.

Sec. 6. Of the money appropriated by Laws 1977, Chapter 90, Section 14, Subdivision 1, Clauses (a) and (b), one-half is available for expenditure in the calendar year ending December 31, 1977, and one-half is available in the calendar year ending December 31, 1978.

The conditions set forth in this section supersede Laws 1977, Chapter 90, Section 14, Subdivision 1, so far as they are inconsistent therewith.

Sec. 7. Notwithstanding the limitations provided in section 15.0412, the temporary rules adopted by the commissioner of agriculture pursuant to Laws 1977, Chapter 90, Section 12 are effective until permanent rules are adopted. The conditions set forth in this section supersede Laws 1977, Chapter 90, Section 12, so far as they are inconsistent therewith.

Sec. 8. EFFECTIVE DATE. This act is effective the day following final enactment.

Approved April 5, 1978.

Changes or additions indicated by underline deletions by strikeout

CHAPTER 257—H.F.No.277

An act relating to shade tree disease control; authorizing grants for municipal shade tree removal and reforestation programs; amending Minnesota Statutes 1978, Sections 18.023, Subdivisions 1 and 3a; and 275.50, Subdivision 6.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 1978, Section 18.023, Subdivision 1, is amended to read:

18.023 **SHADE TREE DISEASE CONTROL.** Subdivision 1. **DEFINITIONS.** As used in subdivisions 1 to 12 the terms defined in this subdivision shall have the meanings given them.

(a) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver.

(b) "Commissioner" means the commissioner of agriculture.

(c) "Municipality" means any home rule charter or statutory city or any town exercising municipal powers pursuant to section 368.01, or any general or special law, located in the metropolitan area; or any special park district as organized under chapter 198; or any special purpose park and recreation board organized under the city charter of a city of the first class located in the metropolitan area; or any county in the metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers; and any municipality or county located outside the metropolitan area with an approved disease control program.

(d) "Shade tree disease" means Dutch elm disease or oak wilt disease.

(e) "Wood utilization or disposal system" means facilities, equipment or systems used for the removal and disposal of diseased shade trees which includes the collection, transportation, processing or storage of wood and which aids in the recovery of materials or energy from wood.

(f) "Approved disease control program" means the municipal plan as approved by the commissioner to control shade tree disease.

(g) "Disease control area" means an area approved by the commissioner within which a municipality will conduct an approved disease control program.

(h) "Sanitation" means the identification, inspection, disruption of a common root system, girdling, trimming, removal and disposal of dead or diseased wood of elm or oak shade trees, including subsidies for trees removed pursuant to subdivision 4, on public or private property within a disease control area.

(i) "Reforestation" means the replacement of shade trees removed from public property and the planting of any species of tree as part of an approved a municipal disease control program. For purposes of this clause, "public property" shall include private property within five feet of the boulevard or street terrace in any city which has enacted an ordinance on or before January 1, 1977, that prohibits or requires a permit for the planting of trees in the public right of way.

Sec. 2. Minnesota Statutes 1978, Section 18.023, Subdivision 3a, is amended to read:

Subd. 3a. **GRANTS TO MUNICIPALITIES.** (a) The commissioner may, in the name of the state and within the limit of appropriations provided, make grants-in-aid to a municipality with an approved disease control program for the partial funding of municipal sanitation and reforestation programs. The commissioner may make grants-in-aid to any home rule charter or statutory city of more than 40,000 population in the metropolitan area as defined in subdivision 1 or a combination of such cities of 40,000 combined population under a joint powers agreement pursuant to section 471.59, or a home rule charter or statutory city of more than 20,000 population outside the metropolitan area or a combination of such cities of 20,000 combined population under a joint powers agreement pursuant to section 471.59 or any special purpose park and recreation board organized under a charter of a city of the first class or any non-profit corporation serving a city of the first class or any county having an approved disease control program for the acquisition or implementation of a wood utilization or disposal system.

(b) The commissioner shall promulgate rules, including temporary rules, for the administration of grants authorized by this subdivision. The rules shall establish and contain as a minimum:

- (1) Procedures for grant applications;
- (2) Conditions and procedures for the administration of grants;
- (3) Criteria of eligibility for grants including, but not limited to, those specified in this subdivision; and
- (4) Such other matters as the commissioner may find necessary to the proper administration of the grant program.

(c) Grants-in-aid payments for wood utilization and disposal systems made by the commissioner pursuant to this subdivision shall not exceed 50 percent of the total cost of the system. Grants for sanitation and reforestation shall be combined into one grant program. Grants to any municipality for sanitation shall not exceed 45 50 percent of sanitation costs approved by the commissioner including any amount of sanitation costs paid by special assessments, ad valorem taxes, federal grants or other funds. A municipality shall not specially assess a property owner any amount greater than the amount of the tree's sanitation cost minus the amount of the tree's sanitation cost reimbursed by the commissioner. Grants to municipalities for reforestation shall not exceed the lesser of 50 percent of the cost or \$40 multiplied by the number, but not more than \$50 per tree, of trees planted pursuant to the reforestation program and shall be limited for any municipality in any year to grants for not more than the number of trees removed on public property in the sanitation program in the previous year, except during the first year of any approved disease control program; provided that a reforestation grant to any county may include up to 90 percent of the cost, but not more than \$60 per tree, of the first 50 trees planted on public property in a town not described in subdivision 1 and of less than 1,000 population upon the town's application to the county. Reforestation grants to towns and home rule charter or statutory cities as described in subdivision 1 of less than ~~4,000~~ 4,000 population with an approved disease control program may include up to 90 percent of the cost, but not more than \$60 per tree, of the first 50 trees planted on public property with the approval of the 1979 application. The governing body of any municipality which receives a reforestation grant pursuant to this section shall appoint up to seven residents of the municipality or designate an existing municipal board or committee to serve as a reforestation advisory committee to advise the governing body of the municipality in the administration of the reforestation program. For the purpose of this subdivision, "cost" shall not include the value of a gift or dedication of trees required by a municipal ordinance but shall include documented "in kind" services or voluntary work for municipalities with a population of less than 1,000 according to the 1970 census.

(d) Based upon estimates submitted by the municipality to the commissioner, which shall state the estimated costs of sanitation and reforestation in the succeeding quarter under an approved program, the commissioner shall direct quarterly advance payments to be made by the state to the municipality commencing April 1, ~~1977~~ 1979. The commissioner shall direct adjustment of any overestimate in a succeeding quarter. A municipality may elect to receive the proceeds of its sanitation and reforestation grants on a periodic cost reimbursement basis.

(e) A home rule charter or statutory city, or county outside the metropolitan area or any municipality, as defined in subdivision 1, may submit an application for a grant authorized by this subdivision concurrently with its request for approval of a disease control program.

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Sec. 3. Minnesota Statutes 1978, Section 275.50, Subdivision 6, is amended to read:

Subd. 6. The cost to a governmental unit of implementing section 18.023, including sanitation and reforestation, as defined in section 18.023, subdivision 1, is a "special levy" and is not subject to tax levy limitations including those contained in sections 275.50 to 275.56 and in Laws 1969, Chapter 593, as amended by Laws 1974, Chapter 108, commencing with the levy made in 1976, payable in 1977, and terminating with the levy made in 1978, payable in 1979. A governmental subdivision may make a supplementary levy in 1977, payable in 1978, for all costs of implementing section 18.023 incurred in calendar year 1977 for which a levy was not made in 1976, payable in 1977. For the purpose of calculating the tax levy limit base under section 275.51, for levy year 1977, taxes payable 1978, there shall be subtracted from the levy limit base of any governmental subdivision an amount equal to 112 percent of the amount levied under section 18.023 in levy year 1974, taxes payable 1975, and included in the levy limit base of the governmental subdivision as a result of Laws 1975, Chapter 437.

Sec. 4. ~~18.023~~ ~~[Subd. 3b.]~~ **LIMITATION UPON GRANTS TO METROPOLITAN AREA.** The commissioner shall not make grants for sanitation and reforestation or wood utilization and disposal systems in excess of 67 percent of the amounts appropriated for those purposes to the municipalities located within the metropolitan area, as defined in Minnesota Statutes, Section 18.023, Subdivision 1.

Sec. 5. Of the money appropriated for the biennium 1980-81 for grants for the combined sanitation and reforestation programs one-half is available for expenditure in the calendar year ending December 31, 1979 and one-half is available in the calendar year ending December 31, 1980. However, money not expended for grants for the combined sanitation and reforestation programs in the calendar year ending December 31, 1979 shall be available for grants for the combined sanitation and reforestation programs in the calendar year ending December 31, 1980.

Sec. 6. **EFFECTIVE DATE.** This act is effective July 1, 1979 and applies to costs incurred on and after January 1, 1979.

Approved May 29, 1979.

Changes or additions indicated by underline deletions by strikeout

LAWS of MINNESOTA for 1979

CHAPTER 299—H.F.No.1206

An act relating to energy; encouraging municipalities to make maximum utilization of diseased shade trees.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. **[18.024] DISEASED SHADE TREE UTILIZATION.** Subdivision 1. The department of agriculture, in cooperation with the Minnesota energy agency and the Minnesota shade tree advisory committee, shall draft recommendations for wood utilization or disposal systems as defined in Minnesota Statutes, Section 18.023. These recommendations shall encourage maximum utilization of diseased shade trees. In addition to insuring maximum utilization, the recommendations shall be designed to insure public safety and to assure compliance with approved disease control programs.

Subd. 2. A municipality operating a program of sanitation as defined in Minnesota Statutes, Section 18.023 and conforming to all regulations relating to shade tree disease control may, with due attention to the recommendations developed pursuant to subdivision 1, institute a program of wood utilization and disposal which will, to the extent practicable, encourage utilization of diseased trees including but not limited to making the trees available to the public for use as firewood.

Approved May 31, 1979.

Changes or additions indicated by underline deletions by ~~strikeout~~

CHAPTER 261 — H.F.No. 409

An act relating to agriculture; requiring department of agriculture approval and receipt of certain grain storage receipts; regulating the family farm security program; changing terms of members of the family farm advisory council; regulating denaturing of certain food; identifying fur pelts; updating references in the shade tree control law; amending Minnesota Statutes 1980, Sections 17.35, Subdivision 7; 18.023, Subdivision 3a; 31.095; 41.52, Subdivisions 5, 8 and 9, and by adding subdivisions; 41.54, Subdivision 2; 41.56, Subdivisions 1, 2, 3 and 4; 41.58, Subdivision 2; 232.06, Subdivision 1; 233.03; 234.27; 236.03; 275.50, Subdivision 6; 290.01, Subdivision 20; and 290.08, Subdivision 24; repealing Minnesota Statutes 1980, Sections 29.091 and 234.02.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 1980, Section 17.35, Subdivision 7, is amended to read:

Subd. 7. **TAGS.** Every fur farmer transporting or selling any pelts of domestic animals shall may attach to every package of pelts a tag identifying the pelts therein. ~~Such~~ The tags shall be obtained from the commissioner.

Sec. 2. Minnesota Statutes 1980, Section 18.023, Subdivision 3a, is amended to read:

Subd. 3a. **GRANTS TO MUNICIPALITIES.** (a) The commissioner may, in the name of the state and within the limit of appropriations provided, make grants-in-aid to a municipality with an approved disease control program for the partial funding of municipal sanitation and reforestation programs. The commissioner may make grants-in-aid to any home rule charter or statutory city, or any special purpose park and recreation board organized under a charter of a city of the first class or any non-profit corporation serving a city of the first class or any county having an approved disease control program for the acquisition or implementation of a wood utilization or disposal system.

(b) The commissioner shall promulgate rules, including temporary rules, for the administration of grants authorized by this subdivision. The rules shall establish and contain as a minimum:

- (1) Procedures for grant applications;
- (2) Conditions and procedures for the administration of grants;
- (3) Criteria of eligibility for grants including, but not limited to, those specified in this subdivision; and
- (4) ~~Such~~ Other matters as the commissioner may find necessary to the proper administration of the grant program.

(c) Grants-in-aid payments for wood utilization and disposal systems made by the commissioner pursuant to this subdivision shall not exceed 50 percent of the total cost of the system. Grants for sanitation and reforestation shall be combined into one grant program. Grants to any municipality for sanitation shall not exceed 50 percent of sanitation costs approved by the commissioner including any amount of sanitation costs paid by special assessments, ad valorem taxes, federal grants or other funds. A municipality shall not specially assess a property owner any amount greater than the amount of the tree's sanitation cost minus the amount of the tree's sanitation cost reimbursed by the commissioner. Grants to municipalities for reforestation shall not exceed 50 percent of the cost, but not more than \$50 per tree, of trees planted pursuant to the reforestation program; provided that a reforestation grant to any county may include 90 percent of the cost, but not more than \$60 per tree, of the first 50 trees planted on public property in a town not described in subdivision 1 and of less than 1,000 population upon the town's application

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to the county. Reforestation grants to towns and home rule charter or statutory cities as described in subdivision 1 of less than 4,000 population with an approved disease control program may include 90 percent of the cost, but not more than \$60 per tree, of the first 50 trees planted on public property with the approval of the 1979 application. The governing body of any municipality which receives a reforestation grant pursuant to this section shall appoint up to seven residents of the municipality or designate an existing municipal board or committee to serve as a reforestation advisory committee to advise the governing body of the municipality in the administration of the reforestation program. For the purpose of this subdivision, "cost" shall not include the value of a gift or dedication of trees required by a municipal ordinance but shall include documented "in kind" services or voluntary work for municipalities with a population of less than 1,000 according to the ~~1970~~ most recent federal census.

(d) Based upon estimates submitted by the municipality to the commissioner, which shall state the estimated costs of sanitation and reforestation in the succeeding quarter under an approved program, the commissioner shall direct quarterly advance payments to be made by the state to the municipality ~~commencing~~ April 1, 1979. The commissioner shall direct adjustment of any overestimate in a succeeding quarter. A municipality may elect to receive the proceeds of its sanitation and reforestation grants on a periodic cost reimbursement basis.

(e) A home rule charter or statutory city, or county outside the metropolitan area or any municipality, as defined in subdivision 1, may submit an application for a grant authorized by this subdivision concurrently with its request for approval of a disease control program.

Changes or additions are indicated by underline, deletions by ~~strikeout~~.

18.023 SHADE TREE DISEASE CONTROL. Subdivision 1. DEFINITIONS. As used in subdivisions 1 to 12 the terms defined in this subdivision shall have the meanings given them.

(a) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver.

(b) "Commissioner" means the commissioner of agriculture.

(c) "Municipality" means any home rule charter or statutory city or any town exercising municipal powers pursuant to section 368.01, or any general or special law located in the metropolitan area; or any special park district as organized under chapter 398; or any special purpose park and recreation board organized under the city charter of a city of the first class located in the metropolitan area; or any county in the metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers; and any municipality or county located outside the metropolitan area with an approved disease control program.

(d) "Shade tree disease" means Dutch elm disease or oak wilt disease.

(e) "Wood utilization or disposal system" means facilities, equipment or systems used for the removal and disposal of diseased shade trees which includes the collection, transportation, processing or storage of wood and which aids in the recovery of materials or energy from wood.

(f) "Approved disease control program" means the municipal plan as approved by the commissioner to control shade tree disease.

(g) "Disease control area" means an area approved by the commissioner within which a municipality will conduct an approved disease control program.

(h) "Sanitation" means the identification, inspection, disruption of a common root system, girdling, trimming, removal and disposal of dead or diseased wood of elm or oak shade trees, including subsidies for trees removed pursuant to subdivision 4, on public or private property within a disease control area.

(i) "Reforestation" means the replacement of shade trees removed from public property and the planting of any species of tree as part of a municipal disease control program. For purposes of this clause, "public property" shall include private property within five feet of the boulevard or street terrace in any city which has enacted an ordinance on or before January 1, 1977, that prohibits or requires a permit for the planting of trees in the public right of way.

Subd. 1a. PURPOSE. The legislature finds that an epidemic of Dutch elm disease and oak wilt disease is occurring in Minnesota which threatens the natural environment. Immediate action is therefore necessary to provide funds to assist local units of government in the implementation of shade tree disease control programs by conducting sanitation and reforestation programs, expanding diseased wood destruction programs, increasing public awareness of shade tree disease, accelerating training of tree inspectors and research for disease prevention and subsidizing private property owners for the removal of diseased elm and oak trees.

Subd. 2. COMMISSIONER TO ADOPT RULES. The commissioner shall adopt and may amend rules relating to shade tree disease control in any municipality, as defined in subdivision 1. The rules shall prescribe control measures to be used to prevent the spread of shade tree diseases and shall include the following: (a) A definition of shade tree, (b) qualifications for tree inspectors, (c) methods of identifying diseased shade trees, (d) procedures for giving reasonable notice of inspection of private real property, (e) measures for the removal of any shade tree which may contribute to the spread of shade tree disease, and for reforestation of disease control areas, (f) approved methods of treatment of shade trees, (g) criteria for priority designation areas in an approved disease control program, and (h) any other matters determined necessary by the commissioner to prevent the spread of shade tree disease and enforce the provisions of this section. After reasonable notice of inspection an owner of the real property on which a diseased shade tree is located shall remove or treat the tree within the period of time and in the manner established by the commissioner. Diseased shade trees which are not removed or treated in compliance with the commissioner's rules shall be declared a public nuisance and removed or treated by approved methods by the municipality which may assess the total expense, which shall be limited to the lowest contract rates available, provided said rates include wage levels which meet Minnesota minimum wage standards, or any part thereof to the property and the expense shall become a lien on the property. A municipality may assess not more than 50 percent of the expense of treating with an approved method or removing diseased shade trees located on street terraces or boulevards to the abutting properties and the assessment shall become a lien on the property.

Subd. 3. RULES AND REGULATIONS; APPLICABILITY TO MUNICIPALITIES. The rules and regulations of the commissioner shall apply in a municipality unless the municipality adopts an ordinance which is determined by the commissioner to be more stringent than the rules and regulations of the commissioner. The rules and regulations of the commissioner or the more stringent ordinance of the municipality shall be in effect 60 days from March 31, 1974. The rules and regulations of the commissioner or the municipality shall apply to all state agencies, special purpose districts and metropolitan commissions as defined in section 473.121, subdivision 7, which own or control land adjacent to or within a shade tree disease control area in Laws 1975, Chapter 253.

Subd. 3a. GRANTS TO MUNICIPALITIES. (a) The commissioner may, in the name of the state and within the limit of appropriations provided, make grants-in-aid to a municipality with an approved disease control program for the partial funding of municipal sanitation and reforestation programs. The commissioner may make grants-in-aid to any home rule charter or statutory city or any special purpose park and recreation board organized under a charter of a city of the first class or any non-profit corporation serving a city of the first class or any county having an approved disease control program for the acquisition or implementation of a wood utilization or disposal system.

(b) The commissioner shall promulgate rules, including temporary rules, for the administration of grants authorized by this subdivision. The rules shall establish and contain as a minimum:

- (1) Procedures for grant applications;
- (2) Conditions and procedures for the administration of grants;

(3) Criteria of eligibility for grants including, but not limited to, those specified in this division; and

(4) Other matters the commissioner may find necessary to the proper administration of the grant program.

(c) Grants-in-aid payments for wood utilization and disposal systems made by the commissioner pursuant to this subdivision shall not exceed 50 percent of the total cost of the system. Grants for sanitation and reforestation shall be combined into one grant program. Grants to any municipality for sanitation shall not exceed 50 percent of sanitation costs approved by the commissioner including any amount of sanitation costs paid by special assessments, ad valorem taxes, federal grants or other funds. A municipality shall not specially assess a property owner any amount greater than the amount of the tree's sanitation cost minus the amount of the tree's sanitation cost reimbursed by the commissioner. Grants to municipalities for reforestation shall not exceed 50 percent of the cost, but not more than \$50 per tree, of trees planted pursuant to the reforestation program; provided that a reforestation grant to any county may include 90 percent of the cost, but not more than \$60 per tree, of the first 50 trees planted on public property in a town not described in subdivision 1 and of less than 1,000 population upon the town's application to the county. Reforestation grants to towns and home rule charter or statutory cities as described in subdivision 1 of less than 4,000 population with an approved disease control program may include 90 percent of the cost, but not more than \$60 per tree, of the first 50 trees planted on public property with the approval of the 1979 application. The governing body of any municipality which receives a reforestation grant pursuant to this section shall appoint up to seven residents of the municipality or designate an existing municipal board or committee to serve as a reforestation advisory committee to advise the governing body of the municipality in the administration of the reforestation program. For the purpose of this subdivision, "cost" shall not include the value of a gift or dedication of trees required by a municipal ordinance but shall include documented "in kind" services or voluntary work for municipalities with a population of less than 1,000 according to the most recent federal census.

(d) Based upon estimates submitted by the municipality to the commissioner, which shall state the estimated costs of sanitation and reforestation in the succeeding quarter under an approved program, the commissioner shall direct quarterly advance payments to be made by the state to the municipality commencing April 1, 1979. The commissioner shall direct adjustment of any overestimate in a succeeding quarter. A municipality may elect to receive the proceeds of its sanitation and reforestation grants on a periodic cost reimbursement basis.

(e) A home rule charter or statutory city, or county outside the metropolitan area or any municipality, as defined in subdivision 1, may submit an application for a grant authorized by this subdivision concurrently with its request for approval of a disease control program.

Subd. 3b. LIMITATION UPON GRANTS TO METROPOLITAN AREA. The commissioner shall not make grants for sanitation and reforestation or wood utilization and disposal systems in excess of 67 percent of the amounts appropriated for those purposes to the municipalities located within the metropolitan area, as defined in Minnesota Statutes, Section 18.023, Subdivision 1.

Subd. 4. SUBSIDIES TO CERTAIN OWNERS. A municipality may provide subsidies to nonprofit organizations, to owners of private residential property of five acres or less, to owners of property used for a homestead of more than five acres but less than 20 acres and to nonprofit cemeteries, however organized, for the approved treatment or removal of diseased shade trees.

Notwithstanding any law to the contrary, an owner of property on which shade trees are located may contract with a municipality to provide protection against the cost of approved treatment or removal of diseased shade trees or shade trees that will contribute to the spread of shade tree diseases. Under such contracts, the municipality shall pay for the removal or approved treatment under such terms and conditions as may be determined by the governing body of the municipality.

Subd. 5. TREE INSPECTOR. (a) Within 75 days from March 31, 1974, the governing body of each municipality shall appoint a qualified person to administer the rules and regulations of the commissioner or the more stringent shade tree disease control ordinance who shall be known as the tree inspector. In accordance with the provisions of section 471.59, two or more municipalities may jointly appoint a tree inspector for the purpose of administering the regulations or ordinance within their communities. In those municipalities which have not appointed a tree inspector upon the expiration of 75 days from March 31, 1974, the commissioner may appoint a tree inspector to serve the municipality until the municipality has made an appointment. If the commissioner is unable to make such appointment he may assign a qualified employee of the department of agriculture to perform the duties of the tree inspector. The expense of a tree inspector appointed by the commissioner shall be paid by the municipality. If an employee of the department of agriculture performs such duties the expense shall be billed to the municipality and paid into the state treasury and credited to the general fund.

(b) Upon a determination by the commissioner that a candidate for the position of the inspector is qualified, he shall issue a certificate to the tree inspector that he is so qualified. Any person certified as a tree inspector by the commissioner is authorized upon prior notification to enter and inspect any public or private property which might harbor diseased shade trees.

(c) The commissioner may upon notice and hearing, decertify any tree inspector when it appears to him that said tree inspector has failed to act competently or in the public interest in the performance of his duties. Such notice shall be provided and the hearing conducted in accordance with the provisions of chapter 15, governing contested case proceedings. Nothing in this clause shall limit or otherwise affect the authority of a municipality to dismiss or suspend a tree inspector at its discretion; except as otherwise provided by law.

Subd. 6. The cost to a governmental unit of implementing section 18.023, including sanitation and reforestation, as defined in section 18.023, subdivision 1, is a "special levy" and is not subject to tax levy limitations including those contained in sections 275.50 to 275.56 and the Laws 1969, Chapter 593, as amended by Laws 1974, Chapter 108, commencing with the levy made in 1976, payable in 1977, and terminating with the levy made in 1980, payable in 1981.

Subd. 7. FINANCING. (a) A municipality may collect the amount assessed against the property under subdivision 2 as a special assessment and may issue obligations as provided in section 429.101, subdivision 1, provided that a municipality at its option make any assessment levied payable with interest in installments not to exceed five years from the date of the assessment.

(b) After a contract for the sanitation or approved treatment of trees on private property has been let, or the work commenced, the municipality may issue obligations to defray the expense of any such work financed by special assessments imposed upon private property. Section 429.091 shall apply to such obligations with the following modifications:

(1) Such obligations shall be payable not more than five years from the date of issuance; and

(2) No election shall be required.

Obligations issued under the provisions of this clause shall not be considered bonded indebtedness for the purposes of section 273.13, subdivisions 6 and 7. The certificates shall not be included in the net debt of the issuing municipality.

Subd. 8. DEPOSIT OF PROCEEDS IN SEPARATE FUND. The proceeds of any tax levied, assessments and interest collected, or any bonds or certificates of indebtedness issued under subdivision 7 and section 275.50, subdivision 6, and any grants received under subdivision 3a, shall be deposited in the municipal treasury in a separate fund and expended only for the purposes authorized by this section.

Subd. 9. DIAGNOSTIC LABORATORY. The commissioner of agriculture shall operate a diagnostic laboratory for culturing diseased trees for positive identification of diseased shade trees.

Subd. 10. COOPERATION BY UNIVERSITY. The university of Minnesota college of agriculture shall cooperate with the department of agriculture in control of shade tree disease. The college of agriculture shall also conduct research into means for identifying diseased shade trees, shall develop and evaluate control measures, shall develop means for disposing of and utilizing diseased shade trees.

Subd. 10a. EXPERIMENTAL PROGRAMS. The commissioner may establish experimental programs for sanitation or treatment of shade tree diseases. The commissioner may make grants to municipalities, or enter into contracts with municipal, state or federal agencies in connection with experimental shade tree programs including research to assist municipalities in establishing priority designation areas in an approved disease control program.

Subd. 11. REPORT TO THE LEGISLATURE. On or before January 31 of each year, the commissioner shall report to the legislature on the proceeding year's approved disease control programs and any experimental programs conducted pursuant to subdivision 10a. The commissioner, with the assistance of the commissioner of energy, planning and development, shall investigate and evaluate the potential uses of wood infected with shade tree disease, including the uses as an alternative energy source and as a component in the construction or manufacture of new products.

Subd. 12. SECTIONS 18.021 to 18.022 SUPERSEDED. The provisions of sections 18.021 to 18.022, which are inconsistent with Laws 1974, Chapter 355 are hereby superseded for any municipality as defined in subdivision 1, clause (c).

Subd. 13. MUNICIPAL OPTION TO PARTICIPATE IN PROGRAM. After December 31, 1981, the term "municipality" shall include only those municipalities which have informed the commissioner of their intent to continue an approved disease control program. Any municipality desiring to participate in the grants-in-aid for the partial funding of municipal sanitation and reforestation programs must notify the commissioner in writing before the beginning of the calendar year in which it wants to participate and must have an approved disease control program during any year in which it receives grants-in-aid. Notwithstanding the provisions of any law to the contrary, no municipality shall be required to have an approved disease control program after December 31, 1981.

18.024 DISEASED SHADE TREE UTILIZATION. Subdivision 1. The department of agriculture, in cooperation with the commissioner of energy, planning and development and the Minnesota shade tree advisory committee, shall draft recommendations for wood utilization or disposal systems as defined in section 18.023. These recommendations shall encourage maximum utilization of diseased shade trees. In addition to insuring maximum utilization, the recommendations shall be designed to insure public safety and to assure compliance with approved disease control programs.

Subd. 2. A municipality operating a program of sanitation as defined in section 18.023 and conforming to all regulations relating to shade tree disease control may, with due attention to the recommendations developed pursuant to subdivision 1, institute a program of wood utilization and disposal which will, to the extent practicable, encourage utilization of diseased trees including but not limited to making the trees available to the public for use as firewood.

126.11 ARBOR DAY. Subdivision 1. The last Friday in April is designated Arbor Day. On that day there may be special observances throughout the state celebrating and emphasizing the importance of cultivating forest, fruit and ornamental trees. In the public schools of the state, time may be devoted by the teachers, either in the classroom or outside of the classroom, to appropriate instructions and exercises commemorating the history and tradition of Arbor Day observances in the past and illustrating the future value to the state of cultivating, planting and developing the trees and forest resources. These observances shall not consume more than one-half of the normal school day.

Subd. 2. The department of natural resources may assist and encourage the observance of Arbor Day by any public school, group or association requesting assistance. The department may lend its facilities and resources to such public school, group or association for the planting and cultivating of trees.

Subd. 3. The governor shall in any way he deems necessary encourage the observances and exercises set forth in this section and he shall by proclamation call the public's attention to the importance of the state forest resources and the policy herein set forth.

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MINNESOTA DEPARTMENT OF AGRICULTURE
STATE OFFICE BUILDING
ST. PAUL, MINNESOTA 55155

Rules and Regulations of
The Department of Agriculture

CHAPTER 4: AGR 101 - 120

SHADE TREE DISEASE CONTROL

AGR 101 Statement of Public Policy. It is the purpose of the rules and regulations contained herein to carry out and enforce the provisions of Laws of Minnesota, 1974, Chapter 355, Section 66. An epidemic of Dutch elm disease and oak wilt disease is occurring in the seven county metropolitan area. Trees are an important element in the healthful environment of the seven county metropolitan area, because of the concentration of population in the area. The impact of the diseases appears to be greater in the seven county metropolitan area than it does in other areas of the state, therefore, it is necessary to take extraordinary measures to control such diseases.

AGR 102 Definitions. As used in this regulation the following words and terms shall have the meanings given:

- (a) "Shade tree" means any oak or elm tree situated in a disease control area approved by the Commissioner.
- (b) "Shade tree disease" means Dutch elm disease caused by Ceratocystis ulmi, or oak wilt disease caused by Ceratocystis fagacearum.
- (c) "Commissioner" means the Commissioner of Agriculture.
- (d) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver.
- (e) "Municipality" means any city or any town exercising municipal powers pursuant to Minnesota Statutes, Section 368.01, or any general or special law, located in the metropolitan area or any special park district as organized under Minnesota Statutes, Chapter 398, or any special purpose park district organized

under the city charter, or any portion of a county in such metropolitan area located outside the geographic boundaries of a city or town exercising municipal powers and any municipality located outside the metropolitan area which petitions to and has consent of the Commissioner to come within the provisions of this act.

NOTE: It is the determination of the Commissioner that any county in the metropolitan area shall for the purposes of these regulations and for Minnesota Laws 1974, Chapter 355, Section 66, be considered a "municipality" for any and all land area which is owned by said county.

(f) "Tree inspector" means a person who has the necessary qualifications to properly plan, direct and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the limits of all laws, rules, and regulations governing this control and is so certified by the Commissioner.

(g) "Disease control area" means an area approved by the Commissioner within which a municipality will conduct a shade tree disease control program.

AGR 103 Tree Inspector Employment and Qualifications.

(a) A municipality will employ or retain on a continuing basis a tree inspector or will employ or retain jointly with one or more municipalities a tree inspector as provided by M. S. 471.59.

(b) Provisional appointments

(1) A municipality may provisionally appoint a tree inspector for a period of not more than 6 months.

(2) This appointment is dependent on approval by the Commissioner after determining the competence of the appointee.

(3) The provisional appointment cannot be extended and the appointee must either pass the tree inspectors examination or successfully complete the next training course approved by the Commissioner to be certified as a tree inspector.

(4) The provisional appointment may be withdrawn by the Commissioner upon notice and hearing for cause.

(c) A tree inspector must be able to demonstrate the following qualifications:

(1) Identify all native tree species common to his work area with or without leaves and all felled or down trees with bark intact.

(2) Distinguish oak wilt and Dutch elm disease from all other tree problems of oak and elm.

(3) Know the proper method of collecting samples for disease diagnosis.

(4) Know and understand the biology of oak wilt and Dutch elm disease.

(5) Know the appropriate Minnesota laws and rules and regulations relative to oak wilt and Dutch elm disease.

(6) Know the approved control methods for oak wilt and Dutch elm disease.

(d) If a municipality fails to appoint a tree inspector by June 13, 1974, an appointment may be made by the Commissioner pursuant to Laws of Minnesota, 1974, Chapter 355, Section 66. Ten working days prior to such appointment, the Commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the Commissioner shall be paid by the municipality for a minimum of 90 days even though the municipality may appoint their own inspector prior to the expiration of 90 days. However, this provision shall not apply to an inspector whose employment is suspended or terminated for cause.

AGR 104 Certification of Tree Inspector.

(a) Certification of tree inspectors shall be accomplished by their passing an examination prescribed by the Commissioner for the purpose of determining that the applicant possesses the necessary qualifications. Each applicant shall be notified by the Commissioner by mail of the time and date of such examination. The applicant and the employing municipality will be notified of the results of the examination within 15 days.

(b) After certification, a tree inspector shall be required to attend annually at least one program of continuing education as approved by the Commissioner. Failure to attend such programs as required may be grounds for revocation, termination, or suspension of certification.

AGR 105 Decertification of Tree Inspectors. The Commissioner may upon notice and hearing decertify any tree inspector for cause as provided in the law.

AGR 106 Shade Tree Disease Control Program. The tree disease control program of all municipalities affected by these regulations shall include as a minimum the

following elements:

(a) Control area. Each municipality shall designate and submit for approval by the Commissioner a disease control area.

(b) Program plan. Each municipality shall prepare a tree disease control program plan that details the manner in which these regulations will be fulfilled.

(c) Methods of identifying diseased shade trees. Diseased shade trees will be identified by generally accepted field symptoms such as wilting, or yellowing of leaves, or staining of inner bark. Confirmation when determined to be necessary, will be made by the Minnesota Department of Agriculture, tree disease laboratory, or other laboratory recognized by the Commissioner.

(d) Dutch elm disease and oak wilt control

(1) Tree inventory. A reasonable estimate of elms, oaks, and other tree species on both public and private property must be made and recorded. This should be a permanent record and reported to the Department of Agriculture.

(2) Dutch elm disease control must include the following:

(aa) Sanitation. Sanitation is the major element in any Dutch elm disease control program because it is needed to eliminate elm bark beetles, diseased trees, and dead or weakened elm wood arising from any cause. This must include trees on private property.

(i) Prior to April 15, check all public and private properties for elm wood or logs that could serve as bark beetle breeding sites and require removal, or de-barking if wood is to be retained. Before making any inspections on private property within a municipality, it shall be the duty of the municipality to attempt to give notice of said inspection to all affected residents either through individual, oral or written notice or by publishing said notice in a local newspaper.

(ii) Check all elm trees at least twice during the growing season (by July 1 and August 15) for Dutch elm disease symptoms.

(iii) Remove and properly dispose of diseased or dead elm

trees or any above ground parts thereof within 20 days after notification in accordance with prescribed methods approved by the Commissioner and consistent with applicable air quality and solid waste regulations.

(bb) Root Graft Control. Disrupt common root systems by chemical or mechanical means as approved by the Commissioner to prevent root graft spread of Dutch elm disease.

(3) Oak wilt. Oak wilt control involves both root graft treatment and prevention of infection by oak wilt spores carried by insects or other agents (overland spread).

(aa) Use chemical or mechanical means to disrupt root graft transmission of the oak wilt fungus as approved by the Commissioner.

(bb) Overland spread

(i) Avoid pruning or other mechanical damage during the most susceptible period in May and June. Use tree wound dressings if wounding is unavoidable during susceptible period.

(ii) Girdle diseased trees as soon as they are detected to reduce spore mat formation. Chemical or mechanical root disruption should precede girdling if root graft spread is likely to occur.

(iii) Eradicate or destroy the following diseased oaks: northern red oak, Quercus rubra, northern pin oak, Quercus ellipsoidalis, black oak, Quercus velutina, and scarlet oak, Quercus coccinea, in accordance with prescribed methods approved by the Commissioner and consistent with applicable air quality and solid waste regulations.

(e) Records. Shade tree disease program records must be kept by each municipality and be available for examination at any time by the Commissioner. A yearly report of the summation of these records must be made to the Commissioner by December 1 and this report should include the following:

(1) Monies expended on personnel, equipment, and contracts listed separately.

(2) Man hours spent on tree inventory, sanitation, and any chemical control measures.

(3) Number of samples submitted for diagnosis, and the results, the

number of diseased trees and the number of trees removed.

(4) Number of removal notices issued for the diseased tree located on private property.

(5) Number of notices issued for removal of wood which may be a hazard in the spread of a shade tree disease.

(6) The report must include the beginning inventory and indicate the number of trees removed, both diseased and others.

(f) Program Review

(1) Prior to June 13, 1974 and annually thereafter by January 1st municipalities must submit their shade tree disease control program plan to the Commissioner for review to determine if it meets or exceeds the requirements of the law and any rules and regulations related thereto.

(2) The Commissioner shall complete this review and notify the municipalities of his approval within 15 days.

(3) Final determination of municipal program compliance with these rules and regulations shall rest with the Commissioner.

(4) The Commissioner may require changes or improvements at anytime he determines they are needed in any municipal program in order to obtain compliance with these rules and regulations.

AGR 107 - 120 Reserved for future use

Filed: 6-14-74

(Delete 2 blue sheets Agr 101 thru 107 and insert the following 4 sheets)

CHAPTER 4: AGR 101-120

SHADE TREE DISEASE CONTROL

Agr 101 Purpose. It is the purpose of the rules and regulations contained herein to carry out and enforce the provisions of Minnesota Statutes 1974, Section 18.023, as amended by Laws 1975, Chapter 253. The rules relate to the control of Dutch elm disease and oak wilt by local units of government and include procedures and criteria for two grants-in-aid programs.

Agr 102 Definitions. As used in this regulation, the following words and terms shall have the meaning given:

(a) "Shade tree" means any oak or elm tree situated in a disease control area approved by the commissioner.

(b) "Shade tree disease" means Dutch elm disease caused by *Ceratocystis ulmi*, or oak wilt disease caused by *Ceratocystis fagacearum*.

(c) "Commissioner" means the commissioner of agriculture. (Minn. Stat. Sec. 18.023, Subd. 1)

(d) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver. (Minn. Stat. Sec. 18.023, Subd. 1)

(e) "Municipality" means any city or any town exercising municipal powers pursuant to Minnesota Statutes, Section 368.01, or any general or special law, located in the metropolitan area, or any special park district as organized under Minnesota Statutes, Chapter 398, or any special purpose park district organized under the city charter of a city of the first class located in the metropolitan area, or any county in the metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers and any municipality or county located outside the metropolitan area which makes request to and has consent of the commissioner to come within the provisions of this section. (Minn. Stat. Sec. 18.023, Subd. 1)

(f) "Tree inspector" means a person who has the necessary qualifications to properly plan, direct and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the limits of all laws, rules, and regulations governing this control and is so certified by the commissioner.

(g) "Disease control area" means an area approved by the commissioner within which a municipality will conduct a shade tree disease control program. (Minn. Stat. Sec. 18.023, Subd. 1)

(h) "Disease control program" means the municipal plan as approved by the commissioner to control shade tree disease. (Minn. Stat. Sec. 18.023, Subd. 1)

(i) "Subsidy Program" means a municipal program of financial assistance to private, residential property owners for the removal of diseased elm and/or oak shade trees.

(j) "Wood utilization or disposal system" means a system used for the removal and disposal of diseased shade trees which includes the collection, transportation, processing or storage of wood and which aids in the recovery of materials or energy from wood. (Minn. Stat. Sec. 18.023, Subd. 1)

(k) "Equipment" means machinery or devices which singly or in combination are designed, constructed and operated for the purposes of wood utilization and/or disposal and shall include all machinery, tools and devices ancillary to the use of such machinery or devices.

(1) "Facility" means land, buildings, and other appurtenances which are necessary or useful in the operation of wood utilization or disposal equipment.

Agr 103 Tree Inspector Employment and Qualifications.

(a) A municipality will employ or retain on a continuing basis a tree inspector or will employ or retain jointly with one or more municipalities a tree inspector as provided by Minnesota Statutes, Section 471.59.

(b) Provisional appointments

(1) A municipality may provisionally appoint a tree inspector for a period of not more than six (6) months.

(2) This appointment is dependent on approval by the commissioner after determining the competence of the appointee.

(3) The provisional appointment cannot be extended and the appointee must either pass the tree inspector examination or successfully complete the next training course approved by the commissioner to be certified as a tree inspector.

(4) The provisional appointment may be withdrawn for cause by the commissioner upon notice and hearing.

(c) A tree inspector must be able to demonstrate the following qualifications:

(1) Identify all native tree species common to his work area, with or without leaves, and all felled or down trees with bark intact.

(2) Distinguish oak wilt and Dutch elm disease from all other tree problems of oak and elm.

(3) Know the proper method of collecting samples for disease diagnosis.

(4) Know and understand the biology of oak wilt and Dutch elm disease.

(5) Know the appropriate Minnesota laws and rules and regulations relative to oak wilt and Dutch elm disease.

(6) Know the approved control methods for oak wilt and Dutch elm disease.

(d) If a municipality fails to appoint a tree inspector an appointment may be made by the commissioner pursuant to Minnesota Statutes 1974, Section 18.023. Ten working days prior to such appointment, the commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the commissioner shall be paid by the municipality for a minimum of 90 days even though the municipality may appoint their own inspector prior to the expiration of 90 days. This provision shall not apply to an inspector whose employment is suspended or terminated for cause.

Agr 104 Certification of Tree Inspector.

(a) Certification of tree inspectors shall be accomplished by their passing an examination prescribed by the commissioner for the purposes of determining that the applicant possesses the necessary qualifications. Each applicant shall be notified by the commissioner by mail of the time and date of such examination. The applicant and the employing municipality will be notified of the results of the examination within 15 days.

(b) After certification, a tree inspector shall be required to attend annually at least one program of continuing education as approved by the commissioner. Failure to attend such programs as required may be grounds for revocation, termination, or suspension of certification.

Agr 105 Decertification of Tree Inspectors. The commissioner may upon notice and hearing decertify any tree inspector for cause as provided in the law.

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Agr 106 Shade Tree Disease Control Program. The tree disease control program of all municipalities affected by these regulations shall include as a minimum the following elements:

(a) Control area. Each municipality shall designate and submit for approval by the commissioner a disease control area.

(b) Program plan. Each municipality shall prepare a tree disease control program plan that details the manner in which these regulations will be fulfilled.

(c) Methods of identifying diseased shade trees. Diseased shade trees will be identified by generally accepted field symptoms such as wilting, or yellowing of leaves, or staining of wood under bark. Confirmation when determined to be necessary, will be made by the Minnesota department of agriculture tree disease laboratory, or other laboratory recognized by the commissioner.

(d) Dutch elm disease and oak wilt control.

(1) Tree inventory. Each municipality shall make and record a reasonable estimate of elms, oaks, and other tree species on both public and private property within the municipality. Estimates of tree numbers may be made by acceptable forest inventory procedures. Control areas shall be designated with estimates of tree numbers within control areas recorded separately from estimates of tree numbers outside of control areas. These records shall be permanent and shall be reported to the department of agriculture.

(2) Dutch elm disease control shall include the following:

(aa) Sanitation. Sanitation is the major element in any Dutch elm disease control program and is essential for the elimination of elm bark beetles, diseased trees, and dead or weakened elm wood arising from any cause. This must include trees on private property.

(i) Prior to April 15, each municipality shall annually inspect all public and private properties for elm wood or logs that could serve as bark beetle breeding sites and require removal, or debarking if wood is to be retained. Before making any inspections on private property within a municipality, it shall be the duty of the municipality to attempt to give notice of said inspection to all affected residents either through individual, oral or written notice or by publishing said notice in a local newspaper.

(ii) Each municipality shall inspect all elm trees within a control area at least twice during the growing season (by July 1 and August 15) for Dutch elm disease symptoms.

(iii) After notification by the municipality, private property owners shall remove and properly dispose of diseased or dead elm trees or any above ground parts thereof within 20 days in accordance with prescribed methods approved by the commissioner and consistent with applicable air quality and solid waste regulations.

(iv) Trees or parts thereof not removed within 20 days of such notification shall be removed by the municipality and the costs thereof shall be assessed against the property.

(bb) Root Graft Control. A municipality shall disrupt common root systems by chemical or mechanical means as approved by the commissioner to prevent root graft spread of Dutch elm disease.

(3) Oak wilt. Oak wilt control involves both root graft treatment and prevention of infection by oak wilt spores carried by insects or other agents (overland spread).

(aa) A municipality shall use chemical or mechanical means to disrupt root graft transmission of the oak wilt fungus as approved by the commissioner.

(bb) To control overland spread of the disease, a municipality shall do the following:

(i) Avoid pruning or other mechanical damage during the most susceptible period in May and June. Use tree wound dressings if wounding is unavoidable during susceptible period.

(ii) Girdle diseased trees as soon as they are detected to reduce sport mat formation. Chemical or mechanical root disruption shall precede girdling if root graft spread is likely to occur.

(iii) Eradicate or destroy the following diseased oaks: northern red oak, *Quercus rubra*; northern pine oak, *Quercus ellipsoidalis*; black oak, *Quercus velutina*; and scarlet oak, *Quercus coccinea*; in accordance with prescribed methods approved by the commissioner and consistent with applicable air quality and solid waste regulations.

(e) Records. Shade tree disease program records shall be kept by each municipality and be available for examination at any time by the commissioner. A yearly report of the summation of these records shall be made to the commissioner by December 1 and this report shall include the following:

- (1) Monies expended on personnel, equipment, and contracts, listed separately.
- (2) Man hours spent on tree inventory, sanitation, and any chemical control measures.
- (3) An initial inventory of trees.
- (4) Number of samples submitted for diagnosis and the results.
- (5) Number of diseased trees identified.
- (6) Number of removal notices issued for the diseased trees located on private property.
- (7) Number of trees removed, both diseased and others.
- (8) Number of notices issued for removal of wood which may be a hazard in the spread of a shade tree disease.

(f) Program Review.

- (1) By January 1 of each year, municipalities shall submit their shade tree disease control program plan to the commissioner for review to determine if it meets the requirements of the law and any applicable rules and regulations.
- (2) The commissioner shall complete this review and notify the municipalities of his determination within 15 days.
- (3) Final determination of municipal program compliance with these rules and regulations shall rest with the commissioner.
- (4) The commissioner may require changes or improvements anytime he determines such changes or improvements are needed to any municipal program to comply with these rules and regulations.

Agr 107 Grants-in-aid to Municipalities for Removal of Diseased Shade Trees.

(a) Application for grants-in-aid.

(1) A municipality may apply to participate in the grants-in-aid program provided for in Minnesota Statutes, Section 18.023 and in this regulation by submitting annually at a time designated by the commissioner a completed application on a form provided by the commissioner.

(2) The application shall state that the municipality is eligible for a grant-in-

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aid and shall include the municipality's general plan for distribution of payments to private, residential property owners.

(b) Eligibility for grants-in-aid. To the extent appropriations are provided by the legislature, the commissioner may make grants-in-aid to municipalities for partial funding of municipal subsidy programs for the the removal of diseased shade trees by owners of private, residential property, provided the following criteria are met:

(1) A municipality shall be eligible to receive grants-in-aid for the removal of diseased shade trees if:

(aa) The municipality is within the metropolitan area and has a shade tree disease control program approved by the commissioner, or

(bb) The municipality is outside the metropolitan area, has an approved shade tree disease control program, and has made request and received the consent of the commissioner to come under the shade tree disease control program described in Minnesota Statutes, Section 18.023, and Regulations Agr 101 to 106.

(cc) The municipality has a subsidy program for tree removal complying with the requirements of Minnesota Statutes, Section 18.023 and these regulations.

(2) A grant-in-aid may be given to an eligible municipality for the removal of trees meeting the following criteria:

(aa) The tree shall have been removed on or after June 1, 1975,

(bb) The tree shall have been in a disease control area,

(cc) A determination shall have been made by the municipal tree inspector that the tree was a hazard to the disease control program,

(dd) The tree shall have been removed from private, residential property, and

(ee) The tree must have been removed and disposed of pursuant to Regulation Agr 106.

(c) Procedures for administration of grants-in-aid.

(1) The commissioner may make grants-in-aid to eligible municipalities based on the number of qualifying trees removed from private, residential property within the municipality. Said grants-in-aid may be less than, but shall not exceed the amount of subsidies paid to private, residential property owners by the municipality for the removal of eligible trees.

(2) In determining whether or in what amount a grant-in-aid shall be made to an eligible applicant municipality, the commissioner shall attempt to further the policy of Minnesota Statutes, Section 18.023 by considering all factors he deems to be relevant, including but not limited to the following:

(aa) The incidence of shade tree disease in the applicant's disease control area,

(bb) The number of shade trees within the disease control area immediately threatened by the disease,

(cc) The potential for and magnitude of economic and esthetic losses which may occur as a result of the spread of the disease, and

(dd) The extent of conformance of the municipality to its respective approved shade tree disease control program.

(3) An eligible municipality may make requests for a grant-in-aid payment on forms provided by the commissioner. Said requests may be submitted to the commissioner by the 15th day of any calendar month, and shall include eligible trees removed during the preceding calendar month or months for which no pay-

ment had been made by the commissioner. Requests for payment shall include the following information:

- (aa) A certified list of the private, residential property owners qualifying for the municipal subsidy for tree removal,
- (bb) The number of eligible trees removed from each specific parcel of private property,
- (cc) A certification that the trees removed meet all of the requirements of paragraph (b) (2) (aa) through (ee) of this regulation,
- (dd) A certification as to the total amount of subsidy payments the municipality either will pay out or has paid out to the private, residential property owners, and
- (ee) Such other information deemed relevant by the commissioner.

Agr 108 Grants-In-Aid for Wood Utilization or Disposal Systems.

(a) The commissioner may, within moneys appropriated, make grants-in-aid to eligible applicants for the cost of facilities, equipment, and systems for the disposal or utilization of diseased shade trees. Said grants-in-aid may be made to cities with more than 80,000 population, or any special purpose park district organized under the charter of a city of the first class, or any non-profit corporation serving a city of the first class, or any county, or any combination thereof so provided by Minnesota Statutes, Section 471.59; provided that:

- (1) Said city or county has an approved shade tree disease control program as described in Minnesota Statutes, Section 18.023, and Regulations Agr 101 to 106,
- (2) Grants-in-aid may be less than but shall not exceed 50 percent of the cost of such facility, equipment, or system,
- (3) Grants-in-aid shall not be paid for costs of operating such facility, equipment, or system,
- (4) Grants-in-aid for site acquisitions shall be made only for land used in the actual operational site,
- (5) Grants-in-aid shall not be paid by the commissioner until he receives certified evidence of the actual cost of the equipment or site.
- (6) Allowable cost shall be determined by the commissioner.

(b) Criteria for Administration of Grants-in-Aid.

(1) Grants-in-aid to eligible applicants may be made by the commissioner provided that such wood disposal utilization system meets the following criteria:

- (aa) It aids in the control of shade tree diseases,
- (bb) It aids in the recovery of material or energy from wood,
- (cc) It is located to accomplish the above with maximum efficiency and use of available facilities,
- (dd) It is available to all parties, public and private,
- (ee) It is able to render wood pest-risk free within 72 hours of delivery to the site,
- (ff) It includes adequate manpower to operate and service equipment, and
- (gg) It provides for proper handling and the timely removal of processed wood from the site.

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(2) In addition to the general criteria under (b) (1) above, the commissioner, as appropriate, may consider other specific criteria including, but not limited to the following in evaluating grant payment requests:

(aa) Sites for Wood Disposal Systems:

(i) Shall be selected on the basis of anticipated volumes of wood and/or the need for a wood disposal system,

(ii) Shall be accessible by roadways that permit year-round truck traffic,

(iii) Shall have adequate storage areas for both processed wood and equipment,

(iv) Shall have protective enclosures and adequate control and supervision to prevent entry of unwanted materials and unauthorized persons, and

(v) Shall be in compliance with all applicable Federal and State statutes, rules and regulations.

(vi) Shall be in conformance with regional solid waste management plans and requirements.

(bb) Equipment for Wood Disposal Systems:

(i) Shall, where feasible, be portable so that it can be used for servicing more than one site,

(ii) Shall be stationary only when the anticipated volume over a five-year period will fully utilize the facility.

(iii) Shall be capable of processing large-diameter logs, and

(iv) Shall include auxiliary units and equipment necessary to the operation of the system.

(3) Requests for grant-in-aid payments shall be made on forms provided by the commissioner. Contingent upon the availability of funds, the timeliness of applications and other administrative considerations, the commissioner may set deadlines for consideration of requests. Requests for payments shall include the following:

(aa) An itemized list of the applicant's proposed expenditures for qualifying equipment and/or site, and the total amount of these expenditures.

(bb) Additional documents or other information deemed relevant by the commissioner.

(4) Record keeping. Applicants receiving grants-in-aid under this regulation shall keep detailed records concerning the operation of the wood disposal and utilization system. Said records shall be made available to the commissioner on request and shall include hours of operation, clientele served, volume of wood handled and any other information deemed relevant by the commissioner.

(5) Annual report. Applicants receiving grants-in-aid under this regulation shall file, on or before December 1 of each year on forms provided by the commissioner an annual report concerning the operation of the wood disposal and utilization system. Said report shall contain information regarding hours of operation, clientele served, volume of wood handled and any other information deemed relevant by the commissioner.

Agr 109-120 Reserved for future use

Filed 6-14-74; 8-25-75.



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

612-296-3347

C 5

TO: ALL METROPOLITAN MUNICIPAL OFFICIALS

SUBJECT: APPROVED REMOVAL AND WOOD DISPOSAL PRACTICES

Revised April, 1976

The Shade Tree Disease Control rules and regulations of the Minnesota Department of Agriculture, Chapter 4, Agr 101-120 refer in Agr 106 to various prescribed methods and means for the disposal of elm and oak wood and root graft control.

It has been determined by the Commissioner of Agriculture that the methods or means as outlined below will constitute the approved practices. The letters and numbers in parenthesis refer to specific sentences or paragraphs in the rules and regulations.

Agr 106 (d), (2), (iii) - Elm wood removal and disposal.

1. Elm trees, public and private, diagnosed positive for Dutch elm disease by either field or laboratory methods should be promptly marked and removed within twenty (20) days after notification. This twenty (20) day period applies equally to elm trees marked for removal on public property.
2. Elm trees on public and private property that are dead, dying or weakened, with bark intact, pose a threat to healthy elms by providing breeding places for elm bark beetles. Such trees should be marked and removed within twenty (20) days after notification. This twenty (20) day period applies equally to elm trees marked for removal on public property.
3. If there are healthy elms within fifty (50) feet or less of an elm diagnosed positive for Dutch elm disease, a Vapam treatment to prevent disease spread through root grafts should be applied as soon as possible. It is advisable to apply Vapam treatment to suspect trees that show typical Dutch elm disease symptoms without waiting for laboratory confirmation. Trenching is also an acceptable method for root graft control.



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

EQUAL OPPORTUNITY EMPLOYER

4. Tree stumps should be removed or debarked to the ground line to eliminate elm bark beetle breeding sites.
5. Elm wood (logs, branches, brush, etc.) must be removed to disposal sites promptly for processing to render the wood pest-risk free. Acceptable methods include debarking, chipping, burying, or burning consistent with applicable air quality or solid waste regulations. Such processing must be completed within 72 hours of delivery to the disposal site. Processing should be done preferably within 24 hours.
6. Completely debarked elm logs or lumber are safe for local use or shipment.
7. Diseased elm wood chipped or shredded constitutes no hazard to the spread of Dutch elm disease.
8. Buried elm wood should be covered with at least six (6) inches of compacted soil at the disposal site.
9. Stockpiling of elm logs with bark intact is not permitted for longer than 72 hours during the period April 15 through September 15.

Agr 106 (d), (2), (bb) - Dutch elm disease root graft control.

1. Refer to mechanical or chemical means given in Agricultural Extension Service, University of Minnesota Extension Folder 211 - Revised 1974, "The Dutch Elm Disease", pp. 8-12.

Agr 106 (d), (3), (aa) - Oak wilt root graft control.

1. Since oak wilt spread is primarily by root grafts, it is important to properly disrupt root grafts between diseased and healthy trees. Refer to mechanical or chemical means given in Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".

Agr 106 (d), (3), (bb), (iii) - Oak wood removal and disposal.

The main purpose of requiring special handling of diseased oaks is to prevent spore formation under the bark. These spores can be carried overland by insects and other vectors to wounds on healthy trees.

1. Since the oak wilt fungus seldom produces spores on bur oak and rarely if ever on white oak, these species may be used for firewood or other purposes at anytime.
2. Red oaks (includes northern red oak, northern pin oak, black oak, and scarlet oak) that have been dead for over one year can be utilized for firewood without danger of spreading spores of the oak wilt fungus.

3. The appropriate handling of red oaks (includes northern red oak, northern pin oak, black oak and scarlet oak) will depend on when the diseased tree is detected and treatment undertaken. Trees wilting and treated during June should choose one of the "alternative treatments" for the period July 1 - September 1.

PERIOD OF TREATMENT

ALTERNATIVE TREATMENTS (use one)

July 1 - September 1

- a) removal and disposal of the tree by burning, burying, chipping, or debarking
- b) the tree may be deeply girdled around its base and left standing in place for at least one year (Note: Girdling may seriously weaken a tree and should not be performed where a hazard to life and property would result from the tree falling down.)
- c) splitting the wood into firewood (See "Oak Firewood" below)

September 1 - September 15

- a) removal and disposal of the tree by burning, burying, chipping, or debarking
- b) splitting the wood into firewood (See "Oak Firewood" below)

September 15 - July 1 (following year)

- a) removal and disposal of the tree by burning, burying, chipping, or debarking
- b) the logs or firewood may be kept if it is wrapped in 4 mil plastic during the period April 15 to July 1 (This is necessary only within one year of when the tree wilted.)

"Oak Firewood" means oak wood with bark intact which has been cut into lengths not to exceed 24 inches and having been at least cut or split into quarter sections. Oak wood greater than 16 inches in diameter should be split further into smaller sections.

RULES AND REGULATIONS OF THE DEPARTMENT OF AGRICULTURE
PART A, CHAPTER 4, REGULATIONS AGR 101 - 108

Agr 101 Purpose: It is the purpose of the rules and regulations contained herein to carry out and enforce the provisions of Minnesota Statutes 1974, Section 18.023, as amended by Laws 1975, Chapter 253. The rules relate to the control of Dutch elm disease and oak wilt by local units of government and include procedures and criteria for two grants-in-aid programs.

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(b) "Shade tree disease" means Dutch elm disease caused by Ceratocystis ulmi, or oak wilt disease caused by Ceratocystis fagacearum.

(c) "Commissioner" means the commissioner of agriculture. (Minn. Stat. Sec. 18.023, Subd. 1)

(d) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver. (Minn. Stat. Sec. 18.023, Subd. 1)

(e) "Municipality" means any city or any town exercising municipal powers pursuant to Minnesota Statutes, Section 368.01, or any general or special law, located in the metropolitan area, or any special park district as organized under Minnesota Statutes, Chapter 398, or any special purpose park district organized under the city charter of a city of the first class located in the metropolitan area, or any county in the metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers and any municipality or county located outside the metropolitan area which makes request to and has consent of the commissioner to come within the provisions of this section. (Minn. Stat. Sec. 18.023, Subd. 1)

(f) "Tree inspector" means a person who has the necessary qualifications to properly plan, direct and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the limits of all tree disease in one or more governmental subdivisions within the limits of all commissioner.

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(h) "Disease control program" means the municipal plan as approved by the commissioner to control shade tree disease. (Minn. Stat. Sec. 18.023, Subd. 1)

(i) "Subsidy Program" means a municipal program of financial assistance to private, residential property owners for the removal of diseased elm and/or oak shade trees.

(j) "Wood utilization or disposal system" means a system used for the removal and disposal of diseased shade trees which includes the collection, transportation, processing or storage of wood and which aids in the recovery of materials or energy from wood. (Minn. Stat. Sec. 18.023, Subd. 1)

(k) "Equipment" means machinery or devices which singly or in combination are designed, constructed and operated for the purposes of wood utilization and/or disposal and shall include all machinery, tools and devices ancillary to the use of such machinery or devices.

(l) "Facility" means land, buildings, and other appurtenances which are necessary or useful in the operation of wood utilization or disposal equipment.

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(a) A municipality will employ or retain on a continuing basis a tree inspector or will employ or retain jointly with one or more municipalities a tree inspector as provided by Minnesota Statutes, Section 471.59.

(b) Provisional appointments

(1) A municipality may provisionally appoint a tree inspector for a period of not more than six (6) months.

(2) This appointment is dependent on approval by the commissioner after determining the competence of the appointee.

(3) The provisional appointment cannot be extended and the appointee must either pass the tree inspector examination or successfully complete the next training course approved by the commissioner to be certified as a tree inspector.

(4) The provisional appointment may be withdrawn for cause by the commissioner upon notice and hearing.

(c) A tree inspector must be able to demonstrate the following qualifications:

(1) Identify all native tree species common to his work area, with or without leaves, and all felled or down trees with bark intact.

(2) Distinguish oak wilt and Dutch elm disease from all other tree problems of oak and elm.

(3) Know the proper method of collecting samples for disease diagnosis.

(4) Know and understand the biology of oak wilt and Dutch elm disease.

(5) Know the appropriate Minnesota laws and rules and regulations relative to oak wilt and Dutch elm disease.

(6) Know the approved control methods for oak wilt and Dutch elm disease.

(d) If a municipality fails to appoint a tree inspector an appointment may be made by the commissioner pursuant to Minnesota Statutes 1974, Section 18.023. Ten working days prior to such appointment, the commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the commissioner shall be paid by the municipality for a minimum of 90 days even though the municipality may appoint their own inspector prior to the expiration of 90 days. This provision shall not apply to an inspector whose employment is suspended or terminated for cause.

Agr 104 Certification of Tree Inspector:

(a) Certification of tree inspectors shall be accomplished by their passing an examination prescribed by the commissioner for the purposes of determining that the applicant possesses the necessary qualifications. Each applicant shall be notified by the commissioner by mail of the time and date of such examination. The applicant and the employing municipality will be notified of the results of the examination within 15 days.

(b) After certification, a tree inspector shall be required to attend annually at least one program of continuing education as approved by the commissioner. Failure to attend such programs as required may be grounds for revocation, termination, or suspension of certification.

Agr 105 Decertification of Tree Inspectors: The commissioner may upon notice and hearing decertify any tree inspector for cause as provided in the law.

Agr 106 Shade Tree Disease Control Program: The tree disease control program of all municipalities affected by these regulations shall include as a minimum the following elements:

(a) Control area. Each municipality shall designate and submit for approval by the commissioner a disease control area.

(b) Program plan. Each municipality shall prepare a tree disease control program plan that details the manner in which these regulations will be fulfilled.

(c) Methods of identifying diseased shade trees. Diseased shade trees will be identified by generally accepted field symptoms such as wilting, or yellowing of leaves, or staining of wood under bark. Confirmation when determined to be necessary, will be made by the Minnesota Department of Agriculture tree disease laboratory, or other laboratory recognized by the commissioner.

(d) Dutch elm disease and oak wilt control:

(1) Tree inventory. Each municipality shall make and record a reasonable estimate of elms, oaks, and other tree species on both public and

private property within the municipality. Estimates of tree numbers may be made by acceptable forest inventory procedures. Control areas shall be designated with estimates of tree numbers within control areas recorded separately from estimates of tree numbers outside of control areas. These records shall be permanent and shall be reported to the Department of Agriculture.

(2) Dutch elm disease control shall include the following:

(aa) Sanitation. Sanitation is the major element in any Dutch elm disease control program and is essential for the elimination of elm bark beetles, diseased trees, and dead or weakened elm wood arising from any cause. This must include trees on private property.

(i) Prior to April 15, each municipality shall annually inspect all public and private properties for elm wood or logs that could serve as bark beetle breeding sites and require removal, or debarking if wood is to be retained. Before making any inspections on private property within a municipality, it shall be the duty of the municipality to attempt to give notice of said inspection to all affected residents either through individual, oral or written notice or by publishing said notice in a local newspaper.

(ii) Each municipality shall inspect all elm trees within a control area at least twice during the growing season (by July 1 and August 15) for Dutch elm disease symptoms.

(iii) After notification by the municipality, private property owners shall remove and properly dispose of diseased or dead elm trees or any above ground parts thereof within 20 days in accordance with prescribed methods approved by the commissioner and consistent with applicable air quality and solid waste regulations.

(iv) Trees or parts thereof not removed within 20 days of such notification shall be removed by the municipality and the costs thereof shall be assessed against the property.

(bb) Root Graft Control. A municipality shall disrupt common root systems by chemical or mechanical means as approved by the commissioner to prevent root graft spread of Dutch elm disease.

(3) Oak wilt. Oak wilt control involves both root graft treatment and prevention of infection by oak wilt spores carried by insects or other agents (overland spread).

(aa) A municipality shall use chemical or mechanical means to disrupt root graft transmission of the oak wilt fungus as approved by the commissioner.

(bb) To control overland spread of the disease, a municipality shall do the following:

(i) Avoid pruning or other mechanical damage during the most susceptible period in May and June. Use tree wound dressings if wounding is unavoidable during susceptible period.

(ii) Girdle diseased trees as soon as they are detected to reduce spore mat formation. Chemical or mechanical root disruption shall precede girdling if root graft spread is likely to occur.

(iii) Eradicate or destroy the following diseased oaks: northern red oak, Quercus rubra; northern pin oak, Quercus ellipsoidalis; black oak, Quercus velutina; and scarlet oak, Quercus coccinea; in accordance with prescribed methods approved by the commissioner and consistent with applicable air quality and solid waste regulations.

(e) Records. Shade tree disease program records shall be kept by each municipality and be available for examination at any time by the commissioner. A yearly report of the summation of these records shall be made to the commissioner by December 1 and this report shall include the following:

(1) Monies expended on personnel, equipment, and contracts, listed separately.

(2) Man hours spent on tree inventory, sanitation, and any chemical control measures.

(3) An initial inventory of trees.

(4) Number of samples submitted for diagnosis and the results.

(5) Number of diseased trees identified.

(6) Number of removal notices issued for the diseased trees located on private property.

(7) Number of trees removed, both diseased and others.

(8) Number of notices issued for removal of wood which may be a hazard in the spread of a shade tree disease.

(f) Program Review.

(1) By January 1 of each year, municipalities shall submit their shade tree disease control program plan to the commissioner for review to determine if it meets the requirements of the law and any applicable rules and regulations.

(2) The commissioner shall complete this review and notify the municipalities of his determination within 15 days.

(3) Final determination of municipal program compliance with these rules and regulations shall rest with the commissioner.

(4) The commissioner may require changes or improvements anytime he determines such changes or improvements are needed to any municipal program to comply with these rules and regulations.

Agr 107 Grants-in-aid to Municipalities for Removal of Diseased Shade Trees;

(a) Application for grants-in-aid.

(1) A municipality may apply to participate in the grants-in-aid program provided for in Minnesota Statutes, Section 18.023 and in this regulation

by submitting annually at a time designated by the commissioner a completed application on a form provided by the commissioner.

(2) The application shall state that the municipality is eligible for a grant-in-aid and shall include the municipality's general plan for distribution of payments to private, residential property owners.

(b) Eligibility for grants-in-aid. To the extent appropriations are provided by the legislature, the commissioner may make grants-in-aid to municipalities for partial funding of municipal subsidy programs for the removal of diseased shade trees by owners of private, residential property, provided the following criteria are met:

(1) A municipality shall be eligible to receive grants-in-aid for the removal of diseased shade trees if:

(aa) The municipality is within the metropolitan area and has a shade tree disease control program approved by the commissioner, or

(bb) The municipality is outside the metropolitan area, has an approved shade tree disease control program, and has made request and received the consent of the commissioner to come under the shade tree disease control program described in Minnesota Statutes, Section 18.023, and Regulations Agr 101 to 106.

(cc) The municipality has a subsidy program for tree removal complying with the requirements of Minnesota Statutes, Section 18.023 and these regulations.

(2) A grant-in-aid may be given to an eligible municipality for the removal of trees meeting the following criteria:

(aa) The tree shall have been removed on or after June 1, 1975,

(bb) The tree shall have been in a disease control area,

(cc) A determination shall have been made by the municipal tree inspector that the tree was a hazard to the disease control program,

(dd) The tree shall have been removed from private, residential property, and

(ec) The tree must have been removed and disposed of pursuant to Regulation Agr 106.

(c) Procedures for administration of grants-in-aid

(1) The commissioner may make grants-in-aid to eligible municipalities based on the number of qualifying trees removed from private, residential property within the municipality. Said grants-in-aid may be less than, but shall not exceed the amount of subsidies paid to private, residential property owners by the municipality for the removal of eligible trees.

(2) In determining whether or in what amount a grant-in-aid shall be made to an eligible applicant municipality, the commissioner shall attempt to further the policy of Minnesota Statutes, Section 18.023 by considering all factors he deems to be relevant, including but not limited to the following:

(aa) The incidence of shade tree disease in the applicant's disease control area,

(bb) The number of shade trees within the disease control area immediately threatened by the disease,

(cc) The potential for and magnitude of economic and aesthetic losses which may occur as a result of the spread of the disease, and

(dd) The extent of conformance of the municipality to its respective approved shade tree disease control program.

(3) An eligible municipality may make requests for a grant-in-aid payment on forms provided by the commissioner. Said requests may be submitted to the commissioner by the 15th day of any calendar month, and shall include eligible trees removed during the preceding calendar month or months for which no payment had been made by the commissioner. Requests for payment shall include the following information:

(aa) A certified list of the private, residential property owners qualifying for the municipal subsidy for tree removal,

(bb) The number of eligible trees removed from each specific parcel of private property,

(cc) A certification that the trees removed meet all of the requirements of paragraph (b) (2) (aa) through (ee) of this regulation,

(dd) A certification as to the total amount of subsidy payments the municipality either will pay out or has paid out to the private residential property owners, and

(ee) Such other information deemed relevant by the commissioner.

Agr 108 Grants-In-Aid for Wood Utilization or Disposal Systems

(a) The commissioner may, within monies appropriated, make grants-in-aid to eligible applicants for the cost of facilities, equipment, and systems for the disposal or utilization of diseased shade trees. Said grants-in-aid may be made to cities with more than 80,000 population, or any special purpose park district organized under the charter of a city of the first class, or any non-profit corporation serving a city of the first class, or any county, or any combination thereof so provided by Minnesota Statutes, Section 471.59; provided that:

(1) Said city or county has an approved shade tree disease control program as described in Minnesota Statutes, Section 18.023, and Regulations Agr 101 to 106,

(2) Grants-in-aid may be less than but shall not exceed 50 percent of the cost of such facility, equipment, or system,

(3) Grants-in-aid shall not be paid for costs of operating such facility, equipment, or system,

(4) Grants-in-aid for site acquisitions shall be made only for land used in the actual operational site,

(5) Grants-in-aid shall not be paid by the commissioner until he receives certified evidence of the actual cost of the equipment or site.

(6) Allowable cost shall be determined by the commissioner.

(b) Criteria for Administration of Grants-In-Aid.

(1) Grants-in-aid to eligible applicants may be made by the commissioner provided that such wood disposal utilization system meets the following criteria:

(aa) It aids in the control of shade tree diseases,
(bb) It aids in the recovery of material or energy from wood,
(cc) It is located to accomplish the above with maximum efficiency
and use of available facilities,

(dd) It is available to all parties, public and private,

(ee) It is able to render wood pest-risk free within 72 hours
of delivery to the site,

(ff) It includes adequate manpower to operate and service equip-
ment, and

(gg) It provides for proper handling and the timely removal of
processed wood from the site.

(2) In addition to the general criteria under (b) (1) above, the
commissioner, as appropriate, may consider other specific criteria including,
but not limited to the following in evaluating grant payment requests:

(aa) Sites for Wood Disposal Systems:

(i) Shall be selected on the basis of anticipated volumes
of wood and/or the need for a wood disposal system,

(ii) Shall be accessible by roadways that permit year-
round truck traffic,

(iii) Shall have adequate storage areas for both processed
wood and equipment,

(iv) Shall have protective enclosures and adequate control
and supervision to prevent entry of unwanted materials and unauthorized persons,
and

(v) Shall be in compliance with all applicable Federal
and State statutes, rules and regulations.

(vi) Shall be in conformance with regional solid waste
management plans and requirements.

(bb) Equipment for Wood Disposal Systems:

(i) Shall, where feasible, be portable so that it can be used for servicing more than one site,

(ii) Shall be stationary only when the anticipated volume over a five-year period will fully utilize the facility,

(iii) Shall be capable of processing large-diameter logs, and

(iv) Shall include auxiliary units and equipment necessary to the operation of the system.

(3) Requests for grant-in-aid payments shall be made on forms provided by the commissioner. Contingent upon the availability of funds, the timeliness of applications and other administrative considerations, the commissioner may set deadlines for consideration of requests. Requests for payments shall include the following:

(aa) An itemized list of the applicant's proposed expenditures for qualifying equipment and/or site, and the total amount of these expenditures.

(bb) Additional documents or other information deemed relevant by the commissioner.

(4) Record keeping. Applicants receiving grants-in-aid under this regulation shall keep detailed records concerning the operation of the wood disposal and utilization system. Said records shall be made available to the commissioner on request and shall include hours of operation, clientele served, volume of wood handled and any other information deemed relevant by the commissioner.

(5) Annual report. Applicants receiving grants-in-aid under this regulation shall file, on or before December 1 of each year on forms provided by the commissioner an annual report concerning the operation of the wood disposal and utilization system. Said report shall contain information regarding hours of operation, clientele served, volume of wood handled and any other information deemed relevant by the commissioner.

Agr 109-120 Reserved for future use.

MINNESOTA DEPARTMENT OF AGRICULTURE
DIVISION OF PLANT INDUSTRY
670 STATE OFFICE BUILDING
ST. PAUL, MINNESOTA 55155

Revised March, 1976

CHAPTER 18

PLANT AND ANIMAL PEST CONTROL

Sec.

- 18.011 Definition
- 18.012 Agriculture; Local Pest Control; Approval of Programs; Policy
- 18.021 Definitions
- 18.022 Insect pests, plant diseases, bee diseases, and destructive or nuisance animals
- 18.023 Shade tree disease control

18.011 DEFINITION. Subdivision 1. Except where the context otherwise indicates, for the purposes of this chapter, the terms defined in this section have the meanings given them.

Subd. 2. "Commissioner" means the commissioner of the department of agriculture.

18.012 AGRICULTURE; LOCAL PEST CONTROL; APPROVAL OF PROGRAMS; POLICY. The purpose of this local pest control act is to authorize subdivisions of state government to establish and fund their own programs to control pests that may be detrimental to the health and welfare of man or animals and to the environment. To assure that these local programs are conducted in a proper manner, these programs must be formulated and conducted in accordance with the directions and recommendations prescribed by the commissioner.

LOCAL PEST CONTROL

18.021 DEFINITIONS. Subdivision 1. Terms. Unless the language or context clearly indicates that a different meaning is intended, the following terms shall, for the purposes of section 18.022, be given the meanings subjoined to them.

Subd. 2. Insect pest. "Insect pest" includes grasshoppers, cutworms, army worms, European corn borers, Japanese beetles, European elm bark beetles, native elm bark beetles, forest tent caterpillars, bee diseases, and any other insects which the commissioner may designate as dangerous to crops or the welfare of the people.

Subd. 3. Destructive or nuisance animals. "Destructive or nuisance animals" includes such animals as rats, gophers, mice, and other unprotected wild animals as defined in Minnesota Statutes 1961, Section 100.26, and acts amendatory thereof, which the commissioner may designate as dangerous to the welfare of the people.

Subd. 4. Diseases. The term "Diseases" refers to such dangerous plant diseases and bee diseases as the commissioner may designate as dangerous to agriculture, horticulture, and forestry.

18.022 INSECT PESTS, PLANT DISEASES, BEE DISEASES, AND DESTRUCTIVE OR NUISANCE ANIMALS. Subdivision 1. Control. When recommended so to do by the commissioner of agriculture, the governing body of any county, city, or town of this state is hereby authorized and empowered to appropriate money for the control of insect pests, plant diseases, bee diseases, or destructive or nuisance animals. Such money shall be expended according to technical and expert opinions and plans as shall be designated by the commissioner and the work shall be carried on under the direction of the commissioner.

Subd. 2. Cost. (a) In order to defray the cost of such activities, the governing body of any such political subdivision may levy a special tax which, except when levied by a county, shall not exceed two thirds mill in any year in excess of charter or statutory millage limitations, but not in any event more than 50 cents per capita, and any such political subdivision may make such a levy, where necessary, separate from the general levy and at any time of the year. (b) If, because of the prevalence of Dutch elm disease, the governing body of such a political subdivision is unable to defray the cost of control activities authorized by this section within the limits set by this subdivision, the limits set by this subdivision are increased to 1 1/3 mills, but not in any event more than one dollar per capita.

Subd. 3. Certificates of indebtedness. To provide funds for such activities in advance of collection of the tax levies under subdivision 2, the governing body, may, at any time after the tax has been levied and certified to the county auditor for collection, issue certificates of indebtedness in anticipation of the collection and payment of such tax. The total amount of such certificates, including principal and interest, shall not exceed 90 percent of the amount of such levy and shall be payable from the proceeds of such levy and not later than two years from the date of issuance. They shall be issued on such terms and conditions as the governing body may determine and shall be sold as provided in Minnesota Statutes, Section 475.60. If the governing body determines that an emergency exists, it may make appropriations from the proceeds of such certificates for authorized purposes without complying with statutory or charter provisions requiring that expenditures be based on a prior budget authorization or other budgeting requirement.

Subd. 4. Deposit of proceeds in separate fund. The proceeds of any tax levied under subdivision 2 or of any issue of certificates of indebtedness under subdivision 3 shall be deposited in the municipal treasury in a separate fund and expended only for purposes authorized by this section. If no disbursement is made from the fund for a period of five years, any monies remaining therein may be transferred to the general fund.

Subd. 5. Penalty. Any person who shall prevent, obstruct, or in any manner interfere with the county authorities or their agents in carrying out the provisions of subdivisions 1 to 4, or neglects to comply with the rules and regulations of the county commissioners promulgated under authority thereof, shall be guilty of a misdemeanor.

Subd. 6. Regulations, scope. The council of any city by ordinance and the board of county commissioners of any county and the town board of any town by resolution may adopt and enforce regulations to control and prevent the spread of plant pests and diseases. Such regulations may authorize appropriate officers and employees to enter and inspect any public or private place which might harbor plant pests, as defined in section 18.46, subdivision 13, may provide for the summary removal of diseased trees from public or private places where deemed necessary to prevent the spread of the disease, may require the owner to destroy or treat plant pests, diseased plants, or other disease bearing material and in

default thereof to provide for such work at the expense of the owner, which expense shall be a lien upon the property and may be collected as a special assessment as provided by section 429.101 or by charter. In this subdivision, the term private place means every place except a private home.

Subd. 7. Failure of political subdivision to act; commissioner's duties. If the governing body of a political subdivision does not appropriate money for the control of Dutch elm disease pursuant to subdivision 1, or does not adopt and enforce regulations to control and prevent the spread of Dutch elm disease pursuant to subdivision 6, and if the commissioner determines that economic, recreational, or aesthetic losses will result, the commissioner shall proceed as provided in section 18.48, subdivisions 1 and 4, to control the spread of Dutch elm disease. However, the expense of these control activities performed on land owned by a county, city, or town is a charge upon the county, city, or town owning the land and shall be paid by the governing body from money which it shall appropriate pursuant to subdivision 1 and, if necessary, for which it shall levy taxes pursuant to subdivision 2. The purpose of this subdivision and of the increased maximum tax levies authorized by subdivision 2, clause (b), is to protect elm trees from Dutch elm disease and thus prevent the economic, recreational, and aesthetic losses which occur when elm trees are killed by Dutch elm disease.

Subd. 8. Rules and Regulations. The commissioner may make reasonable rules and regulations after a public hearing, in a manner provided by law, to properly carry out the purposes of section 1 of this act [Minnesota Statutes, Section 18.012] and Minnesota Statutes, Section 18.022.

Subd. 9. Rules and Regulations. The commissioner may adopt rules and regulations in accordance with sections 15.0411 to 15.0422 prescribing control measures to be used to prevent the spread of shade tree diseases and shall include the following: (a) a definition of shade tree, (b) qualifications for inspectors, (c) methods of identifying diseased shade trees, (d) procedures for giving reasonable notice of inspection of private real property, (e) measures for treatment and removal of any shade tree which may contribute to the spread of shade tree disease, and (f) such other matters as shall be determined to be necessary by the commissioner to prevent the spread of shade tree disease and enforce the provisions of this section. The rules and regulations of the commissioner shall apply in a county, city or town unless the county, city or town adopts an ordinance or resolution pursuant to subdivision 6 which is determined by the commissioner to be more stringent than the rules and regulations of the commissioner. The rules and regulations of the commissioner or the more stringent ordinance or resolution of the city, county or town shall apply to all state agencies and special purpose districts which own or control land within any county, city or town exercising the powers granted in section 18.022.

STATE OF MINNESOTA
DEPARTMENT OF AGRICULTURE

IN THE MATTER OF THE EMERGENCY)
RULES FOR SHADE TREE DISEASE)
CONTROL GRANTS TO MUNICIPALITIES)
FOR REFORESTATION AND SANITATION)

ORDER ADOPTING
EMERGENCY RULES

Minnesota Laws, 1977, Chapter 90, Section 12 requires that the Commissioner of the Department of agriculture "adopt emergency rules pursuant to section 15.0412, subdivision 5, concerning grants to municipalities for reforestation and sanitation which shall be effective until either September 1, 1977, or the effective date of the amended permanent rules to be promulgated pursuant to section 3 of this act, whichever occurs first".

Having confirmed the need for the above captioned emergency rules and the reasonableness thereof and having considered the available evidence,

NOW, THEREFORE, IT IS ORDERED that the emergency rules for shade tree disease control grants to municipalities for reforestation and sanitation are adopted this 30th day of June, 1977, pursuant to authority vested in me by Minnesota Statutes 1976, Sec. 15.0412 and Minnesota Laws 1977, Chapter 90, Section 12.

STATE OF MINNESOTA



Darryl L. Anderson
Acting Commissioner of Agriculture

EMERGENCY RULES OF THE DEPARTMENT OF AGRICULTURE
 TO IMPLEMENT LAWS OF MINNESOTA 1977, CHAPTER 90
 SHADE TREE DISEASE CONTROL PROGRAM

Emergency Rule 1. Definitions.

- A. As used in these emergency rules, the definitions in Minn. Laws 1977, ch. 90 shall apply, including the following words and terms:
1. "Municipality" means any home rule charter or statutory city or any town exercising municipal powers pursuant to Minn. Stat. § 368.01, or any general or special law, located in the metropolitan area; or any special park district as organized under Minn. Stat. ch. 398; or any special purpose park and recreation board organized under the city charter of a city of the first class located in the metropolitan area; or any county in the metropolitan area for the purposes of county owned property or any portion of a county located outside the geographic boundaries of a city or town exercising municipal powers; and any municipality or county located outside the metropolitan area with an approved disease control program.
 2. "Approved disease control program" means the municipal plan as approved by the commissioner to control shade tree disease.
 3. "Sanitation" means the identification, inspection, disruption of a common root system, girdling, trimming, removal and disposal of dead or diseased wood of elm or oak shade trees, including subsidies for trees removed pursuant to Minn. Stat. § 18.023, subd. 4, on public or private property within a disease control area.
 4. "Reforestation" means the replacement of shade trees removed from public property as part of an approved disease control program. For purposes of this clause, "public property" shall include private property within five feet of the boulevard or street terrace in any city which has enacted an ordinance on or before January 1, 1977, that prohibits or requires a permit for the planting of trees in the public right of way.
 5. "Population" means the population of a municipality as published in the U. S. Bureau of Census, 1970 Census.
 6. "Planned expenditure" means the amount budgeted by a municipality for either sanitation or reforestation in the grant period.

Emergency Rule 2. Grants-in-Aid to Municipalities for Sanitation and Reforestation Program

- A. The commissioner may, in the name of the state and within the limit of appropriations provided, make grants-in-aid to a municipality with an approved disease control program for the partial funding of municipal sanitation and reforestation programs.
1. Sanitation Grants. Grants to any municipalities for sanitation shall not exceed 45 percent of the total costs for sanitation approved by the commissioner. The total cost may include any amounts paid for sanitation by special assessments, ad valorem taxes, federal grants, or other funds. A municipality may assess not more than 50 percent of the expense of treating with an approved method or removing diseased shade trees located on street terraces or boulevards to the abutting properties.
 - 18 2. Reforestation Grants. Grants to any municipality for reforestation shall not exceed either 50 percent of the cost to the municipality for reforestation, or 40 dollars multiplied by the number of trees planted on public lands pursuant to the reforestation program, whichever is less.

- a. Reforestation grants to a municipality shall be limited in any calendar year to grants for not more than the number of trees removed from public lands in the sanitation program in the previous calendar year, except during the first year of an approved disease control program. During the first year of an approved disease control program, there shall be no restriction upon the number of trees for which grants may be made.
 - b. Reforestation grants to any county with an approved disease control program may include up to 90 percent of the cost of planting the first 50 trees on public lands in a town not defined as a municipality and of less than 1,000 population, upon the town's application to the county and the county's designation of that town as a disease control area.
 - c. Reforestation grants to towns which are defined as municipalities and are less than 1,000 in population with an approved disease control program may include up to 90 percent of the cost of planting the first 50 trees on public lands.
3. Program Eligibility. Any municipality is eligible to receive sanitation and reforestation grants upon completing and submitting to the commissioner by July 1, 1977 a program application form provided by the commissioner, and upon receiving notice of an approved disease control program designation. Applications may be accepted and considered after July 1, 1977 if the municipality can show good cause for not having submitted the application before July 1, 1977.
- a. The program application shall serve as the basis for approving the municipality's shade tree disease control program.
 - b. Approval shall be granted only upon the municipality's agreement to conduct its sanitation program in conformance with Minnesota Rules Agr 101 through Agr 106, and recommended disease control practices issued by the commissioner.
 - c. Approval shall only be granted upon the municipality's agreement to conduct its reforestation program in conformance with the recommended practices issued by the Minnesota Agricultural Extension Service.
 - d. Program approval may be revoked upon a determination by the commissioner that the municipality has failed to conduct its sanitation and reforestation program in conformance with the standards set forth above.
 - e. Sanitation and reforestation grants may be terminated upon the municipality's failure to maintain an approved shade tree disease control program.
4. Program Application. To receive a sanitation and reforestation grant, a municipality shall complete and submit to the commissioner by July 1, 1977 a program application form provided by the commissioner. If a municipality has not received a program application form prior to that date, it shall, nonetheless, be eligible for such grants.
- a. A municipality's program application shall include, but not be limited to, the following information:
 - (1) An inventory of shade trees within the municipality's disease control area, and an estimate as to the distribution of these shade trees between public and private lands;
 - (2) A complete description of the municipality's sanitation and reforestation programs which includes, but is not limited to:
 - (a) The method and schedule of diseased trees surveys;
 - (b) The extent of disease control tree trimming activities;
 - (c) The policies for removal of trees on public lands;
 - (d) The policies for removal of trees on private lands;
 - (e) The method and location of disposal of tree wastes;
 - (f) The policies for planting new shade trees, including:

- 1) The source of nursery stock;
- 2) Species planted;
- 3) Type of stock planted;
- 4) Distribution of species;
- 5) Other relevant information;

(g) The methods of financing sanitation and reforestation programs, including:

- 1) The use of funds derived from general tax levies;
- 2) Special assessments;
- 3) Federal funds;
- 4) Other sources of funding; and,

(3) A statement of planned expenditures for the sanitation and reforestation program for the calendar year.

- b. Grants for sanitation shall be 45 percent of the applicant's planned expenditures for sanitation, unless the total of planned expenditures for all applicants exceed 45 percent of the funds designated for sanitation grants; in which case, grants shall be a pro rata allocation among the eligible applicants.
- c. Grants for reforestation shall be 50 percent of the applicant's planned expenditures for reforestation, unless the total of planned expenditures for all applicants exceeds 50 percent of the funds designated for reforestation grants; in which case, grants shall be a pro rata allocation among the eligible applicants.
- d. Grants for reforestation to municipalities with populations of less than 1,000, and to towns with populations of less than 1,000 which have been designated as control areas by a county with an approved program shall be 90 percent of the applicant's planned expenditures for planting the first 50 trees on public lands, and 50 percent of the applicant's planned expenditures for planting trees on public lands in excess of the first 50 trees.

5. Request for Payment. A municipality receiving a sanitation and reforestation grant shall make request for payment upon forms provided by the commissioner.

- a. Payment periods shall be January 1 through March 31; April 1 through June 30; July 1 through September 30; and, October 1 through December 31 of each calendar year.
- b. Requests for payment shall be due fifteen days after the close of the preceding payment period.
- c. Request for payment may be for actual costs incurred during the payment period for which documentation can be produced upon request of the commissioner. Requests may also be made for advance payments for planned expenditures for the succeeding payment period.
- d. Requests for payment shall include:
 - (1) The population of the municipality making the request for payment;
 - (2) A statement of actual sanitation and reforestation costs for the payment period;
 - (3) If advance payments for planned expenditure is sought by the municipality, a statement of planned expenditure for the succeeding payment period;
 - (4) The signature of an authorized agent of the municipality making the request for payment; and,
 - (5) Notorization of the agent's signature.
- e. Grant payments for actual sanitation and reforestation costs incurred shall be a percentage of the actual costs stated in the municipality's request for payment; that percentage being the same percentage used to make the initial grant award.
 - (1) Advance grant payments for planned sanitation and reforestation expenditures shall be a percentage of the planned expenditures for the succeeding payment period stated in the municipality's request

for payment; that percentage being the same percentage used to make the initial grant award.

- (a) In the event that planned expenditures exceed or are less than actual costs incurred by the municipality for a payment period for which advance payment is made, the appropriate adjustments shall be made in the next request for payment submitted by the municipality.
- (b) In the event that over payment is made to the municipality by the commissioner because of an advance payment for the last payment period of the calendar year, the municipality shall be liable to the state for the amount of over payment, and shall make payment of this amount to the state within 30 days after notice of such over payment.

6. Eligible Costs. Grants shall be based upon the total eligible costs of the municipality's sanitation and reforestation program.

a. Sanitation activities on public and private lands which are eligible for grants shall include:

- (1) Disease tree identification and inspection;
- (2) Disruption of common root systems;
- (3) Trimming of elm and oak trees for purposes of disease control;
- (4) Girdling of oak trees where appropriate for purposes of disease control;
- (5) Removal and disposal of dead or diseased wood of elm and oak trees; and,
- (6) Subsidies for trees removed from private property pursuant to Minn. Laws 1977, ch. 90, § 5.

b. Reforestation activities on public lands which are eligible for grants shall include:

- (1) Acquisition of nursery stock; and,
- (2) Tree planting.

c. Grants shall be made only for costs incurred in the actual and direct physical performance of sanitation and reforestation activities.

d. Grants shall be made for costs to be paid by:

- (1) Ad valorem taxes;
- (2) Special assessments; however, no assessment shall exceed the total of the sanitation cost less the amount of grant for such cost;
- (3) A charge through direct invoice to a property owner pursuant to a municipal program whereby the sanitation activity is carried out by municipal employees or a contractor acting in behalf of the municipality; however, no charge against a property owner shall exceed the total sanitation cost less the amount of grant for such cost;
- (4) Federal grants, except that no grant shall be made for costs paid pursuant to the Federal Comprehensive Employment and Training Act; and,
- (5) In the case of a municipality with a population of less than 1,000, documented "in kind" services or voluntary work from or by private sources.

**MINNESOTA CODE OF AGENCY RULES
DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM**

1978 Edition



Cite the Rule as:
(for example)
3 MCAR § 1.0109

Published by

**OFFICE OF THE STATE REGISTER
DEPARTMENT OF ADMINISTRATION**

Room 415, Hamm Bldg., 408 St. Peter Street, St. Paul, Minnesota 55102

Distributed by

**DOCUMENTS SECTION
DEPARTMENT OF ADMINISTRATION**

Room 140, Centennial Building, St. Paul, Minnesota 55155

SHADE TREE PROGRAM

Chapter 4

3 MCAR §§ 1.0109 through 1.0113

§ 1.0109 General.

A. Purpose and authority. The rules contained herein are prescribed by the Commissioner pursuant to Minn. Stat. § 18.023, as amended, to implement a program to control Dutch elm disease and oak wilt by local units of government and to include procedures and criteria for three grant-in-aid programs. The provisions of these rules are in addition to those set forth in the act itself.

B. Definitions. For purposes of these rules, the following definitions, in addition to those in the act, shall apply:

1. "Commissioner" means the Commissioner of Agriculture or his designee.

2. "Shade tree" means any oak or elm tree situated in a disease control area approved by the Commissioner.

3. "Shade tree disease" means Dutch elm disease caused by *Ceratocystis ulmi*, or oak wilt caused by *Ceratocystis fagacearum*.

4. "Town" means township as described in Minn. Stat. § 18.023, subd. 1, as amended.

5. "Tree inspector" means a person who has the necessary qualifications to properly plan, direct, and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the geographical limits set by the Commissioner.

6. "Disease control area" means an area designated by a municipality in which it will conduct a shade tree disease control program according to these rules. The extent of this control area shall be determined by the municipality and approved by the Commissioner.

7. "Equipment" means machinery or devices which singularly or in combination are designed, constructed, or operated for the purpose of wood utilization and/or disposal, and shall include all machinery, tools, and devices ancillary to the use of such machinery or devices.

8. "Facility" means land, buildings, and other appurtenances which are necessary or useful in the operation of wood utilization or disposal equipment.

9. "The act" means Minn. Stat. § 18.023, as amended.

10. "Population" means the population of a municipality as published in the U. S. Bureau of Census, 1970 Census.

§ 1.0110 Tree inspector.

A. Tree inspector employment and qualifications.

1. In order to be eligible for grants-in-aid pursuant to these rules, a municipality shall either individually or jointly with one (1) or more other municipalities employ or retain a tree inspector, on a continuous year round basis as provided by the act.

2. Provisional appointments.

a. A municipality may provisionally appoint a tree inspector for a period of not more than six (6) months.

b. This appointment shall be dependent upon approval by the Commissioner after determining the competence of the appointee.

c. The provisional appointment shall not be extended and the appointee shall pass the tree inspector examination to become certified.

d. The provisional appointment may be withdrawn for cause by the Commissioner upon notice and hearing.

3. A tree inspector shall be able to demonstrate the following qualifications:

a. Identify all native tree species, with or without leaves, common to his/her work area, and all felled or downed trees with bark intact;

b. Know and understand the biology of oak wilt and Dutch elm disease;

c. Be familiar with the problems of elm trees and oak trees other than those of Dutch elm disease and/or oak wilt, as well as identifying symptoms characteristic of these problems that affect oak and elm trees;

d. Know the proper method of collecting samples for disease diagnosis;

e. Know the appropriate Minnesota laws and rules relative to oak wilt and Dutch elm disease;

f. Know the approved control methods for oak wilt and Dutch elm disease; and,

g. Be familiar with the recommended tree species to be used in the replanting program, their planting requirements (available through the Uni-

versity of Minnesota Extension Service), and the care of these trees after planting.

4. If a municipality fails to appoint a tree inspector, an appointment may be made by the commissioner pursuant to the act. Ten (10) working days prior to such appointment, the commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the commissioner shall be paid by the municipality for a minimum of ninety (90) days, even though the municipality may appoint its own inspector prior to the expiration of ninety (90) days. This provision shall not apply to a municipality that has suspended or terminated the employment of a tree inspector for cause.

B. Certification of tree inspector.

1. A tree inspector shall be certified upon the passing of an examination prescribed by the commissioner for the purpose of determining that the applicant possesses the necessary qualifications set forth in this rule. The commissioner shall notify by mail each applicant and municipality of the time and date for such an examination. The applicant shall be notified of the results of the examination within fifteen (15) days after its administration.

2. After certification, a tree inspector shall be required to annually attend at least one (1) program of continuing education approved by the commissioner. Failure to attend one (1) such continuing education program, or failure to meet alternative certification requirements, shall terminate certification.

C. Certification alternatives. Upon written application, the commissioner shall grant to an individual an alternative for the certification requirement and procedures set forth in this rule provided that:

1. There is good cause why the individual cannot comply with the provision of this rule;

2. The requirements and procedures provided for in the alternative are equivalent to those set forth in this rule;

3. When an examination is involved, the subject matter and difficulty of the examination is equivalent to the examination for which the alternative is granted;

4. The intent of the act and these rules is not violated; and,

5. The environment or the public will not be adversely affected by the alternative requirements or procedures.

§ 1.0111 Shade tree disease control program. The shade tree disease control program of all municipalities affected by these rules shall include as a mini-

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must include the following elements. However, the ordinances or resolutions adopted by the municipality regarding the local shade tree disease control program may be more stringent than these rules.

A. Control area. Each municipality shall designate an area or areas in which the municipality shall enact control procedures for Dutch elm disease and/or oak wilt. The extent of the control areas will be determined by the municipality and approved by the commissioner.

B. Program plan. Each municipality shall prepare a shade tree disease control program plan detailing the manner in which the requirements set forth in these rules shall be fulfilled.

C. Methods of identifying diseased shade trees. Diseased shade trees shall be identified by generally accepted field symptoms such as wilting, yellowing of leaves, and/or staining of wood under the bark. Confirmation, when determined to be necessary by the certified municipal tree inspector, shall be made by the Minnesota Department of Agriculture Tree Disease Laboratory, or other laboratories capable of performing such services approved by the commissioner.

D. Dutch elm disease and oak wilt control.

1. Tree inventory. Each municipality shall maintain a reasonable estimate of:

a. The number of elms, oaks and other tree species on both public and private property within the control area of the municipality as well as those regions of the municipality outside this control area; estimates of the tree count shall be made by acceptable forest inventory procedures. These records shall be permanent and shall be filed with the commissioner.

b. The number of high risk and low risk elm trees anticipated; and,

c. The schedule for the continuous and orderly removal of low risk elm trees. The removal of low risk trees shall commence after the removal of all of the high risk trees identified prior to June 25, shall be conducted on a continuous basis and shall be completed prior to April 1 of the following year.

2. Dutch elm disease control.

a. Sanitation. All elm bark beetles, trees affected with Dutch elm disease, and any dead or weakened elm wood arising from any cause shall be eliminated in a timely manner within the control area of the municipality. This shall include trees on private property.

(1) Prior to April 1 of each year, municipalities shall inspect all public and private properties for elm wood or logs/stumps that could serve as bark beetle breeding sites, and require by April 1, removal, or debarking, of

all wood, logs, and stumps to be retained. Before making any inspection on private property within a municipality, it shall be the duty of the municipality to give notice of said inspection to all affected residents and property owners either through an individual oral or written notice, or by publishing said notice in a local newspaper.

(2) Each municipality shall inspect all elm trees within a control area at least three times during the growing season (by June 15, July 15, and August 15) for Dutch elm disease symptoms. For a control program to be most effective, it is highly recommended that continuous inspections be initiated in those areas where the incidence of the disease is severe.

(3) Due to a summer generation of elm bark beetles emerging in late July, the municipality's tree inspector shall be responsible for:

(a) Visually identifying whether a tree infected with Dutch elm disease has extensive wilt or is only showing early symptoms of the disease; and

(b) Categorizing trees infected with Dutch elm disease as either high risk trees or low risk trees.

(i) High risk elm trees shall be those trees that are dead, barren, or have extensive wilt [thirty (30) percent or more of the tree is wilted]. Such trees shall be identified, and marked in a distinctive manner to indicate their high risk status prior to June 25. These high risk trees located on public property shall be removed within twenty (20) days of identification; high risk trees located on private property shall be removed within twenty (20) days of notification of the property owner. Any high risk tree identified and marked after June 25 shall be removed within twenty (20) days of identification on public property and within twenty (20) days of notification on private property.

(ii) Low risk elm trees shall be those trees that show early stages of infection in June or subsequently during the growing season with those symptoms not progressing beyond the thirty (30) percent wilting point. Such trees shall be identified, marked, and removed before April 1 of the following year. Municipalities shall make every reasonable effort to remove all low risk trees on private and public property within twenty (20) days of notification, but in no case shall it be later than April 1 of the following year. Only methods of removal approved by the commissioner shall be utilized.

(4) All dead or diseased elm trees, including any above ground parts thereof on private property which are not removed within the time periods provided for in these rules or within the time limits established by the municipality, if more stringent, shall be removed by the municipality within twenty (20) days and the costs thereof assessed against the property.

(5) If upon application of the municipality the commissioner

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has determined that extraordinary circumstances prevented the removal of the trees according to the schedule described above and that good cause has been shown by the municipality, the commissioner shall establish an alternative removal schedule based upon a program which will expedite their timely removal.

(6) All diseased elm trees including the above ground parts thereof shall be properly disposed of by such methods including burning, burying, chipping, and utilization.

(7) Stumps of all elm trees shall be removed or debarked to the ground-line to eliminate all possibilities of beetle habitation.

(8) Stockpiling and storage of elm logs with bark intact shall be prohibited except during the period September 15 through April 1 of the following year at locations specifically allowed by individual municipal permits or a municipal ordinance.

b. Root graft control. It is recommended to a municipality that all common root systems of trees growing within forty (40) to fifty (50) feet of a tree infected with Dutch elm disease should be disrupted by chemical or mechanical means as approved by the commissioner to prevent root graft spread of Dutch elm disease. (Refer to the Agricultural Extension Service, University of Minnesota Extension Folder 211-Revised 1977, "The Dutch Elm Disease", pp. 8-12.)

3. Oak wilt. Although oak wilt and Dutch elm disease are both vascular infections caused by a fungus, each infection shall be dealt with separately. Control methods prescribed for each disease are different, and again, shall be dealt with separately. Oak wilt control shall include the disruption of root grafts and the prevention of infection by insect-carried spores (overland spread).

a. Root graft control. Since most oak trees are susceptible to the fungus through root grafts, it is recommended to a municipality that all common root systems of trees growing within forty (40) to fifty (50) feet of a diseased oak tree of the same species should be disrupted by chemical or mechanical means to prevent the root graft transmission of the oak wilt fungus as approved by the commissioner. (Refer to Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".)

b. To control the overland spread of the disease, a municipality shall:

(1) Avoid pruning or other mechanical damage during the most susceptible period of May and June. A tree inspector may determine that emergency pruning by utility companies is necessary during this susceptible period if trees interfere with utility lines. If wounding is unavoidable during this period, as in the aftermath of a storm or when the tree interferes with utility lines, a tree wound dressing shall be applied.

(2) Red oak trees diagnosed as having oak wilt may be girdled as soon as they are detected in order to reduce spore production. Girdling shall be done only in areas where a weakened tree will not constitute a hazard to life and/or property should it fall.

(3) Identify, mark and remove from both private and public property by April 1 of the following year those trees in the Red Oak group that wilt in July and August that could have spores on them the following May or June. The trees in this group are the Northern Red Oak (*Quercus rubra*); Northern Pin Oak (*Quercus ellipsoidalis*); Black Oak (*Quercus velutina*); and Scarlet Oak (*Quercus coccinea*).

(4) After notification by the municipality, private property owners shall remove and properly dispose of diseased oak trees including any above ground parts thereof by April 1 by burning, burying, chipping, and utilization which includes the storage of the wood as set forth in Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".

(5) Trees or parts thereof not removed on or before April 1 by the property owner shall be removed by the municipality within twenty (20) days after notification and the cost thereof assessed against the property.

(6) Stumps of Red Oak trees removed due to oak wilt shall be removed or debarked to the ground-line to eliminate all possibilities of spore formation.

E. Records.

1. Shade tree disease program records shall be kept by each municipality and shall be made available for examination at reasonable times by the commissioner. These records shall include the following:

a. Monies expended on personnel, equipment, and contracts, listed separately;

b. Man hours spent on tree inventory, sanitation, and any chemical measures;

c. An initial inventory of trees;

d. The number of diseased trees identified on private and public property, and the dates of identification;

e. The number and the dates of trees removed, both diseased and other, on private and public property;

f. The number of log piles found which were a hazard in the spread of a shade tree disease; and,

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g. Other information deemed relevant and necessary by the commissioner.

2. A yearly report containing a summation of these records shall be made to the commissioner by December 1.

F. Program review.

1. By November 15 of each year, municipalities shall submit to the commissioner their shade tree disease control and replanting programs for the following calendar year. The commissioner shall review these programs to determine if the requirements of the law and the applicable rules have been met.

2. Final determination of municipal program compliance with the rules shall rest with the commissioner.

3. The commissioner may require that changes be made in any municipal program whenever a determination is made that such changes are needed to comply with the act or these rules.

§ 1.0112 Grants-in-aid to municipalities for sanitation and reforestation program. The commissioner may, in the name of the state and within the limits of appropriations provided, make grants-in-aid to a municipality with an approved disease control program for the partial funding of municipal sanitation and reforestation programs.

A. Sanitation grants. Grants to any municipality for sanitation shall not exceed forty-five (45) percent of the municipality's total cost for sanitation approved by the commissioner. The total cost may include any amounts paid for sanitation by special assessments, ad valorem taxes, federal grants, or other funds. A municipality may assess to the abutting property not more than fifty (50) percent of the expense of treating with an approved method or removing diseased shade trees located on street terraces or boulevards to that abutting property.

Grants shall not be made to a municipality if the total cost of tree removal has been incurred solely by the individual property owner and the municipality has not reduced the cost to the property owner via direct subsidy or reduced special assessment. The only amount that may be included in the municipality's total cost for purposes of computing the above described reimbursement is the reduction of the cost to the property owner. Provision is made for municipalities with population of less than 1,000 pursuant to Minn. Stat. § 18.023, subd. 3c, as amended.

B. Reforestation grants. Grants to any municipality for reforestation shall not exceed either fifty (50) percent of the cost to the municipality for reforestation, or forty (40) dollars multiplied by the number of trees planted on public lands pursuant to the reforestation program, whichever is less.

1. Reforestation grants to a municipality shall be limited in any calendar year to grants for not more than the number of trees removed from public lands in the sanitation program in the previous calendar year except during the first year of an approved disease control program. During the first year of an approved disease control program, there shall be no restriction upon the number of trees for which grants may be made.

2. Reforestation grants to any county with an approved disease control program may include up to ninety (90) percent of the cost of planting the first fifty (50) trees on public lands in a town not defined as a municipality of less than 1,000 population, upon the town's application to the county and county's designation of the town as a disease control area.

3. Reforestation grants to towns with an approved disease control program which are defined as municipalities in the act and are less than 1,000 in population may include up to ninety (90) percent of the cost of planting the first fifty (50) trees on public lands.

C. Program eligibility. Any municipality is eligible to receive sanitation and reforestation grants upon submitting to the commissioner by November 15 a completed program application form provided by the commissioner, and upon receiving notice of an approved disease control program designation. Extensions shall be granted for good cause shown.

1. The program application shall serve as the basis for approving the municipality's shade tree disease control program.

2. Approval shall be granted only upon the municipality's agreement to conduct its sanitation program in conformance with these rules and disease control practices designated by the commissioner upon the recommendation of the Shade Tree Advisory Committee.

3. Approval shall only be granted upon the municipality's agreement to conduct its reforestation program in a manner consistent with advise and counsel given the commissioner by the Minnesota Agricultural Extension Service.

4. Program approval may be revoked upon a determination by the commissioner that the municipality has failed to conduct its sanitation and reforestation program in conformance with the standards set forth in this rule. Such a determination or disapproval of a municipal program or control area may be appealed by the municipality and upon request, a hearing pursuant to Minn. Stat. ch. 15 shall be granted.

5. Sanitation and reforestation grants may be terminated upon the municipality's failure to maintain an approved shade tree disease control program and upon evidence that proper record-keeping and documentation has not been maintained.

D. Program application. To receive a sanitation and reforestation grant, a

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municipality shall submit to the commissioner by November 15 a completed program application form provided by the commissioner.

1. A municipality's program application shall include, but not be limited to, the following information:

a. An inventory of shade trees within the municipality's disease control area and an estimate of the distribution of these shade trees between public and private lands;

b. A complete description of the municipality's sanitation and reforestation programs which shall include:

- (1) The method and schedule of diseased trees surveys;
- (2) The extent of disease control tree trimming activities;
- (3) The policies for removal of trees on public lands;
- (4) The policies for removal of trees on private lands;
- (5) The method and location of disposal of tree wastes;
- (6) The policies for planting new shade trees, including:
 - (a) The source of nursery stock, if known;
 - (b) Species planted;
 - (c) Type of stock planted;
 - (d) Distribution of species; and,
 - (e) Other relevant information;

(7) The methods of financing sanitation and reforestation programs, including:

- (a) The use of funds derived from general tax levies;
- (b) Special assessments;
- (c) Federal funds;
- (d) Other sources of funding; and,

(8) A complete description of the municipality's subsidy program, if any.

c. A statement of planned expenditures for the sanitation and reforestation program for the calendar year.

d. A copy of local ordinances and resolutions authorizing the local shade tree program.

e. Other information deemed necessary and relevant by the commissioner.

2. Grants for sanitation shall be forty-five (45) percent of the applicant's planned expenditures for sanitation, unless forty-five (45) percent of the total planned expenditures for all applicants exceeds the funds designated for sanitation grants; in which case, grants shall be a pro rata allocation among the eligible applicants.

3. Except for the first fifty (50) trees for towns as set forth in 4. below, grants for reforestation shall be fifty (50) percent of the applicant's planned expenditures for reforestation, unless fifty (50) percent of the total of planned expenditures for all applicants exceeds the funds designated for reforestation grants; in which case, grants shall be a pro rata allocation among the eligible applicants.

4. Grants for reforestation in eligible towns shall be ninety (90) percent of the town's planned expenditures for planting the first fifty (50) trees on public lands.

E. Request for payment. A municipality receiving a sanitation and reforestation grant shall make request for payment upon forms provided by the commissioner.

1. Payment periods shall be January 1 through March 31; April 1 through June 30; July 1 through September 30; and, October 1 through December 31 of each calendar year.

2. Requests for payment shall be due forty-five (45) days after the close of the preceding payment period unless the municipality has requested and received an extension of time from the commissioner. Costs in one request for payment period may be carried over into a succeeding payment period, but shall not be carried over into a succeeding calendar year.

3. Requests for payments may be for the lesser of actual costs incurred or costs not to exceed the limits established by the commissioner during the payment period for which documentation for such costs and expenditures can be produced upon request of the commissioner. Requests may also be made for advance payments for planned expenditures for the succeeding period.

4. Request for payment shall include:

a. The population of the municipality making the request for payment;

b. A statement of actual sanitation and reforestation costs for the payment period;

c. If advance payments for planned expenditures are sought by the municipality, a statement of planned expenditure for the succeeding payment period;

d. The signature of an authorized agent of the municipality making the request for payment; and,

e. Notorization of the agent's signature.

5. Grant payments for actual sanitation and reforestation costs incurred shall be a percentage of the actual costs stated in the municipality's request for payment; that percentage being the same percentage used to make the initial grant award.

a. Advance grant payments for planned sanitation and reforestation expenditures shall be a percentage of the planned expenditures for the succeeding payment period stated in the municipality's request for payment; that percentage being the same percentage used to make the initial grant award.

(1) In the event that planned expenditures exceed or are less than actual costs incurred by the municipality for a payment period for which advance payment was made, the appropriate adjustments shall be made in the next request for payment submitted by the municipality.

(2) In the event that over payment is made to the municipality by the commissioner because of an advance over payment for the last payment period of the calendar year, the municipality shall be liable to the state for the amount of over payment, and shall make payment of this amount to the state within thirty (30) days after notice of such over payment is received.

F. Eligible costs. Grants shall be based upon the total eligible cost of the municipality of its sanitation and reforestation program.

1. Sanitation activities on public and private lands which are eligible for grants shall include:

a. Diseased tree identification and inspection;

b. Disruption of common root systems;

c. Trimming of elm and oak trees for purposes of disease control;

d. Girdling of oak trees where appropriate for purposes of disease control;

e. Removal and operational costs associated with the disposal of dead or diseased wood of elm and oak trees; and,

f. Subsidies for trees removed from private property pursuant to Minn. Stat. as amended, § 18.023, subd. 4.

2. Reforestation activities on public lands which are eligible for grants shall be limited to:

- a. Acquisition of nursery stock; and,
- b. Tree planting which includes only the initial cost of planting, watering, fertilizing, and staking. Maintenance costs thereafter shall not be eligible for reimbursement.

3. Grants shall be made only for costs incurred by the municipality in the actual and direct physical performance of sanitation and reforestation activities.

4. Grants shall be made for costs to be paid by:

- a. Ad valorem taxes;
- b. Special assessments pursuant to a municipal program whereby the sanitation activity is carried out by municipal employees or a contractor acting in behalf of the municipality; however, no assessment shall exceed the total of the sanitation cost less the amount of grant for such cost;
- c. A charge through direct invoice to a property owner pursuant to a municipal program whereby the sanitation activity is carried out by municipal employees or a contractor acting in behalf of the municipality; however, no charge against a property owner shall exceed the total sanitation cost less the amount of grant for such cost;
- d. Federal grants; and,
- e. In the case of a municipality with a population of less than 1000, documented "in kind" services or voluntary work from or by private sources.

§ 1.0113 Grants-in-aid for wood utilization and disposal systems.

A. The commissioner shall within the monies appropriated, make grants-in-aid to eligible applicants for the cost of facilities, equipment, and systems for the disposal or utilization of diseased shade trees. Such grants-in-aid shall be made to:

1. Any home rule charter or statutory city of more than 40,000 population in the metropolitan area or a combination of such cities with a combined population of 40,000 under a joint powers agreement pursuant to Minn. Stat. § 471.59 (1976);

2. Any home rule charter or statutory city of more than 20,000 population outside the metropolitan area or a combination of such cities with a combined population of 20,000 under a joint powers agreement pursuant to Minn. Stat. § 471.59 as amended;

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3. Any special purpose park and recreation board organized under a charter of a city of the first class;

4. Any non-profit corporation serving a city of the first class; or,

5. Any county.

B. Such grants shall be made with the following provisions:

1. The city (cities) or county has an approved shade tree disease control program as described in the act or these rules;

2. Grants-in-aid may be less than but shall not exceed fifty (50) percent of the cost of such facility, equipment, or system;

3. Grants-in-aid shall not be made for costs of operating such facility, equipment, or system;

4. Grants-in-aid for site acquisitions shall be made only for land used in the actual operational site;

5. Grants-in-aid shall not be made by the commissioner until he receives certified evidence of the actual cost of the equipment or site; and,

C. Criteria for administration of grants-in-aid:

1. Grants-in-aid to eligible applicants shall be made by the commissioner provided that such wood disposal utilization system meets the following criteria:

a. It aids in the control of shade tree diseases;

b. It aids in the recovery of material or energy from wood;

c. It is located to accomplish the above with maximum efficiency and use of available facilities;

d. It is available to all parties, public and private;

e. It is able to render wood pest-risk free within five (5) days of delivery to the site unless an extension of time has been granted by the commissioner based on existing circumstances of the disposal/utilization site;

f. It includes adequate manpower to operate and service equipment; and,

g. It provides for proper handling and the timely removal of processed wood from the site.

2. In addition to the general criteria under C. 1. above, the commission-

er, as appropriate, may consider other specific criteria including the following in evaluating grant payment requests:

a. Sites for wood disposal systems:

(1) Shall be selected on the basis of anticipated volumes of wood and/or the need for a wood disposal system;

(2) Shall be accessible by roadways that permit year-round truck traffic;

(3) Shall have adequate storage areas for both processed wood and equipment;

(4) Shall have protective enclosures, adequate control, and supervision to prevent entry of unwanted materials and unauthorized persons;

(5) Shall be in compliance with all applicable Federal and State statutes, rules, and regulations; and,

(6) Shall be in conformance with regional solid waste management plans and requirements.

b. Equipment for wood disposal systems:

(1) Shall, where feasible, be portable so that it can be used for servicing more than one site;

(2) Shall be stationary only when the anticipated volume over a five-year period will fully utilize the facility;

(3) Shall be capable of processing large-diameter logs; and,

(4) Shall include auxiliary units and equipment necessary to the operation of the system.

3. Requests for grant-in-aid payments shall be made on forms provided by the commissioner. Contingent upon the availability of funds, the timeliness of applications and other administrative considerations, the commissioner may set deadlines for consideration of requests which shall be published in the State Register at least thirty (30) days prior to the deadline. Requests for payments shall include the following:

a. An itemized list of the applicant's proposed expenditures for qualifying equipment and/or site, and the total amount of these expenditures; and,

b. Additional documents or other information deemed relevant by the commissioner.

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4. Records.

a. Applicants receiving grants-in-aid under this rule shall keep detailed records concerning the operation of the wood disposal and utilization system and shall make these records available to the commissioner at any reasonable time. Such records shall include:

- (1) Hours of operation;
- (2) Clientele served;
- (3) Volume of wood handled; and,

(4) Other information deemed necessary and relevant by the commissioner.

b. A yearly report containing a summation of these records shall be made to the commissioner by December 1.

**MINNESOTA CODE OF AGENCY RULES
DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM**

1980 Edition
10/80



Cite the Rule as:
(for example)
3 MCAR § 1.0109

Published and Distributed By

**DIVISION OF STATE REGISTER AND PUBLIC DOCUMENTS
DEPARTMENT OF ADMINISTRATION**

First Floor, 117 University Avenue
St. Paul, Minnesota 55155

SHADE TREE PROGRAM

(Amended 10/80)

Chapter 4

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§ 1.0109 General.

A. Purpose and authority. The rules contained herein are prescribed by the Commissioner pursuant to Minn. Stat. § 18.023, as amended, to implement a program to control Dutch elm disease and oak wilt by local units of government and to include procedures and criteria for three grant-in-aid programs. The provisions of these rules are in addition to those set forth in the act itself.

B. Definitions. For purposes of these rules, the following definitions, in addition to those in the act, shall apply:

1. "Commissioner" means the Commissioner of Agriculture or his designee.

2. "Shade tree" means any oak or elm tree situated in a disease control area approved by the Commissioner.

3. "Shade tree disease" means Dutch elm disease caused by *Ceratocystis ulmi*, or oak wilt caused by *Ceratocystis fagacearum*.

4. "Town" means township as described in Minn. Stat. § 18.023, subd. 1, as amended.

5. "Tree inspector" means a person who has the necessary qualifications to properly plan, direct, and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the geographical limits set by the Commissioner.

6. "Disease control area" means an area designated by a municipality in which it will conduct a shade tree disease control program according to these rules. The extent of this control area shall be determined by the municipality and approved by the Commissioner.

7. "Equipment" means machinery or devices which singularly or in combination are designed, constructed, or operated for the purpose of wood utilization and/or disposal, and shall include all machinery, tools, and devices ancillary to the use of such machinery or devices.

8. "Facility" means land, buildings, and other appurtenances which are necessary or useful in the operation of wood utilization or disposal equipment.

9. "The act" means Minn. Stat. § 18.023, as amended.

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10. "Population" means the population of a municipality as published in the U. S. Bureau of Census, 1970 Census.

§ 1.0110 Tree inspector.

A. Tree inspector employment and qualifications.

1. In order to be eligible for grants-in-aid pursuant to these rules, a municipality shall either individually or jointly with one (1) or more other municipalities employ or retain a tree inspector, on a continuous year round basis as provided by the act.

2. Provisional appointments.

a. A municipality may provisionally appoint a tree inspector for a period of not more than six (6) months.

b. This appointment shall be dependent upon approval by the Commissioner after determining the competence of the appointee.

c. The provisional appointment shall not be extended and the appointee shall pass the tree inspector examination to become certified.

d. The provisional appointment may be withdrawn for cause by the Commissioner upon notice and hearing.

3. A tree inspector shall be able to demonstrate the following qualifications:

a. Identify all native tree species, with or without leaves, common to his/her work area, and all felled or downed trees with bark intact;

b. Know and understand the biology of oak wilt and Dutch elm disease;

c. Be familiar with the problems of elm trees and oak trees other than those of Dutch elm disease and/or oak wilt, as well as identifying symptoms characteristic of these problems that affect oak and elm trees;

d. Know the proper method of collecting samples for disease diagnosis;

e. Know the appropriate Minnesota laws and rules relative to oak wilt and Dutch elm disease;

f. Know the approved control methods for oak wilt and Dutch elm disease; and,

g. Be familiar with the recommended tree species to be used in the replanting program, their planting requirements (available through the Uni-

iversity of Minnesota Extension Service), and the care of these trees after planting.

4. If a municipality fails to appoint a tree inspector, an appointment may be made by the commissioner pursuant to the act. Ten (10) working days prior to such appointment, the commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the commissioner shall be paid by the municipality for a minimum of ninety (90) days, even though the municipality may appoint its own inspector prior to the expiration of ninety (90) days. This provision shall not apply to a municipality that has suspended or terminated the employment of a tree inspector for cause.

B. Certification of tree inspector.

1. A tree inspector shall be certified upon the passing of an examination prescribed by the commissioner for the purpose of determining that the applicant possesses the necessary qualifications set forth in this rule. The commissioner shall notify by mail each applicant and municipality of the time and date for such an examination. The applicant shall be notified of the results of the examination within fifteen (15) days after its administration.

2. After certification, a tree inspector shall be required to annually attend at least one (1) program of continuing education approved by the commissioner. Failure to attend one (1) such continuing education program, or failure to meet alternative certification requirements, shall terminate certification.

C. Certification alternatives. Upon written application, the commissioner shall grant to an individual an alternative for the certification requirement and procedures set forth in this rule provided that:

1. There is good cause why the individual cannot comply with the provision of this rule;

2. The requirements and procedures provided for in the alternative are equivalent to those set forth in this rule;

3. When an examination is involved, the subject matter and difficulty of the examination is equivalent to the examination for which the alternative is granted;

4. The intent of the act and these rules is not violated; and,

5. The environment or the public will not be adversely affected by the alternative requirements or procedures.

§ 1.0111 Shade tree disease control program. The shade tree disease control program of all municipalities affected by these rules shall include as a mini-

mum the following elements. However, the ordinances or resolutions adopted by the municipality regarding the local shade tree disease control program may be more stringent than these rules.

A. Control area. Each municipality shall designate an area or areas in which the municipality shall enact control procedures for Dutch elm disease and/or oak wilt. The extent of the control areas will be determined by the municipality and approved by the commissioner.

B. Program plan. Each municipality shall prepare a shade tree disease control program plan detailing the manner in which the requirements set forth in these rules shall be fulfilled.

C. Methods of identifying diseased shade trees. Diseased shade trees shall be identified by generally accepted field symptoms such as wilting, yellowing of leaves, and/or staining of wood under the bark. Confirmation, when determined to be necessary by the certified municipal tree inspector, shall be made by the Minnesota Department of Agriculture Tree Disease Laboratory, or other laboratories capable of performing such services approved by the commissioner.

D. Dutch elm disease and oak wilt control.

1. Tree inventory. Each municipality shall maintain a reasonable estimate of:

a. The number of elms, oaks and other tree species on both public and private property within the control area of the municipality as well as those regions of the municipality outside this control area; estimates of the tree count shall be made by acceptable forest inventory procedures. These records shall be permanent and shall be filed with the commissioner.

b. The number of high risk and low risk elm trees anticipated; and,

c. The schedule for the continuous and orderly removal of low risk elm trees. The removal of low risk trees shall commence after the removal of all of the high risk trees identified prior to June 25, shall be conducted on a continuous basis and shall be completed prior to April 1 of the following year.

2. Dutch elm disease control.

a. Sanitation. All elm bark beetles, trees affected with Dutch elm disease, and any dead or weakened elm wood arising from any cause shall be eliminated in a timely manner within the control area of the municipality. This shall include trees on private property.

(1) Prior to April 1 of each year, municipalities shall inspect all public and private properties for elm wood or logs/stumps that could serve as bark beetle breeding sites, and require by April 1, removal, or debarking, of

all wood, logs, and stumps to be retained. Before making any inspection on private property within a municipality, it shall be the duty of the municipality to give notice of said inspection to all affected residents and property owners either through an individual oral or written notice, or by publishing said notice in a local newspaper.

(2) Each municipality shall inspect all elm trees within a control area at least three times during the growing season (by June 15, July 15, and August 15) for Dutch elm disease symptoms. For a control program to be most effective, it is highly recommended that continuous inspections be initiated in those areas where the incidence of the disease is severe.

(3) Due to a summer generation of elm bark beetles emerging in late July, the municipality's tree inspector shall be responsible for:

(a) Visually identifying whether a tree infected with Dutch elm disease has extensive wilt or is only showing early symptoms of the disease; and

(b) Categorizing trees infected with Dutch elm disease as either high risk trees or low risk trees.

(i) High risk elm trees shall be those trees that are dead, barren, or have extensive wilt [thirty (30) percent or more of the tree is wilted]. Such trees shall be identified, and marked in a distinctive manner to indicate their high risk status prior to June 25. These high risk trees located on public property shall be removed within twenty (20) days of identification; high risk trees located on private property shall be removed within twenty (20) days of notification of the property owner. Any high risk tree identified and marked after June 25 shall be removed within twenty (20) days of identification on public property and within twenty (20) days of notification on private property.

(ii) Low risk elm trees shall be those trees that show early stages of infection in June or subsequently during the growing season with those symptoms not progressing beyond the thirty (30) percent wilting point. Such trees shall be identified, marked, and removed before April 1 of the following year. Municipalities shall make every reasonable effort to remove all low risk trees on private and public property within twenty (20) days of notification, but in no case shall it be later than April 1 of the following year. Only methods of removal approved by the commissioner shall be utilized.

(4) All dead or diseased elm trees, including any above ground parts thereof on private property which are not removed within the time periods provided for in these rules or within the time limits established by the municipality, if more stringent, shall be removed by the municipality within twenty (20) days and the costs thereof assessed against the property.

(5) If upon application of the municipality the commissioner

has determined that extraordinary circumstances prevented the removal of the trees according to the schedule described above and that good cause has been shown by the municipality, the commissioner shall establish an alternative removal schedule based upon a program which will expedite their timely removal.

(6) All diseased elm trees including the above ground parts thereof shall be properly disposed of by such methods including burning, burying, chipping, and utilization.

(7) Stumps of all elm trees shall be removed or debarked to the ground-line to eliminate all possibilities of beetle habitation.

~~*~~(8) Stockpiling and storage of elm logs with bark intact shall be prohibited except during the period September 15 through April 1 of the following year at locations specifically allowed by individual municipal permits or a municipal ordinance.

b. Root graft control. It is recommended to a municipality that all common root systems of trees growing within forty (40) to fifty (50) feet of a tree infected with Dutch elm disease should be disrupted by chemical or mechanical means as approved by the commissioner to prevent root graft spread of Dutch elm disease. (Refer to the Agricultural Extension Service, University of Minnesota Extension Folder 211-Revised 1977, "The Dutch Elm Disease", pp. 8-12.)

3. Oak wilt. Although oak wilt and Dutch elm disease are both vascular infections caused by a fungus, each infection shall be dealt with separately. Control methods prescribed for each disease are different, and again, shall be dealt with separately. Oak wilt control shall include the disruption of root grafts and the prevention of infection by insect-carried spores (overland spread).

a. Root graft control. Since most oak trees are susceptible to the fungus through root grafts, it is recommended to a municipality that all common root systems of trees growing within forty (40) to fifty (50) feet of a diseased oak tree of the same species should be disrupted by chemical or mechanical means to prevent the root graft transmission of the oak wilt fungus as approved by the commissioner. (Refer to Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".)

b. To control the overland spread of the disease, a municipality shall:

(1) Avoid pruning or other mechanical damage during the most susceptible period of May and June. A tree inspector may determine that emergency pruning by utility companies is necessary during this susceptible period if trees interfere with utility lines. If wounding is unavoidable during this period, as in the aftermath of a storm or when the tree interferes with utility lines, a tree wound dressing shall be applied.

(2) Red oak trees diagnosed as having oak wilt may be girdled as soon as they are detected in order to reduce spore production. Girdling shall be done only in areas where a weakened tree will not constitute a hazard to life and/or property should it fall.

(3) Identify, mark and remove from both private and public property by April 1 of the following year those trees in the Red Oak group that wilt in July and August that could have spores on them the following May or June. The trees in this group are the Northern Red Oak (*Quercus rubra*); Northern Pin Oak (*Quercus ellipsoidalis*); Black Oak (*Quercus velutina*); and Scarlet Oak (*Quercus coccinea*).

(4) After notification by the municipality, private property owners shall remove and properly dispose of diseased oak trees including any above ground parts thereof by April 1 by burning, burying, chipping, and utilization which includes the storage of the wood as set forth in Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".

(5) Trees or parts thereof not removed on or before April 1 by the property owner shall be removed by the municipality within twenty (20) days after notification and the cost thereof assessed against the property.

(6) Stumps of Red Oak trees removed due to oak wilt shall be removed or debarked to the ground-line to eliminate all possibilities of spore formation.

E. Records.

1. Shade tree disease program records shall be kept by each municipality and shall be made available for examination at reasonable times by the commissioner. These records shall include the following:

a. Monies expended on personnel, equipment, and contracts, listed separately;

b. Man hours spent on tree inventory, sanitation, and any chemical measures;

c. An initial inventory of trees;

d. The number of diseased trees identified on private and public property, and the dates of identification;

e. The number and the dates of trees removed, both diseased and other, on private and public property;

f. The number of log piles found which were a hazard in the spread of a shade tree disease; and,

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g. Other information deemed relevant and necessary by the commissioner.

2. A yearly report containing a summation of these records shall be made to the commissioner by December 1.

F. Program review.

1. By November 15 of each year, municipalities shall submit to the commissioner their shade tree disease control and replanting programs for the following calendar year. The commissioner shall review these programs to determine if the requirements of the law and the applicable rules have been met.

2. Final determination of municipal program compliance with the rules shall rest with the commissioner.

3. The commissioner may require that changes be made in any municipal program whenever a determination is made that such changes are needed to comply with the act or these rules.

3 MCAR § 1.0112 Grants-in-aid to municipalities for sanitation and reforestation program. The commissioner may, in the name of the state and within the limits of appropriations provided, make grants-in-aid to a municipality with an approved disease control program for the partial funding of municipal sanitation and reforestation programs. One grant shall be made for all eligible sanitation and reforestation costs.

A. Sanitation and reforestation grants.

1. Sanitation. Grants to any municipality for sanitation shall not exceed fifty (50) percent of the municipality's total cost for sanitation approved by the commissioner. The total cost may include any amounts paid for sanitation by special assessments, ad valorem taxes, federal grants, or other funds. A municipality may assess to the abutting property not more than fifty (50) percent of the expense of treating with an approved method or removing diseased shade trees located on street terraces or boulevards to that abutting property.

Grants shall not be made to a municipality if the total cost of tree removal has been incurred solely by the individual property owner and the municipality has not reduced the cost to the property owner via direct subsidy or reduced special assessment. The only amount that may be included in the municipality's total cost for purposes of computing the above described reimbursement is the reduction of the cost to the property owner. Provision is made for municipalities with population of less than 1,000 pursuant to Minn. Stat. 18.023, subd. 3c, as amended.

2. Reforestation. Grants to any municipality for reforestation shall not

exceed fifty (50) percent of the cost to the municipality for reforestation on public property. Grants shall not exceed fifty (50) dollars per tree planted.

a. Reforestation grants to any county with an approved disease control program may include ninety (90) percent of the cost of planting the first fifty (50) trees on public lands in a town not defined as a municipality of less than 1,000 population, upon the town's application to the county and county's designation of the town as a disease control area. The grant for these fifty (50) trees shall not exceed sixty (60) dollars per tree planted.

b. Reforestation grants to towns and home rule charter or statutory cities with an approved disease control program which are defined as municipalities in the act and are less than 4,000 in population may include ninety (90) percent of the cost of planting the first fifty (50) trees on public lands. The grant for these fifty (50) trees shall not exceed sixty (60) dollars per tree planted.

c. Any municipality that receives a grant for reforestation shall have appointed seven (7) residents of the municipality or designate an existing municipal board or committee to serve as a reforestation advisory committee to advise the municipality in the development and administration of the reforestation program.

B. Program eligibility. Any municipality is eligible to receive sanitation and reforestation grants upon submitting to the commissioner by November 15 a completed program application form provided by the commissioner, and upon receiving notice of an approved disease control program designation. Extensions shall be granted for good cause shown.

1. The program application shall serve as the basis for approving the municipality's shade tree disease control program.

2. Approval shall be granted only upon the municipality's agreement to conduct its sanitation program in conformance with these rules and disease control practices designated by the commissioner upon the recommendation of the Shade Tree Advisory Committee.

3. Approval shall only be granted upon the municipality's agreement to conduct its reforestation program in a manner consistent with advice and counsel given the commissioner by the Minnesota Agricultural Extension Service.

4. Program approval may be revoked upon a determination by the commissioner that the municipality has failed to conduct its sanitation and reforestation program in conformance with the standards set forth in this rule. Such a determination or disapproval of a municipal program or control area may be appealed by the municipality and upon request, a hearing pursuant to Minn. Stat. ch. 15 shall be granted.

5. Sanitation and reforestation grants may be terminated upon municipi-

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palilty's failure to maintain an approved shade tree disease control program and upon evidence that proper record-keeping and documentation has not been maintained.

C. Program application. To receive a sanitation and reforestation grant, a municipality shall submit to the commissioner by November 15 a completed program application form provided by the commissioner.

1. A municipality's program application shall include, but not be limited to the following information:

a. An inventory of shade trees within the municipality's disease control area and an estimate of the distribution of these shade trees between public and private lands;

b. A complete description of the municipality's sanitation and reforestation programs which shall include:

(1) The method and schedule of diseased trees surveys;

(2) The extent of disease control tree trimming activities;

(3) The policies for removal of trees on public lands;

(4) The policies for removal of trees on private lands;

(5) The method and location of disposal tree wastes;

(6) The policies for planting new shade trees, including:

(a) The source of nursery stock, if known;

(b) Species planted;

(c) Type of stock planted;

(d) Distribution of species; and,

(e) Other relevant information;

(7) The methods of financing sanitation and reforestation programs, including:

(a) The use of funds derived from general tax levies;

(b) Special assessments;

(c) Federal funds;

(d) Other sources of funding; and,

(8) A complete description of the municipality's subsidy program, if any.

(9) The name or names of the person or persons or committee appointed by the municipality to advise the municipality in the development and administration of the reforestation program.

c. A statement of planned expenditures for the sanitation and reforestation program for the calendar year.

d. A copy of the local ordinances and resolutions authorizing the local shade tree program.

e. Other information deemed necessary and relevant by the commissioner.

2. Except for the first fifty (50) trees for towns and cities as set forth in 3. below, grants for sanitation and reforestation shall be fifty (50) percent of the applicant's planned expenditures for sanitation and reforestation, unless fifty (50) percent of the total planned expenditures for all applicants exceeds the funds designated for sanitation and reforestation grants; in which case, grants shall be a pro rata allocation among the eligible applicants. Reforestation grants shall not exceed fifty (50) dollars per tree planted.

3. Grants for planting the first fifty (50) trees on public lands in eligible towns and cities may be ninety (90) percent of the town's or city's planned expenditures for planting those trees, providing the availability of sufficient funding. The grant for these fifty (50) trees shall not exceed sixty (60) dollars per tree planted.

D. Request for payment. A municipality receiving a sanitation and reforestation grant shall make request for payment upon forms provided by the commissioner.

1. Payment periods shall be January 1 through March 31; April 1 through June 30; July 1 through September 30; and, October 1 through December 31 of each calendar year. -

2. Requests for payment shall be due forty-five (45) days after the close of the preceding payment period unless the municipality has requested and received an extension of time from the commissioner. Costs in one request for payment period may be carried over into a succeeding payment period, but shall not be carried over into a succeeding calendar year.

3. Requests for payments may be for the lesser of actual costs incurred or costs not to exceed the limits established by the commissioner during the payment period for which documentation for such costs and expenditures can be produced upon request of the commissioner. Requests may also be made for advance payments for planned expenditures for the succeeding period.

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4. Request for payment shall include:

- a. The population of the municipality making the request for payment;
- b. A statement of actual sanitation and reforestation costs for the payment period;
- c. If advance payments for planned expenditures are sought by the municipality, a statement of planned expenditure for the succeeding payment period;
- d. The signature of an authorized agent of the municipality making the request for payment; and,
- e. Notorization of the agent's signature.

5. Grant payments for actual sanitation and reforestation costs incurred shall be a percentage of the actual costs stated in the municipality's request for payment; that percentage being the same percentage used to make the initial grant award.

a. Advance grant payments for planned sanitation and reforestation expenditures shall be a percentage of the planned expenditures for the succeeding payment period stated in the municipality's request for payment; that percentage being the same percentage used to make the initial grant award.

(1) In the event that planned expenditures exceed or are less than actual costs incurred by the municipality for a payment period for which advance payment was made, the appropriate adjustments shall be made in the next request for payment submitted by the municipality.

(2) In the event that over payment is made to the municipality by the commissioner because of an advance over payment for the last payment period of the calendar year, the municipality shall be liable to the state for the amount of over payment, and shall make payment of this amount to the state within thirty (30) days after notice of such over payment is received.

E. Eligible costs. Grants shall be based upon the total eligible cost of the municipality of its sanitation and reforestation program.

1. Sanitation activities on public and private lands which are eligible for grants shall include:

- a. Diseased tree identification and inspection;
- b. Disruption of common root systems;
- c. Trimming of elm and oak trees for purposes of disease control;

d. Girdling of oak trees where appropriate for purposes of disease control;

e. Removal and operational costs associated with the disposal of dead or diseased wood of elm and oak trees; and,

f. Subsidies for trees removed from private property pursuant to Minn. Stat. as amended, § 18.023, subd. 4.

2. Reforestation activities on public lands which are eligible for grants shall be limited to:

a. Acquisition of nursery stock; and,

b. Tree planting which includes only the initial cost of planting, watering, fertilizing, and staking. Maintenance costs thereafter shall not be eligible for reimbursement.

3. Grants shall be made only for costs incurred by the municipality in the actual and direct physical performance of sanitation and reforestation activities.

4. Grants shall be made for costs to be paid by:

a. Ad valorem taxes;

b. Special assessments pursuant to a municipal program whereby the sanitation activity is carried out by municipal employees or a contractor acting in behalf of the municipality; however, no assessment shall exceed the total of the sanitation cost less the amount of grant for such cost;

c. A charge through direct invoice to a property owner pursuant to a municipal program whereby the sanitation activity is carried out by municipal employees or a contractor acting in behalf of the municipality; however, no charge against a property owner shall exceed the total sanitation cost less the amount of grant for such cost;

d. Federal grants; and,

e. In the case of a municipality with a population of less than 1000, documented "in kind" services or voluntary work from or by private sources.

3 MCAR § 1.0113 Grants-in-aid for wood utilization and disposal systems.

A. The commissioner shall within the monies appropriated, make grants-in-aid to eligible applicants for the cost of facilities, equipment, and systems for the disposal or utilization of diseased shade trees. Such grants-in-aid shall be made to:

1. Any home rule charter or statutory city.

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2. Any special purpose park and recreation board organized under a charter of a city of the first class;

3. Any non-profit corporation serving a city of the first class; or,

4. Any county.

B. Such grants shall be made with the following provisions:

1. The city (cities) or county has an approved shade tree disease control program as described in the act or these rules.

2. Grants-in-aid may be less than but shall not exceed fifty (50) percent of the cost of such facility, equipment, or system;

3. Grants-in-aid shall not be made for costs of operating such facility, equipment, or system;

4. Grants-in-aid for site acquisitions shall be made only for land used in the actual operational site;

5. Grants-in-aid shall not be made by the commissioner until he receives certified evidence of the actual cost of the equipment or site; and,

C. Criteria for administration of grants-in-aid.

1. Grants-in-aid to eligible applicants shall be made by the commissioner provided that such wood disposal utilization system meets the following criteria:

a. It aids in the control of shade tree diseases;

b. It aids in the recovery of material or energy from wood.

c. It is located to accomplish the above with maximum efficiency and use of available facilities;

d. It is available to all parties, public and private;

e. It is able to render wood pest-risk free within five (5) days of delivery to the site unless an extension of time has been granted by the commissioner based on existing circumstances of the disposal/utilization site;

f. It includes adequate manpower to operate and service equipment; and,

g. It provides for proper handling and the timely removal of processed wood from the site.

2. In addition to the general criteria under C. 1. above, the commission-

er, as appropriate, may consider other specific criteria including the following in evaluating grant payment requests:

a. Sites for wood disposal systems;

- (1) Shall be selected on the basis of anticipated volumes of wood and/or the need for a wood disposal system;
- (2) Shall be accessible by roadways that permit year-round truck traffic;
- (3) Shall have adequate storage areas for both processed wood and equipment;
- (4) Shall have protective enclosures, adequate control, and supervision to prevent entry of unwanted materials and unauthorized persons;
- (5) Shall be in compliance with all applicable federal and state statutes, rules and regulations; and,
- (6) Shall be in conformance with regional solid waste management plans and requirements.

b. Equipment for wood disposal systems:

- (1) Shall, where feasible, be portable so that it can be used for servicing more than one site;
- (2) Shall be stationary only when the anticipated volume over a five-year period will fully utilize the facility;
- (3) Shall be capable of processing large-diameter logs; and,
- (4) Shall include auxiliary units and equipment necessary to the operation of the system.

3. Requests for grant-in-aid payments shall be made on forms provided by the commissioner. Contingent upon the availability of funds, the timeliness of applications and other administrative considerations, the commissioner may set deadlines for consideration of requests which shall be published in the State Register at least thirty (30) days prior to the deadline. Requests for payments shall include the following:

a. An itemized list of the applicant's proposed expenditures for qualifying equipment and/or site, and the total amount of these expenditures; and,

b. Additional documents or other information deemed relevant by the commissioner.

4. Records.

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a. Applicants receiving grants-in-aid under this rule shall keep detailed records concerning the operation of the wood disposal and utilization system and shall make these records available to the commissioner at any reasonable time. Such records shall include:

- (1) Hours of operation;
- (2) Clientele served;
- (3) Volume of wood handled; and,

(4) Other information deemed necessary and relevant by the commissioner.

b. A yearly report containing a summation of these records shall be made to the commissioner by December 1.

MINNESOTA CODE OF AGENCY RULES
DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM

1981 Edition



Cite the Rule as:
(for example)
3 MCAR § 1.0109

Published and Distributed By

DIVISION OF STATE REGISTER AND PUBLIC DOCUMENTS
DEPARTMENT OF ADMINISTRATION

First Floor, 117 University Avenue
St. Paul, Minnesota 55155

SHADE TREE PROGRAM
(Amended 1/82)

Chapter 4
3 MCAR §§ 1.0109 through 1.0113

§ 1.0109 General.

A. Purpose and authority. Rules 3 MCAR §§ 1.0109-1.0113 are prescribed by the Commissioner pursuant to Minn. Stat. § 18.023 to implement a program to control Dutch elm disease and oak wilt by local units of government and to include procedures and criteria for three grant-in-aid programs.

B. Definitions. For purposes of 3 MCAR §§ 1.0109-1.0113, the following definitions, in addition to those in Minn. Stat. § 18.023, shall apply:

1. "Commissioner" means the Commissioner of Agriculture or his designee.
2. "Shade tree" means any oak or elm tree situated in a disease control area approved by the Commissioner.
3. "Shade tree disease" means Dutch elm disease caused by *Ceratocystis ulmi*, or oak wilt caused by *Ceratocystis fagacearum*.
4. "Town" means township as described in Minn. Stat. § 18.023, subd. 1, as amended.
5. "Tree inspector" means a person who has the necessary qualifications to properly plan, direct, and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the geographical limits set by the Commissioner.
6. "Disease control area" means an area designated by a municipality in which it will conduct a shade tree disease control program according to these rules. The extent of this control area shall be determined by the municipality and approved by the Commissioner.
7. "Equipment" means machinery or devices which singularly or in combination are designed, constructed, or operated for the purpose of wood utilization and/or disposal, and shall include all machinery, tools, and devices ancillary to the use of such machinery or devices.
8. "Facility" means land, buildings, and other appurtenances which are necessary or useful in the operation of wood utilization or disposal equipment.
9. "The act" means Minn. Stat. § 18.023, as amended.

clude at least the following elements. However, the ordinances or resolutions adopted by the municipality regarding the local shade tree disease control program may be more stringent than the provisions of 3 MCAR §§ 1.0109-1.0113.

A. Control area. Each municipality shall designate an area or areas in which the municipality shall enact control procedures for Dutch elm disease and/or oak wilt. The extent of the control areas will be determined by the municipality and approved by the commissioner.

B. Program plan. Each municipality shall prepare a shade tree disease control program plan detailing the manner in which the requirements set forth in these rules shall be fulfilled.

C. Methods of identifying diseased shade trees. Diseased shade trees shall be identified by generally accepted field symptoms such as wilting, yellowing of leaves, and/or staining of wood under the bark. Confirmation, when determined to be necessary by the certified municipal tree inspector, shall be made by the Minnesota Department of Agriculture Tree Disease Laboratory, or other laboratories capable of performing such services approved by the commissioner.

D. Dutch elm disease and oak wilt control.

1. Tree inventory. Each municipality shall maintain a reasonable estimate of:

a. The number of elms, oaks and other tree species on both public and private property within the control area of the municipality as well as those regions of the municipality outside this control area; estimates of the tree count shall be made by acceptable forest inventory procedures. These records shall be permanent and shall be filed with the commissioner.

b. The number of high risk and low risk elm trees anticipated; and,

c. The schedule for the continuous and orderly removal of low risk elm trees. The removal of low risk trees shall commence after the removal of all of the high risk trees identified prior to June 25, shall be conducted on a continuous basis and shall be completed prior to April 1 of the following year.

2. Dutch elm disease control.

a. Sanitation. All elm bark beetles, trees affected with Dutch elm disease, and any dead or weakened elm wood arising from any cause shall be eliminated in a timely manner within the control area of the municipality. This shall include trees on private property.

(1) Prior to April 1 of each year, municipalities shall inspect all public and private properties for elm wood or logs/stumps that could serve as bark beetle breeding sites, and require by April 1, removal, or debarking, of

all wood, logs, and stumps to be retained. Before making any inspection on private property within a municipality, it shall be the duty of the municipality to give notice of said inspection to all affected residents and property owners either through an individual oral or written notice, or by publishing said notice in a local newspaper.

(2) Each municipality shall inspect all elm trees within a control area at least three times during the growing season (by June 15, July 15, and August 15) for Dutch elm disease symptoms. For a control program to be most effective, it is highly recommended that continuous inspections be initiated in those areas where the incidence of the disease is severe.

(3) Due to a summer generation of elm bark beetles emerging in late July, the municipality's tree inspector shall be responsible for:

(a) Visually identifying whether a tree infected with Dutch elm disease has extensive wilt or is only showing early symptoms of the disease; and

(b) Categorizing trees infected with Dutch elm disease as either high risk trees or low risk trees.

(i) High risk elm trees shall be those trees that are dead, barren, or have extensive wilt [thirty (30) percent or more of the tree is wilted]. Such trees shall be identified, and marked in a distinctive manner to indicate their high risk status prior to June 25. These high risk trees located on public property shall be removed within twenty (20) days of identification; high risk trees located on private property shall be removed within twenty (20) days of notification of the property owner. Any high risk tree identified and marked after June 25 shall be removed within twenty (20) days of identification on public property and within twenty (20) days of notification on private property.

(ii) Low risk elm trees shall be those trees that show early stages of infection in June or subsequently during the growing season with those symptoms not progressing beyond the thirty (30) percent wilting point. Such trees shall be identified, marked, and removed before April 1 of the following year. Municipalities shall make every reasonable effort to remove all low risk trees on private and public property within twenty (20) days of notification, but in no case shall it be later than April 1 of the following year. Only methods of removal approved by the commissioner shall be utilized.

(4) All dead or diseased elm trees, including any above ground parts thereof on private property which are not removed within the time periods provided for in these rules or within the time limits established by the municipality, if more stringent, shall be removed by the municipality within twenty (20) days and the costs thereof assessed against the property.

(5) If upon application of the municipality the commissioner

has determined that extraordinary circumstances prevented the removal of the trees according to the schedule described above and that good cause has been shown by the municipality, the commissioner shall establish an alternative removal schedule based upon a program which will expedite their timely removal.

(6) All diseased elm trees including the above ground parts thereof shall be properly disposed of by such methods including burning, burying, chipping, and utilization.

(7) Stumps of all elm trees shall be removed or debarked to the ground-line to eliminate all possibilities of beetle habitation.

(8) Stockpiling and storage of elm logs with bark intact shall be prohibited except during the period September 15 through April 1 of the following year at locations specifically allowed by individual municipal permits or a municipal ordinance.

b. Root graft control. It is recommended to a municipality that all common root systems of trees growing within forty (40) to fifty (50) feet of a tree infected with Dutch elm disease should be disrupted by chemical or mechanical means as approved by the commissioner to prevent root graft spread of Dutch elm disease. (Refer to the Agricultural Extension Service, University of Minnesota Extension Folder 211-Revised 1977, "The Dutch Elm Disease", pp. 8-12.)

3. Oak wilt. Although oak wilt and Dutch elm disease are both vascular infections caused by a fungus, each infection shall be dealt with separately. Control methods prescribed for each disease are different, and again, shall be dealt with separately. Oak wilt control shall include the disruption of root grafts and the prevention of infection by insect-carried spores (overland spread).

a. Root graft control. Since most oak trees are susceptible to the fungus through root grafts, it is recommended to a municipality that all common root systems of trees growing within forty (40) to fifty (50) feet of a diseased oak tree of the same species should be disrupted by chemical or mechanical means to prevent the root graft transmission of the oak wilt fungus as approved by the commissioner. (Refer to Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".)

b. To control the overland spread of the disease, a municipality shall:

(1) Avoid pruning or other mechanical damage during the most susceptible period of May and June. A tree inspector may determine that emergency pruning by utility companies is necessary during this susceptible period if trees interfere with utility lines. If wounding is unavoidable during this period, as in the aftermath of a storm or when the tree interferes with utility lines, a tree wound dressing shall be applied.

(2) Red oak trees diagnosed as having oak wilt may be girdled as soon as they are detected in order to reduce spore production. Girdling shall be done only in areas where a weakened tree will not constitute a hazard to life and/or property should it fall.

(3) Identify, mark and remove from both private and public property by April 1 of the following year those trees in the Red Oak group that wilt in July and August that could have spores on them the following May or June. The trees in this group are the Northern Red Oak (*Quercus rubra*); Northern Pin Oak (*Quercus ellipsoidalis*); Black Oak (*Quercus velutina*); and Scarlet Oak (*Quercus coccinea*).

(4) After notification by the municipality, private property owners shall remove and properly dispose of diseased oak trees including any above ground parts thereof by April 1 by burning, burying, chipping, and utilization which includes the storage of the wood as set forth in Agricultural Extension Service, University of Minnesota Extension Folder 310-1975, "Oak Wilt Disease".

(5) Trees or parts thereof not removed on or before April 1 by the property owner shall be removed by the municipality within twenty (20) days after notification and the cost thereof assessed against the property.

(6) Stumps of Red Oak trees removed due to oak wilt shall be removed or debarked to the ground-line to eliminate all possibilities of spore formation.

E. Records.

1. Shade tree disease program records shall be kept by each municipality and shall be made available for examination at reasonable times by the commissioner. These records shall include the following:

a. Monies expended on personnel, equipment, and contracts, listed separately;

b. Man hours spent on tree inventory, sanitation, and any chemical measures;

c. An initial inventory of trees;

d. The number of diseased trees identified on private and public property, and the dates of identification;

e. The number and the dates of trees removed, both diseased and other, on private and public property;

f. The number of log piles found which were a hazard in the spread of a shade tree disease; and,

10. "Population" means the population of a municipality as published by the United States Bureau of Census in the most recent federal census.

§ 1.0110 Tree inspector.

A. Tree inspector employment and qualifications.

1. In order to be eligible for grants-in-aid pursuant to these rules, a municipality shall either individually or jointly with one (1) or more other municipalities employ or retain a tree inspector, on a continuous year round basis as provided by the act.

2. Provisional appointments.

a. A municipality may provisionally appoint a tree inspector for a period of not more than six (6) months.

b. This appointment shall be dependent upon approval by the Commissioner after determining the competence of the appointee.

c. The provisional appointment shall not be extended and the appointee shall pass the tree inspector examination to become certified.

d. The provisional appointment may be withdrawn for cause by the Commissioner upon notice and hearing.

3. A tree inspector shall be able to demonstrate the following qualifications:

a. Identify all native tree species, with or without leaves, common to his/her work area, and all felled or downed trees with bark intact;

b. Know and understand the biology of oak wilt and Dutch elm disease;

c. Be familiar with the problems of elm trees and oak trees other than those of Dutch elm disease and/or oak wilt, as well as identifying symptoms characteristic of these problems that affect oak and elm trees;

d. Know the proper method of collecting samples for disease diagnosis;

e. Know the appropriate Minnesota laws and rules relative to oak wilt and Dutch elm disease;

f. Know the approved control methods for oak wilt and Dutch elm disease; and,

g. Be familiar with the recommended tree species to be used in the replanting program, their planting requirements (available through the Uni-

versity of Minnesota Extension Service), and the care of these trees after planting.

4. If a municipality fails to appoint a tree inspector, an appointment may be made by the commissioner pursuant to the act. Ten (10) working days prior to such appointment, the commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the commissioner shall be paid by the municipality for a minimum of ninety (90) days, even though the municipality may appoint its own inspector prior to the expiration of ninety (90) days. This provision shall not apply to a municipality that has suspended or terminated the employment of a tree inspector for cause.

B. Certification of tree inspector.

1. A tree inspector shall be certified upon the passing of an examination prescribed by the commissioner for the purpose of determining that the applicant possesses the necessary qualifications set forth in this rule. The commissioner shall notify by mail each applicant and municipality of the time and date for such an examination. The applicant shall be notified of the results of the examination within fifteen (15) days after its administration.

2. After certification, a tree inspector shall be required to annually attend at least one (1) program of continuing education approved by the commissioner. Failure to attend one (1) such continuing education program, or failure to meet alternative certification requirements, shall terminate certification.

C. Certification alternatives. Upon written application, the commissioner shall grant to an individual an alternative for the certification requirement and procedures set forth in this rule provided that:

1. There is good cause why the individual cannot comply with the provision of this rule;

2. The requirements and procedures provided for in the alternative are equivalent to those set forth in this rule;

3. When an examination is involved, the subject matter and difficulty of the examination is equivalent to the examination for which the alternative is granted;

4. The intent of the act and these rules is not violated; and,

5. The environment or the public will not be adversely affected by the alternative requirements or procedures.

§ 1.0111 Shade tree disease control program. The shade tree disease control program of a municipality affected by 3 MCAR §§ 1.0109-1.0113 must in-

4. Request for payment shall include:

- a. The population of the municipality making the request for payment;
- b. A statement of actual sanitation and reforestation costs for the payment period;
- c. If advance payments for planned expenditures are sought by the municipality, a statement of planned expenditure for the succeeding payment period;
- d. The signature of an authorized agent of the municipality making the request for payment; and,
- e. Notorization of the agent's signature.

5. Grant payments for actual sanitation and reforestation costs incurred shall be a percentage of the actual costs stated in the municipality's request for payment; that percentage being the same percentage used to make the initial grant award.

a. Advance grant payments for planned sanitation and reforestation expenditures shall be a percentage of the planned expenditures for the succeeding payment period stated in the municipality's request for payment; that percentage being the same percentage used to make the initial grant award.

(1) In the event that planned expenditures exceed or are less than actual costs incurred by the municipality for a payment period for which advance payment was made, the appropriate adjustments shall be made in the next request for payment submitted by the municipality.

(2) In the event that over payment is made to the municipality by the commissioner because of an advance over payment for the last payment period of the calendar year, the municipality shall be liable to the state for the amount of over payment, and shall make payment of this amount to the state within thirty (30) days after notice of such over payment is received.

E. Eligible costs. Grants shall be based upon the total eligible cost of the municipality of its sanitation and reforestation program.

1. Sanitation activities on public and private lands which are eligible for grants shall include:

- a. Diseased tree identification and inspection;
- b. Disruption of common root systems;
- c. Trimming of elm and oak trees for purposes of disease control;

d. Girdling of oak trees where appropriate for purposes of disease control;

e. Removal and operational costs associated with the disposal of dead or diseased wood of elm and oak trees; and,

f. Subsidies for trees removed from private property pursuant to Minn. Stat. as amended, § 18.023, subd. 4.

2. Reforestation activities on public lands which are eligible for grants shall be limited to:

- a. Acquisition of nursery stock; and,
- b. Tree planting which includes only the initial cost of planting, watering, fertilizing, and staking. Maintenance costs thereafter shall not be eligible for reimbursement.

3. Grants shall be made only for costs incurred by the municipality in the actual and direct physical performance of sanitation and reforestation activities.

4. Grants shall be made for costs to be paid by:

- a. Ad valorem taxes;
- b. Special assessments pursuant to a municipal program whereby the sanitation activity is carried out by municipal employees or a contractor acting in behalf of the municipality; however, no assessment shall exceed the total of the sanitation cost less the amount of grant for such cost;
- c. A charge through direct invoice to a property owner pursuant to a municipal program whereby the sanitation activity is carried out by municipal employees or a contractor acting in behalf of the municipality; however, no charge against a property owner shall exceed the total sanitation cost less the amount of grant for such cost;
- d. Federal grants; and,
- e. In the case of a municipality with a population of less than 1000, documented "in kind" services or voluntary work from or by private sources.

3 MCAR § 1.0113 Grants-in-aid for wood utilization and disposal systems.

A. The commissioner shall within the monies appropriated, make grants-in-aid to eligible applicants for the cost of facilities, equipment, and systems for the disposal or utilization of diseased shade trees. Such grants-in-aid shall be made to:

- 1. Any home rule charter or statutory city.

g. Other information deemed relevant and necessary by the commissioner.

2. A yearly report containing a summation of these records shall be made to the commissioner by December 1.

F. Program review.

1. By December 31 of each year, a municipality must submit to the commissioner its shade tree disease control and replanting programs for the following calendar year. The commissioner shall review these programs to determine if the requirements of the law and the applicable rules have been met.

2. Final determination of municipal program compliance with the rules shall rest with the commissioner.

3. The commissioner may require that changes be made in any municipal program whenever a determination is made that such changes are needed to comply with the act or these rules.

3 MCAR § 1.0112 Grants-in-aid to municipalities for sanitation and reforestation program. The commissioner may, in the name of the state and within the limits of appropriations provided, make grants-in-aid to a municipality with an approved disease control program for the partial funding of municipal sanitation and reforestation programs. One grant shall be made for all eligible sanitation and reforestation costs.

A. Sanitation and reforestation grants.

1. Sanitation. Grants to any municipality for sanitation shall not exceed fifty (50) percent of the municipality's total cost for sanitation approved by the commissioner. The total cost may include any amounts paid for sanitation by special assessments, ad valorem taxes, federal grants, or other funds. A municipality may assess to the abutting property not more than fifty (50) percent of the expense of treating with an approved method or removing diseased shade trees located on street terraces or boulevards to that abutting property.

Grants shall not be made to a municipality if the total cost of tree removal has been incurred solely by the individual property owner and the municipality has not reduced the cost to the property owner via direct subsidy or reduced special assessment. The only amount that may be included in the municipality's total cost for purposes of computing the above described reimbursement is the reduction of the cost to the property owner. Provision is made for municipalities with population of less than 1,000 pursuant to Minn. Stat. 18.023, subd. 3c, as amended.

2. Reforestation. Grants to any municipality for reforestation shall not

exceed fifty (50) percent of the cost to the municipality for reforestation on public property. Grants shall not exceed fifty (50) dollars per tree planted.

a. Reforestation grants to any county with an approved disease control program may include ninety (90) percent of the cost of planting the first fifty (50) trees on public lands in a town not defined as a municipality of less than 1,000 population, upon the town's application to the county and county's designation of the town as a disease control area. The grant for these fifty (50) trees shall not exceed sixty (60) dollars per tree planted.

b. Reforestation grants to towns and home rule charter or statutory cities with an approved disease control program which are defined as municipalities in the act and are less than 4,000 in population may include ninety (90) percent of the cost of planting the first fifty (50) trees on public lands. The grant for these fifty (50) trees shall not exceed sixty (60) dollars per tree planted.

c. Any municipality that receives a grant for reforestation shall have appointed seven (7) residents of the municipality or designate an existing municipal board or committee to serve as a reforestation advisory committee to advise the municipality in the development and administration of the reforestation program.

B. Program eligibility. A municipality is eligible to receive sanitation and reforestation grants upon submitting to the commissioner by December 31 a completed program application form provided by the commissioner, and upon receiving notice of an approved disease control program designation. Extensions shall be granted for good cause shown.

1. The program application shall serve as the basis for approving the municipality's shade tree disease control program.

2. Approval shall be granted only upon the municipality's agreement to conduct its sanitation program in conformance with these rules and disease control practices designated by the commissioner upon the recommendation of the Shade Tree Advisory Committee.

3. Approval shall only be granted upon the municipality's agreement to conduct its reforestation program in a manner consistent with advice and counsel given the commissioner by the Minnesota Agricultural Extension Service.

4. Program approval may be revoked upon a determination by the commissioner that the municipality has failed to conduct its sanitation and reforestation program in conformance with the standards set forth in this rule. Such a determination or disapproval of a municipal program or control area may be appealed by the municipality and upon request, a hearing pursuant to Minn. Stat. ch. 15 shall be granted.

5. Sanitation and reforestation grants may be terminated upon municipi-

pality's failure to maintain an approved shade tree disease control program and upon evidence that proper record-keeping and documentation has not been maintained.

C. Program application. To receive a sanitation and reforestation grant, a municipality must submit to the commissioner by December 31 a completed program application form provided by the commissioner.

1. A municipality's program application shall include, but not be limited to the following information:

a. An inventory of shade trees within the municipality's disease control area and an estimate of the distribution of these shade trees between public and private lands;

b. A complete description of the municipality's sanitation and reforestation programs which shall include:

- (1) The method and schedule of diseased trees surveys;
- (2) The extent of disease control tree trimming activities;
- (3) The policies for removal of trees on public lands;
- (4) The policies for removal of trees on private lands;
- (5) The method and location of disposal tree wastes;
- (6) The policies for planting new shade trees, including:

- (a) The source of nursery stock, if known;
- (b) Species planted;
- (c) Type of stock planted;
- (d) Distribution of species; and,
- (e) Other relevant information;

(7) The methods of financing sanitation and reforestation programs, including:

- (a) The use of funds derived from general tax levies;
- (b) Special assessments;
- (c) Federal funds;
- (d) Other sources of funding; and,

(8) A complete description of the municipality's subsidy program, if any.

(9) The name or names of the person or persons or committee appointed by the municipality to advise the municipality in the development and administration of the reforestation program.

c. A statement of planned expenditures for the sanitation and reforestation program for the calendar year.

d. A copy of the local ordinances and resolutions authorizing the local shade tree program.

e. Other information deemed necessary and relevant by the commissioner.

2. Except for the first fifty (50) trees for towns and cities as set forth in 3. below, grants for sanitation and reforestation shall be fifty (50) percent of the applicant's planned expenditures for sanitation and reforestation, unless fifty (50) percent of the total planned expenditures for all applicants exceeds the funds designated for sanitation and reforestation grants; in which case, grants shall be a pro rata allocation among the eligible applicants. Reforestation grants shall not exceed fifty (50) dollars per tree planted.

3. Grants for planting the first fifty (50) trees on public lands in eligible towns and cities may be ninety (90) percent of the town's or city's planned expenditures for planting those trees, providing the availability of sufficient funding. The grant for these fifty (50) trees shall not exceed sixty (60) dollars per tree planted.

D. Request for payment. A municipality receiving a sanitation and reforestation grant shall make request for payment upon forms provided by the commissioner.

1. Payment periods shall be January 1 through March 31; April 1 through June 30; July 1 through September 30; and, October 1 through December 31 of each calendar year.

2. Requests for payment shall be due forty-five (45) days after the close of the preceding payment period unless the municipality has requested and received an extension of time from the commissioner. Costs in one request for payment period may be carried over into a succeeding payment period, but shall not be carried over into a succeeding calendar year.

3. Requests for payments may be for the lesser of actual costs incurred or costs not to exceed the limits established by the commissioner during the payment period for which documentation for such costs and expenditures can be produced upon request of the commissioner. Requests may also be made for advance payments for planned expenditures for the succeeding period.

2. Any special purpose park and recreation board organized under a charter of a city of the first class;

3. Any non-profit corporation serving a city of the first class; or,

4. Any county.

B. Such grants shall be made with the following provisions:

1. The city (cities) or county has an approved shade tree disease control program as described in the act or these rules.

2. Grants-in-aid may be less than but shall not exceed fifty (50) percent of the cost of such facility, equipment, or system;

3. Grants-in-aid shall not be made for costs of operating such facility, equipment, or system;

4. Grants-in-aid for site acquisitions shall be made only for land used in the actual operational site;

5. Grants-in-aid shall not be made by the commissioner until he receives certified evidence of the actual cost of the equipment or site; and,

C. Criteria for administration of grants-in-aid.

1. Grants-in-aid to eligible applicants shall be made by the commissioner provided that such wood disposal utilization system meets the following criteria:

a. It aids in the control of shade tree diseases;

b. It aids in the recovery of material or energy from wood.

c. It is located to accomplish the above with maximum efficiency and use of available facilities;

d. It is available to all parties, public and private;

e. It is able to render wood pest-risk free within five (5) days of delivery to the site unless an extension of time has been granted by the commissioner based on existing circumstances of the disposal/utilization site;

f. It includes adequate manpower to operate and service equipment; and,

g. It provides for proper handling and the timely removal of processed wood from the site.

2. In addition to the general criteria under C. 1. above, the commission-

er, as appropriate, may consider other specific criteria including the following in evaluating grant payment requests:

a. Sites for wood disposal systems;

(1) Shall be selected on the basis of anticipated volumes of wood and/or the need for a wood disposal system;

(2) Shall be accessible by roadways that permit year-round truck traffic;

(3) Shall have adequate storage areas for both processed wood and equipment;

(4) Shall have protective enclosures, adequate control, and supervision to prevent entry of unwanted materials and unauthorized persons;

(5) Shall be in compliance with all applicable federal and state statutes, rules and regulations; and,

(6) Shall be in conformance with regional solid waste management plans and requirements.

b. Equipment for wood disposal systems:

(1) Shall, where feasible, be portable so that it can be used for servicing more than one site;

(2) Shall be stationary only when the anticipated volume over a five-year period will fully utilize the facility;

(3) Shall be capable of processing large-diameter logs; and,

(4) Shall include auxiliary units and equipment necessary to the operation of the system.

3. Requests for grant-in-aid payments shall be made on forms provided by the commissioner. Contingent upon the availability of funds, the timeliness of applications and other administrative considerations, the commissioner may set deadlines for consideration of requests which shall be published in the State Register at least thirty (30) days prior to the deadline. Requests for payments shall include the following:

a. An itemized list of the applicant's proposed expenditures for qualifying equipment and/or site, and the total amount of these expenditures; and,

b. Additional documents or other information deemed relevant by the commissioner.

4. Records.

a. Applicants receiving grants-in-aid under this rule shall keep detailed records concerning the operation of the wood disposal and utilization system and shall make these records available to the commissioner at any reasonable time. Such records shall include:

(1) Hours of operation;

(2) Clientele served;

(3) Volume of wood handled; and,

(4) Other information deemed necessary and relevant by the commissioner.

b. A yearly report containing a summation of these records shall be made to the commissioner by December 1.

NICHOLAS D. COLEMAN
Senator 5th District
Majority Leader
208 State Capitol
St. Paul, Minnesota 55155
(612) 296-4105

Senate

State of Minnesota

May 4, 1976

MEMO

TO: Bill Riemerman

Ronnie Brooks

SUBJECT: Elm Reforestation

I don't place the matter of shade trees in the same categories as pressing human needs. Nevertheless, the certain loss of our elm trees is a very serious matter. I am not sure that anybody is taking a coordinated look at the matter. I would like the 1977 session to face this problem.

A year ago I talked to the forestry people in the Agricultural Extension Service at the University of Minnesota about preserving elms. They had only tenuous proposals. In addition no one was talking about a genuine replacement program. Since that time I understand if you want a shade tree of any dimension that you have to stand in line and wait a considerable length of time. In order to prepare a proposal I would like a complete report on the expected rate of demise of the elms (I understand that elms have an average life of 75 years and are due to die whether or not there are beetles). And what is being done to replace them with something other than a quarter inch sampling, a tree so small they have to be protected from rabbits? What would the state - counties - city have to do to make sure that the magnificent elm was replaced with a respectable size tree? Should there be a program of temporary replacement with fast-growing softwood trees along with a mix of the slower growing hardwoods? How many trees of what kind will it take? Where are they growing now? Why ain't they?

I am sure that there are nature lovers in your sections who would dearly love to come up with a proposal and I trust that you will seek them out and turn them loose.

Warmest Wishes.

STATE OF MINNESOTA
OFFICE OF SENATE RESEARCH

C7

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August 6, 1976



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DUTCH ELM DISEASE INFORMATION

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LEGISLATIVE LIBRARY
STATE OF MINNESOTA

The American Elm & Oak

American Elm, which is by far the most common of our native species, grows naturally in moist sites throughout Minnesota. Most of the trees in Minnesota's urban areas are either Elm or Oak.

The Elm is the predominant tree planted in the older cities and smaller town areas. Minneapolis has 90% Elm trees or about 171,000. St. Paul has 80% Elm trees or about 131,000. Bloomington has 400,000 Elms. 1975 inventory figures indicate 3.9 million Elms in the 7 county metro area.

The Oak is the predominant tree type in the newer suburbs. 1975 inventory figures reveal 6 million Oaks in the 7 county metro area.

Dutch Elm Disease

Dutch Elm disease is a vascular disease, caused by a fungus technically called Cerotocytis Ulmi. After being introduced into the water conducting vessels of the sapwood of an elm, by the feeding activities of elm bark beetles, the fungus is able to grow and spread throughout the tree. Substances produced by the fungus stimulate the production of gums which plug the water supply available to the

leaves. Also, substances produced by the fungus poison the leaf tissues. Affected trees show characteristic wilt symptoms and later die.

This disease is carried from diseased to healthy trees most commonly by the elm bark beetle. This beetle breeds in dying and dead elm trees. The fungus grows and fruits abundantly in beetle galleries. Beetles emerging from these galleries carry the fungus on them. They feed in the young twig crotches of healthy trees and, while feeding, deposit the fungus in the feeding wounds.

The average life expectancy of an American elm is 75-150 years, but Dutch elm disease can bring them to the ground in 2-3 years.

There is now no cure for Dutch elm disease. Trees have no immunity system as do animals, therefore most plant diseases, like Dutch elm disease, in all probability can never be cured.

Dutch Elm disease was brought into the United States from Europe around 1930. Apparently, it was carried across the Atlantic by elm logs imported for the purpose of making elm veneer in Ohio. These logs were host to the European bark beetle and were probably infected with the fungus. The bark beetles emerged from their breeding place and transferred the disease to elms in the neighborhood. The American bark beetle then picked it up and began to aid in the spread

From Ohio, the disease quickly spread into the northeastern states and eastern Canada. Today the disease can be found in 40 of the 48 states.

Eight infected trees were first found in Minnesota in 1961; 2 more were found in 1962, 43 in 1963, over 49 in 1966 and 136 in 1967

Oak Wilt

Oak wilt is caused by a fungus which is spread by insects and through root grafts. The fungus attacks and kills the entire tree. The only effective control is removal of diseased trees before the fungus can produce more inoculum. The disease devastates entire stands of oak, and once in a stand, it spreads at the rate of 25 feet per year.

Recent Losses

Oak Wilt: In 1974, 6787 oak trees were lost to wilt in the 7 county metro area. In 1975, 6981 oaks were diseased. As of July 1, 1976, 1655 oaks were marked as diseased and 1098 were removed.

While oak wilt remains a serious problem due to the large number of oak trees in the area, it is easier controlled than Dutch Elm Disease.

Dutch Elm Disease: In 1974, 9792 elm trees were lost to dutch elm disease in the 7 county metro area. In 1975, over 27,000 were found to be diseased. 1976 losses are expected to be around 50,000. The disease has reached monumental proportions. The cost of removal may be as high as \$12 or \$13 million for 1976 alone, not to mention replacement costs.

Sanitation and Control

The bark beetle prefers to breed in dead, dying or devitalized elm wood, so it is possible to prevent the development of large numbers of beetles by the timely destruction of trees affected by Dutch elm diseases. Piles of elm logs, dead or weakened elm branches on healthy

trees or elms weakened by some other cause also are suitable for beetle breeding and should be destroyed. Special emphasis has been placed on removing all potential beetle breeding material by April of each year which is about when young beetles begin to leave the dead trees and move to new feeding grounds, namely living, healthy elm trees. Debarking methods are being used to destroy the beetle yet save the wood for pulp and lumber uses. Burning is the most complete answer to destruction of diseased trees and bark beetles, however PCA's ban on burning remains in effect. Most diseased elms are ending up in sanitary land fills throughout the metro area.

DDT was used as a control method until 1972. However, with EPA's ban of the highly toxic chemical, methoxychlor has become the predominant spray used on elms.

Sanitation practices destroy reservoirs of infection and breeding places for the beetles that carry the Dutch elm disease fungus. Spraying healthy trees protects them against infection by killing fungus-bearing beetles that attempt to feed on them.

Dutch elm disease can be passed from tree to tree through the root systems as well as through bark beetle carriers. Root graft transfer can be cut back somewhat through the use of Vapam, a chemical introduced into the ground between trees.

A Cure?

No treatment is known that will cure a tree once infection has spread into the trunk. Many research groups, both private and public, continue to search for chemicals which will prevent or cure the disease. Tests, to be valid, must be carried on over a period of

several years and must involve a large number of trees.

Although there are several fungicides undergoing tests at the present time, the only material approved by the EPA to date for injection as a "control" for Dutch elm disease is a product called Lignasan BLP.

Lignasan BLP is 0.7% active ingredien (Methyl 2-benzimidazolecarbamate phosphate) and 99.3% inert ingredients. It is manufactured by DuPont Chemical Company and is available in 5 gallon demijohns. Lignasan has been and continues to be researched and tested on thousands of elms in Canada and the United States. It is fully endorsed by the Elm Research Institute, a non-profit research and educational organization founded in 1964 and located in Harrisville, New Hampshire.

According to the EPA approved Lignasan label, 1 quart of Lignasan should be mixed with 8 gallons of water for "protective" treatment and 1 quart of Lignasan should be mixed with 4 gallons of water for "therapeutic" treatment. Two (2) gallons of the diluted solution for each 4 inches of tree diameter (or for each foot of circumference) measured at crest height, using multiple injection sites (6 inches apart) as close to the ground level as possible is the recommended treatment. Low pressure (10 to 30 pounds per square inch) is suggested on injection pumps. Treatments are recommended annually usually during the first week in June. There are no guarantees for Lignasan, and the label warns that treatment of a tree with crown damage over 5% may not be effective.

The cost of Lignasan is \$9-\$11 per gallon. The tree injector apparatus providing pressure application is available from the Elm

Research Institute for around \$100 per kit. Gravity flow application does work especially on healthy elms.

Numerous neighborhood groups and individuals have either contracted out or have done the injection themselves. At least 10-15 companies are providing Lignasan injections to the metro area for a cost of \$20-\$100 per tree depending on tree size and number of trees per block.

The U.S. Forest Service Research group in Detroit, Michigan has conducted 5 years of experiments with Lignasan. The mixture they use is 5 times as strong as the 1:4 mixture on the Lignasan label. Using a pressure of 70 pounds per square inch, the Forest Service has cut the average treatment time (A.T.T.) to 12 minutes per tree (30 minutes total including tree hook up and disconnecting). Preliminary research has revealed that if treatment is done before the tree is 20% diseased and if the diseased portions of the tree are properly pruned, there is a 90% chance of recovery for that tree. The high pressure is necessary to push the extra-rich mixture into not only the free flowing veins of the tree but also into the diseased areas as well. Gravity pull works fine except the tree will only pull the solution into the free-flowing veins of the tree.

Dr. David French, a plant pathologist at the University of Minnesota feels that the present Lignasan label is far too weak. However, because of EPA regulations, any application of Lignasan over the approved dosage is against the law.

Hopkins Agricultural Chemical Company of Madison, Wisconsin is the sole Mid-Western distributor of Lignasan. According to Paul Steinbrecher, General Manager of Hopkins Chemical, the Lignasan market

is limited to states like Minnesota this year because of the late date that EPA approved Lignasan (May 12, 1976). While Lignasan remains "basically experimental," according to Steinbrecher, sales are expected to increase next spring as markets in Kentucky, Missouri, and Colorado open up.

However, even EPA admits that Lignasan is probably not a cure-all.

State Involvement

On March 30, 1974, the Legislature passed the Shade Tree Disease Law (M.S. 18.023), the purpose of which was to provide for the establishment of Dutch elm disease and Oak wilt control programs by every metropolitan municipality. Two important basic elements of the law were the provision for the appointment and certification of a tree inspector by each municipality and the inclusion of authority for a special tax levy outside of all existing tax limitations.

In 1975 the state legislature added language to provide a grant program for partial funding of municipal programs of subsidies to residential property owners for treatment or removal of diseased trees and for aid to cities over 80,000 population and counties for up to 50% of the cost of wood utilization or disposal systems. The legislation also authorized the Commissioner of Agriculture to promulgate rules and regulations prescribing minimum shade tree disease control measures for outstate cities, counties and towns. \$1.6 million was appropriated for fiscal years 1976/1977. Funds were earmarked for various program elements: public education (\$45,000); tree waste disposal/utilization (\$700,000); private property subsidies (\$800,000);

and, administration (\$50,000).

Sixty-one (61) communities are participating in the grant program. Twenty-three (23) of these communities are outside the metropolitan area.

St. Paul and Minneapolis were awarded \$230,000 for a large capacity chipping facility to be located in the Pigs Eye area. The chipper is expected to be in operation in early 1977.

The Department of Agriculture is presently in the process of formulating a new budget proposal which is expected to ask for at least \$4.5 million for the present activities of the Shade Tree Disease Control Program.

Present private property subsidies are limited to 25% of the cost of removal (or a maximum of \$50 per tree) but may only match and not exceed the municipal subsidy. It is possible that the formula could be changed to provide a 50-50 match, which would increase the cost to the state while reducing the total cost to the municipality or county.

Replacement Efforts and Costs

Presently no state money is used for replanting. It is also possible that state involvement may be necessary in this effort in some formula match such as 25-75 or 50-50. Any state involvement in reforestation efforts would mean additional costs to the program.

The Minneapolis Approach

Of the 300,000 trees in Minneapolis, 95,000 on public property, 121,000 are in parks, and 75,000 are on private property. 75-80 percent of the public trees are elm; 20 percent of the park trees are

elm. There are few oak in the city. In 1975, Minneapolis planted 10,000 trees on public areas. Another 5,000 were planted in the spring of 1976. Another 5,000 will be planted this fall. This effort is part of a 4-year plan to plant 40,000 trees. While Minneapolis maintains a city nursery, 8,000 of the 10,000 trees planted in 1975 came from private nurseries. Fifteen to eighteen types of trees are being planted in Minneapolis. However, no elms and few oaks are being used. The city is planting "bare-root" trees, which are 2-2½ inches in diameter and cost about \$20 per tree. In 1976, \$200,000 will be spent on tree purchases, money raised through property taxes.

The St. Paul Approach

In 1975, the city planted 2,000 trees. In 1976, that number may climb to 2,500. There are 80,000 public property trees in St. Paul; 53,000 of them are elm. In addition, there are 20,000 park trees, and 50,000 private property trees in the city. Twelve to fifteen types of trees are being planted, but no elms and few oaks are being used. About \$370,000 will be spent on tree purchases in St. Paul this year. The city plants 2½-3 inch diameter trees surrounded by enough ground to contain the main root system. The cost per tree is \$140, which includes a one-year guarantee. The city maintains a nursery, but to date no trees have been taken from the site. According to a St. Paul official, only about half the needed replacements in the city are being made due to the limited money.

Control or Replacement?

According to all the experts we talked to, consensus was that the genuine replacement program is of little value without a good control program. A good control program would spread the cost of removal and replacement out over enough years to provide for a health transfer from elm trees to a multi-variety-urban-type forest.

Other American cities have kept elm losses down through an effective control program. Evanston, Illinois still has 75% of its original elms. Syracuse, New York was able to keep its elm losses under 2% until 1965, when financial problems resulted in less money being made available for the control program. Detroit, Michigan had a good control program, but big city financial worries are causing elm losses to increase drastically. Other cities like Champaign-Urbana, Illinois were unprepared for Dutch elm disease control and lost almost all their elms in the mid 1950's. In 1976, there are 20 elm trees left in Champaign-Urbana, 12 in Urbana and 8 in Champaign.

A good control program is a necessity. Diseased trees must be brought down as quickly as possible. The 20-day removal law in Minnesota is highly regarded and-respected but at the same time is unworkable and impossible in some cases. But every effort must be made to remove and destroy diseased elms as soon as physically possible after marking.

Replacement tree types in the 7 county metro area include ash, linden, honeylocust, maple, and hackberry. While a new hybrid "urban elm" that is apparently resistant to Dutch elm disease is being developed by the USDA, no elms and few oaks are being planted presently. With no positive cure in sight it appears to be wise to stay away from

these two types, at least for the time being.

Most shade trees need 15-20 years to reach 6 inches in diameter, which can be considered a fair sized shade tree. Private nurseries have been able to provide ample supply of desired trees. However, some city nurseries such as Minneapolis and St. Paul maintains, are being used to develop additional supplies.

The argument over bare root vs. balled and burlapped trees can be developed either way. Bare root trees are much less expensive and if handled properly can maintain a low loss posture. Balled and burlapped trees, while more expensive, add the dimension of a more complete root system and possibly up to an extra inch in the diameter of a young tree. There are places and situations for both types of trees.

Conclusions:

Without a doubt, Dutch Elm disease is here to stay. While we cannot provide an absolute cure for the disease yet, we can control its spread. Good sanitation programs remain the key.

The State of Minnesota has a vested interest in its trees. While being a renewable resource, trees need considerable time to grow. Our Elm population may be doomed, but we can save some of them through doing away with the diseased ones.

Areas of State Involvement

1. Need for better disease control and enforcement.

Present Minnesota Shade Tree Disease Control Program appears to be the logical place to start from and build on to. Presently,

there are 3 field inspectors for 168 metro municipalities and the total outstate area. Last year, 9,000 diseased elms were left standing or piled up somewhere in the metro area that provided a perfect breeding ground for the beetle.

2. Better Identification of Diseased Trees

Diseased trees need to be identified and destroyed. There aren't enough tree inspectors to get the job done. More inspectors need to be trained and hired.

3. Better Public Education

If you have a diseased tree in your back yard would you know it? Public service TV spots, action lines, brochures, etc. all could be used to better educate the general public as to the signs of Dutch Elm disease and what to do about it.

4. Genuine Replacement Program

Presently, all replacement efforts are handled by municipalities. With continued heavy losses in the metro area the need for an increased reforestation effort becomes even more important.

5. Continued Research and Experimentation with Lignasan and other Chemicals

While Lignasan may or may not be a cure that everyone is looking for, it's early experiments have been fairly successful. Continued research may be necessary, but many people are willing to try it now. The value of Lignasan is especially high in areas of highly valued historic trees such as under the Capitol or on Summit Ave., etc.

Other chemicals such as Vapam and Pheromone (used in a synthetic

"multi-lure" fly trap device for European bark beetles) need to be developed farther and applied where possible.

6. Tax Deduction or Tax Credit

It is possible that homeowners could be given a tax deduction or even a tax credit for tree removal costs, replacement costs, Lignasan treatment costs, or any combination of the three.

7. Lift the PCA ban on tree burning

PCA remains adverse to allowing municipalities to burn any trees. Present disposal in sanitary land fills is bulky, time consuming, and expensive.

8. Appeal to EPA for increased strength in Lignasan mixture

Research tests indicate the EPA approved Lignasan label is far too weak. But to use a stronger mixture is against the law.

ATTACHMENTS

1. State Map Indicating Dutch Elm Disease in Rural Areas - 1974
2. Elm Losses - Metropolitan area (1974-75)
3. Oak Losses - Metropolitan area (1974-75)
4. Syracuse, N.Y. Losses (July 1969)
5. Champaign-Urbana Losses (May 1974)
6. Summary Report Minnesota Department of Agriculture Shade Tree Disease Control Program (July 30, 1976)
7. Lignasan BLP Label by DuPont
8. Environmental Protection Agency News Release on Lignasan (May 13, 1976)
9. Hopkins Agricultural Chemical Company News Release on Lignasan
10. Elm Research Institute Pressure Injector #104 diagram
11. Hopkins Chemical Gravity Pull Elm Treater diagram

1974

1975

METRO COUNTY	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
Anoka	111,893	1,097	.98	677	61	122,617	2,057	1.70	1,414	68
Carver	166,232	37	.02	59	--	95,549	107	.11	97	90
Dakota	384,286	870	.23	577	66	786,319	4,041	.51	2,397	59
Hennepin	1,215,376	2,419	.20	2,259	93	1,608,662	8,145	.51	5,548	68
Ramsey	345,473	3,074	.90	1,728	56	349,900	8,577	2.45	5,951	69
Scott	819,121	95	.01	84	88	754,059	317	.04	295	93
Washington	303,955	2,200	.72	1,233	56	183,793	3,800	2.01	2,360	62
TOTAL	3,346,336	9,792	.29	6,616	67	3,900,899	27,044	.69	18,062	66

TABLE 1

ELM LOSSES - METROPOLITAN AREA

1974

1975

METRO COUNTY	OAK INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	OAK INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
Anoka	391,572	1,057	.27	749	71	273,545	1,288	.47	1,188	92
Carver	120,771	4	.003	50	--	90,872	4	.004	3	--
Dakota	1,590,074	2,909	.18	2,054	70	2,816,450	1,903	.07	1,520	30
Hennepin	654,983	1,484	.23	344	23	708,365	1,007	.14	492	48
Ramsey	411,628	1,009	.24	246	24	516,363	1,479	.29	896	60
Scott	815,132	71	.009	81	--	547,286	56	.01	48	85
Washington	1,056,229	253	.02	156	61	1,107,376	1,244	.11	712	57
TOTAL	5,040,389	6,787	.13	3,680	54	6,060,257	6,981	.11	4,859	69

TABLE 2

OAK LOSSES - METROPOLITAN AREA

Table 1. Summary of losses by Dutch elm disease (DED), bark beetles (BB), and miscellaneous causes from 1951 to 1967^a.

SYRACUSE, N.Y.

Year	Total : elms	Loss : by DED	% loss : by DED	Loss by : BB and misc.	% loss by : BB and misc.	Total : loss	Total : % loss
<u>Minimum sanitation (Initial disease buildup)</u>							
1951	53,618	1	0.00	56	0.10	57	0.10
1952	53,551	7	0.01	54	0.10	61	0.11
1953	53,500	19	0.03	68	0.13	87	0.16
1954	53,413	181	0.33	116	0.22	297	0.55
1955	53,116	657	1.24	97	0.18	754	1.42
1956	52,362	864	1.65	57	0.11	921	1.76
1957	51,441	1,055	2.07	85	0.17	1,152	2.24
Total		2,795		534		3,329	
<u>Maximum sanitation (Disease stabilized)</u>							
1953	50,289	425	0.84	43	0.09	473	0.94
1959	49,816	817	1.64	26	0.05	843	1.69
1950	48,973	581	1.19	39	0.08	620	1.27
1961	48,353	510	1.05	155	0.32	666	1.37
1962	47,687	529	1.11	187	0.39	716	1.50
1963	46,971	751	1.60	198	0.42	949	2.02
1964	46,022	748	1.63	107	0.21	855	1.86
Total		4,361		761		5,122	
<u>No sanitation (Disease epidemic)</u>							
1965	45,167	2,597	5.75	177	0.39	2,774	6.14
1966	42,393	4,053	9.56	271	0.64	4,324	10.19
1967	38,859	5,687	14.94	325	0.85	6,012	15.76
Total		12,337		773		13,110	
Grand Total		19,493		2,032		21,561	

^aIn the miscellaneous category are trees weakened by drought, insect defoliation and adverse site factors.

When it became apparent that considerable disease transmission was occurring through root grafts, recommendations were made to use sodium methylthiocarbamate (Vapam) to prevent underground spread of the pathogen. No funds were appropriated for this purpose, however, and by then funds available for sanitation were inadequate.

OBSERVATIONS AND PROCEDURE

From 1951 through 1954, every elm suspected of having the disease was tested by plate culture. The incidence of other wilt-producing fungi, such as species of *Verticillium* and *Cephalosporium*, was insignificant. Cultures were also made from random collections of elm bark beetles to determine the percentage contaminated with the Dutch elm disease pathogen. As high as 32% of the bark beetles in some areas of the city had the pathogen spores on or within their bodies. Based on the isolations made in laboratory tests, it was apparent that strains of the fungus were present. The effect of the disease on trees varied from mortality during the first season of disease detection to death 2 or 3 years after detection. In 1953-1966, losses from the disease on publicly-owned property were significantly greater than those on private property. It is assumed that the publicly-owned trees were growing on sites less conducive to vigorous growth, and thus were more attractive to infestation by bark beetles. During the period from 1951 to the present, there has been no extensive use of dormant DDT or other insecticidal sprays to prevent inoculation of elms by bark beetles. It was shown in 1953 that 37% reduction in disease incidence was obtained by the use of dormant DDT sprays alone (2); however, less than 1% of the elms in the City of Syracuse, including those on private property, were sprayed. Thus, the sanitation program was the primary means of control. The city did apply DDT sprays during May and June, however, to combat defoliating insects. While such foliar application may have killed some bark beetles, it was applied too late and of insufficient concentration to prevent any significant infection by bark beetles.

In 1960 a survey made of tree species within the city limits of Syracuse revealed that of 47,000 street trees, 19,838 were elms and 21,731 maples. These two species represented approximately 88% of the total number of street trees. In addition, there were 19,946 elms on

Table 7.—Elms killed by phloem necrosis and Dutch elm disease in Champaign-Urbana, Illinois, from 1944 through 1972.

Year	Residual Elm Population	Elms Killed Annually by Phloem Necrosis			Elms Killed Annually by Dutch Elm Disease			Elms Killed Annually by Both Diseases		
		Number	Percent of Original Population	Percent of Residual Population	Number	Percent of Original Population	Percent of Residual Population	Number	Percent of Original Population*	Percent of Residual Population*
1944	14,103	2	0.01	0.01	...	...	...	2	0.01	0.01
1945	14,101	1	0.01	0.01	...	...	...	1	0.01	0.01
1946	14,100	2	0.01	0.01	...	...	...	2	0.01	0.01
1947	14,098	3	0.02	0.02	...	...	...	3	0.02	0.02
1948	14,095	8	0.06	0.06	...	...	...	8	0.06	0.06
1949	14,087	99	0.70	0.70	...	...	...	99	0.70	0.70
1950	13,988	313	2.22	2.24	...	...	...	313	2.22	2.24
1951	13,675	359	2.55	2.63	1	0.01	0.01	360	2.55	2.63
1952	13,315	555	3.94	4.17	11	0.08	0.08	566	4.01	4.25
1953	12,749	388	2.75	3.01	164	1.16	1.29	552	3.91	4.33
1954	12,197	179	1.27	1.47	694	4.92	5.69	873	6.19	7.16
1955	11,324	123	0.87	1.09	1,805	12.80	15.94	1,928	13.67	17.03
1956	9,396	60	0.43	0.64	1,836	13.02	19.54	1,896	13.44	20.18
1957	7,500	368	2.61	4.91	2,116	15.00	28.21	2,484	17.61	33.12
1958	5,016	344	2.44	6.86	1,770	12.55	35.29	2,114	14.99	42.15
1959	2,902	148	1.05	5.10	1,804	12.79	62.16	1,952	13.54	67.26
1960	950	12	0.09	1.26	689	4.99	72.53	701	4.97	73.79
1961	249	3	0.02	1.20	119	0.54	47.79	122	0.86	49.99
1962	127	1	0.31	0.79	31	0.22	24.41	32	0.23	25.20
1963	95	4	0.03	4.21	9	0.06	9.47	13	0.09	13.68
1964	82	4	0.03	4.88	1	0.01	1.22	5	0.04	6.10
1965	77	1	0.01	1.30	4	0.03	5.19	5	0.04	6.49
1966	72	1	0.01	1.39	1	0.01	1.39	2	0.01	2.78
1967	70	3	0.02	4.29	0	...	...	3	0.02	4.29
1968	69 ^b	2	0.01	3.33	1	0.01	1.67	3	0.02	5.00
1969	57	0	...	...	1	0.01	1.75	1	0.01	1.75
1970	56	3	0.02	5.36	0	...	...	3	0.02	5.36
1971	53	5	0.04	9.43	0	...	...	5	0.04	9.43
1972	48	3	0.02	6.25	5	0.04	10.42	8	0.06	15.67
Total or percent		2,994	21.23		11,062	76.44		14,056	99.67	

* Some percentages in this column are not exact totals of the corresponding percentages in preceding columns because all percentages have been rounded to two decimal places.

^b Seven trees that were not diseased but were severely damaged by ice in January 1968 were removed. Healthy trees removed because of construction or any other cause have not been included in this study.

MAY 1974 GARDNER & GARDNER PHLOEM NECROSIS AND DUTCH ELM DISEASE 131

SUMMARY REPORT

MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE DISEASE CONTROL PROGRAM

Prepared for the Minnesota Shade Tree Advisory Committee
July 30, 1976

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As a result of the Shade Tree Advisory Committee's recommendations for fiscal years 1976/1977, legislation was passed which appropriated 1.6 million dollars for shade tree disease control. Funds were earmarked for various program elements; public education (\$45,000); tree waste disposal/utilization (\$700,000); private property subsidies (\$800,000); and, administration (\$50,000). The Department's law enforcement activities are funded from the Department's budget appropriation.

PUBLIC EDUCATION

The public education program was implemented by contracting for a public education package with a local advertizing agency. The contract price was \$38,700 and almost all services contracted for have been completed. Six radio spots, four T.V. spots, and a multimedia slide show have been produced. The contractor has arranged nine major media events. Eleven 16 mm movies have been made from the slide show at an additional cost of \$1300.00. A balance of \$5,000 remains in the public education fund.

Public education efforts were notably successful in the area of news media exposure. The public service announcements produced were of high quality, with the sixty second T.V. spot winning an award as one of Minnesota's best public service announcements. It is difficult, however, to measure the actual air time recieved by the public service announcements. The 16 mm movie has proven an invaluable tool to the Department, local units of government and other organizations when presenting their case of shade tree disease control to the public.

WOODWASTE DISPOSAL/UTILIZATION

The Department has awarded \$313,500 from the disposal/utilization fund for two separate wood chipping facilities in the metropolitan area. Hennepin County has received \$83,500 to augment their existing chipping operation. The county has purchased a new 22 inch mobile chipper and a chip screen to improve the market ability of their chips.

St. Paul and Minneapolis have been awarded \$230,000 for a large capacity chipping facility to be located in the Pig Eye area. Implementation of the Pig's Eye project has evolved slowly. Approval of the site by various levels of government took sev-

eral months. The St. Paul and Minneapolis Park Board procurement divisions have also experienced difficulties in receiving acceptable bids on the project. Notwithstanding these difficulties, the facility is expected to become operational by January 1977.

The balance of the disposal/utilization fund is expected to be awarded to the remaining metropolitan counties. An application for the funds from these counties will follow the completion of the Metropolitan Inter-County study on tree waste in the metropolitan area. As of this time, the Department has not received an application for disposal/utilization funds from outside the seven metropolitan counties.

PRIVATE PROPERTY SUBSIDIES

Grants to cities for subsidies to private property owners for tree removal total \$511,010. Sixty-one (61) communities are participating in the grant program. Twenty-three (23) of these communities are outside the metropolitan area.

Applications now pending with the Department are expected to consume the balance of the private property subsidy fund. When these applications receive approval by the Department, the program will be completed for the 1976/1977 biennium.

The subsidy program has been received well by municipalities. Administration of the program has run smoothly with the only complaint being the statutory requirement of fifty percent local match. It is expected that interest in the program will increase substantially during the next biennium.

SURVEILLANCE AND ENFORCEMENT

The Department is presently in the process of implementing revised surveillance and enforcement procedures. All municipalities subject to the provision of Minn. Statute § 18:023 have employed a qualified tree inspector. Each of the 164 municipalities in the metropolitan area were inspected by July 1, 1975. Twelve cities were found to have inadequate disease detection programs. A second round of inspections of metropolitan communities is now underway to determine the quality of removal programs. Results of those inspections will be released in August.

In May, inspections were made of sixty-six (66) communities outside the metropolitan area. Inspectors were unable to ascertain the quality of these programs because of the time of year. Contacts, however, indicated an awareness of the problem and the ability to deal with it.

At this time the Department has not felt it necessary to pursue available legal remedies. It is hoped that such action can be avoided. If it is determined, however, that communities are failing to remove diseased trees, the Department will recommend that the necessary legal measures be taken to insure compliance with the law.

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<u>PROGRAM ELEMENT</u>	<u>APPROPRIATION</u>	<u>EXPENDITURES</u>	<u>BALANCE</u>
Public Education	\$ 45,000	\$ 40,000	\$ 5,000
Disposal/Utilization Grant	\$700,000	\$313,500	\$386,500
Private Property Subsidy	\$800,000	\$511,010	\$288,990

DISPOSAL UTILIZATION GRANT AWARDS

<u>Grantee</u>	<u>Amount</u>
Hennepin County	\$ 81,500
St. Paul/Minneapolis	\$230,000

PRIVATE PROPERTY SUBSIDY GRANT AWARD

<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>	<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>
Minnnetonka	\$25,000	\$32,500	Chaska	\$	\$ 2,500
Bloomington	9,603	16,000	St. Louis Park		5,000
Monticello	3,203	3,203	Madison		500
Lauderdale	1,000	2,000	Fridley		15,000
Spring Valley	500	2,500	Plymouth		40,000
Red Wing	800	2,000	Cottonwood		750
Deephaven	2,500	12,000	Little Falls		1,800
Wash. Co.	6,130	20,000	Shorewood		10,000
Burnsville	10,675	20,600	Twsp/Forest Lk		1,500
Cottage Grove	2,250		Hassan Twsp		500
Coon Rapids	5,000	30,000	Littlefork		500
Edina	15,000	15,000	Excelsior		2,500
Madison Lake		11,000	Lilydale	300	400
Pipestone	750	1,000	Eden Prairie	2,653	4,000
S. St. Paul	1,000	2,000	Madelia		2,000
Mahtomedi	4,055	21,000	St. Charles		3,100
Fairmont	4,000	5,500	Northfield		1,000
Chanhassen	3,000	18,000	Ramsey		2,000
Maplewood	6,000		Sauk Centre		2,000
Golden Valley		7,500	Buffalo		4,000
Gaylord		1,500	Lamberton	1,297	2,782
Richfield	500	7,500	Tonka Bay		3,000
Columbia Hgts.		3,000	Wayzata		1,000
St. Cloud		4,500	Willmar	2,000	2,000
Vernon Center		1,500	Robbinsdale		15,000
Brooklyn Park		20,000	Hopkins		63,750
Crystal		3,000	Falcon Hgts.	300	750
Waseca		250	Maple Grove	2,022	
Hutchinson		2,500	Cottage Grove		3,000



REG. U.S. PAT. & TM. OFF.

LIGNASAN[®] BLP

FUNGICIDE

An Aid for the Control of Dutch Elm Disease

ACTIVE INGREDIENT

Methyl 2-benzimidazolecarbamate phosphate 0.7%

INERT INGREDIENTS 99.3%

EPA Reg. No. 352-377-AA

EPA Est. 4255-WY-1

Keep out of reach of children.

Hazards to Humans

CAUTION! HARMFUL IF ABSORBED THROUGH SKIN.
MAY IRRITATE EYES, NOSE, THROAT, AND SKIN.

Avoid contact with skin, eyes, and clothing.

In case of contact, flush skin or eyes with plenty of water; for eyes, get medical attention.

Environmental Hazards

Keep out of lakes, streams, or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

NOTICE OF WARRANTY

Du Pont warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with the directions under normal use conditions. It is impossible to eliminate all risks inherently associated with the use of this product. In no case shall Du Pont be liable for consequential, special or indirect damages resulting from the use or handling of this product. All such risks shall be assumed by the Buyer. Du Pont makes no warranties of merchantability or fitness for a particular purpose nor any other express or implied warranty except as stated above.

NOTICE TO BUYER: Purchase of this material does not confer any rights under patents of countries outside of the United States.

GENERAL INFORMATION

"Lignasan" BLP Fungicide is a water soluble liquid recommended for use as an injection treatment in elm trees as an aid in the control of Dutch Elm Disease. It may be used as a protective treatment for uninfected trees and as a therapeutic treatment at first sign of disease in infected trees.

"Lignasan" BLP is to be used by trained arborists and others trained in the identification of Dutch Elm Disease and injection techniques. It should be used in conjunction with sanitation and insect control programs.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

For protective treatment, dilute 1 qt. "Lignasan" BLP with 8 gals. of water; for therapeutic treatment, dilute 1 qt. "Lignasan" BLP with 4 gals. of water. When preparing solution, add water to the "Lignasan" BLP to minimize possible precipitation. Do not use highly alkaline water or water high in calcium (water hardness in excess of 10 grains per gal.) as precipitation may occur; use distilled, deionized or bottled spring water instead.

Inject 2 gals. of the diluted solution for each 4" of tree diameter (or for each foot of circumference) measured at breast height. Inject into root flare or trunk, using multiple injection sites (6" spacing) as close to ground level as possible. Use low pressure injection equipment (10 to 30 psi); follow operating instructions furnished with the equipment. Maintain pressure until the proper volume of solution has been injected into the tree.

Treatment may be made any time during the growing season but preferably in the spring when trees reach half-to-full leaf and before beetle feeding begins (usually the first week in June in most areas). Retreat uninfected trees annually. For infected trees, begin treatment at first sign of disease; treatment after crown damage exceeds 5% may not be effective. Make repeated treatments if symptoms of disease reappear or continue to progress.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Do not re-use empty container; crush and bury in a safe place away from water supplies.

Do not subject to temperatures below 32°F.

*Du Pont trademark

NET 5 GALS.

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Printed in U.S.A.

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E. I. DU PONT DE NEMOURS & CO. (INC.), BIOCHEMICALS DEPARTMENT, WILMINGTON, DEL.



C7



Environmental News

O'Neill (202) 755-0344

FOR IMMEDIATE RELEASE THURSDAY, MAY 13, 1976

NEW PESTICIDE FOR CONTROL OF DUTCH ELM DISEASE APPROVED BY EPA

A new pesticide, called Lignasan ELP, has been approved for use against the highly destructive Dutch elm tree disease, according to Environmental Protection Agency Administrator Russell E. Train.

The disease, a fungus accidentally brought into this country on imported logs in 1930, is estimated to fell 400,000 elm trees annually, according to the U.S. Forest Service.

Lignasan, produced by the DuPont Company, Wilmington, Delaware, has been approved by EPA for use only by trained arborists because special pressurized injection equipment is needed to correctly apply the compound. This is not the type of hardware that most homeowners would have access to or know how to properly operate. In addition, some expertise is needed to correctly identify the elm disease as opposed to certain other problems that can afflict this tree.

Homeowners with sick elms are most likely to obtain Lignasan treatments from a local professional tree care service or a local government program.

"I understand that production and distribution of Lignasan can begin almost immediately," Train said. "This means it would be available for broad-scale use this spring as the

(more)

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EPA FORM 1512-1 (REV. 8-72)

disease begins to reoccur. EPA moved quickly to review this compound because of its importance for this spring."

DuPont's application for registration of Lignasan was filed with EPA on March 1, 1976.

The desirability of putting the compound to work as soon as possible has been expressed by the Elm Research Institute of Harrisville, New Hampshire, a non-profit group interested in preserving this native American tree.

"EPA has measured Lignasan against our standards of effectiveness and human and environmental safety," Train said. "We're satisfied that, if used according to label directions, this fungicide can prevent Dutch elm disease or help arrest it in very early stages without posing unreasonable environmental problems."

Lignasan is not without potential hazards if improperly applied. The label warns "Harmful if absorbed through skin, may irritate eyes, nose, throat and skin. Keep out of lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes."

Treating a tree with the fungicide involves mixing it with water and injecting it into the tree trunk just above ground level or sometimes through the root system. One treatment per year is recommended.

According to EPA scientists, however, Lignasan is probably not a cure-all. The product is effective in preventing the disease in trees not already infected. It also will usually cure the problem in trees with less than five percent damage.

But an overall control program should continue to include sanitation practices--pruning and fertilizing healthy trees and removing hopelessly infected ones--and the control of the elm bark beetle that spreads the blight. Methoxychlor oil and dicrotophos are the two EPA registered pesticides now primarily used to curb the beetles.

The effectiveness of Lignasan is supported by Elm Research Institute tests last year on some 2,000 healthy and barely diseased trees in 15 States.* Roughly 1,000 trees were treated with Lignasan, and 1,000 were not. Among the treated trees only three percent succumbed to the blight, while the loss rate among the untreated trees was 30 percent. In addition, the Canadian Forestry Service has had good success for several years with Lignasan in saving trees in the early stages of infection.

(more)

A number of other chemical pesticides are now being field tested under EPA permits to determine their effects against the disease and general environmental impact. These include a thiabendazole compound by Merck Co., Inc., Rahway, New Jersey; Elm Guard by Aldine Products Co., Birmingham, Michigan, and Ceratocide by Lowden, Inc., Needham Heights, Massachusetts.

*Connecticut, Delaware, Indiana, Illinois, Iowa, Maine, Massachusetts, Michigan, Nebraska, New Hampshire, New York, Ohio, Pennsylvania, Vermont, and Wisconsin.

¶ # ¶

FRIDAY

HOPKINS AGRICULTURAL CHEMICAL CO.
P.O. BOX 594, MADISON, WISCONSIN 53701Harvey Ernst
608-222-0624

FOR RELEASE: IMMEDIATE

The stately, majestic American Elm - *Ulmus Americana* - the tree that still lines the streets of some cities and shades some back yards, may have finally found a saviour from its dreaded enemy -- Dutch Elm Disease. That saviour is Lignasan BLP -- a product of the Dupont Chemical Company. Lignasan BLP is distributed in the midwest by Hopkins Agricultural Chemical Company, Madison, Wisconsin. Since Dupont only received label registration from E. P. A. in mid-May, the product may not yet be locally available; however, every effort is being made by Dupont and Hopkins Agricultural Chemical Company to get Lignasan BLP out into the market place.

Understandably, the American Elm became the most popular shade tree in America. It is admired for its graceful beauty, its vase-shaped crown, its ample shade, its longevity and ease of propagation. However, in 1930 Dutch Elm Disease was imported from Holland to this country in some logs. Since that time the disease has multiplied to the extent that since the late 1950's over a million elm trees per year have been killed and cut down. This painful process has been all too common for cities and homeowners east of the Rockies. In the past few years the disease has even spread into California. Many so-called "cures" have appeared to control Dutch Elm Disease, but all have failed. Now scientists believe that Lignasan BLP may

offer some hope for survival of *Ulmus Americana*.

John Hansel, executive director of the Elm Research Institute, Harrisville, NH believes "the future of the American Elm looks greener". The Institute has coordinated tests in 33 states on 7470 elm trees. Some results to date: of 785 healthy trees treated with Lignasan BLP, only one was infected; of 785 healthy trees in an untreated control group, 303 trees became infected and 117 died. Of 250 infected trees treated with Lignasan BLP, 29 died; in a control group of 250 infected and untreated trees, 177 died.

Treatment for Dutch Elm Disease which is carried from tree to tree by the Elm Bark Beetle had been a program of spraying with DDT and removing infected trees. With the banning of DDT in 1972, the major emphasis had been on removal of infected or dead trees as soon as possible in an often futile effort to control the spread of the disease. Substitute sprays for DDT were also employed, but were more expensive and less effective.

Another way to combat the problem has been to develop resistant species of elm trees. Both the U.S.D.A., Nursery Crops Research Laboratory, Delaware, Ohio and University of Wisconsin have developed resistant varieties. However, none offer the size and stately qualities of *Ulmus Americana* and nurseries are reluctant to propagate them.

The new treatment - Lignasan BLP - is injected into the vascular system of the tree much as a penicillin shot is injected into the bloodstream

More

of humans. Small holes are drilled into the trunk just above the ground for injection of the Lignasan BLP into the tree. If the chemical is injected before the disease reaches 5 to 10% of the leaves, the possibility of saving the tree is excellent.

Lignasan BLP may not be the ultimate in control of Dutch Elm Disease, but researchers feel that it is the best that has been found to this point in time.

End.

**HOUSE
MAJORITY
RESEARCH**

FOCUS ON: SHADE TREE DISEASE CONTROL

In spite of record cold temperatures experienced this winter, Dutch Elm Disease remains a serious threat to our urban shade trees. Cold weather and a lack of snow cover reduces the Dutch Elm beetle population, but not to the extent of slowing the spread of the epidemic.

Dutch Elm Disease and Oak Wilt are the two major tree diseases which are currently killing Minnesota's shade trees. To date, the only proven method of disease control is: identification, removal and disposal of diseased wood as quickly as possible.

The experience of hundreds of other cities in the United States is that if no control measures are taken, almost all shade trees will die in a relatively short period of time, resulting in "naked" cities, reduced property values and immediate expenditure (both public and private) of millions of dollars in removal costs. (See Focus On paper dated 10/14/76 for more information on shade tree disease.)

What Is Currently Being Done?

The Minnesota Shade Tree Disease Control Law (Minnesota Statutes 18.023) of 1975 and current federal and state programs provide local governments with several sources of funding to control shade tree disease, e.g., property tax revenues, Federal Revenue Sharing funds, special assessment bonds, grants-in-aid. However, the amount of revenue available from each of these sources differs greatly from community to community.

In 1967, the Legislature permitted local governments to raise their tax levies in excess of levy limits to conduct shade tree disease control programs. However, when the Legislature enacted the Omnibus Tax Bill of 1975, all "special levies" previously created were eliminated. Currently, only those local governments which have been issued "lawful orders" by the Commissioner of the Department of Agriculture may levy outside of levy limits for shade tree disease control.

Lawful orders are issued by an executive agency to enforce state laws or regulations. To date, 60 lawful orders have been issued by the Department of Agriculture to municipalities and counties under the Shade Tree Disease Control Law. To date, 41 of these local governments have levied a total of \$4,988,606 outside of levy limitations to comply with the requirements of the state law. Presumably, the other cities issued lawful orders have raised revenue from other sources to comply with the law.

The Shade Tree Disease Control Law, as amended by the Legislature in 1975, appropriated a total of \$1.6 million to the Department of Agriculture to contain shade tree disease. The effort was divided between education (\$45,000), tree waste disposal/utilization grants (\$700,000), grants to local governments to conduct private property owner subsidy programs (\$800,000), and program administration (\$50,000).

Under the Shade Tree Disease Control Law, all municipalities in the 7-county metropolitan area are required to establish shade tree disease control programs approved by the Department of Agriculture. Any municipality outside of the 7-county metropolitan area which chooses to establish a disease control program must have the approval of the Department of Agriculture and comply with the Department's rules and regulations relative to shade tree disease control programs.

Local governments conducting approved disease control programs are eligible to participate in a private property owner subsidy grant program administered by the Department of Agriculture. Grants are awarded on a 50/50 matching basis to local governments to provide financial assistance to private property owners for tree removal and disposal. All of the \$800,000 available for grants to local governments for this purpose has been committed to 40 metropolitan and 27 outstate cities. Of this \$800,000, approximately \$85,740 was awarded to outstate communities. The size of these outstate cities varies from the population of Woodstock (217) to a population of 40,000 in St. Cloud.

The Department has awarded two grants to Hennepin County and Minneapolis/St. Paul to construct wood utilization facilities to "recycle" diseased trees. Currently, a relatively small proportion of waste wood is "chipped" and sold for various purposes, e.g., mulch, recreational trails, fuel for municipal power plants, landscaping. With the construction of these facilities, a greater proportion of waste wood can be put to productive use, rather than disposed of by burning or disposal in landfills.

The Department has also engaged in various public education activities, such as media announcements and publication of shade tree disease materials.

What is Proposed?

The Minnesota Shade Tree Advisory Committee

The Minnesota State Shade Tree Advisory Committee was established in 1974 by the Commissioner of the Department of Agriculture. Members of the committee include representatives of local governments, tree disease experts, the League of Minnesota Cities, the Department of Natural Resources, the Inter-County Council and business.

The Shade Tree Advisory Committee, in a recently published report, recommended a comprehensive approach to shade tree disease control (that would cost approximately \$46.5 million) during the 1978-79 biennium. The Committee requested that the Legislature:

1. Appropriate \$260,000 to the Department of Agriculture to conduct a public education program on shade tree diseases;
2. Appropriate \$44,100,000 to the Department of Agriculture to provide financial assistance to local governments for shade tree disease control and replacement of diseased trees;
3. Appropriate \$900,000 to the Department of Agriculture to provide financial assistance to local governments for establishing tree waste disposal and utilization facilities;
4. Appropriate \$268,568 to the Department of Agriculture for administration of the proposed public education and grants-in-aid programs;

5. Appropriate \$274,432 to the Department of Agriculture to monitor local governments' disease control programs;
6. Appropriate \$221,000 to the University of Minnesota to conduct research on shade tree diseases;
7. Appropriate \$441,900 to the University of Minnesota Agricultural Extension Service to train local government personnel in implementation of effective shade tree disease control programs;
8. Appropriate adequate funding to state departments for implementation of shade tree disease control programs on state-owned lands;
9. Enact legislation to permit local governments to levy outside current levy limitations for purposes of shade tree disease control and, thus eliminate the use of "lawful orders" by the Department of Agriculture for special levy purposes;
10. Enact legislation to permit local governments to establish special taxing districts within their boundaries to finance shade tree disease control programs.

Department of Natural Resources

The Department of Natural Resources, in its proposed budget for 1978-79, requested an appropriation of \$1,213,000 for shade tree disease control and reforestation on state-owned lands in outstate areas. The Department would attempt to establish "buffer zones" around outstate communities that have approved shade tree disease control programs to prevent the spread of shade tree disease from state-owned lands into municipal boundaries.

Governor Rudy Perpich

Governor Rudy Perpich, in his budget message, recommended that the Legislature appropriate \$26 million for the 1978-79 biennium for a statewide disease control program; \$2 million of the appropriation would be used for purchasing replacement trees. He also recommended that a greatly expanded State Summer Youth Employment Program might help tackle the job of planting replacement trees.

Licensing of Tree Removal Contractors

Suggestions have been made regarding the need for state or metropolitan licensing of tree removal contractors to ensure competent, effective and uniform tree removal practices. State licensing would simplify the procedure by which contractors must obtain licenses and, perhaps, expedite the tree removal process. However, the adoption of contractor licensing requirements could directly affect the cost of tree removal to governments and private property owners by increasing the contractor's cost of doing business. It might also limit the number of contractors who could afford to do business.

The Association of Metropolitan Municipalities has adopted the position that local governments should be encouraged to adopt uniform local licensing requirements, rather than having state-imposed licensing. The Association claims that

uniformity in licensing and more effective enforcement by local governments could be achieved by maintaining licensing authority at the local level.

House of Representatives Proposals

To date, several House bills have been introduced which address different aspects of the shade tree disease problem. Many of the bills contain a combination of solutions to the problem and, therefore, may be listed more than once.

Grants-In-Aid Programs--

H.F. 66 (Pehler), H.F. 89 (A. Carlson), H.F. 147 (Enebo), H.F. 215 (Berg), H.F. 219 (Enebo), H.F. 272 (Heinitz), H.F. 321 (Wynia), H.F. 370 (Hanson), H.F. 371 (Hanson), H.F. 372 (Casserly)--all contain language to either continue or alter the existing grants-in-aid program to local units of government for removal, disposal and/or private property owner subsidy programs.

Reforestation Programs--

H.F. 125 (Berg), H.F. 219 (Enebo), H.F. 272 (Heinitz), H.F. 321 (Wynia), H.F. 370 (Hanson), H.F. 372 (Casserly)--all contain language which would expand the existing local government aid programs to include reforestation activities.

Public Education and Research Programs--

H.F. 89 (A. Carlson), H.F. 215 (Berg), H.F. 219 (Enebo), H.F. 321 (Wynia), H.F. 370 (Hanson)--all contain language which would expand current public education and research activities.

Authorizing Special Levies--

H.F. 89 (A. Carlson), H.F. 108 (Berg), H.F. 215 (Berg), H.F. 219 (Enebo), H.F. 272 (Heinitz), H.F. 321 (Wynia)--all contain language to permit local governments to levy outside of current levy limitations for shade tree disease control programs.

Establishing Tax Credits and/or Deductions--

H.F. 29 (A. Kempe), H.F. 95 (Dean), H.F. 376 (Hanson), H.F. 89 (A. Carlson), H.F. 579 (Kahn)--all contain language which would permit property owners to claim either an income tax credit or deduction for the costs associated with diseased tree removal.

Tree Disposal--

H.F. 272 (Heinitz) would permit the Pollution Control Agency to promulgate rules governing the transportation and disposal of diseased shade trees (open burning).

Appropriations

The major cost item of the proposals is the level of funding necessary to implement the grants-in-aid programs. Most of the proposals assume a 50/50

matching grant program for removal, disposal, utilization and/or reforestation activities. However, estimates of removal, disposal and replacement costs per tree and the number of trees expected to be lost over the next biennium differ greatly and, therefore, result in a wide range of requested appropriation levels.

For example, the Shade Tree Advisory Committee assumed a cost figure of \$315 per tree for removal and replacement, and projected tree losses to be 280,000 over the biennium, to arrive at a grants-in-aid appropriation of \$44,100,000.

$$280,000 \text{ trees} \times \$315 = \$88,200,000 / 2 = \$44,100,000 \text{ (state share)}$$

Using lower cost per tree and tree loss figures results in a lower appropriation level for the grants-in-aid program. For example, a bill recently reported out of the Senate Committee on Agriculture and Natural Resources contained an appropriation of \$24,000,000 based upon a cost figure of \$155 per tree for removal and replacement, and an estimated loss of 308,000 trees.

Additional appropriations would be required to support other program activities: public education, research, training, administration. Income tax credit proposals would result in state revenue losses.

The appropriations contained in the House bills summarized above range from \$20,000,000 to \$46,465,900. It seems certain that efforts to control the spread of shade tree disease will be expensive. However, inaction will also be expensive. Dead trees in urban areas create public nuisances and must be removed as they die. An effective control program initiated in the early phases of the epidemic can reduce and spread removal costs over a period of many years, and provide the needed time to permit replacement trees to grow sufficiently to preserve the beauty of our cities and towns.

FOR MORE INFORMATION: Contact Mary Schweiger, Majority Caucus Research, Room 285, State Office Building, 296-5972.

COMMITTEE BILL APPROPRIATIONS

SANITATION GRANTS:

\$24,687,500

Grants will be made to municipalities for up to one-half (1/2) the cost of their sanitation program. Sanitation includes inspection, root graft control, removal and disposal on both public and private property.

390,000 trees x 125/tree = \$49,375,000

One-half (1/2) State share = \$24,687,500

REFORESTATION GRANTS:

\$ 7,312,500

Grants will be made to municipalities for up to one-half (1/2) the cost of planting trees on public property. No replanting grant shall exceed an amount equal to \$40 multiplied by the number of trees planted.

195,000 trees x \$75/tree = \$14,625,000

One-half (1/2) State share = \$17,312,500

UTILIZATION/DISPOSAL GRANTS:

\$ 700,000

Grants will be made to eligible municipalities for up to one-half (1/2) the cost of establishing woodwaste utilization/disposal facilities.

D

2 facilities (metro) @ \$500,000 ^{Wage Equiva} \$1,000,000

10 facilities (outstate) @ \$40,000 \$ 400,000

TOTAL \$1,400,000

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PUBLIC INFORMATION:

\$ 250,000

Public information funds will be used to inform municipal and county officials of the grant program and its procedures. The major portion of funds, however, will be committed to alerting the general public to the dangers of storing elm wood; the needs for prompt tree removal and proper disposal; and the need to cooperate with local authorities in identifying all diseased trees.

Production (Radio/TV public service announcements; brochures; billboards; busboards; newspaper ads; displays; slide shows; films). \$ 26,000

Media Time (Radio; TV; billboard; newspaper). \$214,000

Public Relations (Press conferences; news media features; special news events) \$ 10,000

TOTAL \$250,000

EXPERIMENTAL PROGRAMS:

\$ 337,000

There are many economic, political, and administrative realities within a community which bear heavily upon the successful implementation of new control technology. The experimental program will allow for comprehensive field testing of new technology and the evaluation of existing technology within the municipal control program setting. This type of applied experimentation will narrow the gap between basic control research and actual day-to-day implementation of the ideas and methods which result from research. It also will allow for intensive on-site cost studies to determine the cost effectiveness of various control measures, and thereby help reduce the overall cost of sanitation.

Evaluation of management strategies \$ 42,125

Evaluation of existing control measures \$ 126,375

Field testing of new technology \$ 168,500

TOTAL \$ 337,000

ADMINISTRATION: \$ 300,000

Salaries	
1 Administrator	\$ 42,789
1 Planning Grants	\$ 33,838
1 Information Officer	\$ 33,838
3 Clerical	\$ 53,490

SUBTOTAL \$ 163,955

Non-Salary Support	\$ 29,607
Shade Tree Disease Laboratory	\$ 27,870
Program Evaluation	\$ 78,568

TOTAL \$ 300,000

RESEARCH: \$ 120,000

Funds will be used to develop improved methods of control which will help people in Minnesota to slow the disease and save a portion of the elms. There is no reason to become enmeshed in a long-term research. It is believed the research must be concentrated in the areas of survey, sanitation, and disruption of common root systems. These efforts involve the Remote Sensing Laboratory, the Forest Products Department, the Department of Entomology, and the Department of Plant Pathology.

Oak wilt continues to cause extensive losses in Minnesota and, in some areas, is responsible for almost total destruction of oak forests. This disease can be controlled. The research effort needs to be directed toward better methods of survey, prevention of sporulation by the fungus, and primarily at disruption of common root systems. This program is mainly in the Department of Plant Pathology.

Salaries	
Forest Pathologist	\$ 32,000
Forest Entomologist	\$ 32,000
Graduate Assistants	\$ 55,000
Undergraduate Assistants	\$ 15,000

SUBTOTAL \$ 134,000

Non-Salary Support	
Field Expense	\$ 44,000
Aerial Photography	\$ 10,000
Equipment and Supplies	\$ 26,000
Publication Costs	\$ 6,000

SUBTOTAL \$ 86,000

TOTAL \$ 220,000

EDUCATION:

\$ 300,000

Dutch elm disease curtailment and shade tree management is biologic in its subject matter. The decisions to be made for effective private and community shade tree programs are, however, made by people who have varying levels of understanding and attitudes toward the problem.

An effective Dutch elm disease curtailment program will depend on a sound understanding of all aspects of the disease and intelligent application of curtailment and management measures. As a community program evolves, the citizens of Minnesota, their elected officials, their public agency representatives, and private firms need current research and technical information as well as assistance in organizing for an effective program.

Existing University of Minnesota resources in staff time and support materials do not permit mounting a comprehensive educational, informational, and training effort commensurate with present and emerging Dutch elm disease and shade tree management program needs.

Professional Staff	\$ 180,000
Plant Pathology	
Horticulture	
Entomology	
Ag Information	
Project Assistants	\$ 40,000
Plant Pathology	
Horticulture	
Forestry and Products	
Printing	\$ 60,000
TV, film cassettes, equipment	\$ <u>20,000</u>
	 TOTAL \$ 300,000

CONTROL ON STATE-OWNED LANDS:

\$1,000,000

The Department of Natural Resources is responsible for managing large areas of state land which lie adjacent or within municipal control areas. Funds provided by this provision would be used to implement a disease control program on state lands which have the potential of adversely effecting local programs.

Buffer Zones	\$ 294,280
State lands within municipalities	\$ 316,800
DNR public use areas	\$ <u>388,920</u>
	 TOTAL \$1,000,000

OTHER RELATED SHADE TREE APPROPRIATIONSDEPARTMENT OF AGRICULTURE:

The Department's regulatory activities are funded through the on-going Municipal Pest Control Program. The Department's budget request for this program for the 1978-79 biennium was \$268,157. The majority of these funds will be spent on activities relating to the regulation of local shade tree disease control programs.

UNIVERSITY OF MINNESOTA:

The University of Minnesota, through the Agricultural Experiment Station, has requested \$50,000 for each year of the biennium for a total of \$100,000. Considering the magnitude of the research responsibilities for Dutch elm disease and oak wilt, the four departments at the University concerned with this program will need this \$100,000 plus the \$120,000 for the Committee Bill.

COORDINATION BETWEEN STATE DEPARTMENTS

RESEARCH AND EXPERIMENTAL PROGRAMS:

The Department of Plant Pathology and other departments in the Agricultural Experiment Station will cooperate with the State Department of Agriculture in planning the experimental programs, in the monitoring of these programs in the field, and in the evaluation of the data obtained.

EDUCATION AND PUBLIC INFORMATION:

The public information program to be administered by the Department of Agriculture is a promotional effort to make the general public aware of the problems of shade tree disease. Its effect will be to create a greater demand for educational programs.

The education effort to be conducted by the University of Minnesota Extension is a technical education program aimed at local program managers and personnel. It will also meet the increasing demands for materials relating to the biological and other more technical aspects of shade tree disease control.

PLAN B

MINNESOTA SHADE TREE LEGISLATION - 1977-78

July 10, 1978

Portfolio Approach

Gary Botzek

Reviewer: George Warp

Research

On May 4, 1976, Majority Leader Senator Nicholas Coleman asked Senate Research to look into Dutch elm disease and replanting possibilities (see memo). My supervisor, Bill Riemerman, assigned me to the project.

During the summer of 1976, I spent approximately three-fourths of my research hours on Dutch elm and oak wilt diseases.

On August 6, 1976, I presented a report to Senator Coleman and Minority Leader Senator Robert Ashbach.

On August 20, 1976, I presented a report to Senator John Chenoweth, a major force for a statewide replanting effort.

On October 1, 1976, I presented a further report to Senator Coleman, dealing with financial implications of the diseases.

On October 12, 1976, I presented a general paper entitled Dutch Elm Disease Facts and Figures.

On January 10, 1977, I presented Senator Hubert H. Humphrey III a report identical to the October 1, 1976, report to Senator Coleman. Senator Humphrey had been delegated the responsibility of this effort by Senator Coleman in November-December 1976.

Throughout the 1977 legislative session, I worked closely with Senator Humphrey and Senate Counsel staffers Jim Dinerstein and Gary Johnson.

S.F. No. 32 was introduced in the Senate on January 13, 1977.

Numerous hearings were held in subcommittee and committee in both the House and the Senate. Representative Tom Berg introduced the House companion, H.F. No. 215.

Battles occurred over the need for a state effort on this problem, and over whether sanitation or replanting was more important. There were urban-rural fights and dollar fights, but a compromise was worked out in conference committee and both the House and the Senate passed the Conference Report on S.F. No. 32 by large margins late in the 1977 session.

The Governor signed S.F. No. 32 on May 18, 1977. The bill became Chapter 90, Laws of 1977. The law was retroactive to January 1, 1977, and contained \$28.5 million for 30 months ending June 30, 1979.

On June 21, 1977, Senator Humphrey testified before the Subcommittee on Forests of the U. S. House Agriculture Committee. His testimony was prepared by our office.

The 1978 Legislature amended Chapter 90 in order to extend the special levy language. H.F. No. 2044 (Chapter 773, Laws of 1978) also made a number of other minor changes in the law, but it did not appropriate additional money to the program.

The Shade Tree Program is administered by the Department of Agriculture. Jane Meyer replaced Peter Grills as administrator of the program in August 1977. The program presently has 13 employees.

The Shade Tree Program staff filed its annual report to the Legislature on the year 1977, and was active in the legislative process during the 1978 session.

Acceptance of the program has been mixed. Approximately 550 communities received funds under the program in 1977. More are

expected to participate in 1978. Sanitation and reforestation have become part of municipal budgets across Minnesota. The state has been the "clearinghouse" of tax dollars to be spent at the local level to counterbalance Dutch elm and oak wilt diseases.

There was opposition and criticism of the proposal and Program in 1977 and 1978. 1979 will be the key year for the future of the Minnesota Shade Tree Program. Concern over administrative growing pains and philosophical differences over state involvement in urban trees are common.

The state made a \$28.5 million commitment to shade trees in 1977. The commitment will be tested in the 1979 session as budgets begin to tighten. The future of the program will be determined by its early performance.

STATE OF MINNESOTA
OFFICE OF SENATE RESEARCH

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August 20, 1976

MEMORANDUM

TO: Senator John Chenoweth
FROM: *gb* Gary Botzek - Senate Research
RE: Dutch Elm Disease Losses

In response to your August 5 letter to Mr. Riemerman, I have prepared the following memo:

1. What is the progress of the disease in the metropolitan area and in the state. What were the rates in prior years, and the best estimates of diseased trees for 1976, 1977 and 1978. I am particularly interested in the rates for the cities of Minneapolis and St. Paul.

1) Dutch Elm disease was first noticed in Ramsey and Sherburne Counties in 1961. From 8 infected trees that year, 2 more were found in 1962, 43 in 1963, over 49 in 1966, and 136 in 1967.

Elm losses in 1974 in the 7 county metro area totaled 9,792. In 1975, that figure had increased to 27,044. In 1976, around 50,000 elms are expected to die because of Dutch Elm disease. Projected losses for 1977 are estimated to be around 80,600 elms, 125,600 in 1978, 177,000 in 1979, and 218,400 in 1980. There are about 3.9 million elms in the 7 county metro area today.

Minneapolis has around 171,000 elms trees (90% of the city forest). Minneapolis lost 235 elms in 1973, 937 in 1974 and 1,688 in 1975. Losses are expected to reach 2,500 - 4,000 in 1976. 1977 losses are projected at over 3,400 and over 5,000 in 1978. According to an elm loss projection report by Dr. Robert Shrum and Dr. David French of the

University of Minnesota, Minneapolis will lose 95% of its elms by 1978 (based on present control efforts).

St. Paul's elm tree population numbers around 131,700 (80% of the entire city forest population). Losses in 1973 numbered 585 elms, 1,594 in 1974, and 2,682 in 1975. Projected losses for 1976 are estimated to be around 4,700 - 5,000, around 8,400 in 1977 and over 13,000 in 1978. Drs. Shrum and French project a 95% loss level of St. Paul elms by 1973 (based on present control programs).

2. Are there any preventative measures which have a chance of success with the shade tree diseases in as advanced a stage as they are in St. Paul and Minneapolis. What are the costs of these measures. Is there any chance that preventative measures will have much success without a similar preventative effort made by the local units, counties, state, and the federal government on publicly owned land. Are there comparable American communities which have had success with any particular measures. In what ways are we similar and different from these successful communities.

2) There is no cure for Dutch Elm disease. 40 years of research has produced no totally effective chemical to provide immunity for the American Elm. Adequate sanitation control procedures appear to be the best hope for Minnesota elms. Even if a cure were developed soon it would be too late for most of our elm forest.

Research continues on a number of fungicides that may be helpful in disease control. DDT was used to a degree of effectiveness, but was banned in 1972. Methoxychlor is now used as an elm spray, while Vapam is the chemical mainly used to stop root graft between a diseased elm and a healthy one.

The chemical Lignasan BLP has received a great deal of attention this summer and has been used on a number of metropolitan trees. It i

not a cure; it is a preventive. It was approved by EPA and endorsed by the Elm Research Institute. Tests have been conducted and are continuing to be conducted on the effectiveness of Lignasan at different strengths and applied under different pressure levels.

My research on other cities that have been or are going through an elm disease crisis has shown a great reliance on sanitation control methods. DDT was used in many cities in the 50's and 60's, but the disease continued. Lignasan is too new to have been used extensively in any other areas except the Twin Cities. Many cities were unprepared for the disease and have lost the lion's share of their elms. Reforestation efforts have varied in approach and effectiveness. The Twin Cities area is unique because of its high concentration of elms. Other cities' losses are mere drops in the bucket compared to the huge elm losses we can expect in the Twin Cities.

The cost of removal and disposal of a diseased elm averages about \$150 per tree. Lignasan costs about \$10 per gallon, however, because of labor and equipment costs, Lignasan injection firms are charging anywhere from \$10 - \$130 per tree depending on tree size and number of trees per block.

Direct federal involvement in Dutch Elm disease control has been limited to research conducted through the U.S. Forest Service. Senator Mondale has introduced legislation (S. 2442) to provide between \$5 - \$10 million per year over the next three years for work in the area of protecting or treating healthy trees or destroying diseased ones. However, Congressional action is not expected this year.

The State of Minnesota provided \$1.6 million for 1976 and 1977 for statewide distribution.

In states that I checked on, I was unable to find any state involvement in control or reforestation efforts. The major responsibility for Dutch Elm disease control programs and reforestation efforts has fallen upon local units of government, namely municipalities and counties.

3. What are the resources available for a reforestation program, particularly for the metropolitan area. Are there available stocks of appropriate size street trees to replace diseased elms. How many trees are necessary, and what will be the cost of removal of existing trees and planting of new trees.

3) The reforestation program for public trees in Minnesota cities has been left to the local municipality. While DNR provided 13 million trees in 1975 (about 50% were planted on private property and 50% were planted on public property), their planting has been on public grounds such as parks and state forests, or sold to private citizens for personal use (in lots of 500).

Municipalities can either buy young trees from private nurseries or produce them in city nurseries. While both Minneapolis and St. Paul have started city nurseries, few trees have been taken from the city nurseries due to the need for 6-8 years in nursery time for most shade trees.

Minneapolis planted 10,000 trees on public grounds in 1975. Another 10,000 trees are expected to be planted in 1976.

St. Paul planted 2,000 trees in 1975. In 1976, 2,500 are expected to be placed in the ground. Private property planting figures are not available.

Assuming that 50,000 elm trees need to be replaced (based on 1976 estimated losses) in the 7-county metro area and assuming a cost

of \$150 per tree for removal and disposal and \$100 per tree for replacement expenses, the total bill for 1976 alone would be \$12.5 million.

There appear to be plenty of trees available through the private sector. However, if orders totalling 50,000 trees were to be placed, undoubtedly shortages of certain species of trees probably would occur. Upwards of twenty different types of trees are suitable for planting in Minnesota.

To date the reforestation effort has been playing catch-up to the removal effort. While Minneapolis and St. Paul's Parks and Recreation offices are concerned about replanting trees, their emphasis has been on removal of dead or dying trees. Replanting can be done in the spring and the fall; removal and disposal can be done all year round. Removal efforts has fallen behind the death rate. Minneapolis crews are able to remove 75 trees per week, while 100 trees are cut per week in St. Paul. Elm losses have run much higher than 75-100 per week, therefore dead trees remain standing (in violation of the 20-day state law for removal).

4. What is the effect of the loss of an elm on a particular piece of property. How should this affect the overall property value in the city of St. Paul.

4) The effect of the loss of an elm on a particular piece of property is difficult to estimate. There is no set rule of thumb used by the Department of Revenue, IRS, or real estate agents in adjusting the property value of a particular piece of property. Case-by-case examination is used in storm damage appraising.

All appraisers recognize the value of trees, especially elms and oaks, because of their tremendous shade potential and their

beautiful appearance.

The greatest value loss of a tree in regard to property value is when an established tree is lost from a built up lot. There are many new homes being sold with no trees or with "just starting" trees in the metro area. However, potential home buyers in most cases look for "mature" trees. This is especially true of out-of-state home buyers. In most cases a buyer will choose property with trees on it over a vacant lot if he has a choice.

The loss of an elm or a group of elms not only decreases the value of a particular piece of property, but as individual property values go down, so does the overall property value of a city like St. Paul or Minneapolis. While it is difficult to place a figure on the exact dollar loss to the city, it is easy to see the dollar loss pass through from the particular property to the city as a whole.

While this property value loss can not be stopped it can be lessened to a degree. It is obviously better to lose 3 or 4 elms per block than 3 or 4 elms per household. The property value loss can be lessened through a good sanitation control program and a health reforestation effort.

It appears that 90-95% of the urban elm forest will have to be replaced by other species such as maple, ash, and linden. But if we can spread that loss over 20 years, and at the same time replant with new species of trees, the property value loss can be kept at a minimum. To let 95% of St. Paul's elms die by 1983, as is predicted, without a healthy replanting effort would result in a tremendous loss in property value, possibly in the millions of dollars.

Another consideration of tree loss is added costs of heating

and cooling a house. Trees, especially elms and oaks, serve as a screen for direct sunlight in the hot summer months and as a blanket holding in heat in the cold of winter. Estimates for added heating and cooling bills could run into the millions of dollars as well.

5. What options do you see for producing the money necessary to carry out various levels of effort against Dutch elm disease and oak wilt.

5) According to the French and Shrum report (assuming an average of \$250 per tree for removal-replacement costs) the total bill for removing and replacing the metro area's diseased elms will reach one billion dollars over the next 12 to 14 years if sanitation is not improved.

Some federal participation can be expected. Continued research by the Forest Service in the Dutch Elm disease area can be expected. Public Works monies will help provide additional man power.

State financial participation began in 1975. The Legislature's appropriation to the Department of Agriculture of \$1.6 million for fiscal year 1976-77 can be considered a positive indication of state interest and probably continued support for public education, tree waste disposal/utilization, and private property subsidies for out-state and metro communities. The Department will be requesting additional funds for 1978-79, possibly anywhere from \$5 - \$15 million.

St. Paul Mayor George Latimer's proposal for a \$1 million program to impede the spread of Dutch Elm disease provides for 100% of the removal costs to be paid by the city on private and public property. Funding is expected to be provided through fund balances in the city treasury, state private property subsidy monies, and some

of the dollars from the \$3.45 billion Public Works Employment Act.

St. Paul expects to receive \$694,000 per year from the federal Public Works Act. However, these funds can be used to pay only wages and salaries of workers providing public services. While diseased elm tree removal qualifies as a "public service" under the law, the federal monies can not be used for anything except wages and salaries of unemployed manpower. St. Paul will receive \$139,000 in the first quarter under the Public Works Act, all of which will be used for elm removal, according to the Mayor's office.

Debate between the Mayor's office and the City Council continues on whether Community Development funds should be used for elm removal. The Mayor is concerned about forestalling a tax increase which his office says would be necessary if only funds from the city treasury are used. Because C.D. funds are federal, use of first year reserve funds from this account would not cause an increase in taxes, according to the Mayor's office.

To date the St. Paul City Council has approved \$639,000 of the Mayor's million dollar proposal with only the C.D.-city treasury debt to be resolved.

St. Paul expects to receive around \$250,000 from the state private property subsidy program for use yet this year.

Minneapolis' Park and Recreation Board is considering a proposal under which the home owner would pay the first \$150 of the removal cost while the city and the state would pay the rest. Minneapolis expects \$1 million per year from the Public Works Act, and elected officials are already suggesting that Minneapolis use some of these federal dollars for Dutch Elm disease removal. However, if St. Paul enacts

a 100% city assumption of tree removal costs on both public and private property, Minneapolis may have to follow suit.

In 1974 the Legislature authorized all metro municipalities to levy a special tax outside existing levy limitations for Dutch Elm disease and Oak Wilt control programs. However, in 1975 the Legislature placed all special levies under a "new" levy limit, including the special shade tree levy. One hundred sixty-seven (167) governmental subdivisions in the metro area were using the special levy under M.S. (1974) 18.023. Eight-six (86) of those communities are subject to the base property tax levy limitations set up in M.S. (1975) 275.51.

However, the Legislature granted the Levy Limit Review Board the authority to allow a governmental subdivision to levy over its limitations (Chapter 437, Laws of 1975, Sec. 6). Therefore, it appears that any of the 86 governmental subdivisions affected by the "new" levy limits could levy above that limit if the Levy Limit Review Board approved the proposal.

It also appears that other governmental subdivisions will need to levy outside their levy limits in order to meet their shade tree control costs.

Federal financial assistance probably will continue in the form of research monies and public service programs. Direct assistance for control or replanting programs should not be anticipated.

State financial assistance is just beginning. It is likely the state will increase its role in control programs as well as begin to assist in replanting efforts. Tax credits or deductions may provide a means of direct reimbursement to taxpayers for removal and disposal

costs, Lignasan treatment costs, or reforestation efforts.

Local financial assistance probably will come from money levied inside or outside the levy limits of the governmental subdivision. Use of general treasury funds could mean increased taxes. Long term bonding could also be considered.

The amount of money needed will be determined by the level of effort cities, counties, and the state decide to make in combating Dutch Elm disease and Oak Wilt. An all-out effort at removal, Lignasan treatment, and replanting of all 3.9 million elms in the 7-county metro area would cost billions of dollars. Barring an increase in taxes, priorities must be established.

Attachment

xc: James Dinerstein - Senate Counsel

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January 10, 1977

MEMORANDUM

TO: Senator Hubert Humphrey III
FROM: Gary Botzek, Senate Research
RE: Dutch Elm Disease Information
and Funding Proposals

What is Dutch Elm Disease?

Dutch Elm disease is a vascular disease, caused by a fungus technically called Cerotocytis ulmi. After being introduced into the water conducting vessels of the sapwood of an elm, the fungus spreads throughout the tree and together with by-products produced by the host tree is able to grow and prevent the uptake of water, causing the host tree to wilt and die.

The main carrier of the disease is the small European elm bark beetle, but the native elm bark beetle also spreads the disease. The bark beetles breed in dying and dead elm trees. The fungus grows and fruits abundantly in beetle galleries. Beetles emerging from these galleries carry the fungus on their bodies. They feed in the young twig crotches of healthy trees and, while feeding, deposit the fungus spores in the feeding wounds.

The average life expectancy of an American elm is 75-150 years, but Dutch Elm disease can bring them to the ground in 1-3 years.

There is now no cure for Dutch Elm disease. Trees have no immunity system as do animals, therefore they do not build any resistance to diseases like Dutch Elm. Forty years of research has

been unsuccessful in developing a cure.

History of Dutch Elm Disease

Dutch Elm disease was brought into the United States from Europe around 1930. Apparently, the fungus was carried across the Atlantic in elm logs imported for the purpose of making elm veneer in Ohio. These logs were host to the European bark beetle and were infected with the fungus. The bark beetles emerged from their breeding place and transferred the fungus to elms in the neighborhood. The American bark beetle then picked it up and began to aid in the spread.

From Ohio, the disease quickly spread into the northeastern states and eastern Canada. Today the disease can be found in 40 of the 50 states. The disease was first spotted in Minnesota in 1961.

Elm Inventory

According to the latest figures put together by National Biocentric Inc. of St. Paul there are 4.9 million elms in the seven-county area. Of those 2.7 million or 56% are over 5 inches in diameter. 2.2 million or 44% are under 5 inches in diameter.

The remaining 80 counties of Minnesota are estimated to have 140 million elms.

History of Elm Losses

In 1961, eight Dutch elm disease cases were diagnosed as "positive" in Minnesota. By 1967, the number of positive cases had reached 136.

Elm losses in the seven-county area totaled 9,800 in 1974 and 27,100 in 1975. This year losses are already over 57,332 and are expected to reach 60,000.

It is important to keep in mind that these figures include mostly public elms reported to public agencies. No attempt has been made to assess the private property elm losses over the years. Due to the fact that millions of elms are located in outstate woods, forests, pastures, and on field front land it would be extremely difficult to save all the elms in some of these remote areas of the state. To date all efforts have consisted of establishing "control areas" -- in effect, restricting elm control programs to residential municipalities only.

St. Paul Losses

St. Paul has about 130,000 elms which is 80% of its entire tree inventory. Since 1961, over 21,000 elm trees, or 17% of the total elm population, have been lost to Dutch Elm disease. These losses include 2,995 elms in 1975 and 15,100 in 1976. According to a study done by Dr. David French and Dr. Robert Shrum of the University of Minnesota, if a stricter control program is not instituted, 95% of St. Paul's elms will be gone by 1983.

Minneapolis Losses

Minneapolis has about 170,000 elms, which comprises 90% of the city's tree population. The city lost 1,700 elms in 1975 and is expected to lose another 3,500 this year. According to French and Shrum, under current control methods, 95% of Minneapolis' elms will be dead by 1989.

Bloomington Losses

The city of Bloomington has about 200,000 elms. Losses in 1976 are over 1,400; 431 on boulevards, and 1,010 on private property.

St. Cloud Losses

St. Cloud has about 20,000 elm trees. In 1976, 465 elms died, up from 64 in 1975. The St. Cloud situation illustrates the extent of the problem in outstate municipalities.

Projected Losses for 1977 and 1978

Based on losses totaling 60,000 elms in 1976, elm losses are expected to reach 100,000 in 1977 and close to 200,000 in 1978. The loss estimates assume no change in control programs. If beefed up sanitation methods are used, losses could be kept down somewhat especially in 1978.

Methods of Control

There are a number of different techniques that have been used, are being used, or could be used to fight Dutch elm disease. They include sanitation, combating root grafting, spraying, trimming, and chemical treatments.

1. Sanitation:

The goal of a good sanitation program is to spread the loss of the diseased or dying trees over a longer period of time, thereby providing adequate time for replanting in addition to spreading the financial burden over a longer period of time.

The strategy of a sanitation control program is to destroy reservoirs of infection and breeding places for the bark beetle. Even if no control program were used at all dead trees would have to be removed. High costs are accumulated earlier in do nothing programs than in good control programs. According to Dr. William Cannon and Dr. David Worley of the U.S. Forest Service, if a program of no control is followed, a city's elm population will be reduced to 75% in 5 years and 50% in 7 years. If a "fair" control is followed it would take 11 years for a city's elm population to drop to 75% and 17 years to drop to 50%. Under a "good" control program it would take 13 years for a city to lose 25% of its elms and 21 years to lose 50%. Using what Cannon and Worley call the "best" control program, a city can expect to retain 75% of its elms after 26 years and still have 50% after 46 years.

With no control program whatsoever, the dead trees still would have to be taken down as a hazard or public nuisances, and at a faster rate than under a good sanitation program.

How Does a Good Sanitation Program Work?

Elm bark beetles breed in dead or dying elm trees or branches. Trees under unusual stress such as drought or severed roots are especially susceptible to bark beetle attack. As the beetles feed and fly they spread the fungus. Beetle movement in search of food and breeding mates begins in mid May or early June.

An essential part of a good sanitation program is the removal and disposal of all dead or diseased trees by early April. A second heavy flight takes place in August. A lighter third flight takes

place in late September or early October. While most experts believe in dead or diseased tree removal and disposal all year round, some, like Dr. French of the University of Minnesota advise against removal in May and June because of increased beetle movement.

Early Identification

The key to a good sanitation program is early spotting of the disease. Due to seasonal color change it becomes difficult to spot diseased trees in the fall. It is difficult to determine whether a tree is diseased or just turning colors in late August or September. Better means of inspection are needed in fall which may mean more lab tests. Department of Agriculture labs are used now from the end of May to the middle of September. Lab work could be done in April and sight inspection could begin June 1, as it now does.

Trees should be inspected as soon as the growing season begins. Generally public inspection in the metro area is being done by sight. Most authorities agree that there is no need for lab tests on public trees. Presently, few lab tests are being done on public or private trees. It is important, according to most authorities, to lab test all private trees before marking them as positive disease cases in order to avoid civil suits.

Research has revealed that it is also important not to overload an inspector with too large an area to survey. One inspection team should not handle more than two square miles per team. Frequent inspection is also advisable. Elmhurst, Illinois inspectors check their trees four times each growing season. In Evanston, Illinois, three full time inspection units circulate in their control area once every two weeks.

Presently, three tree inspectors are hired and trained by the Department of Agriculture. By law each municipality in the Shade Tree Private Property Subsidy Program must have a municipal tree inspector. However, one inspector is not enough for most cities.

Additional manpower is needed. National Guard personnel, seasonal help, neighborhood groups, and forestry students could be trained to be part of a survey unit or to survey a given area individually. Supervision and training become very important under a seasonal program as proposed. Short courses on the disease and how to detect it could be provided at the University of Minnesota. These courses, as well as in-service training by municipal foresters would be of value to local inspectors.

Once a tree has been positively identified as being diseased, a good sanitation program dictates that it be removed as soon as possible. Disposal of all elm branches and logs is extremely important under a good sanitation program.

Department of Agriculture regulations call for removal of a diseased or dead tree within 20 days after identification. However, due to the heavy increase in losses this year, lack of manpower, and lack of dollars, many municipalities have not been able to take down the diseased trees within 20 days. Private property enforcement also has been behind schedule because of the lack of manpower and money. The Agriculture Department's Shade Tree Advisory Committee has been considering possible changes in the 20 day limit.

Methods of Disposal

Burning is the least expensive method of disposal if nearby burning sites are available. While the Pollution Control Agency

has relaxed its burning ban in the metro area, restrictions such as having a meteorologist evaluate the wind speed and direction each day and limiting burning to 100 trees per day have placed St. Paul in a difficult position. St. Paul's average cost of removal is considered \$10 per tree cheaper if burning is used instead of landfill. Minneapolis does not expect to use burning in their disposal efforts. The east Park District of Detroit is using a large incinerator to dispose of 500-600 cubic yards of elm trees per 8 hour shift. A 125 ft. precipitator tower rids the smoke of all particles and only steam escapes. Detroit has two such "burners". The main drawback to incinerator burning is the waste of valuable wood. In addition, PCA and others are concerned about the air pollution which results from burning.

Burying dead or diseased elms in sanitary landfills is the most common disposal method used in the Twin Cities. Since elms are large and bulky, they are taking up a great deal of space in the landfills. In addition, burial of elm logs means hauling them across areas which are not yet affected. Disposal trucks can and do carry elm beetles. Burning elm branches and logs as close to home as possible lessens the risk of beetle movement by trucks. Like burning, burial of elm logs wastes wood.

Chipping reduces the amount of space needed in a landfill as well as destroying the prime sites for bark beetle breeding. However, wood chippers require a heavy capital investment. In 1975-76 Hennepin County paid \$82,500 and the state paid the same amount for a 22-inch mobile metro chipper and tandem truck. In addition, \$230,000 was awarded to St. Paul for a larger, stationary chipping site at Pigs Eye

which will be used by Minneapolis, other communities, and the general public.

Wood chips also have a market value when sold as mulch. Certain types of elm logs are of value if they have been debarked. When bark is removed from the elm logs the main breeding areas for beetles are destroyed. Furniture veneer, saw logs, railroad ties and industrial ties, pulpwood for fiber products, and mulch offer potential markets for elm wood, bark, and branches. However, special emphasis in a good sanitation program calls for the removal of dead or dying elms, including wood piles. The elm wood can be stored if it is completely debarked. Remaining tree stumps also must be debarked. Presently, the markets for elm wood are not being sought out and thousands of trees and dollars are being burned or buried.

All methods of tree removal and disposal are capital intensive. In order to remove thousands and thousands of diseased trees, a large number of trucks, aerial buckets, loaders, chippers, and chain saws are needed. Most cities have some of the needed equipment. However, they usually do not have enough of it. In addition, they are not budgeted for the necessary manpower to handle the equipment.

Municipalities either bond for needed equipment as a capital improvement or purchase it from general treasury monies. In order to issue additional bonds, municipalities would have to come to the Legislature for additional bonding authority or pass a referendum. The major drawback to a referendum is the time needed to set up an election.

In light of the unemployment figures, it is apparent that there are able bodied men and women available to fill the additional need.

However, any new workers need to be trained and supervised closely, adding additional costs. Federal public works money could be used for the costs of new workers.

Costs of Removal and Disposal

In most cases, city crews have been in charge of removing and disposing of dead or diseased trees.

St. Paul's average cost of removal is running \$115 per tree if burning sites are used and \$125 per tree if land fill sites are used. In Minneapolis, the average cost of removal is \$125 on public property and \$200 on private property. Bloomington's average cost of removal is \$100 per tree on public property and \$114 on private property.

The seven-county metro area will lose about 60,000 elms in 1976, and an estimated 100,000 in 1977, and 200,000 in 1978, if present disease rates continue to double. Assuming an average cost of sanitation of \$125 per dying tree over the next two years, the total costs of removing dead or diseased elms is as follows:

<u>Year</u>	<u># Elms</u>	<u>Total Cost of Sanitation</u>
1976	60,000	\$ 7.5 million
1977	100,000	12.5 million
1978	200,000	25.0 million

If a good sanitation program were enacted and financed in early 1977 by the state, the individual municipalities themselves, or both, costs could be reduced slightly in 1977 and substantially in 1978. Results of a good sanitation program will not be seen until the following year's loss figures are reported. If losses can be reduced, costs will also be less.

Good sanitation programs across the country, including Elmhurst and Evanston, deal with private and public tree removal and disposal. While replanting efforts may be dealt with separately for public and private trees, experts agree that sanitation programs must include both.

In Elmhurst, the cost to the home owner of removal and disposal of a dead elm on private property is limited to \$150 per tree. The city assumes any additional cost over that amount. Minneapolis is considering such an approach.

St. Paul is now paying the total bill for private tree removal.

Research has discovered no other large metropolitan area where the total cost of private elm removal is picked up by the city.

Elm losses in Elmhurst are expected to be only 400 this year, while Evanston is expected to lose 425. The magnitude of the problem faced in the Twin Cities area is far larger than any other city has faced before due to the area's high population of elms.

Use of Private Contractors for Elm Removal

In most cases, city crews are unable to remove all the dead or dying elm trees fast enough.

In Detroit, city crews are equipped to remove 5,000 trees a year. In 1975, 10,000 trees had to be contracted out to private contractors. Detroit city crews' average cost of removal is \$75 per public tree, compared to \$55 by private contractors. Union contracts wage and crew size provisions appear to account for the difference in the price.

In Elmhurst, where the average cost of removal is \$100, the

city crews remove all dead public trees. Private contractors are brought in to handle private property trees.

In Evanston, private companies are hired to prune trees on private property while city crews handle most of the removal effort on public and private trees. Removal bids in Evanston are taken on a "per tree" basis.

There are at least 50 tree trimming and/or removal firms in the metro area.

Under St. Paul's expanded sanitation program, private contractors have been asked to place bids for removal of some 13,000 dead or diseased elms in the city. Five city crews are averaging 40 trees removed per day. The private firms range in size from 2 or 3 man operations to larger "truck and bucket" operations. The city has conducted a survey to determine the "prevailing wage" required by the Little Davis-Bacon Act. Wage rates in the private sector are lower than the wages being paid to city crews. Groundmen make an average of \$5.36 an hour in the private sector and \$6.41 for the city. Tree trimmers make \$6.53 with private contractors and \$6.89 for the city. Driver-operators make \$5.05 with private contractors, while city truck drivers make \$7.29, clam operators make \$8.38. The city also pays its foremen \$8.18 and park aids get \$3.00.

Private contract bids are expected to range anywhere from \$5 - \$15 per diameter inch, which would be \$120 - \$360 per 24 inch tree. Most bidders are expected to get some work, and will be hired for one week at a time. Removal by private contractors is expected to commence October 15.

The Effectiveness of a Good Sanitation Program

A number of American cities have kept their elm losses down through an effective control program. Evanston still has over 70% of its original elms twenty-one years after the disease first struck. Arlington Heights and Park Ridge, Illinois also have been able to keep their losses extremely low through good sanitation efforts.

Syracuse, New York was able to keep the elm losses under 2% per year until 1965, when financial problems resulted in less money being made available for the sanitation program. Syracuse then rapidly began to lose many of its elms.

Detroit, Michigan had a good sanitation program, but financial worries have resulted in less and less emphasis on sanitation and the elm population has dropped from over 350,000 in 1950 to less than 60,000 this year.

Other cities like Champaign-Urbana, Illinois were unprepared for Dutch Elm disease and lost almost all their elms in the mid 1950's. In 1976, there are only 12 elms left in Urbana and 8 in Champaign. Ames, Iowa has only 300 elms today. In 1968, they had 11,000. Half of the remaining 300 are dying this year. Des Moines, Iowa lost the same battle, as did Freeport and Rockford, Illinois, and Beloit and Madison, Wisconsin.

According to authorities, a good sanitation effort requires at least a 15-20 year commitment to the program. To cut back in the middle is self defeating.

2. Root Graft Prevention

Another method of Dutch Elm disease control is to prevent the spread through root graft. The fungus can be transmitted to an adjacent healthy tree from a diseased tree. Underground transmission can be prevented by destroying all grafted roots.

Root grafts occur between elms growing near one another. Grafting is a paramount problem in the Twin Cities because of the proximity of the elms and the hard soil conditions. In sandier soil root grafting is less of a problem because the roots have gone deeper, in effect, straight down, rather than spreading out horizontally just below the surface. Dr. Ed Kondo of the Canadian Forest Service indicated that he has never experienced any problems with root grafting of elms in Canada, where the soil tends to be sandier.

Root grafts have been known to occur between trees as much as 50 feet apart, and develop long before the fungus is deposited in the twig crotches of a healthy elm.

The chemical Vapam has been used, both in the Twin Cities and around the country, in an effort to cut through root grafts.

Both Minneapolis and St. Paul use Vapam, as does Evanston. Elmhurst has ceased using the chemical as has Detroit.

Vapam costs about \$5 a gallon. It is injected 18 inches into the ground between trees. It has been unsuccessful because of grafting that occurs under streets and sidewalks. While elm trees are able to graft under the street or sidewalk, it is impossible to inject through cement or asphalt. Even in areas where a tree is accessible, a vibrator plow cutting the ground may be just as effective as the chemical itself.

3. Healthy Tree Spraying

Another method of control is to spray healthy trees. DDT was used with some effectiveness until 1972 when it was replaced by a chemical called methoxychlor. Methoxychlor does not have the same negative impact on the environment as did DDT. Thoroughness is important in spraying. All bark surfaces must be completely covered with spray to prevent bark beetle feeding or breeding. Spraying must be done before the smaller European elm bark beetle becomes active in the spring, according to the U.S. Forest Service. Some cities do spray in fall instead of spring.

Spraying is restricted to days that have little or no wind, no rain, and temperatures above freezing. Because the residual effectiveness of methoxychlor is not known at this time, dormant application in the spring is recommended. Due to the large number of lakes in the Twin Cities, spraying has been limited. Besides being hard on fish, methoxychlor pits new paint on cars and causes grease spots on aluminum siding.

Neither St. Paul or Minneapolis use methoxychlor.

4. Removal of Dead Branches

Another method of Dutch Elm disease control is through the removal of all dead branches from healthy and injected elms. The disease shows its first signs in the crown of the elm where the initial beetle feeding takes place. Removal of dead branches eliminates just another breeding place for the bark beetle.

Tree trimming is done at all times of the year. However, a U.S. Forest Service study indicated that trimming during the summer months spreads the disease.

Tree trimming operations in the Twin Cities has been set back greatly because crews that normally would be trimming are tied up with tree removal operations.

5. Chemical Treatments

Much work has been done by research groups, both private and public, with chemicals which will prevent the spread of the fungus from one tree to another. However, research in this area is only a few years old and tests continue to determine the effectiveness of a number of chemicals over a longer period of time.

DDT was used extensively until it was banned by the Environmental Protection Agency in 1972 because of its high toxicity and its overall effect on the environment.

Research with a chemical called Lignasan, which is derived from Benlate, has been promising. Lignasan BLP research has been conducted by Dr. Kondo in Canada, the Elm Research Institute in 30 states, and the U.S. Forest Service in a number of cities. Most research findings tend to show that Lignasan may be useful when correctly applied in controlling the disease in trees which show limited symptoms.

Dr. Kondo has been using the chemical since 1969. His research is based on injections into the roots and/or the root flare of the tree about a foot below ground level. Kondo claims he gets the best distribution by injecting below ground and in the lower roots. He injects 3.8 times as much Lignasan into a tree as the EPA label permits. Dr. Kondo believes that Lignasan or water must be injected into a tree for an average of 24 hours in order to get the best distribution of the chemical. Licensed applicators in Canada are

required to attend a four day training session to learn the proper injection procedure. Kondo feels that even this amount of training, which is not required in the U.S., is probably not adequate to learn the proper techniques. Since Canada does not face root graft problems, Kondo believes that Canadian experiments and their results may not necessarily be applicable to American elms because of differences in soil type and climate conditions.

The Elm Research Institute (ERI) provided the big push behind the quick EPA approval of the Lignasan BLP label. Applications for EPA approval was made in March 1976 and on May 12 EPA allowed Lignasan to be produced commercially. According to ERI, EPA's approval was based on five years of Canadian experiments, namely Dr. Kondo's. ERI claims research was done from June - October 1975 on 7,000 trees in 33 states at EPA approved label strength and done at 20 pounds of pressure and injected as close to the ground level as possible. Initial research findings were favorable but were based on 1,000 injected trees. Follow up research is being done this year according to ERI.

The U.S. Forest Service has conducted research for five years with Lignasan. The strength used by the Forest Service is five times as strong as EPA's level. In addition, 70 pounds of pressure per square inch is used instead of 10-30 pounds as the label recommends. Using this stronger pressure, the average treatment time has been reduced to 12 minutes per tree. Preliminary results are favorable. Assuming a tree is less than 20% diseased and pruned back properly it has a 90% chance of recovery if treated using U.S. Forest Service Procedures.

The high pressure is used to push the extra-rich mixture not only into the free flowing veins of the tree but also into the

clogged, diseased areas as well.

Dr. French, a plant pathologist at the University of Minnesota, is among the authorities who feel that the present Lignasan label is far too weak. However, any application of Lignasan over the approved dosage is against the law.

While EPA granted DuPont a permanent registration approval on Lignasan, supposedly based on Dr. Kondo's research, Canada has chosen to grant DuPont only an "experimental" registration so that experiments can be continued.

ERI indicates that more than 100,000 trees from Maine to California are being treated with the new solubilized chemical. It is difficult to estimate the number of elms that were injected in Minnesota in 1976. However, at least 80 commercial firms opened their doors or added Lignasan injections to their line of business, while numerous private individuals and neighborhood groups also injected a large number of trees. While the Department of Agriculture by law, must license all Lignasan applicators, it does not monitor techniques of application, pressure used, and strength of the Lignasan solution. It is reasonable to assume that the EPA label strength and pressure directions were not completely followed by everyone injecting trees.

Hard research data on the application of Lignasan BLP at the strength approved by EPA and used in the Twin Cities area is extremely limited. The jury is still out on Lignasan BLP; yet some Twin Cities citizens have spent anywhere from \$20 - \$125 per tree on Lignasan injections. A number of injected trees have been removed and more will have to be taken down next spring. In many cases, the tree was too far gone when injected. In some cases, the chemical was not applied properly.

Lignasan needs to be injected yearly regardless of which formula is used. It can be used as a cure or as a preventative.

U.S. Forest Service scientists believe that excessive use of Lignasan may result in the development of a Lignasan-resistant strain in the fungus, further emphasizing the need to apply Lignasan properly.

Dr. Kondo's injection procedure is expensive. He has indicated that total cost per tree can run up to \$1,000 if it is done properly. If higher Lignasan injection levels are approved in the future by EPA and if root and flare injection are the best method of application, the expense may restrict usage of this chemical to high value, "historic" trees only. It could become too expensive for most homeowners to use.

Another chemical that is being researched is KT-Fungicide, which is a new anti-fungal discovered by Dr. M.J. Thirumalacher of the University of Minnesota. KT-Fungicide is derived from another anti-fungal antibiotic called Aureofungin, which was also discovered by Dr. Thirumalacher while in Poona, India. Dr. Marvin Whitehead, retired from his position as Professor of Plant Pathology at Georgia State University, has conducted a number of successful experiments with Aureofungin in Atlanta, Georgia.

KT-Fungicide was found to be much more effective than Aureofungin, which itself is considered highly superior in reversing the course of Dutch Elm disease, according to the chemical's developers.

A few trees around the University of Minnesota medical school campus have been injected with KT-Fungicide. Some treated trees, injected with KT-Fungicide and pruned back, have shown signs of new

growth. KT-Fungicide has also been tested in Denmark in other seed diseases and has shown some promise. However, research has been limited to Dr. Whitehead's work with Aureofungin and Dr. Thirumalacher's work with KT-Fungicide. The U.S. Forest Service is familiar with the chemicals and some tests were run late this summer. Additional research is expected on KT-Fungicide next year both by Thirumalacher in Minnesota and by the U.S. Forest Service.

Research is also being conducted by the U.S. Forest Service on multi-lure bark beetle traps. The traps are designed to catch European beetles through the use of a sticky coating on an 18" x 26" paper or wire trap and a small bait in the middle of the trap containing odors that lure bark beetles. Experiments are being conducted in Detroit; Fort Collins, Colorado; Washington, D.C.; and Evanston, Illinois. The traps are also being used as a survey device to determine where beetles are. One trap in Evanston was found to contain 18,000 bark beetles attached to it. One thousand traps encircle the city. While the overall usefulness of the multi-lure trap remains in question, research with the trap may lead to better sanitation control methods.

Summary of Chemical Research

Research in the chemical treatment area of Dutch Elm disease is being approached from three different angles. Plant pathologists are studying the tree itself trying to produce a stronger, disease-resistant tree like the Urban Elm (a cross between an Asiatic and a European elm). Entomologists are researching the life cycles and habits of both the European and native bark beetle looking for a way to stop the greatest spreader of the disease. Biologists are studying

the fungus itself, which moves from tree to tree and when all is said and done actually kills the tree.

Forty years of research has produced no cure. Even if a "miracle drug" were found today, it would be too late for many of Minnesota's elms.

Replacement Efforts

A good control program will spread the cost of both removal and replacement out over enough years to provide for a healthy transfer from elm trees to a multi-variety urban forest.

Present replacement efforts are handled by local municipalities in Minnesota. No state money has been spent on replanting to the best of our knowledge.

Prices for replacement trees vary with the species, the city, and how much work the city does in planting and maintaining the new tree.

In 1976, St. Paul planted 2,500 trees at an average cost of \$140 per tree for its boulevard trees. These trees averaged 2½ - 3 inches in diameter and were "balled and burlapped" (roots surrounded by ground). The private nurseries that won a contract with the city through competitive bidding, plant, water, and maintain the trees for one year. If the tree dies in that first year, the private nursery will replace it at no cost to the city. St. Paul expects to plant 12,000 trees in 1977. While St. Paul maintains a city nursery it is not yet producing large enough shade trees to be replanted.

Minneapolis planted 5,000 trees this spring and will plant another 5,000 this fall. Private nurseries will provide 7,000 of the 10,000 trees planted in Minneapolis this year. Minneapolis' city

nursery provided the rest. Trees cost \$20 for 2 - 2½ inch "bare root" (no ground) types. There is no private nursery guarantee and the city must maintain and water the trees. Minneapolis expects to plant another 10,000 trees in 1977.

Species like ash, linden, honeylocust, maple, and hackberry are being used to replace elms. While research continues on a new hybrid tree called an "urban elm," its development, if successful, may be too late to be used in Minnesota.

Most shade trees require 15 - 20 years to reach 6 inches in diameter, which is considered a fair sized shade tree. Private nurseries, both in Minnesota and around the country, have been providing the bulk of the replacement trees for the metro area. Some cities including Minneapolis, St. Paul, Bloomington, Fridley, and White Bear Lake maintain city nurseries. However, in most cases, the city nurseries are not able to provide enough trees to supply the demand.

The Minnesota Department of Natural Resources nurseries produce 13 million 8 to 12 inch high seedlings each year. Around 45 different types of trees are produced including shade trees. These seedlings are sold in lots of 500. Half of the DNR production is planted on private property and the rest is planted in parks, forests, and roadways. DNR nurseries may be able to provide starter trees for city nurseries at a reasonable cost.

In Evanston, 2½ - 3 inch "b&b" trees are planted on the boulevard. The city has a master plan for replanting, using 26 species and alternating species block by block. Spacing varies depending on the species. Seven hundred trees are planted yearly. If a resident wants a larger tree (3½ - 4 inch) planted in the boulevard in front

of his house, he must pay an additional \$40. Replacement trees in Evanston cost an average of \$125 (\$65 - \$70 for the tree, \$35 for labor, and \$10 for watering and maintenance over two years). City crews do all the work. In Evanston, a real estate company as a promotional activity, is offering to pay one-half (\$20) of the residents \$40 for a 3½ - 4 inch tree.

Just as in Evanston, there is potential here for civic-minded individuals, groups, organizations, or businesses to join the replanting effort. One encouraging sign in the Twin Cities metro area has been the involvement of the First National Bank of Minneapolis in the education of the public on Dutch Elm disease. Dayton-Hudson and other business firms also are beginning to become active in the fight against the disease. School groups, service clubs, public utilities, banks, the Chamber of Commerce, and other groups could become active in community replanting.

Since the city will be buying trees in bulk anyway, possibly groups could add their orders to those of the cities and take advantage of a bulk rate with private nurseries. Also, public service announcements could be produced by media publicizing planting weekends or Arbor Day.

Financial Alternatives

The first consideration on financing is that the state does not have the resources to deal with a program that deals with all one hundred million or more elms in Minnesota. Even if it were feasible, such action would not necessarily be desirable since nature will take care of the reforestations in woods, forests and wild areas.

The question then is what is a reasonable and affordable limitation on an elm disease program.

Evidence of programs in other parts of the country and common sense indicates that municipal elm disease control programs are attainable and affordable. The goal would be to save the boulevard shade trees that give communities character, energy-saving shade and insulation and generally add to the quality of life. Such a program must also include private property elms within municipalities because of the nature of the disease.

There are proponents of almost every facet of an elm disease control program mentioned in this report, but it seems to us that state involvement would be most effective in two essential areas -- sanitation and reforestation.

The two programs are inter-related. Experience of communities in other states indicate that a good sanitation program (spotting, removal and disposal) can preserve a substantial number of elm trees over 20, 30 and 40 years.

Since there is no cure for the disease, a sanitation program buys a community time to replant, so that over the long run the community will have mature new trees to replace the dying elms.

A reforestation program without a good sanitation program means disappearance of virtually all elms within a few years and a high

cost of removal of dead trees both on the basis of esthetics and hazard. (There have been incidences of injury and even death from limbs of dead elms in New York, Massachusetts and in Iowa).

A good sanitation program without a reforestation program defeats the major purpose of sanitation -- the buying of time for an orderly transition from elms to a multi-species urban forest.

Our discussion of financial alternatives are based on these assumptions:

1. That a good sanitation program is no costlier than a program to let the disease run rampant, since dead trees will have to be removed.
2. That a good sanitation program is expensive.
3. That a sanitation-reforestation program will allow communities to maintain tree-lined boulevards and residential streets.
4. That such a program would significantly increase property taxes.
5. And that because of the above assumptions, state financial participation in a control program is essential to achieve broad local participation and quality control programs.

A number of policy decisions have to be made, if the state enacts a Dutch Elm disease control aid program. Among those decisions would be political boundaries of control districts; the percentage of state-local match; the financing of removal, disposal and replantings on private properties within control districts; authority to finance the local effort portion of the control cost and the level of state funding.

Because of budgeting factors involved in elm disease control,

it seems reasonable to organize control districts along municipal boundaries. Communities should also be able to get together in joint powers type of cooperative efforts.

An extremely important issue in financing is timing. The spread of the disease in 1976 makes immediate efforts imperative. This means removal of diseased trees before the April beetle flights and quick identification and removal in the Spring of 1977.

Many communities will not have the funds or the equipment needed early enough in 1977 unless the Legislature acts early.

State funds made available early in the session are essential to an effective 1977 program. Furthermore, arrangements should be made to allow borrowing for local shares for elm disease control for communities which because of levy limits or other factors had not levied enough for control programs in their 1977 budgets adopted in the fall of 1976.

Based on elm tree losses reported to the State Department of Agriculture by 164 metropolitan and 239 out-state municipalities we have developed these loss and cost estimates.

	1976 (Actual)	1977 (Estimated)	1978 (Estimated)
<u>Elm Losses:</u>			
Metro	60,000	100,000	200,000
Outstate ¹	10,000	17,000	35,000
<u>Cost of Removal:</u>			
(Ave. \$125)	\$8.75 mil.	\$14.625 mil.	\$29.375 mi.
<u>Cost of Replanting:²</u>			
(Ave. \$100)	4.37 mil.	7.31 mil.	14.68 mi.
<u>Total Costs:</u>	\$13.02 mil	\$21.93 mil	\$44.05 mi.

- 1 Limited to outstate municipalities; does not include rural areas
- 2 Assumes 1/2 replacement effort

The total cost for this three year period is about \$80 million. It should be noted, though, that experts agree that a good 1977 sanitation program would probably significantly reduce the 1978 losses.

If the Legislature decides to deal with the elm problem, it is our suggestion that it finance a share of the clean-up of the 1976 problem, the 1977 problem and early control efforts in 1978. Our suggestion is that the Legislature review the problem and efforts made during its 1978 session. By that time some information will be available on the success of the program to that date. The allocation and thrust of the program could be changed on new information.

In our judgment from \$40 to \$50 million could handle an excellent sanitation and reforestation program from early 1977 through the middle of 1978.

On a 50-50 match basis that would involve a state appropriation of between \$20 and \$25 million.

Under normal legislative appropriations monies could not be made available to the local municipalities until July 1, 1977. However, most authorities consider the spring of 1977 to be the pivotable year. If a major sanitation control effort is not made this spring the cause may be lost. In fact, in St. Paul, where losses went from 4,000 in 1975 to 16,000 in 1976, it may already be too late to control the wild spread of Dutch Elm disease.

In view of this the Legislature would do well to:

1. Assure communities that do not have access to local share funding of sources for borrowing such funds.
2. Give communities authority to levy sufficient amounts to cover any borrowings and local share funding for 1978.

January 10, 1977

A major point on the above is that even if the Legislature allows municipalities a special levy for elm disease control, the levy could not be made until late in 1977 and could not be collected before May and October of 1978.

Local Share of Funding

The most familiar funding of local costs of elm disease control is the property tax.

This could be done with special levies or by passing bond issues to cover costs and spreading costs more evenly. In either case legislation would be needed. One involves special levy authority outside the levy limits; and the second involves bonding authority for maintenance type programs.

Senator Skip Humphrey has expressed some concern about the property tax as a source of financing of the local share because it falls disproportionately on senior citizens and other low income citizens. He has asked for alternatives involving a system of financing related on ability to pay.

There are two alternatives to deal with this problem; one is an income tax surtax and the other a piggyback sales tax.

Each 1 per cent of income tax surtax (\$10 on a \$1,000 tax liability) would raise \$10 million statewide and about \$5 million a year in the metro area. Such a tax could revert to the community of residence of the taxpayer or it could go into a formula for re-distribution of elm control communities. Such a system would reflect ability to pay and would involve very small contributions from senior citizens and low income families.

An additional penny on the sales tax would yield about \$100 million a year statewide and about \$55 million in the metro area. Again such a fund could be redistributed to the communities of collection or on a formula basis.

This approach would put the smallest bite on poor people because food, clothing, shelter, medical costs and services are exempt from the sales tax. Furthermore, it would collect some of the funds from visitors.

Either of the above two approaches should be accompanied with tight controls so that income or sales tax funds cannot be manipulated to get around the levy limitations.

State Funding

Our suggestion is that funds for sanitation and reforestation should be separately appropriated. It seems to us that sanitation funds should not be granted without a commitment to reforestation and vice versa. As suggested earlier, the two programs working together gives the best assurance of maintaining an adequate supply of shade trees in the communities.

The level of state support involves legislative judgments not related to the elm disease problem (property vs. other taxes, levy limits, etc.). But assuming any percentage of state cost sharing we recommend a per tree dollar limitation for sanitation and reforestation.

For instance, our figures indicate an average cost of removal of about \$125 per tree and an average replanting cost of \$100. If the legislature adopted 50 percent sharing in both those instances, the dollar limit should correspond to 50 percent of the average cost or,

if our costs estimates are accepted, \$62.50 and \$50, respectively.

It seems to us that in the area of sanitation the state should treat public and private trees within municipalities the same because a good sanitation program should remove all diseased trees within a community.

Thus the subsidy would be \$62.50 for either private or public trees. The communities themselves could decide on further subsidization of private tree removal and disposal.

It seems to us that the state should stay away from subsidizing replanting on private properties, partly because of cost and primarily because the state should have very good public reasons for improving the esthetics and value of private property. It seems that community organizations and private business could play a role in encouraging private shade tree replanting. Furthermore, municipalities could make bulk nursery replanting prices available to private property owners.

Our evidence indicates that on a cost-effectiveness basis the state should not make any major effort in helping finance lignasan type therapeutic program, although the state and municipalities may find it desirable to use such methods on selected high value trees. Possibly the state could encourage the U.S. Forest Service to experiment with therapeutic methods in areas of high value trees.

Financing for programs beyond the above would best remain within local perogatives and financing.

Summary and Conclusions

Dutch Elm disease is here to stay. Since 1961 thousands of elms have died in Minnesota from the blight. Countless millions can be expected to be lost by 1985. We can not stop the disease, but we can control its spread.

If we do nothing the costs of removing dead elms and replacing them with other types of trees will be forced upon our cities within the next five years.

Through the use of a good sanitation program we can spread the losses over a longer period of years and buy the necessary time to replant. To do nothing will leave our cities without mature shade trees thereby increasing heating costs, cooling costs, and destroying the beauty of the tree-abundant municipalities. Property values will be affected, causing decreases in the property taxes collected. The price of doing nothing is very expensive, and its consequences are far reaching.

All the experts point to a good sanitation program as the only way to attempt to subdue the disease. A good sanitation program calls for adequate funding for early and efficient inspection, prompt removal, and rapid disposal of elms.

There are a number of methods for disposal. Burning and burial are the most efficient in a good sanitation program because of the need to dispose of elm wood promptly.

The cost of removal and disposal varies depending on tree size and location of the standing tree. The average cost is \$125 per tree.

Elms have to be removed from private and public property. City crews have not been able to handle the removal of even all the public

trees because of the large loss increases. Private contractors are being hired to supplement the city effort, placing strain on city budgets.

A good sanitation program works. It has been used in other parts of the country with success. Dead tree removal could be accompanied by local efforts in tree trimming, spraying, root graft prevention, and possibly chemical treatments. While all of these methods of control appear to have some merit, the state would get the most for its money (and the best results) by placing its money in the sanitation and reforestation areas, specifically in the prompt removal and disposal of dead and dying elms and replacement with new shade trees.

We are especially concerned about Lignasan. While early research has shown the chemical to be of some value, additional research needs to be done on the strength of the chemical, the pressure used in injections, and the methods of application. Local municipalities may wish to experiment with Lignasan or even reimburse citizens who inject their trees, but we believe the state is much better off investing its money in a good sanitation and reforestation program.

A key part of an overall program should be replacement. A number of species are available to replace elms with costs ranging from \$20 - \$140 per tree. Replacement trees should never be planted as close together as elm trees were, if we are to avoid similar root graft problems in the future. State financial involvement in a replanting effort should be limited to public property. Private groups and individuals must be responsible for replanting on private property.

Based on loss projections we have recommended the total cost of tree removal and replanting efforts to be in the \$40 - \$50 million

range. Assuming a 50-50 state-local match the state will need to provide \$20 - \$25 million for finishing the 1976 removal efforts, the entire calendar year 1977 efforts, and the first 4 months in 1978.

Local communities need financial assistance early in 1977. The bulk of the essential work under a good sanitation program must be done in January - April of each year. Replanting can be done in spring and fall. If we are going to get a handle on the spread of Dutch Elm disease early 1977 is the pivotal time. If we wait until July 1, 1977 we will have lost another season and the disease may be past the control stage in many areas.

Use of this unusual funding period also allows the legislature to review any progress that may be made by early 1978. Funding levels and state-local matches could be changed at that time as conditions change.

Tremendous financial burdens are going to be placed on local communities to come up with the local match. Property tax levies appear to be the most logical method, but may also be the most unpopular.

A metro wide surtax on the state income tax or an additional penny on the sales tax are two "non-property" tax alternatives that could be considered. Use of the property tax will cause great concern for people on fixed incomes, especially senior citizens.

APPENDIX D

MDA Reports to the Legislature 1974-77.



LAND OF QUALITY FOODS

STATE OF MINNESOTA**DEPARTMENT OF AGRICULTURE**

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

OFFICE OF THE COMMISSIONER

A SUMMARY REPORT OF TREE DISEASE CONTROL ACTIVITIES
IN THE SEVEN COUNTY METROPOLITAN AREA - 1974

Prepared by the
 Minnesota Department of Agriculture

January, 1975

PART I: THE ROLE OF THE MINNESOTA DEPARTMENT OF AGRICULTURE

I. INTRODUCTION:

In the first half of this report, the Minnesota Department of Agriculture would like to sum up what our Department accomplished since the passage of the Shade Tree Disease Law on March 30, 1974 in implementing this new legislation. In the second half of this report, we would like to analyze the activities and results of the municipalities in the seven county metropolitan area in implementing this new legislation.

II. THE PURPOSE OF THE NEW LAW AND ITS IMPLEMENTATION:

A. The purpose of the Shade Tree Disease Law was to provide for the establishment of Dutch elm disease and Oak Wilt control programs by every metropolitan municipality. It was the considered judgment of the legislature that these two diseases had reached epidemic proportions and that extraordinary measures were necessary. Two important basic elements of the law were the provision for the appointment and certification of a tree inspector by each municipality and the inclusion of authority for a special tax levy outside of all existing tax limitations.



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

B. Immediately on learning that the Shade Tree Disease Law had passed, the Department sent out on April 3, 1974, a hearing notice for the purpose of adopting rules and regulations. This notice was sent to the registered mailing list received from the Secretary of State and to all affected municipalities in the seven county metropolitan area. Included with this notice was a copy of proposed rules and regulations. These rules and regulations had been prepared anticipating passage of the legislation.

C. This legislation mandated that rules and regulations be adopted within 60 days and that municipalities appoint a tree inspector within 75 days. These time constraints placed an extreme burden on the Department and municipalities. Although burdensome, these mandated time constraints did result in effective programs being initiated in 1974.

D. A Dutch Elm and Oak Wilt Advisory Committee representing a cross section of metropolitan communities and scientific resource people was appointed. This committee met on April 16th and again on April 30th to review and amend the proposed rules and regulations.

The members of the committee are listed below:

LLOYD BURKHOLDER
City Forester
1224 North Lexington Parkway
St. Paul, Minnesota 55103
612-488-7291

DAVE DEVOTO
Park Forester
38th Street & Bryant Avenue So.
Minneapolis, Minnesota 55409
612-822-2126

GLEN SHIRLEY
City Forester
2215 West Old Shakopee Road
Bloomington, Minnesota 55431
612-888-5811, Ext. 225

- RALPH MCGINLEY
Deputy Director
Metropolitan Inter County Council
55 Sherburne Avenue
St. Paul, Minnesota 55101
612-222-5823

JOSEPH HELGEVOLD
Hennepin County
Public Works Department
320 Washington Avenue South
Hopkins, Minnesota 55343
612-935-3381

VERN PETERSON
Executive Director
Metropolitan League of Municipalities
300 Hanover Building
480 Cedar Street
St. Paul, Minnesota 55101
612-222-2861

DAVE NOETZEL
Extension Entomologist
Department of Entomology,
Fisheries & Wildlife
University of Minnesota
St. Paul Campus
St. Paul, Minnesota 55108
612-373-1044

JOHN BOLAND
Metropolitan Council
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7th & Robert Streets
St. Paul, Minnesota 55101
612-227-9421

CHUCK LOWERY
Dakota County Parks
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Hastings, Minnesota 55033
612-437-3191

DR. DAVID FRENCH
Department of Plant Pathology
University of Minnesota
St. Paul Campus
St. Paul, Minnesota 55108
612-373-0854

MICHAEL KANNER
Pollution Control Agency
1935 West County Road B-2
Roseville, Minnesota 55113
612-296-7306

GORDON BAILEY, JR.
Bailey Nurseries
1325 Bailey Road
St. Paul, Minnesota 55119
612-459-9744

ARTHUR SCHOENING
Tree Inspector
Route #1, Box #184
Loretto, Minnesota 55357
612-498-8196

KEN SIMONS
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KEITH KUCKLER
Farmer
Route #1, Box 38
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JOHN HERMAN
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800 Midland Bank Building
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DONALD C. WILLEKE
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80 South 8th Street
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612-341-3800

CLARENCE SEEFERT
Seefert's Hudson Road Nursery
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JANETTE HAYNES
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Minneapolis, Minnesota 55406
612-339-8117

EARL ADAMS
Forestry Division
Department of Natural Resources
Centennial Office Building, 3rd Floor
612-296-4484

E. The full advisory committee met on October 2, 1974, to consider tree disposal and utilization. At this meeting, it was recommended and agreed to develop a stepped up program with greatly increased state funding. A subcommittee was named to work on these proposals and to submit a new program to the full committee. The subcommittee met on October 10, 31, and November 7, 1974 to develop the new program which was presented to the full committee on November 15, 1974. The committee accepted the proposal and recommended it be transmitted to the governor's office. At the same time, another subcommittee was formed to look at the various means of wood waste disposal. The subcommittee met on November 21, 1974, and the members who could attend were present at presentations by representatives of industry on November 26 and December 16, 1974.

F. The public hearing on the rules and regulations was held on May 7, 1974. Testimony was received at that time from all interested parties and some changes in the rules and regulations were made based on the testimony. The finalized copy of the rules and regulations was then submitted to the Attorney General's Office for the final adoption procedures. The effective date was June 14, 1974.

III. THE DEPARTMENT MAKES IMPLEMENTING OF LAW A TOP PRIORITY:

A. In order to carry on the activities prescribed by the Shade Tree Disease Law and the rules and regulations, it became necessary to curtail activities in Nursery Inspection and Crop Pest Control and reassign personnel to work exclusively on Dutch elm disease and Oak Wilt programs. Following are some of the major responsibilities and tasks performed in order to meet our responsibilities:

1. Brought in four Barberry crew personnel from out-state to work full-time.
2. Reassigned one nursery inspector to supervise field contact and survey activities.
3. Assigned one additional secretary and when required, used entire clerical staff.
4. Hired five additional seasonal people to work in the Shade Tree Disease Laboratory.
5. Used a vacancy at the Shakopee Greenhouse to get one additional field man. This man had training and experience appropriate to our needs.
6. Two additional staff were added to Department complement.

B. In addition, 4 supervisory personnel spent considerable time on the activity -- sometimes ranging up to 100%. In short, because we gave the implementing of the new Shade Tree Disease Law the highest priority, the Minnesota Department of Agriculture utilized upwards of 22 full and part-time people. This is unprecedented for the history of our Department. Following is a cost breakdown of what funds our Department has spent from March through December, 1974.

METROPOLITAN SHADE TREE DISEASE PROGRAM COSTS
March through December, 1974

1. Adjusted salaries*	\$78,942
2. Mileage	1,982
3. Meals & Lodging	3,279
4. Printing	1,954
5.. Mailing (Postage)	1,298
6. Telephone	312
7. Equipment	525

8. Maps	28
9. Fair Exhibit	22
10. Rent (75%)	<u>2,104</u>
	\$90,446

* Includes salaries of 22 people. Of these, four are supervisors - from 22 to 75% of their salaries were charged to this activity. Seven staff inspectors were transferred to this activity for a period of three months. Four full time seasonal agricultural laboratory technicians and three 3/4 time technicians worked in the Tree Disease Laboratory. One full time entomologist and one full time agricultural laboratory technician was added to our staff. The costs of two secretarial staff people was charged to this activity.

IV. SETTING UP AND OPERATION OF TRAINING SESSIONS:

A. It was obvious from the beginning that training programs would be necessary for municipal tree inspectors if disease control programs were to be successful and meet the goals set by the legislature. The Department of Agriculture met with the University of Minnesota Extension Service to develop a comprehensive training program specifically designed for the needs of local metropolitan tree inspectors. Excellent cooperation was forthcoming from the University and 2 two-day sessions (June 27 & 28, and July 1 & 2) were scheduled. Announcement of the training session was sent out and then followed up by telephone calls made by the Department to every metropolitan municipality. Attendance was very good. One hundred forty-three municipal representatives completed the training course. The response from those who attended was most favorable. For example, Dave DeVoto, the Minneapolis Park Board Forester, said the training sessions were excellent and of great value.

B. As the Department is also committed to curbing the tree diseases in the outstate municipalities, training programs were conducted at Aitkin, Glenwood, McIntosh, Owatonna, and Sleepy Eye. These training programs were held in May to train County Agriculture Inspectors, who could then give assistance to municipalities in their counties. The attendance at these meetings totaled 152. Following completion of the metropolitan training programs, similar sessions were scheduled for three outstate locations for training of municipal officials in charge of tree disease programs. These were at Rochester, Mankato, and Marshall with total attendance of 120. Department personnel played an important role in the planning and presentation of all of the above sessions.

V. THE FOLLOWING ARE SOME OF THE IMPORTANT ACTIONS WE TOOK IN 1974:

A. On June 19, 1974, we sent each municipality a copy of the Shade Tree Disease Law along with a copy of the newly adopted rules and regulations. We ordered every municipality to appoint a tree inspector and to begin a disease control program so that some accomplishment could be shown this year.

B. Following the above notification, personal contacts were made with every municipality to determine (1) if a tree inspector had been appointed; (2) if control program aspects as outlined in the rules and regulations were being followed, and; (3) to provide technical aid and assistance. Further it was a way of collecting data for our evaluation of program development.

C. Concentrated efforts were directed toward preparation for the training session. The objective was to provide the best possible training so that communities could get the job done.

D. Through the month of June, 294 contacts were made with metropolitan municipal officials.

E. During the same period, examinations were being prepared for qualifying tree inspectors for provisional or full certification. Tree inspector lists were updated, and notification was sent to each inspector. The exams were scheduled for August 20, 21, and 22. Ninety-four inspectors took the examination for certification. Another exam was scheduled for October 7, 8, and 28 for 61 individuals. Future examinations will be scheduled. In 1974, a total of 147 municipalities employed a tree inspector.

F. During July and early August, 117 contacts were made to evaluate program progress. Based on this evaluation, it was determined that 59 municipalities were doing a good job; 37 were questionable, and 15 were not complying. Not all communities could be contacted during this period.

G. In the course of our surveys, one of the important weaknesses that became apparent was that certain municipalities were failing to mark and remove trees. Field contacts were made with most of the closer-in suburbs to insist that great efforts be made to mark and remove dead or dying trees. This was followed-up with a letter to every municipality urging immediate action. It was pointed out the trees must be marked now while symptoms are still apparent and leaves are present.

H. A telephone survey the week of September 1 was made to collect information to see how well communities responded to our tree marking campaign. Following are the results gathered in

contacting 117 communities:	<u>ELM</u>	<u>OAK</u>	<u>TOTAL</u>
TREES MARKED	3,819	962	4,781
TREES REMOVED	2,950	1,473	<u>4,423</u>

roughly 10,000 trees
marked and/or removed

I. Presently, the field staff is continuing the work with municipalities on various program aspects.

J. Throughout the whole period the Department has maintained and strengthened its working relationships with other agencies such as the Department of Natural Resources, Pollution Control Agency, University of Minnesota, Minnesota League of Municipalities, Metropolitan Inter-County Council and others.

K. The municipalities are required to submit a report of their program by December 1 of each year. To obtain uniformity, a reporting form was mailed to the municipalities on October 29.

L. The Department of Agriculture approves shade tree disease control programs of each municipality for the coming year. These programs are to be submitted by January 1 and may be changed by the Commissioner if necessary prior to approval. The tabulation below indicates the progress of program approval as of January 15, 1975.

SHADE TREE DISEASE PROGRAMS - 1975				
County	Programs Required	Received	Approved	Changes Required
Anoka	22	10	5	5
Carver	13	5	3	2
Dakota	24	8	4	4
Hennepin	47	39	25	14
Ramsey	17	7	6	1
Scott	11	3	0	3
Washington	33	19	16	3
	167	91	59	32
Outstate	2	1	1	0

The Department is continuing to contact the cities which have not submitted a program for approval.

VI. THE SHADE TREE DISEASE LABORATORY FOR 1974

A. The passage of the Shade Tree Disease Law caused a substantial increase in the number of disease samples submitted. This was especially true in regard to oak samples. During the peak period, as high as 250 samples per day were received. In order to handle this load and to provide municipalities with the best possible service, the Department employed as many as seven seasonal laboratory technicians to process samples. This laboratory work was under the direction of an experienced and well qualified plant pathologist who devoted practically full time to this activity. Following is a tabulation of the samples received and diagnosed in 1974 through October 21.

	<u>ELM</u>	<u>OAK</u>
SAMPLES RECEIVED	5,877	907
SAMPLES POSITIVE	3,167	314
SAMPLES NEGATIVE	2,710	593

Appendix A, The Shade Tree Laboratory report for 1974 contains further details.

B. Special report forms were prepared in triplicate and supplied to all municipalities on request. This form was completed by the municipal sample collectors and sent to the Shade Tree Disease Laboratory along with the sample. One copy of this form, giving the diagnosis, was returned to the municipal collector. Numbered duplicate tree tags were also supplied in order to assist the communities in maintaining accurate records. The tabulation and the returning of results generated a large workload for secretarial staff.

VII. ADDITIONAL FACTS

A. Information Service - The increasing number of cases of Dutch elm disease and Oak Wilt resulted in great increase in telephone requests for information. These came from homeowners, municipal officials, companies, concerned citizens, news media, etc. There were also many requests for someone from the Department to attend meetings and to discuss the disease situations. We honored these requests to the best of our ability. The large number of telephone calls from local citizens took so much time that it became necessary to refer many calls to the local tree inspectors. The training provided to the tree inspectors enabled them to handle most problems.

B. State Fair - An educational exhibit devoted primarily to Dutch elm disease and Oak Wilt was set up and staffed during the 11 day State Fair. Literally thousands of people viewed this exhibit. Many asked questions and expressed concern about the rapid spread of the diseases in their home locality.

VIII. THE DEPARTMENT'S EFFORTS IN OUTSTATE MINNESOTA

A. In March, 206 outstate municipalities that had positively diagnosed cases of Dutch elm disease were notified that they must have a control program on line and functioning by June 30, 1974.

B. In March, our Management by Objective Plan expected 50% of the state's municipalities with Dutch elm disease to have established control programs by June 30. We exceeded this and had a percentage figure of 66%.

C. As of December 31, 1974, 202 (91%) outstate municipalities have approved control programs; and 20 (9%) have not made the effort to develop a sound program. To obtain compliance with the statutes, the

cities have been contacted by mail and telephone 3 to 4 times each. This has resulted in the low number of cities without sound programs.

D. The addition of 18 outstate municipalities recording their first case of Dutch elm disease has now increased the cities requiring control programs to 222.

PART II: THE ROLE OF THE MUNICIPALITIES

I. THE FOLLOWING SUMMARY FOR THE SEVEN COUNTY AREA INCLUDES THESE FACTS FOR THE PERIOD THROUGH DECEMBER 31, 1974

A. Expenditures

Municipalities spent a total of \$2,255,877 on shade tree control programs. This figure indicates municipalities are responding to the legislative mandate to control Dutch elm disease and Oak Wilt. Considering this is the first year most municipalities have begun to develop programs, the total money spent is impressive.

B. Tree Inventory

Number of elm trees	3,346,336
Number of oak trees	6,744,189
Number of other species	7,532,432

The number of elm and oak trees indicates the immense problem facing the metropolitan area in controlling Dutch elm disease and Oak Wilt.

C. Diseased Trees and Trees Removed

	Diseased	Removed
Elm	9,792	6,616
Oak	46,837	3,680

The large number of disease oak listed includes trees dead for more than one year. Such trees are being removed for aesthetic and safety reasons as they pose no biological hazard. In addition, many of the

oaks are in rural settings which may be outside control areas. To some extent this is also true of elm. We anticipate that all trees which present a hazard in the spread of the disease will be removed by April 15, 1975.

D. Trees Planted

Municipalities have planted 14,352 trees in 1974. This is encouraging as it indicates they are replacing and anticipating tree losses while planning for the future.

II. ATTACHED IS AN INDIVIDUAL MUNICIPALITY TABULATION BY COUNTY FOR THE SEVEN COUNTY METROPOLITAN AREA.

SEVEN COUNTY METROPOLITAN AREA

COUNTY	MONEY SPENT	MAN HOURS	# TREE INSPECTORS	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Anoka	\$ 32,616	3,866	15	1,097	41,107	677	749	111,893	2,095,372	1,067,669	2,466
Carver	24,797	2,507	6	37	4	58	50	166,232	120,771	286,197	225
Dakota	108,422	6,276	11	870	2,909	577	2,054	384,286	1,590,074	1,539,634	124
Hennepin	1,748,831	183,376	36	2,419	1,484	2,259	344	1,215,376	654,983	2,180,095	4,071
Ramsey	344,375	32,863	16	3,074	1,009	1,728	246	345,473	411,628	411,327	6,752
Scott	7,030	647	3	95	71	84	81	819,121	815,132	1,079,950	93
Washington	47,495	6,272	22	2,200	253	1,233	156	303,955	1,056,229	967,560	621
TOTALS	\$2,313,566	235,807	109	9,792	46,837	6,616	3,680	3,346,336	6,744,189	7,532,432	14,352

ANOKA COUNTY

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Anoka	\$ 3,880	1,250	no	228	21	87	16	15,017	6,079		
Bethel	166	0	yes	11	1	11	1	265	22,300	36,400	300
Blaine	1,780	100	yes	4	274	4	99				2,000
Burns twsp.											
Centerville	360	70	yes	94	8	46	0	1,000	50		
Circle Pines			no								
Columbia Heights	12,315	1,760	yes	280	5	280	1	10,000	3,000	7,000	66
Columbus twsp.	200	0	yes	1	0	3	2				
Coon Rapids	2,814	605	yes	23	40,050	23	300	27,660	1,703,800	700,000	75
East Bethel	43	0	yes	3	88	70	106	320	30,820	6,750	25
Fridley	7,674	0	no	437	519	153	154	5,000	35,000		
Andover (Grow twsp.)	125	0	yes	0							
Ham Lake	1,909	32	yes	0	71						
Hilltop	50	9	yes	16							
Lexington			no								
Lino Lakes	1,100	0	yes	0	70	0	70	52,338	167,739	208,923	
Linwood twsp.			yes								
Oak Grove twsp.	200	40	yes								
Ramsey twsp.			no								
St. Francis			yes	Report Received, No Program Conducted							
Spring Lake Park			yes								
Anoka County Report			no								
TOTALS	32,616	3,866	15	1,097	41,107	677	749	111,893	2,095,372	1,067,669	2,466

CARVER COUNTY

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Carver	\$ 50	10	yes	13	0	6	0	1,100			0
Chanhassen	1,468	267	yes	6	4	35	50	88,320	88,320	176,640	125
Chaska	22,786	2,096	no	17	0	16	0	71,680	30,720	102,400	100
Cologne		32	no					452	218	386	
*Dahlgren twsp.			no	Report Received, No Program Conducted							
Hamburg	75	8	yes	0	0	0	0	190	70	600	
*Hancock twsp.			no	Report Received, No Program Conducted							
Mayer	10	1	yes								
New Germany	13	0	yes								
Norwood	75	10	yes	0	0	0	0	520	50	1,200	
*San Francisco twsp.			no	Report Received, No Program Conducted							
Victoria	245	65	no	0	0	1	0	1,560	1,213	4,191	
Waconia			no								
Watertown			no								
Young America	75	8	yes	0	0	0	0	350	120	780	
Young America twsp.			no	Report Received, No Program Conducted							
Carver County Report		10		1	0	0	0	2,060	60	0	0
TOTALS	\$24,797	2,507	6	37	4	58	50	166,232	120,771	286,197	225

* no program required

DAKOTA COUNTY

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Apple Valley	\$ 3,045	161	yes	1	194	1	110	1,280	134,000	59,520	24
Burnsville	64,693	708	yes	95	1,663	130	1,684	220,000	700,000	1,010,000	0
Coates			yes								
Egan	1,120	90	yes	3	15	3	7				
Farmington	1,700	106	yes	6		6		1,000	50	1,000	
Hampton			yes	Report Received, No Program Conducted							
Hastings	345	142	no	38		19		30,822	5,388	12,087	
Inver Grove Heights	2,344	230	no	36	1	12	1				
Lakeville	5,166	1,916	yes	36	780	36	163	70,649	529,869	282,536	
Lilydale		160	no	277		5		3,000	50	7,000	100
Marshan twsp.			no	Report Received, No Program Conducted							
Mendota Heights	4,145	454	yes	180		218		2,000	2,000	4,000	
Mendota			no								
Miesville			no								
New Trier			no	Report Received, No Program Conducted							
Nininger twsp.			no								
Randolph		18	no								
*Randolph twsp.		13	no								
Ravenna twsp.			no								
Rosemount	6,149	1,137	yes	7	229	13	48	29,155	216,117	129,440	
South St. Paul	4,613	690	yes	114	17	114	17	19,480		29,051	
Sunfish Lake	(all money spent by individuals)	49	yes			17	14	900	1,200	5,000	
*Vermillion twsp.			no	Report Received, No Program Conducted							
Vermillion			no	3		3					
West St. Paul	15,101	402	no	74	10		10	6,000	1,000		
Dakota County Report			no								
TOTALS	108,422	6,276	11	870	2,909	577	2,054	384,286	1,590,074	1,539,634	124
* No program required					-17-						

HENNEPIN COUNTY

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Bloomington	\$ 50,388	5,293	yes	515	47	515	47	200,000	50,000	200,000	1,100
Brooklyn Center	12,617	615	yes	34	4	34	4	15,000	5,000	15,000	50
Brooklyn Park	5,503		yes	248		219					
Champlin			yes								
Corcoran		0	no	7	0	7	0				
Crystal			yes								
Dayton	185	44	yes	7	0	27	0	20,000	24,000	20,000	
Deephaven	893	90	yes	0	1	5	7	40,000	40,000	20,000	
Eden Prairie	8,091	1,303	yes	88	48	88	48				
Edina	66,440	4,410	yes	0	1,075	35	100	53,121	100,345	245	
Excelsior	1,470	180	yes	8	2	8	2	4,700	600		
Golden Valley	8,060		no	30	0	30	0				
Greenfield	462	103	yes	3	0	3	0	15,000	5,000	10,000	
Greenwood	250	31	yes	3	4	3	4	4,100	500		
Hanover			no								
Hassen twsp.	114	10	no	0	0	0	0				
Hopkins	23,657	3,986	yes	71	53	61	44	24,331	6,107	1,333	
Independence	809	160	yes	8	0	8	0	169,500	40,680	467,820	
Long Lake			yes								
Loretto	36	6	no	1	0	1	0				
Maple Grove	11,225	780	no	106		98		365	150	1,729	
Maple Plain	143	30	yes	4	0	32	0	4,000	200	11,800	
Medicine Lake	225	43	yes	3		3					
Medina	0	60	yes	5	0	5	0	944	234		
Minneapolis	1,298,010	141,985	yes	937	0	842	15	135,000	500	13,500	1,538
Minnetonka	62,015	4,897	yes	26	220	26	25	157,000	200,000	153,000	375
Minnetonka Beach	225	29	yes	0	0	0	0	2,712	926	5,812	

HENNEPIN COUNTY CON'T

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Minnetrista	\$ 300	50	no	2	0	2	0				
Mound	1,352	194	yes	9	0	13	2	10,000	8,000	12,000	10
New Hope	1,680	232	yes	5	0	5	0	35	0	800	150
Orono	1,556	78	yes	1	0	8	0	54,123	41,934	164,058	
Osseo	710	77	no	4	0	4	0	1,870	0	1,675	
Plymouth			yes								
Richfield	133,950	10,690	yes	0	0	6	1	75,000	100,000	40,000	
Robbinsdale	7,550	365	no	42	10	42	10	6,927	166	10,341	17
Rockford	214	47	yes	0	0	40	0	3,000	400	4,000	
Rogers	179	49	yes	0	0	17	14	900	1,200	5,000	
St. Anthony	3,650	738	yes	1	0	1	0	2,000	500	4,500	
St. Bonifacius	100		no	0			0				
St. Louis Park	3,346	3,998	yes	29	4	27	4	42,000	7,869		600
Shorewood			no								
Spring Park	325	53	yes	1	0	10	2	3,000	1,000	5,000	
Toinka Bay	913	220	yes	0	0	12	15	4,650	3,330	12,490	
Wayzata	8,700	646	yes	0	0	4	0	3,778	110	1,724	6
Woodland	3,886	422	yes	0	0	10	0				
Hennepin County Park Reserve	22,552	383	yes	215	16	8	0	162,329	16,232	998,268	225
Hennepin County Report	7,051	1,079	yes								
TOTALS	1,748,831	183,376	36	2,419	1,484	2,259	344	1,215,376	654,983	2,180,095	4,071

RAMSEY COUNTY

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Arden Hills			yes								
Falcon Heights	\$ 3,000	45	yes	1		1		1,200		200	
Gem Lake	427	107	yes	0	0	0	0	2,189	6,046	3,200	
Lauderdale			yes								
Little Canada	1,699	266	yes	195		93					
Maplewood	25,270	930	yes	350	2	350	2	30,000	30,000	70,000	150
Moundsview	1,922	424	yes	65	167	65	40	21,500	34,400	30,100	
New Brighton	6,251	634	no	91	119	91	6	26,685	42,696	37,359	2,000
North Oaks	2,875	640	yes	80	429			5,000	40,000	5,000	
North St. Paul	11,497	167	yes	187	5	33	4	4,700	4,800	14,000	300
Roseville	19,033	843	yes	23	1	23	1	23,726	13,824	160,156	73
St. Paul	260,821	28,000	yes	1,614	1	940	1	110,000	16,500	30,000	2,050
Shoreview	3,256	341	yes	26	136	17	44	99,072	198,144	33,024	2,000
Vadnais Heights	546	72	yes	73	28	22	16	901	218	288	
White Bear Lake	7,253	346	yes	65	8	75	49	11,000	17,000	28,000	179
White Bear twsp.	525	48	yes	304	143	18	83	9,500	8,000		
Ramsey County Program			yes								
TOTALS	344,375	32,863	16	3,074	1,009	1,728	246	345,473	411,628	411,327	6,752

SCOTT COUNTY

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Belle Plaine			yes	Report Received, No Program Conducted							
*Cedar Lake twsp.	\$ 79	17	no								
Credit River twsp.			no	Report Received, No Program Conducted							
Elko			no					329	675	950	
*Helena twsp.			no	Report Received, No Program Conducted							
Jordan	60	20	no	0	0	7	0				
New Market			no	Report Received, No Program Conducted							
New Prague	149	32	yes	0	0	11	0	1,343	207	1,000	93
Prior Lake	3,364	246	no	37	1	11	0	325,000	455,000	520,000	
Savage	703	68	no	53	70	36	70	485,000	355,000	558,000	
Shakopee	2,667	262	yes	5	0	19	11	7,449	4,250		
Spring Lake twsp.			no								
Scott County Park	9	2	no								
Scott County Program			no								
TOTALS	7,030	647	3	95	71	84	81	819,121	815,132	1,079,950	93
* No program required											

WASHINGTON COUNTY

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Afton	14	30	yes	58		33					
Bayport	370	0	no	13	0	13	0	22,000	1,000	1,000	30
Baytown twsp.	565	72	yes	1		1		8,470	60,244	31,044	
Birchwood	425	47	yes	33	13	33	13	240	2,118	3,199	
Cottage Grove	1,952	342	yes	5	8	83	28	119,317	204,400	122,255	296
Dellwood	350	0	yes	1	0	1	0	6,231	28,162	26,697	
Denmark twsp.			no								
Forest Lake	1,815		no	229	27	97	5	1,355	2,490		
Forest Lake twsp.	1,742	533	yes	183	5	172	5	21,000	197,350	136,236	
Grant twsp.	860	103	yes	10	0	4	0	18,625	140,165	116,175	
Grey Cloud twsp.	521	181	yes	27	0	27	0	17,200	52,000	64,800	
Hugo	1,150	160	yes	110	0	5	0	22,376	207,203	162,361	
Lake Elmo	1,220	165	yes	83	64	57	36	18,225	118,793	98,042	
Lakeland	142	20	yes	18	0	5	0	2,200	1,650	4,300	
Lakeland Shores			yes	Report Received, No Program Conducted							
Lake St. Croix Beach			no	Report Received, No Program Conducted							
Landfall	389	64	no	8	0	13	0	24			
Mahtomedi			no								
Marine on St. Croix			no								
May twsp.	180	26	yes	0	0	0	0	565	3,195	6,870	
Newport	5,297	76	yes	479	0	41	0				
New Scandia	655	143	no	25	15	30	15				
Oakdale	1,753	264	yes	112	6						
Oak Park Heights	3,676	76	no	11	0	35	0	300	300	2,000	175
Pine Springs	25	50	yes	15	34	13	26	468	5,696	60,445	120
St. Mary's Point	310	205	yes	0	14	0	7				
St. Paul Park	3,140	219	yes	17		31		9,850	1,680	10,530	

WASHINGTON COUNTY (con't)

MUNICIPALITY	MONEY SPENT	MAN HOURS	TREE INSPECTOR	DISEASED TREES		TREES REMOVED		TREE INVENTORY			TREES PLANTED
				Elm	Oak	Elm	Oak	Elm	Oak	Other	
Stillwater	\$ 12,922		no	63	0	48	0	8,440	2,911	16,681	
Stillwater twsp.			yes								
West Lakeland twsp.			no								
Willernie	350	40	yes	7	0	5	0	439	787	1,485	
Woodbury	2,084	528	yes	527	12	426	5	12,000	12,000	36,000	
Washington County Report	5,590	2,928	yes	165	55	60	16	14,630	14,145	67,440	
TOTALS	47,495	6,272	22	2,200	253	1,233	156	303,955	1,056,229	967,560	621

CHIPPEWA COUNTY
WRIGHT COUNTY

Montevideo
Monticello

Petitioned Commissioner of Agriculture to come under provisions of 18.023 and accepted for the year 1975.

1974 SHADE TREE DISEASE LABORATORY REPORT

Dutch elm disease continued to increase in severity during the 1974 season. Public awareness of Dutch elm disease has led to increased programs of detection and control by local municipalities. Forty-four municipalities found their first positive case in 1974, as did two counties. Three hundred twenty-eight municipalities now have Dutch elm disease. This represents 38% of the 854 incorporated cities in Minnesota. Sixty-four of the eighty-seven counties are infested. Outside of the Twin City metropolitan area, the hardest hit cities were Austin, Albert Lea, and Mankato.

During the period June 1st to October 21, 1974, 5,877 elm samples were submitted to the Minnesota Department of Agriculture, Tree Disease Laboratory. Of these, 3,167 were diagnosed as positive for Dutch elm disease. The City of Austin laboratory confirmed 172 positive cases, and the St. Cloud laboratory - 20. The total of positive diagnosed cases in 1974 from all agencies was 3,359. This total represents an increase of nearly 1/3 over last year's positive cases. These cases are only a small percentage of the actual number of cases in the state, but they do reflect the statewide trend. If this trend continues or even worsens, there will be a sharp increase in 1975, possibly as much as 50%. Since 1961, a total of 11,250 cases of Dutch elm disease have been diagnosed, mainly from municipal areas.

Dutch elm disease is becoming increasingly evident in rural areas in wood lots and especially along rivers and their tributaries. Thousands of dead elms are evident along the rivers in southeastern Minnesota.

It is expected that Dutch elm disease will be found in many more municipalities in central Minnesota in 1975. The future increase of Dutch elm disease in municipalities will be determined by the effectiveness of their control program. Unless there is an increased control effort for Dutch elm disease, each municipality will see a rapid and drastic change in its shade tree environment. Intensified control measures will slow down the spread of this disease, and allow an orderly transition to a more diversified tree population.

LABORATORY DIAGNOSED CASES BY YEAR

1961 - 8 positive cases	1968 - 283 positive cases
1962 - 2 positive cases	1969 - 549 positive cases
1963 - 43 positive cases	1970 - 795 positive cases
1964 - 54 positive cases	1971 - 1,158 positive cases
1965 - 23 positive cases	1972 - 2,236 positive cases
1966 - 49 positive cases	1973 - 2,545 positive cases
1967 - 136 positive cases	1974 - 3,359 positive cases

TOTAL - 11,250

SUMMARY TABULATION

Total cases confirmed through October 21, 1974 by the Shade Tree Disease Laboratory of the Minnesota Department of Agriculture.....	3,167
Confirmed cases by the City of Austin Laboratory.....	172
Confirmed cases by the City of St. Cloud Laboratory.....	20
Total confirmed cases for Minnesota.....	3,359

1974 Season Positive Cases
 Diagnosed by the Shade Tree Disease Laboratory
 Minnesota Department of Agriculture

<u>ANOKA</u>	<u>CHIPPEWA</u>	<u>DODGE</u>
Anoka.....16	Montevideo.....4	Dodge Center.....22
*Bethel.....1		Hayfield.....10
Blaine.....2	<u>CHISAGO</u>	Kasson.....3
*Columbia Heights.....2	*Harris.....1	<u>FARIBAULT</u>
Coon Rapids.....13	*Lindstrom.....7	Wells.....14
*East Bethel.....3	North Branch.....2	Winnebago.....14
Fridley.....11	Wyoming.....4	
*Spring Lake Park.....1		
<u>BENTON</u>	<u>COTTONWOOD</u>	<u>FILLMORE</u>
Foley.....4	Windom.....4	Chatfield.....2
*Gilman.....1		Preston.....10
Sauk Rapids.....1	<u>CROW WING</u>	
<u>BLUE EARTH</u>	Brainerd.....2	<u>FREEBORN</u>
Mankato.....225	<u>DAKOTA</u>	Albert Lea.....71
	*Apple Valley.....1	Clarks Grove.....2
<u>BROWN</u>	Burnsville.....32	<u>GOODHUE</u>
Evan.....1	*Eagan.....2	Cannon Falls.....2
New Ulm.....18	Inver Grove Heights...2	Red Wing.....6
Sleepy Eye.....12	*Lakeville.....2	Zumbrota.....1
Springfield.....17	Lilydale.....1	
<u>CARVER</u>	*Mendota.....1	<u>HEMNEPIN</u>
*Carver.....2	Mendota Heights.....2	Bloomington.....413
Chaska.....3	Rosemount.....3	Brooklyn Center.....34
	South St. Paul.....24	Brooklyn Park.....76
	Sunfish Lake.....1	Champlin.....8
	*Vermillion.....1	Coicoran.....3
	West St. Paul.....5	

HENNEPIN (con't)

Dayton.....2
 Eden Prairie.....95
 Edina.....8
 Excelsior.....1
 Golden Valley.....9
 *Greenfield.....3
 *Greenwood.....2
 *Hanover.....1
 Hopkins.....2
 *Independence.....1
 Maple Grove.....11
 Maple Plain.....1
 *Medicine Lake.....3
 Medina.....5
 Minneapolis.....305
 Minnetonka.....18
 *Mound.....6
 New Hope.....5
 Osseo.....4
 Plymouth.....30
 Richfield.....6
 Robbinsdale.....7
 St. Anthony.....1
 St. Louis Park.....27
 Shorewood.....7

HOUSTON

Caledonia.....1

ISANTI

Braham.....3
 Cambridge.....4

JACKSON

Jackson.....9

*KANABEC

*Mora.....1

KANDIYOH

Spicer.....2
 Willmar.....3

LAC OUI PARLE

Dawson.....1
 *Madison.....1

LE SUEUR

*Montgomery.....1
 Waterville.....1

LINCOLN

Lake Benton.....12

LYON

Cottonwood.....1
 Marshall.....34
 Minneota.....5
 Tracy.....5

MARTIN

Fairmont.....5
 Trimont.....2
 Truman.....5

MC LEOD

Glencoe.....2
 Hutchinson.....2
 *Winsted.....1

MEEKER

*Grove City.....1

MILLE LACS

*Foreston.....2
 Milaca.....2
 Princeton.....9

MORRISON

Little Falls.....1

NICOLLET

Lafayette.....3
 St. Peter.....1

NOBLES

Adrian.....4
 Ellsworth.....6
 Wilmont.....2
 Worthington.....29

OLMSTED

Rochester.....141

OTTERTAIL

Fergus Falls.....1

PIPESTONE

Pipestone.....4

RAMSEY

*Arden Hills.....1
 Falcon Heights.....1
 *Gem Lake.....8
 Little Canada.....15
 Maplewood.....20
 New Brighton.....1
 North Oaks.....1
 North St. Paul.....12
 Roseville.....10
 St. Paul.....455
 Shoreview.....1
 Vadnais Heights.....4
 White Bear Lake.....55

REDWOOD

*Belview.....1
 *Milroy.....2
 Morgan.....2
 Redwood Falls.....8

RENVILLE

Olivia.....1

RICE

Faribault.....16
 Northfield.....5

ST. LOUIS

*Aurora.....	1
Biwabik.....	1
*Cook.....	1
Duluth.....	1
Gilbert.....	2
*Hibbing.....	1
Virginia.....	1

SCOTT

*Prior Lake.....	28
Savage.....	2
Shakopee.....	6

SHEREBURNE

Elk River.....	2
Zimmerman.....	1

SIBLEY

Arlington.....	1
*Gaylord.....	2
*Gibbon.....	1
Green Isle.....	1

STEARNS

Cold Spring.....	1
Melrosé.....	8
St. Cloud.....	4
Sauk Centre.....	1
Waite Park.....	2

STEELE

Medford.....	2
--------------	---

SWIFT

*Benson.....	1
--------------	---

WABASHA

Lake City.....	5
Wabasha.....	4

WASECA

New Richland.....	2
Waseca.....	2

WASHINGTON

Afton.....	3
Bayport.....	13
*Birchwood.....	4
Cottage Grove.....	6
*Dellwood.....	1
*Forest Lake.....	2
*Hugo.....	1
Lake Elmo.....	24
Lakeland.....	3
Mahtomedi.....	12
Marine on St. Croix..	17
Oakdale.....	30
*Oak Park Heights.....	1
*Pine Springs.....	1
St. Paul Park.....	12
Stillwater.....	20
*Willernie.....	6
Woodbury.....	69

WATONWAN

Madelia.....	3
--------------	---

WINONA

*Goodview.....	2
St. Charles.....	2
Winona.....	65

WRIGHT

Buffalo.....	7
Maple Lake.....	1

YELLOW MEDICINE

Canby.....	2
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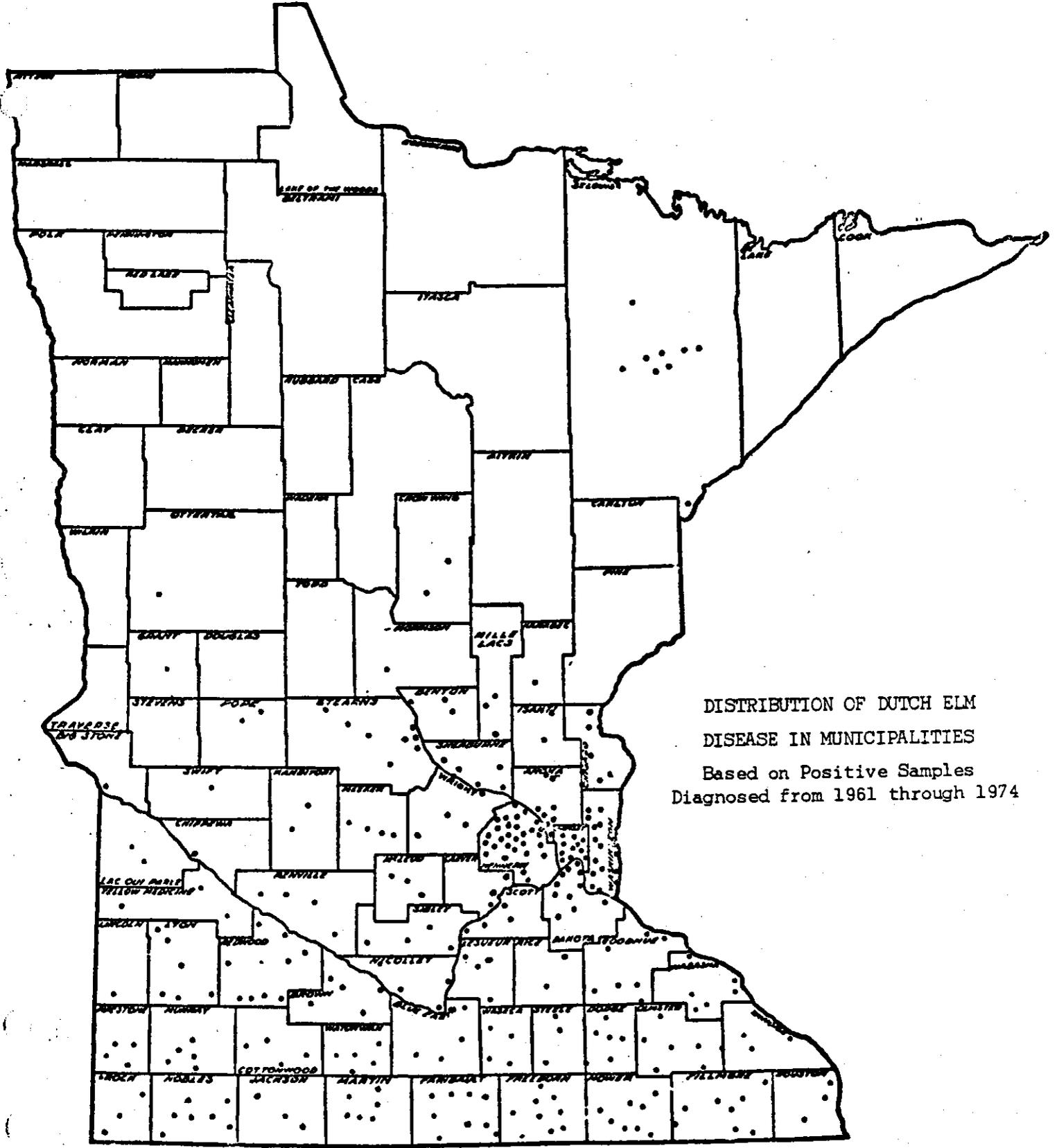
RURAL LOCATIONS

*AITKIN rural.....	1
ANOKA rural.....	2
BENTON rural.....	3
CARVER rural.....	1
CHISAGO rural.....	4
DAKOTA rural.....	7
HENNEPIN rural.....	6
KANDIYOHJI rural.....	4
LE SUEUR rural.....	1
LINCOLN rural.....	2
LYON rural.....	1
MC LEOD rural.....	1
MILLE LACS rural.....	1
MOWER rural.....	1
MURRAY rural.....	1
NICOLLET rural.....	3
OLMSTED rural.....	3
PINE rural.....	1
POPE rural.....	1
RAMSEY rural.....	2
RICE rural.....	2
SCOTT rural.....	11
STEARNS rural.....	2
SWIFT rural.....	1
TODD rural.....	1
WABASHA rural.....	2
WASECA rural.....	1
WASHINGTON rural.....	94
WATONWAN rural.....	1
WINONA rural.....	1
WRIGHT rural.....	1
YELLOW MEDICINE rural.	2

* indicates new location for 1974

Two new counties were infected in 1974; they are Aitkin and Kanabec.

The following four maps outline: (1) distribution of Dutch elm disease in municipalities, (2) Dutch elm disease occurrence by counties, (3) distribution and progression of the smaller European elm bark beetle which is the main carrier of the disease, and (4) area of high incidence of Dutch elm disease in rural areas.



DISTRIBUTION OF DUTCH ELM
 DISEASE IN MUNICIPALITIES
 Based on Positive Samples
 Diagnosed from 1961 through 1974

* * * * *

*
 * SHADE TREE DISEASE CONTROL *
 *
 * 1975 *
 *
 * A REPORT TO THE *
 *
 * MINNESOTA LEGISLATURE *
 *
 * * * * *

MINNESOTA DEPARTMENT OF AGRICULTURE
 DIVISION OF PLANT INDUSTRY

Prepared by:

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 Sylvia Roman
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Peter Grills
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 Dharma Sreenivasam



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

OFFICE OF THE COMMISSIONER

January 30, 1976

TO: RECIPIENTS OF "REPORT TO THE MINNESOTA LEGISLATURE ON THE
MINNESOTA DEPARTMENT OF AGRICULTURE'S SHADE TREE DISEASE
CONTROL ACTIVITIES FOR 1975"

FROM: COMMISSIONER JON WEFALD

The plain fact is that Dutch elm and oak wilt disease continues to take its toll. Losses of both oak and elm have increased significantly in 1975 --- despite the increased dollars committed to containment of shade tree diseases.

Much of the increase can be accounted for, however, by improved disease surveillance and reporting. Yet it is clear that the disease is spreading north and westward, and it is getting worse in those areas where its presence has been confirmed for several years. Minnesota communities must continue their persistent efforts to contain Dutch elm disease. Most importantly, they must continue to improve their surveillance procedures and improve their removal and disposal practices. Sanitation is absolutely essential to effective control.

We realize that control is costly. It requires manpower, equipment and dollars. Shade tree disease control is but one of the many local programs and services competing for limited revenues. But priorities must be attached, and we hope that in making these decisions local officials are well aware of the severe consequence of losing their shade trees over the short term.

With the support of the Minnesota Legislature, the Department has been able to improve the services offered to local communities in the area of shade tree disease control. The Department now provides technical assistance, free laboratory services, grants-in-aid and is active in the area of public education. We hope that these services are helping alleviate the strain upon local resources. We are making every attempt to provide effective assistance to local government; to be more responsive; and to eliminate the traditional reluctance of local government to turn to the state for assistance. We will continue our efforts to simplify the administration of the state's shade tree programs and to meet local needs in the simplest manner possible.



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

D 2

MEMORANDUM TO: RECIPIENTS OF "REPORT TO THE MINNESOTA LEGISLATURE ON THE
MINNESOTA DEPARTMENT OF AGRICULTURE'S SHADE TREE DISEASE
CONTROL ACTIVITIES FOR 1975"

January 30, 1976

Page 2

It is our sincere belief that the devastating consequences of shade tree disease can be minimized by a joint effort of state and local government. With that in mind, we are enclosing a "Report to the Minnesota Legislature on the Minnesota Department of Agriculture's Shade Tree Disease Control Activities for 1975".

JW:vf

enc.

SHADE TREE DISEASE CONTROL ACTIVITIES - 1975

A REPORT TO THE MINNESOTA LEGISLATURE

PREPARED BY

THE MINNESOTA DEPARTMENT OF AGRICULTURE

* * * * * EXECUTIVE SUMMARY * * * * *



"The American elm provides beauty, shade, tranquility and dignity to our homes."

* * * JUST HOW BAD IS DUTCH ELM AND OAK WILT DISEASE? * * *

Cities of the seven county metropolitan area lost over 27,000 elms in 1975. This figure constitutes about 0.69% of the elms in these metropolitan cities and is a three-fold increase from the 9,792 elms lost in 1974. Hardest hit were the counties of Anoka, Ramsey and Washington. A most dramatic increase in losses was seen in the City of St. Paul who lost 2.7% of their elm population.

As of December 1, 1975 there were 9,000 diseased elms still standing in metropolitan cities. This figure is far in excess of what is considered acceptable from a control standpoint. These 9,000 diseased trees must be removed by April 1, 1976 or these cities are likely to see more than a doubling of the 1975 losses.

The metropolitan area lost only slightly more oaks than they did in 1974. Washington county was the only county to experience a sharp rise in oak losses over 1974. All other counties were able to maintain losses at the 1974 level. The percentage loss of the oak population in the metropolitan area actually dropped from 0.13% in 1974 to 0.11% in 1975 as a result of the revised inventories.

D 2

Elm losses in cities and towns outside the seven metropolitan counties appear to be up from 1974. Elm and oak losses, however, are difficult to assess in non-metropolitan areas at this time. Less than one half of the municipal reports have been received by the Department. A complete report of the losses will become available as soon as the balance of the reports have been received and data compiled.

ELM LOSSES - METROPOLITAN AREA

METRO COUNTY	<u>1974</u>		<u>1975</u>	
	NUMBER DISEASED	PERCENT DISEASED	NUMBER DISEASED	PERCENT DISEASED
Anoka	1,097	.98	2,057	1.70
Carver	37	.02	107	.11
Dakota	870	.23	4,041	.51
Hennepin	2,419	.20	8,145	.51
Ramsey	3,074	.90	8,577	2.45
Scott	95	.01	317	.04
Washington	2,200	.72	3,800	2.01
TOTAL	9,792	.29	27,044	.69

WHAT EFFORTS HAVE BEEN MADE TO CONTAIN

* * * *

* * * *

SHADE TREE DISEASE?

This rapid increase in elm losses comes despite a slight increase in average dollar expenditures by metropolitan cities for control. The average time spent by city personnel in 1975 in shade tree disease control actually declined from 1974. A metropolitan city spent on the average of \$23,057.00 while committing an average of 1601 person-hours to control of shade tree disease. Cities not within the metropolitan communities spent an average of \$4,927.00 and committed 317 person-hours.

The Minnesota Department of Agriculture has increased its level of service to local government in shade tree disease control. Under the new grant-in-aid program \$303,281.00 has been made available to local communities in an effort to assist residential property owners in tree removal costs. A total of \$230,00.00 has been granted to the Minneapolis Park Board and the City of St. Paul for establishing a new wood waste utilization center. Hennepin County has received \$21,000.00 for improvement of their existing wood waste processing system. The county still has a \$156,000.00 request for additional processing equipment pending with the Department.

The Department is also sponsoring a media campaign to increase citizen's awareness of shade tree disease. Television and radio

will be used to increase the interest in disease control by the general public. The Department will maximize the impact of this interest by assisting citizens and community service groups in implementing programs which support local disease control efforts.

The Department continues its laboratory services to local communities. The number of samples processed in 1975 increased substantially and is expected to rise sharply in 1976. In furthering its role of providing technical assistance, the Department has initiated a research project in cooperation with the Governor's Internship Program. The project will monitor the incidence of the disease throughout the state and determine patterns of distribution.

<u>COUNTY</u>	<u>AVERAGE</u> <u>PERSON-HOUR</u> <u>PER MUNICIPALITY</u>		<u>AVERAGE</u> <u>EXPENDITURE</u> <u>PER MUNICIPALITY</u>	
	<u>1974</u>	<u>1975</u>	<u>1974</u>	<u>1975</u>
	Anoka	258	819	2,174	14,326
Carver	418	74	4,133	1,345
Dakota	571	494	9,857	8,638
Hennepin	5,094	2,978	48,579	50,044
Ramsey	2,054	4,118	21,523	34,003
Scott	216	139	2,343	1,064
Washington	285	286	2,159	4,593

AVERAGE PERSON HOURS AND DOLLAR EXPENDITURES - METROPOLITAN MUNICIPALITIES

GRANTEE	AMOUNT OF AWARD 1975	AMOUNT OF AWARD 1976	TOTAL AWARD
Bloomington	\$ 9,500.00	---	\$ 9,500.00
Burnsville	\$10,675.00	\$20,600.00	\$31,275.00
Chanhassen	\$ 3,000.00	\$ 6,000.00	\$ 9,000.00
Coon Rapids	\$ 5,000.00	\$30,000.00	\$35,000.00
Columbia Heights	---	\$ 3,000.00	\$ 3,000.00
Cottage Grove	\$ 2,250.00	---	\$ 2,250.00
Deephaven	\$ 2,500.00	\$12,000.00	\$14,500.00
Edina	\$15,000.00	\$15,000.00	\$30,000.00
Fairmont	\$ 4,000.00	\$ 5,500.00	\$ 9,500.00
Falcon Heights	\$ 300.00	---	\$ 300.00
Gaylord	---	\$ 1,500.00	\$ 1,500.00
Golden Valley	---	\$ 7,500.00	\$ 7,500.00
Lauderdale	\$ 1,000.00	\$ 2,000.00	\$ 3,000.00
Madison Lake	---	\$ 6,000.00	\$ 6,000.00
Mahtomedi	\$ 3,000.00	\$21,000.00	\$24,000.00
Maplewood	\$ 6,000.00	---	\$ 6,000.00
Minnetonka	\$25,000.00	\$32,500.00	\$57,500.00
Monticello	\$ 3,203.00	\$ 3,203.00	\$ 6,406.00
Pipestone	\$ 750.00	\$ 1,000.00	\$ 1,750.00
Red Wing	\$ 800.00	\$ 2,000.00	\$ 2,800.00
Richfield	\$ 500.00	\$ 7,500.00	\$ 8,000.00
St. Cloud	---	\$ 2,500.00	\$ 2,500.00
South St. Paul	\$ 1,000.00	\$ 2,000.00	\$ 3,000.00
Spring Valley	---	\$ 2,500.00	\$ 2,500.00
Vernon Center	---	\$ 1,500.00	\$ 1,500.00
Washington County	\$ 5,000.00	\$20,000.00	\$25,000.00
TOTALS	\$98,478.00	\$204,803.00	\$303,281.00

HAVE THESE EFFORTS HAD AN APPRECIABLE
EFFECT ON CONTAINING SHADE TREE DISEASE?

* * * * *

* * * * *

An assessment of the impact of these control activities on the spread of shade tree disease is most difficult because of the serious constraints placed on the availability of data. It appears, however, that increased treatment of infected oaks has reduced the spread of oak wilt disease, or at least confined it to smaller infection centers. It is more difficult to determine the impact of control measures upon Dutch elm disease. Losses continue to rise sharply despite improved control programs. The increased losses can partially be accounted for by the improved disease detection and reporting of diseased trees. Due to the biological nature of the disease, there will always be a natural increase in losses despite the most diligent control efforts. The objective of control is merely to slow down the rate at which the disease spreads. Notwithstanding the difficulty in drawing definitive conclusions from municipal reports, there appears to be a substantially better chance of prolonging the loss of elm populations in those communities who are implementing effective control programs.

It must be recognized that there is a point beyond which control is no longer practical and the municipality passes into the clean-up phases of Dutch elm disease. A substantial number of communities in the eastern portions of the metropolitan area are critically close to this point. These communities must act now or expect to bear the expenses of a massive clean-up. It is imperative that these communities remove all elms known to be diseased prior to the 1976 growing season and make every possible effort to insure sanitation throughout the season.

* * * * * DIRECTIVES FOR 1976 * * * * *

The following are directives for the Minnesota Department of Agriculture in its administration of the Shade Tree Disease Control Program in 1976.

REGULATORY

I. CONTINUE TO EMPHASIZE SANITATION AS THE MOST IMPORTANT ASPECT OF DISEASE CONTROL.

A. TAKE AVAILABLE LEGAL ACTION AGAINST THOSE MUNICIPALITIES WHO PERSISTENTLY FAIL TO PROVIDE ADEQUATE CONTROL MEASURES.

In 1976 the Department shall take available legal action against those municipalities who continually fail to respond to administrative orders to provide adequate control measures. This will necessitate an effective system of surveillance by the Department. Legal action will always remain a last resort measure and will be limited to municipalities with gross violations and who have exhibited bad faith.

B. CONDITION GRANT FUNDS UPON SANITARY REMOVAL AND DISPOSAL.

No municipality will be eligible for grant funds from the state unless they have complied with all removal and disposal regulations. The subsidy to the municipality will be used as an incentive to properly remove and dispose of diseased trees. Variances will be allowed only where the municipality can show that circumstances made it impossible to comply with the state's regulations. The municipality's burden of proof will be heavy.

- II. URGE ALL STATE AGENCIES RESPONSIBLE FOR STATE OWNED PROPERTY TO PROVIDE ADEQUATE CONTROL WHEN THE STATE PROPERTY LIES ADJACENT TO A MUNICIPAL CONTROL AREA.

It is most difficult for the Department to enforce control programs in municipalities when adjacent state property is being neglected. State officials will be requested to assume the responsibility of disease control on these lands immediately.

STATE SERVICES

- III. DEVELOP AN INFORMATION SYSTEM WHICH WILL IMPROVE REPORTING FROM MUNICIPALITIES, DATA STORAGE AND HANDLING, AND DATA ANALYSIS.

The effort will be continued to simplify reporting procedures for municipalities. Data will be computerized for ease in compilation and storage. Electronic data processing will greatly improve the efficiency of data analysis and significantly reduce the factor of human error.

- IV. INCREASE RESEARCH WHICH IS SUPPORTIVE OF THE DEPARTMENT'S IMMEDIATE DECISION-MAKING NEEDS.

The Department will work more closely with the University of Minnesota to coordinate research activities with the Department's decision-making needs. Departmental policy concerning the biological aspects of control needs the direct technical support from University researchers.

- V. DEVELOP A LONG RANGE PLAN FOR PUBLIC EDUCATION IN SHADE TREE DISEASE.

If public education in shade tree disease control is to be effective, it must educate and motivate people in the long term. A

piecemeal approach to public education is likely to be expensive and ineffective in sustaining public interest over the long term. A strategy must be developed to insure continued public interest.

VI. EXAMINE THE NEEDS FOR THE REPLACEMENT OF SHADE TREES AND IDENTIFY STATE ACTIONS WHICH WILL AID LOCAL REPLACEMENT PROGRAMS.

The Department will determine in 1976 the replacement rate for the metropolitan and rural areas. It will attempt to identify local needs in shade tree replacement and increase technical assistance accordingly.



"Dutch elm disease is an American tragedy - without a sincere public concern, it will rage unabated throughout our neighborhoods."

PREFACE

This report approaches the discussion of shade tree disease control activities for 1975 by posing three basic questions:

JUST HOW BAD IS DUTCH ELM AND OAK WILT DISEASE?

WHAT EFFORTS HAVE BEEN MADE TO CONTAIN SHADE TREE DISEASE?

HAVE THESE EFFORTS HAD AN APPRECIABLE EFFECT ON CONTAINING SHADE TREE DISEASE?

The first of the three questions posed is answered by a report of tree losses throughout Minnesota, and a discussion of what these losses mean. The second question is answered by a report of local control activities and the state services offered to local governments in control of shade tree disease. Finally, the third and most difficult of the questions posed is answered by a comparison of the tree losses in relation to the quantitative terms of control activity for the years of 1974 and 1975.

Answers to these questions are subject to the limitations of available data. It is important to acknowledge these limitations at the onset. The report is based upon only the annual municipal reports received by the Minnesota Department of Agriculture as of December 1, 1975. Tree loss figures are confined to designated control areas within the boundaries of the political unit reporting. The quality of reporting varies, depending upon the local government's experience in shade tree control. Notwithstanding these practical limitations on available data, the report makes an attempt to determine the incidence of shade tree disease, the amount of effort that is being made to contain the diseases, and an assessment of whether these efforts have had any appreciable effect on the spread of the diseases.

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TREE LOSSES AND CONTROL ACTIVITIES BY MUNICIPALITY

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PART I - INCIDENCE OF SHADE TREE DISEASES

A. METROPOLITAN MUNICIPALITIES

1. Dutch Elm Disease. The incidence of Dutch elm disease in the metropolitan municipalities¹ has seen a dramatic increase in 1975. Total tree losses for 1975 were at 27,044, approximately a three-fold increase from the 1974 losses of 9,792.² Elm losses calculated from elm population inventories in control areas in the metropolitan area show a 0.69% loss in 1975, more than twice the 0.29% loss recorded in 1974. (See Table 1)

The incidence of Dutch elm disease increased in all seven of the metropolitan counties in 1975. Municipalities within Ramsey, Washington and Anoka counties were the hardest hit. Ramsey county municipalities reported a 2.45% loss; Washington county municipalities a 2.01% loss; and Anoka county municipalities a 1.70% loss. These counties also reported heavy losses in 1974, Anoka 0.98%; Ramsey 0.90%; and Washington 0.72%. (See Table 1)

Prompt removal of diseased trees and proper disposal are the most important aspects of disease control.³ In absolute numbers, removal activity within the metropolitan area has increased substantially from 1974. The number of trees removed as a percentage of the diseased trees, however, remains about the same. Although these diseased tree removal percentages are comparable - 67% in 1974 and 66% in 1975, the problem of standing diseased trees remains serious. In 1974, a little over 3,000 disease elms were left standing. Those diseased elms which remained standing at the beginning of the 1975 growing season were a significant factor in the three-fold increase in tree losses for 1975. There are now almost 9,000 diseased trees left standing. This may be a startling indicator of things to come in 1976 in terms of disease dissemination by the elm bark beetles.

By all indications the problem of Dutch elm disease is very serious in the metropolitan area. There is the real possibility that losses in 1976 will double that of 1975 to well over 50,000 elms, should a substantial number of the 1975 diseased trees still be standing at the onset of the 1976 growing season. This 1975 level of sanitation (66%) is likely to precipitate conditioning in 1976 which will require a substantial increase in control activity in terms of dollars, personnel, and time.

2. Oak Wilt Disease. Reports reveal only a slight increase in the losses of oaks in metropolitan municipalities, from 6,787 in 1974 to 6,981 in 1975. Oak losses as a percentage of revised oak population inventories show 0.11% loss in 1975 for all metropolitan municipalities compared to the 0.13% loss recorded in 1974. The disease incidence is approximately the same for both years considering the increase in the inventory of over 1 million trees. (See Table 2)

Municipalities within Washington, Anoka and Ramsey counties had increased losses in 1975, with Washington county showing a sharp increase from a 0.02% loss in 1974 to a 0.11% loss in 1975. Dakota and Hennepin had a decline in losses, both in terms of actual numbers as well as percentage losses. (See Table 2)

Diseased oak tree removal and girdling in the metropolitan area, as a percentage of diseased trees reported, showed a significant increase from 54% in 1974 to 69% in 1975. Ramsey, Washington and Hennepin counties, however, are below the seven county average of 69%. Important to note is that Hennepin county municipalities have removed or treated only 48% of the diseased oaks. This is less than desirable from a control standpoint. (See Table 2)

From all available indications oak wilt disease is controllable in the metropolitan area. In 1974 the number of diseased oaks left untreated was 3,107 and in 1975 it was 2,122. The improved control in 1975 emphasizes the

fact that given proper control measures the oak wilt disease will not spread rapidly and remains in small pockets as infection centers. Treatment eliminates the efficiency of the vector in transmitting the disease.⁴

B. RURAL MINNESOTA

1. Dutch Elm Disease. Dutch elm disease is progressing geographically to the western and the northern portions of the state. Four more counties were added to the list of Minnesota counties who have confirmed the presence of Dutch elm disease. The addition of Carlton, Koochiching, Roseau and Stevens raises the total of counties with confirmed Dutch elm disease to sixty-eight. Nine more municipalities reported their first case of Dutch elm disease in 1975. This raises the total of rural municipalities⁵ who have confirmed cases of Dutch elm disease to 231.⁶

Reporting of losses from rural municipalities is not required by law.⁷ The Department does, however, request reports from municipalities who have control programs. (See Table 3) With approximately one half of the municipalities returning the Department's questionnaire to date there appears to be an increase in the number of elm losses. As of December 31, 1975 the percentage loss for municipalities throughout the state was up from 1.1% in 1974 to 1.24% in 1975. A better assessment of the incidence and distribution of Dutch elm disease in rural municipalities can be made after the balance of reports have been received by the Department. (See Figure 1)

2. Oak Wilt Disease. Presently the existence of oak wilt disease has been limited to southeastern Minnesota and parts of central Minnesota.⁸ The disease is reported to be active in thirty-two counties in the state. The incidence and distribution of the disease is difficult to determine at this time. Reporting of the disease has not been consistent, seriously limiting the availability of data.

1974

1975

METRO COUNTY	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
Anoka	111,893	1,097	.98	677	61	122,617	2,057	1.70	1,414	68
Carver	166,232	37	.02	58	--	95,549	107	.11	97	90
Dakota	384,286	870	.23	577	66	786,319	4,041	.51	2,397	59
Hennepin	1,215,376	2,419	.20	2,259	93	1,608,662	8,145	.51	5,548	68
Ramsey	345,473	3,074	.90	1,728	56	349,900	8,577	2.45	5,951	69
Scott	819,121	95	.01	84	88	754,059	317	.04	295	93
Washington	303,955	2,200	.72	1,233	56	183,793	3,800	2.01	2,360	62
TOTAL	3,346,336	9,792	.29	6,616	67	3,900,899	27,044	.69	18,062	66

TABLE 1

ELM LOSSES - METROPOLITAN AREA

1974

1975

METRO COUNTY	OAK INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	OAK INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
Anoka	391,572	1,057	.27	749	71	273,545	1,288	.47	1,188	92
Carver	120,771	4	.003	50	--	90,872	4	.004	3	--
Dakota	1,590,074	2,909	.18	2,054	70	2,816,450	1,903	.07	1,520	80
Hennepin	654,983	1,484	.23	344	23	708,365	1,007	.14	492	48
Ramsey	411,628	1,009	.24	246	24	516,363	1,479	.29	896	60
Scott	815,132	71	.009	81	--	547,286	56	.01	48	85
Washington	1,056,229	253	.02	156	61	1,107,376	1,244	.11	712	57
TOTAL	5,040,389	6,787	.13	3,680	54	6,060,257	6,981	.11	4,859	69

TABLE 2

OAK LOSSES - METROPOLITAN AREA

1974

1975

DISTRICT	1974					1975				
	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
SE	77,810	1,415	1.8	NA	NA	98,991	1,550	1.6	1,068	69
SC	123,817	1,115	0.9	"	"	*124,939	1,415	1.13	1,395	98
SW	29,270	821	2.8	"	"	26,593	723	2.7	455	63
EC	12,260	58	0.5	"	"	16,088	386	2.4	360	93
C	51,767	260	0.5	"	"	49,319	490	0.99	323	66
WC	33,250	48	0.14	"	"	45,419	84	0.18	80	95
NE	21,925	31	0.14	"	"	25,885	159	0.61	34	21
TOTAL	350,099	3,748	1.1	"	"	387,234	4,807	1.24	3,715	77

* Faribault inventory 100,000 added.

NA - data not available

TABLE 3

ELM LOSSES - OUTSIDE THE METROPOLITAN AREA

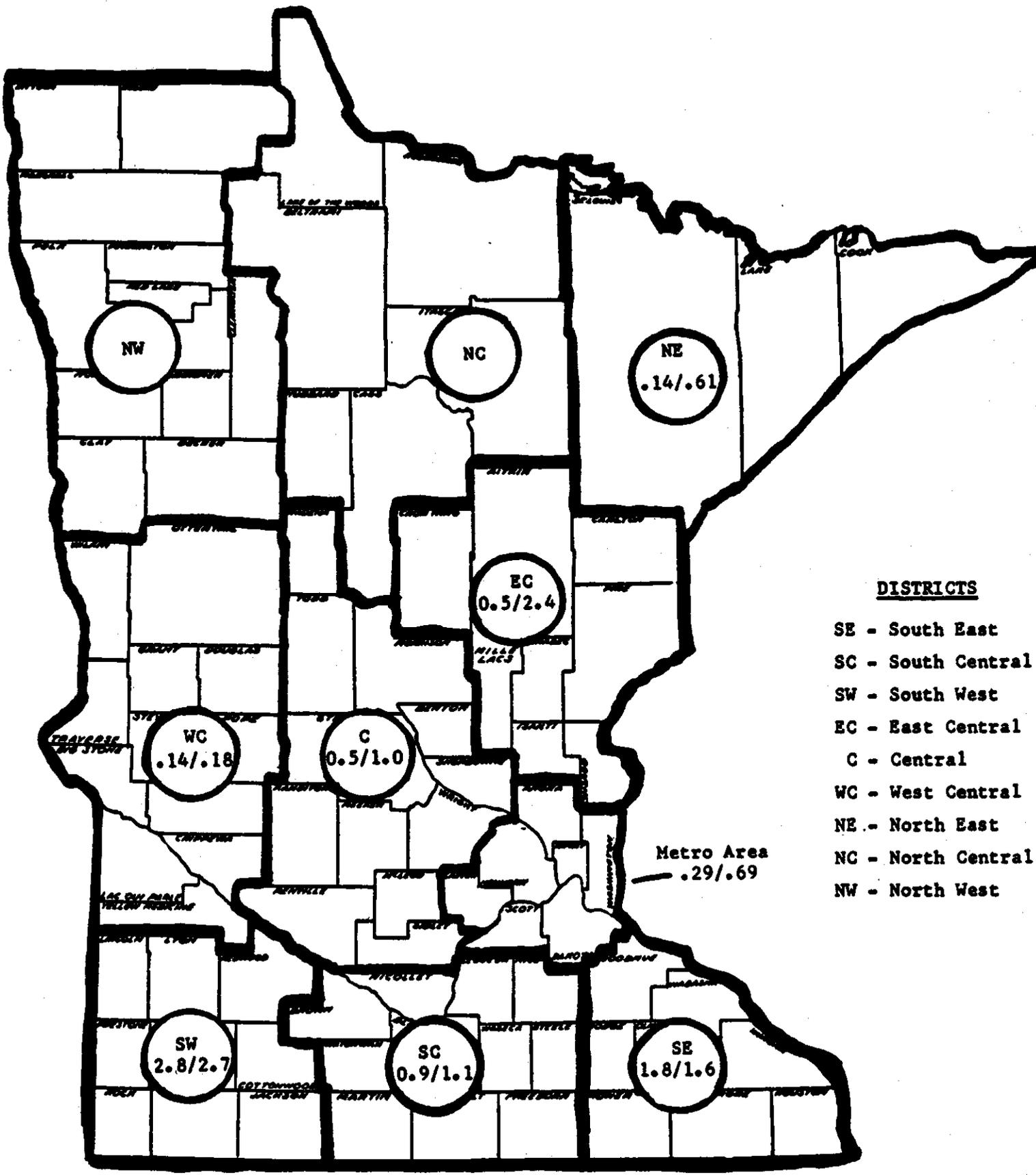


Figure 1
 PERCENT EIM LOSSES
 1974/1975

PART II - LOCAL CONTROL PROGRAMS

A. BACKGROUND

Minnesota's Shade Tree Disease Control Act of 1974 requires that all municipalities within the seven metropolitan counties have a control program which complies with the provisions of the Act.⁹ Pursuant to the authority granted by the 1974 Act, the Department has promulgated rules governing the standard control measures which are required of each municipality subject to the Act.¹⁰ The provisions of the 1974 Act and the Department's regulations, however, are not applicable to municipalities outside the seven metropolitan counties. The rural municipalities are subject to the provisions of the Local Pest Control Act.¹¹ The Act requires that municipalities initiate a control program only at the recommendation of the Commissioner of Agriculture.¹² The Commissioner makes such recommendation when the first case of Dutch elm disease within the municipality has been confirmed. Programs initiated pursuant to the Local Pest Control Act are not subject to the Department's regulations setting forth standard control practices.¹³ The Department does, however, request that rural municipalities conduct their control program in conformance with Department guidelines.

In carrying out its regulatory responsibilities, the Department has stated two objectives. The first objective is to insure that all municipalities employ a qualified tree inspector who has been certified by the Department of Agriculture. The second objective is to insure that each municipality is conducting their control program in conformance with the minimum control standards set out in the Department's regulations.¹⁴ These include the requirement that each municipality conduct at least two complete inventories within the growing season for the purpose of identifying diseased trees.¹⁵

Once identified as diseased, the municipality must insure that the diseased tree is removed within twenty days of notice to the property owner, public or private.¹⁶ Disposal practices are also subject to regulation.¹⁷ The established Department policy has been to work closely with the municipality in overcoming deficiencies in their control programs. This approach makes allowances for the time required in developing and implementing a control program and proves to be less alienating to both state and local government.

In this section there is an attempt to assess control activities provided by local communities. The section begins with a report on compliance and then attempts to quantify control activities. Person-hours and expenditures in dollars have been compiled from municipal reports to provide a quantitative measure.

B. METROPOLITAN MUNICIPALITIES

A total of 157 municipalities and 7 counties in the metropolitan area are subject to the provisions of the 1974 Shade Tree Disease Control Act.¹⁸ During 1975, 151 of these municipalities and 5 counties had certified tree inspectors and shade tree disease control programs approved by the Department. This was a substantial increase over the number of approved programs in 1974, which was the first year of implementing the Act.

There were 204,936 person-hours dedicated to control of shade tree disease in 1975 by those municipalities reporting as of December 1, 1975. On the average a municipality spent 1,601 person-hours in the control of Dutch elm and oak wilt diseases in 1975. This is a decline from the 1974 figure of 2,163 person-hours. The overall reduction in person-hours can be accounted for by the dramatic decrease in person-hours spent by municipalities in Hennepin County.

There is a significant disparity between average person-hours spent by a municipality in Hennepin and Ramsey counties, and average person-hours spent by a municipality in the other metropolitan counties. The reason for this

disparity is the different conditions under which control activities are conducted in Minneapolis and St. Paul. Both cities have a highly urbanized environment which requires a greater expenditure of person-hours in detection, removal and disposal. Further, the Twin Cities generally have a much larger proportion of their shade trees, which are elm, requiring more control activity.¹⁹

Dollar expenditures for 1975 for municipalities in metropolitan areas totaled \$2,951,257 based on reports received to date. Metropolitan municipalities expended an average of \$23,057 on their control program in 1975. This is up slightly from the 1974 figure of \$21,223. Personnel cost accounted for a large percentage of the total budget.

Generally speaking, there has been a slight reduction in the person-hours spent in control of shade tree diseases, and a slight increase in dollar expenditures in metropolitan communities. Since all municipalities do not use uniform procedures for recording person-hours and dollars, a comparison may not always be valid. These figures can, however, give a good approximation of the amount of effort being committed to control of shade tree disease.

Larger communities appear to be adequately detecting shade tree diseases. Removal procedures are, however, often inadequate.²⁰ In the case of elms municipalities must reduce the time between identification of a diseased tree and removal. It has been suggested that the unavailability of tree removal services has contributed to the municipality's inability to comply with the state's 20 day time requirement.²¹ In many instances, however, cumbersome administrative procedures and mere inaction are the reasons for the delay in removal.

C. RURAL MUNICIPALITIES

The Shade Tree Disease Control Act of 1974 provides that municipalities outside the metropolitan area can request to come within the provisions of

the Act in order to take advantage of tax levy limitation waiver and available grant funds.²² To date 12 municipalities have elected to come within the provisions of this law. The size of these municipalities varies from Vernon Center's population of 387, to a population of 100,578 in Duluth. (See Table 6)

Rural municipalities are subject to the provisions of the Local Pest Control Act.²³ In 1975 there were 222 non-metropolitan communities with programs pursuant to the Pest Control Act. In administering the Act, the Department's efforts are directed more towards providing technical assistance to communities rather than regulation of control programs. Communities are, however, required to follow the Department's guidelines for establishing and maintaining control programs.²⁴

Rural municipalities spent an average of 316.85 person-hours and \$4,927.08 in control of shade tree diseases. The southeastern and south central portions of the state have the highest expenditures in terms both of person-hours and dollars. Municipalities in the southeastern district had an average expenditure of \$8,669.83 while those of the east central district had average expenditures of only \$5,206.00. (See Table 5)

Note that the differences in expenditures of time and money between metropolitan and rural communities are quite significant. This can be accounted for by the fact that the smaller rural communities do not have as large a geographic area in which to conduct control activities; rural communities are not faced with control in the highly urbanized setting; and, charges for tree services and disposal are significantly higher in the metropolitan area.

D. STATE OWNED LANDS

Amendments made by the 1975 legislature provide that state owned lands are subject to the provisions of the 1974 Shade Tree Disease Control Act.²⁵ It became the responsibility of the various state agencies to detect and remove diseased trees on state owned lands in compliance with state regulations,

when these state lands are adjacent to a municipal control area. Since the amendment became effective on June 2, 1975 little has been accomplished on state owned lands during the 1975 season.

The Department received considerable criticism for the state's failure to comply with its own regulations. In an effort to remedy this problem, the Department has located all state lands which are affected by the regulatory provisions of the Act. Those state agencies responsible for maintenance of these lands are being notified of their obligations under the 1974 Act.

* * * * *

PART III - STATE SERVICE

The Minnesota Department of Agriculture provides a variety of services to assist local governments and property owners with the problem of shade tree disease. Included in these services is the state's grant-in-aid program, laboratory services, a limited amount of research, and public education and information. These programs are designed to support local control efforts and complement the state's regulatory activities.

A. GRANTS-IN-AID

The 1975 legislature amended the Shade Tree Disease Control Act of 1974 to authorize the Department of Agriculture to make grants to local governments.²⁶ The purpose of these grants is to support local programs which subsidize removal of diseased trees from private residential property, and to aid projects which improve disposal practices and promote utilization of wood wastes. All metropolitan municipalities with approved programs are eligible for the funds. Rural municipalities may become eligible for funds by requesting to come within the provisions of the Shade Tree Disease Control Act. To date, there have been 12 rural municipalities which have elected to come within the

provisions of the Act; 9 of these have taken advantage of the grant monies available. (See Table 7)

1. Subsidy Program. Under the grants program, the state may award funds to local governments to aid programs which subsidize, or by some method reduce the cost to a residential property owner of removing diseased trees. Objectives of the program are two-fold. First and most obvious is the objective of providing financial assistance to those property owners who are faced with the unexpected cost of removing or disposing of diseased trees. The second is to provide an incentive for removing the tree in a sanitary fashion. The incentive is provided by making compliance with the state removal disposal regulations a prerequisite to receiving aid.²⁷

Only certain trees qualify for the subsidy.²⁸ The tree must have been removed from private residential property which lies within a designated control area of a municipal program; it must have been removed on or after June 1, 1975; it must have been determined that the tree was a hazard to the spread of the shade tree diseases; and its removal and disposal must have conformed to all applicable Department regulations. It is the responsibility of the local tree inspector to insure that trees being subsidized by the state program meet these requirements.

Initially, the state grant formula was based upon a "per tree" allocation of funds.²⁹ The state would match each dollar of the local subsidy. The state's share, however, would never exceed 25% of the cost of removing and disposing of the tree and never exceed \$50.00. Upon receipt of applications from a number of municipalities, it became clear that every municipality had a different type and amount of subsidy to offer the property owner. A uniform application of this original formula proved to be impractical, since it created an excessive amount of administrative work for both local and state officials.

Prior to the execution of any grant award agreement, the formula was changed to alleviate administrative problems. The 25% limitation and \$50.00 ceiling were dropped. Under the new formula, the state matches every dollar of the local subsidy without the "per tree" ceiling. The state simply pays one half ($\frac{1}{2}$) the total cost of the subsidy program. This new formula simplifies and clarifies the method of allocating funds. It substantially reduces the effort required in administration of the program by both local and state officials. Most importantly, the change makes state funds more accessible to the smaller rural communities who have serious shade tree disease problems, but lack staff and bureaucratic experience in procuring grant-in-aid funds.

Since the beginning of the program in September, a total of \$303,281.00 has been awarded to local communities. A total of forty-nine (49) municipalities will receive aid under the program for 1975. Thirty-one (31) of these municipalities are within Washington County who will administer the program for the municipalities. Fifty-two (52) communities, including the Washington County municipalities have secured funds for 1976. Funds awarded total \$98,478.00 for 1975 and \$204,803.00 for 1976. The average grant received by a municipal government for the two year period amounts to \$7,135.00. The largest grant yet awarded for a single year went to the City of Minnetonka for \$32,500.00 in 1976. The smallest award went to Falcon Heights for \$300.00. (See Table 7)

The total amount awarded to metropolitan communities for the two year period is \$268,825.00 with an average of \$9,270.00 per municipality. (See Table 8) Total amount awarded to rural communities is \$34,456.00 with the average per community being \$2,650.00. (See Table 8) The most important reason for the difference in expenditures between the metropolitan area and rural Minnesota is that almost all metropolitan communities had the required

control program when the grant funds became available. Most rural municipalities who elected to take advantage of the funds had to first initiate a control program satisfying the requirements of the Shade Tree Disease Control Act. In some rural communities, there appears to be a reluctance to subject themselves to the regulatory provisions of the law, and to provide the necessary funds to implement the control program. An additional factor contributing to the disparity between the metropolitan and rural area is the inability or unwillingness of rural municipalities to provide the necessary matching funds. It also appears that many of these communities simply believe the cost of removing diseased trees is a natural and inherent cost of maintaining private property and should not be subsidized by public funds.³⁰

It is premature to make any definitive conclusions concerning the subsidy program. It can be said, however, that not all municipal officials are willing to provide the necessary matching funds. The subsidy program is competing with other needed programs for limited local funds. Many local officials fear the cost of a subsidy program could become exceedingly high when tree losses begin to rise. An additional deterrent is the uncertainty of the availability of state funds (i.e. the program depends upon a legislative appropriation). Despite the legitimate concerns of local officials, there appears to be a positive feedback from the general citizenry concerning the subsidy program.

2. Disposal/Utilization Program. The 1975 amendment to the Shade Tree Disease Control Act authorizes the Department to make grants to local governments of up to one half ($\frac{1}{2}$) the cost of establishing wood waste disposal and utilization centers.³¹ The objective of the program is to stimulate installation of these centers so as to increase the capacity to handle wood waste in a sanitary, environmentally acceptable, and economical

fashion. Any county, city of more than 80,000 population, special purpose park district organized under the charter of a city of the first class, or any non-profit corporation serving a city of the first class is eligible to make application for the funds.³² All applicants are required to have a control program approved by the Department. Factors to be considered in determining whether a grant shall be made include the incidence of disease in the area requesting funds, the emphasis placed upon utilization, and technical and economic reliability of the proposal.³³

The first series of awards was made in December of 1975. At that time, \$230,000.00 was awarded to the City of St. Paul for installation of a wood waste processing facility in Pig's Eye area of St. Paul. The facility is capable of processing large volumes of wood wastes into marketable wood chips. The chips will be sold for pulp and hog fuel offsetting the operational cost of the facility. It is hoped that ultimately the facility will become economically self-sufficient.

The St. Paul project is the result of a determined and uniquely cooperative effort initiated by Public Service Options, the Occupational Training Center, the Minneapolis Park Board, and the City of St. Paul. The project as approved by the Department will be owned and managed jointly by the Minneapolis Park Board and the City of St. Paul. The operation of the facility is expected to be contracted out to the Occupational Training Center, a group who provides employment for the mentally and physically handicapped.

In December an award of \$21,000.00 was also made to Hennepin County. The County will purchase a chip screen to improve the quality and the marketability of the chips produced at their existing wood waste processing facilities. The County still has a \$156,000.00 request pending with the Department for other processing equipment.

D

A second and third award series are scheduled to take place prior to the beginning of the 1976 growing season. Awards to metropolitan applicants will be based upon the results of the Metropolitan Inter-County Council Study. The study is an attempt to identify the most stable markets for wood waste products, to identify the processing equipment necessary to provide these products, and to design a metropolitan-wide wood waste disposal system.

Very little interest has been shown in the disposal and utilization program by rural communities. The problem of disposal does not appear to be as critical in the rural areas. Burning permits can be more readily obtained, with burning providing a cheaper method of disposal than land-filling or processing. A Task Force on Elm Utilization in Rural Minnesota has been appointed by the Shade Tree Advisory Committee and their work is under way. It is hoped that the recommendations of this task force will stimulate an interest in utilization among rural communities.

B. PUBLIC EDUCATION

Public education is a new and important part of the state's disease control program. The 1975 amendment to the Shade Tree Disease Control Act earmarked \$45,000 specifically for public education.³⁴ These funds will effectively support both state and local government in their task of promoting effective shade tree disease control.

The public education goal is to create a citizen's awareness in the problem of shade tree diseases. The public is to be made aware of the devastating consequences of shade tree disease. They are to be educated in the things they can do as citizens and as community service groups. The Department placed a high priority upon public education because of its recognition that community action depends upon citizen action.

Education materials are being produced and distributed among the different media. Television spots reflecting the disease's visual and aesthetic impact are under preparation. Radio commercials providing a continuing reminder to citizens are also in the making. Copies of a short and effective film are being prepared which communicate the basic biology of the disease as well as relate the severity of its consequences. Copies of the film will be circulated among community service groups throughout the state. This film will provide the Department with an effective visual aid in communicating the needs for control to local councils and other public officials.

The most important and what appears to be one of the most difficult tasks in the area of public education is the procurement of public service time from local media. Production of educational materials are of no avail if good public service time cannot be secured. The Department will be making every effort to insure that this public service time is secured and that educational materials produced will get the most effective exposure.

Another very important aspect of public education is the personal contact the Department's staff makes with the general public. Personal exposure is one of the most effective methods of public education. In September and October of 1975, the Department held seven public meetings throughout the state to inform public officials and citizens of the new grant-in-aid program.³⁵ Again, in December, January, and February the Department will take part in a series of meetings scheduled throughout the state to inform public officials and interested citizens of the state services that are available.³⁶ In addition to regularly scheduled public meetings the staff continues to meet individually with municipal and county officials to discuss specific problems and to provide needed technical assistance. These inter-personal contacts not only provide education to

the public, but provide valuable feedback to the Department's staff concerning local needs and problems.

C. LABORATORY

The Department provides a laboratory service to local communities free of service charge. In 1975 the laboratory processed 7048 elm and oak samples.³⁷ This figure was up from 5,877 in 1974 and the number of samples is expected to rise sharply in 1976. Despite the very limited laboratory facilities and the high volume of samples to be processed in a three month period, the laboratory was able to provide a responsive state service. Service will continue to improve as local inspectors become more familiar with the sampling technique.

In 1975, 69.7% of the elm samples processed were diagnosed as positive for Ceratocystis ulmi, the causative organism of Dutch elm disease. Of the oak wilt samples processed, 57.9% were diagnosed as positive. (See Table 8) The City of St. Cloud reported an additional 64 positive cases diagnosed by their laboratory and Austin reported 200 positive cases from their city laboratory.

C. APPLIED RESEARCH

Under the Governor's Internship Program the Department employed an intern for the summer of 1975. The intern assisted in the establishment of Dutch elm disease monitoring plots throughout the state. Fifty-three (53) plots were established. Included were 22 urban, 24 rural and 7 river valley plots. The plot size is 0.10 hectare (approximately $\frac{1}{4}$ acre) with the number of elms averaging 23 per plot. In the urban locations, the elm trees in the entire block were counted in addition to elm counts in the plot. In 1975 the Dutch elm disease incidence averaged to 2% in these plots. The plots will be monitored annually to assess the spread and increase of Dutch elm disease.

<u>COUNTY</u>	<u>AVERAGE PERSON-HOUR PER MUNICIPALITY</u>		<u>AVERAGE EXPENDITURE PER MUNICIPALITY</u>	
	<u>1974</u>	<u>1975</u>	<u>1974</u>	<u>1975</u>
	Anoka	258	819	2,174	14,326
Carver	418	74	4,133	1,345
Dakota	571	494	9,857	8,638
Hennepin	5,094	2,978	48,579	50,044
Ramsey	2,054	4,118	21,523	34,003
Scott	216	139	2,343	1,064
Washington	285	286	2,159	4,593

TABLE 4
AVERAGE PERSON-HOURS AND DOLLAR EXPENDITURES - METROPOLITAN MUNICIPALITIES

<u>DISTRICT</u>	<u>AVERAGE PERSON-HOUR PER MUNICIPALITY</u>		<u>AVERAGE EXPENDITURE PER MUNICIPALITY</u>	
	<u>1975</u>		<u>1975</u>	
	SE	522	8,670	
SC	353	6,272		
SW	76	1,335		
EC	67	434		
C	515	6,234		
WC	166	2,478		
NE *	97	2,125		

TABLE 5
AVERAGE PERSON-HOURS AND DOLLAR EXPENDITURES - RURAL MUNICIPALITIES

* Excludes the City of Duluth

<u>MUNICIPALITY</u>	<u>POPULATION</u>
Duluth	100,578
Fairmont	10,751
Gaylord	1,720
Madison Lake	587
Montevideo	5,729
Monticello	1,636
North Mankato	7,347
Pipestone	5,328
Red Wing	12,834
St. Cloud	42,223
Spring Valley	2,572
Vernon Center	347

TABLE 6

RURAL MUNICIPALITIES SUBJECT TO THE 1974 SHADE TREE DISEASE CONTROL ACT

GRANTEE	AMOUNT OF AWARD 1975	AMOUNT OF AWARD 1976	TOTAL AWARD
Bloomington	\$ 9,500.00	---	\$ 9,500.00
Burnsville	\$10,675.00	\$20,600.00	\$31,275.00
Chanhassen	\$ 3,000.00	\$ 6,000.00	\$ 9,000.00
Coon Rapids	\$ 5,000.00	\$30,000.00	\$35,000.00
Columbia Heights	---	\$ 3,000.00	\$ 3,000.00
Cottage Grove	\$ 2,250.00	---	\$ 2,250.00
Deephaven	\$ 2,500.00	\$12,000.00	\$14,500.00
Edina	\$15,000.00	\$15,000.00	\$30,000.00
Fairmont	\$ 4,000.00	\$ 5,500.00	\$ 9,500.00
Falcon Heights	\$ 300.00	---	\$ 300.00
Gaylord	---	\$ 1,500.00	\$ 1,500.00
Golden Valley	---	\$ 7,500.00	\$ 7,500.00
Lauderdale	\$ 1,000.00	\$ 2,000.00	\$ 3,000.00
Madison Lake	---	\$ 6,000.00	\$ 6,000.00
Mahtomedi	\$ 3,000.00	\$21,000.00	\$24,000.00
Maplewood	\$ 6,000.00	---	\$ 6,000.00
Minnetonka	\$25,000.00	\$32,500.00	\$57,500.00
Monticello	\$ 3,203.00	\$ 3,203.00	\$ 6,406.00
Pipestone	\$ 750.00	\$ 1,000.00	\$ 1,750.00
Red Wing	\$ 800.00	\$ 2,000.00	\$ 2,800.00
Richfield	\$ 500.00	\$ 7,500.00	\$ 8,000.00
St. Cloud	---	\$ 2,500.00	\$ 2,500.00
South St. Paul	\$ 1,000.00	\$ 2,000.00	\$ 3,000.00
Spring Valley	---	\$ 2,500.00	\$ 2,500.00
Vernon Center	---	\$ 1,500.00	\$ 1,500.00
Washington County	\$ 5,000.00	\$20,000.00	\$25,000.00
TOTALS	\$98,478.00	\$204,803.00	\$303,281.00

TABLE 7

SUBSIDY GRANTS-IN-AID
1975/1976

	\$ AMOUNT 1975	AVERAGE AMOUNT 1975 GRANTEE	\$ AMOUNT 1976	AVERAGE AMOUNT 1976 GRANTEE	TOTAL/AMOUNT 1975/1976	AVG. AMT. TOTAL MUNICIPALITY 1975/1976
METRO	\$89,725	\$6,052*	\$179,100	\$13,258*	\$268,825	\$9,270*
RURAL	\$ 8,753	\$2,188	\$ 25,703	\$ 2,856	\$ 34,456	\$2,650

* Excludes Washington County

TABLE 8
SUBSIDY GRANTS-IN-AID COMPARISON
METROPOLITAN vs. RURAL

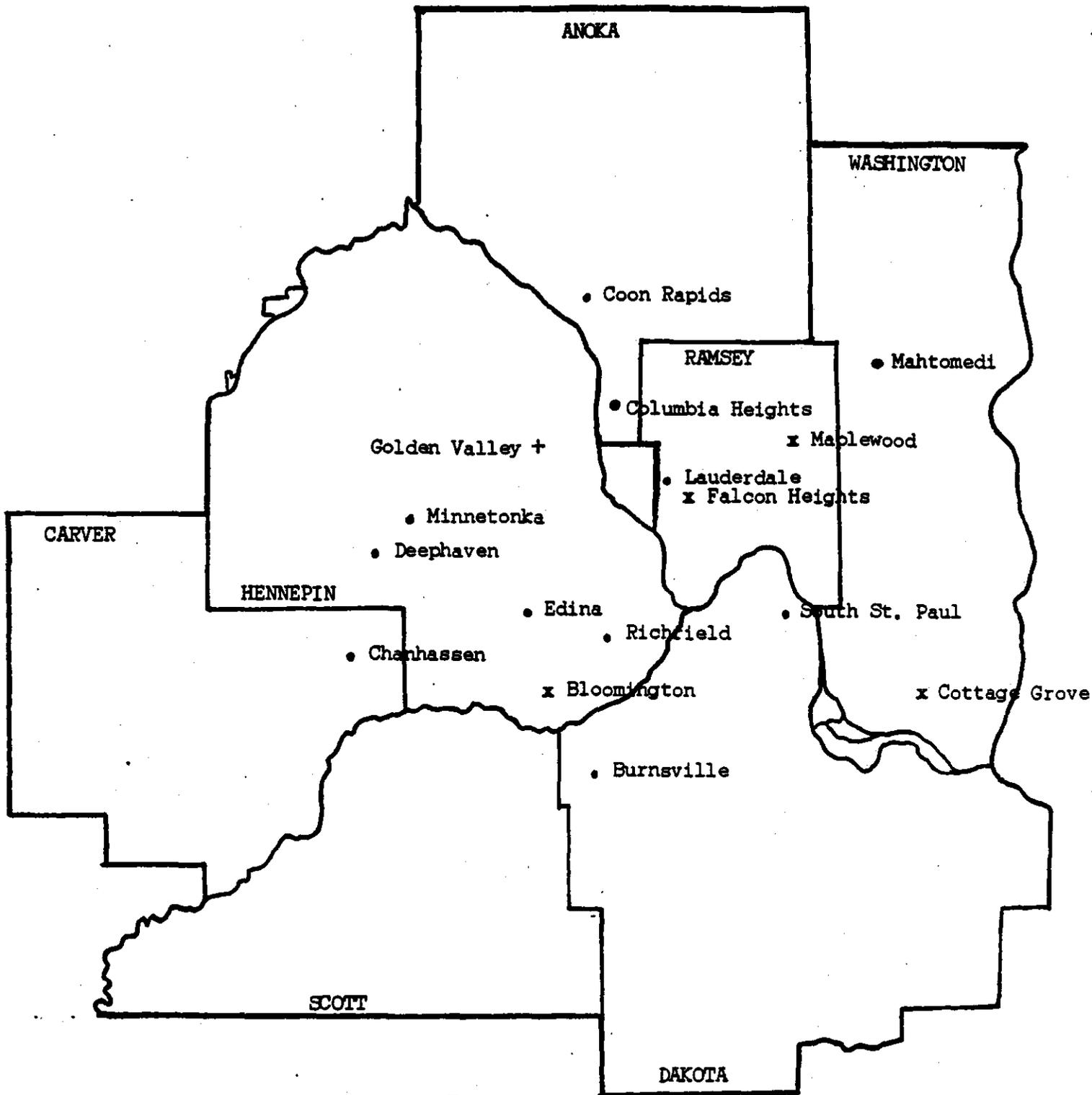
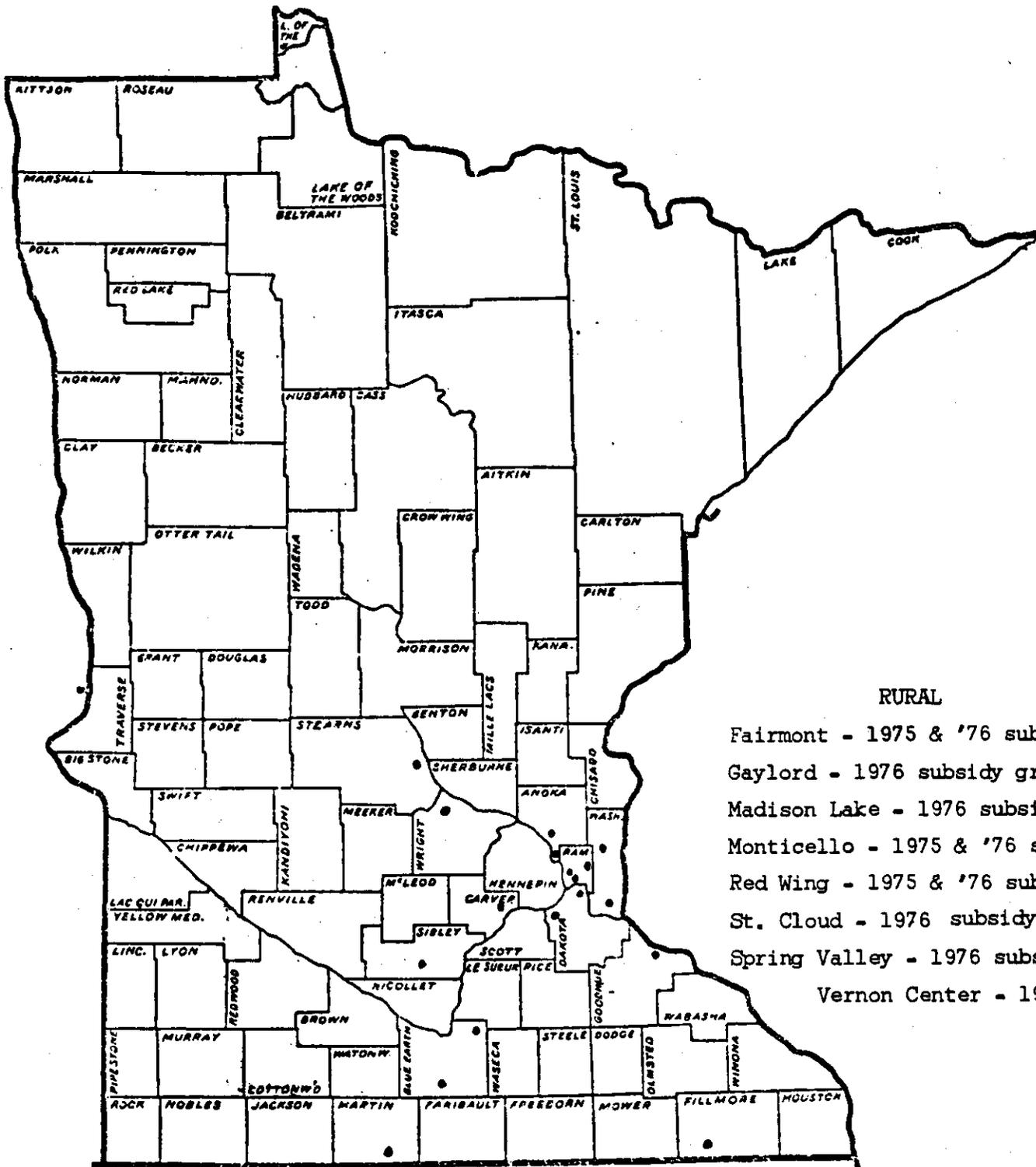


Figure 2
 DISTRIBUTION OF SUBSIDY GRANTS-IN-AID
 SEVEN COUNTY METROPOLITAN AREA

- = 1975 and 1976 subsidies granted
- x = 1975 subsidy granted
- + = 1976 subsidy granted as of Dec. 1, 1975



RURAL

- Fairmont - 1975 & '76 subsidy granted
- Gaylord - 1976 subsidy granted
- Madison Lake - 1976 subsidy granted
- Monticello - 1975 & '76 subsidy grant
- Red Wing - 1975 & '76 subsidy granted
- St. Cloud - 1976 subsidy granted
- Spring Valley - 1976 subsidy granted
- Vernon Center - 1976 subsidy granted

DISTRIBUTION OF GRANTS-IN-AID
RURAL MUNICIPALITIES

Figure 3

Dutch Elm Disease

Metro Area	Total Positives:	3156	76.1%
	Total Negatives:	992	23.9%
	Sample Total:	4148	
Outstate Area	Total Positives:	1304	58.0%
	Total Negatives:	943	42.0%
	Sample Total:	2247	
Combined Areas	Total Positives:	4460	69.7%
	Total Negatives:	1935	30.3%
	Sample Total:	6395	

Oak Wilt Disease

Metro Area	Total Positives:	361	59.6%
	Total Negatives:	245	40.4%
	Sample Total:	606	
Outstate Area	Total Positives:	17	36.2%
	Total Negatives:	30	63.8%
	Sample Total:	47	
Combined Area	Total Positives:	378	57.9%
	Total Negatives:	275	42.1%
	Sample Total:	653	

Table 9

SHADE TREE DISEASE LABORATORY
DIAGNOSTIC RESULTS

HAVE THESE EFFORTS HAD AN APPRECIABLE
EFFECT ON CONTAINING SHADE TREE DISEASE?

PART IV - CONCLUSION AND DIRECTIVES FOR 1976

A. CONCLUSION

The data compiled from the annual municipal reports provides somewhat of a frustrating and confusing picture. It is easily concluded that losses of elm are increasing rapidly, while oak losses are remaining stable or increasing only slightly. In the metropolitan area there was a slight increase in dollar expenditures in control of shade tree diseases, accompanied by a slight decrease in the person-hours committed to control. The annual reports do not, however, provide us with a clear answer to the question of whether these control activities have had any appreciable effect in containing the disease.

Data compiled from annual reports indicate that increased treatment of infected oaks tends to reduce losses. Municipalities within four metropolitan counties did improve sanitation in oak wilt control. Two of these counties experienced fewer losses of oak in 1975, and two experienced only a slight increase in losses. Municipalities within the county which dropped its level of sanitation realized a significant increase in its losses of oaks.

The annual reports do not, however, show such positive correlations in Dutch elm disease control. The data fails to show any significant correlation between increased expenditures/person-hours and improved disease control. Even more frustrating is the fact that the data failed to indicate that improved disease control could be achieved through improved sanitation. This is a basic assumption of all control programs.

While these annual municipal reports do not reveal new findings, or even appear to confirm previous findings, this does not mean control efforts have been futile. The information retrieved from annual reports is subject to innumerable constraints. For example, any attempt to correlate expenditures with effective control must take in account that infection of Dutch elm disease is not evenly distributed. One dollar worth of control will not have the same impact in an area heavily infected, as one dollar of control in an area lightly infected. Another important constraint on the data received from municipalities is the lack of uniformity in reporting procedures. A municipality who just purchased a \$15,000.00 "cherry picker" may report this as an expenditure in shade tree disease control, even though one half of the time this equipment may be used to repair street lights. Another municipality may report the expenditure under general maintenance. The quality of the information received from municipalities depends upon the experience of the municipality in shade tree disease control. The older and more developed the control program, the more likely the information received is reliable.

It appears that any significant findings as to impact of control activities on the spread of shade tree diseases must await a more structured and refined data system. The Department is presently developing a computer based data system. Practical limitations must be either overcome or built into the system. The new data system will increase the frequency of reporting during the growing season. It will allow the Department to compile and examine end-year results with greater efficiency and more accuracy.

In 1976, the Department will continue to emphasize sanitation in control of both Dutch elm and oak wilt disease. Municipalities already appear to be experiencing positive results in oak wilt control with

increased sanitation and awareness of the disease. Municipalities must continue to expand their treatment of infected oaks to achieve the desired results. Based upon the historical evidence from cities who have experienced Dutch elm disease, sanitation appears to be paramount in control. An effective control program must include timely field identification of the disease; it must remove the diseased tree within at least 20 days of identification; and the diseased tree must be disposed of in a sanitary fashion. Insuring that these basic elements of control are present in municipal programs will be a priority task of the Department in 1976.

B. DIRECTIVES FOR 1976

The following are directives for the Minnesota Department of Agriculture in its administration of the Shade Tree Disease Control Program in 1976.

* * * * * REGULATORY * * * * *

I. CONTINUE TO EMPHASIZE SANITATION AS THE MOST IMPORTANT ASPECT OF DISEASE CONTROL.

A. TAKE AVAILABLE LEGAL ACTION AGAINST THOSE MUNICIPALITIES WHO PERSISTENTLY FAIL TO PROVIDE ADEQUATE CONTROL MEASURES.

In 1976 the Department shall take available legal action against those municipalities who continually fail to respond to administrative orders to provide adequate control measures. This will necessitate an effective system of surveillance by the Department. Legal action will always remain a last resort measure and will be limited to municipalities with gross violations and who have exhibited bad faith.

B. CONDITION GRANT FUNDS UPON SANITARY REMOVAL AND DISPOSAL.

No municipality will be eligible for grant funds from the state unless they have complied with all removal and disposal regulations. The subsidy to the municipality will be used as an incentive to properly remove and dispose of diseased trees. Variances will be allowed only where the municipality can show that circumstances made it impossible to comply with the state's regulations. The municipality's burden of proof will be heavy.

II. URGE ALL STATE AGENCIES RESPONSIBLE FOR STATE OWNED PROPERTY TO PROVIDE ADEQUATE DISEASE CONTROL WHEN THE STATE PROPERTY LIES ADJACENT TO A MUNICIPAL CONTROL AREA.

It is most difficult for the Department to enforce control programs in municipalities when adjacent state property is being neglected. State officials will be requested to assume the responsibility of disease control on these lands immediately.

* * * * * STATE SERVICES * * * * *

III. DEVELOP AN INFORMATION SYSTEM WHICH WILL IMPROVE REPORTING FROM MUNICIPALITIES, DATA STORAGE AND HANDLING, AND DATA ANALYSIS.

The effort will be continued to simplify reporting procedures for municipalities. Data will be computerized for ease in compilation and storage. Electronic data processing will greatly improve the efficiency of data analysis and significantly reduce the factor of human error.

IV. INCREASE RESEARCH WHICH IS SUPPORTIVE OF THE DEPARTMENT'S IMMEDIATE DECISION-MAKING NEEDS.

The Department will work more closely with the University of Minnesota to coordinate research activities with the Department's decision-making needs. Departmental policy concerning the biological aspects of control needs the direct technical support from University researchers.

V. DEVELOP A LONG RANGE PLAN FOR PUBLIC EDUCATION IN SHADE TREE DISEASE.

If public education in shade tree disease control is to be effective, it must educate and motivate people in the long term. A piecemeal approach to public education is likely to be expensive and ineffective in sustaining public interest over the long term. A strategy must be developed to insure continued public interest.

VI. EXAMINE THE NEEDS FOR THE REPLACEMENT OF SHADE TREES AND IDENTIFY STATE ACTIONS WHICH WILL AID LOCAL REPLACEMENT PROGRAMS.

The Department will determine in 1976 the replacement rate for the metropolitan and rural areas. It will attempt to identify local needs in shade tree replacement and increase technical assistance accordingly.

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FOOTNOTES

1. Metropolitan municipalities is defined in Minnesota Statutes § 18.023, subdivision 1(c), (1974).
2. 1974 figures are taken from "A Summary Report of Tree Disease Control Activities in the Seven County Metropolitan Area - 1974, Minnesota Department of Agriculture (1975)". 1975 figures have been compiled from Shade Tree Disease Control Program Reports 1975.
3. French, Stienstra, and Noetzel. The Dutch Elm Disease, Extension Folder 211, revised 1974, Agriculture Extension Service, University of Minnesota (1974).
4. French and Stienstra, Oak Wilt Disease, Extension Folder 310-1975, University Extension Service, University of Minnesota (1975).
5. For purposes of this report, a rural municipality is any municipality not within Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Carver counties.
6. Shade Tree Disease Laboratory Report, Minnesota Department of Agriculture (1975).
7. Minnesota Statutes § 18.022 does not specifically require that municipalities report shade tree disease control activities to the Minnesota Department of Agriculture.
8. 1975 Consolidated Minnesota Pest Report, Minnesota Department of Agriculture, Division of Plant Industry (1976).
9. Minnesota Statutes § 18.023, subdivision 5(a), (1974).
10. Minnesota Statutes § 18.023, subdivision 2, (1974), Minnesota Regulations Agr 101 - 106.
11. Minnesota Statutes § 18.022 (1945).
12. Minnesota Statutes § 18.022, subdivision 1.
13. Minnesota Regulations Agr 101 - 106.
14. Id.
15. Minnesota Regulation Agr 106 (d) (2) (aa) (ii).
16. Minnesota Regulation Agr 106 (d) (2) (aa) (iii).
17. Id.
18. Minnesota Statutes § 18.023, subdivision 1 (c), (1974).
19. Shade Tree Disease Control Program Reports - 1974.
20. Based upon 1975 inspections conducted by Minnesota Department of Agriculture.
21. A survey conducted by the Minnesota Department of Agriculture in July, 1975 indicated that the majority of tree services in the metropolitan area could meet the 20 day limit for removal.

22. Minnesota Statutes § 18.023, subdivision 1 (1974).
23. Minnesota Statutes § 18.022 (1945).
24. Required Program for Dutch Elm Disease Control in Municipalities, AGR 14 5C.
25. Minnesota Laws 1975, Ch. 253, sec. 5, Minnesota Statutes § 18.023, subdivision 3(a), (supp. 1975).
26. Minnesota Laws 1975, Ch. 253, sec. 3, Minnesota Statutes § 18.023, subdivision 3(a), (supp. 1975).
27. Minnesota Regulation Agr 107 (b) (2) (ee).
28. Minnesota Regulation Agr 107 (b) (2).
29. Residential Property Tree Removal Subsidy, Application Packet, August 1975.
30. The statements concerning the rural municipality's reaction to the subsidy grant-in-aid program are based upon feedback received from rural areas during field trips and public meetings.
31. Minnesota Laws 1975, Ch. 253, sec. 3, Minnesota Statutes § 18.023, subdivision 3(a), (supp. 1975).
32. Minnesota Statutes § 18.023, subdivision 3(a), (supp. 1975).
33. Minnesota Regulation Agr 108 (b) (1).
34. Minnesota Laws 1975, Ch. 253, sec. 4.
35. Meetings were held in Mora, Appleton, Litchfield, Sauk Rapids, Slayton, Rochester and Mankato.
36. Meetings are part of a program sponsored by Agronomy Services Division of the Minnesota Department of Agriculture.
37. Shade Tree Disease Laboratory Report, Minnesota Department of Agriculture (1975).

SEVEN COUNTY METROPOLITAN AREA

COUNTY	PROGRAMS REQUIRED	# TREE INSPECTORS	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
					ELM	OAK	ELM	OAK	ELM	OAK	
Anoka	22	18	9,823	171,907	122,617	273,545	2,057	1,288	1,414	1,188	578
Carver	13	12	744	13,453	95,549	90,872	107	4	97	3	65
Dakota	21	15	9,878	172,754	786,319	2,816,450	4,041	1,903	2,397	1,520	1,510
Hennepin	47	50	119,101	2,001,778	1,608,662	708,365	8,145	1,007	5,548	492	21,457
Ramsey	17	16	57,566	476,042	349,900	516,363	8,577	1,479	5,951	896	2,133
Scott	11	7	1,249	9,577	754,059	547,286	317	56	295	48	2,657
Wash- ington	33	31	6,575	105,645	183,793	1,107,376	3,800	1,244	2,360	712	25,746
TOTAL	164	149	204,936	2,951,156	3,900,899	6,060,257	27,044	6,981	18,062	4,859	54,146

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ANOKA COUNTY

MUNICIPALITY	TREE INSPECTOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Anoka	yes	573	4,031	17,500	9,000	284	7	227	7	-
Andover	yes	-	-	-	-	-	-	-	-	-
Bethel	yes	-	-	-	-	-	-	-	-	-
Blaine	yes	-	10,535	(9,292)*	(290,272)*	38	207	38	194	-
Centerville	yes	-	-	-	-	-	-	-	-	-
Circle Pines	yes	497	2,400	6,300	5,770	182	78	182	78	-
Columbia Heights	yes	440	22,659	42,960	2,969	164	5	106	5	488
Coon Rapids	yes	5,210	94,700	-	-	102	229	102	229	90
East Bethel	yes	205	678	1,790	10,278	17	48	15	41	-
Fridley	yes	1,698	20,759	48,000	72,800	797	310	637	280	-
Ham Lake	yes	270	2,980	-	-	-	90	5	80	-
Hilltop	yes	98	566	150	-	10	-	7	-	-
Lexington	yes	378	5,000	1,920	1,630	10	95	10	95	-
Lino Lakes	yes	392	3,230	1,575	168,739	452	199	84	171	-
Ramsey	yes	-	-	-	-	-	-	-	-	-
St. Francis	no	-	-	-	-	-	-	-	-	-
Spring Lake	yes	62	4,369	2,422	2,359	1	20	1	8	-
Burns Twsp.	yes	-	-	-	-	-	-	-	-	-
Columbus Twsp.	yes	-	-	-	-	-	-	-	-	-
Linwood Twsp.	yes	-	-	-	-	-	-	-	-	-
Oak Grove Twsp.	-	-	-	-	-	-	-	-	-	-
Anoka County	yes	-	-	-	-	-	-	-	-	-
TOTAL		9,823	171,907	122,617	273,545	2,057	1,288	1,414	1,188	578

*Not included in total.

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CARVER COUNTY

MUNICIPALITY	TREE INSPECTOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Carver	yes	-	-	-	-	-	-	-	-	-
Chanhassen	yes	-	7,249	88,320	88,320	89	3	88	3	-
Chaska	yes	553	4,851	1,997	750	13	1	4	-	33
Cologne	yes	50	605	452	214	1	-	1	-	32
Hamburg	yes	15	85	190	70	-	-	-	-	-
Mayer	yes	1	13	-	-	-	-	-	-	-
New Germany	yes	-	15	-	-	-	-	-	-	-
Norwood	yes	30	85	520	35	-	-	-	-	-
Victoria	yes	20	392	1,560	1,213	3	-	3	-	-
Waconia	yes	-	-	-	-	-	-	-	-	-
Watertown	no	-	-	-	-	-	-	-	-	-
Young America	yes	15	85	450	210	-	-	-	-	-
Carver County	yes	60	73	2,060	60	1	-	1	-	-
TOTAL		744	13,453	95,549	90,872	107	4	97	3	65

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DAKOTA COUNTY

MUNICIPALITY	TREE INSPEC- TOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Apple Valley	yes	1,010	4,560	460	251,375	20	263	20	263	150
Burnsville	yes	2,434	35,459	220,000	750,000	551	162	422	115	882
Coates	yes	14	400	-	-	2	-	2	-	-
Eagan	yes	540	9,800	4,000	5,500	159	24	159	61	-
Farmington	yes	71	6,500	3,500	40	10	-	10	-	-
Hampton	yes	12	100	-	-	4	-	4	-	-
Hastings	yes	403	3,924	30,822	5,388	41	1	41	1	-
Inver Grove Heights	yes	757	7,650	5,300	148,357	1,523	179	239	80	-
Lakeville	yes	1,000	12,600	38,000	195,000	80	840	80	840	116
Lilydale	yes	150	-	600	-	222	-	203	-	-
Mendota	no	-	-	-	-	-	-	-	-	-
Mendota Heights	yes	226	7,268	15,000	3,000	607	-	607	-	69
Miesville	yes	3	50	-	-	-	-	-	-	-
New Trier	yes	15	100	-	-	6	-	6	-	-
Randolph	yes	15	-	-	-	-	-	-	-	-
Rosemount	yes	1,810	9,583	33,050	231,515	86	276	71	101	37
South St. Paul	yes	280	28,209	-	-	258	4	258	4	150
Sunfish Lake	yes	20	-	1,200	1,000	41	11	41	11	-
Vermillion	yes	12	100	-	-	3	-	3	-	-
West St. Paul	yes	644	31,650	5,926	990	197	14	179	14	-
Dakota County	yes	462	14,801	428,461	1,224,285	231	129	52	30	106
TOTAL		9,878	172,754	786,319	2,816,450	4,041	1,903	2,397	1,520	1,510

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HENNEPIN COUNTY I

MUNICIPALITY	TREE INSP- TOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Bloomington	yes	3,129	95,480	399,435	99,993	1,359	84	735	57	1,000
Brooklyn Center	yes	796	7,977	15,000	5,000	47	-	47	-	15
Brooklyn Park	yes	1,245	31,828	16,065	12,187	543	25	543	15	1,000
Champlin	yes	99	-	-	-	82	11	77	11	-
Corcoran	yes	108	2,000	-	-	19	-	10	-	-
Crystal	yes	329	3,758	-	-	22	125	22	-	-
Dayton	yes	-	-	-	-	-	-	-	-	-
Deephaven	yes	-	9,824	119	13	132	9	131	9	-
Eden Prairie	yes	1,284	8,766	-	-	164	10	129	10	-
Edina	yes	3,340	86,300	62,500	102,500	168	74	168	74	150
Excelsior	yes	1,087	9,270	2,500	900	33	6	33	6	80
Golden Valley	yes	820	12,639	-	-	650	4	350	4	-
Greenfield	yes	39	500	-	-	1	-	1	-	-
Greenwood	yes	179	3,477	7,150	5,142	29	-	29	-	47
Hanover	yes	-	-	-	-	-	-	-	-	-
Hassan Twp.	yes	9	84	-	-	-	-	-	-	-
Hopkins	yes	-	-	-	-	-	-	-	-	-
Independence	yes	107	792	169,164	30,660	35	-	30	-	-
Long Lake	yes	-	-	-	-	-	-	-	-	-
Loretto	yes	25	500	-	-	4	-	4	-	-
Maple Grove	yes	594	4,049	52,500	18,000	355	20	85	20	7,650
Maple Plain	yes	38	300	3,964	200	16	-	-	-	-
Medicine Lake	yes	25	163	362	150	9	-	9	-	-
Medina	yes	40	107	937	234	9	-	9	-	-
Minneapolis	yes	79,016	1,272,040	321,457	47,250	1,688	8	1,688	8	9,436
Minnetonka	yes	6,061	85,898	156,900	200,000	365	315	327	246	643
		81	737	2,712	926	21	-	21	-	-

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HENNEPIN COUNTY II

MUNICIPALITY	TREE INSPECTOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Minnetrista	yes	185	700	45,250	10,030	120	3	110	3	-
Mound	yes	165	8,874	10,000	8,000	15	-	9	-	5
New Hope	yes	598	-	2,341	956	-	-	25	1	-
Orono	yes	517	5,220	35,473	41,934	168	4	163	4	-
Osseo	yes	84	1,052	1,862	-	10	-	10	-	-
Plymouth	yes	560	16,950	-	-	237	-	237	-	-
Richfield	yes	7,972	81,250	80,400	101,040	78	19	78	19	138
Robbinsdale	yes	727	17,925	6,927	248	65	-	65	-	60
Rockford	yes	31	600	550	160	1	-	1	-	-
Rogers	yes	39	1,000	-	-	-	-	-	-	-
St. Anthony	yes	-	-	-	-	-	-	-	-	-
St. Bonifacius	yes	-	-	-	-	-	-	-	-	-
St. Louis Park	yes	690	13,672	46,000	5,500	60	3	60	3	935
Shorewood	yes	867	27,376	-	-	500	25	24	1	277
Spring Park	yes	11	600	3,000	1,000	1	-	1	-	-
Tonka Bay	yes	-	-	-	-	-	-	-	-	-
Wayzata	yes	452	4,950	3,774	110	1	-	1	-	21
Woodland	yes	240	3,652	-	-	*(7)	*(4)	*(7)	*(4)	-
Hennepin Co. Park Reserve District	yes	4,409	144,347	162,320	16,232	1,058	262	288	1	-
Hennepin County	yes	3,103	37,121	-	-	80	-	28	-	-
TOTAL		119,101	2,001,778	1,608,662	708,365	8,145	1,007	5,548	492	21,457

* Not included in total.

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RAMSEY COUNTY

MUNICIPALITY	TREE INSPECTOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Arden Hills	yes	736	2,631	9,519	29,478	112	95	45	20	25
Falcon Heights	yes	60	60	2,348	77	5	-	5	-	-
Gem Lake	yes	152	1,139	2,200	6,100	19	22	-	-	-
Lauderdale	yes	-	-	-	-	-	-	-	-	-
Little Canada	yes	450	1,823	2,175	1,000	974	6	229	6	-
Maplewood	yes	2,493	21,250	44,100	106,600	1,122	213	1,122	213	-
Mounds View	yes	-	-	-	-	-	-	-	-	-
New Brighton	yes	944	28,900	26,568	42,678	619	338	619	338	-
North Oaks	yes	663	3,207	5,000	40,000	101	316	101	16	-
No. St. Paul	yes	-	-	-	-	-	-	-	-	-
Roseville	yes	1,200	17,465	23,692	13,816	255	33	237	18	11
St. Paul	yes	45,800	324,824	108,060	16,000	3,938	2	2,225	2	2,080
Shoreview	yes	2,114	9,977	100,072	198,144	179	270	179	105	-
Vadnais Heights	yes	205	1,905	2,703	660	155	35	91	29	-
White Bear Lake	yes	346	10,992	11,700	17,100	139	13	139	13	17
White Bear Twsp.	yes	323	1,869	5,300	17,190	337	32	337	32	-
Ramsey County	yes	2,080	50,000	6,463	27,520	622	104	622	104	-
TOTAL		57,566	476,042	349,900	516,363	8,577	1,479	5,951	896	2,133

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SCOTT COUNTY

MUNICIPALITY	TREE INSPECTOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Belle Plaine	yes	82	2,144	4,330	2	7	-	7	-	-
Elko	yes	18	81	177	23	3	-	3	-	-
Jordan	yes	80	1,200	5,110	2,365	25	-	23	-	-
New Market	yes	-	-	-	-	-	-	-	-	-
New Prague	yes	62	461	1,332	207	3	-	3	-	12
Prior Lake	yes	221	1,045	106,040	94,275	118	22	102	14	2,550
Savage	yes	76	801	226,316	165,634	68	18	67	18	-
Shakopee	yes	586	3,620	15,754	6,780	58	14	58	14	-
Credit River	yes	-	-	-	-	-	-	-	-	-
Spring Lake	yes	124	225	395,000	278,000	35	2	32	2	95
TOTAL		1,249	9,577	754,059	547,286	317	56	295	48	2,657

8-8

WASHINGTON COUNTY I

MUNICIPALITY	TREE INSPEC- TOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Afton	yes	12	1,470	-	-	40	-	40	-	-
Bayport	yes	165	3,717	22,000	2,020	55	-	55	-	29
Birchwood	yes	-	-	-	-	-	-	-	-	-
Cottage Grove	yes	716	13,023	27,417	224,400	283	42	161	34	245
Dellwood	yes	178	1,238	2,575	28,152	31	14	9	13	-
Forest Lake	yes	125	-	1,355	2,490	222	4	213	4	-
Hugo	yes	394	3,235	1,550	200,976	380	131	112	96	-
Lake Elmo	yes	387	3,385	7,825	118,520	215	62	153	60	5,000
Lakeland	yes	12	100	2,200	1,650	21	3	10	2	500
Lakeland Shores	no	-	-	-	-	-	-	-	-	-
Landfall	yes	-	-	-	-	-	-	-	-	-
Mahtomedi	yes	181	11,326	18,455	34,000	50	176	29	76	50
Marine on St. Croix	yes	-	-	-	-	-	-	-	-	-
Newport	yes	-	-	-	-	-	-	-	-	-
Oakdale	yes	246	5,917	10,000	2,500	166	19	162	16	-
Oak Park Heights	yes	94	5,016	300	350	35	6	35	3	232
Pine Springs	yes	84	300	453	5,670	17	23	17	23	28
Lake St. Croix	yes	-	-	-	-	-	-	-	-	-
St. Mary's Point	yes	-	-	-	-	-	-	-	-	-
St. Paul Park	yes	320	4,785	9,809	1,680	125	2	93	2	14
Stillwater	yes	792	17,454	8,440	2,911	166	-	96	-	11,998
Willernie	yes	71	616	434	787	19	2	18	2	-
Woodbury	yes	524	-	12,000	12,000	642	154	587	153	-
Baytown Twsp.	yes	249	1,720	2,744	60,244	72	64	57	51	-
Dermark Twsp.	yes	-	-	-	-	-	-	-	-	-

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0

WASHINGTON COUNTY II

MUNICIPALITY	TREE INSPECTOR	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
				ELM	OAK	ELM	OAK	ELM	OAK	
Forest Lake Twp.	yes	295	3,400	20,763	197,345	129	13	124	13	-
Grant Twp.	yes	278	2,595	2,250	140,165	413	134	149	97	-
Grey Cloud Twp.	yes	75	118	17,173	51,886	46	3	46	3	7,650
May Twp.	yes	150	543	1,450	5,500	282	98	154	44	-
New Scandia Twp.	yes	93	262	-	-	45	-	-	-	-
Stillwater Twp.	yes	-	-	-	-	-	-	-	-	-
West Lakeland Twp.	yes	54	225	-	-	38	150	38	-	-
Washington County	yes	1,080	25,200	14,600	14,130	308	144	2	20	-
TOTAL		6,575	105,645	183,793	1,107,376	3,800	1,244	2,360	712	25,746

SHADE TREE DISEASE CONTROL IN MINNESOTA



A REPORT
TO THE 1977
LEGISLATURE

Prepared by
The Minnesota Department of Agriculture



LAND OF QUALITY FOODS

STATE OF MINNESOTA

DEPARTMENT OF AGRICULTURE

STATE OFFICE BUILDING

SAINT PAUL, MINN. 55155

OFFICE OF THE COMMISSIONER

January 31, 1977

TO: RECIPIENTS OF "SHADE TREE DISEASE CONTROL IN MINNESOTA - A REPORT TO THE 1977 LEGISLATURE"

FROM: COMMISSIONER JON WEFALD

Dutch elm and oak wilt disease still continue to take a heavy toll in our urban forests. Losses of both elm and oak have increased in 1976 -- despite increased municipal expenditures aimed at containing these diseases.

It is clear from the reports received by the Department that the disease is spreading to new locations throughout the State and is intensifying in those areas where its presence has been previously confirmed.

With the support of the Minnesota Legislature, the Department has provided assistance to local communities in the area of shade tree disease control. Departmental services include technical assistance, a diagnostic laboratory, and a municipal grants-in-aid program. We have also taken an active role in cooperation with the University of Minnesota in educating the public about shade tree diseases. We hope that these services aid communities in understanding and coping with Dutch elm and oak wilt disease.

It is our belief that the devastating consequences of shade tree disease can be minimized by a joint effort of State and local governments. For your information, I am enclosing "SHADE TREE DISEASE CONTROL IN MINNESOTA - A REPORT TO THE 1977 LEGISLATURE."

JW:dj

Enclosure



ENJOY THE HIGH QUALITY AND INFINITE VARIETY OF MINNESOTA FOODS

PREFACE

This report is subject to the limitations of available data. It is important to acknowledge this limitation at the outset. The report is based upon the annual reports received by the Minnesota Department of Agriculture as of December 15, 1976. Tree inventory and loss figures are confined to control areas within the designated boundaries of the political unit reporting. The quality of the reporting varies, depending upon the local government's experience in shade tree control. Notwithstanding these practical limitations, the report makes an attempt to determine the incidence and impact of shade tree diseases in Minnesota. The commitment of money and person-hours being made by local municipalities is also examined and an assessment is made as to whether these efforts have had any appreciable effect in controlling Dutch elm and oak wilt diseases in the State.

John Tabet
Plant Health Specialist
Division of Plant Industry

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I. INCIDENCE OF SHADE TREE DISEASES IN MINNESOTA

A. Dutch Elm Disease in the Seven Metropolitan Counties

The incidence of Dutch elm disease in metropolitan municipalities continued to climb at the same rate in 1976 as it did in 1975. Total reported tree losses for 1976 were 75,460, up 279 percent from the 1975 losses of 27,044. Elm losses calculated as a percentage of elm population inventories in "control" areas in the metropolitan area show a 1.93 percent loss for 1976, nearly three times the 0.69 percent loss recorded in 1975. (See Table 1).

The incidence (percent diseased) of Dutch elm disease increased in all seven metropolitan counties in 1976. While this is significant in itself, a closer look at reported tree inventories is warranted if one wishes to ascertain the impact of Dutch elm disease on a county-by-county basis in the seven county metropolitan area. (See Figure 1).

Municipalities north and east of the Mississippi River, i.e., within Anoka, Ramsey, and Washington Counties were hardest hit by Dutch elm disease. Ramsey County municipalities reported a 7.54 percent elm loss, Washington County municipalities a 4.24 percent loss, and Anoka County municipalities a 2.38 percent loss. These counties also reported substantial losses in 1974 and 1975, but these counties only account for 17 percent of the total elms reported to be in the seven county municipal control areas. The remaining four counties south and west of the Mississippi River sustained losses which amounted to less than two percent of their control area inventory. Losses in these counties were significantly higher in 1976. The potential losses for Dakota, Hennepin, and Scott County municipalities are staggering when one considers that they contain 80 percent or nearly 3.3 million of the 4.1 million elms reported to be in the seven county area.

Prompt removal and proper disposal of diseased trees are the most important control measures in slowing the spread of the disease. In absolute numbers, removal activity within the metropolitan area has increased substantially from 1975. The number of trees removed as a percentage of diseased trees, however, was a disappointing 73.5 percent. This figure compares favorably with the diseased elm tree removal percentages in 1974 (67 percent) and 1975 (66 percent), but the problem of standing diseased trees remains serious, and is further compounded by standing diseased trees located outside of the municipal control areas. In 1974, 67 percent removal meant only 3,000 diseased elms were left standing, 66 percent standing in 1975 represented almost 9,000 trees, and a 73.5 percent removal in 1976 meant nearly 20,000 diseased elms were standing at the time the reports were received in December -- 10,000 (50 percent) in the City of St. Paul.*

In last year's report, it was stated that the 9,000 standing diseased trees would probably be "a startling indicator of things to come" and, unfortunately, this grim prediction was borne out as evidenced by the 279 percent increase in disease incidence this past year. Prospects for the 1977 growing season are not encouraging in spite of reports that the bitter cold weather experienced in January may adversely effect the over-wintering ability of the elm bark beetles.

From the reports received by the Department and through visual inspections this past summer, all indications are that Dutch elm disease is a very serious problem in the metropolitan area. The 1976 level of sanitation (73.5 percent removal) is likely to lead to conditions in 1977 and 1978 which will require substantial increases in expenditure of resources for the removal of diseased elm trees.

*(The city has contracted to have these trees removed this winter. The majority of these trees stood more than 20 days after detection and property owner notification and had the potential of harboring at least one generation of elm bark beetles during this past growing season).

TABLE 1
ELM LOSSES - METROPOLITAN AREA

<u>METRO COUNTY</u>	<u>1974</u>		<u>1975</u>		<u>1976*</u>	
	<u>NUMBER DISEASED</u>	<u>PERCENT DISEASED</u>	<u>NUMBER DISEASED</u>	<u>PERCENT DISEASED</u>	<u>NUMBER DISEASED</u>	<u>PERCENT DISEASED</u>
ANOKA	1,097	.98	2,057	1.70	2,920	2.38
CARVER	37	.02	107	.11	666	.70
DAKOTA	870	.23	4,041	.51	6,468	.82
HENNEPIN	2,419	.20	8,145	.51	29,690	1.85
RAMSEY	3,074	.90	8,577	2.45	26,370	7.54
SCOTT	95	.01	317	0.04	1,550	0.21
WASHINGTON	<u>2,200</u>	<u>.72</u>	<u>3,800</u>	<u>2.01</u>	<u>7,796</u>	<u>4.24</u>
TOTALS	9,792	.29	27,044	.69	75,460	1.93

*Based on 1975 Inventory - 88 Percent (145/164) of the Municipalities Reporting

TABLE 1
ELM LOSSES - METROPOLITAN AREA

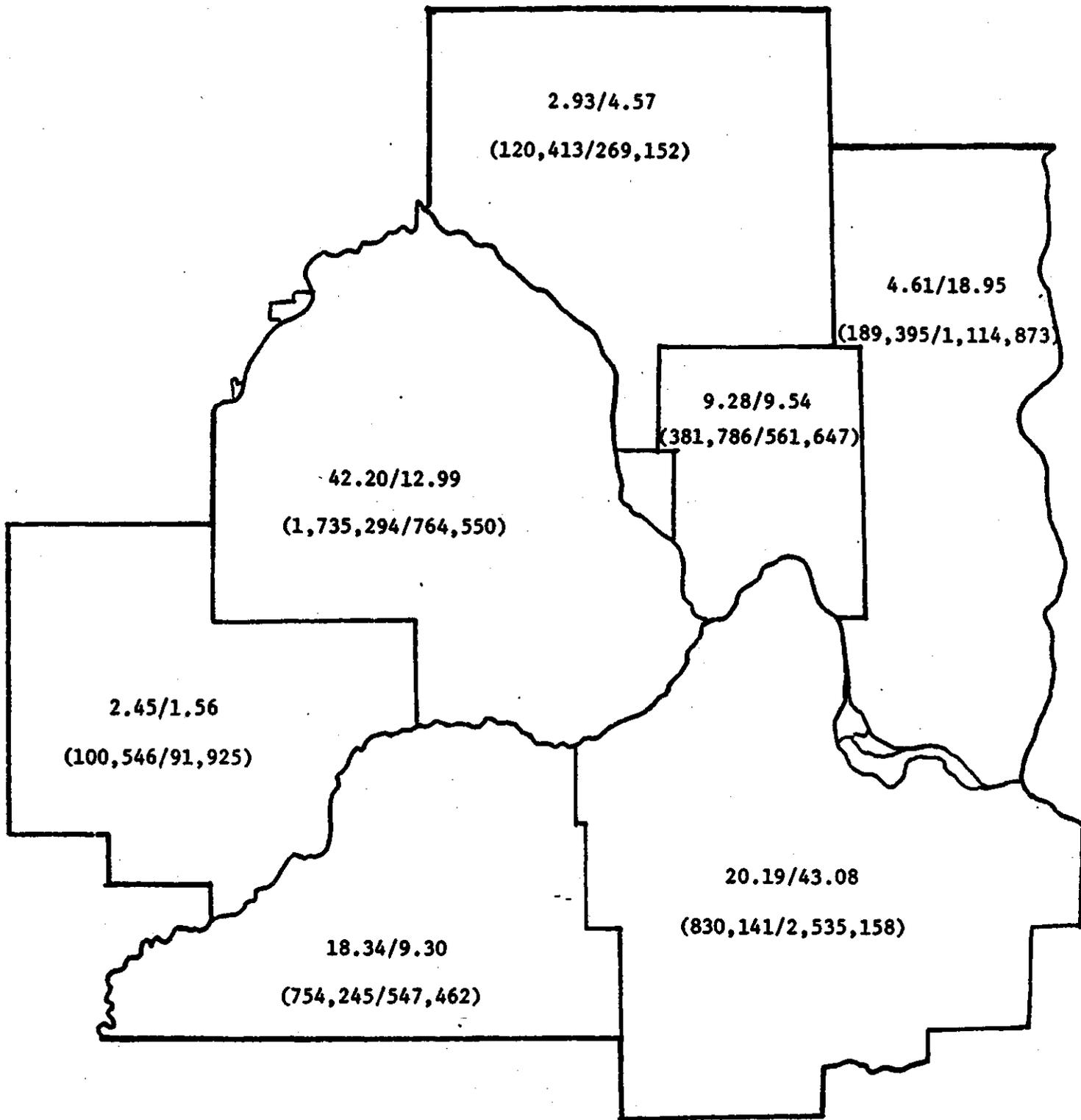
METRO COUNTY	1974					1975				
	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
ANOKA	111,893	1,097	.98	677	61	122,617	2,057	1.70	1,414	68
CARVER	166,232	37	.02	58	—	95,549	107	.11	97	90
DAKOTA	384,286	870	.23	577	66	786,319	4,041	.51	2,397	59
HENNEPIN	1,215,376	2,419	.20	2,259	93	1,608,662	8,145	.51	5,548	68
RAMSEY	345,473	3,074	.90	1,728	56	349,900	8,577	2.45	5,951	69
SCOTT	819,121	95	.01	84	88	754,059	317	.04	295	93
WASHINGTON	303,955	2,200	.72	1,233	56	183,793	3,800	2.01	2,360	62
TOTALS	3,346,336	9,792	.29	6,616	67	3,900,899	27,044	.69	18,062	66

TABLE 1
ELM LOSSES - METROPOLITAN AREA

1976

METRO COUNTY	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
ANOKA	120,413	2,920	2.42	2,611	89
CARVER	100,546	666	0.66	684	100
DAKOTA	830,141	6,468	0.78	5,522	85
HENNEPIN	1,735,294	29,690	1.71	23,331	79
RAMSEY	381,786	26,370	6.91	16,436	62
SCOTT	754,245	1,550	0.21	1,487	96
WASHINGTON	189,395	7,796	4.12	5,399	69
TOTALS	4,111,820	75,460	1.84	55,470	74

PERCENTAGE AND TOTAL* OF ELM/OAK INVENTORY REPORTED FROM
THE 7 COUNTY "MUNICIPAL" CONTROL AREAS



(FIGURE 1)

*145/164 (88%) OF THE MUNICIPALITIES REPORTING

TOTALS: 4,111,820 --- ELMS
5,884,767 --- OAK

B. Dutch Elm Disease Outside of the Metropolitan Area

Dutch elm disease continues to spread to new areas of the State. Wilkin County was added to the list of Minnesota counties who have had laboratory confirmed cases of Dutch elm disease — raising the total number of counties to 69. Eight more municipalities reported their first case of Dutch elm disease in 1976. This raises the total number of "outstate" municipalities who have confirmed cases of the disease to 239.

The reporting of tree losses from municipalities outside the metropolitan area is not required by law. The Department does, however, audit reports from municipalities in the "outstate" area who have control programs.

With approximately one-half (124/239) of the municipalities returning the Department's questionnaire, the total reported elm losses are 9,434, nearly double those reported in 1975. (See Table 2). Assessment of the incidence and distribution of Dutch elm disease in rural municipalities is limited because of the missing reports and the absence of accurate inventories in the majority of the cities reporting losses. (See Figure 2).

TABLE 2

ELM LOSSES - OUTSIDE THE METROPOLITAN AREA

DISTRICT	1974					1975				
	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	ELM INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
SE	77,810	1,415	1.8	NA	NA	98,991	1,550	1.6	1,068	69
SC	123,817	1,115	0.9	NA	NA	*124,939	1,415	1.13	1,395	98
SW	29,270	821	2.8	NA	NA	26,593	723	2.7	455	63
EC	12,260	58	0.5	NA	NA	16,088	386	2.4	360	93
C	51,767	260	0.5	NA	NA	49,319	490	0.99	323	66
WC	33,250	48	0.14	NA	NA	45,419	84	0.18	80	95
NE	21,925	31	0.14	NA	NA	25,885	159	0.61	34	21
TOTALS	350,099	3,748	1.1	NA	NA	387,234	4,807	1.24	3,715	77

*Faribault Inventory 100,000 Added

NA - Data Not Available

TABLE 2

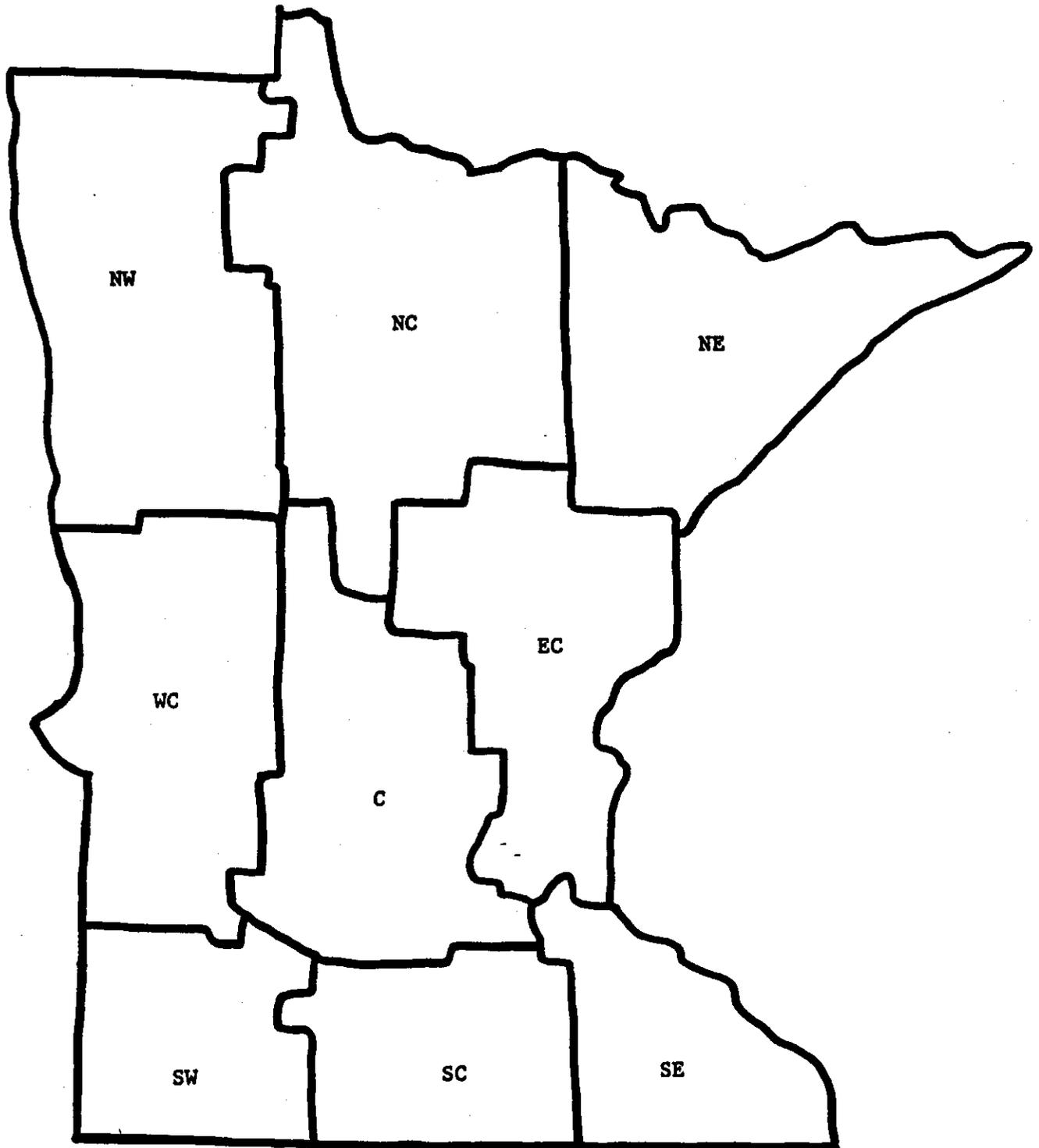
ELM LOSSES - OUTSIDE THE METROPOLITAN AREA

1976

DISTRICT	NUMBER OF CITIES REPORTING	INVENTORY	LOSSES	% LOSS
SW	22	34,989	1,761	5.03
SC	25	45,462	4,441	9.77
SE	24	50,749	1,021	2.01
WC	11	36,845	109	0.30
C	30	123,114	1,532	1.24
EC	6	6,682	201	3.01
NC	2	NA	262	---
NE	<u>4</u>	<u>40,753</u>	<u>107</u>	<u>0.26</u>
TOTALS	124	338,594	9,434	2.79

NA - Not Available

MINNESOTA DISTRICTS REPORTING ELM LOSSES



(FIGURE 2)

C. Oak Wilt Disease

Reports received by the Department showed only a slight increase in the losses of oaks in the metropolitan area municipalities from 6,981, in 1975, to 7,891 in 1976. Oak losses, as a percentage of revised oak population inventories, show 0.13 percent loss in 1976 for all metropolitan municipalities compared to the 0.11 percent loss recorded in 1975. If the 1976 percent oak loss is calculated using the 1975 reported oak inventory, the loss is 0.10 percent — actually a decrease of 0.01 percent from last year. Regardless of which inventory is used to calculate the percentage of oaks lost, it is evident that the reported losses have been nearly the same the past two years in the metropolitan area.

Municipalities within Anoka, Hennepin, and Scott Counties had increased losses in 1976, with Anoka County showing more than a doubling of losses from 0.47 percent in 1975 to 1.03 percent in 1976. Cities in Dakota, Ramsey, and Washington Counties had a decline in losses both in actual numbers as well as percent lost. (See Table 3).

Diseased oak tree removal in the metropolitan area, as a percentage of diseased trees reported, showed a significant increase from 69 percent in 1975 to 82 percent in 1976. Cities in Dakota, Hennepin, Ramsey, and Washington Counties, however, were below the seven county average of 82 percent removal.

Data gathered this past year again indicates that oak wilt disease is controllable in the "metro" area. In 1975, the number of diseased oaks left untreated was 2,122 and, in 1976, the figure was 1,413. The improved control in 1976 emphasizes the fact that given proper control measures, oak wilt disease will not spread as rapidly and tend to remain in the small pockets as infection centers.

Oak wilt disease is now reported to be active in 36 counties, four more than in 1975. The disease has been limited, primarily to

southeastern and central parts of Minnesota. A complete assessment of the incidence and distribution of the disease is difficult to determine because of a lack of data from cities outside of the metropolitan area.

TABLE 3

OAK LOSSES - METROPOLITAN AREA

METRO COUNTY	1974					1975				
	OAK INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED	OAK INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
ANOKA	391,572	1,057	.27	749	71	273,545	1,288	.47	1,188	92
CARVER	120,771	4	.003	50	—	90,872	4	.004	3	—
DAKOTA	1,590,074	2,909	.18	2,054	70	2,816,450	1,903	.07	1,520	80
HENNEPIN	654,983	1,484	.23	344	23	708,365	1,007	.14	492	48
RAMSEY	411,628	1,009	.24	246	24	516,363	1,479	.29	896	60
SCOTT	815,132	71	.009	81	—	547,286	56	.01	48	85
WASHINGTON	1,056,229	253	.02	156	61	1,107,376	1,244	.11	712	57
TOTALS	5,040,389	6,787	.13	3,680	54	6,060,257	6,981	.11	4,859	69

TABLE 3
OAK LOSSES - METROPOLITAN AREA

1976

METRO COUNTY	OAK INVENTORY	# DISEASED	% DISEASED	# REMOVED	% REMOVED
ANOKA	269,152	2,759	1.03	2,670	97
CARVER	91,925	3	0.003	3	100
DAKOTA	2,535,158	1,659	0.07	1,043	63
HENNEPIN	764,550	1,472	0.19	1,136	77
RAMSEY	561,647	995	0.18	801	80
SCOTT	547,462	87	0.02	84	97
WASHINGTON	1,114,873	916	0.08	741	81
TOTALS	5,884,767	7,891	0.10	6,478	82

- 7B -

II. LOCAL CONTROL PROGRAMS

A. Background

Minnesota's Shade Tree Disease Control Act of 1974 requires that all municipalities within the seven metropolitan counties have a control program which complies with the provisions of the Act. Pursuant to the authority granted by the 1974 Act, the Department has promulgated rules governing the standard control measures which are required of each municipality subject to the Act. The provisions of the 1974 Act and the Department's regulations, however, are not applicable to municipalities outside the seven metropolitan counties. The rural municipalities are subject to the provisions of the Local Pest Control Act. The Act requires that municipalities initiate a control program only at the recommendation of the Commissioner of Agriculture. The Commissioner makes such recommendation when the first case of Dutch elm disease within the municipality has been confirmed. Programs initiated pursuant to the Local Pest Control Act are not presently subject to the Department's regulations which set forth standard control practices. The Department does, however, request that rural municipalities conduct their control program in conformance with Department guidelines.

In carrying out its regulatory responsibilities, the Department has stated two objectives. The first objective is to insure that all municipalities employ a qualified tree inspector who has been certified by the Department of Agriculture. The second objective is to insure that each municipality is conducting their control program in conformance with the minimum control standards set out in the Department's regulations. These include the requirement that each municipality conduct at least two complete inventories within the growing season for the purpose of identifying diseased trees.

Once identified as diseased, the municipality must insure that the diseased tree is removed within 20 days of notice to the property

owner, public or private. Disposal practices are also subject to regulation. The Department policy has been to work closely with the municipality in overcoming deficiencies in their control programs. This approach makes allowances for the time required in developing and implementing a control program and proves to be less alienating to both state and local government.

In this section, there is an attempt to assess control activities of local communities by quantifying control activities in person-hours and dollar expenditures.

B. Metropolitan Municipalities

There were 282,689 person-hours committed to control of shade tree disease in 1976 by those municipalities reporting as of December 15, 1976. (See Table 4). On the average, a municipality spent 1,950 person-hours in the control of Dutch elm and oak wilt diseases in 1976. This is an increase from the 1975 figure of 1,601 person-hours. The overall increase in person-hours can be accounted for by the dramatic increase in person-hours spent by municipalities in all counties but Hennepin County.

There is a significant disparity between average person-hours spent by a municipality in Hennepin and Ramsey Counties, and average person-hours spent by a municipality in the other metropolitan counties. The reason for this disparity is the different conditions under which control activities are conducted in Minneapolis and St. Paul. Both cities have a highly urbanized environment which requires a greater expenditure of person-hours in detection, removal, and disposal. Further, Minneapolis and St. Paul generally have a much larger proportion of their shade trees which are elm, requiring more control activity.

Dollar expenditures for 1976 for municipalities in metropolitan areas totaled \$4,799,966 based on reports received to date. Metro-

politan municipalities expended an average of \$33,103 on their control program in 1976. This is up significantly from the 1975 figure of \$23,057. Tree removal costs accounted for 50 percent of the total budget.

Generally speaking, there has been about a one-third increase in the person-hours spent in control of shade tree diseases, and almost a third more in dollar expenditures in metropolitan communities. Since all municipalities do not use uniform procedures for recording person-hours and dollars, a comparison may not always be valid. These figures can, however, give a good approximation of the amount of effort being committed to control of shade tree disease.

Larger communities appear to be adequately detecting shade tree diseases. Removal procedures are, however, often inadequate. Municipalities must reduce the time between identification and removal of diseased elm trees. It has been suggested that the unavailability of tree removal services has contributed to the municipality's inability to comply with the State's 20 day time requirement. In many instances, however, cumbersome administrative procedures and mere inaction are the reasons for the delay in removal.

TABLE 4

AVERAGE PERSON-HOURS AND DOLLAR EXPENDITURES - METROPOLITAN MUNICIPALITIES

<u>COUNTY</u>	<u>AVERAGE PERSON-HOUR PER MUNICIPALITY</u>		<u>AVERAGE EXPENDITURE PER MUNICIPALITY</u>	
	<u>1974</u>	<u>1975</u>	<u>1974</u>	<u>1975</u>
ANOKA	258	819	2,174	14,326
CARVER	418	74	4,133	1,345
DAKOTA	571	494	9,857	8,638
HENNEPIN	5,094	2,978	48,579	50,044
RAMSEY	2,054	4,118	21,523	34,003
SCOTT	216	139	2,343	1,064
WASHINGTON	285	286	2,159	4,593

<u>COUNTY</u>	<u>AVERAGE PERSON-HOUR PER MUNICIPALITY</u>	<u>AVERAGE EXPENDITURE PER MUNICIPALITY</u>
	<u>1976</u>	<u>1976</u>
ANOKA	4,162	30,390
CARVER	234	2,366
DAKOTA	1,106	11,444
HENNEPIN	2,535	77,145
RAMSEY	5,454	56,382
SCOTT	262	2,038
WASHINGTON	588	7,088

C. Rural Municipalities

The Shade Tree Disease Control Act of 1974 provides that municipalities outside the metropolitan area can request to come within the provisions of the Act in order to take advantage of available grant funds. To date, 30 municipalities have elected to come within the provisions of this law. The size of these municipalities varies from the population of Woodstock, Minnesota (217) to a population of 100,578 in Duluth. (See Table 5).

TABLE 5

AVERAGE PERSON-HOURS AND DOLLAR EXPENDITURES - RURAL MUNICIPALITIES

<u>DISTRICT</u>	<u>AVERAGE</u> <u>PERSON-HOUR</u> <u>PER MUNICIPALITY</u>	<u>AVERAGE</u> <u>EXPENDITURE</u> <u>PER MUNICIPALITY</u>
	<u>1975</u>	<u>1975</u>
SE	522	8,670
SC	353	6,272
SW	76	1,335
EC	67	434
C	515	6,234
WC	166	2,478
NE*	97	2,125

*Excludes the City of Duluth

<u>DISTRICT</u>	<u>AVERAGE</u> <u>PERSON-HOUR</u> <u>PER MUNICIPALITY</u>	<u>AVERAGE</u> <u>EXPENDITURE</u> <u>PER MUNICIPALITY</u>
	<u>1976</u>	<u>1976</u>
SE	550	4,576
SC	650	9,618
SW	357	3,723
EC	229	727
C	347	6,680
WC	339	1,568
NE*	281	2,233

*Excludes the City of Duluth

Rural municipalities are subject to the provisions of the Local Pest Control Act. In 1976, there were 239 non-metropolitan communities with programs pursuant to the Pest Control Act. In administering the Act, the Department's efforts are directed more towards providing technical assistance to communities rather than regulation of control programs. Communities are, however, required to follow the Department's guidelines for establishing and maintaining control programs.

Rural municipalities spent an average of 393 person-hours and \$4,161 in control of shade tree diseases. The southeastern and southcentral portions of the State have the highest expenditures in terms both of person-hours and dollars. Expenditures range from an average expenditure of \$9,618 in the southcentral district, to an average expenditure of only \$727 in the east central district. (See Table 5).

TABLE 6

OUTSTATE MUNICIPALITIES SUBJECT TO THE 1974 SHADE TREE DISEASE CONTROL ACT

<u>MUNICIPALITIES</u>	<u>POPULATION</u>
Braham	730
Buffalo	3,275
Butterfield	619
Cottonwood	794
*Duluth	100,578
Fairmont	10,751
Gaylord	1,720
Granite Falls	3,225
Hutchinson	8,142
Lamberton	962
Little Falls	7,467
Little Fork	824
Madelia	2,316
Madison	2,242
Madison Lake	587
Melrose	2,273
*Montevideo	5,729
Monticello	1,636
Northfield	10,235
*North Mankato	7,347
Pipestone	5,328
Red Wing	12,834
St. Charles	1,942
St. Cloud	42,223
Sauk Centre	3,750
Spring Valley	2,572
*Virginia	12,450
Waseca	6,789
Willmar	13,632
Winona	26,438
Woodstock	217

*UNDER M.S. 18.023, BUT NOT PARTICIPATING IN THE GRANT-IN-AID PROGRAM

D 3

Note that the differences in expenditures of time and money between metropolitan and rural communities are quite significant. This can be accounted for by the fact that the smaller rural communities do not have as large a geographic area in which to conduct control activities; the rural communities are not faced with control in the highly urbanized setting; and cost of tree removal and disposal are significantly higher in the metropolitan area.

III. STATE RESOURCE COMMITMENT TO SHADE TREE DISEASE CONTROL

A. Regulation of Local Control Programs

State Plant Health Specialists monitor local programs through field inspections throughout the year. Their objective is to determine if local programs are in compliance with State standards. Specialists concentrate their efforts determining the thoroughness of diseased tree surveys, the rate at which diseased trees are being removed, and investigate reports of illegal dumping of tree wastes.

In addition to their regulatory responsibility, State Specialists serve a valuable technical assistance function. In many instances, local program personnel are not trained foresters. They may experience difficulties in addressing some of the more technical or biological aspects of disease control. State Specialists make their services available to all local tree inspectors to assist them with developing a biologically sound and administratively efficient disease control program. This technical assistance is one of the more time consuming activities of the regulatory program, but one of the most important services offered by the State.

The State's role in the fight against Dutch elm disease has continued to expand over the years. The State is now involved in a variety of activities ranging from its responsibility as regulator of local control programs to such activities as public education, grants for disease control, diagnostic laboratory services, and a limited amount of research. A brief description of these activities follows.

B. Public Education

The importance of public education to any shade tree disease control effort is often underestimated. The effects of public education are more subtle and less visible than the physical activities of tree removal or disease inspections. The connection between results and the public education effort is less discernable to the average citizen, often leading people to place less emphasis upon the public education function. This is a vital mistake in any control program. Shade tree diseases cannot be controlled without the active support and cooperation of the general public.

Citizens should be knowledgeable of disease symptoms and the steps that must be taken to eliminate hazardous conditions. The public's cooperation is essential to a prompt removal of hazardous trees on private property and for removal of elm firewood. This kind of cooperation is much easier to obtain from an educated and concerned citizenry.

In 1975, the State Legislature provided \$45,000 for public education. By the fall of that year, \$40,000 of the appropriation had been committed to the production of public education materials relating to shade tree diseases. By the end of 1976, the balance of the public education appropriation had been expended.

A substantial portion of the public education money was allotted to the production of public service announcements. These

announcements helped alert the public to the consequences of Dutch elm disease and outlined the steps that could be taken to help slow the spread of the disease. Production of public service announcements included: two 60 second television spots; two 30 second television spots; one 10 second television spot; three 60 second radio spots; and three 30 second radio spots. It is worthy of mention that one of the 60 second television announcements received a Certificate of Merit in recognition of its superior quality from the Advertising Federation of Minnesota and the Arts Directors/Copywriters Club of Minneapolis/St. Paul.

An eight minute slide show on Dutch elm disease was also produced to assist the Department in taking their case to the media and soliciting public service time. The slide show presents a brief statement of the biology of Dutch elm disease and the overwhelming consequences of this disease to the State of Minnesota. The show was presented to public service representatives of both the radio and television media throughout the State. It provided a useful tool in convincing the media of the importance and immediacy of the problem.

After receiving a very favorable response to the slide show, the show was put on 16 mm film so that it was more readily adaptable to use by community groups. Eleven copies of the film were circulated among neighborhood groups, local libraries, local units of government, civic organizations, State Legislators, and others who assisted in educating the public to shade tree diseases. The film proved to be one of the most valuable public education materials produced by the Department.

Another very important part of the State's public education program was the public relation effort. Department staff had busy evening schedules attending local meetings organized by neighborhood groups, civic groups, Legislators, and other public interest organi-

zations. The Department organized a series of press conferences and prepared a continuous series of press releases in an attempt to reach the public through the news media. The Department also organized a bus tour for Legislators to visually inspect the devastation caused by Dutch elm disease in St. Paul and played an active role in organizing the State Arbor Day ceremony.

The public education effort was indeed successful. The problem of shade tree diseases became exceptionally visible in 1976. Department contacts with the media prior to the growing season helped enable them to present the shade tree disease problem to the public in an informative and effective manner. Public education announcements, however, would have been more effective with a greater television exposure. The Department plans to intensify its effort in 1977 to educate the public to the problem that Dutch elm and oak wilt diseases pose.

C. Grant for Property Owner Subsidies

The 1975 Legislature appropriated \$1.5 million in grant funds to be disbursed to local units of government. There was \$800,000 specifically earmarked for grants to municipalities who had programs to subsidize removal of diseased trees from private property. It appears that the legislative intent was to afford property owners some financial relief in meeting the costly and unexpected burden of removing diseased trees. The grant program also had the effect of improving control programs by increasing the cooperation received in removing trees from private property.

The entire \$800,000 appropriation was committed by August of 1976. (See Table 7). Only \$78,702 was expended in the 1975 growing season. The small amount spent in 1975 can be accounted for by the fact that many municipalities had not budgeted for the required matching funds in anticipation of the subsidy program.

There were 27 communities participating in the program in 1975, nine of these communities were outside the metropolitan area. There were 64 communities participating in 1976 with 27 of these being from outstate Minnesota. Of the total appropriation, metropolitan municipalities received \$713,523 while municipalities outside the seven metropolitan counties received \$85,740.

The property owner subsidy program appears to be quite successful. There was a high degree of participation for a new program by both large and small communities. Most municipalities participating, and many who did not participate, have indicated their interest in expanding the program to grants for removal from public properties and for reforestation. Expansion of the grant-in-aid program appears to be an issue the Legislature is likely to address in 1977.

The key features in the administration of the program were simplicity and flexibility. Municipalities were not restricted to a particular type or form of subsidy, but were able to receive State funds for subsidy programs designed to meet their specific and unique local needs. All that was required of a municipality to receive funds was the submission of a one page application, execution of an award contract, and documentation of costs actually incurred under the local subsidy program. The State would then reimburse the municipality one-half of the costs of the program.

The types of subsidies provided to property owners varied with the municipality. Generally, the municipality assumed a percentage of the cost of removing the diseased trees. The percentage ranged from 25 percent to 100 percent with the majority of communities using a subsidy formula of 50 percent. In some instances, the percentage assumed by the city increased as the cost of removing the diseased trees increased. Some municipalities assumed all costs above a fixed amount, similar to deductible arrangements on insurance policies. Others simply provided a diseased tree pickup and disposal service to property owners.

TABLE 7

<u>PROGRAM ELEMENT</u>	<u>APPROPRIATION</u>	<u>EXPENDITURES</u>	<u>BALANCE</u>
Public Education	\$ 45,000	\$ 43,000	\$ 5,000
Disposal/Utilization Grant	700,000	393,500	306,500
Private Property Subsidy	800,000	800,000	-0-

DISPOSAL/UTILIZATION GRANT AWARD

<u>GRANTEE</u>	<u>AMOUNT</u>
Hennepin County	\$ 83,500
St. Paul/Minneapolis	310,000

PRIVATE PROPERTY SUBSIDY GRANT AWARD

<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>	<u>CITY/TOWN</u>	<u>1975</u>	<u>1976</u>
Baytown Twp.		1,000	*Madelia		2,000
Bloomington	\$ 9,603.55	16,000	*Madison		500
*Braham		2,000	*Madison Lake		11,000
Brooklyn Park		20,000	Mahtomedi	\$ 4,405.20	21,000
*Buffalo		4,000	Maple Grove	2,017.75	11,250
Burnsville	4,524.45	20,600	Maplewood	6,000.00	
*Butterfield		1,475	*Melrose	2,269.44	2,500
Chanhassen	1,844.50	18,000	Minnetonka	21,769.79	32,500
Chaska		2,500	*Monticello	3,202.50	3,203
Columbia Hts.		3,000	*Northfield		1,000
Coon Rapids	1,639.35	30,000	*Pipestone	750.00	2,025
Cottage Grove	469.75	3,000	Plymouth		40,000
*Cottonwood		2,750	Ramsey		2,000
Crystal		3,000	*Red Wing	607.20	2,000
Deephaven	853.01	12,000	Richfield	392.62	7,500
Eden Prairie	2,653.86	4,000	Robbinsdale		15,000
Edina	364.31	15,000	St. Anthony		4,000
Excelsior		2,500	*St. Charles		3,100
*Fairmont	3,993.58	5,500	*St. Cloud		4,500
Falcon Hts.	25.00	750	St. Louis Park		5,000
Forest Lake		1,500	St. Paul		250,000
Fridley		15,000	*Sauk Centre		2,000
*Gaylord		1,500	Shorewood		10,000
Golden Valley		7,500	*Spring Valley	547.91	2,500
*Granite Falls	925.00	1,250	South St. Paul	367.00	2,000
Hassan Twp.		1,000	Tonka Bay		3,000
Hopkins		31,875	Vadnais Hts.		2,000
*Hutchinson		2,500	*Waseca		250
Lauderdale	510.25	2,000	Washington Cty.	6,130.01	20,000
*Lamberton	1,259.00	2,783	Wayzata		1,000
Lilydale	272.00	400	*Willmar	2,000.00	2,000
Little Canada		10,000	*Winona		5,000
*Little Falls		1,800	*Woodstock		300
*Littlefork		500			

*OUTSIDE THE METROPOLITAN AREA

METRO	40
OUTSTATE	27
Total	67

D. Grants For Utilization and Disposal Facilities

In addition to grants for tree removal, the 1975 Legislature provided \$700,000 for grants to local governments for the establishment of wood waste processing and disposal facilities. The State may pay up to one-half the cost of the facility. All counties throughout the State, certain special purpose park districts, and cities with a population of over 80,000 were eligible to receive funds. At the end of 1976, \$392,500 had been encumbered. (See Table 7).

A grant of \$82,500 was made to Hennepin County to expand their existing wood chipping operation. Grant funds were used to purchase a 22 inch mobile chipper and a chip screen. The screen is used to screen out poor quality material and improve the overall marketability of the chips produced. Hennepin County is now operating two mobile chippers, one in Eden Prairie at the Flying Cloud Sanitary Landfill, and the other in Maple Grove at the leaf recycling station. The county has been successful in marketing all chips produced during the 1976 growing season.

The City of St. Paul received a \$310,000 grant for construction of a wood processing facility in the area of Pig's Eye Island. The project is being carried out jointly by the City of St. Paul and the City of Minneapolis.

The St. Paul/Minneapolis project developed rather slowly in light of the immediate need for disposal capacity within the metropolitan area. Approval of the project was required by the Metropolitan Council, the Minnesota Environmental Quality Council, and the Minnesota Pollution Control Agency. After governmental approvals were obtained, the procurement process began. Difficulties were experienced in the bidding process. It appears that the relatively new concept of processing of municipal wood waste on a large scale was the cause of these difficulties. The facility, however, is now expected to be in operation by April 15, 1977.

The St. Paul/Minneapolis facility will have a capacity of 80,000 trees per year. No charge for disposal will be levied against the two cities, and only limited drop fees are expected for others.

At the time this report was in preparation, the Department had received application for funds from Dakota County for the purchase of a portable sawmill. The mill will be operated in the county parks to produce rough lumber from diseased trees. The lumber will be used by the County Highway and Parks Department. Total project cost is \$94,500 with \$47,250 being requested from the State. It is expected that the grant will be made upon a favorable review.

Several other counties are presently reviewing possible projects which may be funded by grants under the program. Commitment of the balance of the appropriation is expected prior to the end of Fiscal Year 1977.

<u>GRANTEE</u>	<u>AMOUNT</u>	<u>TYPE OF PROJECT</u>
Hennepin County	\$ 82,500	Mobile Chipper
St. Paul/Mpls.	\$310,000	Stationary Chipper
Dakota County	\$ 47,250	Portable Sawmill

E. Diagnostic Laboratory

The Department provides a laboratory diagnosis service for shade tree diseases to communities throughout the State free of a service charge. In 1976, the laboratory received and processed 8,687 elm and oak samples. This figure was up from the 7,048 samples processed in 1975.

Results of the laboratory tests showed that 72.6 percent of the elm samples processed were diagnosed as being positive for Ceratocystis ulmi, the fungus causing Dutch elm disease. Of the

427 oak samples processed, 44.9 percent were diagnosed as being positive for oak wilt.

Most municipalities are now relying on field diagnosis to determine diseased trees rather than sending samples into the laboratory for culture. In spite of this encouraging trend, the number of samples cultured by the laboratory increased this past year and is expected to rise again in 1977.

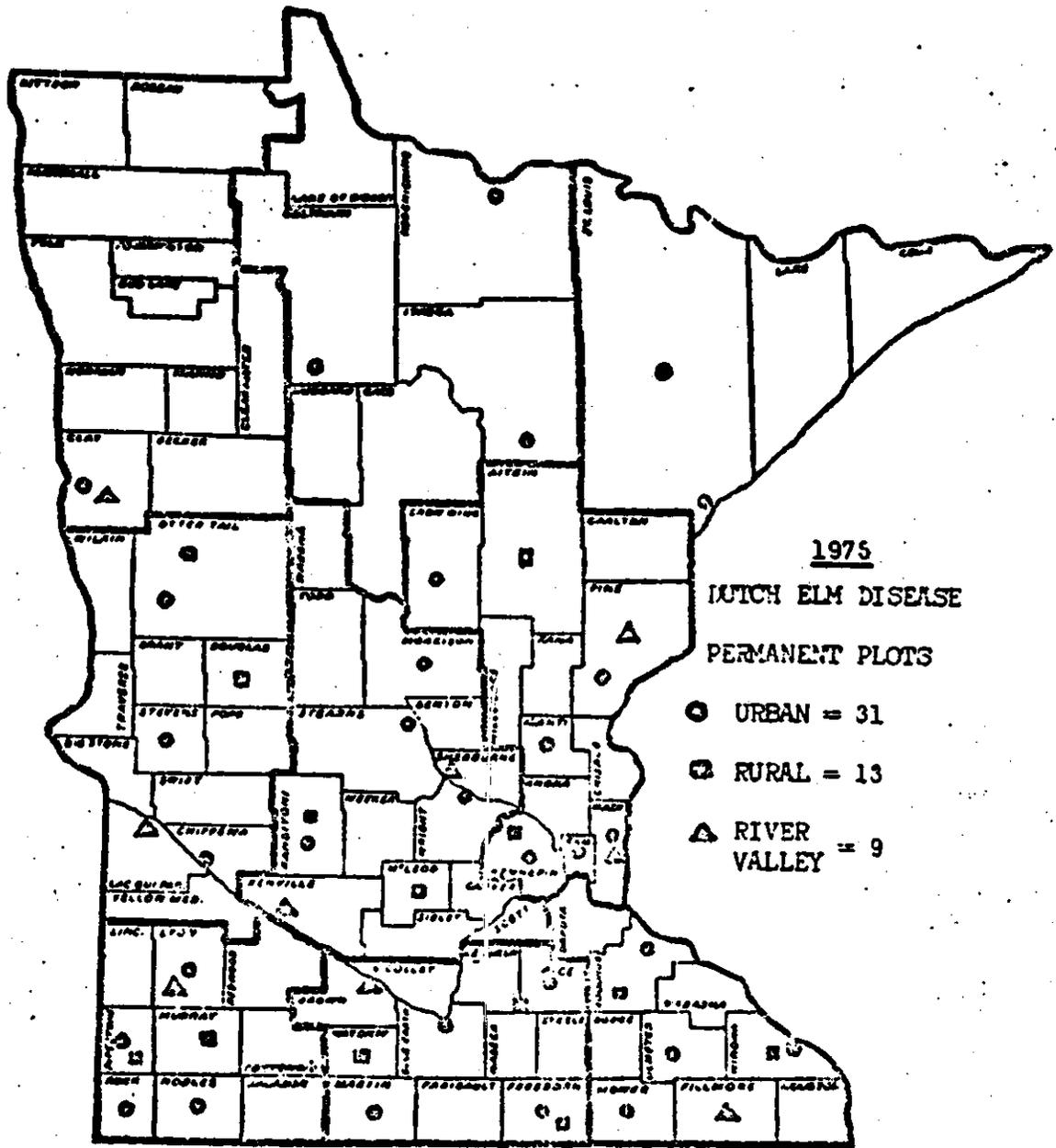
F. Applied Research

The Department, assisted by Jonathon Stiegler of the Governor's Internship Program, established Dutch elm disease monitoring plots throughout the State during the 1975 growing season. Fifty-three plots were established including 31 urban, 13 rural, and 9 river valley plots. (See Figure 3). The plot size was standardized at 0.10 hectare (approximately one-fourth acre) with an average of 23 elms per plot.

In 1975, the statewide Dutch elm disease incidence averaged two percent in these plots. (See Table 8). The plots were monitored again this past year to assess the spread and increase of Dutch elm disease. In 1976, the disease incidence climbed to slightly over nine percent, on the average, in the 53 plots.

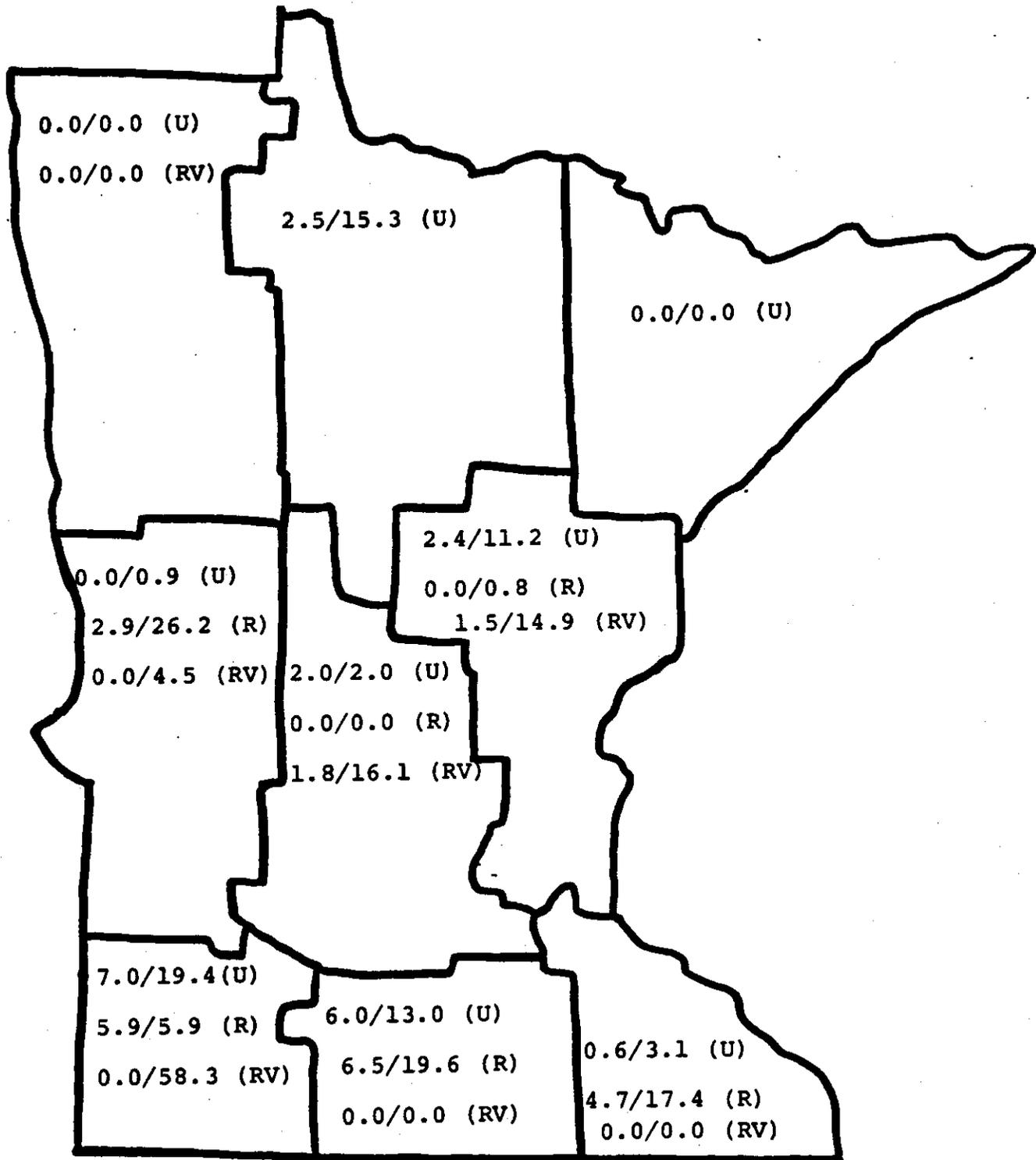
The disease incidence is greatest in the southern region of state/urban plots showing 11.1 percent diseased, and the rural plots is 15.0 percent. (See Figure 4). Plots in the central and northern parts of the State also experienced increased elm losses. The statewide Dutch elm disease incidence in all urban plots averaged 7.8 percent (up last year from 2.4 percent) and in all rural plots averaged an expected slightly higher 11.4 percent loss because of the denser stands of elms in rural habitats. Disease incidence showed the sharpest increase in the river valley plots in the southern two-thirds of the State, up from 0.5 percent in 1975 to

9.3 percent in 1976. Elm density is greatest in river valley plots. The dramatic increase in losses in these plots is not surprising because it occurs with the observation of other scientists who noted a direct relationship between the density of elm population and the intensity of disease attack. Continued monitoring of the plots during the next few years may bring additional support for this hypothesis.



(FIGURE 3)

PERCENTAGE OF DISEASE INCIDENCE
 FOR DUTCH ELM DISEASE STUDY PLOTS
 IN MINNESOTA 75/76



U = URBAN
 R = RURAL
 RV = RIVER VALLEY

(FIGURE 4)

TABLE 8
PERCENTAGE OF DISEASE INCIDENCE

URBAN (U)

<u>DISTRICT</u>	<u># OF PLOTS</u>	<u># OF ELMS</u>	<u># DISEASED</u>		<u>% DISEASED</u>	
			<u>1975</u>	<u>1976</u>	<u>1975</u>	<u>1976</u>
SE	4	160	1	5	0.6	3.1
SC	4	100	6	13	6.0	13.0
SW	4	129	9	25	7.0	19.4
<hr/>						
Southern Region	12	389	16	43	4.1	11.1
EC	6	250	6	28	2.4	11.2
CN	4	202	4	4	2.0	2.0
WC	3	109	0	1	0.0	0.9
<hr/>						
Central Region	13	561	10	33	1.8	5.9
NE	2	70	0	0	0.0	0.0
NC	3	118	3	18	2.5	15.3
NW	1	67	0	0	0.0	0.0
<hr/>						
Northern Region	6	255	3	18	1.2	7.1
<hr/>						
STATEWIDE	31	1,205	29	94	2.4	7.8

TABLE 8
PERCENTAGE OF DISEASE INCIDENCE

RURAL (R)

<u>DISTRICT</u>	<u># OF PLOTS</u>	<u># OF ELMS</u>	<u># DISEASED</u>		<u>% DISEASED</u>	
			<u>1975</u>	<u>1976</u>	<u>1975</u>	<u>1976</u>
SE	2	86	4	15	4.7	17.4
SC	3	92	6	18	6.5	19.6
SW	2	68	4	4	5.9	5.9
<hr/>						
Southern Region	7	246	14	37	5.7	15.0
EC	2	118	0	1	0.0	0.8
CN	2	41	0	0	0.0	0.0
WC	2	69	2	25	2.9	26.2
<hr/>						
Central Region	6	228	2	26	0.9	11.4
<hr/>						
STATEWIDE	13	474	16	63	3.4	13.3

TABLE 8
PERCENTAGE OF DISEASE INCIDENCE

RIVER VALLEY (RV)

<u>DISTRICT</u>	<u># OF PLOTS</u>	<u># OF ELMS</u>	<u># DISEASED</u>		<u>% DISEASED</u>	
			<u>1975</u>	<u>1976</u>	<u>1975</u>	<u>1976</u>
SE	1	12	0	0	0.0	0.0
SC	1	153	0	0	0.0	0.0
SW	1	24	0	14	0.0	58.3
<hr/>						
Southern Region	3	189	0	14	0.0	7.4
EC	2	67	1	10	1.5	14.9
CN	2	56	1	9	1.8	16.1
WC	1	22	0	1	0.0	4.5
<hr/>						
Central Region	5	145	2	20	1.4	13.8
NW	1	31	0	0	0	0
<hr/>						
STATEWIDE	9	365	2	34	0.5	9.3
<hr/>						
STATEWIDE (U & R & RV)	53	2,044	47	191	2.3	9.3

IV. PROBLEMS IN MANAGING LOCAL SHADE TREE DISEASE CONTROL PROGRAMS

A. Special Tax Levies

When mandating disease control programs upon metropolitan municipalities in the Shade Tree Disease Control Law, the 1974 Legislature also provided that costs of disease control to a municipality would not be subject to tax levy limitations. This provision appeared to give municipalities the needed flexibility in generating revenues to finance the high and unexpected costs of tree removal. In the spring of 1976, however, the Department of Revenue, based upon an informal opinion of the Attorney General's Office, ruled that the special levy provided by Minnesota Statutes, Section 18.023 (1974) had been effectively repealed by the enactment of Chapter 437, Laws of 1975.

The repeal has important implications for shade tree disease control. Shade tree diseases impose a very high and unexpected cost of tree removal upon a municipality. In most instances, the cost of a disease control program accounts for a disproportionately large percentage of the municipal budget. In some cases, the cost of effective disease control may even exceed the normal annual budget for all other local government services.

Since the cost of diseased tree removal was not fully expected and the mandate for shade tree disease control is relatively recent, many municipalities have not adequately levied taxes to finance effective disease control programs. In many cases, these same municipalities have levied the maximum amount allowable under applicable levy limitations to finance other public services. To meet the new costs now imposed on them by the State Tree Disease Control Law could substantially impair their ability to finance other more basic public services.

To compound the problem, the automatic per capita increase in levy limits afforded by Chapter 437, Laws of 1975, is often offset by a drop in the estimated population of a municipality. This means a community's levy limits may remain the same, or even be reduced from year-to-year making it even more difficult to finance disease control programs. This is particularly true of St. Paul, Minneapolis, and the first ring of metropolitan suburbs.

Some relief has been provided to communities who were issued a lawful order by the Commissioner of Agriculture directing full compliance with all applicable laws and regulations. By definition of a special levy, municipalities who are issued a lawful order may levy taxes outside its levy limits to meet the costs of complying with such orders. These communities are expected to bring their disease control programs into full compliance eliminating the need for further legal action. A municipality cannot expect to continue to rely upon this administrative order as a means of circumventing levy limits to finance disease control. The issue of whether the costs of shade tree disease control should be subject to levy limitations is an issue which needs to be addressed by the 1977 Legislature.

B. Designation of Disease Control Areas

Designation of disease control areas is becoming an increasingly important aspect of local control programs. This is true because of the limited value of disease control under certain conditions, the costly nature of disease control methods, and limited financial resources of local units of government. In order to insure an optimal expenditure of local program funds, each community must critically appraise its own physical characteristics and the availability of resources in constructing control area boundaries.

Disease control in wild areas usually cannot be justified by its benefits. Wild areas often contain a greater

variety of tree species making the loss of a single species afflicted with disease of less significance aesthetically. Dead and dying trees in the wild areas also do not pose as great a hazard to person and property as does a dead elm in a highly developed area. Benefits of disease control in the wild areas, in most instances, are far exceeded by the cost of disease control. Cost of diseased tree inspections are prohibitive because of the vast area involved and because of the inaccessibility of wild areas to inspection vehicles. The cost and difficulty of tree removal in the wild areas makes disease control impractical and uneconomical. The geography of wild areas usually prevents access to tree removal equipment and vehicles.

Disease control efforts are most important to those areas where the total shade tree population is predominated by a single species of trees and where such species are threatened by one of the shade tree diseases. In constructing boundaries of control areas, a municipality will want to examine the make-up of its shade tree population and determine if the area in question is developed or is likely to be developed. It will have to inspect the area's geographic features and assess the practicality and economics of control under these physical conditions. The cost of control must then be weighted against the value of implementing control technology in the area. It is becoming increasingly evident that each municipality must make a more critical appraisal of the areas within which it intends to actively carry out disease control efforts.

Exclusion of expansive wild areas from control areas does not mean a municipality can afford to leave shade tree diseases unchecked in wild areas situated within or adjacent to designated disease control areas. In many instances, river bottom area is located within the municipal boundaries. Spreading of shade tree diseases within these areas do adversely affect municipal control programs. However, tradi-

tional methods of sanitation are often impractical or impossible. Yet, limited control measures must be taken to minimize the adverse affect of these areas upon the municipalities overall control program.

The Department and the University of Minnesota will be placing greater emphasis in their training of local program personnel upon the special treatment of wild areas affecting disease control efforts within designated control areas.

C. Twenty Day Removal of Elm

After an elm is identified as diseased, the affected property owner, whether public or private, is given notification that the diseased tree must be removed. The property owner is required by department regulation (MN REG AGR 106) to remove the tree within a 20 day period which begins to run from the time of notice of the removal responsibility. If the private property owner fails to remove the tree within the prescribed time period, the municipality must remove the tree and the cost of removal is assessed against the property as part of the owner's property tax liability.

The 20 day removal requirement has created considerable controversy over the past few years. It requires a substantial effort of both private and public property owners to insure that the tree is removed within the time allotted by law. Some argue that the only way to get such prompt removal is to pay a premium to the tree removal contractor. Many municipalities extend the increased cost argument to their own situation as caretakers of street terraces and boulevards. They contend that by requiring them to remove all diseased trees within a three month period increases tree removal costs far in excess of what it would normally cost them if they could remove the trees over a nine month period.

Notwithstanding the legitimate criticism of the 20 day removal

requirement, there remains good reason to keep the requirement in tact. First, the 20 day requirement has a sound biological basis. Trees infected early in the growing season can and do become breeding habitat from which second generation beetles emerge in late July and August. Prompt removal of trees manifesting disease symptoms in June takes away breeding habitat and helps reduce the overall beetle population by totally eliminating second generation beetles. Second, prescribing a fixed period for removal has special advantages in administering both the local programs and the State's regulatory program. It places a deadline upon private property owners encouraging prompt action. Without the force of law behind them, it is doubtful that local tree inspectors could accomplish the prompt removal that is required of any successful control program. By fixing the period of removal, State inspectors are also given a clear standard by which performance of local programs can be measured. The State's task of enforcing the shade tree laws is already difficult. Without clear standards of performance, the job of enforcement could become impossible.

Presently, a task force has been created by the State Shade Tree Advisory Committee to study the problem of the 20 day removal requirement. The task force is charged with determining the reasonableness of the requirement and recommending alternative approaches to insuring prompt removal. The task force's recommendation will be acted on by the State Shade Tree Advisory Committee and forwarded to the Minnesota Department of Agriculture. The Department can then review the committee's recommendation and take the appropriate action. Modification of the 20 day requirement would require formal amendment of the Minnesota Regulation AGR 106, but would not require legislative action.

V. CONCLUSION AND DIRECTIVES FOR 1977

A. Conclusions

The data compiled from the annual municipal reports provides somewhat of a confusing picture. It is easily concluded that losses of elm are increasing rapidly, while oak losses are remaining stable or increasing only slightly. In the metropolitan area, there was a significant increase in dollar expenditures in control of shade tree diseases, accompanied by increases in the person-hours committed to control. The annual reports do not, however, provide us with a clear answer to the question of whether these control activities have had any appreciable effect in containing the disease.

Data compiled from annual reports indicate that increased treatment of infected oaks tends to reduce losses. Municipalities within all seven metropolitan counties did improve sanitation in oak wilt control. One of these counties experienced fewer losses of oak in 1976, and four experienced only a slight increase in losses. Municipalities within Hennepin County, which dropped its level of sanitation, realized a significant increase in its losses of oaks.

The annual reports do not, however, show such positive correlations in Dutch elm disease control. The data fails to show any significant correlation between increased expenditures/person-hours and improved disease control.

In 1976, the Department will continue to emphasize sanitation in control of both Dutch elm and oak wilt disease. Municipalities already appear to be experiencing positive results in oak wilt control with increased sanitation and awareness of the disease. Municipalities must continue to expand their treatment of infected elms to achieve comparable results. Based upon the historical evidence from cities who have experienced Dutch elm disease, sanitation appears to be paramount in control.

An effective control program must include timely field identification of the disease, and then prompt removal and sanitary disposal of the diseased trees. Insuring that these basic elements of control are present in municipal programs will be a priority task of the Department in 1977.

B. Directives

The following are directives for the Minnesota Department of Agriculture in its administration of the Shade Tree Disease Control Program in 1977.

1. Emphasize Sanitation as the Most Important Aspect of Disease Control and Condition Grant Funds Upon Sanitary Removal and Disposal of Diseased Trees.

No municipality will be eligible for grant funds from the State unless they have complied with all removal and disposal regulations. The subsidy to the municipality will be used as an incentive for them to properly remove and dispose of diseased trees. Variances will be allowed only where the municipality can show that circumstances made it impossible to comply with the State's regulations.

2. Urge All State Agencies Responsible for State Owned Property to Provide Adequate Disease Control When the State Property Lies Adjacent to a Municipal Control Area.

It is most difficult for the Department to enforce shade tree disease control programs in municipalities when adjacent State property is being neglected. State officials will be requested to assume the responsibility of disease control on these lands.

3. Increase Research Which is Supportive of the Department's Immediate Decision-Making Needs.

The Department will work more closely with the University of Minnesota to coordinate research activities with the Department's decision-making needs. Departmental policy concerning the aspects of control needs further clarification. Research and direct technical support from University researchers will be a valuable asset in this regard.

4. Develop a Long-Range Plan for Public Education in Shade Tree Disease.

If public support in shade tree disease control is to be expected, we must educate and motivate Minnesotans. A piecemeal approach to public education is likely to be expensive and ineffective in sustaining public interest over the long term. A strategy will be developed to insure continued public interest.

5. Examine the Needs for the Replacement of Shade Trees and Identify State Actions Which Will Aid Local Replacement Programs.

The Department hopes to aid municipalities in 1977 in replacing trees they have lost to Dutch elm and oak wilt diseases. It will attempt to identify local needs in shade tree replacement and provide technical assistance when necessary.

SEVEN COUNTY METROPOLITAN AREA

COUNTY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
			ELM	OAK	ELM	OAK	ELM	OAK	
ANOKA	58,264	425,454	120,413	269,152	2,920	2,759	2,611	2,670	9,037
CARVER	2,108	21,292	100,546	91,925	666	3	684	3	167
DAKOTA	23,222	240,324	830,141	2,535,158	6,468	1,659	5,522	1,043	2,970
HENNEPIN	101,414	3,085,803	1,735,294	764,550	29,690	1,472	23,331	1,136	17,283
RAMSEY	81,814	845,730	381,786	561,647	26,370	995	16,436	801	3,870
SCOTT	2,354	18,341	754,245	547,462	1,550	87	1,487	84	17
WASHINGTON	13,513	163,022	189,395	1,114,873	7,796	916	5,399	741	11,450
TOTALS	282,689	4,799,966	4,111,820	5,884,767	75,460	7,891	55,470	6,478	44,794

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ANOKA

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY ELM OAK	DISEASED TREES ELM OAK	TREES REMOVED ELM OAK	TREES PLANTED			
ANOKA	2,680	11,822	15,017	5,079	397	10	314	10	30
ANDOVER									
BETHEL									
BLAINE	1,200	7,872	9,292*	290,277*	132	285	127	207	8,000
CENTERVILLE	130	1,000	1,000	50	115		115		
CIRCLE PINES	305	18,409	6,300	5,770	189	20	189	20	
COLUMBIA HEIGHTS	1,401	55,563	42,960	2,969	230	8	230	8	477
COON RAPIDS	10,940	87,239	55,000*	1.71 mil*	384	688	372	688	350
EAST BETHEL			1,790	10,278	8		8		
FRIDLEY	6,340	38,100	47,328	73,294	851	178	645	178	60
HAM LAKE		40							
HILLTOP	99	550	150		6	1	6	1	20
LEXINGTON	220	3,000	1,920	1,630	5	12	5	12	
LINO LAKES	637	4,950	1,575	167,739	26	278	26	268	
RAMSEY									
ST. FRANCIS									
SPRING LAKE PARK	300	1,200	2,373	2,343	21	1	18		

BURNS TOWNSHIP									
COLUMBUS TOWNSHIP	143	100			25	5	25	5	
LINWOOD TOWNSHIP									
OAK GROVE TOWNSHIP	100								
ANOKA COUNTY PARK	33,760	195,608	20,000*	100,000*	531	1,273	531	1,273	100
TOTALS	58,264	425,453	120,413	269,152	2,920	2,759	2,611	2,670	9,037

*Not Included in Total

CARVER

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY ELM OAK	DISEASED TREES ELM OAK	TREES REMOVED ELM OAK	TREES PLANTED
CARVER						
CHANHASSEN	808	7,025	88,320 88,320	390 2	390 2	75
CHASKA	866	6,312	1,997 750	108 1	108 1	75
COLOGNE			452 214	2	2	17
HAMBURG	58	375	190 70	6	6	
MAYER						
NEW GERMANY						
NORWOOD	80	540	520 35	12	9	
VICTORIA		516	1,557 1,213	8	5	
WACONIA	97	275			25	
WATERTOWN	30	338	5,000 12	10	9	
YOUNG AMERICA	75	485	450 210	6	6	
<hr style="border-top: 1px dashed black;"/>						
CARVER COUNTY	94	5,424	2,060 1,101	124	124	
TOTALS	2,107	21,292	100,546 91,925	666 3	684 3	167

DAKOTA

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY ELM	TREE INVENTORY OAK	DISEASED TREES ELM	DISEASED TREES OAK	TREES REMOVED ELM	TREES REMOVED OAK	TREES PLANTED
APPLE VALLEY	1,942	7,489	460	375	61	117	61	117	
BURNSVILLE	3,882	44,114	220,000	750,000	1,696	405	1,547	307	1,400
COATES	10	50	25	5	2		2		
EAGAN	877	10,755	4,000	5,500	514	83	478	83	
FARMINGTON	190	4,000	3,500	40	22		22		
HAMPTON	10	50	10						
HASTINGS	502	2,110	30,822	5,388	103	2	101	2	
INVER GROVE HEIGHTS	2,291	20,820	5,300	148,357	296	163	283	163	
LAKEVILLE	1,714	16,229	70,649	589,869	90	50	90	50	17
LILYDALE	184	1,640	700	150	249		249		
MENDOTA	110		1,200	800	110	109		109	
MENDOTA HEIGHTS	741	4,382	15,000	3,000	700		626		50
MIESVILLE	10	50	20						
NEW TRIER	10	50	10						
RANDOLPH	25	5			7		7		3
ROSEMOUNT	3,200	16,245	27,855	197,005	266	225	242	105	8
SOUTH ST. PAUL		80,668			652	1	652	1	410
SUNFISH LAKE	170	1,150	1,500	2,000	173	9	113	9	
VERMILLION	10	50	25		7		3		
WEST ST. PAUL	502	2,110	5,926	990	337	19	311	19	900

DAKOTA COUNTY	6,842	27,155	443,539	581,369	1,184	585	626	187	182
TOTALS	23,222	240,323	830,141	2,535,158	6,468	1,659	5,522	1,043	2,970

HENNEPIN

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY ELM OAK	DISEASED TREES ELM OAK	TREES REMOVED ELM OAK	TREES PLANTED
BLOOMINGTON	8,800	389,025	399,435 99,993	2,567 76	2,391 62	492
BROOKLYN CENTER	2,206	17,005	15,000 5,000	342	679 4	30
BROOKLYN PARK	3,650	55,900	16,065 12,187	995	984	250
CHAMPLIN				112 12	99 12	
CORCORAN	110	667		50	40	
CRYSTAL	2,156	24,000	15,932 4,335	470 11	455 11	3,000
DAYTON	125	820		239	117	
DEEPHAVEN	1,340	7,665	119 13	431 41	431 41	
EDEN PRAIRIE	2,562	31,034		3,568	1,190	550
EDINA	7,996	61,295	62,500 102,500	536 64	375 55	1,245
EXCELSIOR	900	6,721	2,500 900	19 2	19 2	110
GOLDEN VALLEY	660	2,475	9,500 7,500	900 20	800 20	
GREENFIELD	84	342		99	75	
GREENWOOD	205	1,220	7,150 5,142	42	42	25
HANOVER	48	200		17	10	
HASSAN TOWNSHIP	4	20		75	20	
HOPKINS						
INDEPENDENCE	166	1,184	169,164 30,660	171	119	
LONG LAKE	72	334	2,000	30	30	
LORETTO	5	45		4	4	
MAPLE GROVE	2,903	32,617	52,500 18,000	548 8	548 8	100
MAPLE PLAIN	55	256	3,964 200	30	29	
MEDICINE LAKE	80	70	362 150	20 5	20 5	
MEDINA	172	407	937 234	116	96	
MINNEAPOLIS	8,040	1,732,668	321,457 47,250	6,000	4,300	9,500
SUBTOTAL	42,339	2,365,972	1,078,585 334,064	17,381 239	12,873 220	15,302

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HENNEPIN (Continued)

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
			ELM	OAK	ELM	OAK	ELM	OAK	
MINNETONKA	7,450	53,553	156,900	200,000	1,924	189	2,560	67	300
MINNETONKA BEACH	664	17,450	2,712	926	41		41		
MINNESTRA	155	660	45,250	10,030	84		49		
MOUND	530	2,650	10,000	8,000	39		36		
NEW HOPE	1,266	9,550	2,341	956	300	12	298	11	40
ORONO	3,668	70,300	35,473	41,934	411		407		
OSSEO	92	1,260	1,862		44		44		
PLYMOUTH	6,328	83,202	65,000	40,000	3,250		2,052	36	
RICHFIELD	5,875	85,417	80,400	101,040	416	19	414	19	257
ROBBINSDALE	1,290	19,472	6,927	248	555		535		61
ROCKFORD	23	138	550	160	9		9		
ROGERS	30	166	3,000		16		16		
ST. ANTHONY	214	7,100	1,200	350	63		63		15
ST. BONIFACIUS	12	216			18		14		
ST. LOUIS PARK	7,300	105,850	46,000	5,500	352	5	311	5	1,100
SHOREWOOD	2,525	24,700	15,000	1,000	1,200	19	1,115	17	200
SPRING PARK	40	240	3,000	1,000	19		17		
TONKA BAY									
WAYZATA	420	3,546	3,774	110	6	0	48	1	8
WOODLAND	150	3,660	15,000	3,000	58	1	58	1	
HENNEPIN COUNTY PARK DISTRICT	10,560	118,900	162,320	16,232	3,178	986	2,051	757	
HENNEPIN COUNTY	10,483	111,799			326	2	320	2	
TOTALS	101,414	3,085,803	1,735,294	764,550	29,690	1,472	23,331	1,136	17,283

RAMSEY

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASE TREES		TREES REMOVED		TREES PLANTED
			ELM	OAK	ELM	OAK	ELM	OAK	
ARDEN HILLS	1,472	5,399	9,519	29,478	485	110	485	110	
FALCON HEIGHTS	666	6,000	2,348	77	78		78		42
GEM LAKE	120	1,274	2,200	6,100	22		22		
LAUDERDALE	25	227	819	403	110	3	110	3	
LITTLE CANADA	550	2,430	7,138	6,915	434	20	390	20	40
MAPLEWOOD	10,550	106,850	44,100	106,600	1,675	163	1,675	163	200
MOUNDSVIEW	1,480	11,800	21,349	34,166	647	178	1,180	146	90
NEW BRIGHTON	2,176	42,736	26,568	42,678	1,818	142	1,818	142	
NORTH OAKS			5,000	40,000					
NORTH ST. PAUL	1,216	39,000	4,815	4,800	494		484		50
ROSEVILLE	2,143	57,750	23,692	13,816	631	34	611	19	35
ST. PAUL	54,720	421,000	108,000	16,000	16,688	4	6,900	4	3,050
SHOREVIEW	2,368	22,056	100,072	198,144	743	214	515	91	
VADNAIS HEIGHTS	506	3,744	2,703	660	387	40	277	23	
WHITE BEAR LAKE	1,290	15,655	11,700	17,100	415	34	409	34	68

WHITE BEAR TOWNSHIP	219	6,542	5,300	17,190	198	6	193	6	45

RAMSEY COUNTY	2,313	103,264	6,463	27,520	1,545	47	1,289	40	250
TOTALS	81,814	845,729	381,786	561,647	26,370	995	16,436	801	3,870

SCOTT

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
			ELM	OAK	ELM	OAK	ELM	OAK	
BELLE PLAIN	199	4,000	4,330	100	53		53		12
ELKO	4	38	177	23	1		1		
JORDAN	550	2,700	5,110	2,365	90	7	88	7	
NEW MARKET	4	12	186	78	15		15		
NEW PRAGUE	145	1,162	1,332	207			14		
PRIOR LAKE	815	4,575	106,040	94,275	1,087	59	1,030	56	
SAVAGE	16	2,393	226,316	165,634	79	7	76	7	
SHAKOPEE	501	2,860	15,754	6,780	121	12	115	12	5

CREDIT RIVER TOWNSHIP									
SPRING LAKE TOWNSHIP	120	600	395,000	278,000	104	2	95	2	

SCOTT COUNTY									
TOTALS	2,354	18,341	754,245	547,462	1,550	87	1,487	84	17

WASHINGTON

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY ELM OAK	DISEASED TREES ELM OAK	TREES REMOVED ELM OAK	TREES PLANTED
AFTON						
BAYPORT	70	4,700	22,000 2,020	147	147	50
BIRCHWOOD	30	380		32	32	
COTTAGE GROVE	929	14,845	27,417 224,400	322 7	284 7	180
DELLWOOD	452	10,538	2,575 28,152	33 11	33 10	
FOREST LAKE	718	2,872	1,355 2,490	259 6	259 6	
HUGO	916	6,920	1,550 200,976	147 108	147 98	
LAKE ELMO	1,556	11,200	7,825 118,520	252 112	251 112	5,000
LAKELAND	60	280	2,200 1,650	44 3	34 3	500
LAKELAND SHORES						
LANDFALL	230	950	130 10	14	15 1	1,500
MAHTOMEDI	120	27,863	18,455 34,000	134 213	124 124	
MARINE ON ST. CROIX		1,500		249 2	92	75
NEWPORT		6,000		1,700	750	75
OAKDALE	471	14,670	10,000 2,500	428 43	400 41	
OAK PARK HEIGHTS	200	6,890	4,960 5,300	52	52	200
PINE SPRINGS	90	15	453 5,670	25 22	25 22	
LAKE ST. CROIX	42	857	812 2,537	22 11	24 11	
ST. MARY'S POINT	50	110		12	10	
ST. PAUL PARK	310	5,860	9,809 1,680	351	351	50
STILLWATER	989	5,641	8,440 2,911	497 4	399 4	3,300
WILLERNIE	222	2,100	434 787	26	25	
WOODBURY	1,055	6,448	12,000 12,000	1,381 85	869 77	
BAYTOWN TOWNSHIP	500	6,972	2,744 60,244	96 74	80 74	

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WASHINGTON (Continued)

MUNICIPALITY	PERSON HOURS WORKED	MONEY SPENT	TREE INVENTORY		DISEASED TREES		TREES REMOVED		TREES PLANTED
			ELM	OAK	ELM	OAK	ELM	OAK	
DENMARK TOWNSHIP									
FOREST LAKE TOWNSHIP	1,020	2,500	20,763	197,345	856	17	623	17	
GRANT TOWNSHIP	441	8,875	2,250	140,165	102	97	92	92	
GREY CLOUD TOWNSHIP	101	147	17,173	51,886	117		117		
MAY TOWNSHIP	125	475	1,450	5,500	182	51	133	40	
NEW SCANDIA TOWNSHIP		1,350			50		10		
STILLWATER TOWNSHIP									
WEST LAKELAND TOWNSHIP									

WASHINGTON COUNTY	2,816	12,059	14,600	14,130	226	50	21	2	520

TOTALS	13,513	163,021	189,395	1,114,873	7,796	916	5,399	741	11,450

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APPENDIX E

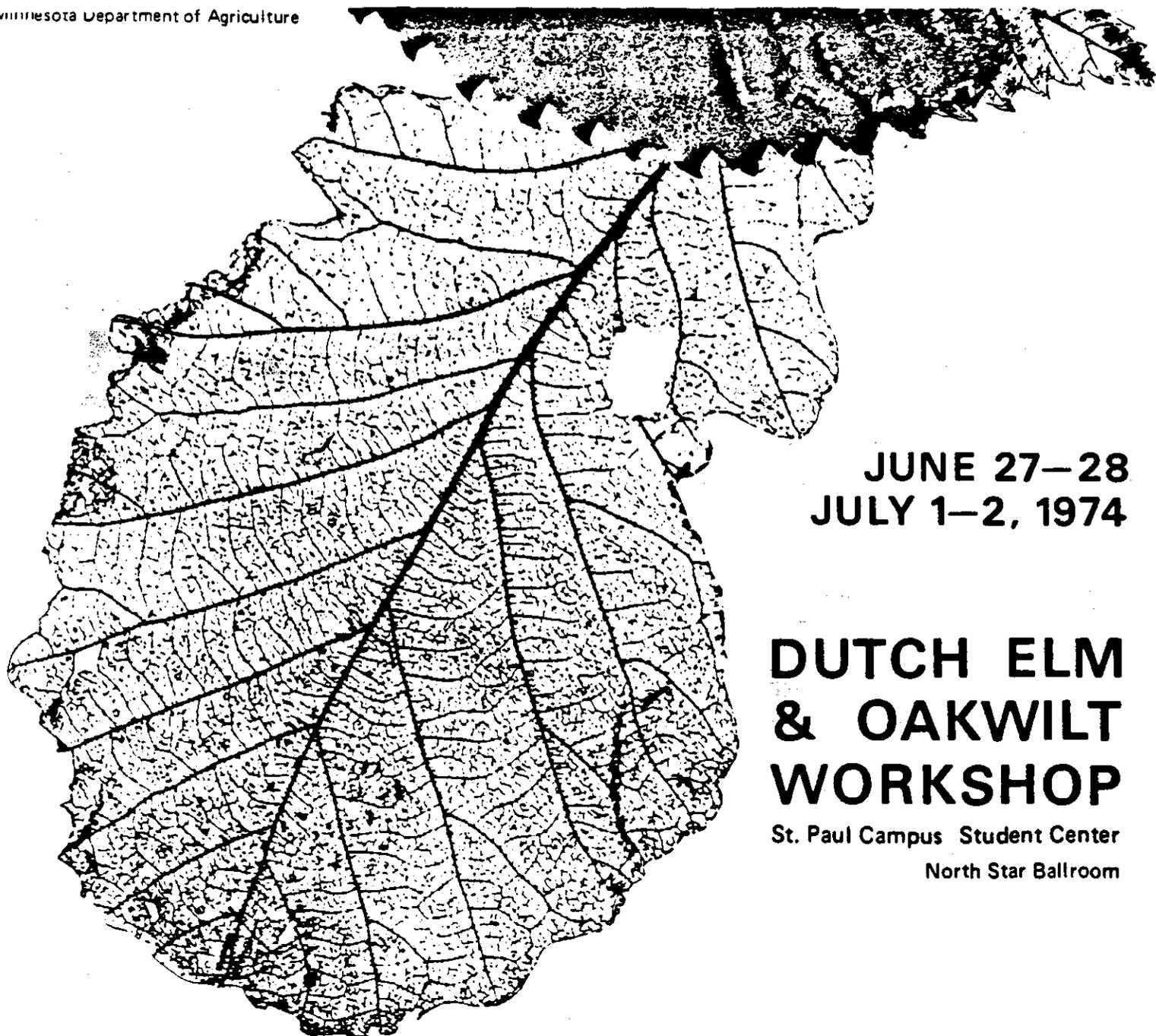
Tree Inspector Certification and Some Supplementary
Educational Materials 1974-81.

E

DUTCH ELM DISEASE TRAINING PROGRAM

- I. Introduction
 - A. History - where and when first found
 - B. Cause - what causes and what spreads
- II. Disease Distribution
 - A. USA - when and where - map
 - B. Minnesota - when and where - map
- III. Fungus/Bark Beetle Complex
 - A. Fungus life cycle in diseased tree (fungus in infected tree - spread throughout tree - roots other trees)
 - B. Beetle life cycle (beetle life cycle in any tree and then spreads to other trees)
 - C. Fungus/Beetle complex in disease spread
 - 1. How this results in severe spread or epidemic
 - 2. Symptoms and identification of Dutch elm disease
 - i. Dutch elm disease
 - ii. Other elm diseases that could confuse
- IV. Control of Dutch Elm Disease in Minnesota
 - A. Sanitation - Eradication
 - 1. Need
 - 2. Effectiveness
 - B. Chemical - Vapam
 - 1. Need
 - 2. Effectiveness
- V. Movie
- VI. Regulations Concerning Dutch Elm Disease in Minnesota
 - A. Inventory
 - B. Sanitation
 - C. Control
- VII. Laboratory
 - A. Fungus plates and cultures - microscope
 - B. Insect - galleries - feeding in crotches
 - C. Stained wood
 - D. Sampling and surveying techniques
 - E. Vapam usage and root graft breakage

Minnesota Department of Agriculture



**JUNE 27-28
JULY 1-2, 1974**

**DUTCH ELM
& OAKWILT
WORKSHOP**

**St. Paul Campus Student Center
North Star Ballroom**

FLA 15

E

Dutch Elm Disease Workshop

Rochester - July 9
Holiday Inn South
630 S. Broadway

Mankato - July 10
Happy Chef
Highway 169 N.

Marshall - July 11
Ramada Inn
East College Drive

[Handwritten notes]

Program Coordinator:	Richard A. Meronuck	373-0725
Course Coordinator:	Ward Stiansira	373-0937
Program Director:	Gene Pilgram	373-1171

PURPOSE:

To provide participants with information concerning Dutch Elm Disease and to aid them in understanding the disease and so better identify the disease, its host, and the treatment and control programs.

OBJECTIVES:

1. To provide written material, lectures, and demonstrations on the subject of Dutch Elm Disease to cover the following areas:
 - I. History of Disease
 - A. Origin
 - B. Range and importance
 - C. Importance
 - D. Northern Boundaries
 - II. Hosts
 - A. Native species susceptible
 - B. Identification of these species (optional?)
 - III. Symptoms
 - A. Field characters
 - collection of samples for culture, how to do it
 - B. Agents that yield similar symptoms
 - IV. Cause
 - A. Life cycle of fungus in host
 - B. Host reactions
 - V. Spread
 - A. Local
 - B. "Long" distance
 - vectors and life cycles
 - VI. Control (Philosophy of Control)
 - A. Control of "long" distance dissemination
 - sanitation, injection treatments, girdling
 - B. Control of local spread
 - disruption of root grafts (chemically and mechanically)
2. To provide information that will aid tree inspectors in the proper identification of species of elms.
3. To hold a "hands on" laboratory experience for participants to actually see and test themselves on the different species of elms, and insect vectors.
4. To provide participants information on the legal aspects of the new legislation and to inform them of their legal authority and responsibility as municipal tree inspectors.

AUDIENCE: Municipal tree inspectors

Fee: \$10.00

SPONSORS:

University of Minnesota Agricultural Extension Service Office
Office of Special Programs
Department of Plant Pathology
Department of Entomology, Fisheries, and Wildlife
Minnesota State Department of Agriculture (St. Paul)

Agricultural Extension Service Office of Special Programs University of Minnesota
Dutch Elm Disease Workshop

July 9, Rochester
July 10, Mankato
July 11, Marshall

Moderator: Joe Sandve

- 8:30 a.m. Registration and coffee
- 9:00 Dutch Elm Disease, Session I - Jon Jeresek, David Noetzel
 History of Disease Symptoms
 Hosts Cause
- 10:15 Coffee
- 10:45 Dutch Elm Disease, Session II - Jon Jeresek, David Noetzel
 Spread
 Control
- 11:45 Lunch - on your own.
- 1:00 p.m. Tree and Insect Identification Lab - John Berends, David Noetzel
 Live and mounted specimens on display for observation.
- 2:00 Coffee
- 2:15 Legal aspects: Implications for Inspectors - Joe Sandve
- 3:00 Questions and Answers
- 3:30 Adjourn

E

Who's Who

- Berends, John, Entomologist, Nursery Inspector, Division of Plant Industry, Minnesota Department of Agriculture, St. Paul.
- * French, David, Professor, Assistant Department Head, Plant Pathology, University of Minnesota.
 - * Jeresek, Jon D., Graduate Research Assistant, Department of Plant Pathology, University of Minnesota.
 - * Meronuck, Richard A., Program Coordinator, Office of Special Programs, University of Minnesota.
Noetzel, David M., Instructor and Extension Entomologist, Entomology, Fisheries, and Wildlife, University of Minnesota.
 - * Sandve, Joe, Senior Entomologist, Division of Plant Industry, Minnesota Department of Agriculture, St. Paul.
 - * Stienstra, Ward, Assistant Professor and Extension Specialist, Department of Plant Pathology, University of Minnesota.
- * Planning Committee
Richard A. Meronuck
Program Coordinator
Office of Special Programs

REGISTRATION FORM
Dutch Elm Disease Workshop
July 9, Rochester
July 10, Mankato
July 11, Marshall
Fee - \$10.00

Name _____

Address _____

City _____ State _____ Zip Code _____

Please make checks payable to the University of Minnesota. Pre-registration is desirable. Mail check with registration to:

Office of Special Programs
University of Minnesota
St. Paul, Minnesota 55108

Please check date and location you will attend.

_____ July 9, Rochester _____ July 10, Mankato _____ July 11, Marshall

We offer our programs and facilities to all people without regard to race, creed, color, sex, or national origin.

University of Minnesota, U.S. Department of Agriculture, and County Extension Service Cooperating.

Things to Do and Persons Responsible

<u>Event</u>	<u>Person Responsible</u>	<u>Date</u>
1. Draw up program.	Ward Stienstra Richard Meronuck Planning Committee	June 3
2. Contact speakers.	Richard Meronuck Joe Sandve	June 10
3. Arrange facilities.	Richard Meronuck	June 11
4. Food arrangements.	Richard Meronuck	June 11
5. Finalize the program.	Richard Meronuck	June 11
6. Notify artist if artwork is necessary for program brochure of self-mailer.	Richard Meronuck	June 12
7. Release the date of the workshop.	Richard Meronuck	June 15
8. Assemble a mailing list.	Joe Sandve	June 11
9. Print the program brochure and registration form.	Richard Meronuck Phyllis Mueller	June 13
10. Send out program brochure and registration form or self-mailer.	Phyllis Mueller	June 17
11. Send audio-visual requirement sheets to speakers.	Phyllis Mueller	June 18
12. Process any requisitions needed.	Lillian Werling	June
13. Handle publicity and information.	Dept. of Information and Ag. Journalism	
14. Order audio-visual requirements and signs.	Phyllis Mueller	June 25
18. Register the participants.	County Agent Secretary and staff	July 9, 10, 11
19. Finalize any follow-up plans.	Richard A. Meronuck	July

DUTCH ELM & OAKWILT WORKSHOP

Thursday, June 5 Moderator—Richard A. Meronuck

8:00 a.m. Registration and Coffee
 8:40 Welcome—Rollin Dennistoun
 8:45 New Information on the Biology of Oak Wilt and Dutch Elm Disease—David French

9:45 Tree Identification—Mervin Eisel
 10:30 Coffee
 10:45 Rules and Regulations—John Berends
 11:15 Criteria for Selecting Control Zones and for Keeping Adequate Records—Jerry Beach, Dan Huff

12:00 noon Lunch

1:00 p.m. Air Quality; Solid Waste—PCA Permit System
 Richard Sandberg, Gary Pulford

1:45 Applying Effective Root Barriers—Ward Stienstra
 2:30 Coffee
 2:45 Report on Beetle Survival—Thomas Skalbeck
 3:15 Questions and Answers—Speakers Panel
 3:30 Adjourn

Friday, June 6 Moderator—Richard A. Meronuck

8:15 a.m. Meet in North Star Ballroom
 Tours and Demonstrations
 Tree Identification—Mervin Eisel
 Symptoms of Oak Wilt and Dutch Elm Disease—David Noetzel
 Barrier Installation—Ward Stienstra

8:30 Round 1
 Group 1 Tree Identification
 Group 2 Symptoms of Oak Wilt and Dutch Elm Disease
 Group 3 Barrier Installation

9:45 Break
 10:00 Round 2
 Group 1 Barrier Installation
 Group 2 Tree Identification
 Group 3 Symptoms of Oak Wilt and Dutch Elm Disease

11:15 Round 3
 Group 1 Symptoms of Oak Wilt and Dutch Elm Disease
 Group 2 Barrier Installation
 Group 3 Tree Identification

12:30 Lunch

Course Summary and Questions for Panel
 John Berends David French
 Lewis Hendricks David Noetzel
 Ward Stienstra—Moderator

2:00 Adjourn

Who's Who

Beach, Gerald, Consulting Forester, Vadris Heights, 624 Berood Ave., St. Paul, 55110.

Berends, John, Entomologist, Nursery Inspector, Division of Plant Industry, Minnesota Department of Agriculture, 670 State Office Building, St. Paul, 55155.

Dennistoun, Rollin, Department Administrator, Minnesota Department of Agriculture, 420 State Office Building, St. Paul, 55155.

†Eisel, Mervin, Instructor, Extension Horticulturalist, Department of Horticultural Science and Landscape Architecture, University of Minnesota

†French, David, Professor, Department of Plant Pathology, University of Minnesota.

†Hendricks, Lewis, Extension Specialist, Department of Forest Products, University of Minnesota, Tree Inspector, City of Centerville.

Huff, Dan, Naturalist, Research Coordinator, City of Fridley.

*†Meronuck, Richard, Program Coordinator, Office of Special Programs, University of Minnesota.

*†Noetzel, David, Instructor, Extension Entomologist, Department of Entomology, Fisheries, and Wildlife, University of Minnesota.

Pulford, Gary, Pollution Control Specialist, Pollution Control Agency, 1935 W. Co. Rd. B2, Roseville, MN 55113.

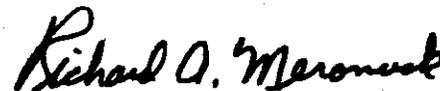
Sandberg, Richard, Pollution Control Specialist, Pollution Control Agency, 1935 W. Co. Rd. B2, Roseville, MN 55113.

*Sandve, Joe, Senior Entomologist, Division of Plant Industry, Minnesota Department of Agriculture, 670 State Office Building, St. Paul, 55155.

†Skalbeck, Thomas, Research Assistant, Department of Plant Pathology, University of Minnesota.

*†Stienstra, Ward, Assistant Professor and Extension Specialist, Department of Plant Pathology, University of Minnesota.

†University of Minnesota
 *Planning Committee



Richard A. Meronuck
 Program Coordinator, Office of Special Programs

REGISTRATION FORM

Dutch Elm Disease and Oak Wilt Workshop
 June 5 and 6, 1975
 Fee: \$25.00 (includes lunch both days)

Name _____ Telephone _____

Address _____

City _____ State _____ Zip Code _____

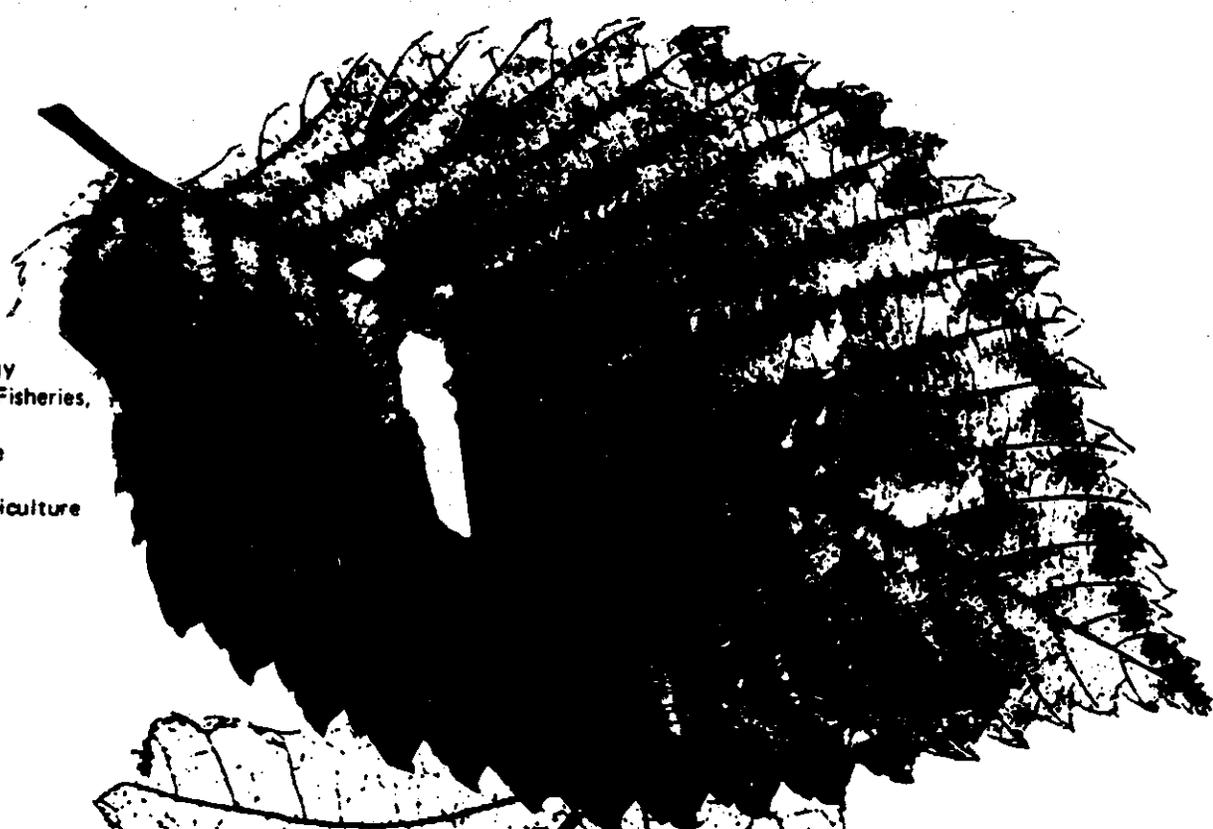
Please make checks payable to the University of Minnesota. Pre-registration is desirable.
 Mail check with registration form to:

Office of Special Programs
 405 Coffey Hall
 University of Minnesota
 St. Paul, Minnesota 55108

University of Minnesota, U.S. Department of Agriculture, and County Extension Service Cooperating.
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SPONSORS:

Department of Plant Pathology
Department of Entomology, Fisheries,
and Wildlife
Agricultural Extension Service
Office of Special Programs
Minnesota Department of Agriculture



JUNE 5 & 6, 1975

**DUTCH ELM
& OAKWILT
WORKSHOP**

St. Paul Campus Student Center
North Star Ballroom

DUTCH ELM WORKSHOP

PROGRAM OUTLINE

- 9:00 a.m. Registration and coffee
 9:30 Film: "American Elm, Plan for Survival"
 10:00 History and cause of Dutch Elm Disease – Ward Stienstra
 10:30 Coffee
 10:45 Distribution of Dutch Elm Disease in Minnesota – John Berends
 11:15 The Fungus-Beetle Complex – Dave Noetzel
 12:00 Lunch (on your own)
 1:00 p.m. Control of Dutch Elm Disease – Ward Stienstra
 2:00 State regulations concerning Dutch Elm Disease – John Berends
 2:30 Disposal of dead trees – Dave Noetzel
 3:00 Questions for Speakers' Panel
 3:30 Adjourn



WHO'S WHO

- Berends, John, Entomologist, Nursery Inspector, Division of Plant Industry, Minnesota Department of Agriculture, St. Paul
 †*Eisel, Mervin, Instructor, Extension Horticulturalist, Department of Horticultural Science and Landscape Architecture
 †*Meronuck, Richard, Program Coordinator, Office of Special Programs
 †*Noetzel, David, Instructor, Extension Entomologist, Department of Entomology, Fisheries, and Wildlife
 *Sandve, Joe, Senior Entomologist, Division of Plant Industry, Minnesota Department of Agriculture, St. Paul
 †*Stienstra, Ward, Assistant Professor and Extension Specialist, Department of Plant Pathology
 †University of Minnesota
 *Planning Committee

Richard A. Meronuck.

Richard A. Meronuck
 Program Coordinator, Office of Special Programs

REGISTRATION FORM

Dutch Elm Disease Workshop
 June 3, 1975 – Alexandria
 June 4, 1975 – Mora
 Fee = \$10.00

Name _____ Telephone _____

Address _____

City _____ State _____ Zip Code _____

Please make checks payable to the University of Minnesota. Pre-registration is desirable.

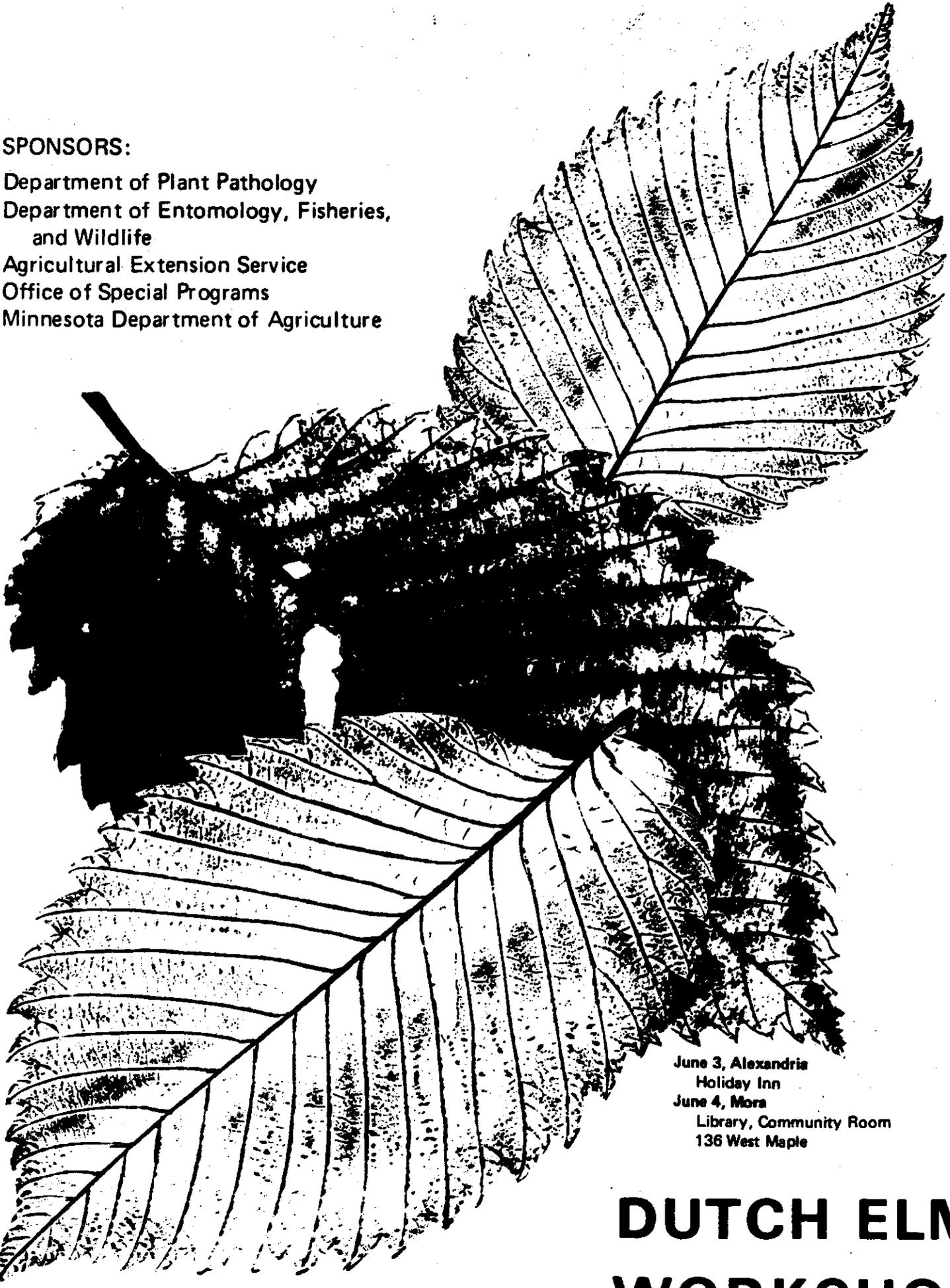
Mail check with registration to: Office of Special Programs, 405 Coffey Hall,
 University of Minnesota, St. Paul, Minn. 55108

Please check date and location you will attend: ___ June 3, 1975 – Alexandria, ___ June 4, 1975 – Mora

University of Minnesota, U.S. Department of Agriculture, and County Extension Service Cooperating.
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Department of Plant Pathology
Department of Entomology, Fisheries,
and Wildlife
Agricultural Extension Service
Office of Special Programs
Minnesota Department of Agriculture



June 3, Alexandria
Holiday Inn
June 4, Mora
Library, Community Room
136 West Maple

**DUTCH ELM
WORKSHOP**

SHADE TREE SHORT COURSE

April 4, 1975

The following is a summary from notes taken by Wm. Bulger & D. Sreenivasam.

Harold Pellett: Producing, Moving, and Planting Replacement trees.

Moving and planting - emphasis on root loss, and drying out. Encourage good root growth - balance with top. Roots grow under cooler temperatures $< 40^{\circ}$ than top. Early planting suggested. Not much growth at $> 80^{\circ}$ because more goes into top.

Hand digging operation better than machine digging. Soil and preparation of planting site important. Functions of soil - Anchorage, fertility balance between water and air exchange - may get buildup of CO_2 . Resort to fertilizer 2nd year when you have poor roots and fairly good soil. Use of slow release fertilizer material suggested for maintenance-- need water and mulch, such as wood chips, black plastic, fiberglass, etc.

Stan Paskar: Legal safeguards, Bonding, Insurance, License requirements.

Publication: "Dutch Elm Disease Control" put out by the League of Minnesota Municipalities.

Sets guidelines; Control from standpoint of nuisance. Handle in light of OSHA regulations.

Contractors and City Council can arrange for bids financing arrangements difficult to arrive at.

Forester or Tree Inspector -- When a diseased tree is removed, keep a sample of evidence for future reference in case of a later suit.

During critical period: Give notice to proper owner. Wait 5 days.

Then municipality does it on its own. Send certified or registered letter.

Alternative -- discuss with proper owner and suggest who could do the work locally.

Forester or Tree Inspector takes action on his own without Council approval.

During noncritical period -- 2 week notice to owner to meet with the council. Indicate proposed action and costs (liberal estimate). Council makes findings. Act of resolution directing Forester or Private Contractor to remove the tree. Direct City Clerk to assess private owner. Boulevard trees in Metro area 50% of cost.

Licensing: No statewide or municipal licensing requirements.

Check with Clerk (municipality, City, twsp.)

Fees -- Sufficient to cover the actual or reasonable cost.

Ordinance -- includes insurance and bond requirements. Also includes bond for completion of work.

Thirty days and hearing not required for DED and OW programs because it is an emergency, Minnesota Statute 5, 14 (1).

Check State Shoreland regulations.

John Berends: Update on Shade Tree Laws.

David French: Status of Dutch Elm and Oak Wilt (in Minnesota).

50% spread through root graft.

1. Benlate (Benomyl)

not a recommended procedure

cost - \$20.00 per gallon (sold by DuPont)

Solubilized available - may not be ready this year.

-- inject into roots (3 main feeders) under some pressure.

-- have to dig out part to expose roots.

-- cost up to \$300.00.

-- treatment needed every year or two.

Disrupt root system all around infected trees

2. Pentachlorophenol 1% will prevent beetles from invading or emerging.

Can be used where logs have to be held but cannot be debarked or otherwise treated.

Merely a supplemental technique on standing trees (infected and condemned).

3. Potassium iodide

Can be used during early stage of Wilt.

Need approval of the Minnesota Department of Agriculture.

Pruning: Do not prune in Spring (May and June).

Use wound dressing on wounds.

Climbing irons will open wounds for infection.

Oak Wilt can be stopped even in wild, because over 95% trees infected by common root systems.

Infection center -- first thing to do -- put a barrier around it.

Symptoms -- Cambium with uniform brown color with a sweet fermenting odor.

Only worry about red oak group.

Watch for spores (spore mats) the following spring. Wilted trees are easy to pick! Loose bark or trees dead for 2 yrs. or more do not present a problem.

Cytospora -- orange filaments -- Oak Wilt cannot compete with this fungus.

Trichoderma -- green mold, if present--no Oak Wilt fungus.

Field diagnosis of Oak Wilt most important. (Laboratory answers too slow!)

Early Winter -- red oaks -- leaves hang and are red brown; terminal shoots with more yellow-brown leaves.

Detection -- (Aerial)

must be compared with ground surveys, OW detected efficiently by aerial photographs 95-100% detection capability.

Develop a management plan to deal with it.

Time of survey -- in July -- first two weeks no later than early part of August.

DED -- aerial surveys are different. Bloomington, North St. Paul -- results discouraging at best 50-70% efficiency. Not adequate.

Sagar Krupa: Minnesota Air Pollutants and Symptoms on City Trees

Stagnant air masses -- New York and New Jersey and California. Minnesota does not have this kind of problem.

Smokestacks and automobile exhaust.

Atmospheric inversion increases amount of pollution.

Primary Pollutants --

Ex. SO_2 -- Injury located in the vicinity of source.

Secondary Pollutant --

Ex. O_3 -- Generated from compounds already in the atmosphere (No converts oxides of nitrogen to O_3)

O_3 is a most important plant pollutant in U.S.

EPA levels established (developed from response of animals and plants).

800 ppm / 1 hour / one year in a given locality.

March 15, 1975 -- 5 hours of pollution in St. Paul.

(in violation of EPA standards)

O_3 on Ash -- reddish stippling on upper surface of leaves

Mountain Ash -- loose pigment on upper surface

White Oak -- Chlorosis, veins remain green.

injury most severe in early spring.

good time to evaluate -- 4 to 6 weeks after bud break.

SO_2 on Birch -- sensitive, death of leaf tissue on both sides

Maple -- dead necrotic areas, irregular

Elm -- brown dead areas and leaf roll

Maple and Oak -- more tolerant than others

Evergreens -- needles turn brown from top down

White pine -- very sensitive

So₂ mist -- occurs near smokestacks; leaves show whitish holes -- appear like pin pricks

Fluorides -- source Aluminum industry, Phosphate fertilizers, Taconite operations, Causes tips and margins of leaves to turn brown.

Particulates -- sources:

1. Combustion of coal
2. Cement manufacture
3. Lime kilns

Balsam poplar -- leaves coated with ashes -- can be dusted off.

Ammonia -- on oak in Twin Cities -- dead areas between veins on leaves. on White pine -- trees killed.

HCL or Chlorine gas -- source refineries, glass blowing,

Scrap burning -- swimming pools can leak the gas. On Sugar maple -- chlorine injury shows bleaching of leaves.

Highway salt -- also an air pollution problem.

What can we do?

Two to three million loss in Twin City area.

Benlate protects leaves but need spraying several times. Residue problems.

Monitoring data? Chemicals out of the ball game.

Currently breeding resistant varieties.

Kenneth Simons: Bracing and Cabling, Publication; "Tree Bracing" Bulletin #3, 15¢, obtainable from the Superintendent of Documents, Washington, D.C.

Ward Stienstra and Dave Noetzel: Chemical recommendations for 1975.

Benomyl (Benlate)

Sprays:	Hydraulic	Mist
	2 lbs./100 gals.	8 lbs./100 gals.
	need 10-20 gals./tree	3-4 gals./tree

VARIES WITH THE SIZE OF CROWNS

Gravity system: Cups spaced 2 inches apart on trunk at the rate of 1 oz./ 3 gals. of water.

Pressure system: 2 lbs. per 100 gals. of water, approximately 1 gallon per 10" diameter tree.

When to apply -- 1st of June

Biological marker -- when leaves approach full size. Apply to healthy or diseased trees with < 5% crown damage.

Results -- Benlate application

	<u>Sprayed (mist)</u>		<u>not sprayed</u>	
	1000 trees		1000 trees	
% beetle infection	1.2			3.1
% root graft	X	same		X
Trunk injection	X	same		X

Not recommended for Minnesota.

Effect about the same on healthy or diseased trees with < 5% crown damage.

If symptoms are delayed the tree died anyway.

Use of Vapam:

Windshield surveys indicate 60-65% of elms are diseased by root grafts.

Proper use of vapam or mechanical trenching required.

Chemical -- very expensive \$1.50 a hole or \$5.00 per gallon, charge not justified.

Solubilized benlate -- only experimental basis. not legal now. no information on success or potential problems.

Insect Control Recommendations:

Restricted use compounds need a license by Federal Law effective from October 1976.

OSHA rules need to be followed -- such as use of masks, coats, etc. Watch for heat exhaustion, dehydration of workers.

Methoxychlor -- only Emulsifiable concentrate (EC) is cleared for use by EPA.

Tree trimming -- not recommended.

Concentrate on tree removal for insect control.

DED control -- no chemical is particularly effective -- no grandiose sales.

Methoxychlor has not been good. No systemic available or labelled. Other recommendations -- see Fact Sheet.

DUTCH ELM DISEASE-OAK WILT TREE INSPECTORS SHORT COURSE

PROGRAM

- a.m. Presiding, Ward Stienstra
- 8:00 Registration and Coffee
- 8:30 Extent of Dutch Elm Disease and Oak Wilt in Minnesota
—John Berends
- 8:45 Oak Wilt and Dutch Elm Disease, Time Sequence of
Disease Progress in Relation to Disease Control
—David French
- 9:45 Use of Vapam in the Control of Dutch Elm Disease
and Oak Wilt—Ward Stienstra
- 10:00 Coffee
- 10:30 Wood Disposal Options in the Metro Area—Jim Shipman
Wood Disposal Options in 1976—Speaker from the
Pollution Control Agency and the Division of
Plant Industry
- 11:15 Relationship of Beetle Activity to Dutch Elm Disease
Symptom Appearance
—David Noetzel
- 11:45 Questions for Speakers' Panel
- 12:00 LUNCH
- p.m.
- 1:00 Proper Sampling of Suspected Dutch Elm Disease
and Oak Wilt Infected Trees and Laboratory
Procedures in Diagnosis—Sylvia Roman
- 1:45 Summary of 1975 Disease Control Programs
—Dharma Sreenivasam
- 2:00 Grants-in-Aid Program in Relation to Shade Tree
Disease Programs—Peter Grills
- 2:30 Guidelines and Approved Practices—John Berends
- 3:00 Questions and Answers—Speakers' Panel
- 3:30 Adjournment

WHO'S WHO

- John Berends, Plant Health Specialist, Minnesota State
Department of Agriculture, Division of Plant Industry,
670 State Office Building, St. Paul, MN 55155
- †David French, Professor, Department of Plant Pathology
- Peter Grills, Planning Grants Analyst, Minnesota State
Department of Agriculture, Division of Plant Industry,
670 State Office Building, St. Paul, MN 55155
- *†Richard Meronuck, Program Coordinator, Office of
Special Programs
- *†David Noetzel, Instructor and Extension Entomologist,
Department of Entomology, Fisheries, and Wildlife
- Sylvia Roman, Plant Health Specialist, Minnesota State
Department of Agriculture, Division of Plant Industry,
670 State Office Building, St. Paul, MN 55155
- * Joe Sandve, Senior Entomologist, Minnesota State
Department of Agriculture, Division of Plant Industry,
670 State Office Building, St. Paul, MN 55155
- James Shipman, Executive Director, Metropolitan Inter-
County Council, MEA Building, 55 Sherburne Ave.,
St. Paul, MN 55155
- Dharma Sreenivasam, Plant Health Specialist, Minnesota
Department of Agriculture, Division of Plant Industry,
670 State Office Building, St. Paul, MN 55155
- *†Ward Stienstra, Associate Professor, Department of
Plant Pathology

- * Planning Committee
- † University of Minnesota

Richard A. Meronuck

Richard A. Meronuck
Program Coordinator, Office of Special Programs

We offer our programs and facilities to all people with-
out regard to race, creed, color, sex, or national origin.

Registration Form

**DUTCH ELM DISEASE-OAK WILT
TREE INSPECTORS SHORT COURSE**

April 8, 1976
North Star Ballroom, St. Paul Campus
Fee: \$15 (includes lunch)

Name _____ Phone _____
Street address _____
City _____ State _____ Zip code _____
Affiliation and title _____

Mailing list update:

- I am registering for this course. Yes ___ No ___
- Are you presently on our mailing list? Yes ___ No ___
- Remove my name from all horticultural mailing lists.
Yes ___ No ___

Remove my name from the Dutch Elm and Oak Wilt
mailing list only. Yes ___ No ___
Present mailing address is correct. Yes ___ No ___
(Indicate change of address on registration blank.)

Please make check payable to the University of Minnesota and
send with this registration form to:

Office of Special Programs
405 Coffey Hall
University of Minnesota
St. Paul, Minnesota 55108

Pre-registration is desirable.

SPONSORS:
Department of Plant
Pathology,
Agricultural Extension
Service
Office of Special Programs

AGRICULTURAL EXTENSION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA
ST. PAUL, MINNESOTA 55108

OFFICIAL BUSINESS

Postage and fees paid
U.S. Department of
Agriculture



DUTCH ELM DISEASE & OAK WILT TREE INSPECTORS SHORT COURSE

St. Paul, Minnesota, 55108 April 8, 1976
St. Paul Campus Student Center

**AGRICULTURE
Plant Industry**

**Dr. Rollin Deanistoun
Dept. Administrator**

4-20-76

**Robert Flaskard
Director**

296-3347

Tree Inspector Training

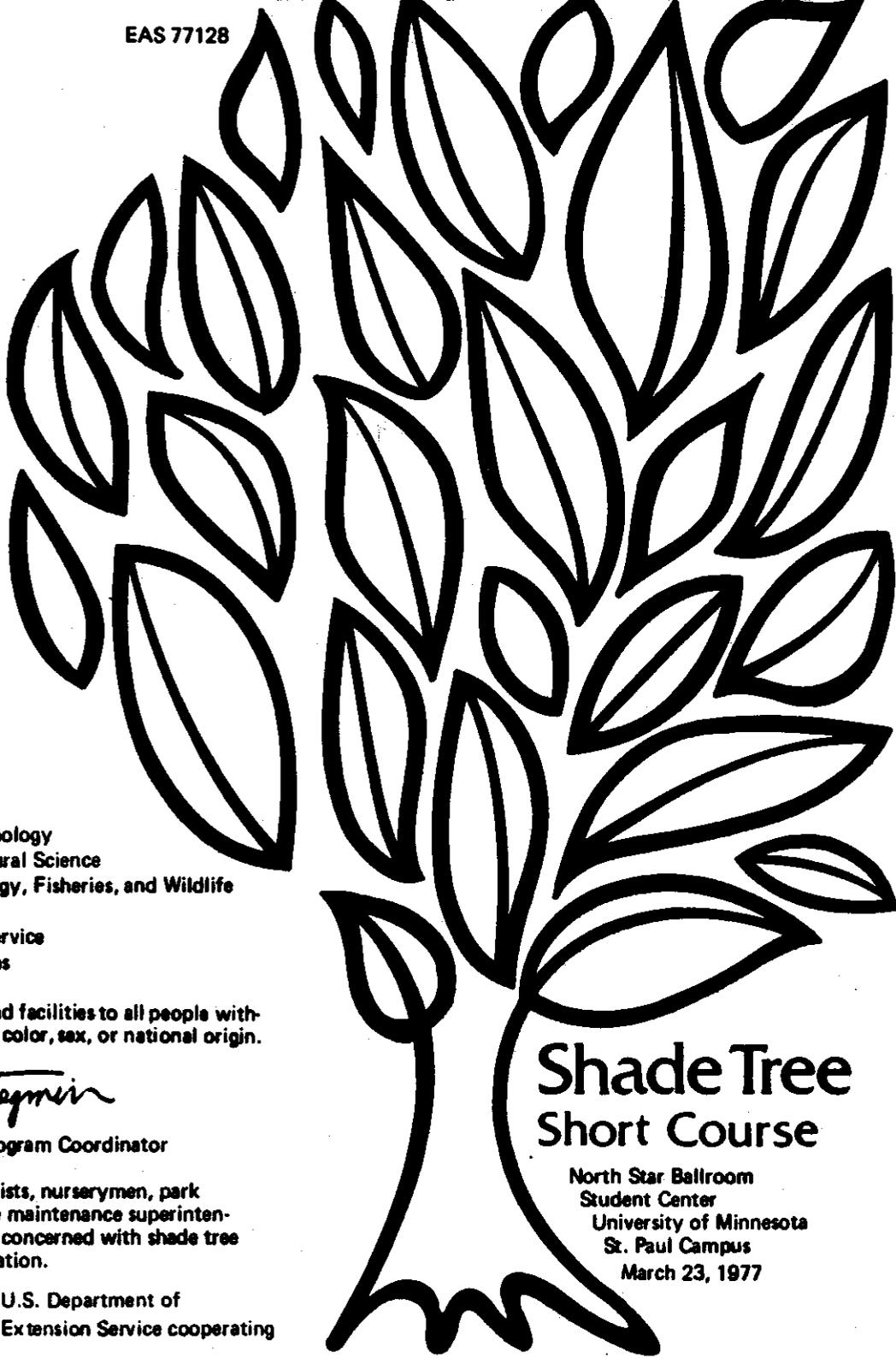
A very successful one day training program for all tree inspectors in the Metropolitan area was held on April 8th at the University of Minnesota. Sponsors were the Department of Plant Pathology, the Agricultural Extension Service, and our own Department of Agriculture.

Attendance far exceeded expectations with over 350 persons registered. Many municipalities sent several inspectors. Even Littlefork in northern Minnesota had a man there. South Dakota State also sent two representatives.

Joe Sandve worked with representatives of extension service and the Office of Special Programs in planning the training course. Four members of our staff, Peter Grills, John Berends, Sylvia Roman, and Dharma Sreenivasam were on the program. Other members of our staff attending were Doug Rau, Mick Marinos and John Tabet.

We feel that the program was very well received. The attendance certainly indicates a widespread interest in Dutch elm disease and oak wilt control. The training provided the tree inspectors should help municipal tree inspectors do a better job and make our task a little easier.

RF: jml



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Department of Entomology, Fisheries, and Wildlife
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Office of Special Programs

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Paul B. Stegmier

PAUL B. STEGMIER Program Coordinator

This program is for arborists, nurserymen, park administrators, landscape maintenance superintendents, and all individuals concerned with shade tree maintenance and preservation.

University of Minnesota, U.S. Department of Agriculture, and County Extension Service cooperating

Shade Tree Short Course

North Star Ballroom
Student Center
University of Minnesota
St. Paul Campus
March 23, 1977

AGRICULTURAL EXTENSION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA
ST. PAUL, MINNESOTA 55108

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE - \$300



Shade Tree Short Course

March 23, 1977

REGISTRATION FORM

North Star Ballroom, St. Paul Campus
Fee: \$15.00 (includes lunch)

Name _____

Address _____

City _____ State _____ Zip _____

Affiliation and Title _____

Please make check payable to the
University of Minnesota and send
with this registration form to:

Office of Special Programs
405 Coffey Hall
1420 Eckles Ave.
University of Minnesota
St. Paul, Minnesota 55108
612-373-0725

Pre-registration is desirable.

PROGRAM

- a.m.
- 8:00 Registration and Coffee
Paul Stegmeir, Moderator
- 8:45 Welcome and Review of Institute
concern for Dutch Elm/Shade
Tree Management - Gene Pilgrim
- 9:00 Trees, Water and Drought -
Ed Sucoff
- 10:00 Pesticide Laws and License of
Tree Services - Mike Fresvik
- 10:15 Sanitation and Insect Control -
Mark Ascerno
- 10:45 DED Outlook 1977 and Beyond -
Ward Stienstra
- 11:00 Urban Forest Tree Diseases -
Dave French
- 11:30 Tree Removal Contracts -
Tom Karl
- 12:00 LUNCH - Minnesota Heritage
Tree Program - Glen Ray
- p.m.
- 1:00 Practical and Safe Tree Trimming
Robert Skiera
- 1:45 Planning, Design, and Selection
Ken Simons and Merv Eisel
- 2:45 COFFEE BREAK
- 3:00 Writing Tree Replacement Con-
tract specifications -
William Sanders
- 3:20 Talking to the Public About
Tree Maintenance - Jane
McKinnon
- 3:50 Minnesota State Department of
Agriculture Tree Program -
Peter Grills
- 4:05 Questions and Answers
- 4:30 Adjournment

WHO'S WHO

*Mark Ascerno, Extension Entomologist,
Department of Entomology, Fisheries,
and Wildlife

- +John Berends, Division of Plant Ind-
ustry, Minnesota Department of Agri-
culture
- *+Marv Eisel, Extension Horticulturist,
Landscape Arboretum, Chaska
- *David French, Professor, Department
of Plant Pathology
- Mike Fresvik, Division of Agronomy
Services, Minnesota Department of
Agriculture
- Peter Grills, Division of Plant Ind-
ustry, Minnesota Department of Agri-
culture
- *+Tom Karl, City Arborist, City of
St. Paul
- *Jane McKinnon, Associate Professor,
Horticulture Science and Landscape
Architecture
- *Gene Pilgrim, Program Director,
Agriculture Extension
- Glen Ray, Executive Secretary, Minn-
esota State Horticulture Society
- William Sanders, Minneapolis Housing
and Redevelopment
- *+Harold Scholten, Associate Professor,
Forest Resources, College of Forestry
- +Ken Simons, Landscape Architect,
Ramsey County Open Space Planning
Office and Arboriculture Instructor
- Robert Skiera, City Forester,
Milwaukee, Wisconsin
- *+Marvin Smith, Extension Forester
- *+Paul B. Stegmeir, Program Coordinator,
Office of Special Programs
- *+Ward Stienstra, Extension Specialist,
Plant Pathology
- *Edward Sucoff, Professor, Forest
Resources, College of Forestry
- +Les Todd, Todd's Tree Service

+University of Minnesota
*Planning Committee

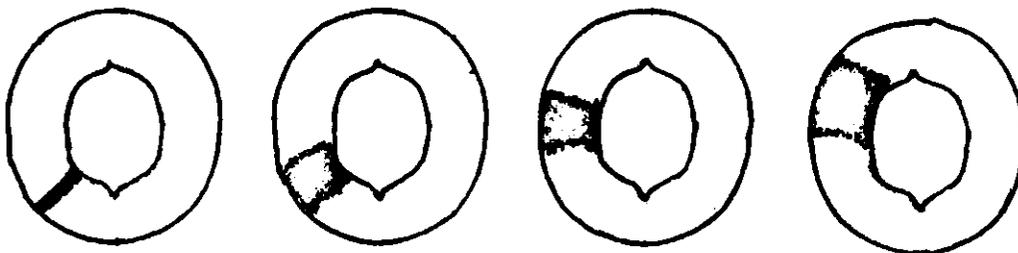
NOTES FROM THE SHADE TREE SHORT COUSE (March 23, 1977)

Gene Pilgrim

Extension will take over DED program entirely - regulatory training, labs, public education, etc.

Ed Sucoff

Water Ascent in Elm and Oak Trees



cross section of how water ascends in elms and oaks



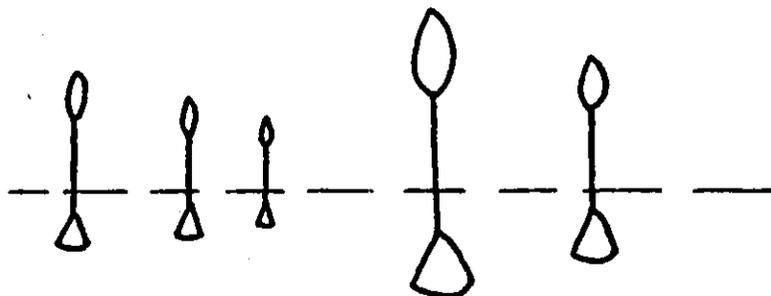
This diagram shows why lignasan must be placed in so many areas of the tree to be equally distributed - any liquid taken up by the tree ascends vertically

Oaks and elms are ~~rain~~ porous trees - this means that the new growth is the only part of the tree which takes up water. This fact is why wilt can so easily affect these trees - it only has to plug the new growth's vessels to have an effect.

A larger root system pulls in more water

- soil affects root system
- a deep water table enables trees to extend their root system

Trees tend to keep their tops and bottoms in proportion. A small root system creates a small top--a large root system creates a large top



The top of a tree needs good light to enable the production of a good root system.

During the day a tree loses more water than it gains - at night it takes up more water than it loses - thus, the tree is able to replenish itself

Prediction

With a normal rainfall, there will be no water in the soil table by August 15, 1977. This means that there will not be a sufficient amount of water to promote the successful production of new growth - there probably will be enough for some survival.

DIRECT EFFECTS OF DROUGHT ON TREES

- ' Loss in growth
- ' Death of leaves, roots, and branches
- ' Death of entire tree
- ' Drought cracks

Trees turning color a month earlier than normal due to drought

- ' 50% came back
- ' 25% had branch dieback
- ' 25% died

Winter drought and conifers - trees keep losing water, roots freeze

EFFECTS OF DROUGHT

Predisposition to disease

Declines and diebacks encouraged

Wilt systems show up easier and quicker

Root death occurs due to cold soil temperatures

Drought-affected elms cannot successfully throw-out the bark beetles

WATERING DURING DROUGHT CONDITIONS

Horizontally water from trunk to six feet beyond perimeter of crown

Water at least one inch vertically

Water at least one inch a week

Water two to four inches in May to increase water in soil reservoir

E

FERTILIZING DURING DROUGHT CONDITIONS

Correct fertilization increases root growth

Incorrect fertilization can enhance production of large succulent leaves which are more susceptible to drought conditions

In drought conditions, place fertilizer deeper so that it eliminates competition between the sod and trees

Mike Fresvik

Passing an exam for pesticide licensing gives five year certification

To keep certification, one must attend an appropriate training session or take another examination

The state requires biennial registration. To keep up certification, one must attend an annual training session or take a monitored or unmonitored exam

Mark Ascerno

Elm bark beetles have a 50% or less survival rate in bark which has a large moisture content

Elm bark beetles have better survival in downed trees, wood piles, and stumps than in standing trees

Smaller European Bark Beetles emerge June 1 and in late July. There is a partial emergence in October

A single tree can support more than one generation - as long as the bark is intact, beetles will emerge

Native Elm Bark Beetles emerge April 1 to mid-June, July-August, and September-October

Smaller Elm Bark Beetle is a better competitor against the Native Elm Bark Beetle

Ward Stienstra

The success of the DED Program depends largely upon sanitation

Tree Inspector's Workshops, 1980 March-April

New Tree Inspectors

Attend both morning and afternoon sessions at one of the workshops scheduled and become trained as a tree inspector. Take the Minnesota certification examination and become certified as a Tree Inspector.

Certified Tree Inspectors

Minnesota state law requires tree inspectors to attend one approved program of continuing education each year. These workshops are approved by the Minnesota Commissioner of Agriculture and are the only ones offered in 1980 to meet the recertification requirement. The Shade Tree Program office of the Minnesota Department of Agriculture will recertify you for 1980 when you attend the required afternoon session of one of the scheduled workshops.

Date	Location
March 25	Rochester — Midway Motor Lodge
March 26	North Mankato — Holiday Inn North
March 27	Marshall — Ramada Inn
April 1	St. Paul — Earle Brown Center (see map)
April 3	St. Cloud — Holiday Inn
April 8	Detroit Lakes — Holiday Inn
April 9	Grand Rapids — Holiday Inn

Registration Fee

\$4.00 per person, includes instructional materials and coffee.

There will be no advance registration by mail or telephone. Registration will be at the door beginning at 12:00 noon at each location. There will be no registration for the morning session.

Program

- a.m.* Training for New Inspectors
(Open to all inspectors)
- 8:30 Integrated Disease Management —
Asimina Gkinis and William Phillipsen
- 9:30 Rules and Regulations — *Lyle Mueller*
- 10:00 Coffee
- 10:15 Tree Identification — *Richard Rideout*
- 11:00 Certification Exam (Required for those not certified in 1979)
- 12:00 Lunch — On Your Own
- 12:00 Registration Begins
- p.m.* Recertification of Certified Tree Inspectors
and Continued Training of New Inspectors
- 1:00 Dutch Elm Disease Research Update —
William Phillipsen
- 1:45 Is All Wilt Dutch Elm Disease? —
Asimina Gkinis
- 2:30 Coffee
- 2:45 '80 Rules and Regulations — *Lyle Mueller*
- 3:10 Shade Tree Committees, What They Can Do
For You — *Richard Rideout*

WHO'S WHO

Eugene Anderson, Assistant Professor and Extension Specialist Program Development, Office of Special Programs, University of Minnesota

Asimina Gkinis, Assistant Extension Specialist, Department of Plant Pathology, University of Minnesota

Lyle Mueller, Plant Health Specialist, Shade Tree Program, Department of Agriculture, State of Minnesota

William Phillipsen, Assistant Extension Specialist, Department of Entomology, Fisheries and Wildlife, University of Minnesota

Richard Rideout, Assistant Extension Specialist, Department of Horticultural Science and Landscape Architecture, University of Minnesota

Those who will be attending a workshop to obtain their first time certification should request study materials from Lyle Mueller to review in advance of the workshop.

For further information contact:

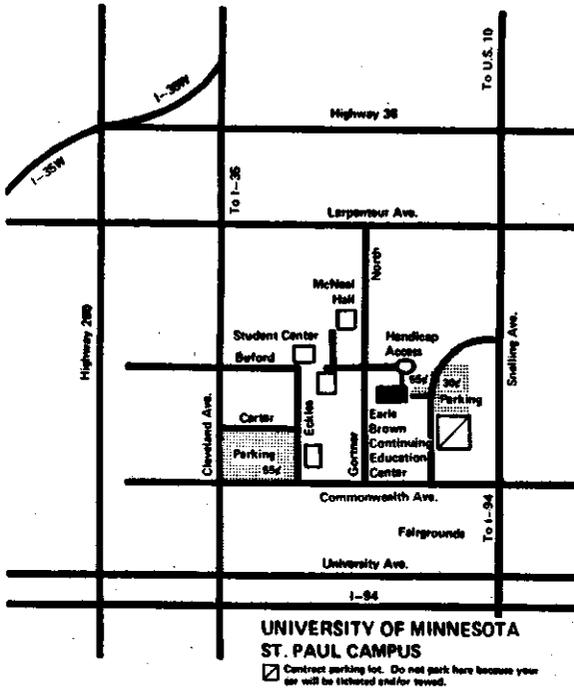
Lyle Mueller
Minnesota Department
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90 West Plato Avenue
St. Paul, MN 55107
(612) 296-8580

Eugene Anderson
Office of Special Programs
405 Coffey Hall
University of Minnesota
1420 Eckles Avenue
St. Paul, MN 55108
(612) 373-0725
Secretary: Sherry Brothen



Tree Inspector's Workshops, 1986 March-April

Office of Special Programs
405 Coffey Hall
University of Minnesota
420 Eckles Avenue
St. Paul, Minnesota 55108



Sponsors:

- Minnesota Department of Agriculture
Shade Tree Program
- University of Minnesota
Department of Entomology, Fisheries and Wildlife
Department of Horticultural Science and
Landscape Architecture
Department of Plant Pathology
Agricultural Extension Service
Office of Special Programs

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Marshall, St. Paul, St. Cloud,
and Rapid





Tree Inspector Workshops

March-April 1981

Participants departing from the forest with a wealth of information, such as identifying the symptoms of oak wilt and Dutch elm disease. Moreover, inspectors with years of experience in community forest management want something more—like tips on buying nursery stock for reforestation or creating workable wood utilization programs. And, frankly, city administrators just don't need to learn the differences between native and European elm bark beetles—but they do need to know how to prepare for an audit or how to best explain the costs and benefits of a shade tree program to the city council.

Speaking of Society...

That's why the 1981 Tree Inspector Workshops have been restructured. Workshop topics are geared to three specialized audiences: new tree inspectors, certified tree inspectors, and city administrators. Here's the bill of fare.

New Tree Inspectors

- Shade Tree Program—Introduction
- Dutch Elm Disease
- Oak Wilt
- Rules and Regulations
- Tree and Wood Identification
- Other Tree Diseases
- Tree Inspector Test

Certified Tree Inspectors

- What's New at the Shade Tree Program?
- Community Relations
- Wood Utilization That Works
- Sharing Community Experiences
- Native Elm Bark Beetle Control
- Current Shade Tree Problems
- Research in Progress
- Buying Nursery Stock

City Administrators

- What's New at the Shade Tree Program?
- Community Relations
- Administrative Concepts
- Administrative Mechanics—from Paperwork to Effective Programs
- Open Consultation with Workshop Staff

About Certification...

After attending both the morning and afternoon sessions for new tree inspectors, participants will have the opportunity to take the Minnesota tree inspector certification examination.

If you are already certified, Minnesota law requires you to attend one approved program of continuing education each year. The 1981 Tree Inspector Workshops are approved by the Minnesota Commissioner of Agriculture and are the only ones offered in 1981 to meet the recertification requirement. The Shade Tree Program, Minnesota Department of Agriculture, will recertify inspectors for 1981 after attending one of the seven scheduled workshops.

Where and When

- Each workshop begins at 10:00 a.m. and ends at 5:00 p.m.
- March 19 - University of Minnesota, St. Paul
 - March 20 - University of Minnesota, St. Paul
 - March 21 - University of Minnesota, St. Paul
 - March 22 - University of Minnesota, St. Paul
 - March 23 - University of Minnesota, St. Paul
 - March 24 - University of Minnesota, St. Paul
 - March 31 - University of Minnesota, St. Paul
 - April 7 - University of Minnesota, St. Paul
 - April 14 - University of Minnesota, St. Paul
 - April 19 - Grand Rapids, Michigan

Sponsors

The workshops are sponsored by the Shade Tree Program, Minnesota Department of Agriculture. Workshop leaders are past members from the Shade Tree Program, the University of Minnesota, Agricultural Extension Service, and the Minnesota Department of Natural Resources.

Registration

Registration is \$10.00 per person and covers workshop sessions, handout materials, lunch, and more. **PRE-REGISTRATION IS REQUIRED.** In order to register for the new tree inspectors sessions, you will receive study packets in advance of the workshop. To register, fill out the registration form and mail it to Tree Inspector Workshop, Suite North 178, 1000 University Avenue, St. Paul, MN 55104 along with \$10.00 for \$10 made payable to "Tree Inspector Workshop." Registration materials must be received by March 1, 1981.

Need More Information?

Contact Lyle Mueller at the Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, Minnesota 55107 or 612/296-8580.

NAME _____

ADDRESS _____

PHONE _____

Which session will you attend? (Check one)

- New Tree Inspector
- Certified Tree Inspector
- City Administrator

Which location will you attend? (Check one)

- March 19, White Bear Lake
- March 24, Waseca
- March 25, Marshall
- March 26, Alexandria
- March 31, Chaska
- April 7, Crookston
- April 15, Grand Rapids

Make checks payable to "Tree Inspector Workshop". Send this form and check for \$10 to: Tree Inspector Workshop, Suite North 178, 1821 University Ave., St. Paul, MN 55104 by March 3, 1981.



Shade Tree Program

Minnesota Department of Agriculture
90 West Plato Boulevard
St. Paul, MN 55107

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Tree
Inspector
Workshops



Tree Inspector Workshops

March — April 1982

Whether you are managing the forest in a small town or a large city, caring for your community's trees demands a wide variety of skills.

The 1982 series of Tree Inspector Workshops, sponsored by the Minnesota Department of Agriculture's Shade Tree Program, addresses the unique needs of the people who care for our communities' trees.

Conference topics range from basic information on Dutch elm disease to aspects of urban forest management.

In addition to covering a range of technical subjects, conference sessions

will also address a problem facing every community this year: less money.

Funding alternatives, use of volunteers, ways to increase community support, and the changing focus of the state Shade Tree Program will be explored.

Certified inspectors and administrators will also receive the new notebook, "Community Forestry". Designed as a resource for local programs, this 200 page guidebook outlines urban forest management, tree maintenance, pest control, tree planting, wood utilization, community relations and administration.

Bill Of Fare

Section A

Shade Tree Program Introduction
Dutch Elm Disease

Oak Wilt

Trees: Rules, Regulations and Laws

Dealing With The Public

Tree And Wood Identification

Other Tree Diseases and Problems

Tree Inspector Test

Section B

Shade Tree Program Update
Managing Forestry Programs With

Less Money

Problem Solving

Upcoming Tree Problems

Reducing Tree Mortality

Buying Contractor Services

Trees And The Law

Dutch Elm Disease/Oak Wilt Refresher

Improving Community Relations

Preparing For Arbor Month

Preparing A Tree Inventory

Master Planting Plans

What's New In Chemicals?



When And Where

Each workshop begins at 8 a.m. and ends at 4 p.m.

March 2	Marshall, Southwest State University
March 5	Eden Prairie, South Hennepin Technical Center
March 9	Hibbing Community College
March 11	Thief River Falls, Northland Community College
March 12	Fergus Falls Community College
March 23	White Bear Lake, Lakewood Community College
March 25	Rochester Community College
April 3	St. Paul, University of Minnesota

Which Section Is For Me?

Section A is for individuals who want to gain certification for the first time as a tree inspector. After attending all sessions, participants may take the Minnesota tree inspector certification examination.

If you are already certified, Section B is for you. Topics in this section are designed for persons who are city foresters, tree inspectors, community leaders, mayors, city clerks and persons who administer tree or parks programs.

The 1982 series of Tree Inspector Workshops is the only continuing education program offered this year to meet the tree inspector recertification requirement of Minnesota law. (Even if municipalities do not receive grants from the state Shade Tree Program, tree inspector certification is required by law of all communities operating local programs under Minnesota Statutes 18.023.)

Certified tree inspectors who are also licensed pesticide applicators may attend the session, "What's New In Chemicals?" and renew their license, (trees and ornamentals only).

Registration

Registration is \$15 per person and covers all workshop sessions, handout materials, tests, and lunch. **PRE-REGISTRATION IS REQUIRED.**

Individuals who register early for Section A will receive study packets in advance of the workshop.

To register, fill out the form on the back and mail the form and a check for \$15 to the address listed on the form. Make the check payable to "Tree Inspector Workshop".

Registration forms and fees must be received by February 10 for the March 2, 5, 9, 11 and 12 workshops. Registration forms and fees for the March 23 and 25, and April 3 workshops must be received by March 1.

Questions?

If you need more registration forms or have a question, contact Lyle Mueller at the Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, MN 55107 or 612/296-8580.

Tree Inspector Workshop Registration Form

Name

Title

Address

City

State

Zip

Phone

Representing what community?

Which section will you attend? (check one)

A

B

Which location will you attend? (check one)

- March 2, Marshall
- March 5, Eden Prairie
- March 9, Hibbing
- March 11, Thief River Falls

- March 12, Fergus Falls
- March 23, White Bear Lake
- March 25, Rochester
- April 3, St. Paul

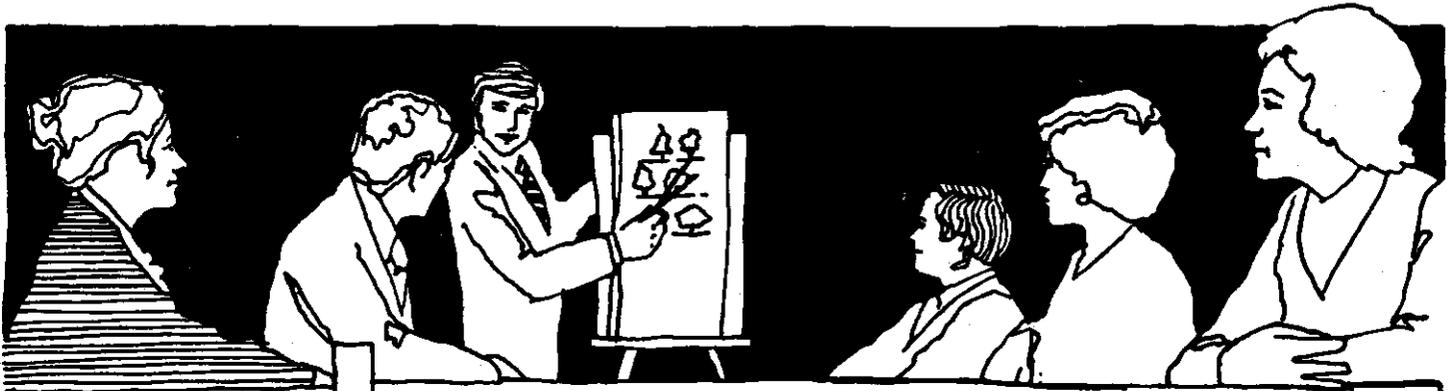
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Tree Inspector Workshops

March-April 1982

MINNESOTA DEPARTMENT OF AGRICULTURE
DIVISION OF PLANT INDUSTRY
670 State Office Building
St. Paul, Minnesota 55155

INFORMATION FOR TREE INSPECTORS (under M.S/ 18.023)

The Tree Inspector's Certification Examination is given in 4 parts, as follows:

	<u>QUESTIONS</u>	<u>PASSING SCORE</u>
Part I - Oak Wilt Disease	20	14
Part II - Dutch Elm Disease	20	14
Part III - Laws, Rules and Regulations	35	24
Part IV - Laboratory	25	17
TOTAL	<u>100</u>	<u>69</u>

READING MATERIALS PROVIDED

1. Minnesota Statutes, Chapter 18.022 and 18.023
2. Rules and Regulations of the Department of Agriculture Chapter 4, Agr. 101-108
3. Approved Removal and Wood Disposal Practices
4. Agricultural Extension Folder 310-1975, Oak Wilt Disease (OUT)
5. Agricultural Extension Folder 211-1974, The Dutch Elm Disease (OUT)

READING MATERIAL NOT PROVIDED

1. Agricultural Extension Bulletin 363-1972, Minnesota's Forest Trees

You may obtain the above material calling the University of Minnesota Bulletin Room. Telephone: 612/373-1615. Copies may also be obtained from County Agricultural Extension Offices.

PART IV - LABORATORY

- Requires:
- a) Identification based on leaf, twig, and stem characteristics of the following trees: Ash, Basswood, Birch, Boxelder, ~~EMK~~ Butternut, Cherry, Cottonwood, Elm, Hackberry, Honeylocust, Ironwood, Maple, Oak, Pine, Poplar and Walnut.
 - b) Identification of Dutch elm disease and oak wilt disease and recommended controls.
 - c) Sampling procedures.

TREE INSPECTORS CERTIFICATION EXAMINATION

10/21/01

E

Instructions.

Questions 1 thru 59 are TRUE or FALSE. Please circle the correct answer (T) TRUE (F) FALSE. Multiple choice questions have only one correct answer - circle the correct answer.

1. Root graft control for Oak Wilt is similar to Dutch elm disease root graft control.
 T F
2. Oak wood run through a chipper is no longer suitable for the growth of the Oak Wilt fungus.
 T F
3. Overland spread of Oak Wilt probably occurs infrequently, and yet, this is the way in which new infection centers are established.
 T F
4. Siberian elm (often referred to as Chinese) are less resistant to Dutch elm disease than our native elms.
 T F
5. Diseased elm trees should be girdled as soon as they are detected to reduce spore formation.
 T F
6. Spore mat formation by the Oak Wilt fungus can be prevented by girdling the infected oak tree in the early stages of wilting.
 T F
7. A tree inspector need not receive permission to enter upon private property if public notice has been given.
 T F
8. The Department of Natural Resources will approve every municipal shade tree program submitted for review.
 T F
9. Oak Wilt spores will not form if bark is removed from an infected Red Oak tree.
 T F
10. Brown streaks in the sapwood of infected branches are characteristic symptoms of Dutch elm disease, but laboratory culturing is necessary for positive identification.
 T F
11. It is always necessary to receive laboratory confirmation of Dutch elm disease or Oak Wilt.
 T F
12. A municipality may not dismiss or suspend a tree inspector without notifying the Minnesota Department of Agriculture.
 T F

14. The Minnesota Department of Agriculture will designate and coordinate control area program plans to municipalities within the metropolitan area.
 T F
15. Records of a shade tree disease control program need only be prepared for examination during the month of December.
 T F
16. All native elm species are susceptible to Dutch elm disease.
 T F
17. There are no limitations to the amount or type of subsidy given a property owner by a municipality.
 T F
18. The State of Minnesota does not subsidize the removal or treatment of trees on private property.
 T F
19. A tree inspector is required to be able to identify all native tree species common to his work area, with or without leaves and all felled or down trees with bark intact.
 T F
20. The Shade Tree Disease Control Law prohibits the imposition of a lien on private property for the treatment or removal of diseased trees.
 T F
21. When diseased trees are less than fifty (50) feet apart, vapam should be applied without waiting for laboratory confirmation.
 T F
22. Laboratory confirmation can only be made by the Minnesota Department of Agriculture.
 T F
23. A municipality may not make any assessment levied for tree treatment or removal payable with interest in installments.
 T F
24. The costs to a municipality implementing the Shade Tree Disease Control Law shall be deemed a "special levy" and may be outside all existing tax levy limitations.
 T F
25. A municipality cannot subsidize the removal or treatment of trees on private property.
 T F
26. Experience has shown that when vapam is applied closer than eight (8) feet to a healthy tree, injury may result to that tree.
 T F
27. A tree inspector may be decertified if his shade tree disease control program fails to comply with the Shade Tree Disease Control Law.
 T F

- 29. By law, any dead or dying tree is considered infected with Dutch elm disease or Oak Wilt and must be treated or removed in accordance with the provisions of the Shade Tree Disease Control Law.
 T F
- 30. A municipal ordinance can require that diseased trees be removed sooner than Minnesota Department of Agriculture Rules and Regulations require.
 T F
- 31. The tree inventory of a municipality need not be reported to the Department of Agriculture.
 T F
- 32. The Minnesota Department of Agriculture may examine records without prior notice to determine compliance with the Shade Tree Disease Control Law and related rules and regulations.
 T F
- 33. Benlate injection should be made as soon as laboratory confirmation is received that the elm tree is diseased.
 T F
- 34. Spore mats of the Oak Wilt fungus are produced on Bur or White Oaks.
 T F
- 35. The costs to a municipality implementing the Shade Tree Disease Control Law, including removal or treatment from municipally or privately owned property, shall be deemed a "general levy" and may be included in all existing tax levy limitations.
 T F
- 36. A municipal tree inspector must submit a shade tree disease control program to the Minnesota Department of Agriculture for review.
 T F
- 37. A tree inspector must have reason to believe that there are diseased trees on private property before he can inspect it.
 T F
- 38. Chemical or mechanical root disruption should be done before girdling of Red Oaks infected with Oak Wilt if root graft spread is likely to occur.
 T F
- 39. Benlate treatment will take the place of conventional root graft treatment in fighting Dutch elm disease.
 T F
- ~~40.~~ Oaks are highly susceptible to Oak Wilt in the late summer, so pruning or trimming should be avoided during this season.
 T F
- 41. A disease control area need not be approved by the Department of Agriculture.
 T F

43. Shade tree disease program records must be kept by each municipality and be available for examination by the Commissioner of Agriculture on or before June 1 and January 1.
 T F
44. Adult elm bark beetles carry spores on the inside and outside of their bodies.
 T F
45. A municipality must pass a bond issue for the financing of a shade tree disease control program.
 T F
46. A municipality may not adopt an ordinance which is more stringent than the rules and regulations of the Minnesota Department of Agriculture.
 T F
47. Elm wood from healthy, weakened, dead, or damaged trees with no bark beetle galleries apparent may be moved at any time of the year to disposal or chipping sites.
 T F
48. A "disease control area" means the area where all oaks and elms are growing.
 T F
49. Municipal tree inspectors should submit program plans after they have been notified by the Minnesota Department of Agriculture.
 T F
50. It is safe to haul elm logs with bark beetles anytime of the year.
 T F
51. A tree inspector may be decertified by the Commissioner if he fails to act competently or in the public interest in the performance of his duties.
 T F
52. Lumber free of bark sawed from elm trees killed by Dutch elm disease is considered safe for local use or shipment.
 T F
53. Spores of the Oak Wilt fungus are produced on mats of mycelium under the bark on all oaks.
 T F
54. It is considered that elm wood chipped or shredded constitutes no hazard to the spread of Dutch elm disease.
 T F
55. The administration and maintenance of a municipal shade tree disease control program is the responsibility of the tree inspector.
 T F
56. Elms growing within fifty (50) feet of a diseased elm may become infected through root grafts.
 T F

58. The Minnesota Department of Agriculture may reject a program if it fails to fulfill statutory requirements.
T F
59. Elm and oak trees infected through root grafts usually die more rapidly than trees infected by beetle transmissions.
T F
60. Spore mats will not form on Red Oaks dead for longer than:
a. 6 months
b. 1 month
c. 1 year
d. 2 weeks
61. Control programs for Oak Wilt control in White Oak groves:
a. the trees should be removed immediately and vapamed
b. the trees should be girdled
c. the trees should be topped and vapamed
d. vapamed and left standing
e. all of the above
62. The Minnesota Department of Agriculture will determine compliance with the Shade Tree Disease Law through:
a. examination of records
b. periodic survey of a municipality
c. annual program review
d. all of the above
e. none of the above
63. A municipality may provisionally appoint a tree inspector for:
a. 3 months
b. 6 months
c. 9 months
d. 12 months
e. 18 months
64. After certification, which of the following is required of a tree inspector:
a. annual re-examination
b. an interview with the Commissioner of Agriculture
c. annual attendance at one program of continuing education
d. all of the above
65. A shade tree, according to the rules and regulations, is defined as:
a. any tree adjacent to or located on public property
b. maples, elms, oaks, and birch on public property
c. oaks and elms within a control area
d. any tree on public or private property
e. maples, elms, oaks, and birch within a control area

symptoms of Dutch elm disease are:

- a. wilting, or yellowing of leaves, or staining of inner bark or outer sapwood
- b. wilting or yellowing of leaves, or staining of inner bark, or extensive loss of leaves
- c. staining of inner bark, extensive loss of leaves, or loss of bark
- d. wilting or yellowing of leaves, or staining of outer bark
- e. wilting, or staining of inner bark

67. In what stage does the smaller European elm bark beetle generally overwinter:

- a. egg
- b. larva
- c. pupa
- d. adult
- e. all of the above

68. What percentage of the cost of treatment or removal of a tree on private property may a municipality assess against the owner:

- a. 0%
- b. 25%
- c. 50%
- d. 75%
- e. 100%

69. What percentage of the cost of treating or removing diseased shade trees located on street terraces and boulevards may be assessed to the abutting private property:

- a. 0%
- b. 25%
- c. 50%
- d. 75%
- e. 100%

70. Which of the following chemicals is used in disruption of root grafts:

- a. methoxychlor
- b. benlate
- c. vapam
- d. vapona

71. Mechanical trenching to disrupt root grafts between adjacent elms should be:

- a. 10-20" deep
- b. 30" deep
- c. 36-40" deep
- d. 50" deep
- e. 60" deep

72. Where do native elm bark beetles overwinter:

- a. in the wood of healthy trees
- b. in the bark of healthy trees
- c. in the wood of dead elm trees or logs
- d. under the bark of dead or dying elm trees or logs
- e. none of the above

- E
- c. by boring holes and pouring in methoxychlor
 - d. with benomyl
 - e. none of the above
74. The spores of the Dutch elm disease pathogen are generally spread by:
- a. insects
 - b. water
 - c. birds
 - d. squirrels
 - e. all of the above
75. Which of the following caused an elm tree to wilt and die:
- a. toxins produced by the fungus poison the tree
 - b. inversion of water flow in the tree
 - c. clogging of the water-conducting vessels of the tree by gums and resins
 - d. all of the above
 - e. none of the above
76. The smaller European elm bark beetles usually feed on:
- a. branches greater than 1 inch in diameter
 - b. young twig crotches
 - c. the leaves
 - d. large branch crotches
 - e. the trunk
77. Red Oak trees wilting in July and August could produce spores the following:
- a. spring
 - b. summer
 - c. fall
 - d. all of the above
 - e. none of the above
78. Which of the following oaks is not a member of the Red Oak group:
- a. Bur Oak
 - b. Red Oak
 - c. Pin Oak
 - d. none of the above
79. Which of the following oak species is least susceptible to Oak Wilt:
- a. Red Oak
 - b. Black Oak
 - c. White Oak
 - d. all of the above
80. How long after vapam application must you wait before removing a diseased elm tree:
- a. 2 weeks
 - b. 1 day
 - c. 4 weeks
 - d. 2 days
 - e. it does not matter

- a. January 1
- b. May 15
- c. April 15
- d. June 1
- e. September 15

82. Dutch elm disease could be classified as a:

- a. leaf spot
- b. root rot
- c. mildew
- d. canker disease
- e. none of the above

83. The agent causing a plant disease is called:

- a. saprophytic organism
- b. pathogen
- c. vector
- d. none of the above

84. Reproductive spore mats are formed by the Oak Wilt fungus on:

- a. Bur Oaks
- b. Red Oaks
- c. White Oaks
- d. none of the above
- e. all of the above

85. Usually a Red Oak that dies of Oak Wilt in June produces spore masses under the bark in:

- a. July
- b. August
- c. September-October
- d. April
- e. none of the above

86. During the growing season, all elm trees must be checked for Dutch elm disease symptoms at least:

- a. once
- b. twice
- c. weekly
- d. three times
- e. four times

87. Egg galleries of the smaller European elm bark beetle are:

- a. parallel with the grain of the wood
- b. across the grain of the wood
- c. diagonal to the grain of the wood
- d. none of the above

- c. die of loss of leaves
 - d. all of the above
89. What are the first symptoms to appear that suggest Oak Wilt infection:
- a. yellowing of lower leaves
 - b. wilting of upper leaves
 - c. holes in the lower leaves
 - d. trees will not leaf out
 - e. none of the above
90. The most likely time for beetle inoculation of elm is:
- a. June
 - b. April
 - c. July
 - d. September
91. The major element in any Dutch elm disease control program is:
- a. vapam
 - b. benlate
 - c. records
 - d. sanitation
 - e. sampling
92. The Shade Tree Disease Control Law and related rules and regulations require that diseased trees be removed within how many days after laboratory diagnosis:
- a. 5 days
 - b. 7 days
 - c. 20 days
 - d. 30 days
 - e. 60 days
93. What chemical is used to disrupt root grafts:
- a. VPM
 - b. vapam
 - c. SMDC
 - d. a & b
 - e. a, b, & c
94. Removal of the bark from an elm stump does the following:
- a. prevents the transmission of the disease through root grafts
 - b. immediately kills the fungus in the roots
 - c. destroys beetle breeding locations
 - d. all of the above

or the Shade Tree Disease Control Law of 1974

- b. It is necessary to take extraordinary measures to control Oak Wilt and Dutch elm disease in the Twin Cities area
- c. A special purpose park district organized under a city charter may maintain a Dutch elm disease control program
- d. Any county in the metropolitan area shall, for purposes of shade tree disease control, be considered a municipality for any and all land area which is owned by the county
- e. An unincorporated township is subject to the jurisdiction of the nearest adjacent municipality in the administration and maintenance of a shade tree disease control program

96. Before what date should all possible beetle breeding sites be checked:

- a. January 1
- b. May 15
- c. April 15
- d. June 1
- e. September 15

97. Smaller European elm bark beetle eggs are laid in:

- a. fall
- b. spring
- c. spring & fall
- d. spring & summer

98. By law, which of the following are considered to be shade tree diseases:

- a. Dutch elm disease and Oak Wilt disease
- b. Dutch elm disease, Oak Wilt, nosema and verticillium
- c. Dutch elm disease, Oak Wilt, verticillium, and dothiorella
- d. Dutch elm disease, Oak Wilt, fusarium, and dothiorella
- e. Dutch elm disease, Oak Wilt, aspergillis, and rhizopus

99. Anthracnose is caused by:

- a. leaf reaction to an insect egg
- b. a virus
- c. a fungus
- d. a bacterium
- e. none of the above

100. Dutch elm disease is caused by the fungus Ceratocystis ulmi and was first found in Minnesota in:

- a. 1890
- b. 1910
- c. 1926
- d. 1952
- e. 1961

1. Which of the following leaf characteristics would you use to separate the given specimens into the Red Oak Group and the White Oak Group? (circle your answer)
- a. Bristle-tipped lobes as opposed to rounded lobes
 - b. Number of lobes
 - c. Deeply indented central lobes ✓
 - d. All of the above

2. CIRCLE the letter (a, b, or c...) of the oak species represented at this station:

a. b. c. d. e.

3. Identify the specimens provided. (Give common names as Red Oak, Honeylocust, etc.)

a. elm

b. elm

c. elm

d. Birch

e. Red Oak

f. elm

4. Name the disease from the symptoms observed in the slide.

Slide A. Witch's Broom

Slide B. Witch's Broom

Slide C. Witch's Broom

5. You are shown 4 different sizes of elm twigs (a, b, c and d). Pick the size you would send to Diagnostic Laboratory. Circle your answer:

a. b. c. d.

Where would you send the elm twigs from the metropolitan area for identification?

- a. Minnesota Department of Agriculture, Shade Tree Disease Laboratory
- b. City of Austin Laboratory
- c. City of St. Cloud Laboratory
- d. none of the above

Black Locust
Red Maple
Green Ash
Boxelder ✓
Hazel

Hackberry
Ironwood (Hophornbeam)
American Beech ✓
Birch
Cottonwood ✓

Bur Oak ✓
American Elm ✓
Mountain Ash
White Oak ✓
Basswood

Red Oak
Siberian Elm
Sugar Maple
Black Walnut ✓
Silver Maple

1. ~~...~~
2. ~~...~~
3. ~~...~~
4. ~~...~~
5. ~~...~~

6. ~~...~~
7. ~~...~~
8. ~~...~~
9. ~~...~~
10. ~~...~~

11. ~~...~~
12. ~~...~~
13. ~~...~~
14. ~~...~~
15. ~~...~~

16. _____

Use the following for questions 17 - 21

Pine
Oak
Boxelder

Maple
Elm
Ash

Cherry
Poplar
Birch

17. ~~...~~
18. ~~...~~
19. ~~...~~

20. ~~...~~
21. ~~...~~

22. _____
23. _____

24. True ✓
False _____

25. Insect _____
Spraying _____
Fungus ✓

a. root

Name two (2) methods used to control the above diseases spread through this plant part.

b. Trenching

c. Japanese Beetle Control

7. Identify or name the structure shown by the pointer

a. egg gallery

Which one of the beetles shown spreads the Dutch elm disease fungus?

- A.
- B.
- C.
- D.

8. Using the list of trees provided, match the following characteristics (letters a, b, or c) with the corresponding tree listed.

Characteristics

- a. Oval, doubly-toothed leaves, large spreading "feather duster" crown; bark in alternate layers of brown.
- b. Long, pointed leaves with singly-toothed smooth margins; bark gray to brown and warty (stucco type)
- c. Oblong, doubly-toothed leaves, narrowed to a slender point with clusters of bladder-like seedbearing pods or hops.

Tree List

Answer

- | | | |
|-----------------|----------|---|
| 1. Hackberry | <u>A</u> | ✓ |
| 2. Ironwood | <u>C</u> | |
| 3. American Elm | <u>B</u> | ✓ |

9. Which one of the following chemicals has EPA clearance for elm bark beetle control? (circle your answer)

- a. Chlordane
- b. DDT
- c. Methoxychlor
- d. Pyrethrum

10. If you pass this examination you will be certified for

- a. ever
- b. one year from date of this examination
- c. a second examination next year
- d. a short course offered by Continuing Education
- e. none of the above

IDENTIFY THE LOG FROM THE LIST OF TREES PROVIDED

- | | |
|--------------------|----------|
| 1. Red Oak | A. 9 ✓ |
| 2. Aspen | B. 14 ✓ |
| 3. Honeylocust | C. 10 |
| 4. Butternut | D. 6 ✓ |
| 5. Red Maple | E. 2 |
| 6. White Ash | F. 10 ✓ |
| 7. Slippery Elm | G. 1 |
| 8. Jack Pine | H. 8 |
| 9. White Spruce | I. 15 |
| 10. Red Pine ✓ | J. _____ |
| 11. White Oak | |
| 12. Black Walnut ✓ | |
| 13. Basswood | |
| 14. Ironwood | |
| 15. Black Cherry ✓ | |

1. A. Which of the following leaf characteristics would you use to separate the given specimens into the Red Oak group and the White Oak group? (Circle one answer)

- a. Bristle-tipped lobes as opposed to rounded lobes
- b. Number of lobes
- c. Deeply indented central lobes
- d. All of the above

B. CIRCLE the letter (a, b, or c...) of the oak species represented at this station:

- a. b. c. d. e.

2. A. Pick out the elm log from this pile. (Circle one answer)

- a. b. c. d. e.

B. Pick out the oak log from this pile. (Circle one answer)

- a. b. c. d. e.

3. Identify the specimens provided. (Give common names as Red Oak, Honeylocust, etc.)

- a. elm
- b. elm
- c. Red Oak
- d. Shade Tree
- e. elm
- f. elm

4. Name the disease from the symptoms observed in the slide.

- Slide A. W.D.
- Slide B. W.D.
- Slide C. W.D.

5. You are shown four (4) different sizes of elm twigs (a, b, c, and d). Pick the size you would send to Diagnostic Laboratory. Circle your answer:

- a. b. c. d.

Where would you send the elm twigs from the metropolitan area for identification?

- a. Minnesota Department of Agriculture, Shade Tree Disease Laboratory
- b. City of Austin Laboratory
- c. City of St. Cloud Laboratory
- d. none of the above

6. Identify (name) the disease in the specimen displayed.

- a. W.D.

Name two (2) methods you would use to control the spread of the above disease through root grafts.

- b. Transection
- c. Wound Sealing

a. European Elm
 Which one of the beetles shown spreads the Dutch elm disease fungus?

- / a. **(b.)** c. d.

8. Using the list of trees provided, match the following characteristics (letters a, b, or c) with the corresponding tree listed.

Characteristics

- a. Oval, doubly-toothed leaves, large spreading "feather duster" crown; bark in alternate layers of brown.
- b. Long, pointed leaves with singly-toothed smooth margins; bark gray to brown and warty (stucco type)
- c. Oblong, doubly-toothed leaves, narrowed to a slender point with clusters of bladder-like seedbearing pods or hops.

Tree List

Answer

- | | |
|-------------------|--|
| 1. Hackberry | <u> C </u> |
| 2. Ironwood | <u> B </u> |
| / 3. American Elm | <u> A </u> |

9. Which one of the following chemicals has Environmental Protection Agency clearance for elm bark beetle control? (Circle one answer)

- a. Chlordane
- b. DDT
- / c. Methoxychlor
- d. Pyrethrum

10. If you pass this examination you will be certified for

- a. ever
- / b. one year from date of this examination
- c. a second examination next year
- d. a short course offered by Continuing Education
- e. none of the above

IDENTIFY THE LOG FROM THE LIST OF TREES PROVIDED

- | | |
|------------------|---|
| 1. Red Oak | A. <u> 7 </u> |
| 2. Aspen | B. <u> 8 </u> |
| 3. Honeylocust | C. <u> 9 </u> |
| 4. Butternut | D. <u> 10 </u> |
| 5. Red Maple | E. <u> 11 </u> |
| 6. White Ash | F. <u> 12 </u> |
| 7. Slippery Elm | G. <u> 13 </u> |
| 8. Jack Pine | H. <u> 14 </u> |
| 9. White Spruce | I. <u> 15 </u> |
| 10. Red Pine | J. <u> 16 </u> |
| 11. White Oak | |
| 12. Black Walnut | |
| 13. Basswood | |
| 14. Ironwood | |
| 15. Black Cherry | |

MINNESOTA DEPARTMENT OF AGRICULTURE
DIVISION OF PLANT INDUSTRY
670 STATE OFFICE BUILDING
ST. PAUL, MINNESOTA 55155

NAME _____

DATE _____

REPRESENTING _____

SCORE: Part I _____ II _____

III _____ IV _____

TREE INSPECTORS CERTIFICATION EXAMINATION

INSTRUCTIONS

Read the following carefully. Do not proceed until the instructor tells you to begin the examination.

The examination is given in four (4) parts.

- Part I Oak Wilt (20 questions)
- Part II Dutch Elm Disease (20 questions)
- Part III Laws, Rules and Regulations (35 questions)
- Part IV Laboratory (25 questions)

Parts I, II, and III are given a maximum of 1 hour for completion.

A maximum of 45 minutes is allowed for the laboratory examination.

CIRCLE the letter T if the answer is True, or F if the answer is False.

For multiple choice questions CIRCLE ONE LETTER (a, b, or c.....) signifying the best answer.

Use a PENCIL for your answers.

NAME _____
REPRESENTING _____
SCORE _____

TREE INSPECTORS EXAMINATION

PART I. Oak Wilt (20 questions)

1. Root graft control for Oak Wilt is similar to Dutch elm disease root graft control
T F
2. Oak wood run through a chipper is no longer suitable for the growth of the Oak Wilt fungus.
T F
3. Spore mat formation by the Oak Wilt fungus can be prevented by girdling the infected oak tree in the early stages of wilting.
T F
4. Oak Wilt spores will not form if bark is removed from an infected Red Oak tree.
T F
5. It is always necessary to receive laboratory confirmation of Dutch elm disease or Oak Wilt.
T F
6. It is important in Oak Wilt control to remove the bark on the stump to the ground line.
T F
7. Oak Wilt will only kill members of the red oak group.
T F
8. Oaks are highly susceptible to Oak Wilt during May and June, so pruning or trimming should be avoided during this season.
T F
9. When a diseased and healthy tree are less than fifty (50) feet apart, Vapam should be applied without waiting for laboratory confirmation.
T F
10. Diseased trees should be removed two (2) weeks prior to installing a chemical barrier to disrupt root grafts.
T F
11. Elm and oak trees infected through root grafts usually die more rapidly than trees infected by beetle transmissions.
T F
12. Spore mats will not form on Red Oaks dead for longer than:
 - a. 6 months
 - b. 1 month
 - c. 1 year
 - d. 2 weeks
13. Which of the following chemicals is used in disruption of root grafts:
 - a. methoxychlor
 - b. benlate
 - c. vapam
 - d. vapona

14. Red Oak trees wilting in July and August could produce spores the following:
 - a. spring
 - b. summer
 - c. fall
 - d. all of the above
 - e. none of the above

15. Which of the following oaks is not a member of the Red Oak group:
 - a. Bur Oak
 - b. Red Oak
 - c. Pin Oak
 - d. none of the above

16. Which of the following oak species is least susceptible to Oak Wilt:
 - a. Red Oak
 - b. Black Oak
 - c. White Oak
 - d. all of the above

17. Oak Wilt is most often transmitted by:
 - a. insects
 - b. animals
 - c. root grafts
 - d. none of these

18. Reproductive spore mats which cause "overland" transmission are formed by the Oak Wilt fungus on:
 - a. Bur Oak
 - b. Red Oak
 - c. White Oak
 - d. none of the above
 - e. all of the above

19. Usually a Red Oak that dies of Oak Wilt in June produces spore masses under the bark in:
 - a. July
 - b. August
 - c. September-October
 - d. April
 - e. none of the above

20. What are the first symptoms to appear that suggest Oak Wilt infection:
 - a. yellowing of lower leaves
 - b. wilting of upper leaves
 - c. holes in the lower leaves
 - d. trees will not leaf out
 - e. none of the above

E

TREE INSPECTORS EXAMINATION

PART II. Dutch Elm Disease (20 questions)

1. Siberian elm (often referred to as Chinese elm) is less susceptible to Dutch elm disease than our native elm.
T F
2. Diseased elm trees should be girdled as soon as they are detected to reduce spore formation.
T F
3. Brown streaks in the sapwood of infected elm branches are characteristic symptoms of Dutch elm disease, but laboratory culturing is necessary for positive identification.
T F
4. Benlate injection should be made as soon as laboratory confirmation is received that the elm tree is diseased.
T F
5. It is safe to haul elm logs with bark beetles anytime of the year.
T F
6. Lumber free of bark sawed from elm trees killed by Dutch elm disease is considered safe for local use or shipment.
T F
7. It is felt that infected elm wood which has been chipped or shredded constitutes no hazard to the control of Dutch elm disease.
T F
8. Elms growing within fifty (50) feet of a diseased elm may become infected through root grafts.
T F
9. Elm trees which die of causes other than Dutch elm disease may still serve to spread the disease.
T F
10. Mechanical trenching to disrupt root grafts between adjacent elms should be:
 - a. 10"-20" deep
 - b. 30" deep
 - c. 36"-40" deep
 - d. 50" deep
 - e. 60" deep
11. Elm stumps should be treated:
 - a. with ammate
 - b. by debarking
 - c. by boring holes and pouring in methoxychlor
 - d. with benomyl
 - e. none of the above

12. The spores of the Dutch elm disease pathogen are generally spread by:
 - a. insects
 - b. water
 - c. birds
 - d. squirrels
 - e. all of the above
13. Which of the following causes an elm tree to wilt and die:
 - a. toxins produced by the fungus poison the tree
 - b. inversion of water flow in the tree
 - c. clogging of the water conducting vessels of the tree
 - d. all of the above
 - e. none of the above
14. The smaller European elm bark beetles usually feed on:
 - a. branches greater than 1 inch in diameter
 - b. young twig crotches
 - c. the leaves
 - d. large branch crotches
 - e. the trunk
15. Egg galleries of the smaller European elm bark beetle are:
 - a. parallel with the grain of the wood
 - b. across the grain of the wood
 - c. diagonal to the grain of the wood
 - d. none of the above
16. The most likely time for beetle inoculation of elm is:
 - a. June
 - b. April
 - c. July
 - d. September
17. The major aspect or emphasis in any Dutch elm disease control program is:
 - a. vapam
 - b. benlate
 - c. records
 - d. sanitation
 - e. sampling
18. Elm wood is considered hazard-free and may be used for firewood only if it is:
 - a. split and dried for at least six (6) months
 - b. debarked
 - c. dead for more than one (1) year
 - d. all of the above
19. Removal of the bark from an elm stump does the following:
 - a. prevents the transmission of the disease through root grafts
 - b. immediately kills the fungus in the roots
 - c. destroys beetle breeding locations
 - d. all of the above
20. Native elm bark beetles overwinter as:
 - a. eggs
 - b. adults
 - c. larvae
 - d. a & b
 - e. b & c

TREE INSPECTORS EXAMINATION

PART III. Laws, Rules and Regulations (35 questions)

1. A tree inspector need not receive permission to enter upon private property if public notice has been given.
T F
2. A municipality may dismiss or suspend a tree inspector without notifying the Minnesota Department of Agriculture.
T F
3. The Minnesota Department of Agriculture will designate and distribute control area program plans to municipalities within the metropolitan area.
T F
4. The State of Minnesota does not subsidize the removal of trees on public property.
T F
5. A municipality cannot subsidize the removal or treatment of trees on private property.
T F
6. A tree inspector is required to be able to identify all native tree species common to his work area, with or without leaves and all felled trees with bark intact.
T F
7. The Shade Tree Disease Control Law prohibits the imposition of a lien on private property for the treatment or removal of diseased trees.
T F
8. Confirmation of diseased trees can only be made by laboratories recognized by the Commissioner.
T F
9. A municipality may not make any assessment levied for tree treatment or removal payable with interest in installments.
T F
10. The costs to a municipality implementing the Shade Tree Disease Control Law shall be deemed a "special levy" and may be outside all existing tax levy limitations.
T F
11. A tree inspector may be decertified if his shade tree disease control program fails to comply with the Shade Tree Disease Control Law.
T F
12. A private place is defined by law as "any place other than a private home".
T F
13. All municipalities within the metropolitan area must administer and maintain shade tree disease control programs.
T F
14. By law, any dead or dying tree is considered infected with Dutch elm disease or Oak Wilt and must be treated or removed in accordance with the provisions of the Shade Tree Disease Control Law.
T F

15. A municipal ordinance can require that diseased trees be removed sooner than Minnesota Department of Agriculture Rules and Regulations require.
T F
16. The tree inventory of a municipality must be reported to the Department of Agriculture.
T F
17. The Minnesota Department of Agriculture may examine records without prior notice to determine compliance with the Shade Tree Disease Control Law and related rules and regulations.
T F
18. The costs to a municipality implementing the Shade Tree Disease Control Law, including removal or treatment from municipally or privately owned property, shall be deemed a "general levy" and must be included in all existing tax levy limitations.
T F
19. A tree inspector must have reason to believe that there are diseased trees on private property before he can inspect it.
T F
20. A disease control area need not be approved by the Department of Agriculture.
T F
21. A municipality may not adopt an ordinance which is more stringent than the rules and regulations of the Minnesota Department of Agriculture.
T F
22. Elm wood from healthy, weakened, dead, or damaged trees with no apparent bark beetle galleries may be moved at any time of the year to disposal or chipping sites.
T F
23. Certified municipal tree inspectors shall submit program plans for approval by the Commissioner by January 1st.
T F
24. A tree inspector may be decertified by the Commissioner if he fails to act competently or in the public interest in the performance of his duties.
T F
25. The planning, direction, and supervision of a municipal shade tree disease control program is the responsibility of the tree inspector.
T F
26. The Minnesota Department of Agriculture will determine compliance with the Shade Tree Disease Law through:
a. examination of records
b. periodic survey of a municipality
c. annual program review
d. all of the above
e. none of the above

- E
27. A municipality may provisionally appoint a tree inspector for:
- a. 3 months
 - b. 6 months
 - c. 9 months
 - d. 12 months
 - e. 18 months
28. After certification, which of the following is required of a tree inspector:
- a. annual re-examination
 - b. an interview with the Commissioner of Agriculture
 - c. annual attendance at one program of continuing education
 - d. all of the above
29. A shade tree, according to the rules and regulations, is defined as:
- a. any tree adjacent to or located on public property
 - b. maples, elms, oaks, and birch on public property
 - c. any oak or elm tree within a control area approved by the Commissioner
 - d. any tree on public or private property
 - e. maples, elms, oaks, and birch within a control area
30. According to the Shade Tree Disease Regulations, the generally accepted field symptoms of Dutch elm disease are:
- a. wilting or yellowing of leaves, or staining of wood under bark
 - b. wilting or yellowing of leaves, or staining of inner bark, or extensive loss of leaves
 - c. staining of wood under bark, extensive loss of leaves, or loss of bark
 - d. wilting or yellowing of leaves, or staining of outer bark
 - e. wilting, or staining of inner bark
31. What percentage of the cost of treating or removing diseased shade trees located on street terraces and boulevards may be assessed to the abutting private property:
- a. 0%
 - b. 25%
 - c. 50%
 - d. 75%
 - e. 100%
32. During the growing season, all elm trees must be checked for Dutch elm disease symptoms at least:
- a. once
 - b. twice
 - c. weekly
 - d. three times
 - e. four times
33. The Shade Tree Disease Control Law and related rules and regulations require that diseased trees be removed within how many days after notification.
- a. 5 days
 - b. 7 days
 - c. 20 days
 - d. 30 days
 - e. 60 days

34. Which of the following is not a true statement:
- a. Non-metropolitan municipalities may petition to come within the provisions of the Shade Tree Disease Control Law (M.S. 18.023).
 - b. Prior to April 15th, each municipality shall inspect all public and private properties for elm wood or logs that could serve as bark beetle breeding sites.
 - c. A special purpose park district organized under a city charter of the first class located in the metropolitan area shall maintain a Dutch elm disease control program.
 - d. Any county in the metropolitan area shall, for purposes of shade tree disease control, be considered a municipality for all county owned land and land outside of a municipality.
 - e. An unincorporated township is subject to the jurisdiction of the nearest adjacent municipality in the administration and maintenance of a shade tree disease control program.
35. By law, which of the following are considered to be shade tree diseases.
- a. Dutch elm disease caused by Ceratocystis ulmi, or Oak Wilt disease caused by Ceratocystis fagacearum
 - b. Nosema and Verticillium
 - c. Verticillium and Dothiorella
 - d. Fusarium and Dothiorella
 - e. Aspergillus and Rhizopus



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Shade Tree Program • Department of Agriculture

TREE INSPECTOR'S STUDY GUIDE

Dutch Elm

Dutch elm disease is caused by a fungus named *Ceratocystis ulmi*. It lives in the sap conducting tissue of the tree. The tree recognizes the fungus as something that is unhealthy to the tree, so it forms a dam in its conducting tissue. This dam stops the sap from flowing in the tree and the tree strangles itself. This fungus will infect and kill all varieties of elm trees.

There are two symptoms of Dutch elm disease. The first one is wilting of the leaves. These leaves will turn yellow and then brown in a few weeks. The second field symptom is brown staining or streaking under the bark. To find the brown stain, you must look at a branch that has wilted.

Dutch elm disease can be spread in two ways. The first way is through root grafts. The second way is by beetles. We will discuss root grafts first. A root graft is where the roots of two different trees have grown together. These root grafts form a natural bridge for the spores, or seeds, of Dutch elm disease to cross from one tree to another. The spores travel easily through the root grafts to infect healthy trees. If trees are growing closer together than 60 feet, they are usually grafted together.

There are two ways of stopping Dutch elm disease from spreading through root grafts. The first way is to use a mechanical trenching machine to cut the roots. This trench should be made 36-40 inches deep to make sure all of the roots are cut. This is the best method of breaking root grafts.

The second method of breaking root grafts is with a chemical. The chemical used is a soil sterilant called vapam. Vapam sinks down into the ground to kill the roots. It does not move up into the tree. The chemical is used by pouring it into one inch holes drilled into the ground halfway between the diseased and the healthy tree. These holes should be drilled at least 12 inches deep and 6 inches apart. Vapam is poured into the holes

and then the holes are covered up. It takes 10-14 days for the vapam to reach down far enough to kill the roots. Because it takes so long for the vapam to reach the roots, the diseased tree should not be cut down for two weeks.

The second way that Dutch elm disease can be spread is by beetles. There are two different beetles that carry the disease. They are the native elm bark beetle and the European elm bark beetle. They live in the sap conducting tissue of the trees. This is where the beetle picks up the spores of the fungus. When the beetle flies from one tree to the next, it carries the spores both on the inside and outside of its body. Both types of elm bark beetles feed on healthy elm trees and breed in dead and dying elm trees. They do not breed in healthy trees because the sap seems to drown the eggs. As soon as a tree dies, it dries enough to become a breeding site for the beetles. Here in Minnesota, one or the other of these beetles is emerging from the end of April through the end of October. When they emerge, they are ready to infest healthy trees. (This is why it is very important to remove dead and dying trees as soon as possible.)

Oak Wilt

Oak wilt is also a disease caused by a fungus. It has spores just like Dutch elm disease and can kill all the different varieties of oak trees. This disease is easier to control because the beetle that spreads oak wilt does not live in the tree. The beetle also cannot chew into the oak tree. It can only put the spores into a tree that already has a wound. It is important not to wound oak trees during May and June. This is the time the pressure pads are present.

Oak wilt spores are produced differently than Dutch elm disease spores. In Dutch elm disease the spores are produced in the conducting tissue of the tree. In oak wilt, the spores form on pressure pads produced under the

bark. These pressure pads grow between the bark and the wood of the diseased tree. They look something like bread mold. The spores grow on this pressure pad. As the pressure pad grows, it splits the bark and forces it away from the wood. The beetles come in and feed on the pressure pad. Then they fly away to feed on a healthy tree, taking the spores with them. It is important not to let these pressure pads form. If the tree is girdled as soon as you find it is diseased, the pressure pads will not form. Girdling greatly reduces the strength of the tree, so be careful where you use this practice.

Oak wood can be kept for firewood with the bark attached. It must be wrapped in 4 mil. (heavy) plastic for the months of May and June to keep the beetles out.

The main way that oak wilt is spread is through the roots by root grafts. It is important to break these root grafts to stop oak wilt from spreading. These root grafts can be broken in the same way as Dutch elm disease root grafts. The two methods are digging a trench around the tree or using a chemical soil sterilizer.

Red oak and white oaks react differently to the disease. Pressure pads form on red oaks but not on white oaks. This is why red oak should be girdled or cut up and split so that the bark dries out and the pressure pad cannot form. Red oaks are killed within a few weeks after they become infected. White oaks may take several years to die after they become infected.

Rules and Regulations

The state has money available to cities to help with a share of their sanitation costs. These sanitation costs include tree inspection costs, pruning costs, root graft treatment with vapam, and tree removal.

This is a review of some of the more important rules and regulations. It is important that you know all of the rules and regulations to conduct your Shade Tree Program effectively.

The following definitions are given to us by the law. A shade tree is only an oak or an elm. Green ash, hackberry, maples, and other trees are not shade trees. The state will not share the cost if you cut them down. A shade tree disease is only Dutch elm disease or oak wilt and not any other disease. A municipality is a town or city that has municipal powers. This also includes special park districts, counties, and non-profit cemeteries.

Each city must have a tree inspector. Cities may share tree inspectors if they want to. For the first six months of your city's shade tree program, a city may provisionally appoint a tree inspector. To become certified the tree inspector must pass a test given by the state. To remain certified, a tree inspector needs to attend one short course a year. This short course is put on by the University of Minnesota. If the tree inspector does not do his job, the state can take away his certification.

To have your city's Shade Tree Program accepted by the state, it must contain at least the following information. The first thing the city needs to do is to define a control area. This area is set up by the city. It is the area in which your city wishes to control Dutch elm disease and oak wilt disease. Some cities include a 1,000 foot buffer zone around their city, others will leave out a river bottom that goes through the middle of the city. The control area should be designed for your city. Inside of the control area, the city must pay for 100% of the cost of removing trees on parks and other public property. The city must also pay for at least 50% of the cost of removing trees on the boulevard.

The cities program plan contains important information. It is a plan of what the city is going to do, not what the city did last year. The program plan form is attached to the program application.

It is important to take good tree samples. Samples should be taken from the actively wilting or diseased part of the tree. If the samples are taken from a part with green leaves or dead brown leaves, the lab will

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not be able to grow the fungus. The sample is best when it is about twig size. This is 6 to 10 inches long and $\frac{1}{2}$ inch in diameter. This is about as big around as your little finger. These samples should be wrapped in a plastic bag, aluminum foil, or wax paper to keep them moist and sent to:

Shade Tree Disease Lab
618 State Office Building
St. Paul, MN 55155

Send the samples first class because second or third class takes up to four weeks. Do not send them to the University of Minnesota.

The sanitation part of the program is an important part. This starts early in the spring. Before April 15, the tree inspector should go around and make sure that all diseased trees from last year are cut down and that no one is storing elm logs with the bark on after April 15. The tree inspector may enter private property if you give the people notice. Check with your city attorney for the tree inspector's authority to enter private property.

The trees in each city's control area must be inspected two times. These two inspections should be done by July 1 and August 15. When a diseased tree is found, it must be taken down in 20 days. You should send homeowners a notice. They have 20 days after they receive the notice to cut the tree down. If the tree is not taken down in 20 days, the state will not pay the city for removing that tree. It is a good idea to break the root grafts first, but it is not necessary.

Now for a little bit on the disposal of elm wood. When the trees are taken to a disposal site, they must be disposed of within 72 hours. They can be chipped, buried, made into lumber, or debarked. If they are buried, they should be buried under six inches of dirt.

Reforestation is also an important part of your Shade Tree Program. The state has funds available for sharing the cost of replanting trees.

Page Six

The state will refund up to 50% or \$40 per tree, which ever is less. These trees can only be planted on public property. This money is for both the cost of the tree and the expense of planting it. It will not pay for the costs of watering or maintaining the trees after they are planted.

NAME : _____

ADDRESS: _____

_____ Zip: _____

WORK ADDRESS: _____

_____ Zip: _____

CITY REPRESENTING: _____

DATE: _____

Phone Number you can be reached at during the day: _____

PLEASE READ THE DIRECTIONS CAREFULLY.
FILL IN THE BLANKS OR CIRCLE THE CORRECT ANSWER.
DO NOT START THE TEST UNTIL YOU HAVE BEEN TOLD TO BEGIN.

DUTCH ELM DISEASE

Dutch elm disease is caused by the _____ *Ceratocystis ulmi*. It will attack and kill some/most/all varieties of elm. The first symptoms of the disease is _____ of the upper branches. Another symptom used especially in field diagnosis is _____.

There are two different bark beetles that can carry Dutch elm disease. The European elm bark beetle over winters in the _____ stage under the bark of dead or dying elm wood. Pupation occurs in spring and adult beetles emerge in _____ (month). After emergence, the adults fly to nearby elm trees to _____. Then the Adult beetle seeks a suitable breeding site such as _____. The egg tunnels of the European species run _____ the wood grain. A second generation of beetles can be produced in _____, _____, or _____.

The native elm bark beetle overwinters as _____ and _____. They become active in _____ and usually seek dead or dying elm material for _____. The egg tunnels of the native elm beetle run _____ the grain of the wood. This generation emerges in _____ and _____ and flies to healthy elms to feed.

When beetles emerge from diseased trees, they may have _____ both internally and externally. These _____ are transmitted through _____. If elm trees are within _____ feet of each other, they probably have grafted together.

OAK WILT

The casual agent of Oak Wilt is a _____. All species and varieties of oak tested have been found _____ to oak wilt. _____ are very susceptible and are killed rapidly. _____ varies from susceptible to resistant while _____ is reasonably resistant to the disease.

In red oaks, the most obvious symptom of wilting generally starts _____. The wilting rapidly covers the crown of the crown of the tree and the complete tree within _____. Leaf symptoms show the outer portion of the leaves turning _____ or _____. _____ in the outer sapwood is another indication of the disease. White oaks respond differently to oak wilt. The disease appears in spotty areas throughout the crown and it may take _____ to kill the tree.

The normal means of transmission of oak wilt disease is _____. The fungus does produce _____ that can cause the bark to split, exposing _____. These _____ can be picked up by sap-feeding beetles and transmitted to other oak trees with fresh wounds. Transmission of oak wilt can be successfully stopped by breaking the root grafts. This can be done by _____ and _____ means. Spores do not form on _____ oak, form rarely on _____ oak, and form readily on _____ oak. The spore mats form shortly after a tree wilts. If the tree wilted in June, the spore mats will form in _____. If the tree wilts in July or August, the spore mats will form in _____ or _____. _____ species of oak seem to be equally susceptible to infection by insect disseminated spores in _____ and _____ (month). Deep mechanical girdling of the tree trunk speeds drying of the wood. If done during early stages of disease, spores will/will not be produced.

RULES AND REGULATIONS

All municipalities within the metropolitan area should/should not administer and maintain shade tree disease control programs. Any dead or dying tree is/is not considered infected with Dutch elm disease or oak wilt and must be treated or removed in accordance with the provisions of the Shade Tree Disease Control Law. A municipal ordinance can/cannot require diseased trees to be removed later than the state laws. The State of Minnesota does/does not keep all of the records for a municipality. The inventory of a municipality should/should not be reported to the Department of Agriculture. Program plans are to be sent to the commissioner by _____ (date). Trees are to be surveyed at least _____ times a year. These surveys should be completed by _____ (Date) and _____ (date). Homeowners shall remove their trees _____ days after receiving notice. If they do not remove their trees, the municipality is/is not responsible for removing the trees. Root graft disruption is a recommended but not required practice. Trees within _____ feet of each other probably have root grafts that should be disrupted. Trees that have been removed and taken to a disposal site must be disposed of within _____ hours.

The tree inspector is hired by the _____ and certified by the _____. The municipality may/may not dismiss a tree inspector. The tree inspector should/should not identify all native tree species common to his work area. He is/is not responsible for the planning, direction, and supervision of a municipal Shade Tree Program. If a municipality cannot find a certified tree inspector, they may provisionally appoint a tree inspector for _____ months. To remain certified, a tree inspector must _____.

To participate in the Shade Tree Program, each municipality should/should not abide by the rules and regulations of M.S. 18.023. Your municipality can/cannot pass an ordinance that is less strict than the state law. Currently the State of Minnesota does/does not make grants to municipalities to subsidize the removal of trees on private property. Your municipality is required to pay certain sanitation

RULES AND REGULATIONS CON'T.

costs. These are _____% of the cost of removing trees on public property and a minimum of _____% of the cost of removing trees on the boulevards. A municipality can/cannot subsidize the removal or treatment of trees on private property. To finance the removal of diseased trees, a municipality of over 1,000 people may _____, or _____. A municipality of over 1,000 people may/may not reimburse people for in-kind services. The State offices will reimburse a municipality for up to ___% of its sanitation costs and up to _____% of its reforestation costs. The sanitation part of the grant reimburses municipalities for 1) _____, 2) _____, 3) _____, and 4) _____. The reforestation part of the grant reimburses municipalities for the expenses of _____ and _____.

In the second year of the program the replanting grant is limited to \$40 times the number of trees removed in the previous year. Payments for these grants are issued four times a year. Requests for these payments are due in the Shade Tree Office on _____, _____, _____, and _____.

LAB SECTION

There are four chemicals approved by EPA for use in a sanitation program. These chemicals are Lignasan, Arbotec, Vapam and Methoxychlor. 1) _____ is a soil sterilant used to break root grafts. 2) _____ is an insecticide used against the beetle, and 3) _____ and 4) _____ are fungistats used against the fungus.

There are two other trees that are easily confused with the elm tree. These trees are hackberry and ironwood. These three trees can be identified by the following definitions. The _____ has oval, doubly-toothed leaves, large spreading "feather duster" crown; bark in alternate layers of brown. The _____ has long pointed leaves with singly-toothed smooth margins; gray to brown warty bark (stucco bark). The _____ has oblong, doubly-toothed leaves, narrowed to a slender point with clusters of bladder-like seedbearing pods or hops.

There are approximately 40 different diseases that affect elm. Some of these diseases are easy to recognize and tell apart from Dutch elm disease and others are not. If you question whether the tree has Dutch elm disease, send a sample in to the lab. Samples should be taken from the _____ part of the tree. The size of the sample should be _____ inch(es) long and _____ inch(es) in diameter. The field diagnosis symptom of _____ should be present. These samples should be wrapped in _____ or _____ to maintain their freshness and mailed first class to:

If the tree is diseased and there are other elm trees within _____ feet, root graft control should be practiced. There are two different methods of breaking these grafts. They are: 1) _____ 2) _____.

I. DUTCH ELM DISEASE.

1. Dutch elm disease is caused by a fungus called:
 - a. Ceratocystis ulmi.
 - b. Verticillium albo-atrum.
 - c. Cytospora chrysosperma.
 - d. Dothiorella ulmi.
2. Which elm species is/are susceptible to Dutch elm disease?
 - a. American.
 - b. Siberian.
 - c. Slippery (red).
 - d. Rock.
 - e. All species.
3. Early symptoms of Dutch elm disease are:
 - a. Wilting of leaves usually accompanied by staining of wood.
 - b. Staining of wood only.
 - c. Bark staining and root grafting.
 - d. Wilting of leaves and prominent staining of bark.
4. Dutch elm disease can be transmitted by:
 - a. The elm leaf beetle, which is a leaf feeder.
 - b. The elm bark aphid, which is a sap-sucking insect.
 - c. The native and the European elm bark beetles, which are bark boring insects.
 - d. All of the above insects.
5. Early spring Dutch elm disease symptoms can be caused by:
 - a. The feeding of spore-carrying adult elm bark beetles.
 - b. The feeding of spore-carrying larvae of the elm bark beetle.
 - c. Appearance of carry-over infection from the previous year.
 - d. None of the above.
 - e. a and c.
6. Elm bark beetles breed in:
 - a. Healthy, elm trees.
 - b. Recently dead or dying elm trees left standing.
 - c. Bark-intact elm wood (limbs, branches, and remaining stump.)
 - d. Elm wood regardless of whether bark is tight or not.
 - e. b and c.
7. The Dutch elm disease fungus can be spread without beetles by:
 - a. Wind-blown spores.
 - b. Spores moving through root grafts.
 - c. Spores moving from wood piles through the soil to infect healthy roots.
 - d. Driving rains from spring and summer storms.

8. Late season Dutch elm disease can result from:
 - a. Root graft infection.
 - b. Second generation adult elm bark beetles.
 - c. Adult beetles emerging from elm logs in nearby woodpiles.
 - d. All of the above.

9. Mechanical trenching is used to disrupt root grafts. This type of trench should be:
 - a. 12 inches to 15 inches deep.
 - b. 24 inches to 28 inches deep.
 - c. 36 inches to 48 inches deep.
 - d. At least 60 inches deep.

10. Trees found having Dutch elm disease and any other bark-intact elm wood are rendered pest-risk free by:
 - a. Chipping.
 - b. Burning.
 - c. Debarking.
 - d. Burying.
 - e. Any or all of the above.

11. Which is necessary for positive confirmation of Dutch elm disease?
 - a. Wilting or flagging of leaves on an upper branch.
 - b. Test-positive results from a sample submitted to an approved Dutch elm disease laboratory.
 - c. Presence of the elm bark beetles in the diseased tree.
 - d. Presence of the fungi pressure pad beneath the bark.

12. The primary emphasis in any Dutch elm disease control program should be:
 - a. Vapam treatment of root grafts.
 - b. Arbotect injection.
 - c. A sanitation program. *Handwritten: 2000-2001*
 - d. Dursban treatment of all trees.

13. Debarking all bark-intact elm wood, whether from diseased elm trees or not, is necessary because:
 - a. It eliminates further root graft transmission.
 - b. It destroys elm bark beetle breeding sites.
 - c. Because it eliminates fungal spore mat formation.
 - d. Because it keeps the wood moisture content high.

14. The key elements in a successful sanitation program are:
 - a. Detection, injection, girdling, and disposal.
 - b. Early detection, condemnation, girdling, and prompt disposal.
 - c. Detection, isolation (root graft disruption), utilization, and disposal.
 - d. Early detection, isolation (root graft disruption), prompt removal, and proper disposal.

- 15. Spraying Dursban on the lower portion of healthy elms in September is meant to:
 - a. Offer late season protection against the fungus.
 - b. Slowly soak into the wood of the tree.
 - c. Kill the native elm bark beetle as it burrows into the bark of an elm tree to overwinter.
 - d. Kill either the native or the European bark beetles as they seek a breeding site beneath the bark.

- 16. ^{Pruning of a Dutch elm diseased tree} Pruning of a Dutch elm diseased tree may be successful if:
 - a. All pruning equipment is disinfected.
 - b. The wilting branches are taken out and disposed of.
 - c. The flagging branch, if it accounts for less than five percent of the total crown, is eliminated along with eight to ten feet of stain-free wood below the visible staining.
 - d. Done only in the late fall or winter to prevent excessive sap flow from the wound.

II. OAK WILT.

- 17. Which of the following oak species is least susceptible to oak wilt?
 - a. Red oak.
 - b. Northern pin oak.
 - c. White oak.
 - d. Black oak.
- 18. The fungus causing oak wilt is:
 - a. Penicillium digitatum.
 - b. Ceratocystis fagacearum.
 - c. Cytospora chrysosperma.
 - d. Fungatum quercus.
- 19. Overland transmission of the oak wilt fungus takes place by means of:
 - a. Root grafts.
 - b. Picnic beetles.
 - c. Wind-blown spores.
 - d. Rain-splashed spores.
- 20. The most common spread of the oak wilt fungus occurs by:
 - a. Spores moving through root grafts.
 - b. The activity of sap-feeding picnic beetles.
 - c. Wind-blown spores following the production of fungal spore mats and pressure pads.
 - d. None of the above.

21. In the most susceptible oak species, the most obvious, early symptoms in a tree infected with oak wilt are:
- The wilting of uppermost leaves followed by the rapid wilting of the entire crown.
 - The gradual browning of leaves from leaf tip toward leaf base.
 - The appearance of fungal spore mats.
 - a and b.
 - b and c.
22. Fungal spore mat formation on infected red oak wood can be prevented by:
- Vapam treatments.
 - Girdling the trunk or debarking the infected oak wood.
 - A methoxychlor treatment to kill sap-feeding wood insects.
 - Cutting down the infected tree immediately.
23. Pruning of any oak trees should be avoided during May and June because:
- Picnic beetles carrying the fungal spores are attracted to fresh wounds.
 - Pruning stimulates root grafting.
 - Wind-blown spores could land on these fresh wounds.
 - Pruning diseased elm wood is a higher priority.
24. In dormant season surveys, infected red oaks that may give rise to spores the following spring:
- Have no leaves and loose, peeling bark.
 - Have overwintering beetle populations beneath the majority of the bark.
 - Have leaves of tan or light brown instead of the more normal rich red-brown.
 - Still have intact bark and stained wood that may give off an odor of fermentation.
 - c and d.
25. Infected red oaks wilting in September must be removed before the following spring because:
- They will leaf out in the spring and avoid disease detection.
 - They will form spore mats during October and November.
 - Root graft disruption is not as effective in controlling oak wilt.
 - They probably will form fungal spore masses which are attractive to sap-feeding beetles.
26. A red oak that dies of oak wilt in June will usually produce spore masses under the bark in:
- July.
 - September.
 - April.
 - June of the following year.

- 27. Infected red oaks dead for longer than _____ are considered safe because the wood is too dry for spore mats to form under the bark.
 - a. 6 months.
 - b. 5 weeks.
 - c. 10 days.
 - d. 1 year.

- 28. After the chemical has been applied to disrupt the root grafts, when should the infected tree be removed?
 - a. Same day as when the chemical is applied.
 - b. The day following the chemical application.
 - c. Removal is never required once root grafts have been disrupted.
 - d. The infected tree should not be removed sooner than two weeks following the chemical application.

- 29. Proper sanitation procedures for an infected red oak near healthy red oak trees include:
 - a. Root graft disruption and tree removal.
 - b. Root graft disruption and tree girdling.
 - c. Tree removal and stump debarking.
 - d. Root graft disruption, tree removal, and stump debarking.

- 30. Proper sanitation procedures for an infected white oak within 30 feet of other healthy white oak trees include:
 - a. Root graft disruption and tree removal.
 - b. No special sanitation practices.
 - c. Root graft disruption.
 - d. Root graft disruption, tree removal, and stump debarking.

- 31. Which of the following procedures is used to chemically disrupt root grafts?
 - a. Dursban sprayed around base of the tree.
 - b. Ziram poured into a shallow surface trench.
 - c. Methoxychlor sprayed over the area in question.
 - d. Arbotect injected into the ground.
 - e. Vapam poured into strategically located holes that have been drilled into the ground.

- 32. Spores of the oak wilt fungus form on:
 - a. Bur and red oak.
 - b. Elm and red oak.
 - c. Red and pin oak.
 - d. Red, bur, and white oak.

III. RULES AND REGULATIONS.

(Questions 33 - 38 are T-F)

- 33. A tree inspector does not need permission to enter private property if public notice has been given.

34. The Minnesota Department of Agriculture will designate and distribute control area program plans to municipalities.
35. The State of Minnesota does not subsidize the removal of trees on public property.
36. A municipality cannot subsidize the removal or treatment of trees on private property.
37. A tree inspector must be able to identify all native tree species with or without leaves, and all felled trees with bark intact.
38. Confirmation of diseased trees can only be made by laboratories recognized by the Commissioner of Agriculture.

(Multiple Choice)

39. A municipality may appoint a provisional tree inspector for:
 - a. 3 months.
 - b. 6 months.
 - c. 9 months.
 - d. 15 months.
40. After passing the certification test, which is required of a tree inspector?
 - a. Annual re-examination.
 - b. A personal interview with the Commissioner of Agriculture.
 - c. Annual attendance at one program of continuing education.
 - d. a or c.
41. A shade tree, according to the Rules and Regulations, is defined as:
 - a. Any tree located on public property.
 - b. Maple, elm, oak, and ash trees on public property.
 - c. Any oak or elm tree within a control area approved by the Commissioner of Agriculture.
 - d. Any tree on public or private property.
 - e. Maple, elm, oak, and ash trees within a designated control area.
42. According to the Rules and Regulations the generally accepted field symptoms of Dutch elm disease are:
 - a. Wilting or yellowing of leaves, and staining of wood under bark.
 - b. Wilting or yellowing of leaves, staining of inner bark, and extensive loss of leaves.
 - c. Staining of wood under bark, extensive loss of leaves, and loss of bark.
 - d. Wilting or yellowing of leaves, and staining of outer bark.

- 43. The Shade Tree Program Rules and Regulations require that all high risk trees be removed within _____ days of notification.
 - a. 5
 - b. 7
 - c. 20
 - d. 30
 - e. 60

- 44. Elm wood that can be considered pest-risk free has been:
 - a. Treated with an insecticide to kill all insects.
 - b. Treated with a fungicide to kill all fungi.
 - c. Debarked, chipped, buried, or burned.
 - d. a and c.

- 45. Bark-intact oak wood from infected red oaks:
 - a. Can never be brought into a disease control area to be used or stored as firewood.
 - b. Is regulated by a Minnesota Department of Agriculture quarantine.
 - c. Must be wrapped in 4 mil plastic from May 1 until July 1 if the wood still harbors the fungus in a reproductive stage.
 - d. Is controlled by issuing firewood permits.

- 46. Bark-intact elm wood can be stockpiled:
 - a. Anywhere from September 15 through April 1.
 - b. Only if a municipal ordinance specifically allows the storage of bark-intact elm wood from September 15 through April 1.
 - c. Any time at an approved elm wood disposal site.
 - d. Any time as long as the homeowner obtains a firewood permit from the municipality.

- 47. The quarantine prohibits the movement of bark-intact elm wood unless:
 - a. The wood is being hauled to an approved wood disposal or utilization site.
 - b. The wood is intended for industrial use, not to include firewood.
 - c. The wood is being brought into a municipality or control area after September 15.
 - d. All of the above.
 - e. a and b.

- 48. By April 1 of each year, a municipal tree inspector must have:
 - a. Inspected all public and private properties for bark-intact elm wood.
 - b. Verified the removal of any remaining low risk elm trees.
 - c. Verified the removal of infected red oak trees.
 - d. All of the above.
 - e. a and b.

49. A municipality must employ a tree inspector and:
- a. Ensure that certification as defined by the Rules and Regulations is obtained.
 - b. Must notify the Commissioner of Agriculture of the tree inspector's appointment.
 - c. Must notify the Commissioner of Agriculture of any change in tree inspector personnel.
 - d. All of the above.
50. A provisional appointment of a tree inspector:
- a. Must be approved by the Commissioner of Agriculture upon receipt, in writing, of the name of the provisional appointee.
 - b. Cannot be extended beyond six months.
 - c. Will run six months, at which time the provisional appointee must take the tree inspector examination to become certified.
 - d. b and c.
 - e. All of the above.

IV. LABORATORY.

51. The chemical(s) used in the curative or preventive injection of elm trees:
- a. Dursban.
 - b. Arbotect.
 - c. Vapam.
 - d. Methoxychlor.
 - e. Pentachlorophenol.
52. The chemical(s) used to kill plant tissue and thereby disrupt root grafts:
- a. Arbotect.
 - b. Dursban.
 - c. Methoxychlor.
 - d. Lignasan.
 - e. Vapam.
53. An insecticide that may be used to control the population of the native elm bark beetle is:
- a. Arbotect.
 - b. Ferbam.
 - c. Dursban.
 - d. Lignasan.



54. For laboratory confirmation of Dutch elm disease or oak wilt, three or four samples per tree should be cut from actively wilting branches. These samples should be _____ in length and _____ in diameter.

- a. 1/4 to 1/2 inch; 1/4 to 1/2 inch.
- b. 1/4 to 1/2 inch; 3 to 4 inches.
- c. 3 to 4 inches; 1/4 to 1/2 inch.
- d. 6 to 10 inches; 1 1/2 to 2 inches.

55. An insecticide sprayed on stored bark-intact elm wood to eliminate this wood from serving as an elm bark beetle breeding site is:

- a. Ferbam.
- b. Dursban.
- c. Methoxychlor.
- d. None of the above.

56. The egg galleries of the European elm bark beetle run:

- a. Parallel with the wood grain.
- b. Perpendicular to the wood grain.
- c. At random angles to the direction of the wood grain.
- d. 75 percent parallel and 25 percent perpendicular to the wood grain.

57. The elm wood sample is labelled as:

- a. F
- b. G
- c. I
- d. J
- e. ~~X~~ Y

58. The red oak wood sample is labelled as:

- a. F
- b. G
- c. Z
- d. W
- e. ~~X~~ Y

59. The elm wood sample is labelled as:

- a. C
- b. D
- c. F
- d. K
- e. L

60. The white oak wood sample is labelled as:

- a. C
- b. F
- c. I
- d. S
- e. Z

3500B
0036B

I. DUTCH ELM DISEASE.

1. Dutch elm disease is caused by:
 - a. a bacteria.
 - b. native and European elm bark beetles.
 - c. a virus, originally diagnosed in Holland.
 - d. a fungus.

2. The Dutch elm disease causal agent is called:
 - a. Ceratocystis ulmi.
 - b. Verticillium albo-atrum.
 - c. Cytospora chrysosperma.
 - d. Dothiorella ulmi.

3. Which elm species is/are susceptible to Dutch elm disease?
 - a. American.
 - b. Siberian.
 - c. Slippery (red).
 - d. Rock.
 - e. All species.

4. Early symptoms of Dutch elm disease are:
 - a. Wilting of leaves usually accompanied by staining of wood.
 - b. Staining of wood only.
 - c. Bark staining and root grafting.
 - d. Wilting of leaves and prominent staining of bark.

5. Dutch elm disease can be transmitted by:
 - a. The elm leaf beetle, which is a leaf feeder.
 - b. The elm bark aphid, which is a sap-sucking insect.
 - c. The native and the European elm bark beetles, which are bark boring insects.
 - d. All of the above insects.

6. Early spring Dutch elm disease symptoms are most likely:
 - a. Nothing more than normal winterkill in elms.
 - b. Confused with the total defoliation caused by the cankerworm.
 - c. The appearance of carry-over infection from the previous year.
 - d. None of the above.

7. Elm bark beetles breed in:
 - a. Healthy elm trees.
 - b. Recently dead or dying elm trees which are still standing.
 - c. Bark-intact elm wood (limbs, branches, and remaining stump.)
 - d. Elm wood regardless of whether bark is tight or not.
 - e. b and c.

8. Other than the elm bark beetle, Dutch elm disease can be spread by:
 - a. Wind-blown spores.
 - b. The movement of the disease organism through root grafts.
 - c. Spores moving from wood piles through the soil to infect healthy roots.
 - d. The action of driving rains during spring and summer storms.
9. Late season Dutch elm disease can result from:
 - a. Root graft infection.
 - b. Second generation adult elm bark beetles.
 - c. Adult beetles emerging from elm logs in nearby woodpiles.
 - d. All of the above.
10. Mechanical trenching is used to disrupt root grafts. This type of trench should be:
 - a. 12 inches to 15 inches deep.
 - b. 24 inches to 28 inches deep.
 - c. 36 inches to 48 inches deep.
 - d. At least 60 inches deep.
11. Trees found having Dutch elm disease and any other bark-intact elm wood is rendered pest-risk free by:
 - a. Chipping, debarking, burning, or burying.
 - b. Stockpiling them at the nearest approved utilization site.
 - c. Cutting them into firewood lengths, and stacking them for air drying.
 - d. All of the above.
12. What is necessary for positive confirmation of Dutch elm disease?
 - a. Two or more persons spotting the specific wilted or flagging leaves on an upper branch.
 - b. Test-positive results from a sample submitted to an approved Dutch elm disease laboratory.
 - c. Presence of the elm bark beetles in the diseased tree.
 - d. Presence of the fungi pressure pad beneath the bark.
13. The primary emphasis in any Dutch elm disease control program should be:
 - a. Immediate Vapam treatment of root grafts.
 - b. Arbotect injection of highly valuable trees.
 - c. A sanitation program: the prompt detection, removal and disposal of diseased trees.
 - d. Dursban treatment of all trees.
14. Debarking all bark-intact elm wood, whether from diseased elm trees or not, is necessary because:
 - a. It eliminates further root graft transmission.
 - b. It destroys elm bark beetle breeding sites.
 - c. It eliminates spore mat formation.
 - d. It keeps the wood moisture content high.

- E
15. The key elements in a successful sanitation program are:
 - a. Detection, injection, girdling, and disposal.
 - b. Early detection, condemnation, girdling, and prompt disposal.
 - c. Detection, isolation (root graft disruption), utilization, and disposal.
 - d. Early detection, isolation (root graft disruption), prompt removal, and proper disposal.
 16. Spraying Dursban on the lower portion of healthy elms in September is meant to:
 - a. Offer late season protection against secondary pathogens.
 - b. Slowly soak into the wood of the tree, thereby slowing the spread of the disease.
 - c. Kill the native elm bark beetle as it burrows into the bark of an elm tree to overwinter.
 - d. Kill either the native or the European bark beetles as they seek a breeding site beneath the bark.
 17. Therapeutic pruning of a Dutch elm diseased tree may be successful if:
 - a. The disease did not enter the trees vascular system through a root graft.
 - b. The wilting branches are taken out and disposed of.
 - c. The flagging branch, if it accounts for less than five percent of the total crown, is eliminated along with eight to ten feet of stain-free wood below the visible staining.
 - d. Done only in the late fall or winter to prevent excessive sap flow from the wound.
 - e. a and c.

II. OAK WILT.

18. Which of the following oak species is least susceptible to oak wilt?
 - a. Red oak.
 - b. Northern pin oak.
 - c. White oak.
 - d. None. All are equally susceptible.
19. Overland transmission of oak wilt takes place by means of:
 - a. Root grafts.
 - b. Picnic beetles.
 - c. Wind-blown spores.
 - d. Rain-splashed spores.
20. The most common spread of oak wilt occurs by:
 - a. The disease moving through root grafts.
 - b. The activity of sap-feeding picnic beetles.
 - c. Wind-blown spores following the production of spore mats and pressure pads.
 - d. The presence of man and his activities.

21. In the most susceptible oak species, the earliest and most obvious symptoms in a tree infected with oak wilt are:
- The wilting of uppermost leaves followed by the rapid wilting of the entire crown.
 - The gradual browning of leaves from leaf tip toward leaf base.
 - The appearance of spore mats.
 - a and b.
 - a and c.
22. Spore mat formation on infected red oak wood may be prevented by:
- Vapam treatments.
 - Debarking the infected oak wood.
 - A methoxychlor treatment to kill sap-feeding wood insects.
 - Cutting down the infected tree immediately.
23. Pruning of any oak trees should be avoided during May and June because:
- Picnic beetles, who carry the spores, are attracted to these fresh wounds.
 - Pruning stimulates root grafting.
 - Wind-blown spores could land on these fresh wounds.
 - Pruning diseased elm wood is a higher priority.
24. Infected red oaks wilting in September must be removed before the following spring because:
- They may leaf out in the spring and avoid disease detection.
 - They may form spore mats during October and November.
 - Root graft disruption is not as effective in controlling oak wilt as it is in controlling Dutch elm disease.
 - They probably will form spore mats which are very attractive to sap-feeding beetles.
25. A red oak that dies of oak wilt in June will usually produce spore masses under the bark in:
- July.
 - September-October of the same year.
 - April of the following year.
 - June of the following year.
26. After the chemical has been applied to disrupt the root grafts, when should the infected tree be removed?
- The same day that the chemical is applied.
 - The day following the application of the chemical.
 - Removal is never required once the root grafts have been disrupted.
 - The infected tree should not be removed sooner than two weeks following application of the chemical.

- E
27. Proper sanitation procedures for an infected red oak near (let's say approximately 20 feet) healthy red oak trees include:
 - a. Immediate and radical (extensive) therapeutic pruning to save the tree.
 - b. Immediate tree removal to stop the spread of the disease.
 - c. Tree removal and stump debarking.
 - d. Root graft disruption, tree removal, and stump debarking.

 28. Proper sanitation procedures for an infected white oak within 20 feet of other healthy white oak trees include:
 - a. Root graft disruption, and tree removal if it poses a safety hazard.
 - b. No special sanitation practices.
 - c. Root graft disruption, immediate tree removal, and disposal.
 - d. Root graft disruption, tree removal, and a follow-up insecticide spray treatment.

 29. Pressure pads on infected, dying red oak trees:
 - a. Rupture the bark to expose the spore mass.
 - b. Produce a fragrance that attracts the picnic beetles.
 - c. Form only when the wood moisture content is still high enough.
 - d. a and c.
 - e. a, b, and c.

 30. The pressure pads and spore mass of the oak wilt disease form on:
 - a. Red oak (or the red oak family).
 - b. White oak (or the white oak family).
 - c. The formations occur most readily on red oak but will grow on bur and white oak as well.
 - d. Any hardwood if the wood moisture content is right, but are most apt to form on red oak.

III. RULES AND REGULATIONS.

(Questions 31 through 38 are True/False.)

31. A tree inspector does not need to specifically ask for permission to enter private property if public notice has been given.
32. The Minnesota Department of Agriculture will designate and distribute control area program plans to each municipality.
33. A municipality cannot adopt an ordinance that is more stringent than the Rules and Regulations of the Minnesota Department of Agriculture.
34. A municipality cannot subsidize the removal or treatment of trees on private property.
35. Positive confirmation of diseased trees can only be made by submitting samples for testing to a laboratory recognized by the Commissioner of Agriculture.

36. A Dutch elm disease control area need not be approved by the Minnesota Department of Agriculture.
37. High risk elms are those trees that are dead, barren, or have extensive wilt (30 percent or more of crown is wilted or defoliated).
38. By December 1st, each municipality must submit to the Commissioner of Agriculture a yearly report containing a summation of shade tree disease control activities.

(Multiple Choice)

39. A municipality may appoint a provisional tree inspector for:
 - a. 3 months.
 - b. 6 months.
 - c. 9 months.
 - d. 15 months.
40. A shade tree, according to the Rules and Regulations, is defined as:
 - a. Any tree located on public property.
 - b. Maple, elm, oak, and ash trees on public property.
 - c. Any oak or elm tree within a control area approved by the Commissioner of Agriculture.
 - d. Any tree on public or private property.
 - e. Maple, elm, oak, and ash trees within a designated control area.
41. According to the Rules and Regulations, the generally accepted field symptoms of Dutch elm disease are:
 - a. Wilting or yellowing of leaves, and staining of wood under bark.
 - b. Wilting or yellowing of leaves, staining of inner bark, and extensive loss of leaves.
 - c. Staining of wood under bark, extensive loss of leaves, and loss of bark.
 - d. Wilting or yellowing of leaves, and staining of outer bark.
42. The Shade Tree Program Rules and Regulations require that all high risk trees be removed within _____ days of notification.
 - a. 5
 - b. 7
 - c. 20
 - d. 30
 - e. 60
43. Elm wood can be considered pest-risk free if it has been:
 - a. Treated with an insecticide to kill all wood boring insects.
 - b. Treated with a fungicide to kill all fungi.
 - c. Debarked or chipped.
 - d. Hauled "as is" out of the disease control area.

- E
44. Bark-intact oak wood from infected red oaks:
 - a. Can never be brought into a disease control area to be used or stored as firewood.
 - b. Is regulated by a Minnesota Department of Agriculture quarantine.
 - c. Must be wrapped in 4 mil plastic from May 1 until July 1 if the wood still harbors the fungus in a reproductive stage.
 - d. Must be controlled by issuing firewood permits.

 45. Bark-intact elm wood can be stockpiled:
 - a. In any municipality from September 15 through April 1.
 - b. Only if a municipal ordinance specifically allows the storage of bark-intact elm wood from September 15 through April 1.
 - c. Any time at an approved elm wood disposal site.
 - d. Any time as long as the homeowner obtains a firewood permit from the municipality.

 46. By April 1 of each year, a municipal tree inspector must have:
 - a. Inspected all public and private properties for stockpiled bark-intact elm wood.
 - b. Verified the removal of any remaining low risk elm trees.
 - c. Verified the removal of previously infected red oak trees.
 - d. All of the above.
 - e. a and b.

 47. A municipality must employ a tree inspector and:
 - a. Make sure that their tree inspector is currently certified as defined by the Rules and Regulations.
 - b. Must notify the Commissioner of Agriculture of the tree inspector's appointment.
 - c. Must notify the Commissioner of Agriculture of any change in their tree inspector personnel.
 - d. All of the above.

 48. During the growing season all elm trees must be checked for Dutch elm disease symptoms:
 - a. At least once - prior to June 1.
 - b. At least twice - by June 15 and by September 15.
 - c. Weekly - by Wednesday for removal by the following Friday.
 - d. At least three times - by June 15, July 15, and August 15.
 - e. At least four times - by April 15, June 15, July 15, and August 15.

 49. The chemical used in the curative or preventive injection of elm trees:
 - a. Dursban.
 - b. Arbotect.
 - c. Vapam.
 - d. Methoxychlor.
 - e. Pentachlorophenol.

50. The chemical used to kill plant tissue and thereby disrupt root grafts:
- Arbotect.
 - Dursban.
 - Methoxychlor.
 - Lignasan.
 - Vapam.
51. An insecticide that may be used to control the population of the native elm bark beetle is:
- Arbotect.
 - Ferbam.
 - Dursban.
 - Lignasan.
52. For laboratory confirmation of Dutch elm disease or oak wilt, three or four samples per tree should be cut from actively wilting branches. These samples should be _____ in length and _____ in diameter.
- 1/4 to 1/2 inch; 1/4 to 1/2 inch.
 - 1/4 to 1/2 inch; 3 to 4 inches.
 - 6 to 10 inches; 1/4 to 1/2 inch.
 - 1 to 2 inches; roughly one inch.
53. An insecticide sprayed on stored bark-intact elm wood to eliminate this wood from serving as an elm bark beetle breeding site is:
- Ferbam.
 - Dursban.
 - Methoxychlor.
 - None of the above.
54. The egg galleries of the European elm bark beetle run:
- Parallel with the wood grain.
 - Perpendicular to the wood grain.
 - At random angles to the direction of the wood grain.
 - 75 percent parallel and 25 percent perpendicular to the wood grain.
55. Which of the following procedures is used to chemically disrupt root grafts?
- Dursban sprayed around base of the tree.
 - Vapam poured into a shallow surface trench.
 - Methoxychlor sprayed over the area in question.
 - Arbotect injected into the ground.
 - Vapam poured into strategically located holes that have been drilled into the ground.

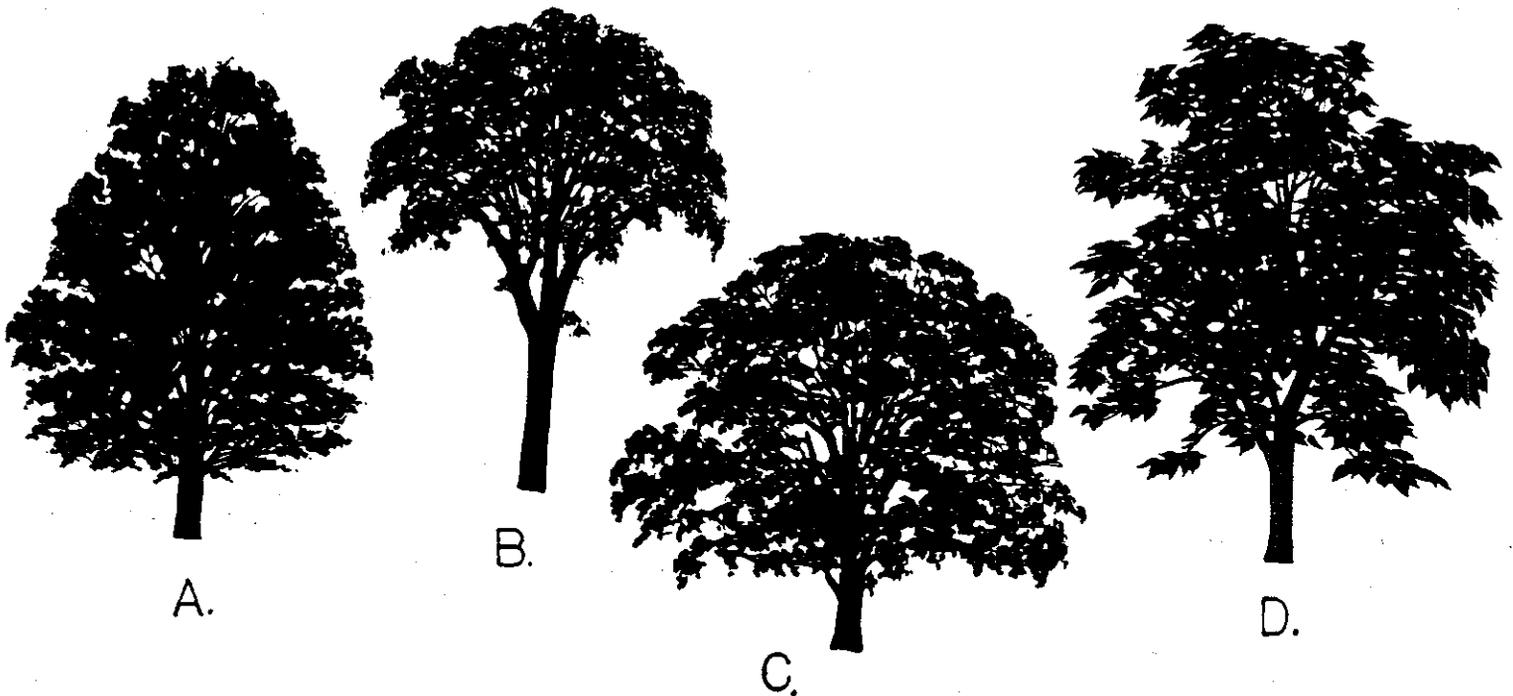
3500B
0036B

TREE AND WOOD IDENTIFICATION

The next 10 questions refer to the wood pile located in the Classroom. You are to identify each piece of wood. If the piece of wood is elm wood, mark "a" on your answer sheet. If the piece of wood is oak, mark "b" and if it any other specie, mark "c" on the answer sheet.

- 56. Log #56 _____
- 57. Log #57 _____
- 58. Log #58 _____
- 59. Log #59 _____
- 60. Log #60 _____
- 61. Log #61 _____
- 62. Log #62 _____
- 63. Log #63 _____
- 64. Log #64 _____
- 65. Log #65 _____

66. Which of the following silhouettes shown below is the American Elm?



67. Which of the following trees has wood cells known as "rays", easily visible when looking at a cross section?

- a. Norway Maple
- b. Green Ash
- c. Red Oak
- d. American Elm
- e. Honeylocust

68. Looking at the slide on the screen, which specie of tree does this leaf sample represent?
- a. American Elm
 - b. Red Oak
 - c. Green Ash
 - d. Red Maple
 - e. American Linden
69. Is the specie depicted on the slide in question #68 susceptible to
- a. Oak Wilt
 - b. Dutch elm disease
 - c. both a & b
 - d. none of the above
70. Which of the following trees can be identified by the alternating layers of light and dark colored bark?
- a. American Elm
 - b. Siberian (or Chinese) Elm
 - c. Red (or Slippery) Elm
 - d. All of the above
 - e. a and b
 - f. b and c
71. The buds on an Elm twig are arranged
- a. opposite
 - b. alternate
 - c. whorled
72. The buds on an Oak twig are arranged
- a. alternate
 - b. opposite
 - c. whorled
73. Elm leaves are what general type of leaf structure?
- a. Pinnately Compound
 - b. Palmately Compound
 - c. Simple
 - d. Twice Compound
74. Oak leaves are what general type of leaf structure?
- a. Simple
 - b. Palmately Compound
 - c. Pinnately Compound
 - d. Twice Compound

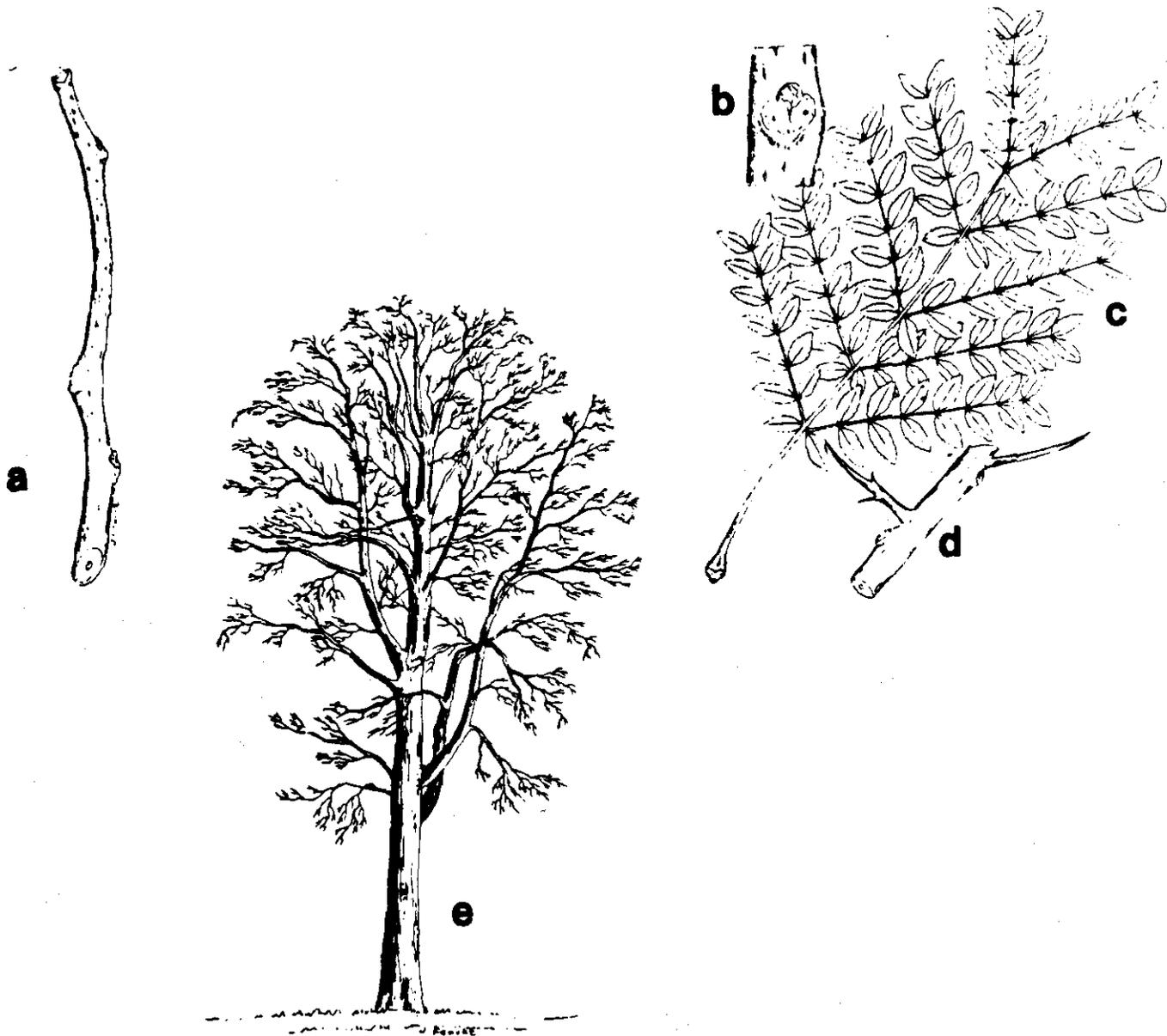
The next 6 questions refer to the tree diagrams labeled "Specie A" through "Specie F" at the end of the test. For each question, mark the letter (or letters) of the diagram (or diagrams) which correctly identifies the specie listed. A question may have more than one correct answer. Be sure that you mark all of the correct letters on your answer sheet.

75. Which specie is Green Ash?
76. Which specie is Red Oak?
77. Which specie is susceptible to Oak Wilt?
78. Which specie is Norway Maple?
79. Which specie is in the White Oak family?

80. Specie "D" is which of the following trees?
 - a. Cottonwood
 - b. Norway Maple
 - c. American Elm
 - d. Littleleaf Linden
 - e. Hackberry

GO OUT AND CELEBRATE! YOU DESERVE IT!

SPECIE F



a — terminal portion of winter twig; b — close-up of lateral bud; c — leaf; d — thorns, to 4" long;
e — growth habit.

MINNESOTA DEPARTMENT OF AGRICULTURE

SHADE TREE PROGRAM
90 West Plato Boulevard
St. Paul, MN 55107

TREE INSPECTORS ALTERNATIVE EXAMINATION

Date Sent

Mail Before

NAME _____

TELEPHONE NUMBER _____

TEST SCORE MAILING ADDRESS:

Name

Street

City State Zip Code

PART 1: DUTCH ELM DISEASE

A. Answer each of the following questions briefly and concisely in the spaces provided.

1. Root grafts:

a. What are root grafts? _____

b. What role do root grafts play in the spread of Dutch elm disease?

c. By what methods can root graft transmission be controlled? _____

2. Please answer the following questions concerning the life cycle of the European elm bark beetle.

a. Where does this beetle deposit its eggs? _____

b. Where does this beetle feed as an adult? _____

c. How and where does this beetle overwinter? _____

3. Why is it important for a municipality to eliminate dead or dying elm branches and trees, and elm firewood, from a control area?

4. Why is debarking of elm wood and stumps important for good sanitation?

B. DUTCH ELM DISEASE

Circle either TRUE T or FALSE F for each of the following statements concerning Dutch elm disease.

- 1. The major vector of Dutch elm disease in northern Minnesota is the smaller European elm bark beetle. T F
- 2. The causative agents of Dutch elm disease are fungal spores deposited in the water conducting vessels of healthy trees. T F
- 3. An elm tree with Dutch elm disease usually survives for a year or more after infection. T F
- 4. Bark beetles overwintering at the base of healthy elm trees are a common cause of root graft transmission of Dutch elm disease the following spring. T F
- 5. All bark removed from dead or dying elm wood must be burned or buried to prevent breeding by elm bark beetles. T F
- 6. Elm trees damaged by lightning or wind are not usually used for breeding by bark beetles unless they are first infected with Dutch elm disease. T F
- 7. European and native bark beetles can both be found breeding in the same elm log. T F
- 8. The primary concern in the rapid removal of high risk trees is control of root graft transmission. T F
- 9. High risk trees in spring left standing in July can give rise to a second generation of beetles by July 15. T F
- 10. Brown streaks in the sapwood of infected elm branches are characteristic symptoms of Dutch elm disease, but laboratory culturing is necessary for positive identification. T F

PART II: OAK WILT

A. Answer each of the following questions or complete the statements briefly and concisely in the spaces provided.

1. What role do root grafts play in the spread of oak wilt?

2. Describe the symptoms of oak wilt on:

a. Leaves: _____

b. The entire tree: _____

3. Fungal pressure pads (spore mats) of the oak wilt fungus can be a cause of overland spread of oak wilt.

a. On which family of oaks can these form? _____

b. Explain how insects can spread oak wilt from these pressure pads:

c. List three methods you could use to prevent spore mat formation on recently dead or dying oaks or oak wood (logs and stumps):

1. _____

2. _____

3. _____

d. Why should pruning of oaks be avoided in May and June?

B. OAK WILT

Circle either TRUE T or FALSE F for each of the following statements concerning oak wilt.

- 1. No red oaks have been known to recover after infection by oak wilt fungus. T F
- 2. Leaves retained by red oaks killed by oak wilt may be used to detect infected trees even during winter. T F
- 3. Field symptoms of oak wilt in red oaks include flagging of one or more branches in the crown and the obvious presence of beetles around the tree. T F
- 4. Oak wilt infections in red oak stands tend to be scattered throughout the entire stand. T F
- 5. Red oaks killed by oak wilt if left standing are generally too dry for spore production after 1 year. T F
- 6. The oak wilt fungus may survive for years in root systems of infected trees which have fused to adjacent oak roots. T F
- 7. Black oak trees are especially resistant to infection by the oak wilt fungus. T F
- 8. Disease diagnosis of oak wilt on white oak trees can be complicated by such factors as drought, construction and insect damage. T F
- 9. Mechanical trenching between diseased and healthy oaks provides the best means of stopping root graft transmission of oak wilt. T F
- 10. Overland transmission of oak wilt in June and July commonly results from infection by wind-blown spores. T F

PART III: RULES AND REGULATIONS

A. Dutch elm disease control. (R and R pages 3-5)

1. Define a high risk elm tree: _____

a. By what date must such trees be identified and marked? _____

b. Briefly describe the removal policy for high risk elm trees:

2. Briefly describe the removal policy for low risk elm trees:

3. Elm firewood:

a. By what date must elm firewood stockpiles be inspected? _____

b. By what date must elm firewood stockpiles be removed and properly disposed of? _____

c. Elm firewood stockpiling may be permitted between September 15 and April 1 of the following year only if a municipality follows specified guidelines. Describe these guidelines:

B. Oak wilt control. (R and R pages 5-6)

1. Oaks wilting during July and August must be identified, marked and removed by what date the following year? _____

a. To which oak family does this apply? _____

b. List the common names for those trees included in this family:

1. _____

2. _____

3. _____

4. _____

- 2. Describe and explain the appropriate treatment of red oak stumps after the removal of an infected tree:

C. Sanitation grants (Public property only). (R and R pages 7-11)

- 1. The state may reimburse municipalities for up to _____ percent of their costs for sanitation.
- 2. List 5 sanitation costs which are eligible for reimbursement:

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

- 3. Describe the reimbursement policy regarding tree removal to street terraces and boulevards: _____

D. Reforestation grants (Public property only) (R and R pages 7-11)

- 1. The state may reimburse municipalities for up to _____ percent of their costs for reforestation.
- 2. List reforestation activities which are eligible for reimbursement:

- a. _____
- b. _____

E. General Review

Circle either TRUE T or FALSE F for each of the following statements:

1. To be certified, a tree inspector must pass a tree Inspector examination given by the Department of Agriculture. T F
2. Control areas may be changed by a municipality, if necessary, without notification of the Department of Agriculture. T F
3. Any high risk elm tree appearing after June 25, may be treated as a low risk tree for the remainder of the year. T F
4. A municipality must submit a sanitation and reforestation program plan with its application each year it participates in the grants program. T F
5. A municipality may require removal of all diseased trees within the control area within 10 days after notification of the property owner. T F
6. Field symptoms of Dutch elm disease or oak wilt must be confirmed by submission of samples to an approved Shade Tree Disease Laboratory. T F
7. Each municipality's tree inventory should include a reasonable estimate of only elm trees growing within the control area. T F
8. Any tree showing over 20 percent wilt constitutes a high risk tree that must be marked and removed within 20 days. T F
9. Notice of inspection must be given before trees on private property may be marked. T F
10. White oaks showing symptoms of oak wilt must be girdled immediately and removed. T F
11. Stockpiling and storage of elm logs from September 15 through April 1 within a control area is permissible if the trees removed did not have Dutch elm disease. T F
12. Wound dressings should be applied to any oak trees trimmed during June or July. T F
13. Elm logs and wood may be stored within control areas during the summer if covered with 4 mil. black plastic. T F
14. Diseased elm trees, if left standing, are not considered a disease hazard after 1 year. T F
15. Costs for tree removal by residents in cities of under 4,000 T F
in population may be submitted directly to the city for reimbursement as "in kind contributions!"

- | | | | |
|-----|--|---|---|
| 16. | Cities of 4,000 or under may be reimbursed for 90% of the cost (not to exceed \$60.00 per tree) for the first 50 trees planted on public property. | T | F |
| 17. | A tree inspector may be decertified if his shade tree disease program fails to comply with Minnesota Shade Tree Disease control laws. | T | F |
| 18. | A report summarizing the year's disease control activities must be submitted by December 1 by each municipality receiving grant-in-aid. | T | F |
| 19. | Costs for private property tree removal, if not paid by the property owner, may be assessed by the city against the property. | T | F |
| 20. | Reforestation is reimburseable at up to 50% for replanting on all public <u>and</u> private property within a municipality's current control area. | T | F |
| 21. | Tree removal within any control area may be confined to public property only. | T | F |
| 22. | Cities must provide reimbursement for private property tree removal. | T | F |
| 23. | Bark-bearing elm logs and wood in control area may be used as firewood any time of year if the city has a firewood permit system. | T | F |
| 24. | Elm stumps left standing do not require debarking to ground line if the trees have been treated with Arbotect 20-S. | T | F |
| 25. | Overland spread of oak wilt is best controlled by immediately girdling all red oaks infected with oak wilt. | T | F |

PART IV: LABORATORY SECTION

A. Chemical treatments and sampling procedures.

1. Name the only insecticide registered for use against elm bark beetles: _____

2. Chemical injection treatments:

a. Name the two most commonly used systemic fungicides used in treating elm trees (see Tree Inspector Vol. 1, No. 1, 1978) _____

b. Why is root flare injection the best injection method?

3. Chemical root graft disruption:

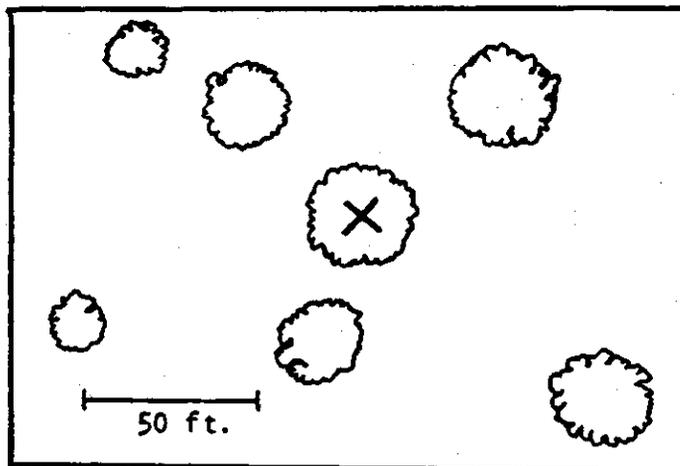
a. Name the chemical (a soil sterilant) used to disrupt root grafts of oaks and elms: _____

b. Briefly outline your method for establishing a chemical barrier:

1. Depth of holes: _____

2. Distance between holes: _____

3. X marks the elm or oak diagnosed positive for fungus disease. Outline the barrier(s) you would establish between the trees in the diagram below for the best protection of healthy trees nearby:



- c. After the chemical treatment, when would you remove the infected tree?

4. Describe the samples you would collect for laboratory confirmation of your disease diagnosis:

a. Length _____

b. Diameter _____

c. Number of samples _____

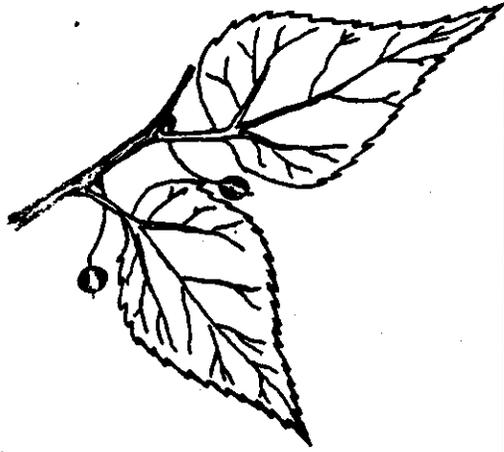
d. Area from which sample is obtained _____

e. Method of wrapping sample for mailing _____

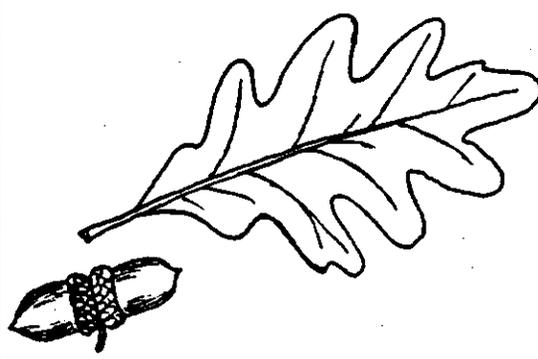
B. Tree Identification.

Identify the following tree leaves and seeds on the attached sheet. Select the common name for each species from the list provided and write it in the appropriate space:

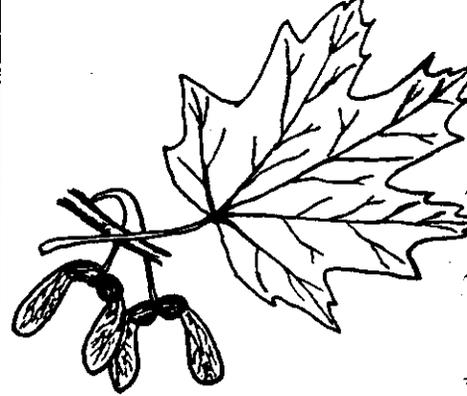
Silver Maple
Sugar Maple
Red Oak
White Oak
Cottonwood
Bur Oak
Basswood
Box Elder
Hackberry
Honey Locust
Green Ash
American Elm



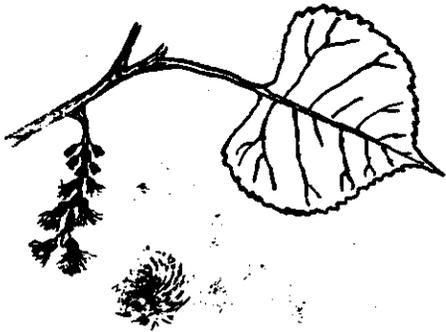
A



B



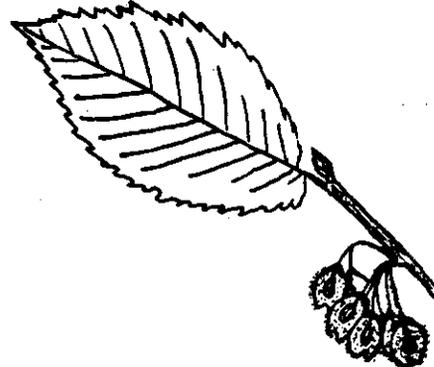
C



D



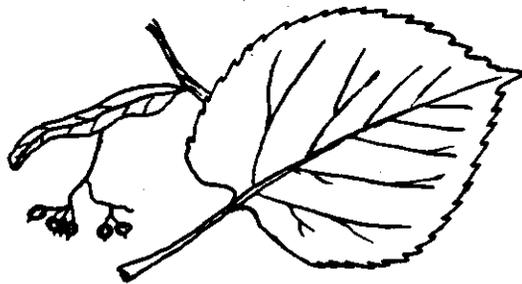
E



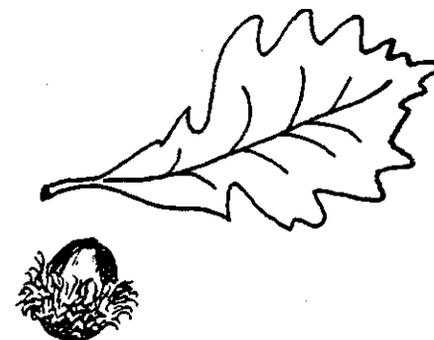
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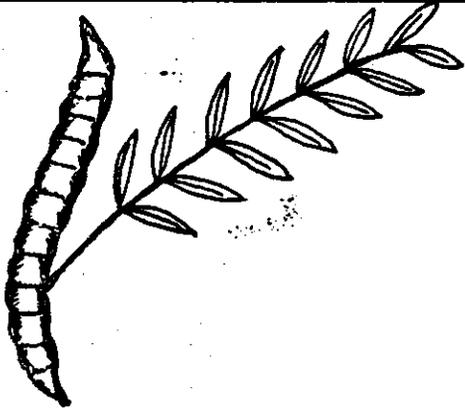
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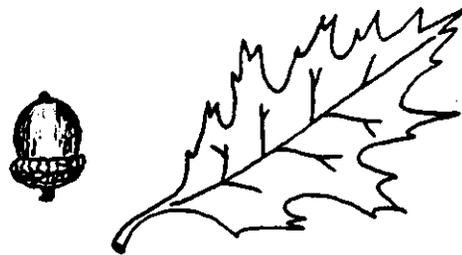
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REFRESHER SESSION 1982
REVIEW QUESTIONS

1. According to Statute 18.023 what must be done by April 1?
 - a. Remove low risk elm trees.
 - b. Remove high risk elm trees.
 - c. Remove diseased red oaks.
 - d. Remove diseased white oaks.
 - e. Destroy or debark bark intact elm wood.
 - f. Destroy or debark bark intact oak wood.

2. Where do European elm bark beetles, S. multistriatus, overwinter?
 - a. Beneath the bark at the bases of healthy elm trees.
 - b. In non-diseased elm firewood.
 - c. In diseased elm firewood.
 - d. In dead or diseased standing elms.

3. Which elms are susceptible to Dutch elm disease?
 - a. American.
 - b. Siberian.
 - c. Red/Slippery.
 - d. Rock.
 - e. Chinese.
 - f. Japanese.

4. Match pesticide with its chemical name:

Dursban	Soil sterilant
Vapam	Fungicide
Arbotect	Insecticide

5. Grinding out or debarking stumps will:
 - a. Eliminate both native and European beetle breeding sites.
 - b. Prevent root graft infections.
 - c. Eliminate overwintering sites for both native and European beetles.

6. The insecticide Dursban legally can be:
 - a. Sprayed at base of healthy elms to kill overwintering native beetles.
 - b. Sprayed on elmwood at utilization-disposal sites.
 - c. Sprayed on elm firewood by homeowners.

7. Where do native elm bark beetle larvae overwinter?
 - a. In dead or dying elmwood.
 - b. At base of healthy elms.

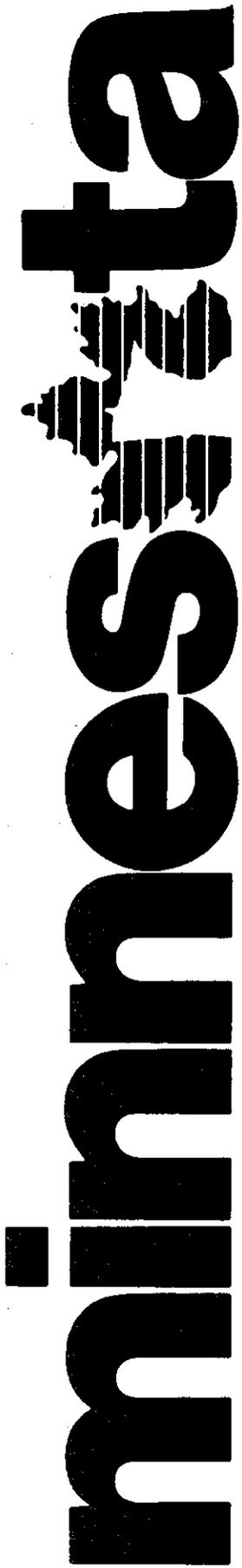
8. Dutch elm disease can be spread by insects and:
 - a. Wind-blown spores.
 - b. The movement of the disease organism through root grafts.
 - c. Spores moving from woodpiles through the soil to infect healthy roots.
 - d. The action of driving rains during spring and summer storms.

9. Therapeutic pruning of a Dutch elm disease tree is usually successful if:
 - a. The disease did not enter the trees' vascular system through a root graft.
 - b. The wilting branch(es) totals less area than five percent of the tree's entire crown.
 - c. If ten feet of stain free wood is removed beyond visible staining.
 - d. Done only in the late fall or winter to prevent excessive sap flow from wound.

10. Proper sanitation procedures for an infected white oak within 20 feet of other healthy white oak trees include:
 - a. Root graft disruption and tree removal if it poses a safety hazard.
 - b. No special sanitation practices.
 - c. Root graft disruption, removal and stump debarking.
 - d. Tree removal and stump debarking.

Shade Tree Program

February 1982



Shade Tree Program • Department of Agriculture • 600 Bremer Building • St. Paul, MN 55101 • 612/296 8580

Tree Inspector Workshop

**OAK/ELM FIREWOOD:
STORAGE & UTILIZATION**

1979

ELM/OAK FIREWOOD: STORAGE AND UTILIZATION

Improper storage or stockpiling of FIREWOOD could seriously weaken your control program. Elm firewood poses the biggest threat to most communities. Proper measures for utilizing both ELM and OAK for FIREWOOD are summarized below.

I. ELM

A. REGULATIONS: APRIL 1 - SEPTEMBER 15

1. HAZARDOUS ELM WOOD is ALL ELM WOOD recently dead or dying which can be used by bark beetles for breeding. This usually means all branches two or more inches in diameter are HAZARDOUS and such wood should never be kept for firewood unless debarked.
2. CONTROL MEASURES:
 - a. Dead or dying branches should be trimmed out of healthy trees and destroyed or debarked within 72 hours if kept.
 - b. ALL diseased trees should be disposed of:
 1. Cut trees MUST be burned, buried, chipped or debarked.
 2. All stumps must be debarked to ground line.

B. REGULATIONS: SEPTEMBER 15 - APRIL 1

Stockpiling and storage of elm logs with bark intact is prohibited within any control area unless regulated by MUNICIPAL ORDINANCE or FIREWOOD PERMITS.

1. MUNICIPAL ORDINANCE; Provisions of the ordinance
 - a. MUST prohibit the stockpiling of bark-bearing elm from April 1 - September 15.
 - b. COULD allow the stockpiling of such wood during the period September 15 - April 1 only on homesteaded property only

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If a permit has been obtained from city officials. Such woodpiles would then be subject to inspection prior to April 1 and any wood not utilized by April 1 MUST then be removed and disposed of by the city and the cost assessed to the homeowner.

2. FIREWOOD PERMIT: this could be a numbered certificate which identifies the owner and location of elm firewood stockpiles. Either printed on the permit or on a separate paper and presented to the permit applicant at the time of permit issuance are:

1. The municipal ordinance governing elm firewood;
2. Local inspection and removal dates; and
3. Municipal penalties for wood kept past April 1.

C. LOCAL CONSIDERATIONS: A city may vary these provisions to match local conditions but should at least consider all the above factors in drafting its ORDINANCE and PERMIT.

D. TRANSPORT REGULATIONS governing movement of ELM FIREWOOD:

Plant Quarantine No. 78-1 ELM WOOD (Effective August 15, 1978):

Movement of ELM FIREWOOD with bark intact is forbidden into or through 1) any home rule charter or statutory city or 2) any designated disease control areas in the unincorporated areas of any county. This means that:

1. ELM FIREWOOD cannot be brought in from outside of a city or control area for use as FIREWOOD.
2. ELM logs from trees cut within the boundaries of a city or control area can be kept from September 15 through April 1 if permitted by municipal ordinance or permit
3. All logs not utilized as firewood MUST be disposed of by April 1.

4. The movement of elm wood intended for industrial uses is not prohibited by this quarantine as long as its movement continues uninterrupted through any city or control area.

5. PENALTIES

a. Any firewood transported in violation of the quarantine must be destroyed or returned to the point of origin at the owner's expense.

b. Any carrier of such wood is in violation of the quarantine and is subject to the misdemeanor penalties set forth in Minnesota Statutes 1976 Section 18.60 (a fine of up to \$500).

II. OAK

A. OAK wood differs from ELM wood in several major ways:

<u>OAK</u>	<u>ELM</u>
1. Only RED oaks form oak wilt fungal pressure pads. WHITE OAKS can get oak wilt but do not form pressure pads.	1. All elm species can get Dutch elm disease. Elm <u>wood</u> from ALL SPECIES of elm can be colonized by elm bark beetles.
2. Fungal pressure pads are attractive to certain sap-feeding insects.	2. ALL elm WOOD is attractive to elm bark beetles.
3. Sap-feeding insects (usually picnic beetles) can carry spores from fungal pressure pads to open wounds in healthy trees especially during MAY AND JUNE. These insects are not very efficient carriers of OAK WILT fungus.	3. Elm bark beetles can infect <u>healthy</u> elm trees or colonize <u>dying</u> elm wood anytime during the growing season. Elm bark beetles are very efficient carriers of the Dutch elm disease fungus.

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4. Red oak wood requires special handling (see below) if it is to be kept for FIREWOOD or other uses.
 4. Elm wood must always be promptly disposed of between April 1 - September 15.
 5. Red oak stumps MUST be debarked to ground line.
 5. All elm stumps MUST be debarked to ground line.

B. RED OAK FIREWOOD (especially logs 6 or more inches in diameter) may give rise to fungal spore mats (pressure pads from which infectious spores could be spread.)

1. The degree of danger depends on the time of year the oak wilt occurs:

TREE WILTS

SPORES FORMED

June

September of the same year.

July-August

October of the same year, May in the following year.

September

June or later in the following year.

2. Fungal pressure pads will not form on wood with 20% or less moisture content. Because of rain or humid storage conditions, these pressure pads may form in the spring or early summer of the year after the wood has been cut. To prevent the spread of spores by insects ALL RED OAK LOGS or FIREWOOD kept past April 1 of the following year MUST be either:
 - a. Properly disposed of: burned, buried, chipped or debarked, or
 - b. Wrapped in 4 mil plastic from April 15 through July 1 to prevent any spread to healthy oaks nearby means of sap-feeding insects.
3. ALL wood piles MUST be inspected for elm logs and improperly stored RED OAK logs before April 1.

C. WHITE OAK firewood does not require any special storage treatment and can be stored anywhere, anytime of year.

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Tree Inspector Workshop

**CERTIFICATION
WHO WHY HOW**

1979

TREE INSPECTOR CERTIFICATION: WHO, WHY, HOW

THE RULE: In order to be eligible for grants-in-aid pursuant to the Minnesota Code of Agency Rules 1978 (3 MCAR 1.0110) a city **MUST** either individually or jointly with one (1) or more other cities employ or retain a tree inspector on a continuous year round basis.

1. Employ: have the inspector on the payroll
2. Retain: contract for the services of a tree inspector in a volunteer capacity or some other arrangement indicating a continuous year-round commitment.

What is so important about CERTIFICATION?

A. KNOW-HOW!

Would you trust your health care to a person calling him or herself a "public health worker" or "nurse" that you knew had no training whatever for the job?

Most people would say "NO!" Trees, like people, are prone to many disease problems. Most are minor; some like Dutch Elm Disease (DED) and oak wilt (OW) can be fatal not only to the infected trees but to those around them. Accurate diagnosis of such diseases is VITAL to properly controlling them. Just knowing what they are is not enough. The tree inspector, through training and experience, becomes a specialist in DED and OW control. He/she learns:

1. The SIGNS, SYMPTOMS and BIOLOGY of DED and OW:
2. What COMMUNITY MEASURES are necessary to control these diseases;
3. How to carry out these measures in his/her own community from first hand knowledge of the community.
4. What state rules and regulations are in effect to help ensure that Minnesota communities can conduct first rate programs.

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Very few people know all these things automatically. There is much a tree inspector has to know. Passing the certification examination demonstrates that a tree inspector is aware of the basics needed to serve his/her community in the somewhat technical job of tree inspecting.

All the training in the world cannot make a good tree inspector. expertise is gained on the job; and on the job a tree inspector is expected to know his/her job (see LEGAL ASPECTS). Certification is a very important first step.

B. THE LEGAL ASPECTS

Being certified (legally qualified) could be very important to you, your city and the state if charges of mismanagement are ever made. An unhappy property owner who does not understand why certain control measures are necessary (for example 20-day removal of his/her tree(s).or inspections of woodpiles on his/her property, etc.) might decide to take legal action against your city. If such a case actually gets to court, your certification serves to demonstrate that you have met the state requirements and hence should know what you are doing. It is not a guarantee against mismanagement, however. It is important for you to know your job and do it well.

II. HOW: to get and stay CERTIFIED

A. To GET CERTIFIED, you must PASS the Tree Inspector' Certification Examination.

1. This examination is administered ONLY through the Department of Agriculture, Shade Tree Program.

2. Certification is granted for 1 year from the date the test was taken.

B. TO STAY CERTIFIED:

1. Each tree inspector **MUST** attend an annual session of continuing education (usually a spring workshop); or
2. Arrange to retake the examination before certification expires.

C. Please NOTE CAREFULLY:

1. Certification is automatically renewed after attending a spring workshop **WITHOUT** retaking the test.
2. Annual attendance at the shade tree workshop (or equivalent as arranged with the Shade Tree Program, see **CERTIFICATION ALTERNATIVES**) is required of **ALL TREE INSPECTORS** otherwise certification will expire 1 year from the date the test was taken, leaving your city or cities without a certified tree inspector.
3. **REGISTRATION** at an annual workshop is the **ONLY** way your attendance will be recorded.

III. WHY have a tree inspector YEAR ROUND?

Most of a tree inspector's work occurs during the growing season but winter does not mean that suddenly all is well and the work is finished. There is usually much left to do. Off season activities might include:

1. Tree trimming (especially dead elm wood)
2. Removal of **LOW RISK** trees left standing
3. Removal of oaks dead from oak wilt
4. Stump debarking or removal (elms and oaks)
5. Firewood control (issuance of firewood permits, wood pile inspections)

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6. Making estimates of the numbers of HIGH RISK and LOW RISK trees anticipated in the upcoming season
 7. Record keeping: tree inventories, budgets, notices, removals, etc.
 8. Planning for replanting
 9. Contract negotiations
 10. Public awareness programs
 11. Continuing education: courses of study, relevant reading, seminars, workshops, etc.

Not every Tree Inspector will be involved with all these activities, but most will be involved with some to a greater or lesser extent.

IV. CERTIFICATION ALTERNATIVES:

- A. If you cannot or did not attend a spring workshop and there is a good reason for your inability to attend (illness, work conflicts, etc.), alternative means of certification can be arranged with the Shade Tree Program.
 1. Such alternatives require the Tree Inspector to submit a written application to the Shade Tree Program and are subject to approval by Program Staff.
 2. IF NO SUCH APPLICATION is made, certification will automatically expire 1 year after you took the test. This could leave your city without a Tree Inspector.
 3. Records of each Tree Inspector's certification are kept by the Shade Tree Program and the Shade Tree Program staff will try to keep you informed of your status; however, it remains the responsibility of each Tree Inspector to keep his/her certification up-to-date.

V. FOR YOUR RECORDS: Test Scores/Tree Inspector Cards

A. TEST SCORES: within 15 days of taking the Tree Inspector test, you will receive a record of your scores and your test date. It is advisable to keep this for your records. A copy of this record is retained in the Shade Tree Program office and these scores serve as the official record of your certification status. If you do not receive your scores, please notify the Shade Tree Program office promptly.

B. Tree Inspector Cards:

1. are issued with the test score sheet and are dated to expire 1 year after the test date.
2. are mailed to each Tree Inspector after attendance at the spring workshop and dated to expire one year from the workshop. This card then replaces the one based on the test.

The Tree Inspector card is provided for the convenience of tree inspectors in the field. They may prove useful if someone questions your credentials.

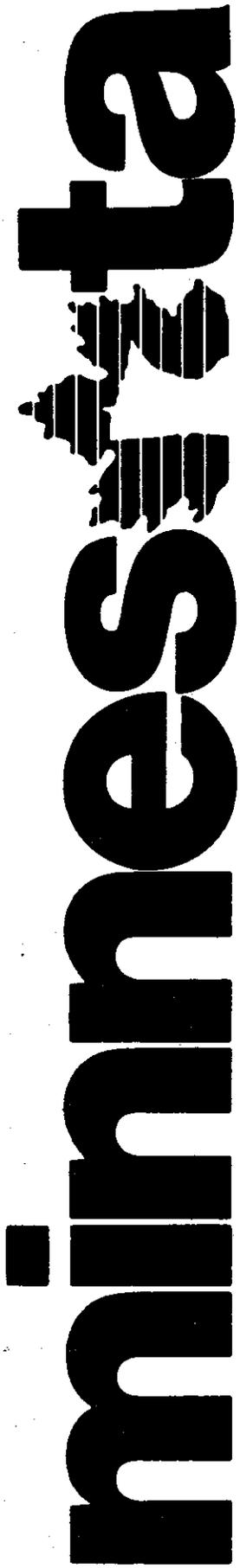
VI. Certification is NOT OBTAINABLE on the basis of:

1. Educational background.
2. Municipal position or appointment
3. Pesticide applicators tests
4. attending workshops ONLY i.e. never having taken the Tree Inspector's Examination

P. S. When you move, please remember to send us your new mailing address.

Prepared 2/79

Minnesota Shade Tree Program



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Tree Inspector Workshop

RULES AND REGULATIONS

CHANGES effective 8/14/78

1979

1978-79 RULES AND REGULATION CHANGES; Changes Indicated By (*)

The new Shade Tree Program Rules and Regulations became effective August 14, 1978. Many rules have not changes but there are some IMPORTANT CHANGES that you should be aware of. These changes are outlined below:

*A. High Risk/Low Risk Trees:

*1. HIGH RISK trees are elms which are:

- a. dead (with bark firmly attached)
- b. leafless (barren) due to rapid kill by Dutch elm disease (DED)
- c. rapidly dying trees with 30% or more leaf wilt by June 25.
- d. more slowly dying trees that now have 30% wilt or more.

Bark beetles will breed in these trees first so they should be promptly removed.

ALL HIGH RISK trees MUST be marked for removal by June 25, 1979.

2. Removal deadlines. ALL HIGH RISK trees:

- a. on PUBLIC PROPERTY must be removed within 20 days of MARKING.
- b. on PRIVATE PROPERTY must be removed within 20 days of NOTIFICATION of the property owner.
- c. should be marked in some unique manner that will separate them from LOW RISK trees and ensure their prompt removal. For example, mark HIGH RISK with a red X; mark LOW RISK with a red band around the trunk.
- d. wilting AFTER JUNE 25, 1979 should likewise be marked HIGH RISK and removed within 20 days as they occur throughout the season.

NOTE: A low risk tree may become a high risk tree as the season progresses. These must then be marked HIGH RISK and removed within 20 days.

3. LOW RISK trees are elms which are:

- a. dying slowly. Wilt may start in June but does not spread to more than 30% of the crown during the growing season.
- b. infected late in the season and do not reach 30% crown wilt. These are good candidates for winter removal and will probably be HIGH RISK trees next spring.

LOW RISK does not mean NO RISK! These trees should be marked immediately and removed as quickly as possible (preferably within 20 days).

* ALL LOW RISK trees MUST be removed before April 1, 1980.

4. HIGH/LOW RISK categories were established so that areas with limited resources and high disease rates can remove their most hazardous trees first. Once all HIGH RISK trees are removed, all efforts should be directed to LOW RISK trees.

5. REMOVAL POLICIES:

a. TIME LIMITS:

All dead or diseased trees (including stumps) must be removed within the time limits above. A city may set stricter time limits. For example, a city may require all diseased trees (LOW or HIGH RISK) be removed within 10 days. Such a policy is encouraged and will improve the city's sanitation program. The option to remove LOW RISK trees later than 20 days should only be used where resources such as contractors and city crews are limited or there are many HIGH RISK trees.

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b. VIOLATIONS

Any dead or diseased elm trees or LOGS and STUMPS with the bark intact NOT removed within the time limits established by the state rules or the city ordinance (if stricter) MUST be removed by the city and the costs assessed against the property.

*ANTICIPATED LOW/HIGH RISK trees: an estimate of the number of HIGH RISK and LOW RISK trees must be included on your PROGRAM APPLICATION prior to beginning your regular inspections.

*B. INSPECTION DATES:

Each city MUST conduct at least THREE (3) inspections during the growing season. These inspections MUST be completed by:

1. June 15
2. July 15
3. August 15

Continuous inspections are recommended, especially for areas where DED is severe.

C. OAK WILT

Disruption of root grafts and prevention of infection by fungal spores carried by insects are the most important methods of controlling oak wilt.

1. ROOT GRAFT CONTROL

All common root systems of oak trees growing within forty (40) - fifty (50) feet of a diseased oak should be disrupted by trenching or using Vapam.

2. GIRDLING

Red oak trees with oak wilt should be girdled when they are detected to dry the tree and reduce spore production. Take care not to girdle trees in areas where they could be a safety hazard. Girdling will weaken the tree.

3. MARKING AND REMOVAL:

Oaks showing oak wilt in June and August should be removed from PUBLIC and PRIVATE property by April 1, 1980.

- a. After NOTIFICATION, PRIVATE PROPERTY owners should remove and properly dispose of diseased oaks by burning, burying, chipping or firewood (see University of Minnesota Extension folder 310 - 1978 "Oakwilt")
- b. Trees that are not removed by the property owner by April 1, should be removed by the city within 20 days after notification and the costs assessed to the property owner.

C. REQUEST FOR PAYMENT (FRP)

1. Payment periods remain the same:

- a. January 1 - March 31
- b. April 1 - June 30
- c. July 1 - September 30
- d. October 1 - December 31

*2. RFP's are now due FORTY-FIVE (45) days after the close of each pay period.

- a. Costs in one or more pay periods may be carried over into a succeeding pay period but MAY NOT be carried over from one calendar year to the next.
- b. Total costs incurred for the year may be submitted on one RFP at the end of the year but can include ONLY COSTS INCURRED that calendar year.
- c. Payments can only be made for work done under the supervision of a CERTIFIED tree inspector

1982 TREE INSPECTOR WORKSHOP

MINNESOTA STATUTES AND YOUR SHADE TREE PROGRAM

CHAPTER 410

--BRIEFLY, THIS CHAPTER CLASSIFIES CITIES BY POPULATION SIZE AND ESTABLISHES PROCEDURES FOR HOME RULE CHARTER.

10% OF MINNESOTA COMMUNITIES ARE KNOWN AS HOME RULE CHARTER CITIES.

THE CITY MAY ADOPT OPERATING PROCEDURES AS THE CITY SO CHOOSES (SO LONG AS IT'S CONSTITUTIONAL).

THE CITY CAN WRITE AMENDMENTS TO ITS CHARTER. THESE MUST BE APPROVED BY 51% OF THE VOTERS.

THE SAME LEVY LAWS AND LIMITATIONS APPLY AS IN STATUTORY CITIES.

CHAPTER 412

--BASIC OPERATING AUTHORITY IS OUTLINED FOR STATUTORY CITIES.

SECTION 412.221

SUBD. 6 "...TO LAY OUT, OPEN, CHANGE, . . . STREETS, ALLEYS, PARKS, SQUARES, AND OTHER PUBLIC WAYS AND GROUNDS AND ... CONTROL AND MAINTAIN THE SAME..."

SUBD. 8 "...TO PROVIDE FOR, AND BY ORDINANCE REGULATE, THE SETTING OUT AND PROTECTION OF TREES, SHRUBS, AND FLOWERS IN THE CITY OR UPON ITS PROPERTY."

SECTION 412.221

SUBD. 23 "...TO DEFINE NUISANCES AND PROVIDE FOR THEIR PREVENTION OR ABATEMENT."

--THE POWERS DESCRIBED IN M.S. 412.221 WOULD ENABLE A CITY TO DECLARE ANY TREE DISEASE OR INSECT PROBLEM A NUISANCE AND THEN PROVIDE FOR ITS PREVENTION OR ABATEMENT. IT ALSO GRANTS THE CITY THE ABILITY TO PLANT AND CARE FOR TREES ON BOULEVARDS, PARKS AND OTHER CITY PROPERTY. AUTHORITY IS FURTHER GRANTED IN SUBD. 8 TO HAVE A DEGREE OF CONTROL OVER ALL TREES WITHIN THE CITY, EVEN IF LOCATED ON PRIVATE PROPERTY. ALL OF THESE POWERS WOULD EASILY ENABLE THE CITY TO LEVY FOR AND OPERATE A VERY EFFECTIVE URBAN FORESTRY PROGRAM.

SECTION 412.251

--THE CITY COUNCIL IS IMPOWERED TO LEVY TAXES FOR THE POWERS LISTED ABOVE IN SUBDIVISIONS 6,8, AND 23.

SECTION 412.491-412.521

--STATUTORY CITIES UNDER THE STANDARD PLAN OF VILLAGE (CITY) GOVERNMENT MAY BY ORDINANCE ESTABLISH A PARK BOARD. WHERE A PARK BOARD IS ESTABLISHED, IT SHALL HAVE "...FULL, ABSOLUTE AND EXCLUSIVE CONTROL..." AND BE EMPOWERED TO EMPLOY NECESSARY PERSONNEL, FIX THEIR COMPENSATION, CONSTRUCT NECESSARY PHYSICAL FACILITIES, ENTER INTO CONTRACTS WITH THE CONSENT OF THE COUNCIL, PURCHASE SUPPLIES AND EQUIPMENT, PROVIDE FOR MAINTENANCE AND CARE OF PROPERTY, AND "...PERFORM WHATEVER ACTS ARE REASONABLE, NECESSARY, AND PROPER TO CARRY OUT THE POWERS GRANTED..."

SECTION 412.541

--OPTION PLAN B--THE COUNCIL-MANAGER FORM OF CITY GOVERNMENT MAY HAVE AN IMPACT ON THE LOCAL SHADE TREE PROGRAM.

CHAPTER 429 PUBLIC IMPROVEMENTS

--BRIEFLY THIS CHAPTER ESTABLISHES THE GENERAL STATUTORY GUIDELINES FOR LOCAL IMPROVEMENT PROJECTS. TREE RELATED PROJECTS ARE INCLUDED IN THIS CATEGORY.

CHAPTER 548 JUDGEMENTS

SECTION 548.05

"WHOEVER SHALL CARRY AWAY, USE, OR DESTROY ANY WOOD, TIMBER, LUMBER,...WITHOUT LAWFUL AUTHORITY SHALL BE LIABLE TO THE OWNER THEREOF FOR TREBLE THE AMOUNT OF DAMAGES ASSESSED THEREFOR IN AN ACTION TO RECOVER SUCH DAMAGES..."

CHAPTER 18 PLANT AND ANIMAL PEST CONTROL

SECTION 18.012 POLICY.

THE PURPOSE OF THIS LOCAL PEST CONTROL ACT IS TO AUTHORIZE SUBDIVISIONS OF STATE GOVERNMENT TO ESTABLISH AND FUND THEIR OWN PROGRAMS TO CONTROL PESTS THAT MAY BE DETRIMENTAL TO THE HEALTH AND WELFARE OF MAN OR ANIMALS AND TO THE ENVIRONMENT. TO ASSURE THAT THESE LOCAL PROGRAMS ARE CONDUCTED IN A SAFE AND PROPER MANNER, THESE PROGRAMS MUST BE FORMULATED AND CONDUCTED IN ACCORDANCE WITH THE DIRECTIONS AND RECOMMENDATIONS PRESCRIBED BY THE COMMISSIONER.

SECTION 18.021

DEFINITIONS

SECTION 18.022

INSECT PESTS, PLANT DISEASES, BEE DISEASES, AND DESTRUCTIVE OF NUISANCE ANIMALS

SUBD.1: CONTROL

SUBD.2: COST

SUBD.3: CERTIFICATES OF INDEBTEDNESS

SUBD.4: DEPOSIT OF PROCEEDS IN A SEPERATE FUND

SUBD.5: PENALTY

SUBD.6: REGULATIONS, SCOPE

SUBD.7: FAILURE OF POLITICAL SUBDIVISIONS TO ACT
COMMISSIONER'S DUTY

SECTION 18.022

SUBD.8: RULES AND REGULATIONS

SECTION 18.023

SUBD.1: DEFINITIONS

SUBD. 1A: PURPOSE

SUBD.2: COMMISSIONER TO ADOPT RULES

SUBD.3: RULES AND REGULATIONS;
APPLICABILITY TO MUNICIPALITIES

SUBD.3A: GRANTS TO MUNICIPALITIES

SUBD.4: SUBSIDIES TO CERTAIN OWNERS

SUBD.5: TREE INSPECTOR

SUBD.6: REPEALED (MOVED TO TAX CODE)

SUBD.7: FINANCING

SUBD.8: DEPOSIT OF PROCEEDS IN SEPARATE FUND

SUBD.9: DIAGNOSTIC LABORATORY

SUBD.10: COOPERATION BY UNIVERSITY

SUBD.10A: EXPERIMENTAL PROGRAMS

SUBD.11: REPORT TO LEGISLATURE

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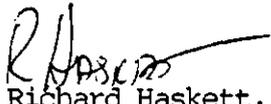
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DEPARTMENT OF AGRICULTURE

Office Memorandum

TO : Shade Tree Staff

DATE: 02/23/82

FROM : 
Richard Haskett, Director
Shade Tree Division

PHONE:

SUBJECT: Outline of Small Group Problem Solving Sessions
at the 1982 Tree Inspector Workshops

Veteran tree inspectors and others attending the 1982 TI Workshops will be given an opportunity to participate in a small group problem solving exercise. This program item has two objectives. First it is intended to foster a spirit of interaction between the participants. Too often, they attend workshops and are addressed by "experts". Consequently the wealth of information and experience that they have accumulated on their jobs is not shared. Second, we want to develop a willingness on the part of our clients to talk back to us. Currently, our information flows from the state to clients with little reverse flow from clients to the Shade Tree Program. By having a representative of the small groups address the audience, which will include STP staff, we may encourage feedback, particularly if we listen well.

The format is set up to provide an introductory period from 11:30 to 11:45 with Michele explaining the exercise to the B1 group and Dick to the B2 group. The small groups will then assemble and eat lunch together, discussing their problems and recording their solution during the lunch. The participants will then return to their classrooms where representatives of the groups will present the group solutions (as recorded on an overhead transparency) to the staff and audience. Michele and Dick will act as facilitators only during these sessions.

Please critique this plan plus the suggested problems. Mark up the margin and return promptly.

Here are some problems I propose to use:

Problem 1.

About 40 percent of the trees which the City of Deep Lake, MN (population 8,500) plants each year are dying. One of the council members invites your group (knowledgable people who work within tree programs in nearby communities) to help find a solution. You examine the trees and appropriate records and you conclude that the planting contract specifications are not being vigorously enforced. What should be done before the next planting contract is awarded?

Problem 2.

Most citizens and officials of your hometown of Riverton, MN are aware of Dutch elm disease and oak wilt and they accept the need to spend public dollars for disease control and planting of new trees. You have planted 19,000 new public trees over the past six years but have never received funds for maintaining these and other trees in the community. As the city forestry staff, you feel it is time to develop a more comprehensive community forestry program. What steps must be taken between now and October when next year's budget will be adopted?

Problem 3

Sota City (population 3,800) began an effective sanitation program several years ago but has never appropriated funds to plant replacement boulevard trees. Last month the Lions Club came to you and offered to provide volunteer labor to plant new trees. Last week you took the offer to the city council. The council is still unable to purchase trees but it did vote to provide wood chips for mulch, plus city equipment and labor to help with the planting. You sense that enthusiasm for the project is growing and you ask this group of civic leaders to meet and work out a plan to purchase the trees. What steps will you take between now and next autumn when you expect to plant the trees?

Problem 3.

You are the newly hired tree inspector for Ceratocity, MN which has a strong Dutch elm disease ordinance on its books. However, because of lack of compliance with the ordinance, the disease rate has climbed until it reached 8½ percent last year. Two city council members feel that there may be enough council support to conduct a program aimed at greater compliance with the ordinance and they ask your group (the city forestry staff) to draw up a plan for achieving greater compliance this season. You call together the city forestry staff and develop the plan. What steps would be taken?

Problem 5

The citizens of Heartwood, MN (population 650) have always used wood as a winter heating fuel. When the city council adopted its shade tree ordinance it originally outlawed the storage of elmwood with bark attached. When the state law was changed to allow storage of wood under a permit system during the period September 15 through April 1, the city adopted a permit system. However, citizens complain that firewood cut after September 15 is too wet to burn before April 1. The council now instructs you to come up with a method to make the wood from diseased trees available to citizens as firewood but you may not have additional funds to purchase equipment. You meet with the tree inspectors from nearby communities and ask for their help. Then you prepare a plan. What steps would be taken between now and the coming summer to carry out your plan?



Shade Tree Program

Minnesota Department of Agriculture

FINANCING YOUR PROGRAM

Tree Inspector Workshops, 1982

Introduction: Features of good funding sources.

1. Equitable
2. Dependable
3. Easy to administer

<u>Source</u>	<u>Advantages</u>	<u>Disadvantages</u>
Direct Bill	No city funds expended. Quick payment.	Financially hard on property owner. Not equitable. Administrative hassle.
Special Assess	Minimal use of general fund. Long term payment for homeowner.	Not equitable. Administrative burden.
General Levy	Equitable taxpayer burden. Financially easy on property owner. Easy to administer. Homestead credit applies.	Levy limitations. Property owners without elms.
Special Levy	Equitable burden. Easy on property owner. Easy to administer. Homestead credit applies. Free of levy limitations.	Property owners without elms.
Service Fees	Established source. Minimal expense (taxpayer). No cost to city.	Not generally applicable.
Wood Products	Potential <u>extra</u> income. Good public relations.	Access to utilization sites. Urban tree contaminants. Markets.
Voluntarism (gifts, grants)	Good potential. Minimal city costs. Quick completion.	Limited applications. Extra effort to administer. Better for reforestation. Short term projects.

Ordinance: include provisions for trees on boulevards, new developments.

MILLTOWN SHADE TREE PROGRAM DATA

Pop. - 4,000 Base Elm Inventory - 3,000
John Smith, Program Manager

ANNUAL LOSSES AND REPLACEMENTS

	1980			Total
	Park	Blvd.	Private	
Removals	10	35	55	100
Plantings	40	60		100

	1981			Total
	Park	Blvd.	Private	
Removals	10	35	55	100
Plantings	40	60		100

	1982 (estimate)			Total
	Park	Blvd.	Private	
Removals	10	35	55	100
Plantings	40	60		100

FINANCIAL BREAKDOWN

Average Removal Cost = \$150.00 Average Replacement Cost = \$50.00

1980

Removal	State Each (total)	City Each (total)	Homeowner Each (total)
Park 10 x \$75 =	(750)	75 =	(750)
Boul. 35 x 50 =	(1750)	50 =	(1750)
Private 55 x 50 =	(2750)	50 =	(2750)
<u>Total</u>	<u>\$5250</u>	<u>\$5250</u>	<u>\$4,500 = \$15,000</u>
 Planting			
Park 40 x 25 =	(1000)	25 =	(1000)
Boul. 60 x 20 =	(1200)	20 =	(1200)
<u>Total</u>	<u>\$2,200</u>	<u>\$2,200</u>	<u>\$600 = \$5,000</u>
 Totals (Removal & Planting)	 \$7450	 \$7450	 \$5100

	State Each (total)	City Each (total)	Homeowner Each (total)
Park	10 x \$ 25 = (250)	125 = (1250)	
Boulevard	35 x 25 = (875)	75 = (2625)	50 = (1750)
Private	55 x 25 = (1375)	75 = (4125)	50 = (2750)
	<u>\$2500</u>	<u>\$8000</u>	<u>\$4,500 = \$15,000</u>

Park	40 x 7.50 = (300)	42.50 = (1700)	
Boulevard	60 x 7.50 = (450)	32.50 = (1950)	10 = (600)
	<u>\$750</u>	<u>\$2,650</u>	<u>\$600 = \$5,000</u>
	\$3250	\$11,650	\$5100
		(\$4200 over budget)	

1982 FINANCIAL BREAKDOWN

City Budget -	Estimated Expenditures -
Sanitation 5,250	Sanitation 15,000
Reforestation <u>3,200</u>	Reforestation <u>5,000</u>
Total \$7,450	Total \$20,000

Difference = \$12,550

City	Home owner
Each (Total)	Each (Total)
Park 10 x \$ 150 = (1500)	
Boulevard 35 x 100* = (3500)	100* = (3500)
Private 55 (2450)	(5800)
<u>\$7,450</u>	<u>\$9,300 = \$16,750</u>

*Includes cost of replacement tree on boulevard.

Fund raiser target = \$3,250 for the rest of 1982's Reforestation Program.

For 1983 - Smith will try to get a special levy approved to cover the entire budget. A \$20,000 levy would mean approximately \$10,000 - \$12,000 collected from city property owners (around \$2.50 - \$3.00 per person) with the difference being made up by homestead credit money from the state.

IDENTIFICATION

E

TAXONOMIC KEYS

Taxonomic keys are one of the tools used to identify unknown tree species. They are found in most of the more important tree identification manuals, and once the necessary terminology is learned, are relatively easy to use.

To use a key, features on the unknown specimen are compared to two numbered alternate descriptions in the key. The user decides which description the specimen fits, and proceeds to the next numbered step indicated by the key. At each step, more and more species are eliminated until in the final step, only one species remains.

The following lists some of the important features used in a taxonomic key:

LEAVES. The leaves of a given tree are characteristic of its species, thus, for at least part of the year, leaves are quite important for tree identification. Some of the more important characteristics of leaves include:

1. Leaf Arrangement - There are three ways leaves are arranged on a twig. When leaves are paired, one on each side of the twig at the same height, they are said to be Opposite. When more than two appear at the same height, they are whorled, and when they are arranged singly at intervals along the twig, they are Alternate. This is the most basic of the identification criteria, and the starting point of most deciduous keys. (See Figure 1A.)
2. Leaf Structure - The next common identification criteria is leaf structure. The most basic type of leaf structure is called the Simple Leaf. This type of leaf has but a single blade along the midrib, and is found on the majority of shade tree species. Many species, however, have leaves divided into three to several dozen leaflets, each leaflet being attached by its stalk to the midrib. This type of structure is called a Compound Leaf. When the leaflets originate from different points laterally along the midrib, it is said to be Pinnately (Feather) Compound, when all leaflets arise from the same point on the midrib, it is Palmately (Fan) Compound. In some species, the leaflets themselves are compound. In this case, the leaves are Twice Compound, and the individual structures are called Pinnae.

An individual leaflet is often mistaken for a complete simple leaf. To determine whether a leaf is single or compound, follow it back toward the stem until a bud is reached. This is the point where the leaf ends and the stem begins. Buds do not form between the leaflet and the midrib. (See Figure 2.)

3. Leaf Shape - The shape of a tree's leaves is another valuable identification characteristic, and can often be used from a distance. Some of the more common leaf shapes are illustrated. (See Figure 1B.)

Lanceolate - Shaped like a spear-head. Several times longer than broad, with the widest point near the base.

Elliptical - Shaped like an ellipse. Symmetrical, with tapered tip and base.

Ovate - Egg-shaped. Broadest near the base.

Oblong - Longer than broad, sides nearly parallel, blunt tip and base.

Cordate - Heart-shaped.

Spatulate - Longer than broad. Widest point near the tip and tapering gradually toward the base. Like an inverted Lanceolate.

Deltoid - Triangular, shaped like the Greek letter "delta."

Oval - Broadly elliptical. Width greater than one-half of the length.

4. Leaf Margins - Leaf margins can take a variety of forms. If the margin extends unbroken from the leaf base to the tip, it is said to be Entire. If the margin is wavy, it is said to be Sinuate. The leaf margins of many tree species are toothed. Such teeth are classified by their shape. A Crenate leaf margin has rounded or blunt teeth, a Dentate leaf margin, sharp teeth pointing outwards. If the leaf margin has sharp teeth pointing towards the leaf tip, it is said to be Serrate, and a Doubly Serrate leaf margin is coarsely serrate, with the teeth margins again serrated.

The last major characteristics of leaf margins are lobes. The number, shape, and arrangement of lobes is characteristic of a tree species, as is the shape of the Sinus - the gap between lobes. A Pinnately Lobed leaf is one in which the lobes arise laterally along the midrib, as in an oak leaf. A Palmately Lobed leaf is one in which the lobes arise from a single central point on the leaf, as in most maples. (See Figure 1C.)

Finally leaves can be classified as to color, degree of hairiness, type of venation, the presence, absence, or shape of Stipules (a scale-like structure at the base of some leafstalks), and the length and shape of the petiole (if the petiole is absent, the leaf is known as a Sessile leaf).

TWIGS. While leaves are a reliable, easy to use identification characteristic, they are only useful during the growing season. Twigs are the major feature used in winter keys. A "twig" is not just any small branch, but rather only that end portion constituting the newest growth. It is separated from the previous year's growth by circular End Bud Scars. Care should be taken in selecting a sample twig from a specimen. It should come from a healthy, vigorous branch. Stunted, slow growing twigs often have distorted features. Figure 3 illustrates some of the more useful features of twigs.

1. Leaf Scars - A leaf scar is what remains when a leaf is separated from a twig. Like the leaves, they are arranged in either an alternate, opposite, or whorled configuration. Within each leaf scar are one or more tiny patches of scar tissue which show where the vascular tissue (which conducts food and water to and from the leaf)

passes from the twig to the leaf. These structures are called Bundle Scars. The arrangement, size, and shape of the leaf scars, and the number, size, and pattern of the bundle scars within them are uniform within a given species, and are quite helpful in identification. E

When stipules are present in a species, paired Stipule Scars will be found in conjunction with the leaf scars. The presence and shape of stipule scars is also a helpful identification feature.

2. Buds - Buds found on twigs are commonly of two types. Side Buds are borne along the twig. End Buds are found at the tip of the twig. Side buds can be further categorized by their location--Lateral Buds are located just above the leaf scars. They form at the junctions of the leaf and the twig. Accessory Buds, if present, can appear anywhere on the node. End buds too can be further categorized. True End Buds emerge directly from the end of the twig. They are usually larger than the lateral buds and form when the twig ceases growing for the season. False End Buds are usually offset from the tip of the twig, a leaf being present at the tip. They are actually the last lateral bud that was formed before twig growth ceased, and are similar in size and appearance to the other laterals. When two sizes of lateral buds occur on the same twig, the larger usually contains the next season's embryonic flower parts, and are called Flower Buds. Buds can be further classified by color, number of scales, presence or absence of hair and shape.
3. Pith - The center portion of a twig is composed of Pith which is usually quite distinctive from the wood which surrounds it. The structure of the pith varies from species to species. Most trees have Solid Pith, that is, continuous and uninterrupted throughout the length of the twig. Others have Chambered Pith in which the pith is divided into empty chambers. A few species are hollow. Pith is further classified by color and sometimes by shape in cross section (some oaks, for example, have star-shaped pith).

Other useful twig features include the presence or absence of hair on the twigs, color, presence or absence of lenticels (small, light colored patches of tissue), scent, sap color, and presence of thorns. Most tree species can be keyed out using nothing more than leaves and/or twigs, but often bark color, thickness, and texture is used along with overall tree size and shape.

Each tree species possesses its own unique combination of identifying features. The key points these out, and herein lies its usefulness.

SAMPLE KEY EXERCISE

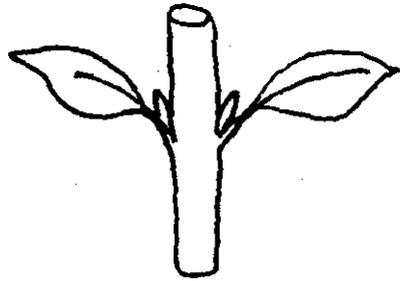
If a municipality had but six species of trees within its boundaries, a winter key for those species might resemble that shown in figure 4. The six species present are green ash, American linden, Norway maple, honeylocust, bur oak, and red oak.

Given twig sample A from the diagram, the first step in keying out the individual species is to examine choice number one in the key, leaf scars opposite versus leaf scars alternate. The leaf scars in sample A are arranged alternately so the choices are narrowed to the four species listed under the "alternate" portion of choice number one. Norway maple and green ash are eliminated from consideration because they have opposite leaf scars.

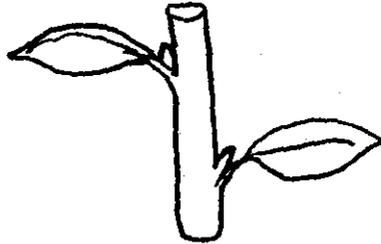
The next step is to examine choice number three, directly under the alternate portion of choice number one. The pith in sample A is star-shaped, so American linden and honeylocust are eliminated from consideration, and the choice is narrowed to bur oak or red oak. The sample has cork at its base, and the end-buds are hairy as in the first part of choice four so the sample is bur oak. Each of the twig samples in figure 4 can be keyed out in the same manner. The answers are given on the bottom of this page.

- | | |
|--------------------|-------|
| 1. American Linden | _____ |
| 2. Bur Oak | _____ |
| 3. Green Ash | _____ |
| 4. Honeylocust | _____ |
| 5. Norway Maple | _____ |
| 6. Red Oak | _____ |

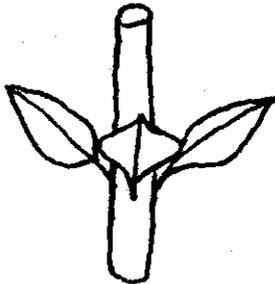
1. D; 2. A; 3. E; 4. C; 5. B; 6. F.



Opposite



Alternate



Whorled

LEAF ARRANGEMENT



Lanceolate



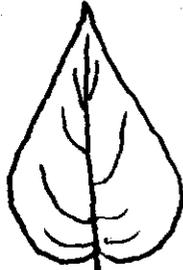
Elliptical



Ovate



Oblong



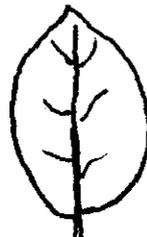
Cordate



Spatulate



Deltoid



Oval

LEAF SHAPES



Entire



Sinuate



Crenate



Dentate



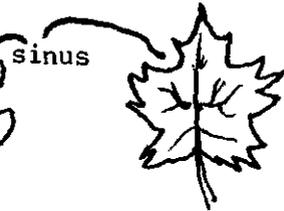
Serrate



Doubly Serrate



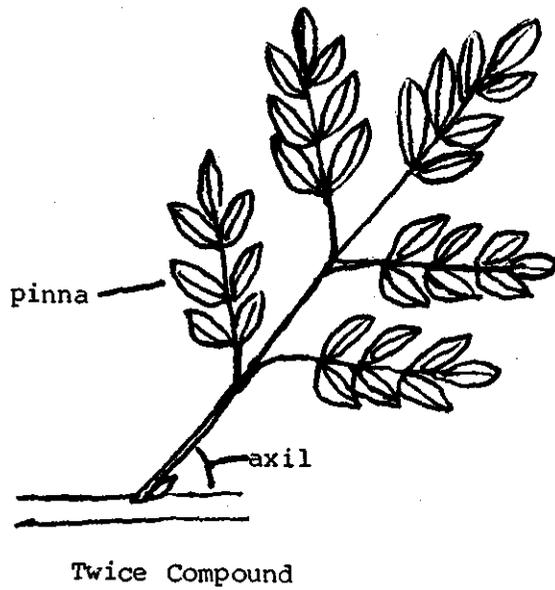
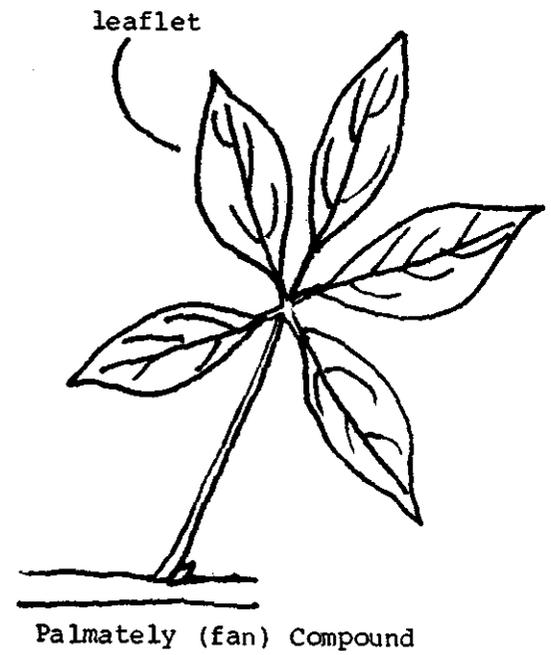
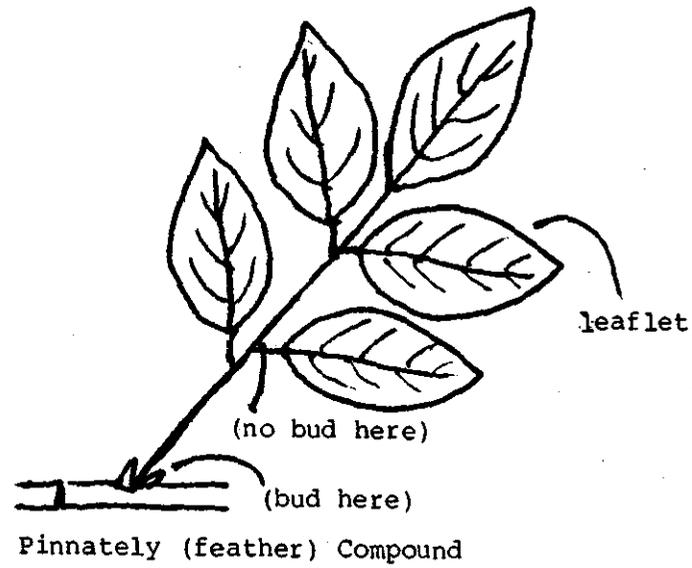
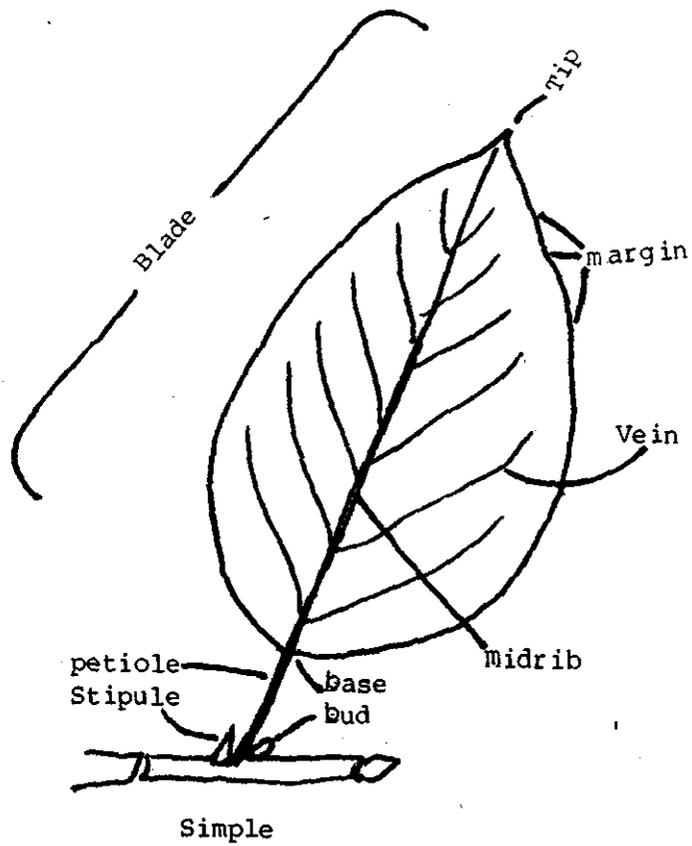
Pinnately Lobed

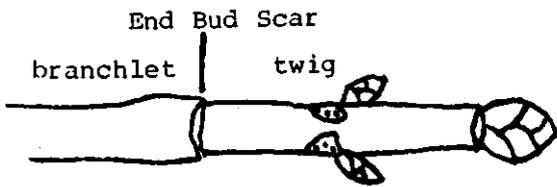


Palmately Lobed

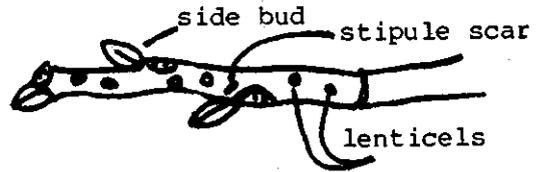
sinus

LEAF MARGINS

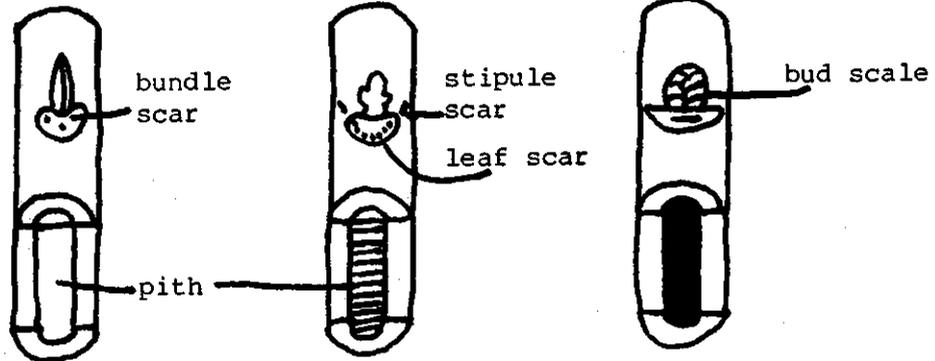




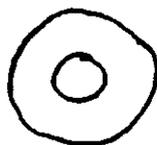
End Bud - true
Leaf Scars - opposite



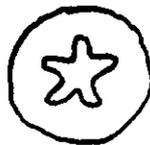
false
alternate



Bud Scales	-	two	none	many
Bundle Scars	-	three	many	one
Pith	-	solid	chambered	hollow



Round



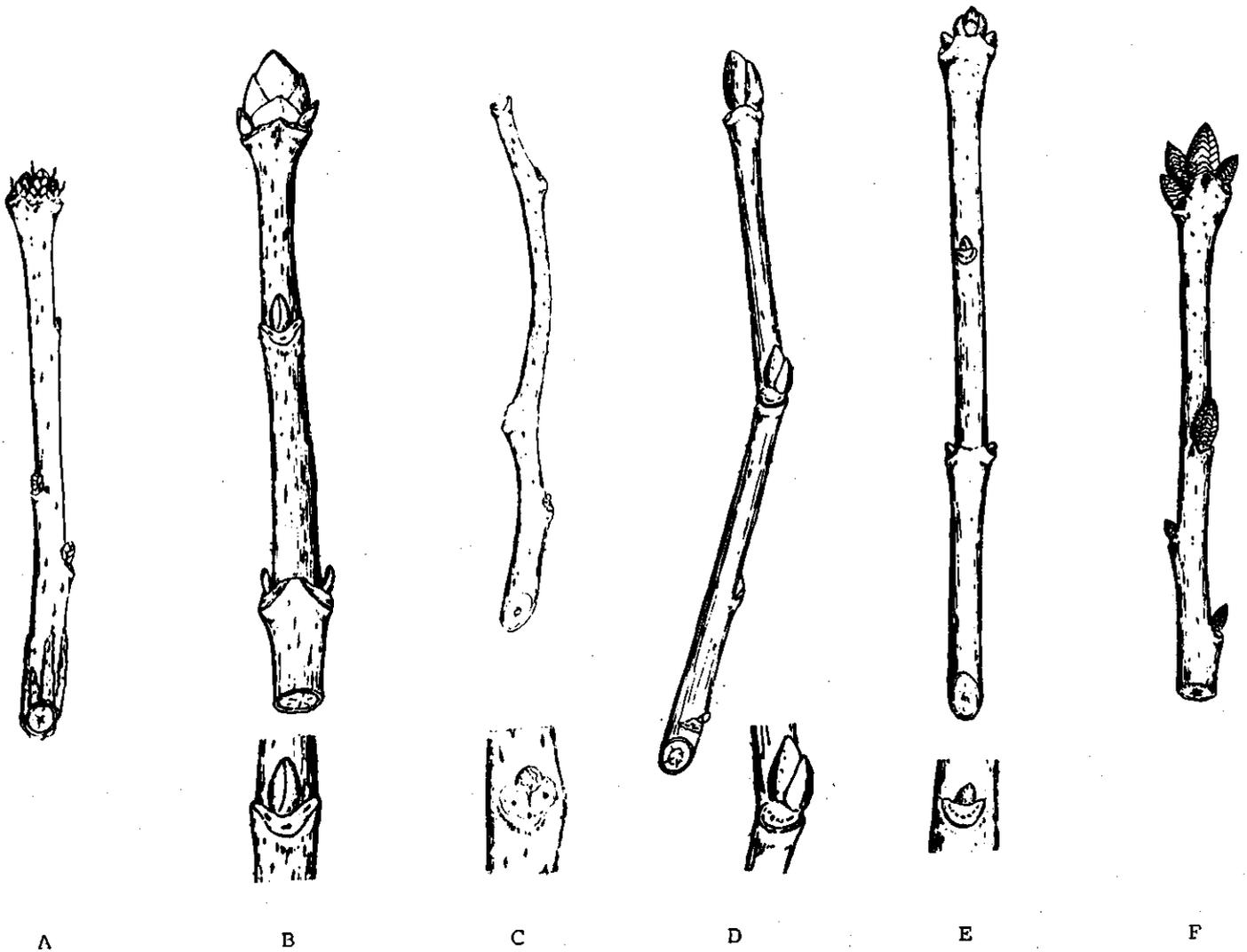
Star Shaped



Irregular

PITH CROSS SECTIONS

Figure 3



- 1) Leaf Scars Opposite
 - 2) Leaf scars crescent shaped, opposing leaf scars almost meet.
 - 3 bundle scars Norway Maple
 - 2) Leaf scars not crescent shaped, many bundle scars Green Ash

- 1) Leaf Scars Alternate
 - 3) Pith star shaped in cross-section
 - 4) Twigs corky, end buds somewhat hairy Bur Oak
 - 4) No cork on twigs, end buds hairless Red Oak
 - 3) Pith not star shaped in cross section
 - 5) Buds pointed, more than 3 bundle scars American Linden
 - 5) Buds small, blunt, 3 bundle scars Honeylocust

Figure 4

APPENDIX F

Shade Tree Advisory Committee - Selected Memoranda
Reports to the Legislature, 1975-81.

F

F 1

of Agriculture
Division of Plant Industry

Dutch Elm and Oak Wilt Disease
Advisory Board

April 25, 1974

J. R. Sanive

APRIL 16th MEETING OF ADVISORY BOARD

The first meeting of this board was held on April 16, 1974 in Room 415 of the State Office Building beginning at 10:00 a.m. The meeting was chaired by Robert Flaskerd, Director of the Division of Plant Industry of the Minnesota Department of Agriculture.

The purpose of the meeting was to review the rules and regulations proposed by the Department in accordance with the requirements of shade tree disease control legislation passed by the 1974 legislature. This law (Chapter 355, Section 66) provides that municipalities in the seven county metropolitan area appoint "tree inspectors" and implement programs of Dutch elm and oak wilt disease control in accordance with rules and regulations as adopted by the Minnesota Department of Agriculture.

Dr. Rollin Dennistoun spoke briefly concerning the policies of the Department in its efforts to implement the new law. It was pointed out that a date (May 7) already had been set for a public hearing on the rules and regulations.

The definition of a shade tree was discussed at some length with no consensus obtained. Suggestive modifications to be formulated into a new definition in time for the next meeting.

Differences in opinion as to what elm and oak come under in the new legislation were brought out. The jurisdiction of the Department of Natural Resources in this area also needs clarification.

The definition of municipality was found to need some additional language and this was to be provided by the Metropolitan Inter County Council.

A number of word changes and clarifications were suggested in the area of tree inspector training and certification.

Rules and regulations relating to control programs were to be reviewed and changes made after consultation with University experts, especially in the area of oak wilt control.

The meeting was adjourned about 1:00 p.m. with another meeting scheduled for April 30th at 9:00 a.m. A revised copy of the rules and regulations is to be mailed to each Advisory board member previous to the April 30th meeting.

The following were in attendance at the April 18th meeting.

Ken Simons - Ramsey County
Chuck Lowery - Dakota County
Lloyd Burkholder - City of St. Paul
Gerald Beach - Department of Natural Resources
Don Carlson - Department of Natural Resources
Robert Flaskerd - Minnesota Department of Agriculture
Keith Kuckler - Jordan, Minn., Farmer
Albert Hergott - Prior Lake, Weed Inspector
Gene Franchett - Metropolitan League of Municipalities
Ralph McGinley - Metropolitan Inter County Council
David M. Noetsel - Dept. of Entomology, Fisheries & Wildlife, U of M
J. R. Burkholder - Department of Public Welfare
George Steele - Minnesota Department of Agriculture
Joe Halgevold - Hennepin County
Dave DeVote - Minneapolis Park & Recreation Board
Rollin M. Dennistoun - Minnesota Department of Agriculture
Glen Shirley - City of Bloomington
D. W. French - University of Minnesota
J. R. Sandve - Minnesota Department of Agriculture

JRS:jp

Agriculture
Division of Plant Industry

Dutch Elm and Oak Wilt Advisory Board

May 8, 1974

J.R. Sandve

April 30, 1974 meeting of Advisory Board to review Rules & Regulations pertaining to Dutch Elm Disease and Oak Wilt

The meeting was chaired by Robert Flaskerd, Director, Division of Plant Industry, Minnesota Department of Agriculture.

Rules and regulations that had been amended in accordance with recommendations made at the previous meeting on April 16th were submitted to the Board.

There was a discussion of the Department of Natural Resources' area of responsibilities. Don Carlson of DNR submitted a memo proposing a change in the definition of a shade tree to include the term "essentially ornamental in character." After considerable discussion of the proposed change, the committee decided to retain the definition as given in the amended rules and regulations.

Ralph McGinley of Metropolitan Inter County Council discussed the special language needed to make it possible for Ramsey County to come under the special levy provided in the law. The law as it is worded, excludes Ramsey County because the entire county is incorporated.

The training of tree inspectors was discussed. There is a need for training sessions to get at the "nuts and bolts" of getting a program started. Dr. Dave French indicated that he would be available to help in this area.

Several word changes were suggested. For example: 1. In the sentence reading "An inspector approved by the Commissioner shall be paid by the municipality." 2. Certification of tree inspector shall be accomplished by their passing an examination. 3. The words a reasonable estimate, were inserted in the sentence dealing with inventory. 4. The word should was substituted for the word "must" in the section on records.

The committee was reminded that the official hearing on the rules and regulations would be held on May 7, 1974, at 10 AM in Room 57 of the State Office Building. Members were urged to attend.

The committee was asked to continue to serve and provide guidance to the Department as it implements the metropolitan Dutch elm and oak wilt disease program.

The following people were in attendance at the April 30th, 1974 meeting of the Advisory Committee:

J. R. Sandve, Minnesota Department of Agriculture
K. C. Simons, Ramsey County Open Space
John D. Berends, Minnesota Department of Agriculture
Lloyd Burkholder, City of St. Paul
Dr. D.W. French, University of Minnesota
Joseph Helgevold, Hennepin County
Dave DeVoto, Minneapolis Park Board
Chuck Lowery, Dakota County Parks
Tom Kalitowski, Minnesota Department of Agriculture
Robert Flaskerd, Minnesota Department of Agriculture
George Steele, Minnesota Department of Agriculture
Ralph McGinley, Metropolitan Inter County Council
Donald M. Carlson, Department of Natural Resources
Al Hergott, City of Prior Lake
Glen Shirley, City of Bloomington
Gene Franchett, Metropolitan League of Municipalities
Larry Kramer, Minnesota Pollution Control Agency
Rollin Dennistoun, Minnesota Department of Agriculture

*Don't
 This is the speech
 in which I kicked off
 the whole thing. It is still
 correct 8 years later. I think it is
 the most important speech I ever gave.
 I look forward
 to seeing you with.
 Don*

A PRIVATE CITIZEN'S THOUGHTS ON
 THE FUTURE OF THE TWIN CITIES
 URBAN FOREST

Remarks of Donald C. Willeke, prepared for the meeting of the
 Minnesota Shade Tree Disease Advisory Committee, 2 October 1974.

In speaking of logging in the Boundary Waters Canoe Area, the late United States District Judge Phillip Neville said that, once destroyed, the virtues of that forest "cannot be regained for perhaps hundreds of years. The recovery period is meaningless for generations to come. The destruction is irreversible." Judge Neville could just as well have been talking about the great forest of trees that covers what someone in yesterday's Minneapolis Star called the "most beautiful of American cities."

That, essentially, is why I am here today. I am a private citizen. I hold no public office. I merely pay taxes and own a small piece of property in Minneapolis which is also the home of one magnificent American Elm and a number of young trees of other species.

Commissioner Wefald has asked that I speak today for a short time about a private citizen's views on the need for a dramatically stepped-up planting program in the metropolitan area, and the need to obtain greater public participation and support of tree disease control programs and tree planting efforts.

David DeVoto, the Minneapolis Forester, and the man in the forefront of the efforts to preserve our present urban forest, was reported recently as saying that "If we lose all our elms, this city is going to look awfully bare."

I realize that I do not need to emphasize these things to the members of the State Shade Tree Disease Advisory Committee, but I note them as background for the considerations which a number of private citizens, myself included, are increasingly urging upon our elected and appointed officials.

The first thing I would urge upon you is a strong effort to obtain more public cooperation for our disease control programs. The public must be educated to the fact that Dutch elm and oak wilt diseases cannot be stopped, but that they can be slowed to tolerable levels. The public must be alerted to the fact that we will be witnessing a vast change in our urban forest, but they must be made to understand that it is within our power (and definitely within our financial capabilities) to slow that change to a tolerable pace. In other words, the public must be made to know:

1. That we can, by choosing action or by choosing inaction, determine whether the change will occur in a few years or many--whether it will take 4 years or 40.
2. That we must use such time as we have, and such additional time as we can gain by sensible, well-funded disease control and removal programs, to plant new trees so that they can be growing even as the loss of elms and oaks mounts.
3. That we will have to incur the costs in any case; if we do nothing, we will have to cut down most of our big trees in a relatively short period and at great cost, and then get to work clothing our nude cities and towns only with skimpy saplings that will take 40 to 80 years to grow to anything like the trees we have today.

4. That if we are vigilant, and if the public cooperates, we can slow the losses and spread the costs, and thus maintain our beautiful trees which are so much a part of the "Quality of Life" that Minnesotans treasure.

5. That public cooperation is vital to disease control efforts and to reforestation efforts.

What can we do to educate the public?

First, we must become better publicists. Perhaps we should even consider area-wide or state wide education programs of public service messages. Money not spent on educating the public to the problems will undoubtedly be spent removing trees which died because of citizen indifference--the "it can't happen here" syndrome.

Second, we must enlist citizen aid. Mr. DeVoto has spoken of the value of citizen reporting networks, since public tree inspectors can look at a tree one day and pronounce it perfectly healthy, only to have that tree wither and die due to Dutch elm disease a few days later. Mr. DeVoto and his counterparts in other cities should actively solicit neighborhood organizations and others to form elements of a citizen reporting network, complete with well-publicized phone numbers. This will take work, but it should save the taxpayers a considerable sum of money, both in the short term by cutting the number of tree inspectors needed to do a good job, and in the long term by reducing the numbers of tree deaths and consequent replanting requirements.

Third, we must elicit citizen understanding. The public must be made to understand that it is a citizen's duty to remove diseased trees from the citizen's own property and to report the existence of diseased trees elsewhere.

Fourth, we must elicit citizen enthusiasm. We must convince citizens that it is a patriotic thing to do to plant trees. It once was. Once upon a time, literally millions of trees were planted in the Twin Cities area. But the spirit of Arbor Day has faded. It must be revived. The Park Boards and City Councils should actively promote it, so that we will have a revival of tree planting. Programs should be set up to encourage families, schools, youth organizations, community groups and other associations to plant and care for young trees---we must convince these groups that here is a concrete contribution that just about anyone can make to the public welfare, and one that will last for centuries! John Adams adopted as his motto the Latin equivalent of the phrase, "He plants trees for future generations." It should be Everyman's motto.

* * * *

But beyond any volunteer effort, beyond the private effort, beyond educating the public, there must be a much greater effort by our governmental bodies themselves.

First, we must have plans. The highway people think up

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the best system for roads that money can buy, then they promote it. The educators devise the best of public school systems, then they promote it. But the public foresters (perhaps it is because of their love of the gentle things of nature and the affect this has on their outlook) have not, in my opinion and in the opinion of a growing number of concerned citizens, been active in promoting what is arguably the single most significant aspect of our great metropolitan area as compared with other large cities around the country. Take away our skyways, our IDS Tower, our super highways,-- even take away our lakes, and the Twin Cities would still be the Twin Cities. But take away our trees, and what do you have? A cold version of Omaha.

A recent Harris poll showed that the American people wanted most of all trees and grass,--even before schools and churches. As a private citizen, I would then urge the public officials present at this meeting to follow the words of Danial Burnham: "Make no little plans. They have no power to stir mens' blood, and will probably not even in themselves be realized." As a private citizen (and I repeat myself because I am painfully aware how little power one person can possess in these matters), I would note to the public servants here who are hired, not elected, that in my opinion it is not their duty to decide whether we need buildings or trees most. That is the job for the elected policy makers. Tell us what a first rate program will cost, and then let us chose our

elected officials accordingly as we agree or disagree with your plans. You can always cut your plans back, you know; the Highway people have had to do that. I suspect, however, that it will be a tropical January in Minnesota before the public decides we have too many trees, or that you are taking too good care of our urban forest. I have included the foregoing cautionary note because a number of us have detected a reluctnace on the part of some public officials to consider the broad range of possibilities, to allow public debate, to inform citizens about the plans (especially the plans for a phased reforestation) and to tell us whether these plans are adequate to meet the clear needs which we face.

Perhaps this problem of apparent reluctance by public officials arises because the data is not available on the needs we face. How many places should there be public trees where there are none now? How many street trees (on the average) die from natural causes each year? How many trees do we have altogether? What is the result of a worst-case-assumption on Dutch Elm Disease? What is the result of a realistic best-case-assumption on Dutch Elm Disease? What are the budget projections?

Now these statistics are available on other aspects of our public life: on our schools, on our highways, even on our local park board building programs in Minneapolis. If they are not available on our cities' shade trees, what will it cost to get them?

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Only by having this kind of information can an informed public make an intelligent decision about the single most prominent feature of our urban environment.

I suspect that a clear and complete set of statistics will illustrate that our present public efforts--throughout the entire metropolitan area--are woefully inadequate, but that an adequate program could be had for little more money than the cost of a few miles of superhighway. I also suspect that partial state funding, on a statewide matching basis, could be made available if a few people were convinced that trees were at least a small fraction as important to our fabled "quality of life" as high speed roads and ever-larger schools. But until we have complete proposals, backed by adequate statistics, any substantial program is likely to get lost in the political woods.

Perhaps I am unduly concerned. Perhaps our public information programs are in fact completely adequate. Perhaps our reforestation plans and programs will provide us with more than enough trees to fill up all the empty spaces along our streets, and still give us plenty of trees each year to enable us to plant small new trees where large old ones are lost to disease or injury. If I am wrong, we are wasting our time here, and I am boring you, and Commissioner Wefald can better spend his hours pinching corn borers than worrying about our great and beautiful urban forest.

But I'll lay you better than even money that I'm not wrong, and woe betide the politician or the civil servant that should have seen the problem and, several years from now, is found to have made inadequate plans! Citizens so prize our quality of life here in the Twin Cities that they will not abide such a result, and I need not elaborate upon just who it will be who will lead the hue and cry for public scalps.

However, I am confident that as we all work together and as we debate ways to solve the problems--not only the problems of Minneapolis, but the problems of Brooklyn Center and of Newport and of Burnsville--then we can arrive at just, equitable, sensible, and long-range solutions to the single greatest threat to our urban environment (which, after all, is the only environment most of see most of the time). In the famous Time Magazine article on Minnesota, a young and forward looking state businessman said "Being way up here, people have had a chance to see the crest of the wave coming and react to it . . . we've got a nice . . . thing and let's keep it that way." I believe most citizens will do their part to "keep it that way".

My favorite politician was Thomas Jefferson, who spoke of the District of Columbia's forest in these very untypical words:

"I wish I possessed despotic power, for by no other means can I preserve the noble forest trees that are still left growing in different parts of the city"

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With public education, citizen cooperation, and strong and effective leadership by our public officials, I trust that such despotic power will not be necessary in Minnesota.

Don Willeke

PRESERVING AND RENEWING A MAJOR ELEMENT

OF MINNESOTA'S QUALITY OF LIFE--

--A Proposal for Controlling Shade Tree Diseases
in the State of Minnesota for Fiscal Years 1976 - 1977

Prepared by the Minnesota State Shade Tree Advisory Committee
to the Commissioner of Agriculture

Approved by the Committee
on 4 February 1975

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Attachments:

A - M.S. Chapter 18.023

B - Department of Agriculture
Rules and Regulations
Chapter 4 - AGR 101-120

C - Shade Tree Advisory Committee Roster

I. INTRODUCTION TO DUTCH ELM DISEASE AND OAK WILT DISEASE IN MINNESOTA

Two devastating and immensely costly diseases are killing the two main types of shade trees in Minnesota.

Most of the trees in Minnesota's urban areas are either elm or oak. The elm is the predominant tree planted in the older cities and smaller town areas (Minneapolis is about 90% elm, St. Paul, 80% elm). The oak is the predominant type in the newer suburbs. As an indication of the scope of the problem, it should be noted that preliminary inventory figures indicated that there are three million elms and seven million oaks in the Twin Cities metropolitan area. Vast numbers of these trees also exist in other cities throughout the State.

A. LOSS OF ELMS

Due to the introduction of Dutch elm disease, the elms are being virtually eradicated in the cities, where they constitute most of the trees along the streets and in the parks. A similar danger exists for elms in rural forests and park lands. Dutch elm disease is caused by a fungus which chokes off the tree's vascular system. The disease is found in almost all parts of the State. However, the southeastern portion of the State, and the Metropolitan area in particular, are areas most heavily

inundated. Minnesota is about the last state to be seriously afflicted by Dutch elm disease because, until now, the severe winter conditions seem to have slowed the multiplication of the beetles which spread the fungus disease from dead and dying trees to healthy ones. But the beetles breed in dead and dying elm wood; therefore, as more and more trees are infected, the incidence of the disease tends to expand geometrically.

There is now no cure for Dutch elm disease. Trees have no immunity system as do animals; most plant diseases (such as Dutch elm disease) in all probability can never be "cured". Even if a cure should be developed, it would undoubtedly come too late to save any of the existing elm trees, as they would be long since dead. However, by proper control measures, tree losses (and the corresponding removal costs) can be held down to manageable levels. With proper control, the majority of the elm trees can be kept alive while orderly efforts to plant different types of trees take place.

Elm disease control measures consist of (1) removing diseased and dead elm trees as quickly as possible and (2) preventing the diseased elm trees from infecting adjacent healthy trees through root grafts (common root systems). It also helps if dead branches are removed from healthy trees by regular trimming so that these possible beetle breeding sites are destroyed.

If no control measures are used, almost all the elms may die in a short while, leaving naked cities, reduced property values and requiring the immediate expenditure of millions of dollars in removal costs.

It costs from \$100 to \$400 to remove a large elm such as the type usually found lining the streets and in the back yards of Minnesota's cities and towns. The cost may be even higher where a tree hangs over a house or garage and has to be taken down piece-by-piece. In the seven-county Metropolitan area, within municipal boundaries alone, there are between 1 million and 1.5 million elms. Outside the municipalities in the seven-county area, there are approximately 2 million additional elms. The out-of-pocket cost to public and private sectors if all the elms die in a short time would be staggering. Far greater economic costs will result from loss of shade trees which improve the landscape, cut heating and air-conditioning costs, and serve to reduce air and noise pollution. Precisely the situation described here has occurred in numerous other metropolitan areas in the country where most elms have already died. The monetary losses and costs to such areas as Des Moines, Omaha, and Champaign, Illinois--to name just a few--have been enormous.

Proper control measures are not excessively costly, when compared with the very real cost of doing nothing. It is estimated that, on the average, a large elm tree

can be kept healthy for 40 to 50 years for the same money it would cost to remove the tree if dead. Furthermore, when a mature tree dies, the municipality or private owner will be faced with the additional cost of replanting a new small tree.

B. LOSS OF OAKS

Oaks present a different problem than do elms. Oaks are the primary non-evergreen forest tree in Minnesota. Thus, the suburban areas which have been developed in former woodland areas, (i.e., the suburbs north and west of the Twin Cities as well as northern Minnesota communities) have a large number of oaks. These trees are subject to oak wilt fungus which is spread by insects and through root grafts and which attacks and kills the entire tree. The only effective control is removal of diseased trees before the fungus can produce more inoculum. The disease devastates entire stands of oak, and once in a stand, it spreads at the rate of 25 feet per year. Removal costs, and the other costs associated with the loss of elm trees, as described above, are also applicable to the loss of oak trees.

II. THE CURRENT STATUS OF CONTROL

In the Spring of 1974, the State Legislature passed into law the Shade Tree Disease Control Act, M.S. Chapter 18.023 (see Attachment A). The purpose of the law is to provide for the establishment of Dutch elm disease and oak wilt control programs by each metropolitan municipality (cities and counties) for public and private lands. It

was the considered judgment of the Legislature that these two diseases had reached epidemic proportion and that extraordinary measures were necessary. Two important elements of the law were: (1) the provision for the appointment and certification of a tree inspector by each municipality, and (2) a mandate to the State Department of Agriculture to establish regulatory measures for the treatment and removal of shade trees which may contribute to the spread of the two diseases (see Attachment B).

During the Summer and Fall months of 1974, a significant amount of activity took place both at the municipal and State level in order to implement the new law and curb the onslaught of these two diseases. The Department of Agriculture has made the implementation of the law its top priority. By doing so, key personnel were transferred from other areas of endeavor to meet the rigorous time constraints imposed by the 1974 legislation and the necessity to act during the summer and fall season, when diseased trees are most easily identified. Rules and regulations for the control program have been adopted, and numerous training programs for tree inspectors have been conducted in conjunction with the University of Minnesota.

At the municipal level some 144 jurisdictional units have appointed tree inspectors and the monitoring program of the Department has revealed that approximately 50% of the involved municipalities are performing the control

function at an adequate level. Considering the severe time constraints and limited resources of the first year of operation, the Department has stated that it considers this to be a sound beginning for the new program.

Although much has taken place in the area of control, there remains much to be done. Through the cooperation of all involved jurisdictions and an increased financial support of the State Legislature, the future of shade tree disease control in Minnesota is bright. Without an adequate program with adequate funding, the State's cities and towns will suffer the tragic fate visited upon the cities and towns of Iowa, Illinois, Nebraska and other states where the great shade trees have been largely wiped out.

III. CONTROL PROGRAM PROPOSALS--INTRODUCTION

Through an extensive process of study and program analysis, the State Advisory Committee has concluded that there are definable areas of need which must be met immediately if the control programs of local governments are to have a significant impact on the effects of shade tree diseases. Further, the State Advisory Committee has concluded that the levels of appropriation written into the 1974 law and the current financing resources of local government are insufficient to meet these needs.

Specifically, there is obvious need for: (1) expanded diseased wood destruction programs which will reduce the direct costs to the private landowner and greatly strengthen the control of disease spread; (2) increased public awareness programs; (3) accelerated training and research programs; and (4) a direct subsidization of private removal costs. The absence of funding for these elements represents the major inhibitor to the development and execution of a truly effective program. The remainder of this report will outline the specific elements of a program which, if accepted, will fulfill the basic objectives and intent of the 1974 law at the lowest cost possible.

Prior to a discussion of these elements, it should be noted that the process of program development does not stop with the proposals as recommended in this document. The Department of Agriculture is committed to the investigation and research of other financing and administrative proposals which will serve to strengthen the program. For example, discussions are presently ongoing with representatives of various Comprehensive Employment and Training Agencies in an effort to pursue the possibility of incorporating the expanded Federal public service jobs program into the shade tree disease control effort. Furthermore, the Department and the State Advisory Committee are exploring alternative means of homeowner payment of

diseased tree removal costs.

IV. PROPOSED PUBLIC EDUCATION PROGRAM

An informed citizenry is an essential element for an effective attack on oak wilt and Dutch elm disease. If the citizens are aware of the epidemics which are threatening their shade trees and are aware of the proper steps to be taken when disease symptoms are spotted, they will be better equipped to deal with diseased trees on private property. Further, they will better understand and support control measures being undertaken by their local governments and park officials. And finally, they will understand the value of replanting as the trees are lost, so that communities are not faced with a long period where few or no significant-sized shade trees exist.

Thus, the stated purpose of the Public Education Program is:

1. To increase citizen awareness of the nature and seriousness of the threat to shade trees as a result of oak wilt and Dutch elm disease.
2. To encourage citizen organizations to joint in the effort to control and combat the diseases.
3. To educate the public as to specific steps to be taken to control and combat the diseases.

4. To increase awareness of the importance of individual and community effort to control and combat the diseases and to replant a variety of shade tree species.

5. To publicize Arbor Day, April 25, 1975, and every year thereafter, in an effort to promote the planting of shade trees by private citizens, corporations and other public and private organizations.

With the support of State funds and under the direction of the Commissioner of Agriculture, the public education program will utilize a comprehensive mix of media services to disseminate information. The program will rely heavily on the "public service announcement" approach supplemented by purchased time in order to insure maximum possible coverage. Public information packages will also be developed whereby prepared presentations will be available to schools, citizen groups and similar organizations.

Without the support and cooperation of an informed citizenry, the efforts of the local government would have to be substantially increased and the potential of control efforts is thereby proportionately diminished. By helping to hold down losses, such a program would certainly provide benefits far in excess of its costs to the State. Therefore, the Advisory Committee strongly recommends an appropriation of \$50,000 per year for the next biennium for this very necessary program.

V. PROPOSED RESEARCH AND TRAINING PROGRAM

A. APPLIED RESEARCH

As this report has previously indicated, there is no cure for Dutch elm disease and oak wilt. The current state of the art for control is to remove the dying or dead trees as swiftly as possible to prevent the spread of the fungi which kill elms and oaks. This is not to say, however, that improved methods of control are not possible. Therefore, there is a basic need for an applied research capability to augment existing control programs.

The objective of the present research program of the University of Minnesota for shade tree diseases is to develop and improve control measures which can be put to use in the immediate future. Like the "no cure" status of the situation, there is no way that resistant varieties of elm can be evolved in time to counter the losses which now face Minnesota. Development of resistant oaks is even less promising. The most logical approach to both of these diseases is to refine and improve the techniques which are now known to be reasonably successful. Sanitation, disruption of common root systems and more complete knowledge of patterns of dispersal need further study. By pursuing these objectives, the research community can and will provide the best possible advice to communities in Minnesota and thus help to achieve the goal of slowing the losses to Dutch elm disease, and reducing oak wilt to a minor disease problem.

Specifically, there is a need to develop better methods of preventing disease-carrying beetle invasion of elm trees, sporulation of the oak wilt fungus, and the movement of either fungus through common root systems from infected to surrounding healthy trees. It is also necessary to ascertain when infection takes place in both oaks and elms, the importance of wounding, and whether or not infections can be pruned out of elms and oaks. Another consideration requiring careful research is how best to utilize the elm and oak wood and especially how to reduce the numbers of these trees which need to be destroyed.

Through a research program, the State of Minnesota will be able to spend its funds more wisely and to receive maximum returns on each dollar invested in tree disease control.

Therefore, the Advisory Committee strongly recommends an appropriation of \$75,000 per year for the next biennium to the University of Minnesota for the purposes of applied research.

B. TRAINING

As is the case in every service delivery endeavor, the quality of the service is only as competent as the personnel involved. In the case of local control programs, the Tree Inspector and his/her staff shoulder the burden of effectiveness requiring a high degree of program understanding and expertise. Therefore, there is an obvious need for continual training and upgrading of skills in disease control

for these individuals. The University of Minnesota Agricultural Extension Service has provided this vital service in the past and has proven to be an effective educational vehicle.

To meet the needs for training of local government personnel, the Extension Service will write and publish bulletins, offer short courses and seminars, and conduct field classes in the areas where diseases can be observed firsthand. This part of the training program requires rather intensive instruction with very small groups of people. Because so many people are involved in one way or another, courses will have to be offered in different parts of the State. In the implementation of this training program, it is anticipated that the Extension Service will draw heavily from and utilize the resources of numerous agencies and groups such as the Department of Natural Resources, Soil and Water Conservation Districts, the Department of Agriculture, etc.

Therefore, the Advisory Committee strongly recommends an appropriation of \$50,000 per year for the next biennium to the University of Minnesota Agriculture Extension Service for the purpose of staff training and education.

VI. PROPOSED WOOD UTILIZATION/DISPOSAL PROGRAM

The State Advisory Committee has conclusively identified the lack of adequate methods and systems of doing away with diseased elm and oak trees, once removed, as

the major problem area in the creation of any effective disease control program. The problem of what to do with diseased trees is a nagging one and has an impact on all components of the prescribed control program, but it must be dealt with effectively and rapidly, as diseased trees are the source of fungi which are spread by insects and root grafts to healthy trees.

At the present time there are three methods of doing away with diseased elm and oak wood, all of which are insufficient, for one reason or another, for the present situation. These three methods are: (1) landfilling; (2) chipping and sawing; and (3) burning. Landfilling, although technically acceptable as a final disposal method, is extremely costly and dictates that trees are often hauled across many jurisdictional boundaries enroute to a landfill site. Further, the projected total landfill capacity is limited and a massive program of diseased wood landfilling would severely cut landfill life.

Burning, the least utilized method of disposal, is an extremely cumbersome process due to the complex and rigorous regulations and permit requirements imposed by the Pollution Control Agency.

Disposal by chipping and sawing is being used to a limited extent at present. It is the only proposal which offers any possibility of resource utilization. Hennepin County has had a wood chipping operation for

two years and has enjoyed relatively good success in their wood chip marketing program. In addition to the Hennepin operation there are a few private chippers operating in the area, but the total complement is far too limited to service the total present and projected needs.

The net result of the above-described methods, as presently employed, is that the present system is highly inadequate and the level of control is sorely diminished. Due to the high associated costs, numerous trees are being stockpiled throughout the disease-infected areas, thus, providing further breeding grounds for beetles and disease fungus.

The primary objective of the proposed utilization/disposal plan is to support the shade tree disease control program by providing a comprehensive system of readily accessible disposal and/or utilization techniques. In effect, the wood utilization disposal plan will be geared toward the swift and complete elimination of hazards posed by beetle infected and/or disease infected trees which have been removed by the various control programs. The secondary objective of the plan is to promote and develop a system which will incorporate cost-effective resource conversion operations as a means of wood disposal. The objectives would be fulfilled by developing strategically located disposal sites throughout the Metropolitan area.

Such sites would supplement present disposal systems by absorbing the anticipated increased volume of hazardous material in the next few years.

The State Advisory Committee, therefore, strongly recommends the establishment of a grants program under the Commissioner of Agriculture whereby cities of the first class and counties (or any combination thereof) with mandated responsibility under M.S. 18.023 could solicit and receive matching funds (75-25) for the procurement of capital equipment to dispose of and/or utilize in some manner diseased trees. Such grants must be made in conformance with the Commissioner's approval relative to the objectives of the control program. For the purposes of funding, the State Advisory Committee recommends an appropriation of \$2,000,000 for the first year of the next biennium.

VII. PROPERTY OWNER SUBSIDY PROGRAM

As this report has previously indicated, the costs of tree removal to the private homeowner are extremely high and the necessity for immediate removal of diseased trees is real. The State Advisory Committee has, therefore, identified the need for some form of private property owner subsidy as a means of providing economic relief and effective incentive for swift action. If, and only if, the general public supports and cooperates with the control program, then the costs of tree removal can be held to a minimum. If they do not, the existence of diseased trees

on private properties will serve as a source of infection to trees on public land and to other privately owned trees in the vicinity of the diseased trees. This concept must be understood and acted upon if there is to be an effective control program in a given area. The existence of a "pocket" of unremoved diseased trees has a definite "rotten apple in the barrel" effect.

In view of this very real potential of unmanageable economic burden, the State Advisory Committee strongly recommends an appropriation of \$1,000,000 per year for the next biennium for the purposes of establishing and administering a public subsidy program for diseased elm and oak removal. We believe the State should provide grant-in-aid funds on a matching basis to local units governments in control areas to establish subsidy programs as a part of overall approved shade tree disease control programs. We recommend that ratio of State to local funds be 75:25, and that payments of not more than one-half of the removal cost or \$50 per tree (whichever is less) be authorized. The subsidy should not be made available to owners who refuse to remove trees in the time required by the regulations, but merely let municipalities come in and condemn and remove diseased trees.

VIII. RECOMMENDED REPLANTING PROGRAM

Another vital element in the effort to maintain and preserve the quality of Minnesota's environment is an extensive program of tree replacement and replanting. The

fact of the matter is that trees will be lost in the near future, and even with a truly effective program, they will be lost in great numbers. In order for the areas affected to provide for an orderly transition from elm and oak trees to mixed tree species, every possible encouragement must be made to the public and private sectors alike to become involved in replanting.

The mechanics of growing trees suitable for replanting purposes dictates a very slow process. Therefore, in order to keep pace with anticipated losses, public and private nurseries must begin now to plan for 1979-80 demands.

Therefore, the State Advisory Committee, in recognition of the increasing need for new trees, strongly urges and recommends the nursery industry to expand their operations to the maximum extent possible to meet future demand, and to endeavor to provide a mixed variety of tree species to the public as economically as possible. Furthermore, the State Advisory Committee urges the State and local units of government to support the efforts of the nursery industry in this expanded program to the maximum extent possible. The Committee itself will, through its continuing discussions, endeavor to work with this concept and assist the program in any way possible.

IX. ADMINISTRATIVE PROPOSAL

With the expansion of the control program as outlined, there is an obvious need for increased administrative support

to the Commissioner of Agriculture. Therefore, the State Advisory Committee recommends an appropriation of \$50,000 per year for each year of the next biennium to the Department of Agriculture for the purpose of administration.

X. RECOMMENDED COST SUMMARIZATION

The recommended appropriations as previously discussed are summarized as follows:

	<u>Fiscal 76</u>	<u>Fiscal 77</u>	<u>TOTAL</u>
A. Public Education	\$ 50,000	\$ 50,000	\$ 100,000
B. Research & Training			
Research	75,000	75,000	150,000
Training	50,000	50,000	100,000
C. Disposal/Utilization*	2,000,000	-0-	2,000,000
D. Property-Owner Subsidy*	1,000,000	1,000,000	2,400,000
E. Administration	<u>50,000</u>	<u>50,000</u>	<u>100,000</u>
TOTALS	\$3,225,000	\$1,225,000	\$4,450,000

XI. RANKING OF PRIORITIES

The Committee believes that the entire program recommended herein is vital if the State of Minnesota is to control the devastating spread of Dutch elm disease and oak wilt disease, if we hope to prevent the rapid destruction of the most important part of the natural environment of our cities and towns as has occurred in Iowa, Illinois, Wisconsin and other

* These amounts include appropriate sums for costs of administering grants programs.

neighboring states. However, we are certain that the Legislature will wish to know whether one element of the program is more vital than any other. Accordingly, the members of the Committee wish to state that our collective judgment is that Disposal/Utilization (Item C, above) is most important, to disease control, followed in turn by adequate funding of the Department of Agriculture's administrative organization to monitor and enforce local programs (Item E), Research and Training (Item B), Public Education (Item A) and Property-Owner Subsidy (Item D). We further recommend that in the unfortunate event that it is necessary to cut out any programs the cuts be made in order of priority, and not in the form of across-the-board percentage cuts.

We emphasize in conclusion that unlike other areas where the State acts to prevent disasters, there will be NO SECOND CHANCE with respect to tree diseases. Once the diseases reach epidemic proportions, the ample evidence of all other areas in the nation illustrates that there is no hope of recovery. We strongly believe that we must act now, or suffer the dire fate which has befallen municipal environments elsewhere where elms and oaks were the predominant shade tree species.

Respectfully submitted by the
STATE SHADE TREE ADVISORY COMMITTEE

18.023 Shade tree disease control

Subdivision 1. Definitions. As used in subdivisions 1 to 11 the terms defined in this subdivision shall have the meanings given them.

(a) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver. (b) "Commissioner" means the commissioner of agriculture. (c) "Municipality" means any city or any town exercising municipal powers pursuant to Minnesota Statutes, Section 368.01, or any general or special law, located in the metropolitan area or any special park district as organized under Minnesota Statutes, Chapter 398, or any special purpose park district organized under the city charter of a city of the first class located in the metropolitan area, or any portion of a county in such metropolitan area located outside the geographic boundaries of a city or town exercising municipal powers and any municipality located outside the metropolitan area which petitions to and has consent of the commissioner to come within the provisions of this section. (d) "Shade tree disease" means Dutch elm disease or oak wilt disease.

Subd. 2. Commissioner to adopt rules. The commissioner shall adopt and from time to time may amend, rules and regulations relating to shade tree disease control in the metropolitan area in accordance with Minnesota Statutes, Sections 15.0411 to 15.0422. Such rules and regulations shall prescribe control measures to be used to prevent the spread of shade tree diseases and shall include the following: (a) a definition of shade tree, (b) qualifications for tree inspectors, (c) methods of identifying diseased shade trees, (d) procedures for giving reasonable notice of inspection of private real property, (e) measures for the treatment and removal of any shade tree which may contribute to the spread of shade tree disease, and (f) such other matters as shall be determined to be necessary by the commissioner to prevent the spread of shade tree disease and enforce the provisions of this section. In accordance with the rules and regulations adopted by the commissioner, and reasonable notice of inspection having been given to the owner of the real property, diseased shade trees shall be removed or treated by the owner of the real property on which such diseased shade trees are located within a period of time as may be established by the commissioner. In the case of the expense of removing or treating diseased shade trees located on street terraces or boulevards, not more than 50 percent of such expense may be assessed to the abutting properties by the municipality which expense shall become a lien on the property. Trees which are not removed or treated shall be declared a public nuisance and removed by the municipality which may assess the total expense or any part thereof to the property which expense shall become a lien on the property.

Subd. 3. Rules and regulations, applicability to municipalities. The rules and regulations of the commissioner shall apply in a municipality unless the municipality adopts an ordinance which is determined by the commissioner to be more stringent than the rules and regulations of the commissioner. The rules and regulations of the commissioner or the more stringent ordinance of the municipality shall be in effect 60 days from the effective date of this section.

Subd. 4. Subsidies to private property owners. (a) A municipality may provide subsidies to private property owners for the treatment or removal of diseased shade trees provided, however, that the cost to the municipality for providing such subsidies shall be within the limitations set forth in Minnesota Statutes, 1973 Supplement, Sections 275.50 to 275.56.

(b) Notwithstanding any law to the contrary, an owner of property on which shade trees are located may contract with a municipality to provide protection against the cost of treatment or removal of diseased shade trees or shade trees that will contribute to the spread of shade tree diseases. Under such contracts, the municipality shall pay for the removal or treatment under such terms and conditions as may be determined by the governing body of the municipality.

Subd. 5. Tree inspector. (a) Within 75 days from the effective date of this act, the governing body of each municipality shall appoint a qualified person to administer the rules and regulations of the commissioner or the more stringent shade tree disease control ordinance who shall be known as the tree inspector. In accordance with the provisions of Minnesota Statutes, 1973 Supplement, Section 471.59, two or more municipalities may jointly appoint a tree inspector for the purpose of administering the regulations or ordinance within their communities. In those municipalities which have not appointed a tree inspector upon the expiration of 75 days from the effective date of this section, the commissioner may appoint a tree inspector to serve the municipality until the municipality has made an appointment. If the commissioner is unable to make such appointment he may assign a qualified employee

of the department of agriculture to perform the duties of the tree inspector. The expense of a tree inspector appointed by the commissioner shall be paid by the municipality. If an employee of the department of agriculture performs such duties the expense shall be billed to the municipality and paid into the state treasury and credited to the general fund.

(b) Upon a determination by the commissioner that a candidate for the position of the inspector is qualified, he shall issue a certificate to the tree inspector that he is so qualified. Any person certified as a tree inspector by the commissioner is authorized upon prior notification to enter and inspect any public or private property which might harbor diseased shade trees.

(c) The commissioner may upon notice and hearing, decertify any tree inspector when it appears to him that said tree inspector has failed to act competently or in the public interest in the performance of his duties. Such notice shall be provided and the hearing conducted in accordance with the provisions of Minnesota Statutes, Chapter 15, governing contested case proceedings. Nothing in this clause shall limit or otherwise affect the authority of a municipality to dismiss or suspend a tree inspector at its discretion; except as otherwise provided by law.

Subd. 6. Tax levies. Except as provided in subdivision 4, the costs to a municipality implementing this act including removal or treatment of trees from municipality or privately owned property shall be deemed a "special levy" and may be outside all existing tax levy limitations including those contained in Minnesota Statutes, 1973 Supplement, Sections 275.50 to 275.56.

Subd. 7. Financing. (a) A municipality may collect the amount assessed against the property as a special assessment and may issue obligations as provided in Minnesota Statutes, 1973 Supplement, Section 429.101, Subdivision 1, provided that a municipality as its option make any assessment levied payable with interest in instalments not to exceed five years from the date of the assessment.

(b) After a contract for the removal or treatment of trees on private property has been let, or the work commenced, the municipality may issue obligations to defray the expense of any such work financed by special assessments imposed upon private property. Minnesota Statutes, Section 429.001 shall apply to such obligations with the following modifications:

(1) Such obligations shall be payable not more than five years from the date of issuance; and

(2) No election shall be required.

Obligations issued under the provisions of this clause shall not be considered bonded indebtedness for the purposes of Minnesota Statutes, 1973 Supplement, Sections 273.13, Subdivisions 6 and 7. The certificates shall not be included in the net debt of the issuing municipality.

Subd. 8. Deposit of proceeds in separate fund. The proceeds of any tax levied, assessments and interest collected, or any certificates of indebtedness issued under subdivisions 6 and 7 shall be deposited in the municipal treasury in a separate fund and expended only for the purposes authorized by this section.

Subd. 9. Diagnostic laboratory. The commissioner of agriculture shall operate a diagnostic laboratory for culturing diseased trees for positive identification of diseased shade trees.

Subd. 10. Cooperation by university. The university of Minnesota college of agriculture shall cooperate with the department of agriculture in control of shade tree disease. The college of agriculture shall also conduct research into means for identifying diseased shade trees, shall develop and evaluate control measures, shall develop means for disposing of and utilizing diseased shade trees.

Subd. 11. Report to the legislature. On or before January 31 of each succeeding year, the commissioner shall report to the legislature on the preceding year's plans and control programs which have been implemented for shade tree diseases in the metropolitan area.

Subd. 12. Appropriation. [Not coded] There is appropriated to the regents of the university of Minnesota the sum of \$35,000 and to the commissioner of agriculture the sum of \$65,000 for the fiscal year ending June 30, 1975, from the general fund, for the purposes of this section.

Rules and Regulations of
The Department of Agriculture

CHAPTER 4: AGR 101 - 120

SHADE TREE DISEASE CONTROL

AGR 101 Statement of Public Policy. It is the purpose of the rules and regulations contained herein to carry out and enforce the provisions of Laws of Minnesota, 1974, Chapter 355, Section 66. An epidemic of Dutch elm disease and oak wilt disease is occurring in the seven county metropolitan area. Trees are an important element in the healthful environment of the seven county metropolitan area, because of the concentration of population in the area. The impact of the diseases appears to be greater in the seven county metropolitan area than it does in other areas of the state, therefore, it is necessary to take extraordinary measures to control such diseases.

AGR 102 Definitions. As used in this regulation the following words and terms shall have the meanings given:

- (a) "Shade tree" means any oak or elm tree situated in a disease control area approved by the Commissioner.
- (b) "Shade tree disease" means Dutch elm disease caused by Ceratocystis ulmi, or oak wilt disease caused by Ceratocystis fagacearum.
- (c) "Commissioner" means the Commissioner of Agriculture.
- (d) "Metropolitan area" means the area comprising the counties of Hennepin, Ramsey, Anoka, Dakota, Washington, Scott and Carver.
- (e) "Municipality" means any city or any town exercising municipal powers pursuant to Minnesota Statutes, Section 368.01, or any general or special law, located in the metropolitan area or any special park district as organized under Minnesota Statutes, Chapter 398, or any special purpose park district organized

under the city charter, or any portion of a county in such metropolitan area located outside the geographic boundaries of a city or town exercising municipal powers and any municipality located outside the metropolitan area which petitions to and has consent of the Commissioner to come within the provisions of this act.

NOTE: It is the determination of the Commissioner that any county in the metropolitan area shall for the purposes of these regulations and for Minnesota Laws 1974, Chapter 355, Section 66, be considered a "municipality" for any and all land area which is owned by said county.

(f) "Tree inspector" means a person who has the necessary qualifications to properly plan, direct and supervise all requirements for controlling shade tree disease in one or more governmental subdivisions within the limits of all laws, rules, and regulations governing this control and is so certified by the Commissioner.

(g) "Disease control area" means an area approved by the Commissioner within which a municipality will conduct a shade tree disease control program.

AGR 103 Tree Inspector Employment and Qualifications.

(a) A municipality will employ or retain on a continuing basis a tree inspector or will employ or retain jointly with one or more municipalities a tree inspector as provided by M. S. 471.59.

(b) Provisional appointments

(1) A municipality may provisionally appoint a tree inspector for a period of not more than 6 months.

(2) This appointment is dependent on approval by the Commissioner after determining the competence of the appointee.

(3) The provisional appointment cannot be extended and the appointee must either pass the tree inspectors examination or successfully complete the next training course approved by the Commissioner to be certified as a tree inspector.

(4) The provisional appointment may be withdrawn by the Commissioner upon notice and hearing for cause.

(c) A tree inspector must be able to demonstrate the following qualifications:

(1) Identify all native tree species common to his work area with or without leaves and all felled or down trees with bark intact.

(2) Distinguish oak wilt and Dutch elm disease from all other tree problems of oak and elm.

(3) Know the proper method of collecting samples for disease diagnosis.

(4) Know and understand the biology of oak wilt and Dutch elm disease.

(5) Know the appropriate Minnesota laws and rules and regulations relative to oak wilt and Dutch elm disease.

(6) Know the approved control methods for oak wilt and Dutch elm disease.

(d) If a municipality fails to appoint a tree inspector by June 13, 1974, an appointment may be made by the Commissioner pursuant to Laws of Minnesota, 1974, Chapter 355, Section 66. Ten working days prior to such appointment, the Commissioner shall notify the municipality by mail of such pending appointment. An inspector appointed by the Commissioner shall be paid by the municipality for a minimum of 90 days even though the municipality may appoint their own inspector prior to the expiration of 90 days. However, this provision shall not apply to an inspector whose employment is suspended or terminated for cause.

AGR 104 Certification of Tree Inspector.

(a) Certification of tree inspectors shall be accomplished by their passing an examination prescribed by the Commissioner for the purpose of determining that the applicant possesses the necessary qualifications. Each applicant shall be notified by the Commissioner by mail of the time and date of such examination. The applicant and the employing municipality will be notified of the results of the examination within 15 days.

(b) After certification, a tree inspector shall be required to attend annually at least one program of continuing education as approved by the Commissioner. Failure to attend such programs as required may be grounds for revocation, termination, or suspension of certification.

AGR 105 Decertification of Tree Inspectors. The Commissioner may upon notice and hearing decertify any tree inspector for cause as provided in the law.

AGR 106 Shade Tree Disease Control Program. The tree disease control program of all municipalities affected by these regulations shall include as a minimum the

following elements:

(a) Control area. Each municipality shall designate and submit for approval by the Commissioner a disease control area.

(b) Program plan. Each municipality shall prepare a tree disease control program plan that details the manner in which these regulations will be fulfilled.

(c) Methods of identifying diseased shade trees. Diseased shade trees will be identified by generally accepted field symptoms such as wilting, or yellowing of leaves, or staining of inner bark. Confirmation when determined to be necessary, will be made by the Minnesota Department of Agriculture, tree disease laboratory, or other laboratory recognized by the Commissioner.

(d) Dutch elm disease and oak wilt control

(1) Tree inventory. A reasonable estimate of elms, oaks, and other tree species on both public and private property must be made and recorded. This should be a permanent record and reported to the Department of Agriculture.

(2) Dutch elm disease control must include the following:

(aa) Sanitation. Sanitation is the major element in any Dutch elm disease control program because it is needed to eliminate elm bark beetles, diseased trees, and dead or weakened elm wood arising from any cause. This must include trees on private property.

(i) Prior to April 15, check all public and private properties for elm wood or logs that could serve as bark beetle breeding sites and require removal, or de-barking if wood is to be retained. Before making any inspections on private property within a municipality, it shall be the duty of the municipality to attempt to give notice of said inspection to all affected residents either through individual, oral or written notice or by publishing said notice in a local newspaper.

(ii) Check all elm trees at least twice during the growing season (by July 1 and August 15) for Dutch elm disease symptoms.

(iii) Remove and properly dispose of diseased or dead elm

trees or any above ground parts thereof within 20 days after notification in accordance with prescribed methods approved by the Commissioner and consistent with applicable air quality and solid waste regulations.

(bb) Root Graft Control. Disrupt common root systems by chemical or mechanical means as approved by the Commissioner to prevent root graft spread of Dutch elm disease.

(3) Oak wilt. Oak wilt control involves both root graft treatment and prevention of infection by oak wilt spores carried by insects or other agents (overland spread).

(aa) Use chemical or mechanical means to disrupt root graft transmission of the oak wilt fungus as approved by the Commissioner.

(bb) Overland spread

(i) Avoid pruning or other mechanical damage during the most susceptible period in May and June. Use tree wound dressings if wounding is unavoidable during susceptible period.

(ii) Girdle diseased trees as soon as they are detected to reduce spore mat formation. Chemical or mechanical root disruption should precede girdling if root graft spread is likely to occur.

(iii) Eradicate or destroy the following diseased oaks: northern red oak, Quercus rubra, northern pin oak, Quercus ellipsoidalis, black oak, Quercus velutina, and scarlet oak, Quercus coccinea, in accordance with prescribed methods approved by the Commissioner and consistent with applicable air quality and solid waste regulations.

(e) Records. Shade tree disease program records must be kept by each municipality and be available for examination at any time by the Commissioner. A yearly report of the summation of these records must be made to the Commissioner by December 1 and this report should include the following:

- (1) Monies expended on personnel, equipment, and contracts listed separately.
- (2) Man hours spent on tree inventory, sanitation, and any chemical control measures.
- (3) Number of samples submitted for diagnosis, and the results, the

ATTACHMENT C

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number of diseased trees and the number of trees removed.

(4) Number of removal notices issued for the diseased tree located on private property.

(5) Number of notices issued for removal of wood which may be a hazard in the spread of a shade tree disease.

(6) The report must include the beginning inventory and indicate the number of trees removed, both diseased and others.

(f) Program Review

(1) Prior to June 13, 1974 and annually thereafter by January 1st municipalities must submit their shade tree disease control program plan to the Commissioner for review to determine if it meets or exceeds the requirements of the law and any rules and regulations related thereto.

(2) The Commissioner shall complete this review and notify the municipalities of his approval within 15 days.

(3) Final determination of municipal program compliance with these rules and regulations shall rest with the Commissioner.

(4) The Commissioner may require changes or improvements at anytime he determines they are needed in any municipal program in order to obtain compliance with these rules and regulations.

AGR 107 - 120 Reserved for future use

Filed: 6-14-74

Attachment C
Page 2

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LOOKING TOWARDS MINNESOTA'S FUTURE
BY INSURING AN ORDERLY TRANSFORMATION
OF OUR URBAN FORESTS

A Proposal for Controlling Shade Tree Diseases
in the State of Minnesota for Fiscal Years 1978 - 1979

Prepared by the Minnesota State Shade Tree Advisory Committee
For the Governor of the State of Minnesota &
For the Minnesota Commissioner of Agriculture

Approved by the
Full Committee On
October 18, 1976

Donald Charles Willeke
Christy - eighth Floor
J D S Tower
Minneapolis, Minnesota 55402

12 November 1976

The Honorable Wendell R. Anderson
Governor of the State of Minnesota
The Statehouse
St. Paul, Minnesota

The Honorable Jon Wefald
Commissioner of Agriculture
State of Minnesota
420 State Office Building
St. Paul, Minnesota 55155

Dear Governor Anderson and
Commissioner Wefald:

I have the honor to transmit to you the Report of the Minnesota State Shade Tree Advisory Committee entitled "Looking Towards Minnesota's Future by Insuring an Orderly Transition of Our Urban Forests."

This Report, comprising the principal part of our recommendations for action by the State of Minnesota in the Fiscal Years 1978 and 1979, is the product of much study and effort by the Committee, assisted by members of the staff of the Department of Agriculture, and other State agencies, the University of Minnesota, local and regional units of governments, the Metropolitan Inter-County Council, the Metropolitan League of Municipalities, private industry and others.

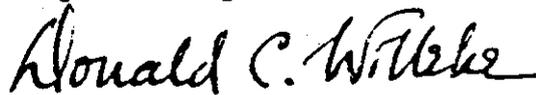
We are not pleased to make the recommendations contained in the Report.

However, we are convinced that there is no escape from heavy expenditures -- of one type

Page -2-
12 November 1976

or another -- in connection with Dutch Elm Disease and Oak wilt disease. We believe the prudent course is to allocate state and local resources now, while the problems may in some measure be controlled. The alternative is to face a financial and environmental disaster of great proportions.

Respectfully submitted,



Donald C. Willeke,
Chairman
State Shade Tree
Advisory Committee

DCW/nlw

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RESOLUTION
OF THE
MINNESOTA STATE SHADE TREE ADVISORY COMMITTEE

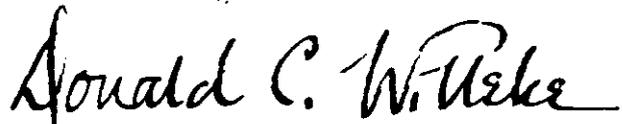
WHEREAS, the Minnesota Shade Tree Advisory Committee reviews on a continuing basis the problems of shade tree diseases in the State of Minnesota, and

WHEREAS, the Committee has developed recommendations for a comprehensive state program for Fiscal Years 1978 and 1979 to curtail the rapid spread of shade tree diseases.

NOW, THEREFORE, be it resolved by the Minnesota State Shade Tree Advisory Committee that the proposed program in the form attached hereto be adopted on the 18th day of October, 1976, and that said program be submitted to the Governor of the State of Minnesota, and the Commissioner of the Minnesota Department of Agriculture.

Unanimously Adopted

October 18, 1976



Donald C. Willeke, Chairman
Minnesota State Shade Tree
Advisory Committee

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I. INTRODUCTION TO DUTCH ELM DISEASE AND OAK WILT DISEASE IN MINNESOTA

As this body informed the Minnesota Legislature and the public in 1975, two devastating and immensely costly diseases are killing the two primary species of shade trees in Minnesota.

The public must be made aware that most of the trees in Minnesota's urban areas are either elm or oak and that the existence of both species is threatened. The elm is the predominant shade tree of older cities and the smaller towns of Minnesota (Minneapolis is about 90% elm; St. Paul about 85% elm). The oak accounts for a large percentage of our shade trees in the newer suburbs. An indication of the scope of the problem can be found in a recent inventory of shade trees in the Twin Cities metropolitan area. Figures indicated that there are in excess of four million elms and nine million oaks in the seven metropolitan counties. Preliminary inventories indicate that vast numbers of elm and oak also exist in other cities throughout the state.

A. DESTRUCTION OF ELMS

As a result of Dutch elm disease, the elms are in grave danger of being virtually eradicated in the cities where they constitute most of the trees along the streets and in the parks. A similar danger exists for elms in rural forests and park lands. Dutch elm disease is caused by a fungus which chokes off the tree's vascular system. The disease is found in almost all parts of the state. However, the southern portion of the state and the metropolitan area, in particular, are areas most heavily infected. Minnesota is about the last state to be seriously afflicted by Dutch elm disease. Until now, the severe winter conditions seem to have slowed the propagation of the beetles which spread the disease from dead and dying trees to healthy ones. In recent years, however, Minnesota cities have experienced a sharp increase in the loss of their elms. Because beetles breed only in dead and dying elm wood, the incidence of the disease tends to expand geometrically as more and more trees are infected.

It remains true that there is now no proven cure for Dutch elm disease. Trees have no immunity system as do animals; most plant diseases (such as Dutch elm disease) in all probability can never be "cured." Even if a cure should be developed, it would undoubtedly come too late to save any of the existing elm trees, as they would be long since dead. Present chemical injection treatments (such as Lignasan BLP) offer only limited protection and must be repeated every year. Lignasan treatments are simply not vaccinations as so many assume. However, by proper control measures, tree losses (and the corresponding removal costs) can be held down to manageable levels. With proper control, the majority of the elm trees can be kept alive while orderly efforts to plant different species of trees take place.

Proven scientifically sound, elm disease control measures consist of:

1. Thorough identification of all diseased elm during the growing season.
2. Removing diseased and dead elm trees as quickly as possible.
3. Disposing of dead elm wood properly, and
4. Preventing the diseased elm trees from infecting adjacent healthy trees through root grafts (common root systems).

It is also advisable to remove dead branches from healthy trees by regular trimming so that these potential beetle breeding sites are destroyed.

The experience of hundreds of other cities proves that if no control measures are taken, almost all the elms may die in a short time, leaving naked cities, reduced property values and requiring the immediate expenditure of millions of dollars in removal costs. It costs from \$150.00 to \$400.00 to remove a large elm such as the type usually found lining the streets and in the backyards of Minnesota's cities and towns. The cost may be even higher where a tree hangs over a house or garage and has to be

taken down piece-by-piece. In the seven county metropolitan area, within municipal boundaries alone, there are over 1.9 million elms. Outside the municipalities in the seven county area, there are approximately 2.9 million additional elms. The out-of-pocket cost to public and private sectors, if all the elms die in a short time, would be staggering. More indirect but even greater economic costs will result from loss of shade trees which improve the landscape, cut heating and air-conditioning costs, and serve to reduce air and noise pollution. Precisely the situation described here has occurred in numerous other metropolitan areas in the country where most elms have already died. The monetary losses and costs to such areas as Des Moines, Omaha, and Champaign, Illinois, to name a few, have been enormous.

Proper control measures are not excessively costly when compared with the very real cost of doing nothing. It is estimated that, on the average, a large elm tree can be kept healthy for 40 to 50 years for the same money it would cost to remove the tree if dead. Furthermore, when a mature tree dies, the municipality or private owner will be faced with the additional cost of replanting a new small tree.

B. DESTRUCTION OF OAKS

Oaks present a different problem than do elms. Oaks are the major hardwood forest tree in Minnesota. These trees are subject to oak wilt which is a fungus spread primarily through root grafts, killing the tree much like the fungus which kills our elm trees. The control of oak wilt depends on preventing root grafts and the production of spore mats. Root graft disruption can be accomplished by mechanical or chemical means. The reduction of moisture content in the wood by any method will normally prevent the formulation of spore mats.

The disease normally kills the red oak species in about six weeks. White and bur oaks may live as long as one to three years. The rate of spread from a diseased center is approximately 25 feet per year. Oak

stands may have several disease centers. The cost of controlling oak wilt may or may not be as great as the cost of controlling diseased elm trees depending on the area and control method employed.

II. THE CURRENT STATUS OF SHADE TREE DISEASE CONTROL

The 1974 legislative session enacted into law Minnesota Statutes, Section 18.023, requiring metropolitan cities and counties to implement effective shade tree disease control programs. The Department of Agriculture was given the responsibility of administering the law and promptly adopting regulations governing local disease control programs. Approximately one-half of the local units of government subject to the new law had implemented adequate disease control programs by the end of the 1974 growing season. Considering the severe time constraints and limited resources of the first year of operation, this effort was a sound beginning for a new program.

Based in part upon recommendations of the Minnesota State Shade Tree Advisory Committee, the 1975 Legislature enacted into law, Subdivision 3a, Minnesota Statutes, Section 18.023. The 1975 law authorized a grant-in-aid program which provides for financial assistance to property owners and local units of government in controlling shade tree diseases. Forty-five thousand dollars (\$45,000.00) was earmarked for public education; eight-hundred thousand dollars (\$800,000.00) for property owner relief; and seven-hundred thousand dollars (\$700,000.00) for aid to local units of government for establishing tree disposal systems.

A public education campaign was promptly initiated by the Department of Agriculture with an expenditure of forty-thousand dollars (\$40,000.00) in the first year of the biennium. As a result, public awareness of shade tree diseases in Minnesota is at a level that no community in the United States has ever had the good fortune to experience. The grant program was expeditiously implemented allowing property owners throughout the state to

receive financial assistance in an amount equal to what was appropriated. Local units of government have received three-hundred and thirteen thousand dollars (\$313,000.00) for the development of tree waste disposal systems. The balance of the appropriation for disposal systems is expected to be committed by the end of calendar year 1976.

The level of control efforts being taken by local units of government has substantially increased. At the onset of the 1976 growing season, all units of government subject to regulation had employed a qualified tree inspector. Expenditures by local units of governments in some cases doubled. Disease detection has improved and tree removal activity is increasing.

Despite these improved efforts, tree losses are still increasing rapidly. In 1975, metropolitan cities lost a total of twenty-seven thousand (27,000) elms. The 1976 figure is expected to exceed fifty thousand (50,000). This is evidence that our efforts are not good enough; we must continue to improve our control programs.

Minnesota is in a stage of disease development where the vast majority of its shade trees are still healthy. Intensive sanitation must be undertaken and continued to keep them healthy. Through the cooperation of all involved jurisdictions, increased financial support of the State Legislature, and a highly motivated public, the future of shade tree disease control in Minnesota will remain bright. Without a program that is adequately funded, the state's cities and towns will suffer the tragic fate visited upon the cities and towns of Iowa, Illinois, Nebraska, and other states where the great shade trees have been largely eliminated.

III. PROPOSED SHADE TREE DISEASE CONTROL PROGRAM - INTRODUCTION

The proposed State Shade Tree Disease Control Program for Fiscal Years 1978 and 1979 reflects a continued support of the existing program

activities of public education, research, training, financial assistance to property owners, and financial assistance to local units of government for disposal and utilization. Evaluation of the existing state program has also prompted a recommendation that the state program be expanded in the areas of financial assistance to local governments for sanitation on public lands, and financial assistance to local governments for planting of new shade trees.

Some of the recommended program activities must be funded by new legislative action and others through state department budgets. For purposes of clarity, discussion of the proposed program will be organized by the state agency or department who will be responsible for conducting the recommended program activity. Discussion of each recommended program activity will examine the need for the activity, the goals, program methodology, and the proposed budget.

IV. SHADE TREE DISEASE CONTROL PROGRAM - MINNESOTA DEPARTMENT OF AGRICULTURE

A. PUBLIC EDUCATION

An informed citizenry is an essential element for an effective attack on oak wilt and Dutch elm disease. If the citizens are aware of the nature of the diseases which are threatening their shade trees, and know the proper steps to be taken when symptoms are spotted, they will be better equipped to deal with diseased trees on private property. Further, they will better understand and support control measures being undertaken by their local governments and park officials. And finally, they will understand the value of replanting as the trees are lost, so that communities are not faced with a long period where few or no significant-sized shade trees exist.

Without the support and cooperation of an informed citizenry, the efforts of the local government would have to be substantially increased and the potential for successful control efforts is thereby proportionately

diminished. By helping to hold down losses, such a program would certainly provide benefits far in excess of its costs to the state.

GOALS:

The stated purpose of the public education program is:

1. To increase citizen awareness of the nature and seriousness of the threat of Dutch elm and oak wilt disease to our shade trees.
2. To encourage citizen organizations to join in the effort to control and combat the diseases.
3. To educate the public as to specific steps to be taken to control and combat the diseases.
4. To increase awareness of the importance of individual and community effort to control and combat the diseases and to replant a variety of shade tree species.
5. To publicize Arbor Day, April 29, 1977, and every year thereafter, in an effort to promote the planting of shade trees by private citizens, corporations, and other public and private organizations.

PROGRAM DESCRIPTION:

The proposed public education program will utilize a comprehensive mix of media services to disseminate information. The level of education citizen. Education materials will focus on increasing the awareness of the consequences of shade tree diseases and alerting the public to the steps that can be taken to curtail the spread of such diseases.

Television and radio spots, billboards, busboards, and other advertising media will be professionally produced. The program will rely heavily on the "public service announcement," supplemented by purchased time in order to insure maximum exposure. An aggressive effort to secure public service time will be undertaken. Programs and meetings will be held throughout the state to educate public service directors of television, radio, and other media.

The newspaper media has been one of the most effective sources of information in the past. There will be a continued effort to supply updated information to newspapers through regularly scheduled press releases, press conferences, and other news media events.

The program will attempt to educate and motivate citizen groups, schools, and public officials. A speakers bureau will be arranged to insure qualified persons are available for all public meetings. Non-technical public education materials will be produced to assist in public presentations.

BUDGET:

A plan of action developing goals, a detailed methodology and scheduling will be developed by experienced public relations personnel to insure maximum effectiveness. Funds will be expended over the biennium as required by the plan. For this reason, the program budget is not broken down between the two fiscal years. (See Appendix "A" for further budget figure justification).

PUBLIC EDUCATION FY 78/79

Production of public education materials	\$100,000
Media Time	140,000
Public Relations	<u>20,000</u>
TOTAL	\$260,000

B. FINANCIAL ASSISTANCE TO LOCAL GOVERNMENTS

1. SANITATION AND REPLANTING

The rapid spread of Dutch elm and oak wilt diseases during the last year has aroused great concern within state government, within cities throughout the state and by the general public. It has become obvious to all who have studied the problem that unless a greatly expanded program for the control of these diseases and replacement of shade trees is mounted during 1977 and 1978, many cities throughout the state will be largely denuded of shade trees. Such an expanded program will require the joint efforts of both the state and local units of government if it is to have any chance of success. As the only practical way in which actual disease control can be effectively carried out is through strong local programs, it is essential that local units of government be given sufficient fiscal capacity and support from the state.

The state purpose of the local government assistance activity is:

1. To provide local units of government with sufficient fiscal capacity to mount an effective shade tree disease control program and to replant (See also Section VIII - Provision for special levy).
2. To maximize the effect of state monies allocated for the control of shade tree disease and replanting by providing financial incentives to undertake aggressive programs and by assuring local effort through the matching grant concept.
3. To provide an efficient and relatively simple method of allocating available grants to participating local units.
4. To permit a large degree of discretion by local units of government to determine the appropriate emphasis for local disease control and replanting programs.

PROGRAM DESCRIPTION:

A direct state grant program to local units of government should be established with a broad scope of eligible activities. It would replace the current subsidy program and encompass any proposed removal and replanting grants. State grant funds could be used to control any type of shade tree disease on public or private property. Furthermore, the program should permit expenditures on a variety of different activities, thus permitting each city or county to fashion a shade tree disease control program tailored to its own situation. The activities authorized under the state grant program should include the following:

- a. Carrying out a preventive program including trimming and disposing of dead or diseased tree branches and applying insecticides and chemicals approved by the Department of Agriculture and the University of Minnesota;
- b. Removing dead or diseased trees and stumps;
- c. Planting trees to replace or supplement shade trees which are prone to disease;
- d. Providing planting stock to property owners and/or community groups for use on either public or private property;
- e. Making inspections and conducting censuses in control areas;
- f. Conducting public education programs and training personnel involved in the shade tree disease control program; and
- g. Contracting for equipment, supplies, services, and/or personnel necessary to carry out any of the activities listed above.

The grant program would be a direct reimbursement to municipalities for local shade tree disease control program expenses. The administration of the program would be as follows:

1. All local units of government wishing to receive grant funds would be required to submit their application at some date prior to the growing season.
2. Each application would consist of an estimated shade tree disease control program budget supported by resolution of the governing body.
3. The program budgets of all applicants would be totaled with the sum representing total dollars budgeted for shade tree disease control by all units of government making application for funds.
4. The ratio between the total budget of all applicants and the amount of the legislative appropriation apportioned to that fiscal year would be calculated.
5. The grant award to each applicant would be based upon the ratio calculated above. The ratio of the grant award to the municipal budget would be the same as that of the total budgets of all applicants to the amount of the appropriation apportioned to that fiscal year.
6. A yearly grant award contract would be executed between the grantee and the state, and the funds would be encumbered in the name of the grantee. The award contract would cover program expenses for the calendar year.
7. The grantee would then submit a request for payment claiming all program expenses allowable under the state's grant program rules and regulations. The grantee would then be reimbursed for the same percentage of the expenditures upon which their grant award is based.

8. All direct labor expenses of municipal personnel would be allowable under the program. Labor expenses would be based on the hourly rate of pay of the employee multiplied by the time the employee commits to the local program.
9. Major equipment expenses would be based upon the hourly cost of operating the equipment multiplied by the time the equipment is committed to the disease control program. Hourly cost of equipment use would be computed by amortizing the capital cost of the equipment, adding required maintenance expenses, and adding required fuel expenses.
10. Minor equipment and supply purchases would also be allowable expenses.
11. All funds not used under a grant award in the first year would be returned to increase the amount of funds available for the second year of the grant program.

An example of the grant award formula would be:

The total of program budgets for all applicants is \$40,000,000 for 1977; the amount of the legislative appropriation apportioned to the first fiscal year is \$20,000,000; a local unit of government with a budget of \$500,000 would receive a grant award of \$250,000.

Shade tree disease control programs are expensive. Tree removal is extremely costly because of the inherent dangers to person and property in removal and the heavy equipment required to remove and transport this bulk material. The methods of disease identification are presently labor intensive.

The most essential part of any disease control program is the replacement of trees. It is generally recognized that trees are not a luxury, but

are a form of life that man finds necessary for his very well being. Healthy urban and rural forests are, therefore, important factors in the quality of life in Minnesota.

The nursery stock and the labor and equipment required to plant new trees is costly. Newly planted trees are subject to many problems and can die, if not properly cared for. Therefore, it is imperative that safeguards are built into the program to insure that proper maintenance is provided for newly planted trees.

It is disputed little than an effective shade tree maintenance program is an essential public service every municipality should afford its residents. However, in light of the rising costs of government and the enormous financial burden this natural disaster is placing upon local government, it is becoming extremely difficult for municipalities to support disease control programs. If Minnesota cities are to maintain their traditionally beautiful urban environments, outside aid must be forthcoming. For this reason, it is strongly urged that the legislative appropriation for the grant program be based upon fifty percent (50%) reimbursement of the local unit of government's program expenses.

BUDGET:

The budget for the grant program is based upon projected tree losses, estimated removal/replacement costs, and extensive participation by municipalities in the grant program. (See Appendix "B" for further budget figure justification).

FINANCIAL ASSISTANCE TO LOCAL GOVERNMENT FY 78/79

	<u>FY 1978</u>	<u>FY 1979</u>	<u>TOTAL</u>
Grants	17,325,000	26,775,000	44,100,000
TOTAL	17,325,000	26,775,000	44,100,000

2. DISPOSAL SYSTEMS

There are three primary disposal methods for tree wastes; landfilling, burning, and processing. Landfill operators are more and more reluctant to accept tree waste because of the difficulty in handling the waste and the scarcity of available landfill space. Burning of tree waste on a large scale defeats the public's objective of maintaining an environmentally acceptable air quality. Processing of tree waste and recovery of a resource is by far the most environmentally sound method of disposal. At the present time, however, there is not the processing capacity necessary to meet disposal needs. Construction and procurement of processing equipment is extremely expensive. The dollars required to provide an adequate processing capacity exceeds the amount made available by the 1975 legislative appropriation.

GOAL:

The stated purpose of the disposal system program is:

1. To insure that an environmentally sound and sanitary disposal capacity exist for the public, municipalities, and commercial tree removal services.
2. To maximize the recovery of resources from tree wastes.

PROGRAM DESCRIPTION:

The program would be administered under the rules and regulations governing the existing disposal grant programs. Counties, or combination thereof, and cities with a population of over 80,000 would be eligible for constructing a long-term tree disposal or utilization facility. It is also recommended that the existing statutory language governing the eligibility of funds for disposal systems be amended to make the Hennepin County Parks Reserve District eligible for grant funds.

It is estimated that an additional seven-hundred thousand dollars (\$700,000) of state funds, beyond the present appropriation, will be required to finance facilities which will adequately meet the metropolitan area disposal needs. Two-hundred thousand dollars (\$200,000) should be set aside for development of disposal and utilization facilities outside the metropolitan area. (See Appendix "C" for further budget figure justification).

DISPOSAL SYSTEM FY 78/79

	<u>1978</u>	<u>1979</u>	<u>TOTAL</u>
Metropolitan facilities	\$700,000	-0-	\$700,000
Outside facilities	<u>200,000</u>	<u>-0-</u>	<u>200,000</u>
TOTAL	\$900,000		\$900,000

C. ADMINISTRATION

The state shade tree program as proposed is significantly expanded from past efforts. To effectively carry out the proposed program, additional staff and resources will be required. Qualified personnel must be assigned to the task of aggressively administering public education funds. It is as necessary that public relations on tree diseases be handled by professionals, as it is that diagnosis of diseased trees be done professionally. The public sector should be as willing to hire professionally trained public relations personnel, as it is to hire professionals in other areas.

The same is true for administration of the grant-in-aid program. In the past, grants administration has had to be carried out by personnel with scientific backgrounds. This has resulted in an inefficient use of talent and has significantly interfered with the responsibility of field inspections and local program monitoring. Additional staff with the appropriate background and experience needs to be assigned to the task of grants administration.

Comprehensive planning efforts need to be undertaken by the Department of Agriculture to develop long-range programs for shade tree disease control.

Shade tree disease control requires long-term commitments by the public. The department needs to provide future direction for these programs. The present system gives responsibility of disease control to local governments. This system of disease control management presents some questions of uniformity and consistency in control program performance. The system needs to be evaluated and an optimal management strategy developed.

The stated purpose of the administrative function is to achieve maximum effectiveness in expenditures of state funds with a minimum of resources dedicated to administration.

A full-time experienced and qualified public relations staff member should be employed by the Department of Agriculture. His/her duties would include the prompt and complete response to all public demands for information. This includes the answering of numerous and diverse questions that citizens pose by telephone, letter, and by way of requests for public speakers. This staff member would also be responsible for a strong and enthusiastic administration of the public education funds here proposed.

A full-time staff member qualified in the area of grants administration should be employed by the Department of Agriculture to assist the Administrator in the design and implementation of the grants program. This staff member's responsibilities include program planning; development of program rules and regulations; informing municipalities of program details; accepting and reviewing applications; execution of award contracts and encumbrance of funds; processing of requests for payments; and, other tasks required in administering a program of this magnitude.

A Program Administrator is required to oversee and assume full responsibility for all facets of program administration. This position was provided for in the past biennium's program.

Three full-time clerical staff are required to assist new and existing personnel in the large volume of correspondence and other clerical duties. Clerical resources are essential to effective and responsive administration of the program. Personnel costs are for the activities of public education; grants for sanitation and replanting; and grants for disposal systems.

Funds must be made available to expand the Department of Agriculture's role in the planning process. The department should be given flexibility to deal with planning funds. The planning effort may be undertaken within the department itself or contracted to outside agencies depending upon existing needs. (See Appendix "D" for further budget justification).

ADMINISTRATION FY 78/79

<u>SALARIES</u>	<u>1978</u>	<u>1979</u>	<u>TOTAL</u>
Informational Officer	14,314	14,314	28,628
Clerical (Typist)	7,862	7,862	15,724
Planning Grants Analyst I	12,741	12,741	25,482
Clerical (Steno)	8,400	8,400	16,800
Administrator	19,609	19,609	39,218
Clerical	<u>8,400</u>	<u>8,400</u>	<u>16,800</u>
	71,326	71,326	142,652
Planning	50,000	50,000	100,000
Non-Salary	<u>13,892</u>	<u>10,881</u>	<u>20,916</u> 24,773
TOTAL	85,218	82,207	163,568 167,255

D. REGULATION OF LOCAL CONTROL PROGRAMS

NEEDS:

In order to perform the regulatory function effectively, the Department of Agriculture has cross-examined ^{through} its personnel to increase the number of qualified inspectors on the shade tree disease control staff and plans to allocate three additional inspectors from other areas during the months of June, July, and August. Adequate travel funds must be made available to insure that these inspectors can carry ^{out} the necessary inspections.

GOAL:

The stated purpose of the regulatory program is:

1. To insure compliance with all shade tree disease control laws, rules and regulations.
2. To provide technical assistance to communities in order that control programs can be carried out effectively and efficiently.

PROGRAM DESCRIPTION:

Inspections would be performed of all metropolitan cities and all out-state cities who have requested to come within the provision of the shade tree disease control law. Inspectors would attempt to determine if adequate disease detection, tree removal, and tree disposal were being carried out by the local units of government. Where problems are identified, inspectors would offer their technical assistance to remedy those problems. Legal action would be taken where necessary.

BUDGET:

The regulatory function should be funded through the State Department of Agriculture's budget request under the municipal pest control activity. (See Appendix "E" for further budget figure justification).

REGULATORY FY 78/79

	<u>1978</u>	<u>1979</u>	<u>TOTAL</u>
Salaries	112,036	112,036	224,072
Non-Salaries	<u>27,450</u>	<u>22,910</u>	<u>50,360</u>
TOTAL	139,486	134,946	274,432

V. SHADE TREE DISEASE CONTROL RESEARCH - UNIVERSITY OF MINNESOTA

NEEDS:

Dutch elm disease has developed to the point in Minnesota that we have lost the advantages we did hold just two years ago. The hope now is to develop improved methods of control which will help people in Minnesota to slow the disease and save a portion of the elms. There is no reason to become enmeshed in a long-term research. It is believed the research must be concentrated in the areas of survey, sanitation, and disruption of common root systems. These efforts involve the Remote Sensing Laboratory, the Forest Products Department, the Department of Entomology, and the Department of Plant Pathology.

Oak wilt continues to cause extensive losses in Minnesota and, in some areas, is responsible for almost total destruction of oak forests. This disease can be controlled. The research effort needs to be directed toward better methods of survey, prevention of sporulation by the fungus, and primarily at disruption of common root systems. This program is mainly in the Department of Plant Pathology.

GOALS:

The stated purpose of the research program for Dutch elm disease is to:

1. Improve methods of survey, primarily by means of aerial photography.
2. Provide alternate methods of dealing with dead and dying elms.
 - a. Injections with potassium iodide.
 - b. Spray applications of pentachlorophenol.
 - c. Water or wet storage of logs.
3. Obtain better information on bark beetle life cycles.

4. Obtain more data on patterns of infection, especially when beetles can inoculate healthy trees.
5. Develop better utilization of the elm resource.
6. Design feasible programs for dealing with the disease in wild areas.
7. Develop better methods of disrupting common root systems.
 - a. Further evaluate vapam and its effectiveness.
 - b. Investigate other techniques to prevent spread into root systems.
8. Evaluate systemic fungicides.
9. Evaluate resistant elms.

The stated purpose of the research program for oak wilt disease is to:

1. Improve methods of aerial photography for detecting the disease.
2. Develop better methods of disrupting common root systems.
3. Investigate methods of detecting and treating trees on which the fungus will produce spores.
4. Learn more about insect vectors and their patterns of spreading the fungus.
5. Evaluate systemic fungicides.

PROGRAM DESCRIPTION:

The success of Dutch elm disease and oak wilt control programs depends to a large degree on the ability of communities to quickly and efficiently

detect a high percentage of the diseased trees. We believe that can best be accomplished by means of aerial photography. It is relatively easy to detect oak wilt and provide control crews with photo maps of diseased trees. It has been more difficult to detect Dutch elm disease, but we think such a system can be developed.

Disruption of common roots is the key to stopping oak wilt and the same method is quite important in slowing the movement of Dutch elm disease. Methods presently recommended have major drawbacks and are not always effective. Alternate more efficient methods are needed.

Sanitation is the primary control measure for Dutch elm disease. It is in need of considerable improvement. We need to know more about the bark beetle cycles and when the beetles can inoculate trees. We must provide alternate methods for dealing with dead and dying elms especially in wild areas (rivers, parks, industrial areas, inaccessible places). Logs waiting to be processed may need to be treated in some manner to prevent beetle development. Systems are needed for concentrating efforts on the most hazardous trees first and then dealing with other trees in turn. Many possibilities exist for utilization of elms and these need development.

Sanitation applies to oak wilt but in a very different way. Oaks on which the fungus will produce spores need to be detected and treated so that spores are not available for overland dissemination. We should know more about insect dissemination, how often and to what distance the fungus can be carried, and result in infection.

Although we consider systemic fungicides as a minor part of a control program, we must develop sufficient background information with these materials so that we can best advise the people in Minnesota.

We consider resistant elms as a minor control measure for Dutch elm disease but do intend to evaluate any promising trees which could be planted in Minnesota.

The program objectives are to be accomplished primarily through the efforts of graduate students. Long-term commitments to permanent personnel is not contemplated.

. It is recommended that budget request for shade tree disease control research activity be heard separately and independent of other university requests for research funds. It is strongly urged that the university identify any other area of their budget which may request funds for similar activities in order to avoid double funding. (See Appendix "F" for further budget justification).

RESEARCH FY 78/79

	<u>1978</u>	<u>1979</u>	<u>TOTAL</u>
Personnel			
Forest pathologist (post-doctor)	\$16,000	\$16,000	\$32,000
Forest Entomologist (post-doctor)	16,000	16,000	32,000
Graduate assistants			
Aerial photography	5,500	5,500	11,000
Forest products	5,500	5,500	11,000
Plant Pathology - Dutch elm disease	5,500	5,500	11,000
Plant Pathology - Oak wilt	5,500	5,500	11,000
Undergraduate assistants - 3 months (3)	<u>7,500</u>	<u>7,500</u>	<u>15,000</u>
	\$61,500	\$61,500	\$123,000
Expenses			
Field expenses (mainly travel)			
Pathology	8,000	8,000	16,000
Entomology	3,000	3,000	6,000
Forest Products	3,000	3,000	6,000
Remote Sensing	4,000	4,000	8,000
Aerial photography (aircraft, film, developing, etc.)	5,000	5,000	10,000
Equipment and supplies	13,000	13,000	26,000
Publication costs	<u>3,000</u>	<u>3,000</u>	<u>6,000</u>
	\$39,000	\$39,000	\$78,000
CONTINGENCY	<u>\$10,000</u>	<u>\$10,000</u>	<u>\$20,000</u>
TOTAL	\$110,500	\$110,500	\$221,000

VI. SHADE TREE DISEASE CONTROL TRAINING - AGRICULTURE EXTENSION SERVICES

NEEDS:

Dutch elm disease curtailment and shade tree management is biologic in its subject matter. The decisions to be made for effective private and community shade tree programs are, however, made by people who have varying levels of understanding and attitudes toward the problem.

An effective Dutch elm disease curtailment program will depend on a sound understanding of all aspects of the disease and intelligent application of curtailment and management measures. As a community program evolves, the citizens of Minnesota, their elected officials, their public agency representatives, and private firms need current research and technical information as well as assistance in organizing for an effective program.

Existing University of Minnesota resources in staff time and support materials do not permit mounting a comprehensive educational, informational and training effort commensurate with present and emerging Dutch elm disease and shade tree management program needs.

GOAL:

The stated purpose of the training program is:

1. To work with communities in a team effort consulting on disease identification and curtailment, sanitation, orderly removal, replanting, and management.
2. To work with the public agencies in training of tree inspectors.
3. To provide educational services for individuals and firms relating to the disease and shade tree management.
4. To provide for widespread dissemination of technical information to assist the general public in their needs concerning disease curtailment and shade tree management.

PROGRAM DESCRIPTION:

While this proposal is for a two year period, it must be recognized that the problem will not be solved in this time period. Educational programs are long-term in nature, assuming large numbers of people who must develop understanding and skills in dealing with the problem.

On this basis, the program would enter on a coordinated interdisciplinary staff effort. Major initial emphasis would be on an awareness effort and disease curtailment. This means that resources must be concentrated on making sanitation programs effective, gaining time for cures and tree replacement. Parallel to these works would be educational efforts on all aspects of managing the shade trees of Minnesota (i.e., disease control, insect control, wood utilization, species selection, planting, and managing).

To do the above, staff and support are needed for:

1. Developing three to six community disease curtailment and shade tree management systems. To provide consultation to Minnesota communities as appropriate to their local situations.
2. To provide a statewide program of training local tree inspectors (short courses, demonstrations, etc.).
3. To provide educational services for the individual citizen, private landowner, and others on all aspects of disease curtailment and shade tree management.
4. To provide special educational offerings for shade tree related persons (i.e., arborists, foresters, parks department, public grounds, wood industry, garden clubs, and nurserymen).
5. To provide technical support materials:
 - a. Community training manuals (management systems)
 - b. Bulletins and fact sheets

c. Slide/cassettes for local leader use

d. Video tapes for local leader use

e. Printing

Recognition is given to an ongoing, though somewhat limited, extension effort in relation to the magnitude of the current Dutch elm shade tree problem. County extension agents, campus plant pest clinics staff, and specialist staff have consulted, conducted meetings, offered short courses and tours, have written bulletins, fact sheets and news releases, and have done radio broadcasts. This effort would be continued but substantially expanded.

A coordinator of Dutch elm curtailment, shade tree extension programs, would be appointed. This would be a full-time professional. The coordinator would give leadership to the campus based interdisciplinary staff. Added staff resources would be required in varying amounts in plant pathology, entomology, forestry, horticulture, and communications.

The coordinator would be the contact person with the Department of Agriculture and other public agencies to integrate program effort statewide. This person would bring together the research and extension staff to develop an integrated approach to the program effort.

The interdisciplinary team would be available to conduct the programs described above through the county and statewide extension network.

The interdisciplinary team will develop the three to six community shade tree management systems and work with communities in their implementation.

The mass media extension effort would be integrated with the public education effort of the State Department of Agriculture, other agencies, and institutions.

Support materials include bulletins, fact sheets, video tape cassettes, slide tape training aids, etc. With the supplemental professional staff and project assistants, extension education, information, and training effort can be offered to communities statewide.

It is recommended that budget request for shade tree disease control research activity be heard separately and independent of other university requests for research funds. It is strongly urged that the university identify any other area of their budget which may request funds for similar activities in order to avoid double funding. (See Appendix "G" for further budget justification).

TRAINING FY 78/79

STAFF (FTE)*

Professional**

Plant Pathologist 1 (FTE)	\$ 30,000	\$ 30,000	\$ 60,000
Horticulture (arborist) (1 FTE)	30,000	30,000	60,000
Entomology (1/2 FTE)	15,000	15,000	30,000
Ag. Information	<u>15,000</u>	<u>15,000</u>	<u>30,000</u>
	\$ 90,000	\$ 90,000	\$ 180,000

Project assistants (technical)

Plant Pathology (2 3/4 FTE)	\$ 14,000	\$ 14,000	\$ 28,000
Horticulture (1 FTE)	7,800	7,800	15,600
Forestry & Products (3 FTE)	<u>18,000</u>	<u>18,000</u>	<u>36,000</u>
	\$ 39,800	\$ 39,800	\$ 79,600

PUBLICATIONS AND EDUCATIONAL AIDS

Printing	\$ 58,300	\$ 50,000	\$ 108,300
T.V.	16,000	16,000	32,000
Film Cassettes, etc.	12,000	10,000	22,000
Film - Cassette equipment	<u>20,000</u>	<u>--</u>	<u>20,000</u>
TOTAL	\$ 106,300	\$ 76,000	\$ 182,300
TOTAL	\$ <u>236,100</u>	\$ <u>205,800</u>	\$ <u>441,900</u>

*FTE (Full-Time Equivalent) amount includes salary, fringe benefits, secretary, telephone, travels, office.

**Program coordinator to be within plant pathology or horticulture position.

VII. SHADE TREE DISEASE CONTROL - STATE/FEDERAL OWNED LANDS

Many acres of land are owned by the State of Minnesota and federal government. Much of this land is adjacent to areas where local disease control programs are being implemented. To insure that local programs are not adversely affected by state and federally owned property, the state and federal government must undertake effective disease control programs on their own lands.

All state departments responsible for maintenance of state lands must be adequately funded to fulfill their responsibility of implementing effective disease control programs. Upon funding, state department officials must insure that control programs are conducted properly and thoroughly.

It is also recommended that the Department of Agriculture encourage the establishment of a liaison office within the federal government to assume the responsibility for shade tree disease control on federal lands. This office would work with the Department of Agriculture to identify federal lands most critically affecting local programs.

VIII. SHADE TREE DISEASE CONTROL - PROVISION FOR SPECIAL LEVY

An essential part of the proposed program for shade tree disease control is enactment of legislation which will permit cities and counties to levy local property taxes for this purpose outside the current levy limits. Such legislation was enacted in 1974 as a part of the Metropolitan Shade Tree Disease Control Act (Laws 1974, Chapter 355). However, when the Legislature enacted Laws 1975, Chapter 437, recasting local government aids and modifying local levy limits, all "special levies" previously enacted in other chapters were repealed.

Repeal of the special levy provision effectively prevents cities and counties from increasing expenditures for shade tree disease control programs except to the extent permitted under a state grant program. However, even if

a state grant program is enacted, there will almost certainly be instances where cities and counties will need to spend additional funds to make their local shade tree disease control program effective. Consequently, cities and counties should be authorized to levy local property taxes for shade tree disease control programs outside of current levy limits and this authority should be retroactive to the 1976 levy.

Additionally, municipalities should be granted the authority to establish taxing districts within the city to finance shade tree disease programs. This flexible financing method would allow cities to concentrate their efforts in problem areas without the use of cumbersome special assessment procedures.

IX. SHADE TREE DISEASE CONTROL - CONCLUSIONS AND PROGRAM RECOMMENDATIONS

Based upon an intensive review of the problem of shade tree diseases in the State of Minnesota, it is the considered and collective judgment of the Minnesota State Shade Tree Advisory Committee that the state effort in the area of shade tree disease control must be significantly expanded. It is believed that the proposed program set forth provides a comprehensive and coordinated effort of existing state departments. The State of Minnesota and its citizens can effectively curtail the rapid spread of shade tree diseases if it is willing to aggressively and enthusiastically adopt the proposed program.

The Minnesota State Shade Tree Advisory Committee highly recommends and strongly urges the State of Minnesota to:

- I. Appropriate two-hundred and sixty thousand dollars (\$260,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, for purposes of conducting a public education program for shade tree diseases.

- II. Appropriate forty-four million, one-hundred thousand dollars (\$44,100,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, for purposes of providing financial assistance to local units of government for shade tree disease control and replacement of shade trees.

- III. Appropriate nine-hundred thousand dollars (\$900,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, for purposes of providing financial assistance to local units of government for establishing tree wastes disposal and utilization facilities.

- IV. Appropriate two-hundred and sixty-three thousand, five-hundred sixty-eight dollars (\$268,568) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, for purposes of administering the proposed public education and state grants-in-aid program.

- V. Appropriate two-hundred and seventy-four thousand, four-hundred thirty-two dollars (\$274,432) to the Minnesota Department of Agriculture pursuant to the department's 1978/79 budget request for purposes of monitoring local disease control programs.

- VI. Appropriate two-hundred and twenty-one thousand dollars (\$221,000) to the University of Minnesota's Remote Sensing Laboratory, the Forest Products Department, the Department of Entomology, and the Department of Plant Pathology, pursuant to the University's 1978/1979 budget request for purposes of conducting research of shade tree diseases in Minnesota.

- VII. Appropriate four-hundred and forty-one thousand, nine-hundred dollars (\$441,900) to the University of Minnesota Agriculture Extension Service pursuant to the University's 1978/1979 budget request for purposes of training personnel of local units of government to carry out shade tree disease control programs.

VIII. Adequately appropriate funds pursuant to all 1978/1979 state department budget requests for purposes of implementing shade tree disease control programs on state-owned lands.

IX. Enact legislation which will permit cities and counties to levy local property taxes for purposes of shade tree disease control outside the current levy limits and also enact legislation which will also allow them to establish taxing districts within their boundaries to finance shade tree disease programs.

BUDGET SUMMARY

MINNESOTA DEPARTMENT OF AGRICULTURE.....45,803,000.00

Public Education..... 260,000.00

Grants-Sanitation/Replanting.... 44,100,000.00

Grants-Disposal/Utilization..... 900,000.00

*Administration..... 268,568.00

Regulation of Local Programs.... 274,432.00

UNIVERSITY OF MINNESOTA..... 6,629,000.00

Research - Institute of
Agriculture, Forestry, &
Home Economics..... 221,000.00

Training - Continuing Education
& Extension..... 441,900.00

TOTAL.....46,465,900.00

*Administration funds excludes regulatory activities.

APPENDIXES

APPENDIX "A"

PUBLIC EDUCATION

APPENDIX "B"

FINANCIAL ASSISTANCE -
SANITATION/REPLANTING

APPENDIX "C"

FINANCIAL ASSISTANCE -
DISPOSAL SYSTEMS

APPENDIX "D"

ADMINISTRATION

APPENDIX "E"

REGULATION OF LOCAL PROGRAMS

APPENDIX "F"

RESEARCH

APPENDIX "G"

TRAINING

APPENDIX "A"

PUBLIC EDUCATION

PRODUCTION: \$ 100,000

30 and 60 Second Television Spots

30 and 60 Second Radio Spots

Billboard Design

Busboard Design

Limited Quantity Brochures

MEDIA TIME: \$ 140,000

Outdoor Advertising

Air Time Television

Air Time Radio

Newspaper Advertising

PUBLIC RELATIONS: \$ 20,000

Production Press Materials

Communications/Mailings

Meeting With Media Representatives

COMPARISONS:

Minnesota Kicks Six Month Budget \$ 134,000
(Concentration on Radio)

Minnesota Crime Commission 1973 Budget \$ 250,000
(Television, Radio, Outdoor Advertising,
and Brochures)

APPENDIX "B"

FINANCIAL ASSISTANCE - SANITATION/REPLANTING

1. \$315 per tree lost is assumed for sanitation and replacement costs in 1977 and 1978.

- \$ 15 per tree inspections (inspections approximately 10% of removal costs)
- 150 per tree removal
- 150 removal (\$75 per tree based on 2 for 1 replacement rate)

- \$315 TOTAL

2. Projected Losses:

- Metro Area
- Outstate
- TOTAL

3. Projected municipal expenses assuming that all municipalities incur a \$315 per tree removal/replacement cost for lost trees on both public and private lands:

$$280,000 \times \$315 = \$88,200,000$$

4. State grants based on 50% reimbursement of municipal expenses and assuming full participation by metro communities and high participation by outstate communities:

$$50\% \text{ of } \$88,200,000 = \$44,100,000$$

APPENDIX "C"

FINANCIAL ASSISTANCE - DISPOSAL SYSTEMS

The Metropolitan Inter-County Council (MICC) whose county representatives are charged with the statutory responsibility for solid waste (including diseased tree wastes) disposal were faced with the task of developing a system that could both effectively and economically accomplish the dual objectives of disease control and diseased tree waste disposal. To accomplish these dual objectives, the MICC initiated a study to determine the magnitude of the tree waste disposal problem and develop an economically acceptable method of disposing of or utilizing the waste material. The subject of economically recovering usable products was pursued in an attempt to provide management alternatives for tree waste disposal/utilization that offered some potential for partial cost recovery and utilization of raw materials otherwise relegated to solid waste disposal.

It was the finding of this study that two to three centers for utilization and disposal of tree wastes should be located in the metropolitan area. The primary cost elements of developing such wood waste centers include:

1. Locating and purchasing land,
2. Preparation of the site, construction of roads, barriers, fences, electrical hookups, etc., and
3. Purchase of equipment to process tree wastes.

The capital cost requirements estimated in the MICC study for two or three disposal/utilization centers are as follows:

	<u>CAPITAL COSTS</u>
Two Disposal/Utilization Centers	\$ 2,069,000
Three Disposal/Utilization Centers	\$ 2,930,000

Projected dollar requirements for Fiscal Years 1978-79 are as follows:

APPENDIX "C" (Con't).

	<u>3 SITE OPTION</u>	<u>2 SITE OPTION</u>
Estimated Cost for Adequate Disposal in Metropolitan Area	\$ 2,930,000	\$ 2,069,000
Funds Committed to Disposal by June, 1977	<u>1,400,000</u>	<u>1,400,000</u>
Estimated Requirements for FY 78/79	\$ 1,530,000	\$ 699,000

APPENDIX "D"

ADMINISTRATION

ADMINISTRATION

<u>Salaries</u>	<u>1978</u>	<u>1979</u>	<u>TOTAL</u>
Informational Officer	\$14,314	\$14,314	\$ 28,628
Clerical (Typist)	7,862	7,862	15,724
Planning Grants Analyst I	12,741	12,741	25,482
Clerical (Steno)	8,400	8,400	16,800
Administrator	19,609	19,609	39,218
Clerical	<u>8,400</u>	<u>8,400</u>	<u>16,800</u>
	\$71,326	\$71,326	\$ 142,652

Non-Salary

Rents

Repairs	\$ 225	\$ 250	\$ 475
Printing and Binding	2,500	3,000	5,500
Communications	1,725	1,625	3,350
Travel - Instate	4,465	4,759	9,224
Travel - Outstate	- 770	882	1,652
Equipment	3,857		
Supplies	300	315	615
Other	<u>50</u>	<u>50</u>	<u>100</u>
	\$13,892	\$10,881	\$20,916

APPENDIX "E"REGULATION OF LOCAL PROGRAMS

Salaries	<u>FY 78</u>	<u>FY 79</u>	<u>TOTAL</u>
5.29 Professional Staff	\$ 84,965	\$ 84,955	
3.50 Clerical Staff	<u>27,071</u>	<u>27,071</u>	
Total Salary	\$112,036	\$112,036	\$224,072
Non-Salary			
Rents/Leases	\$ 4,379	4,642	
Repair Services	305	345	
Printing/Binding	1,400	1,400	
Consultant Services	50	50	
Purchase Services	80	80	
Data Processing	4,000	300	
Communications	3,561	3,775	
In-State Travel	9,807	9,807	
Out-State Travel	1,750	1,750	
Supplies/Materials	343	361	
Equipment	<u>1,775</u>	<u>500</u>	
Total Non-Salary	<u>\$ 27,450</u>	<u>\$ 22,910</u>	<u>\$ 50,360</u>
TOTAL	\$139,486	\$134,946	\$274,432

APPENDIX "F"

RESEARCH

Explanation of Research Budget for University of Minnesota

Personnel

1. Forest Pathologist (present rate of pay ranges from \$14,000 to \$18,000)	\$16,000
2. Forest Entomologist	16,000
3. Graduate Assistants 4 @ \$5,478	21,912
4. Undergraduate assistants 3 @ \$4.25 per hour for 3 months \$2,244 each student	<u>6,732</u>
	\$60,644

Expenses

1. Field expenses	
Vehicle rental - 6 vehicles @ \$165.00 per month for 6 months	5,940
9000 miles at .15/mile	1,350
Other travel expenses	910
Chainsaws	500
Miscellaneous supplies, tags, paint, metal tags, etc.	2,000
Rental of trenchers and high lift equipment	4,000
Helicopter time @ 135.00 per hour for 20 hrs	2,500
2. Aerial photography	
Aircraft rental	4,000
Film	600
Film processing	750
Printing	150

3. Equipment and supplies	
Injection equipment and accessories	2,500
Chemicals	1,500
Dry Kiln and Impregnation equipment	500
Laboratory equipment	500
Expandable supplies (petri plates, agar, etc.)	2,000
Environmental chamber for moisture content students	3,500
4. Publications costs	1,406
5. Travel of 7 researchers to meeting on vascular wilts	3,000
6. Computer time	1,750
7. Contingency	<u>10,000</u>
	\$110,000

APPENDIX "G"

TRAINING

University of Minnesota Agricultural Extension Service
Basis for Budget Calculations

<u>Staff</u>	<u>FTE</u> <u>Salary</u>	<u>Fringe</u>	<u>Clerical</u>	<u>Travel</u>	<u>Total</u>
Professional Staff	18,000	2,000	3,000	5,000	30,000
Project Assistants (Graduate Students)	5000-7000	600-800	500	500	6000-8000

Publications and Educational Aids

Extension Bulletins & Training Manuals
4 Bulletins @ 25¢/copy x 38,000 38,000
(Dutch Elm Disease, Tree Planting & Care
Trees for Boulevards & Public Grounds
Tree Marketing, disposal, utilization)

Fact Sheets & Pamphlets
50,000 x .05/copy x 8 to 10 copies 20,000
(Insects in disease control, sanitation
fungicides, equipment & methods of
fungicide treatment, watering trees
fertilizing new trees, placement of trees
staking, planting patterns, species evaluation)

Visual Aid Materials

- Film - Video Cassettes 6,000
(Trees for shade, planting, managing,
insects, disease, treatments) \$1000 x 6

- Slide tape cassettes 6,000
(All aspects of disease curtailment &
shade tree management)

- Slide tape equipment for library - loan
to communities 25 units - @ \$800 20,000
(including technical subject matter
slide tape sets)

Television

- 10 one-half hour T.V. programs, @ \$1000 10,000

- Short (one or two minute) T.V. programs 6,000

DONALD C. WILLEKE
 ATTORNEY AND COUNSELOR AT LAW
 4844 IDS TOWER
 MINNEAPOLIS, MINNESOTA 55402
 612-339-0281

15 December 1978

The Honorable Albert Quie
 Governor-Elect of the
 State of Minnesota
 The Capitol
 St. Paul, Minnesota

The Honorable Rudy Perpich
 Governor of the State of
 Minnesota
 The Capitol
 St. Paul, Minnesota

The Honorable Members of the
 Senate and the House of
 Representatives of the
 State of Minnesota
 St. Paul, Minnesota

The Honorable William Walker
 Commissioner of Agriculture
 of the State of Minnesota
 State Office Building
 St. Paul, Minnesota

Gentlemen and Ladies:

I have the task of transmitting to you the 1978 Report of the Minnesota State Shade Tree Advisory Committee.

It is not a pleasant task for the members of the Committee--all of whom are Minnesota taxpayers--to tell you that all of the citizens of the State of Minnesota, will have to pay and pay and pay out of our limited resources to deal with the very large problems caused by shade tree diseases, whether we want to or not.

Our estimate of the expense that this problem will visit upon us is especially disquieting in a time of financial scarcity and tight budgets.

But we would be remiss in our obligation to you and to the State which we love if we did not use every opportunity to make it abundantly clear that the people of Minnesota will pay many hundreds of millions of dollars to deal with the problems of Oak Wilt and Dutch Elm Disease, whether or not the State acts to ease and spread the burdens.

We would be equally remiss if we did not tell you that in our estimation, the total burden will be heavier and will be more immediate in its pressures if the State fails to act to slow the spread of Dutch Elm and Oak Wilt Diseases. The ample experiences of other parts of the country are witness

(Continued)

The Honorable Albert Quie
The Honorable Rudy Perpich
The Honorable Members of the Legislature
The Honorable William Walker

15 December 1978
Page Two

enough to that fact.

However, we are heartened to report that the task of rebuilding our Urban Forests--the principal amenity of our cities and towns--is proceeding at a rapid rate as a result of the assistance provided by the State. We strongly recommend that the rebuilding continue.

Each of us has given many hours of our time to produce the report which is attached to this letter. We have worked willingly and without any compensation, save for the good we can do for our State. We will gladly give more time when and as required to explain and amplify upon our recommendations. We believe it to be vital that we deal collectively with the large burdens imposed upon governments and citizens by loss of our Urban Forests. And we believe it to be equally vital that we plant new trees now, so that we may enjoy them in our lifetimes and so that we may leave them as a legacy to our children.

For the good of the State we love, and for its continuing grace and beauty, we hope you will agree with us.

Respectfully submitted,

THE STATE SHADE TREE ADVISORY
COMMITTEE

By 
Donald C. Willeke, Chairman

DCW:pr
Enclosure

MUNICIPAL ECONOMY AND URBAN FORESTS

In a time of limited availability of funds, the greatest waste and the largest folly is to fail to make those expenditures which, by their very nature, prevent the people and their governments from incurring far larger expenditures at a later date. Painting, caulking, fire prevention, flood control and re-roofing are classic examples of such necessary expenditures, the postponement of which only leads to greatly increased costs
In the future.

Another prime example is the effort to limit the spread and to slow the losses from Dutch elm and Oak wilt Diseases in our cities and towns.

The second greatest folly is to fail to invest in capital assets, especially these assets which will appreciate in value. Soil improvement projects and the education of children are classic examples of investments in appreciating assets.

Another prime example is the planting of new shade trees to improve our cities and towns, conserve energy, and reduce noise and air pollution.

This report, on the twin subjects of preventive maintenance of and appreciating investments in our Urban Forests, is prepared for the Governor and the Legislature of the State of Minnesota by the Minnesota State Shade Tree Advisory Committee, November 21, 1978.

EXECUTIVE SUMMARY

This report, prepared by the Minnesota Shade Tree Advisory Committee, documents the need for an on-going state Shade Tree Program and outlines the levels of state financial assistance required to meet that need.

Each year Minnesota municipalities and counties are faced with the increasing costs of shade tree disease management and replanting programs. In 1977, cities engaging in these activities spent nearly \$25 million; in 1978 those costs may exceed \$30 million. These figures are staggering, but cities throughout the state have discovered that the costs are unavoidable. Elm and oak trees infected with Dutch elm disease and oak wilt fungi must be removed and disposed of before life and property are endangered. Such programs impose a heavy financial burden on most municipal governments.

Recognizing this the Legislature in 1977 passed the first statewide shade tree disease management and replanting program, providing over \$26 million to help Minnesota cities and counties defray these program costs. The availability of state aid encouraged hundreds of cities to implement much-needed shade tree programs. Cities that had already lost large numbers of shade trees were provided a financial incentive to plant new trees. After two years, more than 150,000 new shade trees were planted. More important, some cities noted a decreasing rate of disease incidence because of their aggressive disease management programs.

It is imperative that this incentive be sustained. There can be no let-up in the efforts to manage these disease by either the state or the local governmental units. Successful shade tree disease management in Minnesota requires:

1. *aggressive disease management programs by cities and counties throughout the state;*
2. *the enthusiastic cooperation and support of a motivated and educated public; and,*
3. *the continued and increased financial support of the Minnesota Legislature.*

Therefore, the Minnesota Shade Tree Advisory Committee recommends that the existing state Shade Tree Program be continued and that \$38,792,335.00 be appropriated to the Department of Agriculture for the next biennium for this purpose.

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I. SHADE TREE DISEASE MANAGEMENT AND REPLANTING PROGRAMS IN MINNESOTA

A. BACKGROUND

Elm and oak trees are the predominant shade trees in many parts of Minnesota. According to some estimates, the seven-county metropolitan area alone has nearly five million elms and nine million oak trees. Since the presence of Dutch elm disease in Minnesota was first confirmed in 1961, hundreds of thousands of elm trees have been removed because of the disease. The oak wilt fungus is also threatening the oak tree population throughout the state.

Local governmental units have become increasingly aware of the economic, environmental and aesthetic need to control the spread of these devastating diseases. Although there is no known cure for Dutch elm disease or oak wilt, years of reasearch and experimentation have demonstrated that the spread of the diseases can be most effectively slowed through aggressive disease management (sanitation) programs. Such programs require routine inspections for the symptoms of the diseases and the prompt removal and disposal of all potential beetle breeding sites. Without such programs, the elm and oak tree populations across the state will be devastated within a very short period and great costs will be incurred in a short period for removal of dead trees. Through aggressive disease management programs these losses and the resultant costs can be spread over a much longer period of time.

Although the presence of Dutch elm disease has been confirmed in nearly all of Minnesota's 87 counties, the incidence of the disease varies considerably across the state; in addition, certain parts of the state have greater concentrations of elm trees than others. Managing the spread of Dutch elm disease in many cities and towns is made more difficult because the elm tree was planted so extensively on boulevards. According to available data, oak wilt is more of a problem in southern Minnesota than in northern Minnesota. As a consequence, cities in different parts of the state face different problems. Experts in Dutch elm disease are more optimistic about effectively slowing the spread of the disease in northern Minnesota than in southern Minnesota where the disease is more widespread. But, it is southern Minnesota that is critically in need of extensive replanting programs to replace those thousands of elm and oak trees already removed because of shade tree diseases.

B. STATE AND LOCAL RESPONSE

Effectively managing the spread of shade tree diseases is an enormous problem for most municipalities. Such disease management programs impose an overwhelming financial burden on these governing units and their citizens, since dead trees in populated areas cannot be left standing. They must be removed, sooner or later. Recognizing this, the Minnesota Legislature in 1977 passed the most far-reaching and extensive shade tree legislation in Minnesota's history. It provided \$28.5 million for shade tree disease management and replanting activities by local governmental units and state agencies. Of this, \$26 million was earmarked specifically for the following grant-in-aid programs: sanitation (disease management)--\$21,650,000; reforestation--\$4,400,000; wood disposal and utilization systems--\$550,000; and experimental projects and research--\$400,000. The Department of Agriculture was charged with the administration of these four programs and the regulation of municipal shade tree programs. In addition, the Department was granted \$225,000 to conduct an extensive public education program.

The 1977 law also appropriated to the University of Minnesota \$100,000 for research and \$250,000 for continuing education and training of municipal shade tree officials. The Department of Natural Resources received \$625,000 for shade tree disease management efforts on DNR property adjacent to municipal control areas and within camp sites, picnic areas and way-side rest areas.

The new shade tree law was well-received throughout the state. Within months of the passage of the law, over 500 cities, towns and counties in all parts of the state applied for participation in the sanitation and reforestation grant programs. Even cities with populations of less than 1,000 participated because of special incentives in the law. These governmental units spent over \$22 million in disease management (sanitation) activities in 1977; It is estimated that these costs will exceed \$30 million in 1978.

An especially attractive feature of the new law was the reforestation grant program. It provided funds to encourage municipalities to plant new shade trees on public property to replace those lost to shade tree diseases. In 1977 alone, municipalities statewide spent over \$3 million planting nearly 83,000 new trees.

In the last five years many cities and counties have had to expand and intensify their shade tree disease management efforts. For some, these efforts have been rewarded by a decreasing rate of disease incidence. The future direction for the state and city officials remains the same: There can be no let-up in the efforts to manage these diseases by either the state or the local governmental units. Successfully managing the spread of shade tree diseases in Minnesota requires: (1) aggressive disease management (sanitation) efforts by cities and counties throughout the state; (2) the enthusiastic cooperation and support of a motivated and educated public; and, (3) the continued and increased financial support of the Minnesota Legislature.

State Legislators and administrative officers must realize that the costs of shade tree diseases will continue in any event--whether or not the present state-funded programs are extended. Ironically, the total costs to the people of the State of Minnesota will be higher without an adequate state program than they will be with a program equal to that created by the 1977 Legislature. This is because without a disease management program, losses snowball, and the entire costs of removing almost all mature shade trees is concentrated in a short 2 or 3 year period, rather than being spread over 10 to 15 years.

11. PROPOSED SHADE TREE DISEASE MANAGEMENT AND REPLANTING PROGRAM- INTRODUCTION

The State Shade Tree Disease Management and Replanting Program for Fiscal Years 1980 and 1981 which is proposed in this report reflects the continued support of the Legislature's existing program activities of public education, research, training, financial assistance to property owners, and financial assistance to local units of government for disease management on public lands, disposal, utilization and planting of new shade trees. Discussion of each recommended program activity will examine the need for the activity, the goals, program methodology, and the proposed budget.

A. FINANCIAL ASSISTANCE TO LOCAL GOVERNMENTS

1. Disease Management and Replanting

The continuing spread of Dutch elm disease and oak wilt during the last several years has, it is hoped, convinced state and local officials and the general public that this is a problem which will not go away. Whether we act or refuse to act, the problem will continue. It has become obvious to all who have studied the problem that unless strong programs for the management of these diseases are continued during 1979 and 1980, the diseases will take off like wildfire and many cities throughout the state will be largely denuded of shade trees. As in the past, a continuing program will require the joint efforts of both the state and local units of government if it is to have any chance of success. As the only practical way in which actual disease management can be effectively carried out is through strong local programs, we again emphasize that it is essential that local units of government be given sufficient fiscal capacity and support from the state.

An essential aspect of a comprehensive local shade tree program is the replanting of shade trees. Trees are not a luxury, but instead are a form of life that man finds necessary for his very well being. Healthy shade trees are, therefore, important factors in the quality of life in Minnesota. In certain areas of the state where Dutch elm disease has already devastated the urban elm population, the primary emphasis of the local shade tree program must be on replanting trees.

The 1977 Legislature wisely saw that a disease management program without an aggressive replanting program did not make much sense. Why "buy time" if nothing were to be done to use the time so purchased? Accordingly,

the Legislature established a substantial program of financial assistance to local governments for replanting. Although shade tree diseases have now been detected in all parts of the state, certain cities and areas of the state have been harder hit than others. Cities are in different stages of their programs, some requiring more extensive replanting efforts than others. Because of this variability across the state, cities should determine where their emphasis should be and where most of their local dollars should be spent.

Accordingly, the Committee recommends that the Legislature make available for 1979 and 1980 funds for one grant program to include both disease management and replanting activities. The level of funding for this combined grant program should be sufficient to reimburse eligible municipalities at 50% of their disease management and replanting costs. No more than $\frac{2}{3}$ of these funds should be awarded to cities in the metro area in any one calendar year. It is further recommended that the \$40 per newly replanted tree reimbursement limit be removed.

The stated purpose for providing financial assistance to local governmental units for shade tree disease management and replanting is:

1. To provide local units of government with sufficient fiscal capacity to mount an effective shade tree disease management and replanting program (See also Section V - Provision for Special Levy.)
2. To maximize the effect of state monies allocated for the management of shade tree diseases and replanting by providing financial incentives to undertake aggressive programs and by assuring local effort through the matching grant concept.
3. To provide an efficient and relatively simple method of allocating available grants to participating local units.
4. To permit a larger degree of discretion by local governmental units in determining the appropriate emphasis for local disease management and replanting programs.

Program Description: The direct state grant program to local units of government should be continued for the same broad range of eligible activities. State matching grant funds should be available for use, at local discretion, to manage elm and oak shade tree diseases on public or private property and to plant replacement trees on public property. Furthermore, the program should continue to permit expen-

ditures on a variety of differnt activities, thus allowing each city or county to fashion a shade tree program tailored to its own situation. The activities authorized under the combined state grant program should continue to include the following:

- a. Carrying out a preventive program including trimming and disposing of dead or diseased tree branches and applying Insecticides and chemicals approved by the Department of Agriculture;
- b. Removing dead or diseased trees and stumps on a timely basis;
- c. Making inspections and conducting censuses in control areas;
- d. Planting shade trees on public property; and
- e. Contracting for equipment, supplies, services, and/or personnel necessary to carry out any of the activities listed above.

The grant program should, as in the past, be a direct reimbursement to municipalities for local shade tree disease management and replanting program expenses. The administration of the program should continue as in the past, with a few changes as noted below:

- 1. All local units of government wishing to receive grant funds are required to submit their application at some date prior to the growing season.
- 2. Each application consists of a proposed shade tree disease management and replanting program and budget supported by resolution of the governing body.
- 3. The program budgets of all applicants are totaled with the sum representing total dollars budgeted for shade tree disease management and replanting by all units of government making application for funds.
- 4. The ratio between the total budget of all applicants and the amount of the legislative appropriation apportioned to that fiscal year is then calculated.
- 5. In the first year of the biennium, not more than one-half of the funds may be allocated, and this sum should be divided, with not more than two-thirds going to governmental units in the seven-county metropolitan area and one-third allocated to non-metropolitan areas.
- 6. The grant award to each applicant would be based upon the ratio calculated above. The ratio of the grant award to the municipal budget would be the same as that of the total budgets of all applicants to the amount of the appropriation apportioned to that fiscal year, but not more than 50% of such total budgets in any case. A year-end re-computation would be used to reallocate any unused funds.

7. A yearly grant award contract will be executed between each grantee and the state, and the funds will be encumbered in the name of the grantee. The award contract will cover program expenses for the calendar year.
8. The grantee will then submit a request for payment claiming all program expenses allowable under the state's grant program rules and regulations. The grantees will then be reimbursed for the same percentage of the expenditures upon which their grant award is based.
9. All direct labor expenses of municipal personnel will continue to be allowable under the program. Labor expenses will be based on the hourly rate of pay of the employee multiplied by the time the employee commits to the local program.
10. Major equipment expenses will be based upon the hourly cost of operating the equipment as allowed by the Department of Agriculture's equipment allowance schedule, multiplied by the time the equipment is committed to the disease management program. Hourly cost of equipment use will be computed by amortizing the capital cost of the equipment, adding required maintenance expenses, and adding required fuel expenses.
11. Minor equipment and supply purchases are also allowable expenses.
12. As noted above, all funds not used under a grant award in the first year would be returned to increase the amount of funds available for the second year of the grant program up to a maximum 50% reimbursement rate.

As everyone must know by now, shade tree management and replanting programs are expensive. Tree removal, whether now or later, is extremely costly because of the inherent dangers to person and property in removal and the heavy equipment required to remove, transport, and dispose of the exceedingly heavy and very bulky corpses of the dead trees. Tree planting is expensive because of the large numbers of trees that are needed to replace those lost to diseases.

There simply is no escaping the costs. Good disease management programs can spread the costs over more years while doing what must be done anyway. But, there is no ultimate escape, and anyone who thinks that costs can be avoided is foolish. The only true economy is a vigilant program.

Budget: The budget for the combined disease management and replanting grant program is based upon projected tree losses, estimated removal and replanting costs, and continued extensive participation by municipalities in the grant program.

FINANCIAL ASSISTANCE TO LOCAL GOVERNMENTAL UNITS

	<u>1979</u>	<u>1980</u>	<u>TOTAL</u>
Grants	\$18,225,000	\$18,225,000	\$36,450,000

2. Sensible Planting

As indicated previously, it is essential that local shade tree programs make adequate provisions for replanting shade trees. It is also important that careful thought and attention be paid to planting trees that will grow well in the areas selected. Trees of the wrong types planted in the wrong places are sure to be costly mistakes--in terms of money spent and time lost. Therefore, it is imperative that funds be made available to enable cities to develop sensible plans for their local replanting efforts.

Most species of shade trees, unfortunately, are not interchangeable items. The American Elm would grow just about anywhere, on any type of soil, and produce an acceptable shade tree of uniform size and shape with its neighbors. But the many species of replacement trees are not so versatile. They are of widely-varying sizes, branching habits and leafing characteristics. Some grow fairly well on poor soils and in polluted urban conditions; others do not. It is not possible in a report such as this to detail all the variables, but it is sufficient to say that if care in selecting trees is not taken, our cities and towns will end up with a mess--an ugly mass of trees planted without regard to size, form, soil requirements and growth habits. Then, this mess will have to be redone at great expense. The way to prevent this is for each city and town to have a plan.

The two largest cities in the state have already obtained (and paid for) such plans. But many smaller communities have not done so and will not through lack of foresight or lack of money. It is as foolish to plant trees without a blueprint as it is to build a City Hall without a plan, and the tree planting mistakes may last even longer and be more costly. Local surveys and local planning efforts are needed, and these require money--not a lot of money but some funding at least. It is hoped that a modest subsidy of local effort can help save countless dollars in the future in maintenance and replacement costs, and can provide great dividends in the form of more attractive towns and cities.

Accordingly, we recommend that the state subsidize local efforts to develop tree planting plans and that such subsidy be 80% of funds so spent by any community, up to a maximum of \$5,000 and up to a total appropriation of \$500,000--distributed on a first come-first served basis. We further recommend that the local matching portion can be privately-raised, so long as the planning effort is sanctioned by the local governing unit.

3. Disposal

a. Introduction--The Problem

What to do with the enormous carcasses of felled elms remains the single most perplexing problem in managing the spread of Dutch elm disease in Minnesota. Prompt disposal is critical because the insect that transmits Dutch elm disease breeds beneath the bark of dead and dying elm wood.

The first requirement for understanding the problem is to realize that disposal is primary--utilization is a secondary consideration. It is most important that these potential breeding sites be disposed of quickly to protect the standing, healthy elm trees.

If elm were a valuable wood, the problem would be easier; but it is not. This is a difficult concept for most people to understand, since, to the casual observer, a big tree is a big tree, and certainly worth something. It is hard to convince people that the elm tree is most valuable as an ornamental plant, and that its value as "timber" is almost nil. The Minnesota, Iowa, Wisconsin, Illinois, Michigan and Ohio countrysides are filled with vast quantities of prime oak, hickory, birch and other quality hardwood trees that are proceeding past maturity into the rotting stages simply because the value of their wood is not equal to the cost of cutting and curing it at present prices and at present levels of demand. Elm timber (which requires expensive kiln drying--unlike oak, which can be air dried) is a marginal hardwood at best. At worst, it is just a colossal nuisance. Like the body of a human or a horse, an elm tree is worth far more alive than dead.

b. Burning as a Disposal Method

The open burning of diseased elm trees is a disposal method preferred by many governmental units because of the low capital expenditures needed to begin operation. The type of pollution created by burning diseased

elm trees is similar to that created by burning wood in a fireplace. The problem is the quantity of pollutants generated in large-scale open burning operations. These pollutants may have an adverse impact on persons living near the burn site.

Burning this elm wood in small quantities as firewood, however, presents yet another, very serious problem. Elm wood can only be stored in the debarked state because the insect transmitting the disease breeds beneath the bark. If undebarked elm wood is stored in the backyards of hundreds of homes across the city, successfully managing the spread of shade tree diseases becomes an increasingly difficult task. Debarking and splitting the wood is difficult, and, when done on a commercial basis, adds to the cost of the firewood. Elm wood has a high water content and, thus, must be properly seasoned to burn efficiently. This also increases the real cost of converting diseased elm wood into "safe" firewood.

The Minnesota Pollution Control Agency is in the process of amending the existing open burning regulations to achieve, by 1982, the National Ambient Air Quality Standards established by the Environmental Protection Agency. These regulations will prohibit cities in the seven-county metropolitan area from disposing of diseased shade trees by open burning. This action is necessary because the EPA designated this area as a non-attainment area for particulates, hydrocarbons and carbon monoxide, which are the major pollutants created by the open burning of wood.

Nonetheless, it is the consensus of the members of the State Shade Tree Advisory Committee that open burning should be recognized as the most cost-effective solution to disposing of diseased elm trees in the seven-county metro area. (Presently, open burning does not pose a pollution problem in the non-metro areas.) In the metro area, however, complaints from local residents living near the burning sites about the smoke have forced local officials to close most of these sites. The Committee believes that closing these sites is unfortunate and may be short-sighted. There is indeed economic, environmental and aesthetic value to saving the elm population for as long as possible. Prompt and efficient disposal of diseased and dead elm trees by burning will help extend the life of Minnesota's remaining elm trees. We would hope that officials (federal, state, and local) would work together to keep open as many burn sites as possible.

c. Other Disposal Methods

Some cities and governmental entities have attempted to dispose of diseased elm trees by chipping the wood for sale as mulch, fuel, fibre-board and insulation. There are problems associated with this process. Elms are very large trees with huge boles and vast quantities of smaller brush material. The trunk, though exceedingly heavy and hard to handle, yields a high-quality chip; the many branches and stems yield a product of lesser quality. The size and the volume of the trees to be so processed, however, requires very large, very expensive equipment. This was demonstrated at the Pigs Eye plant for chipping the elms removed from St. Paul and Minneapolis. The major problem appears to be a lack of demand, at a sufficiently attractive price, to justify a scale of operation equal to the supply of raw material. Other chipping operations have encountered the same problem.

The Metropolitan Inter-County Council attempted to set up a metro-wide disposal system with a number of chipping sites. Despite strenuous efforts by the MICC and the constituent county governments, which have area responsibility for solid waste disposal, no private contractor could be found to operate the system at an acceptable rate and cost.

In the absence of other economical forms of disposal, however, chipping may be the only alternative. In the metro area in particular, there are high costs associated with both burning and landfilling because of long transportation distances and drop charges. Chipping, then, becomes a viable alternative when the cost of owning and operating the equipment is lower than either the cost of burning or landfilling.

Outside the metropolitan area, disposal methods other than burning have generally not been attempted, despite the availability of financial assistance from the state for such purposes. This may be due, in large part, to a provision in the 1977 law that states that any governmental unit, or combination of units in the non-metro area must have a minimum population of 20,000 to qualify for such aid. Most non-metro cities cannot meet the population requirement alone and are too distant from other cities to make a combined operation economically and practically feasible.

d. Multiple Use Disposal or Utilization Grants

To date, large-scale diseased tree utilization efforts have not been successful. The Committee believes that smaller, less complicated approaches should be tried, especially since such approaches would seem to be more adaptable to disposal requirements that change with the level of tree losses. These would include smaller-scale burning, chipping, sawmilling, bark-free firewood processing, landfilling and other methods. Thus, the Committee recommends that seven-hundred and fifty thousand dollars of state funds be appropriated for grants for government-owned (municipal or county) disposal and utilization systems and that any unit of government be eligible for grants of up to 50% of the capital costs (equipment and land acquisition) of any disposal system reasonably designed to destroy or convert diseased tree wastes.

We note that of the sum of \$750,000, approximately \$400,000 would be available from the 1977 appropriation since this amount was unused as a result of the inability to implement a metro-wide system and the legislatively imposed population requirement for the receipt of grants. Thus, the only additional funds required by this recommendation would be \$350,000.

4. Experimental Programs

Although Dutch elm disease has been present in the United States since the 1920's and in Minnesota since 1961, much remains to be learned about the disease and how to manage it. Oak wilt continues to be responsible for the loss of large numbers of oaks. It is essential that we also learn to control it more effectively.

In 1977, the Legislature appropriated \$400,000 for experimental projects. Six projects have been funded to date: two relating to the use of systemic fungicides; one testing the effectiveness and practicality of aerial photography in disease control; another assesses the relative cost/benefit ratios of currently accepted methods of disease detection and control; the fifth is entomological in nature; and the final project evaluates the current practices used in municipal replanting programs and tests alternate methods for use by municipalities.

The Shade Tree Advisory Committee firmly believes that research of this kind and at this level is essential. The Committee supports the objective

of the experimental grant program, which is: to establish and evaluate the effectiveness of the various types of shade tree disease management practices, treatment methods and planting programs for use in Minnesota. This includes research to assist municipalities in establishing priority areas in an approved disease control program.

Goals: The goals of the experimental grant program are:

- ** To encourage field experiments on various aspects of disease management programs designed to slow the spread of Dutch elm disease or oak wilt.
- ** To encourage experiments and research in planting techniques for boulevard and other municipal planting situations.
- ** To report to Minnesota municipalities the results of such experiments and research.
- ** To learn more about Dutch elm disease and oak wilt so that more adequate measures can be taken to slow their spread.

Program Description: The experimental grant program is available to all Minnesota municipalities, counties, state and federal agencies, and the University of Minnesota. These entities may apply by submitting to the Shade Tree Program a proposal outlining the intended experimental program. Each proposal will be examined by a review committee according to the following criteria:

- ** General applicability--proposed sanitation and treatment programs should not be limited in their application to a single community or county, but should be applicable in other parts of the state;
- ** Contribution to the overall State Shade Tree Program--proposed programs will be considered for their ability to enhance those shade tree disease control and replanting programs already established;
- ** Cost effectiveness--proposed programs will be evaluated for their potential effectiveness given the cost of implementing the program;
- ** Ability of the "proposer" to establish, carry-out and provide the necessary evaluation--the capability of the proposer to reliably collect, interpret and evaluate the results of the experiment will be considered;
- ** The proposed program must lend itself to experimental design and evaluation;
- ** Use of existing staff--proposed programs should operate with a minimum number of additional staff required for the project; and,
- ** Limited purchase of equipment--program proposals should involve limited equipment purchases.

Additional information may be solicited by the review committee.

Budget: It is recommended that this grant program be funded at the same level as in the last biennium -- \$400,000.

B. PUBLIC AWARENESS/EDUCATION

A critical component of a successful municipal shade tree program is an informed, highly motivated citizenry. If a city's residents are aware of the nature of the diseases which are threatening their shade trees, and know the proper steps to be taken when symptoms are spotted, they will better understand and support control measures being undertaken by their local government and park officials. Further, they will be better equipped to deal with diseased trees on private property. And finally, they will understand the value of replanting as the trees are lost, so that communities are not faced with a long period where few or no significant-sized shade trees exist.

Without such support and cooperation, local government officials will have to substantially increase their efforts and the potential for successful shade tree programs will be diminished. A state-wide public education program can help local governments develop and maintain a high level of public support and cooperation. As with a good disease management program, public education must be an on-going endeavor.

Goals: The objectives of the Department of Agriculture's public awareness/education program are:

1. To increase citizen awareness of the nature and seriousness of the threat of Dutch elm disease and oak wilt to Minnesota's elms and oaks.
2. To encourage citizen organizations to join in the effort to control and combat the diseases.
3. To make the public aware of the specific steps necessary to control and combat shade tree diseases.
4. To increase awareness of the importance of individual and community effort to manage the diseases and to replant a variety of shade tree species.
5. To promote Arbor Day and Arbor Month in an effort to encourage the planting of shade trees by private citizens, corporations and other public and private organizations.

Program Description: The Department's proposed public awareness/education program will utilize a comprehensive mix of media services and personal contact to disseminate information. This information will be non-technical, with the primary objective of reaching the average citizen.

The Department's past efforts have resulted primarily in increasing citizen awareness (Goal 1). With this base, greater attention can now be focused on directing communities and individuals to the correct courses of action. As a result, education will emphasize who, what, when and how:

- How to protect healthy trees.
- How to recognize Dutch elm disease and oak wilt.
- What specific steps must be taken when trees are infected.
- When to act.
- Whom to call for help.

Materials will continue to remind Minnesotans why disease management and replanting programs are necessary. But because public understanding of the nature and threat of shade tree disease has increased markedly in the last two years, it is now possible to build upon that knowledge in the promotion of public and private action. Although people are now more aware of Dutch elm disease, they are often unprepared to respond when the disease strikes.

Television and radio will continue to play a key role in the Department's public awareness/education campaign. Efforts will be intensified to acquire more air-time during the prime listening hours. Both television and radio public service announcements (PSA's) will be produced and distributed.

The print media has been an effective source of information in the past, especially in non-metro areas. Timely articles and press releases highlighting the latest developments in the program and the field will be sent to magazines and newspapers.

Coupled with its mass media contact, the program will continue to bring personal outreach efforts into Minnesota communities. Displays and presentations at local conventions, festivals, and commercial centers will be used to intensify communication and help individuals and communities address special problems.

In May, 1978 the Arbor Month program successfully enlisted the aid of civic organizations, schools, neighborhoods and individuals in sharing with local governments the expense and effort of reforestation. Over 350 schools and communities were officially involved, and planted 200,000 saplings during Arbor Month activities. This highly visible program will be expanded to increase awareness of the need for reforestation and to involve more individuals and community organizations in that activity.

Budget: A plan of action developing goals, a detailed methodology and implementation schedule will be developed by experienced public relations personnel to insure maximum effectiveness. Funds will be expended over the biennium as required by the plan. For this reason, the program budget is not broken down between the two fiscal years.

PUBLIC EDUCATION FY 80/81

Production of Public Education Materials.....	\$85,600
Media Time.....	\$62,800
Public Relations.....	\$18,600
Arbor Month.....	<u>\$60,000</u>
TOTAL	\$225,000

C. ADMINISTRATION AND REGULATION

The Department of Agriculture's Shade Tree Program is charged with three primary functions: (1) the administration of four grant-in-aid programs; (2) the implementation of a statewide public education program; and, (3) the regulation of all local shade tree programs of participating governmental units. In both 1977 and 1978, over 500 cities, towns and counties participated in the sanitation and reforestation grant programs. The size of the Program's clientele far exceeded anyone's expectations.

The law passed in 1977 appropriated funds for six positions. The Department of Agriculture received funding for three persons who were assigned to the Shade Tree Program from another activity. Two additional positions were approved by the Legislative Advisory Commission with funding made available through the public education and administration components of the original appropriation. The current staff of the Shade Tree Program consists of: administrator (1), grants analyst (1), public information officer (2)--one

person serves as a full-time Arbor Month coordinator, plant health specialists (4), clerk typists (2), and account clerk (1).

To perform all its functions effectively, efficiently and responsibly, the Shade Tree Program must receive adequate funding to retain a staff of this size and caliber. A program of this magnitude and scope cannot function properly with fewer and less qualified persons. It is highly recommended that another position be added to improve the capability of the regulatory staff.

The current regulatory staff consists of three persons. They have two major responsibilities: (1) to regulate all municipal shade tree programs to ensure compliance with all applicable Department of Agriculture rules concerning shade tree disease control and reforestation; and, (2) to provide technical assistance to communities so that municipal shade tree programs are carried out effectively and efficiently. Their jobs have become increasingly difficult with the vast number of participants in the grants programs. Adding a fourth regulatory person would enable the Program to provide more assistance to these municipalities and to conduct more on-site inspections. This person should have an arboricultural background to enhance the Program's expertise in tree selection, planting and maintenance.

Budget: It is the intent of this proposal that the administration of the the State Shade Tree Program achieve maximum effectiveness in expenditure of state funds with a minimum of resources dedicated to administration.

<u>Salaries</u>	<u>FY80(\$)</u>	<u>FY81(\$)</u>	<u>TOTAL (\$)</u>
Administrator (1)	27,936	27,936	55,872
Information Officer(2)	35,081	35,081	70,162
Grants Analyst (1)	17,277	17,277	34,554
Plant Health Specialist (5)	78,830	78,830	157,660
Clerk Typist (2)	21,681	21,681	43,362
Account Clerk (1)	13,063	13,063	26,126
<u>Non-Salaries</u>	39,800	39,800	79,600
			<u>\$467,336.</u>

III. SHADE TREE DISEASE MANAGEMENT TRAINING AND RESEARCH--UNIVERSITY OF MINNESOTA

The development of effective local shade tree disease management and replanting programs and methodologies is the result of many years of research and experimentation by experts in the field. In Minnesota, much of this work has been done at the University by the Agricultural Extension Service and the Departments of Plant Pathology, Entomology, Horticulture, Forestry and Forest Products. Their contributions over the past years have been significant; this research and training must be continued to ensure progress in managing Dutch elm disease and oak wilt. Much remains to be learned about the nature and spread of these diseases.

Aware of the continuing need and the commitment required at all levels, the University of Minnesota has budgeted separately for these activities. The Committee recommends that this funding request be supported by the Legislature as these activities are an integral part of shade tree disease management in Minnesota.

IV. SHADE TREE DISEASE MANAGEMENT - STATE AND FEDERAL PROPERTY

The State of Minnesota and the federal government own thousands of acres of land throughout the state. Much of this land is adjacent to or directly in the midst of areas where local disease control programs are being implemented. To ensure that these local programs are not jeopardized by actual or potential infection centers on this property, the state and federal government must undertake effective disease control programs on their own property. The state in particular should set an example of aggressive disease control on all state-owned lands, and especially on lands immediately adjacent to municipal control areas. All state departments responsible for maintenance of state lands must be encouraged and adequately funded to fulfill these responsibilities.

It is also recommended that the Department of Agriculture identify those federal and state officials who are responsible for shade tree disease control on their property. The Department of Agriculture should work with these officials to identify those areas most critically affecting local programs.

V. SHADE TREE DISEASE MANAGEMENT AND REPLANTING - PROVISION FOR SPECIAL LEVY

An essential part of the proposed program for shade tree disease management and replanting requires enactment of legislation which will permit cities and counties to levy local property taxes for this purpose outside the current levy limits. Such legislation was enacted in 1974 as a part of the Metropolitan Shade Tree Disease Control Act (Laws 1974, Chapter 355). However, when the Legislature enacted Laws 1975, Chapter 437, recasting local government aids and modifying local levy limits, all "special levies" previously enacted in other chapters were repealed.

The Shade Tree "Special Levy" was reinstated in 1977 for calendar years 1977 and 1978 and extended in 1978 through calendar year 1979. However, since many municipalities will continue to be at their levy limit during calendar years 1980 and 1981, it is absolutely vital to the continued success of effective shade tree disease management programs in these municipalities that the "special levy" statute be extended through calendar years 1980 and 1981.

Additionally, municipalities should be granted the authority to establish taxing districts within the city to finance shade tree disease management and replanting. This flexible financing method would allow cities to concentrate their efforts in problem areas without the use of cumbersome special assessment procedures.

VI. SHADE TREE DISEASE MANAGEMENT AND REPLANTING - CONCLUSIONS AND PROGRAM RECOMMENDATIONS

Managing the spread of Dutch elm disease and oak wilt continues to be a compelling and expensive problem for all Minnesotans. Extensive and intensive shade tree management programs, coupled with well-designed replanting programs, must be undertaken or sustained throughout the state. Therefore, it is the considered and collective judgment of the Minnesota State Shade Tree Advisory Committee that the state effort in shade tree disease management and replanting be continued and significantly expanded. The Committee believes the proposed program as set forth provides a comprehensive and coordinated effort that will benefit the state and all Minnesotans and should be adopted enthusiastically and expeditiously.

The Minnesota State Shade Tree Advisory Committee highly recommends and strongly urges the State of Minnesota to:

- I. *Appropriate thirty-six million, four-hundred and fifty thousand dollars (\$36,450,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, as amended, for purposes of providing financial assistance to local units of government for shade tree disease management and replanting activities.*
- II. *Appropriate five-hundred thousand dollars (\$500,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, as amended, for the purpose of providing financial assistance to local units of government to develop tree planting plans.*
- III. *Appropriate seven-hundred and fifty thousand dollars (\$750,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, as amended, for purposes of providing financial assistance to local units of government for establishing tree waste disposal and utilization facilities.*
- IV. *Appropriate two-hundred and twenty-five thousand dollars (\$225,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, as amended, for purposes of conducting a public education program for shade tree diseases and replanting.*
- V. *Appropriate four-hundred thousand dollars (\$400,000) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, as amended, for purposes of financing experimental projects and research on shade tree disease manage-*

ment and replanting.

- VI. *Appropriate four-hundred and sixty-seven thousand, three-hundred and thirty-five dollars (\$467,335) to the Minnesota Department of Agriculture pursuant to Minnesota Statutes, Section 18.023, as amended, for purposes of administering the proposed public education and state grants-in-aid programs and to monitor and regulate local shade tree programs.*
- VII. *Appropriate the funds requested by the University of Minnesota in its 1980/81 budget for the purposes of conducting activities relating to shade tree disease management and replanting.*
- VIII. *Appropriate sufficient funds pursuant to all 1980/81 state department budget requests for purposes of implementing shade tree disease management programs on state-owned lands.*
- IX. *Enact legislation which will permit cities and counties to levy local property taxes to implement shade tree programs outside the current levy limits and also enact legislation which will also allow them to establish taxing districts within their boundaries to finance shade tree programs.*

APPENDIX I

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CONTINUING TO SAVE MONEY AND TREES:

COMMUNITY TREE PLANTING AND MANAGEMENT IN MINNESOTA

A Report And Recommendations Prepared By
The State Shade Tree Advisory Committee
And Submitted To:

The Governor of the State of Minnesota
The Members of the Minnesota Legislature
The Commissioner of the Minnesota Department of Agriculture
The Commissioner of the Minnesota Department of Natural Resources
The President and the Regents of the University of Minnesota

Minnesotans are:

1. Recognizing the concept of the community forest.
2. Succeeding in combating oak wilt and Dutch elm disease.
3. Planting more trees than ever.
4. Demanding that their neighborhood trees be well managed.

November 24, 1980

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24 November 1980

The Governor of the State of Minnesota
The Members of the Minnesota Legislature
The Commissioner of Agriculture
The Commissioner of Natural Resources
The President and the Regents of the
University of Minnesota:

Dear Minnesota Colleagues:

We are pleased to report to you that the efforts of all of you to preserve and renew the trees of our Minnesota communities are paying off handsomely and, because of your leadership and foresight, the Citizens of Minnesota have saved many, many tens of millions of dollars.

This is our fourth biennial report to you. The group of citizens who make up the State Shade Tree Advisory Committee have been telling you since 1975 that we would have to spend money in order to save money--that we would have to act vigorously and commit ample resources if we were to avoid the disaster that has befallen urban forests elsewhere in the country. You acted. Funds were appropriated. Communities--about 500 of them across the State--organized and spent money to avoid disaster.

Disaster was avoided. Our losses due to Dutch Elm Disease and Oak Wilt Disease have dropped back, due to vigorous sanitation. We have lost nearly a million trees, but over 16 million large shade trees remain healthy and, more importantly, we have not had to spend the money to cut them down and to plant new urban trees in their places. Other states were not as foresighted, and they have paid and are paying a much higher price.

What will you do now? Will we tear down the fire station because we have not had any disastrous fires? Will we snatch defeat from the jaws of victory? That is for you to decide.

We hope, and we believe, that you will continue the programs that have cut our losses of shade trees and have helped to pay for the planting of over 500,000 new trees.

Letter of Transmittal
Page 2

As your fellow taxpayers, we are pleased to recommend that you appropriate no more for shade tree disease control and replanting than you did in 1979, which, in turn, was less than you appropriated in 1977. Thus, taking into account the inflation since 1977, and the increase in state revenues since that date, it is fair to say that this program is costing and will cost far less than it did several years ago. We are very happy about that fact, because it is just what we predicted would happen if a comprehensive program was adopted.

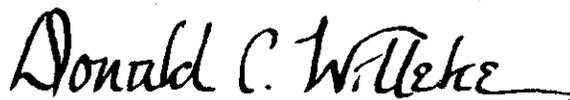
Frankly, it is nice to be able to say that this is one governmental program which is working. It is working very well and it is working as it was planned to work. It is saving a great deal of money, and it is preserving and renewing something that Minnesotans prize: that major element of our fabled Quality of Life known as our Urban Forest.

In light of the success of the efforts which you authorized and put into motion, our advice can, and should, be summarized in four words: "You can't quit now!" To quit now, or to cut back drastically, would only invite a resurgence of the diseases which your appropriations and programs have suppressed. It has happened elsewhere. Syracuse, New York, is one classic example. The cost of such a resurgence would be spectacular in a time when governments can ill afford increased costs. All you have to do is to multiply the number of remaining large shade trees by a modest removal cost of several hundred dollars per tree to see what a disaster we would have.

For these reasons, the members of the State Shade Tree Advisory Committee join in urging you to continue the work you have so nobly begun.

In that spirit, this Report is . . .

Respectfully submitted,



Donald C. Willeke
Chairman, Minnesota State Shade
Tree Advisory Committee

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ACKNOWLEDGMENTS

This report was prepared by the State Shade Tree Advisory Committee, which is composed of interested and informed citizens of the State of Minnesota who are appointed to the Committee by the Commissioner of Agriculture. The purpose of the Committee is to advise the administration and the Legislature in matters relating to shade trees and to evaluate and suggest courses of action that are feasible and effective.

At the time this report was adopted the following persons served on the committee.

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EXECUTIVE SUMMARY

Minnesota continues to work hard at minimizing the environmental and economic consequences of oak wilt and Dutch elm disease. This report summarized the efforts of communities and agencies throughout the state, reports on accomplishments to date, defines needs that must be satisfied in order to sustain these efforts and recommends specific actions to meet the needs.

Specifically, the report shows that Minnesota communities continue to be plagued by shade tree diseases and that state technical and financial assistance are crucial to their ability to develop and operate successful local programs to deal with the problem. Effective local programs are reducing the number of trees lost each year to a manageable number. Only about half the number of trees were lost in 1979 as were lost in 1977. Also, the planting of new trees is being undertaken in most communities. In 1979, for the first time, Minnesotans planted almost as many trees as we lost. The results for 1980, although not completely tabulated, at the present time are even more encouraging.

The report calls for continued same level funding of grants-in-aid to local communities, state funding of urban forestry and extension activities previously carried out with federal funds and development of a legislative policy statement relating to urban and community forestry in Minnesota.

CONTINUING TO SAVE MONEY AND TREES:

COMMUNITY TREE PLANTING AND MANAGEMENT IN MINNESOTA

Wise and active management of the community forest continues to save dollars, benefits and quality of life, all of which Minnesotans highly value. Within the past decade we have begun to recognize the forest in our neighborhoods and have begun to manage it. The threatening catastrophe which oak wilt and Dutch elm disease pose has awakened us to the need for continuous hard management of this home-town resource. We are willing to assign a measure of our own limited physical and financial resources to this task.

Since 1974 Minnesotans have:

- 1. Spent more than \$105,000,000 on controlling shade tree diseases and planting new trees.
- 2. Planted more than 512,000 new shade trees on public property in their cities and towns.
- 3. Lost nearly 840,000 elm and oak trees to disease while protecting an estimated 16 million others from the ravages of shade tree diseases.

Saving individual trees so that they mature and provide shade, wind protection, wildlife habitat, noise abatement and enjoyment has long been a goal of many Minnesota citizens. The realization that Dutch elm disease and oak wilt are community problems, wherein individuals acting alone are ineffective at saving their own trees, has prompted the development of community urban forestry programs aimed at developing, maintaining and protecting a healthy forest rather than a healthy tree. Each of us has

come to realize that "my" tree is significant in that it is a portion of "our" community forest. We have shifted our emphasis from the "internal medicine" needed to protect a given tree to the "public health medicine" that will sustain a healthy population of trees in our communities.

Where do we stand?

Four hundred seventy-seven Minnesota municipalities (cities, townships, counties, and special purpose park districts) now have shade tree disease management programs. In eighty-one of the eighty-seven counties of the state, communities are actively controlling Dutch elm disease and oak wilt and are planting new trees that will comprise the neighborhood forests of the future. Many of these communities operate comprehensive urban forest management programs that include inventorying, developing management plans, inspecting and monitoring trees, operating utilization facilities to recover and return wood from urban trees to productive uses, researching many facets of this rapidly maturing management field and developing and implementing programs of public awareness and participation.

Not only are units of local government involved, but state and federal units as well are active in urban forest management endeavors.

1. The University of Minnesota is:

Conducting research on a wide range of topics important to shade tree management. The new pesticide regulations allowing the use of the insecticide Dursban and increased dosage at which the fungicide Arbotect may be used are direct results of University research. Continuing research

at the Landscape Arboretum develops and tests new plants and techniques that improve the quality of urban forest management.

For
example:

Under a grant from the Department of Agriculture Shade Tree Program, researchers at the University of Minnesota have learned more about native elm bark beetles. Their discoveries provided a new control strategy for Dutch elm disease. The insecticide Dursban^(R) when applied to lower trunks of a community's entire healthy elm population can have a telling impact. When used in combination with a vigorously applied program of tree removal, such control strategies prove particularly useful to many Minnesota communities since the hardy native beetle is considered the primary disease vector in over two thirds of Minnesota.

2. The Agricultural Extension Service offers:

- A. Expanded public and consumer information on shade trees through publications, audio-visuals, displays, news releases, instructional meetings and the operation of question answering services.
- B. Training for tree inspectors and other shade tree professionals in current shade tree management, insect control and disease control techniques.

3. The Minnesota Department of Natural Resources provides:

- A. Technical and limited financial assistance to local communities through its urban forestry staff as well as through district forestry offices throughout the

state. Technical assistance is provided in the areas of planning, planting, tree care and maintenance, urban development, and multiple use management. State funds and limited federal funds support this effort.

- B. Demonstrations of successful disease management practices as part of a five year federal pilot program. The demonstration is funded by the United States Department of Agriculture, Forest Service, State and Private Forestry Group. The program provides financial and technical assistance for Dutch elm disease control and diseased tree utilization in six demonstration cities within Minnesota.
- C. Support for ongoing community disease control programs by implementing sanitation programs on adjacent Department administered lands.
- D. Promotion for the development of comprehensive community forestry programs through the Tree City USA awards program.

4. The Minnesota Department of Agriculture offers:

- A. Financial incentives to local units of government to assist with effective programs for control of Dutch elm disease and oak wilt. Since 1974 the Department's Shade Tree Program has shown the following:

<u>Year</u>	<u>No. of Trees Lost</u>	<u>No. of Trees Planted</u>	<u>State Dollars Spent</u>	<u>Local Dollars Spent</u>
1974	20,327	14,352	\$ 90,449	\$ 2,313,566
1975	38,832	54,146	296,952	2,654,204
1976	92,785	44,794	939,548	3,860,418
1977	250,767	74,949	10,158,316	13,147,428
1978	180,648	102,961	11,225,516	17,548,583
1979	127,947	111,483	10,183,654	9,601,148
1980	<u>126,646*</u>	<u>109,617*</u>	<u>11,986,870*</u>	<u>11,797,390*</u>
Total	837,952*	512,302*	44,881,305*	60,922,737*

*Estimate

- B. Technical assistance to communities in setting up and operating local shade tree disease control and reforestation programs. Personnel are trained through a Tree Inspector Certification Program and Plant Health Specialists from the Department regularly consult with local officials and workers.
- C. Financial assistance in setting up systems to utilize diseased wood and to recover wood products and energy.
- D. Public information campaigns aimed at increased awareness of shade tree diseases and of local programs to control them.
- E. Promotion of Arbor Month wherein citizen involvement in tree planting is encouraged, especially as part of local organized efforts.

F. Financial assistance to researchers to study specific aspects of shade tree disease management.

5. Schools have taken an active part in local urban forestry activities. Arbor Day observances are carried out across the state in public schools at all grade levels.
6. Communities have now organized local reforestation advisory committees tree boards to advise councils and boards on many aspects of local reforestation programs.
7. Civic organizations and businesses continue to offer outstanding assistance to local shade tree efforts. Trade and professional groups such as the Minnesota Nurserymans Association, The Minnesota Society of Arboriculture, The Minnesota Chapter of the American Society of Landscape Architects as well as foundations and community groups are now actively involved.

The legislature has enacted laws which have encouraged the creation of local programs of neighborhood forest management. Minnesota is viewed as one of the nation's leaders in the field of community forest management. Of particular value is the legislation which instills quality into locally devised and locally operated community programs. We can be proud that Minnesota has a state system that involves cooperation of several agencies in assisting the creation of effective, high quality local programs rather than a "state program" that is mandated on each community.

For example:

Faced with a low disease-pressure situation, the city of Moorhead very early created the position of city forester and adopted a rather unique disease control strategy. In addition to running a first rate conventional sanitation program, the city has incorporated several techniques designed to prevent Dutch elm disease from becoming firmly established in the city. These steps include sanitation pruning of the city's elms to eliminate bark beetle breeding habitat, and working together with Fargo to eradicate wild elms in the river corridor. This is vitally important, as once Dutch elm disease gets firmly established in a wild area such as this, disease pressure on the rest of the community increases dramatically. To date, Moorhead has been able to keep yearly losses at a relatively low level; and provides a good example of community action for other Western Minnesota communities.

We now stand at the point of having encouraged the development of good local programs. We stand ready to decide if they will continue to save and to manage Minnesota's neighborhood forests.

What have we accomplished?

Each of you has received the annual and biennial reports of the various state agencies and divisions operating in the field of community forestry. Statistical reviews of accomplishments are contained therein. You will consider financial histories and requests in the budget documents submitted to you and our recommendations for these are presented later. To the extent that these documents tell the story, we suggest that you examine them. More specifically, however, we would like to call your attention to these accomplishments.

1. Programs to control shade tree disease are working.

Between 1977 and 1979, the last year for which efforts are completed and tabulated, local efforts have cut the annual rate of tree losses in half. In 1977 Minnesota communities lost 250,767 trees. In 1979 we lost 127,947 trees.

For
example:

Only about 15 percent of Willmar's original elm inventory has succumbed to Dutch elm disease since 1972. Much of the credit for this record goes to the City Public Works Department, which expanded its tree maintenance program to incorporate on-going tree removal as part of its regular program. Efficient bookkeeping, organized crews and a populace well-educated in the ways of Dutch elm disease make for prompt removal and bodes well for more than 5000 elms still vigorously shading the streets and yards of Willmar. Reforestation and tree maintenance techniques have kept pace with tree removal and have steadily improved. Residents eager to plant trees may have to be discouraged from planting too many too close.

2. We are planting new trees at a faster rate than ever. In 1977 Minnesota municipalities planted 74,949 new trees on public property. By 1978 we had jumped to 102,961 and again in 1979 even greater effort brought us 111,483 new trees. In 1980 communities proposed to plant another 110,000 trees.

For example:

St. Paul actually began planting new trees to replace those lost to Dutch elm disease in 1972. At first the plantings were small in scale but gradually the scope of the task increased. Replacement for lost elm trees became a major concern. A street tree planting master plan was prepared which provides for the planting of at least twenty-three species of shade trees so that the possibility of future epidemic losses will be minimized. For systematic implementation, the city was divided into seventeen districts. Although it will take many years before the project can be completed, new vigorously growing trees are now in many districts where elm trees used to stand. For the three year period, 1977-1979, the city reported total expenditure of \$5,291,505 including state reimbursement of \$1,533,900 in planting 35,158 new trees.

- 3. We have learned how to manage this problem. Research and demonstration projects funded at both the state and federal level are yielding usable results. Each community with a shade tree disease control program has at least one trained, tested and certified Tree Inspector. In addition, competent observers have acclaimed Minnesota's public employees as well informed about the complex technical aspects of their jobs. Awareness and concern among the general public also continues at a high level.

For example:

A survey of Minnesota residents (of communities over 200 population) indicated widespread appreciation of shade trees (91 percent considered them extremely or very important), concern for their condition (24 percent considered them as needing some or lots of work), and willingness to pay additional property taxes to support shade tree programs (adults from 71 percent of the households would pay an annual tax increase of \$10 or more). Fifty-two percent of those interviewed consider Dutch elm disease a major or important threat. Preliminary evidence from case studies of eight communities suggest that while

resources to conduct a program and the enthusiasm of local officials are important, successful outcomes are associated with the active support of the residents. Interviews with a sample of local program managers indicated general satisfaction and appreciation for the state shade tree program. Many northern cities have not yet experienced the disease, yet both public officials and residents express these general beliefs and appear ready to join the state program when necessary.

4. We know more about the disease itself. Dutch elm disease, however, continues to threaten new communities. Trees in western and northern communities of the state are only now being attacked by this disease. While municipalities in southern and eastern locales first experienced Dutch elm disease in the 1970's, some communities will not face the problem until the 1980's.

For
example:

The city of Dilworth has a very active shade tree program, but has yet to find its first case of Dutch elm disease. Already the community conducts vigorous inspection and sanitation pruning programs. Nearly two hundred dead and declining trees which might have served as breeding sites for elm bark beetles have been removed. Trees are being planted now in anticipation of future losses. Dilworth is profiting from the experience of other communities and from available training opportunities, technical aid and financial assistance.

5. We are developing new tools. New chemical uses have been developed and brought into play against the disease. So too have new techniques, new equipment, new management methods and, most

importantly, new ideas that stem from local efforts to solve problems at the local level.

For
example:

In 1979, upon learning of the successful use of the insecticide Dursban as an aid in the control of Dutch elm disease, the city of Wheaton set out to enlist public support and financing for a Dursban spray program. Upon receiving this support, the city purchased the necessary materials and conducted the needed spraying. Surrounded by farmland, Wheaton is isolated from outside populations of native elm bark beetles, and has an excellent sanitation program. These factors, combined with the spray application, caused disease losses to tumble from twenty-nine trees in 1979 to five in 1980, and helped focus the attention of other communities on the potential usefulness of Dursban as a supplementary tool in controlling Dutch elm disease.

6. We are making better use of trees we lose. More communities have developed utilization methods which do not result in landfilling or open burning wood from diseased trees. Many communities have found ways to use diseased elm and oak as home firewood without spreading the diseases.

For
example:

The Mesabi Elm Utilization Authority (MEUA) is a joint powers agency of nine communities formed to aid in the control of Dutch elm disease and to utilize the wood generated. Participating communities include Aurora, Biwabik, Buhl, Chisholm, Eveleth, Gilbert, Hibbing, Mountain Iron and Virginia. Under a matching grant from the Shade Tree Program the MEUA purchased a debarker, a log splitter and a loader and operated them at their utilization facility near Virginia. The facility is operated by a private contractor and produces debarked elm firewood and bark chips. These products are made available to the elderly, disabled and eligible needy citizens. Firewood is also sold to the general public. The MEUA also operates

a brush chipper and stump grinder for participating cities. The chips generated in this way are used to mulch newly planted trees. MEUA provides an environmentally acceptable disposal alternative that is economically feasible for small communities.

For
example:

Dakota County operates a variety of diseased wood utilization equipment purchased under a matching grant from the Shade Tree Program. A debarker and a sawmill produce dimensional and cut-to-order elm and oak lumber, bark chips, saw dust, wood chips, patio blocks, fence slabs and firewood. Wood from diseased trees is accepted from cooperating government agencies as well as tree service companies and private citizens. Presently fourteen communities as well as the State Department of Transportation, Dakota County Highway Department, Department of Natural Resources and the Stillwater State Prison make use of the facility. All products of the facility are for sale to the general public. Typical uses of the processed diseased wood include: saw dust as mulch and bedding for livestock; bark and wood chips as mulch and trail surfacing material; and lumber for decking, fencing, trail bridges, landscaping, picnic tables and shelters. Dakota County's utilization facility is the most diversified operation in the state at this time. In 1979 nearly \$20,000 worth of products were produced.

7. Communities are developing comprehensive tree management programs through adoption of municipal tree ordinances, assessment of present conditions of their trees by intensive tree inventories, and preparation of management plans.

For
example:

Small cities such as Mora and Sleepy Eye have utilized the technical assistance offered by state organizations, volunteer services, and donations in order to develop their tree management programs. A community

of any size can develop a comprehensive tree management program and benefit from having such a program. Often, large cities have Park or Forestry Departments with budgets specified for developing forestry programs. Although small communities may not have these same financial resources or expertise, this fact should not deter the development of their programs.

8. Sanitation programs on state owned lands continue to reduce the possibilities for spreading diseases into adjacent communities.

For
example:

In the Metro area, a special Department of Natural Resources Dutch elm disease crew removed and disposed of 2,963 dead and dying elms. The removal of these trees had a positive impact on the disease rate found within metropolitan cities, particularly those adjacent to the state lands.

What do we need?

The Committee feels that management of community forests will be a continuing responsibility of Minnesota communities and that acceptance of this responsibility generates several specific needs. Community trees may live for one hundred or more years and long range, sustained efforts are required.

First, we need sustained effort at controlling catastrophic shade tree problems. Diseases and insects will always be with our community forests as will potholes with streets and rust with water mains. Because, however, plant pests are somewhat cyclic and transient and because they are closely related with a living host plant, involvement by the State of Minnesota must continue to provide the assistance that local resources cannot meet.

We need state financial and technical assistance. This assistance should not be limited to pest control but should include the other phases of urban forest management as well. Coordination of the various state agencies should also be achieved.

Second, we feel the need to recognize the concept of the community forest and to afford it some measure of public attention and commitment. At the local level, this recognition will take the form of citizen involvement in public programs similar to those already in place to manage our schools, parks, and other public resources.

Third, we need flexibility on the part of any state system. Once having demonstrated local commitment at the local level, communities must be assured that state assistance will be flexible enough to deal with unique local situations.

Fourth, we need confidence that the state's commitment to local communities will continue over a given number of years at a given level. One of the major deficiencies in the current state effort is that there is no assurance to communities that state commitment will continue beyond the year following a legislative session. If local units of government are to cooperate with the state in conducting long term benefit programs, they need some measure of confidence that the state, too, is cooperating under a long term policy.

What do we recommend?

The State Shade Tree Advisory Committee has studied the range of community forestry problems and makes the following recommendations concerning the University of Minnesota, the Minnesota Department of Natural Resources and the Minnesota Department of Agriculture.

Legislation which accomplishes the following should be enacted:

1. That funding for the Department of Agriculture Shade Tree Program continue at the same level as for the 1979 to 1981 biennium with no increase for inflation. The 1979 appropriation was for \$25,557,900 and the same amount is recommended for the 1981-1983 biennium. Most of this appropriation will provide grants-in-aid to local governments for development and operation on local shade tree programs.
2. That \$250,000 be appropriated to the Department of Natural Resources for sanitation efforts on Department lands adjoining community control areas.
3. That support be given for the Department of Natural Resources change level budget request to the Legislative Commission on Minnesota Resources in the amount of \$375,000 for the Urban and Community Forestry Program. These funds will replace federal funds needed to administer the program.
4. That the Legislature express its support to the appropriation of federal funds that will continue the Federal Dutch Elm

Disease Demonstration Cities Project, now in its third year, through its planned five years.

5. That the provision for special tax levy authority by municipalities be continued by striking the portion of the last sentence of Minnesota Statutes 18.023 Subd. 6 which reads "...and terminating with the levy made in 1980, payable in 1981."

6. That a legislative statement on urban forestry policy be adopted and that the legislature either appoint an interim committee to draft the document or that a volunteer committee be appointed to draft a statement for consideration by the 1982 Legislature. The policy statement should address the following issues:
 - A. Define goals for local and state programs.
 - B. Suggest responsibilities for various state programs be assigned to specific state agencies.
 - C. Define state financial and technical commitment to the programs.

We recommend further that the Legislature:

1. Direct that specific current level portions of the appropriations for the University of Minnesota Agricultural Experiment Station and Agricultural Extension Service be used for funding and support of distinctive positions with responsibilities for shade tree pathology, entomology and management.

Lastly, the Committee wishes to express its sincere appreciation to the Legislature which has demonstrated the quality of leadership so vital to successful control of shade tree diseases. The Committee is confident that this outstanding effort will continue.

Respectfully submitted,

THE STATE SHADE TREE
ADVISORY COMMITTEE

November 24, 1980

APPENDIX G

MDA Budget Records.

Shade Tree Expenditure Reconciliations.

Robert FLASKERD - PLANT
Industry

PROPOSED PROGRAM BUDGET

Detailed Estimates

1973 - 1975

Department of Agriculture

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Presented By

GOVERNOR WENDELL R. ANDERSON

To The

Sixty-Eighth Legislature



January 1973 Saint Paul, Minnesota

**BIENNIAL PROGRAM BUDGET - ACTIVITY DETAIL
DESCRIPTION OF CURRENT OPERATIONS**

Activity Pest Control in Municipalities

Each municipality is required to submit in writing details of a proposed control project before such work is begun. Application forms are provided for this purpose and supplemental information is often obtained through correspondence or phone call. The proposal is examined and approved if it meets all the technical standards such as proper chemicals, correct dosage, proper timing, provision for safety measures and evaluation of effectiveness. The decision to carry on a control program rests with the municipality.

In the case of Dutch elm disease however, the Commissioner of Agriculture has specific statutory authority to require control if he determines that economic recreational or esthetic losses will result because of the lack of control. In addition once it has been determined by means of a laboratory test that a tree is diseased, then it is mandatory that that tree be removed to prevent the further spread of Dutch elm disease. Municipal officials are notified of positive cases and are expected to follow-up and report back when diseased trees have been removed. Laboratory records are maintained of all positive cases and their disposition.

Some of the means by which the education aspects of this activity are carried on include:

1 - Holding meetings with municipal councils and interested citizens to inform them regarding current pest problems and means of control. Such meetings are sometimes held jointly with University personnel.

2 - Working with responsible officials in training session so that they can become better qualified to deal with their own municipal problems.

3 - Making pest surveys to evaluate problems and make recommendations.

4 - Providing a diagnostic service for municipal pest samples submitted. The University also maintains a diagnostic service but more generally for the general public and other Extension personnel such as county agents.

5 - Disseminating information through radio, news releases and special newsletters regarding all types of pest control including those that may be of specific municipal concern.

Some of the education aspects of this activity are carried on jointly with the University of Minnesota Agricultural Extension Service. For example the University publishes various informational bulletins and fact sheets that pertain to life history and control of Dutch elm disease, shade tree pests and mosquito control. The Department of Agriculture publishes weekly and annual summaries of the outlook and current status, regulatory requirements and similar information.

One entomologist and one plant pathologist devote most of their time to this activity. The entomologist has considerable administrative duties within the Division of Plant Industry that are not directly concerned with this activity. The plant pathologist also helps out in other activities during the off season. Three seasonal employees work in the Dutch elm disease diagnostic laboratory during the months of June, July, August and part of September. These people also may do some field survey work related to Dutch elm disease.

Date Prepared 11/14/72

Approved by (Name & Title) Robert Flaskerd, Director

Prepared by (Activity Author) J. R. Sandve

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Activity Title Pest Control in Municipalities

Agency Agriculture

BIENNIAL PROGRAM BUDGET - ACTIVITY DETAIL
 CLIENTELE NEEDS
 CHARACTERISTICS, NUMBER, LOCATION, BENEFITS, FUTURE

Activity Pest Control in Municipalities

The clientele are the municipal and other governmental unit officials who have the responsibility for carrying on municipal pest control programs such as in Dutch elm disease, shade tree insects and diseases, mosquito control, rodent control, bird control and other pest problems that may require control at the local level. In the smaller towns and villages the responsibility for pest control may fall to the street superintendent, police chief, city clerk, or some other city employee. In the larger municipalities there may be park superintendents, foresters, or other persons who may have some training in pest control.

These people in general are unqualified to make decisions in regard to proper chemicals, dosage rates, proper timing, proper equipment, hazards involved, evaluation of effectiveness and many other aspects of pest control. The services provided by this activity help the municipal official in decision-making both as to actual need for treatment and the most effective and safest method of accomplishing their objectives.

During the past year 304 municipalities submitted samples for analysis of Dutch elm disease. One hundred and eleven Minnesota municipalities now have Dutch elm disease. Forty-five municipalities carried on some type of mosquito control - usually a program to kill adult mosquitoes. Municipalities that engage in rodent control generally retain the service of a professional pest control operator. In the area of mosquito control it is anticipated the number of municipal programs will increase only slightly or possibly not at all. Unexpected outbreaks or a disease epidemic could change this outlook.

The currently recommended insecticides all are of the short residual type; thus it becomes necessary to make repeated applications with each new mosquito hatch. Many municipalities can not bear this additional cost. Municipal rodent control must often take place at the city or village open dump. Pollution Control Agency regulations will require the closing of many of these dumps and the consolidation of disposal facilities into regional or area-wide sanitary landfills. This changeover will definitely influence the need for rodent control. In the area of Dutch elm disease it is anticipated that the work load will increase greatly. In past years the number of samples submitted and the number of positive cases has about doubled each year. This rate of increase can be expected to become even greater especially in the municipalities in the southern two-thirds of the State. A corresponding increase in the work load can be expected.

The anticipated work load increase will require additional personnel just to maintain the service at the present level. Since more and more cities and villages inevitably will be confronted with Dutch elm disease this means that the Department of Agriculture must be prepared to provide additional reviewal and approval services as well as diagnostic facilities. The level of incidence of disease in urban areas has been relatively light to date. Based upon information from other states sharp increases in infection rates are expected. The above factor coupled with the increase in the number of cities and villages with Dutch elm disease will greatly increase the work load.

Date Prepared 11/14/72

Approved by (Name & Title) Robert Flaskerd, Director

Prepared by (Activity Author) J. R. Sandve

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Activity Title Pest Control in Municipalities

Agency Agriculture

**BIENNIAL PROGRAM BUDGET - ACTIVITY DETAIL
PERFORMANCE INDICATORS
IMPACT MEASURES - OUTPUT MEASURES**

Activity Pest Control in Municipalities

During the 1971 season 304 municipalities submitted samples for Dutch elm disease diagnosis. One hundred eleven had positive cases of Dutch elm disease. The total of positive cases was 1,074. The estimated totals for the 1974-75 biennium in each category could approach three times the 1971 level.

The number of mosquito control programs approved in 1971 was 45. It is anticipated that this figure will not change significantly.

The consultive and laboratory services provided by the activity has helped cities and villages to carry on sound programs of pest control especially as they relate to a new problem like Dutch elm disease. The value of this service cannot be measured numerically. Out of the 45 mosquito control programs approved each year, usually only one or two have problems because of buying or using incorrect materials. Our impact objective is to encourage municipal officials to utilize the services provided by this activity and thus hopefully avoid problems and have better control programs.

Additional personnel will make it possible to spend more time in field evaluation of all municipal pest control programs including Dutch elm disease, mosquito control and nuisance animal control (rodents, etc.). Field evaluation to analyze the effectiveness of control is essential to the supervision of any control program and is in fact required by the statutory authority on which this activity is based.

Such evaluation also will enable the State to obtain some

measure of the impact of this activity.

Date Prepared 11/14/72Approved by (Name & Title) Robert Flaskerd, DirectorPrepared by (Activity Author) J. R. Sandve

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Activity Title Pest Control in MunicipalitiesAgency Agriculture

**BIENNIAL PROGRAM BUDGET - ACTIVITY DETAIL
NEW MANPOWER REQUIREMENTS**

Activity Pest Control in Municipalities

The addition of 3 new personnel will be necessary in order to increase the level of service particularly as it pertains to field evaluation of control programs. The anticipated sharp increase in the work load due to the increased severity of Dutch elm disease will take up a large share of time provided by the additional personnel. The change in level of service will come through additional surveillance of all aspects of the various kinds of control programs plus additional general survey work. This would include field surveys to determine bark beetle populations and distribution, incidence of disease in rural areas, identification of specific problem areas, checking on effectiveness of chemical controls, investigating diseased wood disposal and associated hazards and other similar kinds of investigations.

The additional personnel to be hired should be well grounded in the biological sciences and should have degrees in either entomology or plant pathology. It would be desirable that these people have a major in one specialty and a minor in the other. Because of the entomological problem associated with Dutch elm disease at least one person should be an entomologist. This individual could also function in the area of mosquito control.

Date Prepared 11/14/72Approved by (Name & Title) Robert Flaskerd, DirectorPrepared by (Activity Author) J. R. Sandve

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Activity Title Pest Control in MunicipalitiesAgency Agriculture

BIENNIAL PROGRAM BUDGET - ACTIVITY ANALYSIS SUMMARY
ACTIVITY ANALYTIC STATEMENT

(For further detail see pages 284- , "Activity Detail")

Activity Pest Control in Municipalities

Minnesota Statutes, Chapter 18.022 says that "when recommended to do so by the commissioner of agriculture the governing body of any county, village, borough or town of this state is hereby authorized and empowered to appropriate money for the control of insect pests, plant diseases, bee diseases or destructive or nuisance animals. Such money shall be expended according to technical and expert opinions as shall be designated by the commissioner of agriculture and the work shall be carried on under the direction of the commissioner."

Minnesota has 854 incorporated cities and villages. To date approximately 135 of these have had at least one case of Dutch elm disease within their corporate limits. Twenty-five of these 135 had their first case during the 1972 season. It is estimated that at least half of the 854 cities and villages have sufficient numbers of elm so that Dutch elm disease will have serious financial and aesthetic impacts. The above figures provide some insight as to how serious the problem will be in the future. This is especially true considering that we are just now getting into the period when we can expect that tree losses will mount rapidly and that losses will continue until most of our elms are gone.

In order to reduce the disruption of the environment, lessen the aesthetic impact and reduce the financial burden to cities and villages and ultimately to society, it is essential that the Department of Agriculture be staffed to provide the technical expertise and coordination necessary.

Activity Title Pest Control in Municipalities

Program Development and Protection of Agricultural Res.

Agency Agriculture

BIENNIAL PROGRAM BUDGET - ACTIVITY ANALYSIS SUMMARY

ACTIVITY: Pest Control In Municipalities

ACTIVITY RESOURCES SUMMARY
(For further detail see pages 281-282, "Activity Detail")

Fiscal Summary For A Change Increase Decrease
 Maintenance Objective: Change due to work load Decrease and/or Service Decrease

EXPENSE CATEGORY	ACTUAL					AGENCY REQUEST								GOVERNOR'S RECOMMENDATION			LEGISLATIVE APPROPRIATION				
	ACTUAL		ESTIMATED			Maintenance		Change		Total		Maintenance		Change		Total		F.Y. 74		F.Y. 75	
	F.Y. 71	F.Y. 72	%	F.Y. 73	%	F.Y. 74	F.Y. 74	F.Y. 74	%	F.Y. 75	F.Y. 75	F.Y. 75	%	F.Y. 74	%	F.Y. 75	%	F.Y. 74	F.Y. 75		
Personal Services	21,166	22,877	8	26,269	15	35,792	28,569	64,361	145	35,792	28,569	64,361	26,269	(59)	26,269	(59)					
Expense & Contractual Serv.	1,860	2,000	8	2,100	5	7,384	8,000	15,384	632	7,579	8,000	15,579	4,715	(69)	4,715	(70)					
Supplies & Materials	125	215	72	215	0	300		300	40	325		325	300	0	300	(8)					
Capital Outlays - Equipment							510	510								466					
Capital Outlays - Real Property																					
Debt Service																					
Claims, Grants & Shared - Revenues																					
TOTAL	23,151	25,092	8	28,584	14	43,476	37,079	80,555	181	43,696	36,569	80,265	31,284	(61)	31,750	(60)					

SOURCE OF FUNDS	10 State General		10 Required Gen Fund Match		40 Federal		20 Restricted		80 Agency		80 Revolving		TOTAL			
	F.Y. 71	F.Y. 72	%	F.Y. 73	%	F.Y. 74	F.Y. 74	F.Y. 74	%	F.Y. 75	F.Y. 75	F.Y. 75	%	F.Y. 74	F.Y. 75	
10 State General	23,151	25,092	8	28,584	14	43,476	37,079	80,555	181	43,696	36,569	80,265	31,284	(61)	31,750	(60)
10 Required Gen Fund Match																
40 Federal																
20 Restricted																
80 Agency																
80 Revolving																
TOTAL	23,151	25,092	8	28,584	14	43,476	37,079	80,555	181	43,696	36,569	80,265	31,284	(61)	31,750	(60)

PERSONNEL	F.Y. 71			F.Y. 72			F.Y. 73			F.Y. 74				F.Y. 75				F.Y. 74		F.Y. 75					
	No.	Cost	%	No.	Cost	%	No.	Cost	%	M No.	C No.	Maintenance Cost	Change Cost	Total Cost	%	M No.	C No.	Maintenance Cost	Change Cost	Total Cost	%	Cost	%	Cost	%
	Management																								
Professional	1.5	17,153		1.5	18,241	6	1.5	19,783	8	2.5	3	29,306	28,569	57,875	48	2.5	3	29,306	28,569	57,875		19,783	(66)	19,783	(66)
Clerical			.25	500		.25	1,341	168	.25			1,341		1,341	0	.25		1,341		1,341		1,341	0	1,341	0
Service	.5	4,013		.5	4,136	3	.75	5,145	24	.75		5,145		5,145	0	.75		5,145		5,145		5,145	0	5,145	0
TOTAL	2	21,166		2.25	22,877	8	2.5	26,269	15	3.5	3	35,792	28,569	64,361	36	3.5	3	35,792	28,569	64,361		26,269	(59)	26,269	(59)

ACTIVITY TITLE: Pest Control in Municipalities PROGRAM: Development & Protection of Agricultural Resources AGENCY: Agriculture

BIENNIAL PROGRAM BUDGET - ACTIVITY ANALYSIS SUMMARY
ACTIVITY ANALYTIC STATEMENT

(For further detail see pages 284- , "Activity Detail")

Activity Pest Control in Municipalities

Minnesota Statutes, Chapter 18.022 says that "When recommended to do so by the commissioner of agriculture the governing body of any county, village, borough or town of this state is hereby authorized and empowered to appropriate money for the control of insect pests, plant diseases, bee diseases or destructive or nuisance animals. Such money shall be expended according to technical and expert opinions, as shall be designated by the commissioner of agriculture and the work shall be carried on under the direction of the commissioner."

Minnesota has 854 incorporated cities and villages. To date approximately 135 of these have had at least one case of Dutch elm disease within their corporate limits. Twenty-five of these 135 had their first case during the 1972 season. It is estimated that at least half of the 854 cities and villages have sufficient numbers of elm so that Dutch elm disease will have serious financial and aesthetic impacts. The above figures provide some insight as to how serious the problem will be in the future. This is especially true considering that we are just now getting into the period when we can expect that tree losses will mount rapidly and that losses will continue until most of our elms are gone.

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Activity Title Pest Control in Municipalities

Program Development and Protection of Agricultural Res.

Agency Agriculture

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PROPOSED PROGRAM BUDGET

Detailed Estimates

1975 - 1977

DEPARTMENT OF AGRICULTURE

....

Presented By

GOVERNOR WENDELL R. ANDERSON

To The

Sixty-Ninth Legislature



January 1975 Saint Paul, Minnesota

PROGRAM BUDGET - ACTIVITY ANALYSIS SUMMARY
STATEMENT OF
RECOMMENDED BIENNIAL PLANNING OBJECTIVE(S), OUTPUT AND IMPACT MEASURES

ACTIVITY: Pest Control in Municipalities
 ACTIVITY NO. 0-5/0-9/0-3/0-7/0-2-7
 Plant, Pest, Pesticide & Economic
 SUBPROGRAM: Poisons Control
 PROGRAM: Development & Protection of
 Agricultural Resources
 AGENCY: Agriculture
 DIVISION:

AGENCY RECOMMENDS AN OVERALL SAME LEVEL OF EFFORT
 CHANGE LEVEL OF EFFORT

THIS ACTIVITY

ALTERNATIVE { OBJECTIVE(S) (RESULTS)
 WAYS/METHODS OF ACHIEVING
 THE OBJECTIVE(S)
 LEVELS OF EFFORT } WERE
 CONSIDERED
 FOR THIS
 ACTIVITY

DOES DOES NOT GENERATE REVENUE
 DOES DOES NOT INCLUDE FEDERAL FUNDS
 DOES DOES NOT INCLUDE DEDICATED FUNDS
 DOES DOES NOT REQUIRE LEGAL CHANGE

RECOMMENDED BIENNIAL PLANNING OBJECTIVES

To provide technical assistance and approval for pest control programs such as mosquito control, animal control, Dutch elm disease, and oak wilt conducted by Minnesota municipalities to insure that these programs will be carried on in a safe and proper manner and in accordance with Minnesota Statutes and rules and regulations pertaining thereto through June 30, 1977 at a cost not to exceed \$187,533.

Same

INDICATE WHETHER ANNUAL OR BIENNIAL ESTIMATED MEASURES

ESTIMATED F.Y. 76-77 OUTPUT MEASURES

1. Provided tree disease diagnostic laboratory services to all Minnesota municipalities.
2. Notified 207 out-state municipalities with Dutch elm disease that control programs were required in accordance with Chapter 18.022, subdivision 7.
3. Participated in the planning and presentation of three out-state training programs on Dutch elm disease control in cooperation with the University of Minnesota.
4. Participated in the Metropolitan Inter-County Council ad hoc committee to study the Dutch elm disease and oak wilt situation and to make legislative recommendations.
5. All 159 metropolitan municipalities were notified concerning the requirements of the new Shade Tree Disease law.

ESTIMATED F.Y. 76-77 IMPACT MEASURES

1. Approximately 200 municipalities and 100 rural locations submitted 4,116 tree samples in 1973 and 5,876 samples in 1974; of these 2,545 were positive in 1973 and 3,166 in 1974.
2. One hundred and sixty-three out-state communities have adopted approved control programs.
3. One hundred and twenty representatives from out-state communities received training in Dutch elm disease control and thus will be better able to carry on adequate programs of control.
4. The report of Metropolitan Inter-County Council outlined the Dutch elm disease and oak wilt situation and presented to legislature specific recommendations which eventually resulted in the Metropolitan Shade Tree Disease law.
5. Municipal councils began taking steps to organize Dutch elm disease and oak wilt control programs and appoint tree inspectors as required by law.

PROGRAM BUDGET - ACTIVITY ANALYSIS SUMMARY

STATEMENT OF
RECOMMENDED BIENNIAL PLANNING OBJECTIVE(S), OUTPUT AND IMPACT MEASURES

RECOMMENDED BIENNIAL PLANNING OBJECTIVES	Indicate Whether Annual or Biennial Estimated Measures	
Same	<p>6. Appointed 15 member Shade Tree Disease Advisory Board to assist in development of rules and regulations to implement Shade Tree Disease law.</p> <p>7. Public hearing held on the adoption of rules and regulations pursuant to the Shade Tree Disease law.</p> <p>8. Participated in the planning and presentation of two two-day training courses for metropolitan tree inspectors in cooperation with the University of Minnesota.</p> <p>9. Prepared certification examination for metropolitan tree inspectors.</p> <p>10. Prepared guidelines concerning approved practices in the use of certain chemical treatments and wood removal and disposal as required in the rules and regulations.</p> <p>11. Preliminary compliance survey made in metro area - contacted 159 municipalities.</p>	<p>6. Representatives of communities, agencies and individuals directly affected by the law were given an opportunity to provide input into development of the rules and regulations.</p> <p>7. The hearing was open to general public and any agency or community that might object or suggest deletion or additions. The rules and regulations outline the tree disease control programs which each community must follow. This includes appointment of qualified tree inspectors.</p> <p>8. One hundred and forty-three inspectors representing approximately 130 metropolitan municipalities received training in legal aspects of the law and the rules and regulations, tree identification, control methods, sampling methods, and other technical program information. This training will enable local tree inspectors to organize and carry out shade tree disease programs and meet the certification standards required by the law and the rules and regulations.</p> <p>9. As of this writing municipal tree inspectors are scheduled to take certification examinations.</p> <p>10. Each municipality (159) and every metropolitan tree inspector was provided with detailed guidance on tree removal and disposal and certain chemical usages.</p> <p>11. This activity provided initial guidance to local officials to start and improve local municipal shade tree disease control programs this year.</p>

PROGRAM BUDGET - ACTIVITY ANALYSIS SUMMARY

ACTIVITY RESOURCES SUMMARY

ACTIVITY: Pest Control in Municipalities

(For Further Detail See Pages 329-334 "Activity Detailed Descriptive Analysis")

EXPENSE CATEGORY	ACTUAL												ESTIMATED												AGENCY REQUEST												GOVERNOR'S RECOMMENDATION				LEGISLATIVE APPROPRIATION	
	F.Y. 72			F.Y. 73			F.Y. 74			F.Y. 75			F.Y. 76			F.Y. 77			F.Y. 76			F.Y. 77			F.Y. 76		F.Y. 77															
	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	%	Cost	%															
Personnel Services	22,877	91.2	26,906	92.7	27.6	45,197	83.0	68.0	76,598	84.2	89.2	76,598	82.6	76,598	80.6	76,598	80.6	76,598	82.6	76,598	80.6	76,598	80.6	76,598	80.6	76,598	80.6	76,598	80.6	76,598	80.6											
Expense & Contractual Serv.	2,000	7.9	1,871	6.5	6.5	8,721	16.0	366.1	13,569	15.0	55.6	15,374	16.6	13.3	17,463	18.4	13.6	15,374	16.6	13.3	17,463	18.4	13.6	15,374	16.6	13.3	17,463	18.4	13.6	15,374	16.6	13.3										
Supplies & Materials	215	.9	241	.8	2.1	539	1.0	23.7	500	.5	7.2	500	.6	500	500	1,000	1.0	500	.6	500	500	500	1,000	1.0	500	.6	500	500	1,000	1.0	500											
Capital Outlays																																										
Equipment																																										
Real Property																																										
Debt Service																																										
Claims, Grants & Shared Revenues																																										
TOTAL	25,092	100.0	29,018	100.0	15.6	54,457	100.0	87.7	90,667	100.0	66.3	92,472	100.0	2.0	94,561	500	95,061	100.0	2.8	92,472	-	93,388	1.8	92,472	-	93,388	1.8	92,472	-	93,388	1.8											

SOURCE OF FUNDS	ACTUAL												ESTIMATED												AGENCY REQUEST												GOVERNOR'S RECOMMENDATION				LEGISLATIVE APPROPRIATION	
	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	No.	%	Cost	%	Cost	%															
10 State General	25,092	100.0	29,018	100.0	15.6	54,457	100.0	87.7	90,667	100.0	66.3	92,472	100.0	2.0	94,561	500	95,061	100.0	2.8	92,472	-	93,388	1.8	92,472	-	93,388	1.8	92,472	-	93,388	1.8											
10 Required Gen Fund Match																																										
30 Federal																																										
20 Restricted																																										
80 Agency																																										
90 Revolving																																										
TOTAL	25,092	100.0	29,018	100.0	15.6	54,457	100.0	87.7	90,667	100.0	66.3	92,472	100.0	2.0	94,561	500	95,061	100.0	2.8	92,472	-	93,388	1.8	92,472	-	93,388	1.8	92,472	-	93,388	1.8											

PERSONNEL	F.Y. 72				F.Y. 73				F.Y. 74				F.Y. 75				F.Y. 76				F.Y. 77										
	No.	%	Cost	% Cost	No.	%	Cost	% Cost	No.	%	Cost	% Cost	No.	%	Cost	% Cost	S No.	C No.	Some Cost	Change Cost	Total Cost	% Cost	S No.	C No.	Some Cost	Change Cost	Total Cost	% Cost			
Management																															
Professional	1,566	7.7	18,241	62.9	1,556	7.7	21,444	73.9	38,663	85.7	75,886	84.8	69,191	77.3	69,191	77.3					69,191	77.3			69,191	77.3	69,191	77.3	69,191	77.3	
Clerical	25	0.1	900	3.1	25	0.1	592	2.0	6,534	14.8	11,011	12.2	7,407	8.2	7,407	8.2					7,407	8.2			7,407	8.2	7,407	8.2	7,407	8.2	
Service	22	0.1	4,136	14.2	22	0.1	4,870	16.8																							
TOTAL	1,613	6.5	22,877	78.8	1,603	6.5	26,906	93.1	45,197	100.0	87.7	100.0	76,598	84.8	76,598	84.8					76,598	84.8			76,598	84.8	76,598	84.8	76,598	84.8	

F.Y. 76		F.Y. 77		F.Y. 76		F.Y. 77	
Cost	%	Cost	%	Cost	%	Cost	%
69,191	77.3	69,191	77.3	69,191	77.3	69,191	77.3
7,407	8.2	7,407	8.2	7,407	8.2	7,407	8.2
76,598	84.8	76,598	84.8	76,598	84.8	76,598	84.8

ACTIVITY TITLE Pest Control in Municipalities

AGENCY Agriculture

PROGRAM BUDGET - ACTIVITY ANALYSIS SUMMARY
ACTIVITY ANALYTIC STATEMENT

(For further detail see pages 329-334 -- "Activity Detailed Descriptive Analysis")

Activity Pest Control in Municipalities

Dutch elm disease is probably the most serious pest problem ever faced by Minnesota municipalities. It is the kind of problem that inevitably will impose a financial burden on a very large proportion of our cities, large or small. The table below illustrates how the disease has spread since it was first found in 1961.

<u>Year</u>	<u>Positive Cases</u>	<u>Occurrence by County</u>	<u>Communities with Confirmed Cases</u>
1962	2	2	2
1967	136	17	24
1971	1168	52	191
1974	3166	63	335*

*Includes some rural locations

In addition to the diagnosed cases, there are many thousands of diseased and dead elms in rural areas, in wood lots, and forested areas. A rather sharp increase in the disease occurred in the metropolitan area in 1974. Wilted elm trees were a common sight throughout the area, especially in some of the suburbs. It appears that we may be on the verge of a large scale outbreak that would far exceed the losses that have occurred to date.

Municipalities must act now but unfortunately have very little expertise and need guidance in the development of sound programs. The major emphasis in Dutch elm disease control is on sanitation with the objective of reducing tree losses to a level that is manageable. We cannot eliminate the disease. Money must be spent wisely and not for "quack cures." The Department of Agriculture through its Pest Control in Municipalities activity can provide the guidance and expertise so that maximum benefits are attained. The diagnostic facilities that we provide are essential in enforcement actions that may be necessary on private property. The review and approval of programs is a means of obtaining compliance with certain requirements that are mandated by law. With the prospect that

increasingly large numbers of trees will be affected, it is important that this activity be continued and strengthened.

Summary of Governor's Recommendation:

The Governor concurs with the department's recommended same level of effort to achieve the recommended biennial planning objective. Any other dollar adjustments are decreases in the inflationary calculations only.

Activity Title Pest Control in Municipalities

Program Development & Protection of Agricultural Resources Agency Agriculture

PROGRAM BUDGET - ACTIVITY DETAILED DESCRIPTIVE ANALYSIS
DESCRIPTION OF CURRENT OPERATIONS

Activity Pest Control in MunicipalitiesActivity No. 0 5 / 0 9 / 0 3 / 0 7 / 0 1 7

Headquarters: Division of Plant Industry
 670 State Office Bldg.
 St. Paul, MN 55155

Each municipality is required to submit in writing details of a proposed control project before such work is done. Application forms are provided for this purpose and supplemental information is often obtained through correspondence or by phone. The proposal is examined and approved if it meets all the technical standards, such as proper chemicals, correct dosage, proper timing, provision for safety measures and evaluation of effectiveness.

In the case of Dutch elm disease, the Commissioner has specific statutory authority to require control programs statewide for all municipalities with the disease. In the seven-county metropolitan area special legislation requires every municipality to have Dutch elm and oak wilt disease control programs with certified tree inspectors in charge. For both statewide and metropolitan control programs, the Department has adopted certain minimum standards that are applied in the program reviews indicated above. All evaluation, approval and diagnostic laboratory work is done in the State Office Building, headquarter of the Department.

A diagnostic laboratory for Dutch elm disease and oak wilt is maintained by the Department to process samples submitted by municipal authorities. Municipalities are notified of positive cases and it becomes mandatory to remove and dispose of diseased trees in accordance with certain prescribed methods. Laboratory records are kept of all diagnoses. Municipalities maintain records of positive cases and tree removals and report back to the Department.

Some of the means by which the program aspects of this activity are carried on include:

1. Holding meetings with municipal councils and interested citizens to inform them regarding current pest problems and means of control. Such meetings are sometimes held jointly with University personnel.
2. Working with responsible officials in training sessions so that they can become better qualified to deal with their own municipal problems.
3. Making pest surveys to evaluate problems and make recommendations.
4. Providing a diagnostic service for municipal pest samples submitted. The University also maintains a diagnostic service but more generally for the general public and other Extension personnel such as county agents.
5. Disseminating information through radio, news releases, and special newsletters regarding all types of pest control including those that may be of specific municipal concern.

Some of the education aspects of this activity are carried on jointly with the University of Minnesota Agricultural Extension Service. For example, the University published various informational bulletins and fact sheets that pertain to life history and control of Dutch elm disease, oak wilt, shade tree pests and mosquito control. The Department of Agriculture publishes weekly and annual summaries of the outlook and current status of various pests, regulatory requirements and similar information.

Date Prepared October 1, 1974 Prepared By (Activity Manager) J. R. Sandve Approved By (Name and Title) Robert Flaskard, Director

Page 1 of 2 Pages Activity Title Pest Control in Municipalities Agency Agriculture

PROGRAM BUDGET - ACTIVITY DETAILED DESCRIPTIVE ANALYSIS
CLIENTELE NEEDS
CHARACTERISTICS, NUMBER, LOCATION, BENEFITS, FUTURE

Activity Pest Control in Municipalities

The clientele are the municipal and other governmental unit officials who have the responsibility for carrying on municipal pest control programs, such as in Dutch elm disease, shade tree insects and diseases, mosquito control, rodent control, bird control, and other pest problems that may require control at the local level. In the smaller cities, the responsibility for pest control may fall to the street superintendent, police chief, city clerk, or some other city employee. In the larger municipalities, there may be park superintendents, foresters, or other persons who may have some training in pest control.

The responsible officials in smaller cities in general are poorly qualified to make decisions in regard to proper chemicals, dosage rates, proper timing, proper equipment, hazards involved, evaluation of effectiveness and many other aspects of pest control. The services provided by this activity help the municipal official in decision-making both as to actual need for treatment and the most effective and safest method of accomplishing their objectives.

According to 1974 records, Dutch elm disease has now been found in approximately 300 communities and in 63 counties. Thirty-three municipalities had their first diagnosed case in 1974. Because of increased incidence of Dutch elm disease it is anticipated that the work load will increase substantially in the near future.

In past years, the number of samples submitted and the number of positive cases has about doubled each year. This rate of increase can be expected to become even greater especially in the municipalities in the southern two-thirds of the state. In addition, the decision has been made that every municipality with Dutch elm disease must have a program of control as stipulated by the Department. Municipalities must submit programs for review and approval by the Department. Also, compliance

with state requirements must be checked in the field. All of the above activities related to required programs will substantially increase the work load.

The 1974 legislature passed a metropolitan Dutch elm and oak wilt disease law which substantially increased the number and type of clientele served by the Department. Approximately 159 municipalities were affected. The training, examination, and certification of tree inspectors; the adoption and enforcement of special rules and regulations; the addition of oak wilt as a regulated pest; the responsibilities for programs of continuing education for tree inspectors and the gathering of data and submission of reports to the legislature all were added tasks which required increases in personnel at the professional, technician and clerical level.

Since more and more cities inevitably will be confronted with Dutch elm disease, this means that the Department of Agriculture must be prepared to provide additional review and approval services as well as diagnostic facilities. The level of incidence of disease in urban areas has been relatively light to date. Based upon information from other states, sharp increases in infection rates are expected in the near future.

Thirty to forty municipalities have carried on some type of mosquito control - usually a program to kill adult mosquitoes. In the area of mosquito control, it is anticipated the number of municipal programs will increase only slightly or possibly none at all. Unexpected outbreaks or a disease epidemic could change this outlook. The currently recommended insecticides all are of the short residual type; thus it becomes necessary to make repeated applications with each new mosquito hatch. Many municipalities can not bear this additional cost.

Date Prepared October 1, 1974 Prepared By (Activity Manager) J. R. Sandye Approved By (Name and Title) Robert Flaskard, Director

Page 1 of 2 Pages Activity Title Pest Control in Municipalities Agency Agriculture

PROGRAM BUDGET - ACTIVITY DETAILED DESCRIPTIVE ANALYSIS
BIENNIAL PLANNING OBJECTIVE(S)
ALTERNATIVE OBJECTIVE(S) / ALTERNATIVE WAYS - METHODS

Activity Pest Control in Municipalities

Recommended Objective:

To provide technical assistance and approval for pest control programs such as mosquito control, animal control, Dutch elm disease, and oak wilt conducted by Minnesota municipalities to insure that these programs will be carried on in a safe and proper manner and in accordance with Minnesota Statutes and rules and regulations pertaining thereto through June 30, 1977 at a cost not to exceed \$187,533.

Recommended Way / Method:

The activity is performed through reviewal and approval of pest control programs submitted by municipalities, by consultation with municipal officials, by certification of tree inspectors, by establishing minimum standards for control programs, by participation in the planning of short courses and training programs for municipal officials and tree inspectors, by providing a diagnostic laboratory service, and by making pest surveys as necessary.

Alternatives to the above, Reasons for Rejection, Reasons for Not Considering Alternatives:

Alternative Objectives

None were considered because of statutory limitation. (M.S. Chapter 18.022 and 18.023)

Alternative Methods

Municipalities could be left to develop their own programs of pest control without reviewal by the Commissioner. We have rejected this approach because municipalities (except for the largest) do not have trained personnel with the necessary technical expertise. This would result in a great diversity of programs with questionable benefits and would not be in conformity with the intent of the law.

Date Prepared October 1, 1974 Prepared By (Activity Manager) J. R. Sandve Approved By (Name and Title) Robert Flaskerd, Director

Page 1 of 1 Pages Activity Title Pest Control in Municipalities Agency Agriculture

Disright

BUDGET ACTIVITY: SHADE TREE

BUDGET ACTIVITY FISCAL SUMMARY - BIENNIAL BUDGET

11-80

PROGRAM: DEVELOPEPROTECT AG RESOURCE

AGENCY: AGRICULTURE, DEPARTMENT OF

*** DOLLARS IN THOUSANDS (137,522 = 137.5) ***

	ACTUAL F.Y. 1977	ACTUAL F.Y. 1978	ESTIMATED F.Y. 1979	AGENCY REQUEST F.Y. 1980		AGENCY REQUEST F.Y. 1981		GOVERNOR'S RECOMMENDATIONS	
				SAME	CHANGE	TOTAL	SAME	CHANGE	TOTAL	F.Y. 1980	F.Y. 1981
EXPENDITURES									
PERSONAL SERVICES									
-REGULAR CLASSIFIED	24.3	77.2	106.8	177.1		177.1		177.1	177.1
-REGULAR UNCLASSIFIED	21.9	194.0	94.5						
-OVERTIME COSTS	.1	.2							
-PREMIUM PAY									
-PART-TIME/SEAS/OTHER	1.4	4.0	.6	.6		.6		.6	.6
TOTAL PERSONAL SVCS.	47.7	275.4	191.9	177.7		177.7		177.7	177.7
EXPENSES & CONTR. SVCS.	16.2	198.3	118.2	131.3		131.3		131.3	131.3
SUPPLIES & MATERIALS	.8	18.7	6.5	6.3		6.3		6.3	6.3
EQUIPMENT		15.4	3.0	1.5		1.5		1.5	1.5
REAL PROPERTY									
DEBT SERVICE									
CLAIMS, GRANTS, ETC.	1,340.3	22,096.7	4,886.3	13,500.0		13,500.0		13,500.0	13,500.0
OTHER EXPENSE ITEMS									
TOTAL EXPENDITURE	1,405.0	22,604.5	5,205.9	13,816.8		13,816.8		13,816.8	13,816.8
FINANCING									
DIRECT APPROPRIATIONS:									
GENERAL FUND	1,394.0	22,420.7	5,193.0	13,816.8		13,816.8		13,816.8	13,816.8
OTHER DIRECT APPROP.									
DEDICATED APPROPRIATIONS									
SPECIAL REVENUE									
AGENCY FUNDS		.1	.2						
REVOLVING FUNDS									
OTHER									
FEDERAL FUNDS	21.0	143.7	12.7						
TOTAL FINANCING	1,405.0	22,604.5	5,205.9	13,816.8		13,816.8		13,816.8	13,816.8
POSITIONS									
REGULAR POSITIONS - FUND									
GENERAL FUND	4.5	5.0	11.1	3.0	0.0	11.0	3.0	0.0	11.0
OTHER DIRECT APPROP.									
SPECIAL REVENUE									
AGENCY FUNDS									
REVOLVING FUNDS									
OTHER									
FEDERAL FUNDS	71.0	28.0	1.0						
TOTAL POSITIONS	75.5	37.0	12.1	3.0	0.0	11.0	3.0	0.0	11.0

CETA, ARPA

CETA, ARPA

Reg. Dis.

JOB/STEP: FINB2002/STEP85

BUDGET ACTIVITY FISCAL SUMMARY - BIENNIAL BUDGET
 TRANSACTIONS THRU 11/10/80
 PROGRAM: ADMIN-FINANCIAL AIDS SVC

PAGE 705 DEST-D
 RUN-DATE: 11/14/80
 AGENCY: AGRICULTURE, DEPARTMENT OF

AC/REG RANGE = 600-999 FUND RANGE = 10-99 KDB = 123700 *** DOLLARS IN THOUSANDS (137,822 = 137.8) ***

SOURCE OF EXPENDITURES AND REQUEST	ACTUAL			F.Y. 1982 REQUEST LEVELS			F.Y. 1983 REQUEST LEVELS			GOVERNOR'S RECOMMENDATIONS	
	F.Y. 1979	F.Y. 1980	F.Y. 1981	SAME	CHANGE	TOTAL	SAME	CHANGE	TOTAL	F.Y. 1982	F.Y. 1983
EXPENDITURES											
PERSONAL SERVICES											
-REGULAR CLASSIFIED	110.4	170.5	209.4	209.2		209.2	209.2		209.2		
-REGULAR UNCLASSIFIED	59.0	5.4	17.3	17.3		17.3	17.3		17.3		
-PART-TIME/SEAS./OTHER	6.4	5.1									
-PREMIUM PAY											
-OVERTIME PAY	.4	.5									
-MISCELLANEOUS PAYROLL											
-OTHER BENEFITS	.4		.4	.4		.4	.4		.4		
TOTAL PERSONAL SERVICES	186.6	281.5	227.1	227.1		227.1	227.1		227.1		
EXPENSES & CONTRACTUAL SERVICES	86.0	115.0	172.4	172.4		172.4	172.4		172.4		
SUPPLIES & MATERIALS	5.2	4.4	5.2	5.2		5.2	5.2		5.2		
EQUIPMENT	11.4	7.8	1.8	1.8		1.8	1.8		1.8		
REAL PROPERTY											
POST SERVICE											
TRAVEL, GRANT, ETC.	2,448.2	11,011.6	20,093.2	11,000.0		11,000.0	11,000.0		11,000.0		
OTHER EXPENSE ITEMS											
TOTAL EXPENDITURES	2,740.4	11,323.0	20,498.9	11,300.0		11,300.0	11,300.0		11,300.0		
SOURCES OF FINANCING											
DIRECT APPROPRIATIONS:											
GENERAL FUND	2,742.3	11,309.7	20,470.1	11,342.2		11,342.2	11,370.2		11,370.2		
DEDICATED APPROPRIATIONS:											
GIFTS AND DEPOSITS	9.2										
FEDERAL	17.0	13.3	17.0	17.0		17.0	17.0		17.0		
TOTAL FINANCING	2,768.5	11,323.0	20,487.1	11,366.2		11,366.2	11,394.2		11,394.2		
POSITIONS BY FUND											
GENERAL FUND	11.0	11.0	11.0	11.0		11.0	11.0		11.0		
FEDERAL	1.0	1.0	1.0	1.0		1.0	1.0		1.0		
TOTAL POSITIONS	12.0	12.0	12.0	12.0		12.0	12.0		12.0		

Dwight

ACTIVITY: SHADE TREE
Program: ADMINISTRATION AND FINANCIAL AIDS SERVICE
Agency: AGRICULTURE, DEPARTMENT OF

1981-83 Biennial Budget

ACTIVITY DESCRIPTION:

This activity exists to monitor and regulate the shade tree disease control and reforestation programs of cities, counties and townships statewide; to administer a grant-in-aid program relating to shade tree disease control; and to inform all Minnesotans of the nature and causes of shade tree diseases and recommended courses of action.

ACTIVITY OBJECTIVES:

1. To control the spread of shade tree diseases so sanitation costs can be spread over the next 10-15 years, allowing adequate time for replacement by newly planted trees.
2. To provide financial assistance to eligible program participants so that diseased trees continue to be removed and new trees planted.
3. To provide informational and educational materials and programs to all Minnesotans.
4. To provide financial assistance to encourage wood utilization programs and experimental research.

ACCOMPLISHMENTS AND PERFORMANCE INDICATORS:

After the catastrophic year of 1977 when disease control areas of the state lost 250,767 urban elm and oak trees, losses continued to decline from 180,648 in 1978 to 127,947 in 1979 and an estimated 100,000 in 1980. At the same time, the number of trees planted in control areas continued to increase from 74,949 in 1977 to 102,961 in 1978 to 111,483 in 1979 and an estimated 124,000 in 1980.

Objective No.	C.Y. 1979 Actual	C.Y. 1980 Actual	Estimated C.Y. 1981	Obj./Est. C.Y. 1982	Obj./Est. C.Y. 1983	
1	Number of trees removed:					
	Metropolitan area	93,999	70,000	60,000	45,000	40,000
	Non-metropolitan area	33,948	30,000	32,000	35,000	40,000
1	Number of trees planted:					
	Metropolitan area	66,102	70,000	74,000	82,000	85,000
	Non-metropolitan area	45,381	54,000	65,000	70,000	80,000
2	Total sanitation costs (state and local money-in thousands)					
	Metropolitan area	\$ 14,606	\$ 16,300	\$ 14,500	\$ 13,200	\$ 12,400
	Non-metropolitan area	\$ 4,168	\$ 4,500	\$ 4,800	\$ 6,750	\$ 6,000

ACTIVITY GENERATES NON-DEDICATED REVENUE	ACTUAL F.Y. 1979	ACTUAL F.Y. 1980	ESTIMATE F.Y. 1981	ESTIMATE F.Y. 1982	ESTIMATE F.Y. 1983
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	-0-	-0-	-0-	-0-	-0-

Objective No.	C.Y. 1979 Actual	C.Y. 1980 Actual	Estimated C.Y. 1981	Obj./Est. C.Y. 1982	Obj./Est. C.Y. 1983	
2	Total reforestation costs (state and local money-in thousands)					
	Metropolitan area	\$ 3,655	\$ 2,800	\$ 2,960	\$ 3,280	\$ 3,400
	Non-metropolitan area	\$ 807	\$ 2,160	\$ 2,600	\$ 2,800	\$ 3,200
2.4	Number of grants:					
	Sanitation/Reforestation	462	472	500	500	520
	Wood Utilization	14	23	23	20	16
	Experimental	10	18	24	20	18
3	Information/educational programs (radio, T.V., and other)					
		70	75	75	75	75
3	Arbor Month activities					
	Trees planted	200,000	200,000	200,000	200,000	200,000
	Local celebrations	180	200	220	220	220
	Kits mailed	5,000	6,000	6,000	6,000	6,000

ALTERNATIVES/MAJOR ISSUES:

1. In addition to those communities where it is already established, Dutch elm disease is now becoming more common in northern and western Minnesota communities. Smaller rural cities need added technical assistance.
2. Greater emphasis needs to be placed on careful designation of control areas, especially where large populations of elms are adjacent or within municipalities.

EXPLANATION OF BUDGET REQUEST:

SAFE - Allows for a level of state support which permits continued successful management of the state's shade tree disease problem.

GOVERNOR'S RECOMMENDATION:

EXHIBIT A
MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
METRO PAYMENTS AS OF DECEMBER 31, 1980
LAWS OF MINNESOTA FOR 1977, CHAPTER 90

<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Afton	\$ 1,124.80	\$	\$	\$
Andover	423.68			
Anoka City	14,346.80	17,092.27	1,984.58	420.00
Anoka County	92,695.88	126,880.68	4,934.00	10,907.42
Apple Valley	9,317.50	16,938.73		
Arden Hills	2,437.92	8,017.64	750.50	1,057.44
Bayport	6,766.39	9,539.87	875.00	
Baytown Township	313.08			
Belle Plaine	5,632.55	5,678.24	1,250.00	3,225.88
Birchwood	3,057.73	1,413.53	187.50	85.44
Blaine	6,311.34	4,535.04	2,000.00	
Bloomington	102,558.56	105,459.91		3,760.00
Brooklyn Center	22,000.39	26,151.92	1,260.00	3,800.00
Brooklyn Park	35,017.84	25,434.78	6,373.61	7,452.19
Burnsville	56,608.33	47,869.59	30,558.37	32,959.72
Carver City	82.68	3,263.45		
Carver County	5,309.66	2,731.99	2,255.35	
Centerville	2,620.31	1,575.69		
Champlin	6,526.80	9,286.50		92.11
Chanhassen	12,644.20	14,037.32	274.56	160.00
Chaska	9,028.92	8,252.01	1,600.00	280.00
Circle Pines	3,438.78	3,273.83	750.00	266.11
Columbia Heights	19,447.26	14,603.17	4,000.00	3,360.00
Coon Rapids	41,014.90	40,236.63	889.86	902.18
Cottage Grove	13,839.99	9,328.44	2,893.87	2,841.86
Crystal	42,691.97	29,325.03		130.00
Dakota County	16,263.10		8,065.93	
Dayton	503.99	500.31		
Deephaven	18,390.01	20,616.04	117.68	
Dellwood	446.31	555.52		
Eagan	3,002.62	5,927.51		
Eden Prairie	73,660.02	34,219.13	10,050.00	2,337.93
Edina	25,504.00		4,623.05	
Excelsior	4,616.00	2,633.68	626.39	460.34
Falcon Heights	21,690.34	9,018.63	546.20	377.02
Farmington	4,781.95	7,151.73	307.16	181.46
Forest Lake	1,651.31	1,126.86	2,401.13	1,087.56
Fridley	30,049.48	25,302.23	6,464.25	11,227.19
Gem Lake	1,731.52	4,458.30		
Golden Valley	24,054.42	32,448.87	2,000.00	629.28
Grant Township	946.28	1,614.45		
Greenfield	779.09			

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<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Greenwood	\$ 3,290.99	\$ 226.92	\$ 2,037.60	\$ 1,200.00
Ham Lake	187.76			
Hamburg	183.10	367.84		
Hampton	141.00	186.20		
Hanover	52.72		720.00	
Hassan Township	551.70	84.60		
Hastings	7,901.25	16,509.09	1,000.00	
Hennepin County	127,466.23	74,047.40	21,061.89	97,654.19
Hennepin County	86,822.01	40,730.22	5,720.00	6,275.22
Hilltop	273.43		348.00	
Hopkins	32,595.45	29,918.46	5,000.00	10,320.00
Hugo	1,170.94	986.52		
Independence	364.42			
Inver Grove Heights	9,287.00	2,369.55		
Jordan	3,938.37	1,645.73	685.80	461.23
Lake St. Croix Beach	862.55	2,468.67		770.76
Lakeland	211.83	61.45	98.40	
Lakeland Shores	1,369.09	42.18		
Lakeville	9,948.11	10,168.36	545.80	988.52
Lauderdale	1,070.33	989.73		
Lexington	1,188.48			
Lilydale	539.89	1,960.00		
Lino Lakes	1,238.20	1,546.28		
Little Canada	15,644.16	11,689.17	1,578.75	3,275.96
Long Lake	439.27	478.92		
Mahtomedi	14,858.66	1,078.04		
Maple Grove	25,364.44	27,129.52	5,092.29	4,822.90
Maple Plain	287.18			
Maplewood	74,928.05	42,813.49		
Marine on St. Croix		1,572.76		408.00
Medicine Lake	3,781.32	2,653.03	250.00	
Medina	310.27	672.88		
Mendota	376.32			
Mendota Heights	10,000.00	12,056.97	2,500.00	7,888.24
Minnetonka Beach	1,600.00	8,352.45		880.00
Minnetonka	211,853.71	283,517.45	75.51	3,497.53
Minnetrista	1,910.00			
Mound	5,280.06	7,843.00		
Mounds View	7,376.02	7,314.82	753.17	202.84
Minneapolis	1,965,763.75	3,146,332.80	202,397.33	325,320.00
New Brighton	13,068.02	8,655.77	2,680.00	2,508.14
New Hope	8,610.09	8,224.86	2,868.39	5,200.00

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<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Newport	\$ 9,262.72	\$ 3,640.00	\$	\$
North Oaks		8,700.20		
North St. Paul	15,168.00	12,111.68	8,640.00	7,800.00
Norwood	1,484.88	1,983.54	300.00	260.00
Oak Park Heights	2,982.80	8,258.83	210.00	148.28
Oakdale	7,420.00	6,235.68	383.53	
Orono	3,939.68	6,068.74		
Plymouth	76,372.22	68,655.85	16,480.00	2,800.00
Prior Lake	14,751.39	11,382.90		635.33
Ramsey	2,083.14			
Ramsey County	112,476.60	51,837.77	553.52	
Ramsey County	10,070.11	8,163.90		2,402.83
Richfield	52,995.79	34,633.47		12,720.00
Robbinsdale	30,853.31	25,974.64	7,120.00	5,760.00
Rockford	454.63	96.67		
Rogers	282.44	56.37	153.12	
Rosemount	15,778.03	12,981.85	926.03	1,223.28
Roseville	39,259.47	43,551.97	1,777.29	2,251.01
Savage	4,113.90	776.45		
Scott County	336.46			
Shakopee	12,559.37		940.00	
Shoreview	11,594.67	22,689.05		716.45
Shorewood	7,392.44	12,110.18		
South St. Paul	58,673.14	29,432.44	10,080.00	24,240.00
Spring Lake Park	566.01	973.40	600.00	344.28
St. Anthony	2,275.44	1,059.33	1,400.00	960.00
Spring Park	729.50	603.49		40.00
St. Louis Park	94,490.39	103,039.17	35,675.24	18,760.00
St. Marys Point	1,244.00	1,747.92		
St. Paul	2,592,932.95	2,588,752.16	405,680.00	728,520.00
St. Paul Park	5,506.62	4,092.30	913.29	3,267.20
Stillwater	26,213.50	63,083.04	2,985.58	5,560.46
Stillwater Township	2,652.00	668.42		
Sunfish Lake	3,943.80	1,666.24		
Tonka Bay	9,339.12	4,191.32		
Vadnais Heights	5,352.21	2,027.94	319.25	1,346.82
Victoria	1,431.60	2,379.53		3.12
Washington County	24,659.81	31,185.85	2,306.60	2,295.57
Watertown	836.34	134.70		
Wayzata	14,409.99	24,291.62		807.37
West St. Paul	36,660.40	22,068.92		4,800.00
White Bear Lake	31,690.14	34,071.23	4,140.97	14,480.00

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<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
White Bear Twsp.	\$ 2,000.00	\$ 1,816.44	\$	\$
Willernie	313.80	1,479.31		
Woodbury	6,231.81	4,389.41	1,482.00	540.00
Woodland	5,650.80	11,142.27		
Young America	282.80			
TOTAL	<u>\$6,755,153.09</u>	<u>\$7,705,400.84</u>	<u>\$ 856,518.34</u>	<u>\$1,402,356.66</u>
ADD: Redeposits	<u>\$ 36,409.24</u>	<u>\$ 7,502.99</u>	<u>\$ 6,362.02</u>	<u>\$ 4,703.08</u>
Adjusted Expend.	<u><u>\$6,791,562.33</u></u>	<u><u>\$7,712,903.83</u></u>	<u><u>\$ 862,880.36</u></u>	<u><u>\$1,407,059.74</u></u>
Total Sanitation and Reforestation		<u>\$14,504,466.16</u>		<u>\$ 2,269,940.10</u>

PREPARED BY: Accounting Division
DATE: 12/31/80

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EXHIBIT B
MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
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<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Ada	\$	\$ 123.32	\$	\$ 806.97
Adams	578.64	577.13	140.00	240.00
Adrian	734.07	5,335.25		
Albany	4,622.38	7,292.36	1,050.82	794.30
Albert Lea	34,851.11	39,237.10	9,835.97	6,233.21
Albertville	1,158.74		766.25	
Alden	2,991.15	1,110.71		203.06
Alexandria	5,581.42	3,565.11	516.75	125.41
Amboy	4,053.34	2,516.32		
Annandale	4,873.29	3,060.33	2,092.85	390.81
Appleton	2,408.61	8,761.88		1,057.59
Aitkin		1,619.72		35.20
Arco	433.62	219.93		33.80
Arlington	1,282.11	1,210.57	352.38	270.60
Askov		132.00		
Atwater	483.75	2,124.00	215.31	
Aurora		1,674.23		3,003.24
Austin City	64,546.11	144,126.98	17,381.66	12,154.76
Austin Township	9,288.00			
Avoca		1,024.69	84.16	268.18
Balaton	2,666.93	1,698.30	194.38	
Beaver Creek	3,068.28			
Becker City	8,527.00	2,049.26	1,691.13	
Belgrade	394.80	2,122.88		1,200.00
Bellingham	455.35	153.03		34.72
Belview	1,720.00	4,158.79		482.80
Benson	6,685.18	9,054.13	441.29	210.09
Benton County	248.49			
Big Lake	1,670.63	1,767.06		28.20
Bigelow	1,134.00		1,271.00	
Bingham Lake	952.76	125.10		105.00
Bird Island	2,638.97	2,519.45		
Biscay	180.00		84.00	
Blooming Prairie	4,462.56	3,912.19	351.00	728.64
Bovey	211.96	2,722.50	323.75	248.25
Boyd	1,912.50	1,786.50		459.38
Braham	511.20	1,459.76		
Brainerd		7,465.07		
Brandon	2,475.00		897.50	
Breckenridge	1,757.08	1,659.31		5.80
Brewster	3,047.13	2,764.15		
Bricelyn	526.72	416.25	362.50	

EXHIBIT B
MINNESOTA DEPARTMENT OF AGRICULTURE
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<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Brook Park	\$ 1,041.97	\$	\$	\$
Brooten		211.20		
Brown County	3,273.75			
Brownsdale	2,490.98	2,420.00	396.00	
Brownston	1,094.51	1,249.53	107.03	95.51
Buffalo	4,500.00	4,281.90	716.48	277.62
Buffalo Lake	6,263.44	1,134.45	2,543.45	
Buhl		717.13		
Butterfield	1,518.75	1,991.25	413.65	333.16
Byron	1,104.41	3,514.17		601.88
Caledonia	1,861.25	4,183.64	20.70	105.44
Cambridge	4,275.00	5,358.22		400.00
Canby	5,402.56	6,567.75	623.00	1,263.15
Cannon Falls	4,230.00	6,409.08	428.00	738.00
Canton	3,009.86	5,408.72		
Carlton City	11.83			
Carlton County		193.60		
Cedar Mills	67.50			
Center City	175.50	374.00		
Ceylon	319.95	2,688.49	750.00	
Chatfield	3,657.76	3,407.87	346.50	223.48
Chippewa County	90.00			
Chisago City	3,289.77	5,695.28		
Chisago County	310.05			
Chisholm		4,257.81		
Clara City	1,228.20	2,074.77		916.03
Clarksfield	2,201.79	2,223.68	745.63	462.00
Clarks Grove	292.65			
Clear Lake	83.02			
Clear Water	2,196.09	1,157.51		
Clements	12.16			
Cleveland	1,460.25		682.55	
Clinton	344.88			
Cloquet	14,996.81	19,761.12		617.58
Cobden	1,167.75			
Cokato	450.00		500.00	
Cold Spring	511.65	1,088.69	577.79	
Coleraine		728.06		
Camfrey	4,519.54	2,336.84	600.00	
Conger	117.00		548.62	
Cook City	990.55			
Correll	265.05			

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NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
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<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Cosmos	\$ 405.31	\$ 777.44	\$	\$ 14.84
Cottonwood City	10,072.46	3,332.68		507.63
Cottonwood County	969.74	8,226.70	956.09	969.43
Crookston		768.04		1,100.00
Crosby		439.51		
Currie				
Cyrus	144.45	905.72		
Danube	843.75	858.83	287.00	205.00
Danvers	157.50	329.12	49.50	51.89
Darfur	306.00	228.80		
Dawson	2,905.37	4,143.59		201.78
Delano	1,563.75	2,299.46		
Delavan City	780.75	288.90		
Delhi	542.25			
Dennison	449.82	1,125.00		
Detroit Lakes		960.62		143.68
Dodge Center	3,600.00	5,393.25		247.50
Dover	1,856.43		59.40	
Dovray	667.47	499.50	280.09	
Duluth	67,396.50	93,260.37	4,000.00	6,228.79
Dundas	612.90	1,269.00	37.12	
Dundee	711.00			
Dunnell	601.15	689.48		20.33
Eagle Lake	4,274.99	4,897.35	411.50	
East Grand Forks		3,235.06		5,390.86
Echo	3,150.00	3,911.81		1,112.33
Eden Valley	791.64	1,484.90	812.66	301.68
Edgerton	3,408.17	1,453.03	520.29	1,254.50
Elgin		364.95		
Elk River	3,344.51	3,668.39		10.56
Ellendale	2,960.49			
Ellsworth	1,499.85			60.00
Elmore	6,906.31	2,371.60	426.00	850.26
Elysian	3,034.30	3,398.18	774.18	361.00
Evan	783.00	668.80		
Eveleth		1,565.19		
Eyota	898.74	297.00	242.95	
Fairfax	572.58	1,155.16		
Fairmont	9,073.48	19,507.23		757.26
Faribault City	17,330.60	23,063.04		
Faribault County	3,362.42	5,091.50	1,931.25	
Fergus Falls	13,609.78	14,850.82		478.94

EXHIBIT B
MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
LAWS OF MINNESOTA FOR 1977, CHAPTER 90

<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Fillmore County	\$ 5,961.70	\$	\$ 241.26	\$
Finlayson	47.70	1,012.22		
Floodwood		1,974.56		
Florence	1,186.12			
Foley	1,687.72	2,156.18		900.00
Fountain		508.20		528.00
Franklin	93.29	1,591.45		
Freeborn City	4,765.50	474.75	880.88	821.19
Freeborn County	15,363.94	2,784.50	1,356.81	224.04
Freeport	1,189.18	1,364.33		110.88
Frost	337.54			
Fulda	1,590.22	1,610.73	678.04	518.03
Garvin	87.75	211.28		
Gaylord	3,915.00	3,308.70	625.00	539.00
Geneva	2,695.73			
Ghent	738.02		36.63	
Gibbon	1,530.11			
Gilbert	1,148.11	1,597.20		
Glencoe	4,199.73	9,634.61	978.95	738.86
Glenville	3,143.51		467.00	
Glenwood	1,242.65	2,051.78	750.00	468.20
Good Thunder	6,568.20	670.50		
Goodview	1,472.37	2,090.68		
Grand Rapids	7,056.18	10,094.45		490.36
Granite Falls	3,922.25			
Green Isle	1,170.22	472.01	272.25	
Grove City	395.54	352.38		
Hammond	202.50			
Hanska	3,640.40	1,412.68		357.43
Hardwick	280.33			
Hancock		1,059.35		
Hanley Falls		2,206.24		
Harmony	810.00	198.00	300.00	132.00
Harris	162.45	290.20		
Hartland	606.82			
Hayfield	2,137.50	2,000.35	305.25	104.28
Hayward	1,193.85	226.92	639.73	
Hazel Run	281.25	216.00		
Hector	1,410.75	1,968.08		
Heidelberg	119.25		406.73	
Henderson	1,716.39	1,136.77		
Hendricks	2,216.33	3,100.65	282.03	363.88

EXHIBIT B
MINNESOTA DEPARTMENT OF AGRICULTURE
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NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
LAWS OF MINNESOTA FOR 1977, CHAPTER 90

<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Henriette	\$ 265.05	\$	\$	\$
Heron Lake	4,480.56	6,647.18	415.00	99.95
Hibbing	508.27	671.24		
Hill City		27.32		
Hills City	1,197.00	1,937.75		
Hinckley	562.82	1,049.60		103.06
Hokah	1,762.96	1,369.23		
Holdingford	90.00	1,069.20		
Holland	1,754.67	774.00		326.63
Hollandale	1,326.73		305.17	326.03
Houston	2,790.00	1,682.82	922.78	150.20
Houston County	4,785.21	10,918.61		
Howard Lake	732.27			
Hutchinson	7,191.00	23,504.81	1,861.71	1,228.20
Ihlen	1,666.69		574.37	
International Falls		1,320.00		1,273.08
Iona	543.71			
Isanti	1,623.54		87.12	
Itasca County	630.81			
Ivanhoe	1,694.48	1,644.82	1,375.00	
Jackson City	6,130.90	7,305.87		
Janesville	5,597.88	8,068.54	867.10	1,515.38
Jasper	4,279.50	686.18	568.70	334.40
Jeffers	2,478.60	2,765.84	245.00	225.00
Kandiyohi City	270.00			
Kandiyohi County	2,555.29	2,512.47	551.25	
Kasota	3,337.65	2,700.65	315.00	
Kasson	2,186.71	4,499.10	215.00	1,638.90
Keewatin				538.19
Kenneth	1,331.10	352.00		
Kenyon	2,117.48	2,752.88	600.00	
Kerkhoven	1,329.66	1,420.20		
Kiester	216.00			
Kilkenny	71.45	457.82		
Kingston	22.50			
La Salle	663.75			
Lafayette	690.21	159.50	106.43	126.72
Lake Benton	1,940.24	1,826.42	280.50	370.29
Lake City	6,598.97	3,963.74		
Lake Crystal	8,550.00	7,376.46	588.50	1,823.63
Lake Lillian	240.30	788.48		
Lake Wilson		823.84		

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<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Lakefield	\$ 4,459.59	\$ 16,504.22	\$ 291.00	\$ 360.00
Lamberton	7,938.90	9,180.45	1,411.82	53.42
Lanesboro	1,873.62	2,948.00	1,021.87	
Leroy	3,197.02	2,810.25	397.75	377.92
Le Sueur City	9,184.79	8,625.87	223.53	1,310.68
Le Sueur County	643.61			
Lester Prairie	959.82	2,046.00		320.00
Lewiston	247.61	924.10		
Lewisville	1,667.34		58.74	
Lincoln County	3,442.29	3,101.47		1,098.35
Lindstrom	5,827.05	5,048.10		
Lismore	911.25		183.33	
Litchfield	7,396.80	12,913.05	114.62	317.44
Little Falls	2,115.00	1,643.69	612.30	1,861.30
Littlefork	1,382.45	662.82		371.27
Lonsdale	297.27	1,235.10		
Louisburg	805.50		596.48	
Lucan	475.20	370.13		226.36
Luverne	34,168.74	11,643.20	292.50	8,311.91
Lyle	5,364.20	3,875.60	51.41	
Lyon County	8,272.58	4,257.84		331.16
Madelia	3,198.38	10,789.88	198.00	645.00
Madison	4,500.00	4,315.23		197.67
Madison Lake	7,425.00	8,075.25		159.92
Mankato	146,394.69	150,740.99	20,365.49	23,575.29
Mapleton	8,257.83	7,880.24	1,627.00	1,514.50
Mapleview	4,211.69	1,024.23		
Marietta	1,125.00	591.12		69.76
Marshall	14,300.31	6,948.71	25,067.32	3,140.67
Martin County	450.00	193.78		
Maynard	933.75	1,414.60		107.80
Mc Leod County	2,541.28	6,354.00		1,227.60
Medford	2,332.43			
Melrose	5,086.53	5,010.20		249.38
Milaca	4,641.44	4,584.32	599.90	958.10
Milan	719.13	525.87		19.42
Mille Lacs County		1,525.16		
Millville	414.00	33.75		
Milroy	1,119.05	877.50		150.00
Minneota	9,174.46	4,387.68	1,972.50	2,880.00
Montevideo	29,860.92	27,541.19	3,565.25	7,798.58
Montgomery	2,372.92	3,387.25	396.37	505.50

EXHIBIT B
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NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
LAWS OF MINNESOTA FOR 1977, CHAPTER 90

<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Monticello	\$ 7,593.16	\$ 8,040.29	\$ 877.50	\$ 550.00
Montrose	157.50		264.16	
Moorhead	2,225.33	20,370.27		38.58
Moose Lake	97.33			
Morgan	3,760.47	3,683.88	600.00	456.29
Morristown	1,914.65	324.26		
Morton	569.20			
Morris		1,666.46		
Mountain Lake	6,731.46	6,732.00	48.18	554.62
Mt. Iron		1,562.00		11,000.00
Murdock	1,405.40	1,217.70	1,900.00	166.50
Murray County	250.11	744.21	636.03	81.14
Myrtle	308.25			
Nashwauk		716.40		480.65
Nassau	452.12	426.80		
Nerstrand	1,867.95	2,468.25	29.90	
New London	367.87			
New Prague	900.00	1,978.19		226.49
New Richland	2,425.12	1,786.43	662.93	682.00
New Ulm	12,834.99	21,341.91	895.79	6,285.40
Nicollet	2,369.25			
North Branch	1,379.71			
North Mankato	44,067.10	54,360.73	2,345.54	4,267.75
North Redwood	33.75	198.00		
Nobles County	1,639.14		1,098.00	
Norman County		465.30		12,154.21
Northfield	15,337.97	12,587.82	1,440.00	1,109.58
Northrup	900.36	1,160.73	346.34	
Odessa	819.00	929.72		
Odin	1,219.28	728.33	139.25	
Okabena	258.43	490.60		
Olivia	6,752.61	4,598.35	771.30	421.28
Oronoco	4,500.00			
Ortonville	3,276.59	2,575.12		
Osakis	1,948.86	2,463.35		
Ostrander	938.25	58.30		
Owatonna	41,387.96	56,996.28	3,797.95	6,639.73
Paynesville	305.78		500.00	
Pemberton	326.25			
Pennock	470.25			
Peterson	720.00	1,306.88		

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SHADE TREE PROGRAM
NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
LAWS OF MINNESOTA FOR 1977, CHAPTER 90

<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Pine City	\$ 6,821.01	\$	\$	\$
Pine Island	3,434.40	5,148.00		
Pipestone	12,781.74	9,181.86		2,685.44
Pipestone County	4,903.34	521.10	1,125.50	171.00
Plainview	3,682.95	1,616.20	1,100.00	180.00
Pine River				202.63
Porter	1,362.13	205.25	575.00	
Preston	982.58	4,579.88	350.00	202.50
Princeton	6,642.90	6,534.95	1,300.00	489.09
Prinsburg	1,237.50	96.46	1,279.04	
Proctor	334.44			
Raymond	1,441.63	1,369.13	471.92	150.00
Red Lake Falls	709.88	3,740.00		102.96
Red Wing	6,803.68	21,348.95		265.36
Redwood County	468.37		217.35	760.00
Redwood Falls	4,086.29	7,618.48	2,500.00	2,591.60
Renville	712.81	2,855.59		181.62
Renville County	5,316.24	11,704.51	107.63	641.25
Revere	374.62			
Rice	77.22			
Rice County	1,755.00		495.00	
Rochester	61,903.33	99,296.27	83,192.34	14,057.14
Rollingstone	1,761.62	2,915.37	310.10	280.00
Ronneby	541.80	44.00		
Rose Creek	2,552.31			
Roseau	723.01	1,879.54		
Round Lake	1,911.19		156.33	
Rush City	1,699.84	2,395.12		
Rushmore	1,118.25	594.00	753.75	
Rushford	2,598.75	3,973.16		
Russell	5,377.50	3,280.60	160.00	1,151.21
Ruthton	1,043.33	937.41		199.03
Sacred Heart	3,387.88	2,743.35	1,720.00	1,022.44
Sanborn	3,109.28	2,380.50		1,200.00
Sandstone	803.41	3,032.48		
Sargeant	369.00	213.75	522.00	
Sartell	1,190.06			
Sauk Centre	1,030.73	1,917.77		238.85
Sauk Rapids	7,258.68	10,675.54	407.34	210.29
Seaforth	896.85	650.70		247.75
Shafer	851.62	130.50		350.00
Sherburne County	832.50			

EXHIBIT B
MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
LAWS OF MINNESOTA FOR 1977, CHAPTER 90

<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Sibley County	\$ 975.50	\$ 2,243.03	\$ 726.77	\$
Silver Lake	544.99	332.75	40.00	19.03
Skyline	1,297.01	2,164.05		
Slayton	3,193.00		1,458.79	
Sleepy Eye	33,648.98	24,847.73	55.85	833.16
Spicer	141.75	1,055.43	920.00	
Spring Valley	5,715.27	8,170.91		
Springfield	4,847.48	12,146.20		1,169.46
St. Charles	2,526.97	3,506.47	522.34	847.03
St. Cloud	61,098.22	70,085.42	2,855.12	9,600.00
St. James	18,201.35	13,890.58	950.06	1,071.17
St. Joseph	1,442.76	4,077.61		128.18
St. Michael	1,701.00	840.87	500.00	71.00
St. Peter	11,611.18	14,970.90	4,800.00	5,547.65
Stacy	1,043.55	1,145.10		
Staples	609.34	617.09		
Starbuck	573.63	820.85		114.98
Stearns County	2,571.85	2,845.87		70.40
Steele County	2,069.17	1,025.20	1,773.00	264.00
Stewart	5,967.22	4,883.58		259.47
Stewartville	1,053.00	4,245.80		
Storden	561.12	1,479.28	188.10	
Swift County		555.30		
Tauton	499.50	348.75		
Taylor Falls	452.79	2,014.83		
Thief River Falls	1,221.43	3,008.06		171.50
Tracy	11,007.51	6,000.06	1,740.33	1,819.85
Trimont	2,042.51	2,882.48	277.20	220.06
Truman	3,375.00	6,108.74		473.62
Two Harbors	2,595.45	1,185.60		
Tyler	5,115.33	5,237.10		
Vernon Center	7,073.14	829.67		
Vesta	499.05	507.26	586.13	
Virginia	16,200.00	23,889.51	1,827.73	2,117.26
Wabasha	1,620.00	6,160.00	370.50	459.47
Wabasso	2,098.80	1,143.00		452.08
Wadena	273.73	4,793.06		
Waite Park	900.00	2,052.98		
Waldorf	3,804.75	600.60		
Walnut Grove	1,634.72	1,150.65	180.00	677.48
Walters	186.32	248.60	272.55	
Waltham	1,174.50		384.12	

EXHIBIT B
MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
NON-METRO PAYMENTS AS OF DECEMBER 31, 1980
LAWS OF MINNESOTA FOR 1977, CHAPTER 90

<u>Municipality</u>	<u>Sanitation</u>		<u>Reforestation</u>	
	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>	<u>C. Y. 1977</u>	<u>C. Y. 1978</u>
Wanamingo	\$ 923.85	\$ 1,147.50	\$	\$
Wanda	553.50	450.00	587.48	165.00
Waseca	4,481.55	8,480.04	700.00	
Waseca County	1,693.24	3,642.30	286.80	830.25
Waterville	7,374.73	4,182.75		360.40
Watkins	1,084.31	378.20	280.83	251.70
Watowan County	1,575.00	921.76	47.48	146.23
Waverly	6,075.00	4,068.41	784.74	825.64
Welcome	2,820.86	2,604.62	589.03	637.43
Wells	4,475.13	7,854.63	4,205.84	2,012.40
West Concord	121.50	1,927.80		
Westbrook	5,704.92	5,783.80	146.85	7.04
Wilder	1,784.25	32.56		
Willmar	27,940.04	41,139.47	5,919.20	2,452.72
Whalan		224.40		
Wheaton		527.78		
Willmont		1,232.00		
Windom	19,701.92	20,012.27	226.75	593.35
Winona	38,485.65	52,784.68	2,536.97	2,996.42
Winsted	1,418.40	2,691.43	937.01	944.55
Winthrop	7,987.28	7,481.29	1,297.83	809.88
Wood Lake	3,289.94			
Woodstock	173.19	36.00	69.10	
Worthington	15,297.84	25,396.38	6,033.38	3,734.13
Wykoff	867.96	250.19	250.00	17.88
Wyoming	1,041.94	2,093.85	664.50	494.55
Zumbro Falls		1,593.00		
Zumbrota	4,440.15	4,840.20		
Dakota	717.48	511.45	824.15	15.00
Maple Lake	1,175.03	1,474.66	130.00	
Dexter	1,111.42		232.02	
Darwin	412.72			
Elbow Lake		2,200.00		
TOTAL	\$1,675,034.36	\$1,944,009.75 ^{236.67}	\$ 296,260.86	\$ 246,312.73
ADD: Redeposits	\$ 12,145.33	\$ 71,526.32	\$ 3,021.19	\$ 6,604.18
Adjusted Expend.	\$1,687,179.69	\$2,015,536.07 ^{762.49}	\$ 299,282.05	\$ 252,916.91
Total Sanitation and Reforestation		\$3,702,715.76 ^{942.68}	\$ 552,198.96	

PREPARED BY: Accounting Division
DATE: 12/31/80

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MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
NON-METRO PAYMENTS AS OF SEPTEMBER 30, 1981
LAWS OF MINNESOTA FOR 1979, CHAPTER 333, SEC. 24

Sanitation/Reforestation

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Ada	\$ 4,084.87	\$ 1,363.05
Adams	316.22	775.00
Adrian	3,507.43	3,338.17
Aitkin	3,593.12	2,299.80
Albany	9,560.19	10,084.31
Albert Lea	55,424.03	45,500.00
Albertville	Ø	-
Alden	453.70	1,482.74
Alexandria	11,090.49	4,000.00
Amboy	3,922.56	1,822.50
Annandale	6,651.73	11,266.83
Appleton	6,117.39	5,837.04
Arco	1,352.78	945.52
Arlington	3,110.70	3,468.32
Askov	Ø	795.00
Atwater	1,615.11	1,070.00
Aurora	3,900.70	1,660.54
Austin	163,466.84	163,643.44
Avon	Ø	Ø
Balton	135.00	2,518.80
Barnum	999.93	1,404.71
Becker	10,993.63	9,654.42
Belgrade	3,846.67	1,461.03
Bellingham	-	Ø
Bemidji	478.81	454.65
Benson	15,094.95	15,552.65
Big Lake	Ø	Ø
Bingham Lake	150.00	1,049.61
Bird Island	6,932.58	3,218.52
Biwabik	5,592.75	7,500.00
Blooming Prairie	5,667.23	4,661.44
Blue Earth	7,609.07	24,850.00
Bovey	3,459.26	3,250.00
Boyd	Ø	Ø
Braham	2,195.99	2,442.67
Brainerd	9,495.92	7,500.00
Branch	Ø	-
Brandon	Ø	-
Breckenridge	1,635.52	1,421.12
Brewster	3,728.35	1,851.55
Brooten	-	1,945.81
Brownsdale	2,685.23	381.00
Brownton	1,403.10	1,520.00
Buffalo	11,605.57	11,250.00

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Buffalo Lake	\$ 1,117.18	\$ 4,475.75
Buhl	5,235.14	2,404.13
Butterfield	850.08	1,541.25
Byron	1,551.75	602.25
Caledonia	3,662.26	1,759.85
Cambridge	6,102.05	2,950.65
Canby	9,245.42	8,500.00
Cannon Falls	15,748.00	12,835.00
Carlton	-	0
Center City	1,892.50	2,837.50
Chatfield	3,233.78	2,990.00
Chippewa County	2,107.96	3,743.17
Chisago City	2,448.77	5,825.00
Chisholm	3,961.01	8,530.39
Chokio	1,585.03	0
Clara City	6,073.59	4,692.22
Clarkfield	3,952.33	3,766.57
Clarks Grove	0	-
Clear Lake	51.75	1,204.50
Clearwater	1,732.90	438.48
Cleveland	0	1,247.15
Cloquet	15,325.80	19,462.04
Cokato	11,781.40	8,960.00
Cold Spring	3,388.92	1,720.85
Coleraine	5,392.24	7,320.00
Comfrey	1,648.64	1,604.95
Correll	0	-
Cosmos	833.93	2,260.00
Cottonwood	4,127.07	6,001.49
Crookston	3,036.57	5,000.00
Crosby	3,204.39	300.00
Cyrus	1,579.40	161.65
Dakota	1,567.45	944.09
Danube	-	2,945.35
Danvers	1,716.96	1,155.43
Darfur	801.75	85.00
Dawson	6,738.10	6,200.00
DeGraff	2,563.25	0
Delano	1,325.05	3,257.69
Delavan	340.00	246.50
Dennison	780.00	0
Detroit Lakes	3,079.15	4,745.92
Dilworth	1,326.30	4,710.72
Dodge Center	13,071.75	5,472.50
Dovray	1,381.04	715.80
Duluth	122,198.21	101,054.22
Dundas	4,142.52	1,508.65
Eagle Lake	1,320.00	0
East Grand Forks	6,204.63	6,900.00
Echo	7,265.25	5,624.50
Eden Valley	3,081.03	2,800.00

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Edgerton	\$ 400.70	\$ 3,548.01
Elbow Lake	3,402.38	2,000.00
Elgin	956.25	500.00
Elk River	2,365.70	1,555.60
Elmore	1,894.92	1,350.03
Elysian	-	890.00
Evan	-	783.90
Eveleth	7,597.65	3,596.15
Eyota	891.49	447.50
Fairfax	617.65	2,685.00
Fairmont	-	4,500.00
Faribault	20,587.40	18,316.20
Faribault County	4,030.50	2,500.00
Fergus Falls	19,318.38	21,403.25
Fertile	-	2,040.70
Floodwood	5,891.76	5,000.00
Foley	2,284.80	498.60
*Fosston	-	0
*Franklin	14,214.52	7,295.63
Freeborn County	8,094.03	4,435.93
Freeport	995.40	1,952.54
Frost	2,868.75	-
Fulda	3,879.57	2,044.15
Garvin	2,025.00	0
Gaylord	4,510.08	7,717.56
Geneva	2,961.50	-
Gibbon	1,912.55	3,216.65
Gilbert	3,839.98	3,155.18
Glencoe	9,878.00	15,332.85
Glenville	1,030.43	1,100.00
Glenwood	7,059.83	4,322.33
Good Thunder	0	0
Goodview	2,475.94	3,161.51
Grand Rapids	11,061.43	12,786.51
Granite Falls	16,010.40	15,000.00
Green Isle	0	-
Grove City	1,755.18	1,274.74
Halstad	-	1,243.01
Hancock	360.03	5,409.05
Hanley Falls	3,840.00	1,902.91
Hanska	2,541.55	1,000.00
Harmony	0	-
Hawley	-	2,582.75
Hayfield	2,736.35	1,291.36
Hayward	510.57	-
Hazel Run	125.00	0
Hector	3,223.15	3,440.00
Henderson	-	3,588.17
Hendricks	6,205.86	4,558.16
Hendrum	-	0
Herman	-	850.13
*Fountain	1,992.25	2,053.95

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Heron Lake	\$ 7,683.59	\$ 3,815.05
Hibbing	1,196.09	2,970.60
Hill City	2,909.08	375.00
Hills	-	2,184.08
Hinckley	Ø	1,883.67
Hitterdal	-	664.73
Hokah	1,750.00	2,400.00
Holdingsford	-	1,596.67
Holland Village	2,357.28	371.60
Hollandale	-	1,274.13
Holloway	1,586.17	1,695.35
Houston	1,879.00	3,100.89
Houston County	7,479.96	19,674.33
Howard Lake	2,303.56	1,862.70
Hutchinson	26,129.76	28,522.94
International Falls	4,990.05	6,918.60
Isanti	3,223.07	1,777.19
Itasca County	Ø	5,970.00
Ivanhoe	3,107.69	1,606.15
Jackson	9,689.87	8,500.00
Janesville	8,496.05	6,982.49
Jasper	-	2,968.95
Jeffers	3,050.00	Ø
Kandiyohi	-	2,137.50
Kandiyohi County	5,394.87	-
Kasota	5,215.31	4,936.25
Kasson	3,938.50	7,605.50
Keewatin	1,106.84	Ø
Kenyon	6,216.88	-
Kerkhoven	2,298.75	993.13
Kilkenny	222.50	145.00
LaCrescent	-	Ø
Lafayette	1,270.00	757.37
Lake Benton	3,568.53	3,000.00
Lake City	2,941.91	2,805.28
Lake Crystal	4,474.93	4,035.60
Lake Wilson	2,536.11	1,575.00
Lakefield	3,414.68	2,788.97
Lamberton	10,043.18	9,165.50
Lanesboro	3,558.74	2,175.34
LeCenter	1,609.33	4,619.00
LeRoy	2,398.58	Ø
LeSueur	8,513.35	7,871.41
Lester Prairie	3,989.05	1,950.00
Lewiston	317.90	1,383.00
Lewisville	Ø	Ø
Lincoln County	3,409.10	5,400.00
Lindstrom	13,586.78	6,518.25
Lismore	6,580.47	2,650.48
Litchfield	10,834.63	17,737.78
Little Falls	6,879.28	9,785.72

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Littlefork	\$ 2,477.25	\$ 0
Lonsdale	4,922.04	2,608.18
Lowry	462.50	458.70
Lucan	242.00	3,116.56
Luverne	4,679.25	10,382.16
Lyle	1,237.46	1,906.17
Lynd	2,025.00	0
Lyon County	4,204.97	5,156.85
Madelia	12,984.01	5,576.50
Madison	5,060.88	3,902.25
Madison Lake	3,570.65	3,019.31
Mankato	174,705.72	182,250.00
Maple Lake	3,553.42	1,430.37
Mapeton	12,360.33	5,114.68
Mapleview	722.76	377.04
Marietta	2,133.52	1,025.50
Marshall	8,683.58	8,992.73
Martin County	0	0
Maynard	2,298.45	1,710.00
Medford	1,891.91	865.61
Melrose	8,526.43	7,665.15
Milaca	14,095.46	9,036.00
Milan	3,632.07	571.56
Millville	-	2,062.90
Mille Lacs County	0	0
Milroy	710.00	4,122.50
Minneota	12,747.55	5,596.62
Minnesota Lake	-	0
Montevideo	26,069.36	24,431.44
Montgomery	5,088.78	5,000.00
Monticello	7,854.37	9,845.79
Moorhead	63,715.33	89,557.95
Moose Lake	2,205.35	1,263.53
Mora	-	7,333.50
Morgan	7,247.13	5,600.00
Morris	2,239.97	3,746.73
Morristown	295.50	1,180.00
Morton	-	2,915.00
Mountain Iron	699.77	0
Mountain Lake	11,962.96	11,098.61
Murdock	2,091.04	798.50
Murray County	1,068.12	3,817.86
McLeod County	6,691.64	7,100.00
Nashwauk	2,557.23	-
Nassau	-	1,008.78
Nerstrand	1,291.15	3,757.50
New London	747.25	3,015.00
New Prague	813.51	1,955.39
New Richland	3,438.47	3,101.62
New Ulm	26,336.12	30,330.44
Nicollet	1,292.45	878.21

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Norman County	\$ 5,529.36	\$ 5,080.42
North Branch	4,438.75	6,126.92
North Mankato	54,392.04	57,500.00
Northfield	17,204.08	18,693.04
Northrop	1,726.83	1,038.58
Odin	970.99	Ø
Okabena	-	Ø
Olivia	12,268.48	9,150.00
Ormsby	1,083.68	Ø
Oronoco	4,300.38	2,536.50
Ortonville	4,319.85	5,633.23
Osakis	2,937.93	3,500.00
Ostrander	372.50	1,482.30
Owatonna	35,451.25	56,433.00
Park Rapids	4,138.28	4,150.00
Parkers Prairie	-	5,337.00
Paynesville	1,344.75	1,068.62
Pelican Rapids	705.96	278.47
Peterson	-	1,425.00
Pine Island	4,152.52	2,819.50
Pine River	1,180.75	450.64
Pipestone	22,616.32	13,545.00
Pipestone County	Ø	Ø
Plainview	1,048.45	1,775.78
Plato	30.00	Ø
Porter	1,551.50	2,214.82
Preston	2,235.51	1,000.00
Princeton	5,717.92	10,094.57
Prinsburg	Ø	-
Raymond	-	1,669.19
Red Lake Falls	-	1,198.87
Red Wing	30,045.25	33,823.50
Redwood Falls	6,117.64	11,179.05
Renville	4,688.70	4,822.30
Renville County	13,584.70	9,000.00
Revere	810.54	-
Rice	363.15	1,889.25
Rochester	133,908.92	144,944.55
Rollingstone	2,290.75	-
Ronneby	472.50	450.00
Roseau	1,652.35	2,125.00
Royalton	166.25	-
Rusch City	8,470.50	6,500.00
Rushford	4,042.50	Ø
Russell	2,817.93	1,541.74
Ruthton	2,025.00	Ø
Sacred Heart	3,232.99	3,297.39
St. Charles	Ø	-
St. Cloud	96,550.19	105,117.70
St. James	10,388.23	15,500.00
St. Joseph	1,835.95	2,200.00
St. Michael	3,682.70	1,700.00

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
St. Peter	\$ 17,462.96	\$ 24,490.53
Sanborn	1,697.50	4,597.50
Sandstone	354.44	Ø
Sauk Centre	3,190.54	3,327.94
Sauk Rapids	8,191.19	8,817.05
Seaforth	328.50	3,607.50
Sibley County	-	Ø
Silver Lake	Ø	383.00
Skyline	1,755.10	3,000.00
Slayton	Ø	-
Sleepy Eye	17,671.05	14,447.54
Spicer	-	2,570.00
Spring Grove	1,211.21	2,497.05
Spring Valley	9,096.63	2,380.50
Springfield	10,527.84	12,427.68
Stacy	117.75	154.00
Staples	1,545.00	1,126.50
Starbuck	3,073.37	1,777.27
Steele County	628.50	324.00
Stewart	2,862.64	4,929.30
Stewartville	3,518.90	3,222.36
Storden	2,616.90	Ø
Swift County	-	Ø
Taylor Falls	-	3,075.65
Thief River Falls	4,756.10	5,687.67
Tracy	8,427.60	5,156.62
Trimont	1,588.45	-
Truman	7,800.00	5,375.00
Tyler	10,027.19	6,457.53
Ulen	-	362.46
Upsala	-	895.50
Virginia	30,927.32	29,000.00
Wabasha	12,877.09	10,500.00
Wabasha County	1,712.50	-
Wabasso	1,140.00	3,020.00
Wadena	2,436.84	4,784.26
Waite Park	2,337.17	1,280.00
Walnut Grove	1,734.07	4,320.00
Wanamingo	2,013.00	296.25
Wanda	3,073.25	1,872.03
Warroad	-	Ø
Waseca	6,979.44	13,000.00
Waseca County	3,518.54	3,764.47
Waterville	4,111.40	3,960.05
Watkins	1,541.78	Ø
Watsonwan County	401.05	1,071.40
Waverly	7,986.75	6,141.25
Welcome	4,239.70	438.06
Wells	5,595.40	1,925.60
West Concord	1,746.28	1,283.16
Westbrook	6,495.60	1,505.40

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Wheaton	\$ 1,365.25	\$ 3,207.10
Wilkin County	Ø	-
Willmar	43,378.90	64,500.00
Wilmont	1,235.63	-
Windom	15,825.63	20,382.52
Winnebago	9,963.03	5,503.44
Winona	69,419.74	84,678.87
Winona County	943.91	1,192.50
Winsted	3,929.86	3,500.00
Winthrop	6,827.18	3,520.51
Woodlake	6,000.15	2,066.98
Woodstock	17.50	Ø
Worthington	22,120.63	22,973.13
Wykoff	2,472.00	1,700.00
Wyoming	6,572.97	2,904.75
Yellow Medicine County	-	8,627.50
Zumbro Falls	1,050.00	1,050.00
Zumbrota	<u>6,880.00</u>	<u>4,405.00</u>
TOTAL	\$2,456,014.52	\$2,506,682.16
ADD: Redeposits	<u>\$ 27,307.75</u>	<u>\$ 15,058.79</u>
Adjusted Expend.	<u><u>\$2,483,322.27</u></u>	<u><u>\$2,521,740.95</u></u>

MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
METRO PAYMENTS AS OF SEPTEMBER 30, 1981
LAWS OF MINNESOTA FOR 1979, CHAPTER 333, SEC. 24

Sanitation/Reforestation

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Andover	\$ 0	\$ 0
Anoka	29,849.57	39,368.19
Anoka County	76,304.58	122,922.39
Apple Valley	42,396.33	42,702.50
Arden Hills	10,561.53	10,828.96
Bayport	11,545.53	6,909.20
Belle Plaine	14,173.53	12,250.00
Birchwood Village	2,283.40	1,068.42
Blaine	14,168.05	18,600.00
Bloomington	145,731.78	164,762.50
Brooklyn Center	23,213.04	25,300.48
Brooklyn Park	40,388.61	64,774.49
Burnsville	89,522.53	121,999.02
Carver	6,218.15	473.32
Centerville	2,190.25	3,378.75
Champlin	13,978.05	13,489.66
Chanhassen	18,744.37	16,437.04
Chaska	10,898.18	11,262.50
Circle Pines	3,355.12	3,778.75
Cologne	-	2,813.62
Columbia Heights	12,841.21	14,105.00
Coon Rapids	45,596.19	70,000.00
Corcoran	0	-
Cottage Grove	22,095.95	25,637.88
Crystal	42,938.62	37,258.04
Dakota County	129,713.29	89,320.69
Dayton	349.74	1,349.15
Deephaven	0	21,302.14
Dellwood	481.00	0
Eagan	4,330.53	9,752.41
Eden Prairie	65,089.50	72,227.20
Edina	79,155.25	78,210.00
Excelsior	11,706.74	7,256.04
Falcon Heights	7,023.15	5,111.30
Farmington	9,690.50	6,392.27
Forest Lake	1,771.95	2,709.67
Fridley	24,601.70	20,749.03
Gem Lake	1,318.33	929.48
Golden Valley	27,865.11	19,954.50
Grant Township	1,700.00	0
Greenfield	1,342.38	409.25
Greenwood	3,087.56	2,500.00

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Hamburg	\$ 620.20	\$ 256.50
Hanover	167.29	173.80
Hassan Township	99.70	86.78
Hastings	24,989.42	29,000.00
Hennepin County	105,574.96	49,380.65
Hennepin County Park Res.	204,339.88	183,124.50
Hilltop	1,272.25	300.00
Hopkins	37,057.25	17,583.42
Independence	82.35	Ø
Inver Grove Heights	10,741.36	6,716.88
Jordan	4,739.55	2,743.57
Lake St. Croix Beach	6,736.16	2,288.75
Lakeland	1,387.42	437.50
Lakeland Shores	1,103.24	983.27
Lakeville	10,055.22	23,673.80
Lauderdale	3,475.92	1,140.92
Lexington	1,177.48	1,000.00
Lillydale	-	Ø
Lino Lakes	3,185.97	3,050.00
Little Canada	11,746.25	5,001.76
Long Lake	759.42	2,500.00
Loretto	89.50	-
Mahtomedi	897.71	2,832.67
Maple Grove	36,611.65	36,925.95
Maple Plain	967.06	-
Maplewood	38,198.95	25,873.80
Marine-on-St. Croix	-	860.00
Mayer	Ø	Ø
Medicine Lake	1,910.18	2,050.00
Medina	1,896.98	1,106.40
Mendota	-	Ø
Mendota Heights	5,256.92	2,140.98
Minneapolis	3,107,424.64	2,407,332.61
Minnetonka	237,398.37	249,734.84
Minnetonka Beach	15,249.49	17,000.00
Minnetrissa	528.58	1,092.68
Mound	11,751.86	19,500.00
Moundsview	9,727.39	10,812.67
New Brighton	11,156.59	10,375.92
New Germany	Ø	Ø
New Hope	10,615.25	13,006.20
Newport	5,563.59	3,537.51
North Oaks	14,258.50	12,500.00
N. St. Paul	12,513.99	12,973.93
Norwood	2,571.38	986.16
Oak Park Heights	14,444.30	11,958.59
Oakdale	1,804.50	7,550.00
Orono	15,394.20	15,596.85
Pine Springs	1,205.00	Ø
Plymouth	106,400.12	57,215.87
Prior Lake	14,830.31	16,442.50

<u>Municipality</u>	<u>C. Y. 1979</u>	<u>C. Y. 1980</u>
Ramsey	\$ 2,871.00	\$ -
Ramsey County Hwy.	5,633.20	4,370.21
Ramsey County Parks	67,505.87	48,417.75
Richfield	82,103.57	73,238.57
Robbinsdale	33,411.69	28,930.89
Rockford	335.71	-
Rogers	722.88	714.68
Rosemount	3,776.24	8,599.66
Roseville	24,896.89	34,208.33
St. Anthony	1,064.10	423.13
St. Bonifacius	-	600.00
St. Francis	2,991.60	-
St. Louis Park	119,906.43	124,254.38
St. Marys Point	230.00	510.00
St. Paul	1,310,972.64	871,384.76
St. Paul Park	9,169.52	6,628.77
Savage	5,436.19	4,547.85
Shakopee	18,557.98	11,757.46
Shoreview	27,188.96	32,268.52
Shorewood	25,956.15	16,256.93
S. St. Paul	41,259.14	44,082.74
Spring Lake Park	3,307.13	2,378.20
Spring Park	1,855.40	1,941.50
Stillwater	58,470.19	39,323.69
Stillwater Township	1,386.53	949.24
Sunfish Lake	-	3,129.46
Tonka Bay	7,588.05	7,700.00
Vadnais Heights	3,562.78	2,771.16
Victoria	599.76	1,261.16
Waconia	1,063.48	1,100.98
Washington County	20,646.86	Ø
Watertown	686.20	Ø
Wayzata	39,009.53	32,800.00
W. St. Paul	22,785.00	23,252.00
White Bear Township	2,003.22	4,823.49
White Bear Lake	27,551.76	24,868.33
Willernie	1,668.94	Ø
Woodbury	3,714.36	3,617.50
Woodland	20,452.50	19,342.71
Young America	1,140.00	698.50
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TOTAL	\$7,157,681.05	\$5,918,294.62
ADD: Redeposits	\$ <u>135,495.77</u>	\$ <u>9,835.62</u>
Adjusted Expend.	<u>\$7,293,176.82</u>	<u>\$5,928,130.24</u>

MINNESOTA DEPARTMENT OF AGRICULTURE
SHADE TREE PROGRAM
A-24 DEPOSITS F.Y. 1981
LAWS OF MINNESOTA FOR 1979, CHAPTER 333, SEC. 24

Municipality

<u>Calendar Year 1980</u>	<u>Metro</u>	<u>Non-Metro</u>
Eagon	\$ 778.28	\$
Little Canada	1,122.51	
North St. Paul	2,728.50	
Richfield	4,266.80	
Stillwater	939.53	
Balaton		126.00
Cottonwood		311.68
Dilworth		268.80
Hanley Falls		20.00
Lyle		124.41
Moorhead		4,738.17
Morgan		2,597.50
Peterson		552.50
Pipestone		4,728.73
Skyline		1,491.00
Zumbro Falls		100.00
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TOTAL C.Y. 1980	\$ 9,835.62	\$ 15,058.79

APPENDIX I

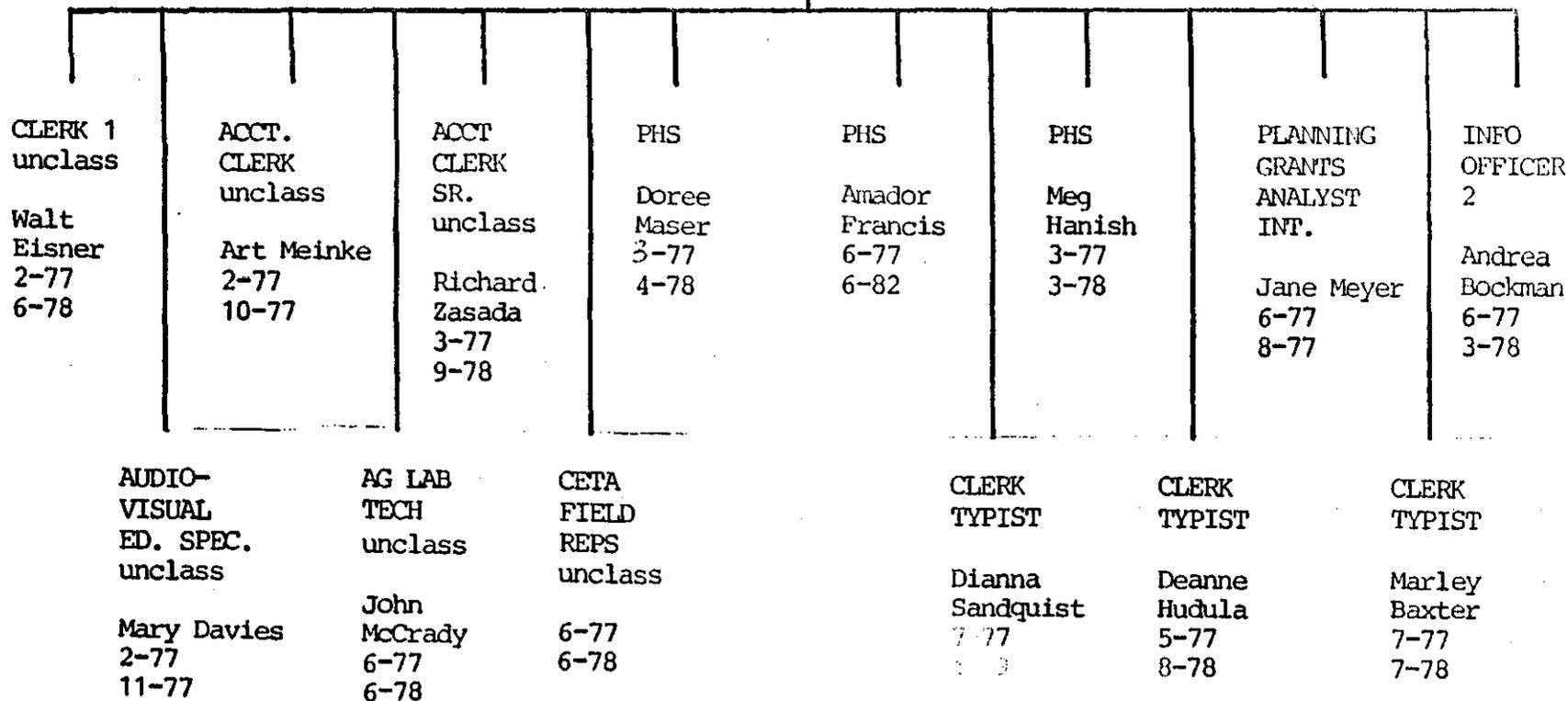
1976 Supporting Materials.



SHADE TREE PROGRAM
1976

PLANNING GRANTS ANALYST, SR.

Peter Grills
3-76
8-77



CETA FIELD REPRESENTATIVES AS OF

2-1-1978

Bruce Brummitt
Pat Chase
William Dahlquist
Jerre Ekstrand
Rick Goddemann
Deanne Gunderson
Joseph Herbert
Dan Kieselhorst
Dave Kuechenmeister
Kerry Ledin
Bill Verschaetse
Edward Menefee
Patricia Meyer
Irene Morrison
William Osborne
Jim Radabaugh
Mark Schnobrich
Frank Snyder
Terry Wade
Thomas Brettin
Doug Erhard
John Swenson
Charlotte Huckstead

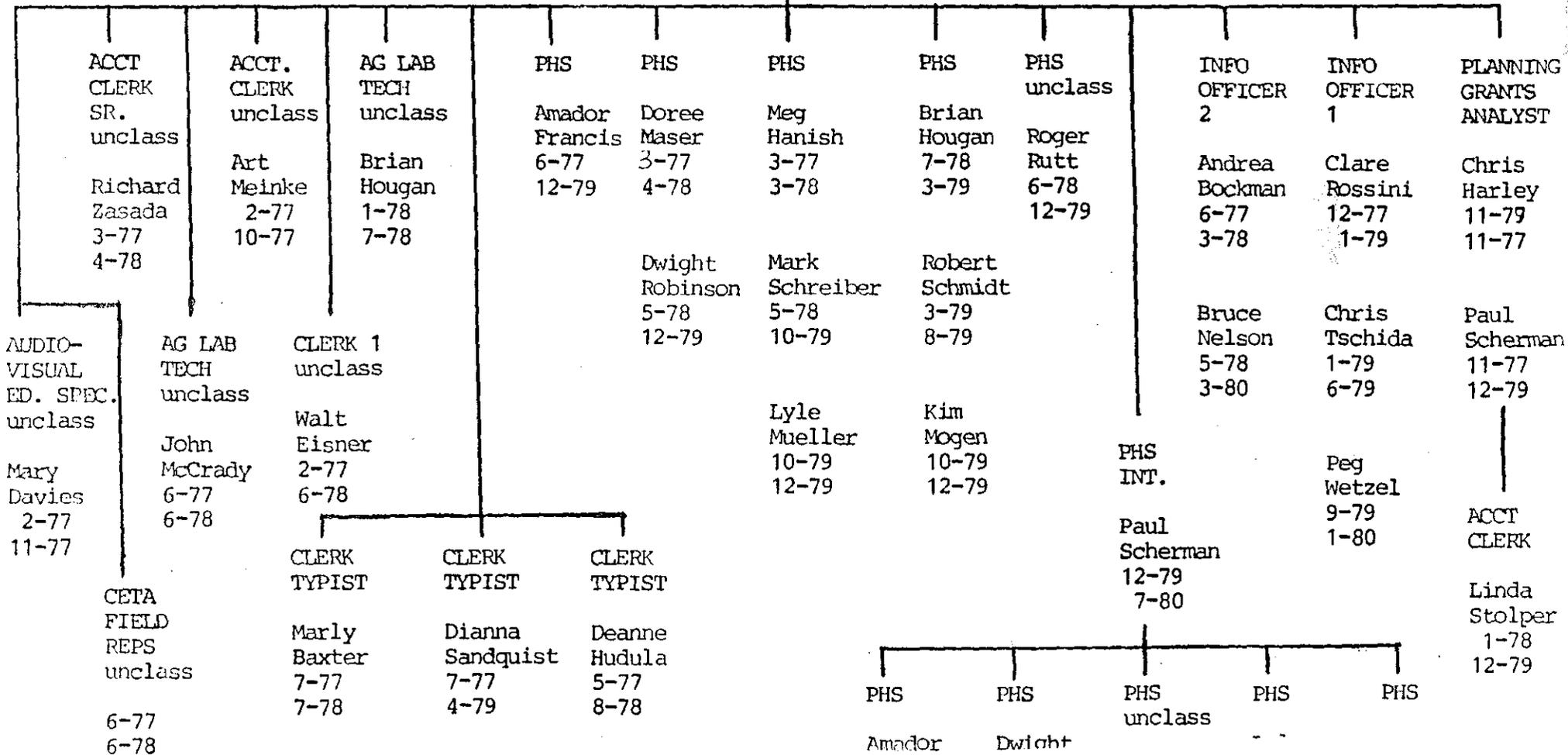
SHADE TREE PROGRAM

1977-1979

PLANNING GRANTS ANALYST, INT.

Jane Meyer
8-77
6-78
ADMINISTRATOR

Jane Meyer
6-78
1-80



1980-1982

DIRECTOR

Richard Haskett
2-80
7-82

CLERK 2

Bonnie
Retzegel
8-79
3-80

Grace
Jacobson
5-80
2-82

PHS
INT.

Paul
Scherman
12-79
7-80

Dwight
Robinson
10-80
6-82

INFO
OFFICER
1

Michele
Gran
3-80
7-82

INFO
OFFICER
2

Bruce
Nelson
5-78
3-80

Lynn
Schwartz
4-80
7-82

PHS
unclass

Roger
Rutt
12-79
3-80

Greg
Ustruck
6-80
6-82

PHS

Kim
Mogen
12-79
4-80

Kris
Caulfield
6-80
6-82

PHS

Dwight
Robinson
12-79
10-80

Greg
Ustruck
4-81
6-82

PHS

Lyle
Mueller
12-79
5-82

PHS

Amador
Francis
12-79
6-82

PHS

Tom
Maier
6-80
5-82

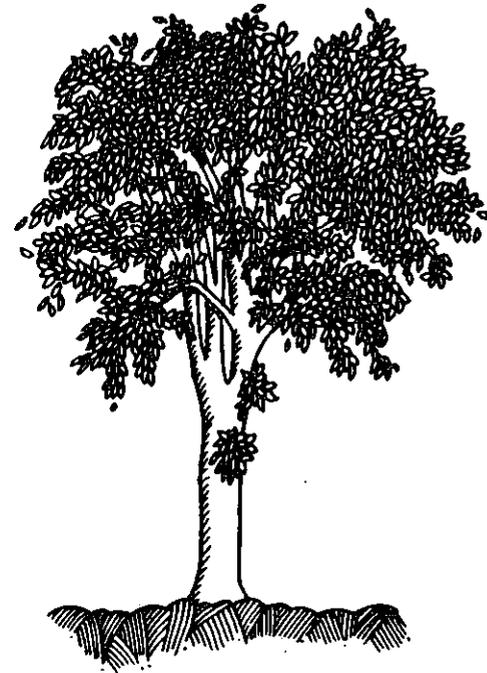
ACCT
CLERK
SR.

Shari
Schroeder
2-80
7-82

APPENDIX H
MDA/Shade Tree Organizational Charts.

Conference Contributors

Bemis Company Foundation
Burlington Northern Foundation
Cargill Foundation
Dayton-Hudson Foundation
First Bank System
First National Bank of Minneapolis
First National Bank of Saint Paul
General Mills Foundation
Hoerner Waldorf Corporation
Honeywell Fund
International Multifoods Corporation
Northwest Bancorporation
Northwestern Bell Telephone
St. Paul Companies
The Pillsbury Company
Peavey Company
3M Foundation
WCCO Midwest Radio and T.V., Inc.



**Metropolitan
Dutch Elm Disease
Leadership Conference**
Friday, September 10, 1976
8:45 A.M. to 2:30 P.M.
Fifth Floor Auditorium
First National Bank of Minneapolis

Sponsored by
The Association of Metropolitan Municipalities
The Metropolitan Council of Chambers of Commerce
in cooperation with the
Twin Cities Business Community

Program

- 8:15-8:45 a.m. Registration (Coffee and Rolls)
- 8:45-8:50 Welcome **Wendy Maltzen**, President, Council of Metropolitan Chambers of Commerce
Josephine Nunn, President, Association of Metropolitan Municipalities
- 8:50 Remarks **Pete Ankeny**, President, First National Bank of Minneapolis
- 9:00 Dutch Elm Disease in Minnesota, **Dr. David French**
- 9:30 Syracuse Experience, **Frank Kelly**, Commissioner of Parks and Recreation, Syracuse, N.Y.
- 10:00 Canadian Experiences with Lignasan BLP, **Ed Kondo**, The Great Lakes Forest Research Center, Canadian Forestry Service
- 10:30 Coffee and Coke
- 10:45 Learning From Our Mistakes, **Harold S. McNabb**, Iowa State University
- 11:15 Cost Considerations, **Tom Rusin**, First National Bank of Minneapolis
- 11:30 How to Put Sex in Sanitation—The Minnesota State Program, **Donald C. Willeke**, Chairman, Minnesota Shade Tree Advisory Committee
- 12:00 Lunch
- 12:30 Reactor Panel (Begins during lunch)
- 1:30 Audience Questions
- 2:30 Adjourn

Conference Planning Committee: Director, Jim Williams, First Minneapolis; Larry Sawyer, General Mills; Bill Schilling, Public Service Options; Jim Heltzer, Dayton-Hudson Foundation; Kathy Besanson and Linda Engler, Minneapolis Chamber of Commerce.

Speakers

David French—Professor of Plant Pathology, University of Minnesota. B.S., M.S., and Ph.D., U. of M. Assistant to the Head of the Department of Plant Pathology. Chairman of the Assembly Committee of Intercollegiate Athletics. In mid-1950's warned Minnesotans of perils of Dutch Elm Disease. First to discover Dutch Elm Disease in Minnesota in 1961. Since then he has worked tirelessly to combat Dutch Elm Disease.

Frank Kelly—Commissioner of Parks and Recreation, Syracuse, N.Y. B.A. and Masters in Public Administration, Syracuse University. Past Chairman of the United Way, Deputy Director of Model Cities Programs.

Ed Kondo—Research Scientist with the Great Lakes Forest Research Center of the Canadian Forestry Service. B.S.C.F., M.S.C.F., and Ph.D. in Botany from University of Toronto. For the past 15 years has researched Dutch Elm Disease.

Harold S. McNabb—Professor of Botany and Plant Pathology, and Forestry at Iowa State University. B.S. University of Nebraska, M.S. and Ph.D. from Yale University. Member Sigma Xi, University of Nebraska. Visiting Research Scientist with the British Forestry Commission.

Tom Rusin—Commercial Banking Officer, First National Bank of Minneapolis. B.A., University of Michigan. M.A., University of Colorado. Has attempted to identify immediate and long-range costs to the metro area of several Dutch Elm Disease programs.

Donald C. Willeke—Chairman, State Shade Tree Advisory Committee. B.S., Iowa State University. J.D., University of Iowa. Editor, Iowa Law Review. Member of the Bar in Iowa, New York, Minnesota, and Washington, D.C. Local elm watch coordinator.

Reactors

Thomas Berg, State Representative, Minneapolis

John Chenoweth, State Senator, St. Paul

Wayne Burggraaff, Richfield City Manager

Peter Vanderpoeh, Director, State Planning Agency

Walt Carpenter, Minnesota Nurserymen's Association

Past President, Twin Cities Nurserymen's Association

Former Member, Minneapolis Park and Recreation Board

Wade Savage, Homeowner and Concerned Citizen

Moderator

James L. Hetland, Jr., Former Chairman, Metropolitan Council
Senior V.P. of Urban Development, First National Bank of Minneapolis.

DUTCH ELM DISEASE LEADERSHIP CONFERENCE

AGENDA

- 9:00 a.m. Opening Remarks--Pete Ankeny, Chairman,
Community Leadership Conference
- 9:15 a.m. Keynote Address--Hubert Humphrey, Walter Mondale,
Don Fraser
- 9:45 a.m. What is Dutch elm disease? Dr. David French
Professor of Plant
What is its destructive power? Pathology
University of Minnesota
- 10:00 a.m. Early Identification, Elm Watch Dave DeVoto,
Bob Seavey
- 10:15 a.m. Removal of Dead Trees (Public and Private)
How is it being done now? What are the problems?
How can it be improved?
- 10:30 a.m. Coffee Break
- 10:45 a.m. Disposal--Jim Shipman, Metropolitan Inter County
Council
A. Chipping
B. Burying
C. Burning
- 11:15 a.m. Replanting--Larry Bachman?
A. Where
B. What types of trees
C. Watering and caring for young trees
- 11:45 a.m. - 1:00 p.m. Lunch Break

1:00 p.m.

Lignasan-- Dr. Kondo, Canadian Forrester and/or
Bob Matters, President, Minn. Living Elm Co

- A. What is it?
- B. Dosage
- C. When to apply and how
- D. What evidence exists to show Lignasan effectiveness

1:45 p.m.

Self-Help Neighborhood Groups--Stephen Bergerson

2:00 p.m.

Metro Area Municipalities--Dennis Sederholm, Metropoli
Council of Chambers of Comm

What are the major problems faced by the metro-area
municipalities in creating and implementing a Dutch elm
control program.

2:20 p.m.

Costs?

- A. Removal
- B. Disposal
- C. Replanting
- D. Increase in heating costs due to loss of trees
- E. Decrease in market value of real estate due to
loss of trees

3:00 p.m.

Coffee, Coke Break

3:15 p.m.

Weak spots in existing legislation and control programs

Speaker: Don Willeke, Chmn. State Shade Tree

Advisory Committee

4:00 p.m.-5:00 p.m.

Questions and Answers

DUTCH ELM DISEASE LEADERSHIP CONFERENCE

Conference Attendees

	<u>Name or Group</u>	<u>Approx. Nos.</u>
1.	State Shade Tree Advisory Committee (Willeke)	10
2.	Key Legislators from Metro Area (Tom Berg, Frank Knoll)	10
3.	Mpls. Neighborhood Elm Watch Representatives	10
4.	CUE (Norma Olson)	10
5.	County Commissioners	7
6.	Mpls. and St. Paul City Councilmen	15
7.	Neighborhood Associations for Both Cities	20
8.	Media Representatives	10
9.	Association of Municipalities (Vern Pederson, J. Nunn)	25
10.	Metropolitan Council of Chambers of Commerce (Sederholm, Maltzer, Martin, Krusell)	10
11.	Dr. French	1
12.	Dave DeVoto	1
13.	Lloyd Burkholder	1
14.	Peter Grills	1
15.	Chamber Urban Beautification Committee (Jeanne Schlosser)	1
16.	City Mgrs. Association for Metro Area	10
17.	Steve Bergerson	1
18.	John Wefald, State Department of Agriculture	1
19.	Chief Forester, City of ^{Wauwatosa} Syracuse	1
20.	Jim Shipman, M.I.C.C.	1

Conference Attendees

<u>Name or Group</u>	<u>Approx. Nos.</u>
21. Metro Waste Commission	3
22. Tree Felling Firms	6
23. Tree Treatment Firms	6
24. Nursery Association (Larry Bachman, Walt Carpenter)	2
25. Gov. Anderson, Mayor Stenvig and Lattimer	3
26. David Durenberger, Hennepin County Park Reserve	1
27. P.S.O.	2
28. Upper Midwest Council	1
29. Citizens League	2
30. Metropolitan Council	3
31. P.C.A.	1
32. Downtown Council	2
33. Business Leaders	20
34. First Minneapolis	5
Total	203

S U M M A R Y

METROPOLITAN
DUTCH ELM DISEASE
LEADERSHIP CONFERENCE

September 10, 1976

Sponsored as a Public Service

by

The Association of Metropolitan Municipalities
The Metropolitan Council of Chambers of Commerce
in cooperation with the
Twin Cities Business Community

On September 10, 1976 the Metropolitan Dutch Elm Disease Leadership Conference (sponsored by the Association of Metropolitan Municipalities, the Metropolitan Council of Chambers of Commerce, and the Twin Cities Business Community) brought together over 250 community leaders from government, the business sector, planning agencies, civic organizations, and neighborhood groups to listen to distinguished speakers and panelists discuss Dutch elm disease. (See the attached Conference Program.) The Conference took place to provide key decision-makers with the most reliable and up-to-date information available on the many issues directly relating to Dutch elm disease and the many responses our community can make to the challenge it poses.

The Conference transcript is well over 100 pages in length. To provide you with the important information presented at the Conference without requiring you to read the entire transcript, we have prepared a summary of the key points made by each speaker and panelist. If you would like to examine a complete copy of the transcript, please notify Jim Williams, First National Bank of Minneapolis, 120 South 6th Street, Minneapolis, Minnesota 55480 (370-4801). We trust that you will find this summary informative and useful in your work during the critical weeks ahead.

The Conference Planning Committee

CONFERENCE SUMMARY HIGHLIGHTS

What is Dutch elm disease (DED)?

Dutch elm disease is a fungus spread by a tiny beetle which breeds and only breeds in dead and dying elm wood and feeds and only feeds on the tops of healthy elm trees. If we remove all or most dead elm wood about as fast as it appears, and if we interrupt root grafts between sick and healthy trees, we will have taken the major steps to slowing Dutch elm disease to minor proportions. Don Willeke

What is the destructive power of Dutch elm disease?

DED was first discovered in Illinois in 1951. Today, over 90% of the elm trees in that state have been lost. David French

DED has spread across the United States. It is now a major environmental problem in California as well as in other western states. David French

95% of the elm population in St. Paul will be gone by 1983, and 95% of the elms in Minneapolis will be gone by 1989, if nothing is done to manage the losses. David French

What can be done to save our elm trees?

You can save over 80% of your elms over a 15 year period with a comprehensive sanitation program consisting of a) early identification, b) prompt removal of both public and private trees, using private contractors, c) proper disposal (burning mostly), and d) replanting. Frank Kelly

Sanitation is the key to controlling DED and getting rid of dead elm wood is the heart of a sanitation program. Harold McNab

What are the ingredients necessary to a successful sanitation program?

Successful sanitation programs require expertise so as to fit individual districts within the community. The successful programs are not the most expensive, nor are they all the same. They must be tailored to fit conditions and distributions of trees. Two ingredients are necessary and common to all successful sanitation programs: a) Clearly identified, responsible, and active leadership, and b) long-term maintenance of the program. Harold McNab

In order for sanitation to work you must have the power to go on private property, using public funds, to remove private trees. Frank Kelly

What causes a sanitation program to fail?

Syracuse lost its 53,000 elm trees because of politics and a lack of public support, not because of a lack of technology. Frank Kelly

When authority to enter on private property was rescinded, public support for the program evaporated and within two years annual losses of fewer than 1,000 trees mushroomed to over 6,000. Within three years after suspending sanitation efforts, annual rate of loss reached 15%. In five more years over 99% of the elms were gone. Frank Kelly

Up to 80% of the spread of DED on streets where trees were planted close together is due to root grafting rather than the elm bark beetle. In fact, sanitation programs can fail if they do not consider root grafting. Harold McNab

Individuals and municipalities alone cannot afford to maintain a sanitation program. State financial and human resources are necessary. Harold McNab

Won't we be able to save money by just letting trees die and simply removing them?

Improved sanitation programs can reduce yearly losses and yearly costs. Tom Rusin

You will not be able to avoid major expenditures by doing nothing. You are going to spend money no matter what you do. Probably more if you allow all the trees to die now. Harold McNab

It will cost the community more to do nothing than it would to have a vigorous control program. It costs more to remove trees than to protect them. It also costs more in aesthetics and indirect costs such as an increase in your air conditioning bill. Frank Kelly

What about lignasan?

Lignasan works, but only if proper injection techniques are used. Ed Kondo

Lignasan is not the sole answer to DED control. Ed Kondo

We will have to deal with rip-off artists dealing in the treatment of trees with lignasan. John Chenoweth

Dr. McNabb will recommend using lignasan only if a) root injection is used, and b) the solution consists of low concentrations of the chemical in large volumes of liquid. Harold McNab

SUMMARY

METROPOLITAN DUTCH ELM DISEASE LEADERSHIP CONFERENCE

September 10, 1976

Wendy Maltzen, President, Council of Metropolitan Chambers of Commerce, and Josephine Nunn, President, Association of Metropolitan Municipalities, welcomed participants to the Conference. In doing so, however, both voiced concern that a "program of action" must be developed soon to deal with the Dutch elm disease problem.

The following are the major points expressed by D. H. Ankeny, Jr., President, First National Bank of Minneapolis:

1. There is mounting public clamor for action.
2. There is urgent need for a plan which will produce a coordinated area-wide program.
3. Legislation is required to relax existing limits on the amount of money municipalities can raise to combat Dutch elm disease.
4. A DED program should not create a new public agency, but rather contain a coordinated plan to be implemented by all our communities, supported by all appropriate existing state and metro agencies.
5. The DED program must be a 10 year undertaking at a minimum.

David French, Professor of Plant Pathology, University of Minnesota

1. The origin of DED is somewhat in doubt. It was discovered somewhere around 1918, 1919 in Northern France.
2. In the 1920's it was established that the disease was caused by a fungus rather than a bacterium.
3. Dutch elm disease first entered the U.S.A. in 1926 or 1927 carried in a shipment of elm logs from Northern France. It was first identified in Ohio.
4. DED will operate at a low level until it has broadened its base of operations and then it will explode.

5. DED has spread across the United States. It is now a major environmental problem in California as well as in other western states.
6. DED was first discovered in Illinois in 1951. Today, over 90% of the elm trees in that state have been lost.
7. DED was first discovered in Minnesota in 1961 and ten years from now we run the risk of losing over 90% of our elm trees.
8. The reason we are so late in getting at the problem of Dutch elm disease is that during the first seven years of its infancy, losses were so small that no one noticed.
9. Today, however, the disease has spread throughout Minnesota.
10. Legislative help did finally come in the early 1970's.

David French predicts that

1. 95% of the elm population in St. Paul will be gone by 1983, and 95% of the elms in Minneapolis will be gone by 1989, if nothing is done to manage the losses.
2. By 1985 St. Paul will need \$30,000,000 to remove and dispose of dead trees and by 1990 Minneapolis will need \$41,000,000.
3. A "sanitation" program must be the backbone of any effort to manage the losses of trees.
4. Very little effort is being put into the development of good sanitation programs.
5. In replanting, we should switch to other species.
6. We need more research into methods for disrupting common root systems.
7. Greater efforts must be made to prune dead wood out of trees.

David French is not opposed to the use of lignasan. However, it is not a replacement for a sanitation program.

Frank Kelly, Commissioner of Parks and Recreation, Syracuse, N.Y.

1. Syracuse lost its 53,000 elm trees because of politics and a lack of public support, not because of a lack of technology.

2. You can keep annual losses to a minimum. You can spread the loss over a period of years, but only if you recognize the seriousness of the problem and have a vigorous campaign to control it, a campaign which must gain and sustain public support.
3. It will cost the community more to do nothing than it would to have a vigorous control program. It costs more to remove trees than to protect them. It also costs more in aesthetics and indirect costs such as an increase in your air conditioning bill.
4. You need a comprehensive, region-wide sanitation program to control the disease.
5. In the City of Syracuse, in four years losses mushroomed from one to 1,000 trees.
6. Areas where elm logs are stored provide an excellent breeding center for the beetle.
7. Syracuse instituted a fine of \$150 for storing bark-on elm logs on one's property.
8. In order for sanitation to work, you must have the power to go on private property, using public funds, to remove private trees.
9. Syracuse contracted with private companies for much of the removal expense.
10. With a comprehensive sanitation program consisting of a) early identification, b) prompt removal of both public and private trees, using private contractors, c) proper disposal (burning mostly), and d) replanting, over a six year period annual losses were held at less than 2%. You can save over 80% of your elms over a 15 year period.
11. When authority to enter on private property was rescinded, public support for the program evaporated and within two years annual losses of fewer than 1,000 trees mushroomed to over 6,000. Within three years after suspending sanitation efforts, annual rate of loss reached 15%. In five more years over 90% of the elms were gone.
12. Replant different trees and not more than 10% of any one kind.

Ed Kondo, Research Scientist with the Great Lakes Forest Research Center of the Canadian Forestry Service.

1. Lignasan is not the answer to DED control.
2. Lignasan is a passive chemical which means it does not actively move throughout the tree.

3. Proper distribution of lignasan throughout the tree is essential and is directly related to the manner in which it is injected. A tremendous amount of technical experience is required in order to get the chemical to distribute properly. For example, although it would appear to be a simple matter to pound a dowel or plastic injector head into a tree, positioning of the head is vital. If you pound it in too deep, you will miss the outer annual rings where the fungus is to be found and, consequently, you will not get proper distribution. You must also take into consideration the circumference of the trunk of the tree, the moisture tension in the tree, and other factors as well. Some trees require a combination of flair and root injections. Dr. Kondo feels that the injection process is so difficult that operators in Canada are required to take a four day course, which most feel is too short, and pass a test before they are allowed to use the chemical
4. Direct root injection rather than flair injection or trunk injection is the best way to obtain proper chemical distribution. Also, with root injection you may inject a tree in early March. Whereas with flair injection you will not get optimal distribution until a time of about 3/4 leaf expansion which occurs much later in the spring.
5. Because elm trees are different in different geographic areas, thorough research with lignasan in our area is needed.
6. Acute chemical toxicity (damage to leaves) can occur if injection is done incorrectly.
7. Lignasan works, but only if proper injection techniques are used.

Harold McNab, Professor of Botany and Plant Pathology and Forestry at Iowa State University.

1. The most serious mistake a community can make in dealing with DED is to neglect to remove and dispose of all dead and dying elm wood.
2. Sanitation is the key to controlling DED and getting rid of dead elm wood is the heart of a sanitation program.
3. Up to 80% of the spread of DED on streets where trees were planted close together is due to root grafting rather than the elm bark beetle. In fact, sanitation programs can fail if they do not consider root grafting.
4. Spraying may have application in the metro area.

- 5. Dr. McNabb will recommend using lignasan only if
 - a. Root injection is used.
 - b. The solution consists of low concentrations of the chemical in large volumes of liquid.
- 6. No responsible person anywhere is recommending using lignasan BLP if you do not also have an intensive sanitation program.
- 7. The USDA feels that a sustained 16 year commitment to controlling the spread of DED is required.
- 8. A high level of skill and training is required for either sanitation or lignasan injections.
- 9. Individuals and municipalities alone cannot afford to maintain a sanitation program. State financial and human resources are necessary.
- 10. You will not be able to avoid major expenditures by doing nothing. You are going to spend money no matter what you do. Probably more if you allow all the trees to die now.
- 11. Start replanting trees now and plant a mixture so one disease or one insect won't wipe out all the trees as DED is doing with the elm.
- 12. Successful sanitation programs require expertise so as to fit individual districts within the community. The successful programs are not the most expensive, nor are they all the same. They must be tailored to fit conditions and distributions of trees.
- 13. Two ingredients are necessary and common to all successful sanitation programs:
 - a. Clearly identified, responsible, and active leadership.
 - b. Long-term maintenance of the program.

Tom Rusin, Commercial Banking Officer, First National Bank of Minneapolis

- 1. It can take many years from the time the first case of Dutch elm disease is discovered to reach the explosive stage. However, once that stage is reached, experience shows that 90% of a typical elm population can be wiped out in 11 years. The average municipality will lose 50% of its elms within 7 years.

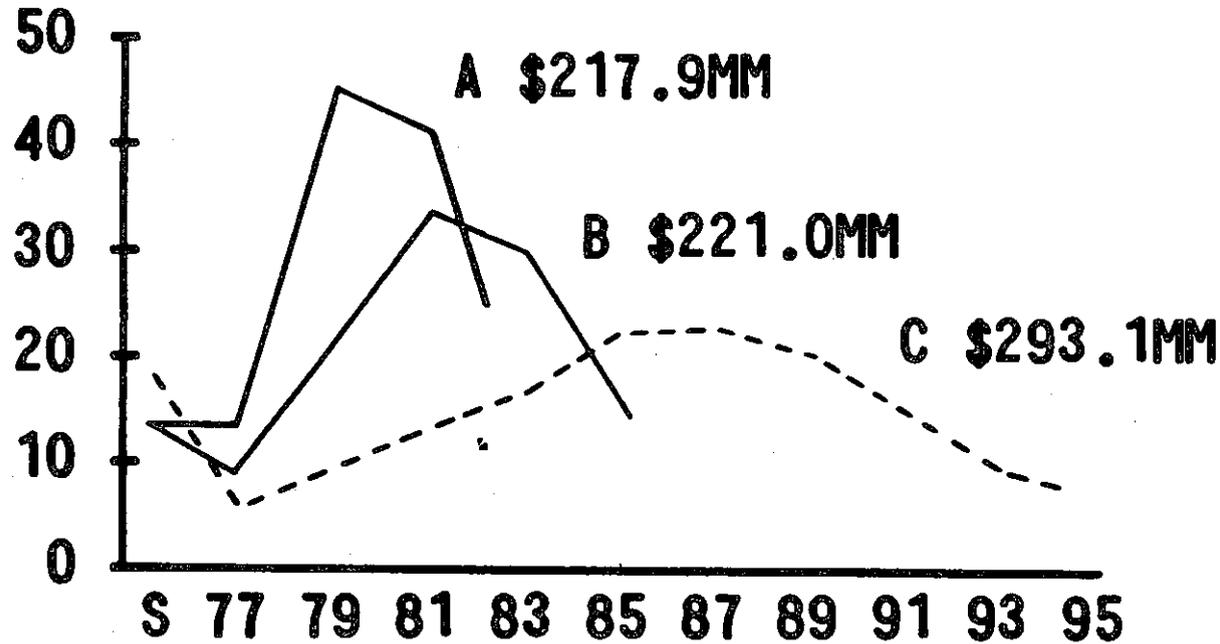
2. Controls can impact on the rate of the disease. By removing dead wood (the beetle's natural breeding ground) a community can slow down the rate of infestation.
3. Rusin describes the rates of loss and the costs under three scenarios.
 - a. Doing nothing, i.e. allowing the disease to run its natural course and simply removing and disposing of trees as they die.
 - b. Doing what we are doing now, i.e. inconsistent and uncoordinated control programs throughout the metro area.
 - c. Improved control programs.
4. The attached chart summarizes Rusin's findings.
 - a. The cost of doing nothing is incurred immediately, extends over a small number years, and is substantial.
 - b. The cost of what we are doing now is incurred over a longer period of time but is substantially the same as the cost of doing nothing.
 - c. The cost of improved sanitation is incurred over an 18 year period (each line in chart ends at year when 90% tree mortality is achieved) and is somewhat higher than the other scenarios.
 - d. Under any circumstances large dollar amounts will be spent.
 - e. Tree losses and control costs will rise yearly for the next several years under all three scenarios.
 - f. Improved sanitation programs can reduce yearly losses and yearly costs.

Don Willeke, Chairman, Minnesota State Shade Tree Advisory Committee.

1. Dutch elm disease is a fungus spread by a tiny beetle which breeds and only breeds in dead and dying elm wood and feeds and only feeds on the tops of healthy elm trees. If we remove all or most dead elm wood about as fast as it appears, and if we interrupt root grafts between sick and healthy trees, we will have taken the major steps to slowing Dutch elm disease to minor proportions.

PROJECTED YEARLY COSTS COMPARISON

\$MM/YR



A. MINIMUM CONTROLS —
B. SANITATION SIMILAR TO 1975 —
C. IMPROVED SANITATION ----

2. The first order of business in the war on Dutch elm disease is to get the dead wood out, out of our forests, and out of some of our public officials.
3. If injection of any chemical works, Willeke is for it, but not as a primary measure. A sanitation program must be the primary measure. The State of Minnesota must intervene to provide the resources for a substantial sanitation program.
4. To do nothing would cost even more than to act and to spend considerable sums now.
5. Minnesota Statute §180.23 enacted in 1974 legislative session requires tree inspectors in every community.
6. The 1975 legislature passed Subdivision 3 to the main statute creating a grant-in-aid program providing financial assistance to property owners and local units of government; \$45,000 for education, \$800,000 for property owner relief, \$700,000 for aid to regional units of government in establishing a tree disposal system.
7. Willeke wants \$300,000 this time for public education alone.

Willeke wants \$100,000 for research on beetle injection systems, other control and prevention measures.

Willeke wants \$900,000 to aid counties and large cities in establishing regional wood utilization center.

Willeke wants \$20,000,000 July 1, 1977 thru June 30, 1979 for 50% matching grants to local governments to assist in the huge costs of detection and removal of diseased trees, interruption of root grafts and removal of dead elm wood.

Wayne Burrgraaff, Richfield City Manager

1. Municipal government has an important responsibility to exert leadership in the war against DED.
2. Municipalities must prioritize DED programs in relationship to other community needs.
3. Municipalities need help in raising money for DED programs. Tax levy limit law restricts municipalities' ability to raise money. When a municipality is at its levy limit, it cannot raise the 50% match money required to participate in the state program. He recommends the institution of a special levy.

Tom Berg, State Representative, Minneapolis

1. He is hopeful that the next legislative session will be able to reinstate a special levy law which will enable municipalities to raise money.
2. Disappointed that Minneapolis did not participate in the state matching grants program.
3. Hopeful government agencies can work together and that a coordinated effort is possible.
4. Thinks a public education program must continue.
5. Suggests asking NSP with all its resources to participate in the DED program.
6. Warns of the difficulty in getting people to accept an increase in taxes for any reason. It is going to be difficult to raise \$20,000,000 recommended by the Shade Tree Advisory Committee.
7. Suggests a metro-wide bonding program as a way of raising money.
8. Local political pressure is the best way to ensure that municipalities participate in DED programs.

John Chenoweth, State Senator, St. Paul

1. He will propose legislation making it illegal to store elm wood on private property in Minnesota.
2. We will have to deal with rip-off artists dealing in the treatment of trees with lignasan.
3. Replanting is central to a DED program. He plans to authorize legislation making \$10,000,000 of state money available on a 50-50 basis to local units of government for the purpose of replanting trees.

Pete Vanderpoel, Director, State Planning Agency

1. Individual homeowners using the chemical lignasan may or may not know what they are doing.
2. A comprehensive sanitation program is vital and requires a long term effort.
3. The cost is probably the same over the long haul whether we have a good sanitation program or whether we don't.

4. We are not currently doing the job that needs to be done. Municipal response is somewhat spotty.
5. In the state legislature, DED, as a matter of priority, will be important. DED will be competing for dollars with other programs that other people think are important as well.

Walt Carpenter, Minnesota Nurserymen's Association

1. A cooperative effort with leadership from the state level is required for any DED program to be successful.
2. In considering transporting diseased logs, remember that fungus bearing beetles are spread along the transportation routes. We should do what is necessary to minimize the distance over which these logs are carried. Loads should be covered. And burning should be used on an increased basis.
3. We as a state must be willing to finance a DED program over a sustained period of time.
4. Reforestation must begin at once.
5. Private industry is capable of and willing to supply trees to the metropolitan area in substantial quantities and at a reduced price.
6. Pledges the support of the Twin Cities Nurserymen's Association in coming up with a solution to the reforestation problem.

Wade Savage, Homeowner and Concerned Citizen

1. Homeowners are frustrated because they want to do something to save their elm trees and the city is only telling them how to cut the elms down.
2. There is no one way of saving the elms. Sanitation is essential, maybe even spraying is essential. The injecting of lignasan is effective. A total integrated program of tree control is going to be required to save the elm trees.
3. You will not be able to sell a DED program to the citizens of Minnesota unless you believe in it. And to believe in a program, you must believe that it will save the elms, not merely prolong them a few more years.
4. No sanitation program will work unless you reach all diseased trees on private property.

5. He is frustrated that local authorities either oppose or are neutral about lignasan. He admits lignasan is not a cure all, but he emphasizes that it can and should be a part of any good control program.
6. The law must be changed so that proper doses of lignasan can be used without violating the law.

DUTCH ELM DISEASE PUBLIC AFFAIRS PROGRAMSITUATION:

There are 4 million elm trees in the Minneapolis/St. Paul metropolitan area -- over 90% of our shade tree population.

They're going to die.

Dutch Elm Disease is the killer and there is no cure. If nothing is done to curb the epidemic, 95% of the metro area's elms will be gone by 1989 -- in 12 short years. The loss is increasingly dramatic -- in the metro area 4 elms died in 1963 ... 600 were gone by 1970 ... 5,900 died in 1973 ... 75,460 in 1976 ... 288,000 elms are doomed in 1977.

The 1976-77 growing season was the critical time period. If a major area-wide disease control program was not instituted, it would be too late to do anything to retard the spread of the disease.

Dutch Elm Disease is a deadly fungus spread from tree to tree by a beetle. It attacks water-conducting vessels and causes the tree literally to choke itself to death.

Needed was a re-allocation of private and legislative resources to develop a treatment, sanitation and replanting program -- estimated to cost nearly \$1 billion over the next 12 years.

Understaffed and underfinanced municipal park boards were trying to cope with the epidemic. But, elected officials would not appropriate funds unless there was sufficient public pressure. What was needed was for the private sector to assume the leadership role to raise public awareness immediately of the tragic aesthetic and economic consequences of the epidemic and to operate as a catalyst for public sector action and increased private sector support.

On August 5, 1976, the First National Bank of Minneapolis declared war on Dutch Elm Disease!

OBJECTIVES:

- * To act as a good corporate citizen by assuming the leadership role to increase public awareness of the magnitude of the Dutch Elm Disease problem.
- * To operate as a catalyst for public sector action and increased private sector support of a comprehensive treatment, sanitation and replanting program.
- * To establish a means by which concerned citizens could organize and vocalize their support for an effective community-wide program to the proper public officials.
- * To develop a coordinated metro-wide long-range strategy to control the spread of Dutch Elm Disease and institute a replanting program.
- * To mobilize the resources of companies, institutions and individuals to assist in creation of a control program.
- * To press for legislative and public funding for implementation of an ongoing control program.
- * To enhance the image of First Minneapolis among the business sector and general public.

IMPLEMENTATION:

It was to be an all-out war. The critical timing, complexity and enormity of the job dictated a three-phase attack.

- I. A blitz multi-media and PR campaign (paid and negotiated public service) in late summer 1976 when the growing season was still in process and identification of diseased trees could still be made. Limited funding meant the campaign had to be a creative "block-buster" to break through the public apathy barrier and initiate meaningful public support. "Dutch Elm Disease ...

It's a dying shame" became the rallying cry.

- II. During the fall and winter months, the Bank concentrated on pressing for legislative action and funding as well as mobilizing the resources of the private sector to back an area-wide control program.
- III. At the start of the 1977 growing season, re-initiate a multi-media/PR campaign continuing public education of the problem, but with primary emphasis on sanitation and reforestation action plans.

The exhibits detail the action plan, but an important part of Phase I was to initiate a "first step" program which included: convening Community Leadership Conferences; establishing a volunteer-staffed Elm Watch Information Center to provide facts about Dutch Elm Disease and treatment; harnessing all available information resources; and providing the community an opportunity to make informed decisions about what is necessary to combat Dutch Elm Disease.

RESULTS:

- * Far and away the most impressive result was the passing of a \$28,500,000 Dutch Elm Disease legislation in May, 1977 providing assistance to municipalities for sanitation and reforestation programs.

When First Minneapolis started its war on August 5, 1976, "total lethargy" by politicians was an understatement. The

"It's a dying shame" campaign was credited for creating the sense of urgency and a stimulus for public and private involvement. By the time the Minnesota State Legislature convened in January 1977, no fewer than 12 Dutch Elm Disease bills were introduced.

- * In six weeks after the Elm Watch Information Center opened on August 5 ... over 8,000 phone calls and over 3,300 coupons were received from concerned citizens -- all a direct result of our media efforts. On April 5, 1977 the First Minneapolis Elm Watch Information Center re-opened its 5 telephone lines and from 300 to 500 calls are still received daily. An incredible number for a volunteer staff to handle.
- * The metropolitan Dutch Elm Disease Leadership Conference organized and convened by First Minneapolis under a joint sponsorship with the Twin Cities business community was telecast live from the First Minneapolis Auditorium and provided the impetus for important private sector action. A few examples: the governor called out the National Guard every weekend for a 3-month period beginning in late September 1976 to pick up and dispose of dead elm wood throughout the metro area. Many corporations encouraged their employees to assist the National Guard with their pick-up programs. Dayton-Hudson Corp., Honeywell and other major corporations adopted public parks to care for within Minneapolis. The Citizens League Board of Directors made Dutch Elm Disease its highest priority item last fall and initiated a thorough study of the problem.
- * Thousands of publicity stories, TV and radio reports and programs were generated during and following our 8-week media campaign -- a great majority citing the Bank's involvement and all adding to the public awareness so desperately needed. There were virtually

no negative responses and we believe we accomplished our image objectives in an overwhelming fashion.

- * The effectiveness of our \$50,000 media budget for the awareness campaign was more than tripled by involving media management in running our messages as public service announcements ... and preparing special electronic execution for their use. On billboards and buses, we negotiated "one free for one paid" postings and arranged for free discussion time on Dutch Elm Disease on dozens of radio and TV shows.
- * First Minneapolis, under the guidance of its Urban Development Department, has continued to maintain its leadership posture in mobilizing the resources of companies, institutions and individuals and is the focal point for information to the press and public.
- * While this effort was strictly a public affairs program, a surprising number of citizens became First Minneapolis customers as a form of "thank you" for our efforts. One example:
 - "... I have a great deal more respect for your bank because of the Elm Watch campaign. Just recently I moved back into the Cities. So, perhaps you might be interested in knowing, that I will be doing my banking with First Minneapolis. May the forward thinking of the First Bank continue."
- * Perhaps the most gratifying result is the expression by so many of our bank management and staff ... the pride and feeling of accomplishment in being involved in a meaningful community effort. No price tag can be placed on that.

On June 4, 1976, the First
Minneapolis Urban Development
Department held an in-bank
informational meeting which
delineated the Dutch Elm
Disease problem and
sparked initial interest
by bank management.



It's a dying shame

Exhibit

INITIAL ELM PRESENTATION
PROGRAM WAS MODEST IN CONCEPT

While the first action plans
were tentative in nature,
the opportunity for
leadership by First
Minneapolis was
acknowledged and
began to crystallize
our thinking.



It's a dying shame

Exhibit

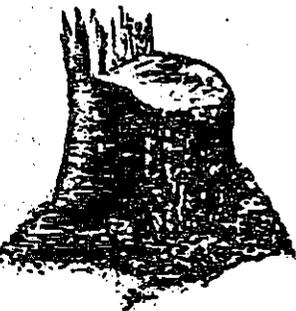
PLANS BEGIN TO GEL FOR A
MASS MEDIA AWARENESS PROGRAM

In July of 1976, a preliminary
proposal was made to top bank
management asking for a
commitment of time and money
resources for a mass media
public awareness program.
The go-ahead was given to
prepare creative and
implementation plans.

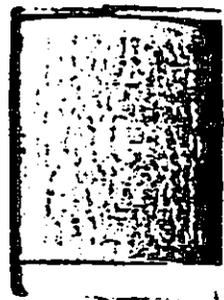


It's a dying shame

It soon became apparent that our involvement had to be more than a media awareness program. To ensure success, commitments had to be made for a coordinated metro-wide, long-range program with First Minneapolis providing a continuity leadership role.



It's a dying shame

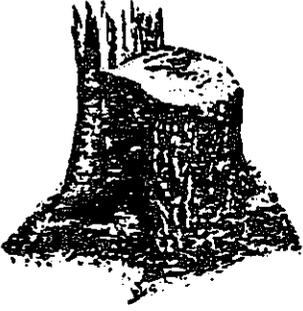


Exhibit

**BATTLE PLANS OUTLINED TO
DUTCH ELM ACTIVISTS/EXPERTS**

A select task force representing citizen and corporate interests regarding the Dutch Elm problem met for their input on our non-media plans.

Their response was overwhelmingly enthusiastic and full support was pledged.

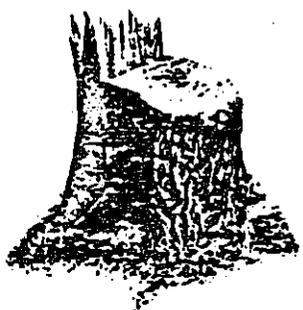


It's a dying shame

Exhibit.

**FINAL PRE-LAUNCH MEETING ENLISTED
SUPPORT OF ELECTED OFFICIALS,
METROPOLITAN COUNCIL, THE PRESS
AND COMMUNITY LEADERS.**

An overflow attendance by those vital to the success of the program gave us our first heartening glimmer that we could indeed achieve, or exceed, our objectives.



It's a dying shame



COMPLETE BRIEFING GIVEN
TO PRESS, GOVERNMENT
AND COMMUNITY LEADERS AT
AUGUST 5 KICK-OFF MEETING



It's a dying shame

Exhibit

BANK EMPLOYEES WERE
BRIEFED BY PRIVATE BANK
WIRE AND EDUCATIONAL
BROCHURE

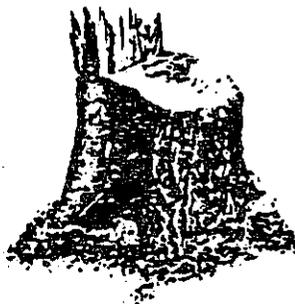


It's a dying shame

Exhibit

"IT'S A DYING SHAME"
NEWSPAPER AD WAS OPENING SALVO

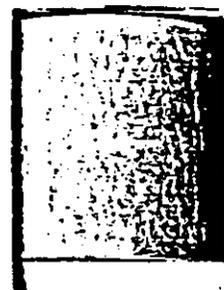
For maximum impact, the
full-page newspaper ads
were scheduled into a
4-week "blitz" campaign.



It's a dying shame

OVER 3,300 COUPON RESPONSES FROM
CONCERNED CITIZENS WERE RECEIVED
FROM ADVERTISING EFFORTS

Here are a few
representative responses.
All 3,300 were forwarded
to members of the State
Legislature. Please
read some of them.

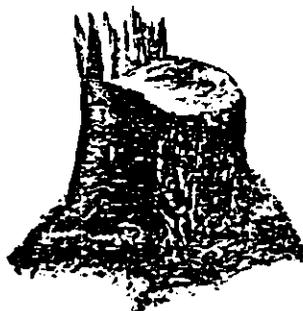


It's a dying shame

Exhibit

RADIO CAMPAIGN EXTENDED OUR
REACH -- ESPECIALLY WITH
NEGOTIATED "FREE" PUBLIC
SERVICE SPOTS

The radio spots
were quite dramatic
and won several
creative awards.



It's a dying shame

Exhibit

OUTDOOR POSTERS AND BUS SIDE
POSTERS COMPLETED OUR MEDIA PACKAGE

As with radio, our meetings
with media people along
with community leaders
helped greatly in
negotiating free space.



It's a dying shame

60,000 BROCHURES WERE DISTRIBUTED
IN-BANK AND IN CHECKING ACCOUNT
STATEMENTS

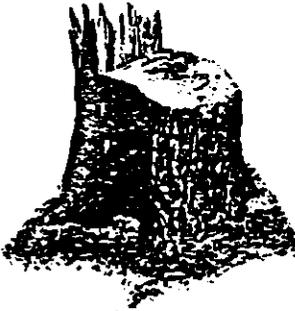
As with our newspaper ads,
readers were asked to
state their concern and
we forwarded their
responses to appropriate
elected officials.



It's a dying shame

Exhibit

ELM WATCH INFORMATION CENTER
WAS HEART OF THE OPERATION



A totally dedicated, patient
volunteer staff handled
over 8,000 phone calls at
First Minneapolis in August
and September 1976 giving
out vital information --
most of it in great depth
-- to concerned citizens.

It's a dying shame

Exhibit

METROPOLITAN DUTCH ELM DISEASE
LEADERSHIP CONFERENCE WAS MAJOR
FACTOR IN MOBILIZING PRIVATE
RESOURCES AND LEGISLATIVE APPEALS

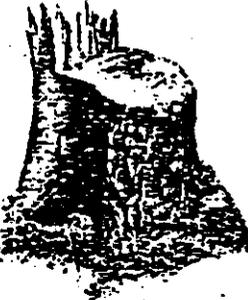


Exhibits show program,
summary of conference,
opening remarks by
Mr. Ankeny and
legislator invitees.

It's a dying shame

THOUSANDS OF PUBLICITY STORIES
HEIGHTENED PUBLIC AWARENESS OF
THE DUTCH ELM PROBLEM

The combination of the media awareness campaign and enormous newspaper coverage brought necessary public pressure on elected officials -- leading eventually to passage of \$28½ million Dutch Elm Disease aid legislative bill.



It's a dying shame

Exhibit

SPECIAL EFFORTS HELP
SPUR PRIVATE SECTOR SUPPORT

Cooperation with civic and business groups, employee communications, stockholder reports, public demonstrations, media contacts have become a continuing effort on First Minneapolis' part.



It's a dying shame

Exhibit

SPRING/SUMMER '77 MEDIA CAMPAIGN
COMPLETED PHASE III OF ACTION PLANS

Award-winning newspaper ads continued public education efforts but placed primary emphasis on "What Can You Do" in terms of identification, sanitation and reforestation.



It's a dying shame

ENDORSEMENTS OF FIRST MINNEAPOLIS'
EFFORTS PROVIDED EXTRA MEASURE OF
SATISFACTION

Exhibits are a few
of the many warm
letters we received.



It's a dying shame

Exhibit

AT 3:30 PM MAY 18, 1977, MINNESOTA
GOVERNOR RUDY PERPICH AUTHORIZED
\$28½ MILLION TO FIGHT DUTCH ELM DISEASE

... a momentous moment
in Minnesota history.



It's a dying shame

News from the office of the Governor Wendell R. Anderson

For Release 9:00 a.m.
Friday, September 3, 1976

From: Duane C. Scribner
130 State Capitol
St. Paul, Mn.
(612) 296-3391

Governor Wendell R. Anderson today announced a statewide elm cleanup program to intensify efforts in Minnesota this fall to stem the spread of Dutch elm disease.

The four-part effort will:

1. Make resources and equipment of the Minnesota National Guard and State Highway Department available throughout the state to pick up elm firewood, diseased logs, and trees on private property on a neighborhood-by-neighborhood basis.

2. Use the Office of the Governor to coordinate an information and pickup effort in designated parts of Minneapolis, St. Paul, and outstate communities beginning the weekend of September 18-19, and continue throughout the metropolitan area and outstate Minnesota during the fall and winter.

3. Obtain the cooperation of businesses in the metropolitan area in seeking volunteers among their employees to assist in the removal and disposal of dead and diseased elms in the 35 public regional parks in the metropolitan area and help plant new trees next year. The governor indicated that 36 companies have already agreed to assist the effort (see accompanying statement and list).

4. Ask local governments to provide leadership in their communities in working with the Governor's Office, the National Guard, and the State Highway Department on the cleanup program. The governor reminded local governments that they must apply for burning permits from the Pollution Control Agency if needed to dispose of wood, and property tax levies may be used to provide funds for cleanup if necessary.

(over)

Calling Dutch elm disease "a national, catastrophic epidemic," Governor Anderson noted that many civic groups and local governments are now working to remove trees. State funds have been made available, the governor indicated, "but we can't save those elms unless we intensify our effort now." He asked for the cooperation of every group, individual and government unit in Minnesota.

Removal of dead elm wood is important to the effort to slow down the spread of Dutch elm disease because the elm bark beetle that spreads the disease breeds in dead elm wood and then attacks healthy trees. Removal efforts are the major known method of limiting the spread of the disease, which has devastated elm trees throughout the nation and is now in an epidemic stage in Minnesota.

Experts predict, for example, that 95 percent of St. Paul's elms will be lost by 1983 and the same proportion of Minneapolis elms by 1989 without a major cleanup effort. The loss of elms in the metropolitan area during 1975 and 1976 is expected to be about 75,000, with losses on an increasing basis in coming years. The metropolitan area is estimated to have more than three million elm trees; the estimate for Minnesota is more than 137 million.

In 1975, Governor Anderson's environmental message proposed a \$3 million Shade Tree Disease Control and Replacement program, with the funds to be used for public education, research, and program grants to county and municipal governments, in order to "avoid the ecological disasters which have overtaken our neighboring states." The 1975 session of the Legislature appropriated \$1.6 million to the Minnesota Department of Agriculture for shade tree disease control.

Information on the statewide cleanup effort will be available through the Governor's Office, 612-296-3391.

FOR FURTHER INFORMATION, see accompanying materials.

13

News from the office of the Governor Wendell R. Anderson

For Release at 9:00 a.m.
Friday, September 3, 1976

From: Duane C. Scribner
130 State Capitol
St. Paul, Mn.
(612) 296-3391

STATEMENT OF GOVERNOR WENDELL R. ANDERSON ON STATE ELM CLEANUP PROGRAM

Governor Wendell R. Anderson issued the following statement today announcing a statewide elm cleanup program to help slow down the spread of Dutch elm disease:

Dutch elm disease in Minnesota is an epidemic. Many civic groups and local governments are working to slow it down, and we have made state funds available to help. But that's not enough. We've got to do more than we've been doing.

Every piece of dead elm wood in Minnesota is a breeding place for the elm bark beetle that spreads the disease. That wood must be identified, removed, and disposed of in order to keep our remaining elm trees as healthy as we can for as long as we can.

Today I am announcing a statewide elm cleanup program to use public and private resources to get that job done this fall. We are taking these four steps:

1. The resources and equipment of the Minnesota National Guard and the State Highway Department will be made available statewide to assist volunteers in the pickup of elm logs (including firewood) and trees on private property on a neighborhood-by-neighborhood basis.

2. Our office will coordinate an information and pickup effort in designated parts of Minneapolis, St. Paul, and outstate communities, beginning on the weekend of September 18 and 19. We will continue that effort every weekend throughout the metropolitan area and outstate Minnesota as long as there is a need and weather permits.

3. We have obtained the cooperation of 36 companies in the metropolitan area to take responsibility for the removal of dead and diseased elms in our 35 regional public parks by seeking volunteers among their employees. Every company we have asked so far has agreed

(over)

to help. We still need more volunteers, and we also want those companies to help replace the lost trees in our parks next year.

4. We are asking local governments to help us work with the National Guard and State Highway Department to provide leadership for the program in their communities. Local governments will need burning permits to dispose of the wood, and the Pollution Control Agency has assured us that those permits will be granted. If necessary, local governments can provide necessary funds by levying taxes in excess of our statewide levy limits.

To do this job, we will need the cooperation of every group, individual, and government unit in our state that can possibly help. Information on the program will be available in the Governor's Office by calling 612-296-3391. Our staff coordinator is John Kingrey.

This elm cleanup program can't save the trees that are already dead or dying. But a major effort this fall can slow down the spread of the disease to healthy trees and protect our magnificent elms for years and years.

Our state Department of Agriculture estimates that we have more than 137 million elm trees in Minnesota. The rapid spread of Dutch elm disease - a national, catastrophic epidemic - has already destroyed many of them. Of the more than three million elm trees in the seven-county metropolitan area, for example, we will have lost more than 75,000 in 1975 and 1976 alone. We can expect to lose 95 percent of our St. Paul elms by 1983 without a major cleanup effort, and 95 percent of our Minneapolis elms by 1989. With a proper effort, we can prolong the life of our urban elms by 15 or 20 years.

But we can't save those elms unless we intensify our effort now. I hope and believe that the steps we are taking this fall will make a big difference, and we need a great deal of help to be successful. In announcing this program today, we are also asking for that help.

13

News from the office of the Governor Wendell R. Anderson

For Release 9:00 a.m.
Friday, September 3, 1976

From: Duane C. Scribner
130 State Capitol
St. Paul, Mn.
(612) 296-3391

DESCRIPTION OF STATE ELM CLEAN-UP PROGRAM

This emergency program is an effort to mobilize and manage all available public and private resources in the fight against Dutch elm disease. The program will consist of actual tree removal and a curb-side pick-up of hazardous elm wood. The effort will be targeted at those areas experiencing the highest incidence of the disease.

The following outline describes in detail the goals and methods of the statewide elm clean-up program.

I. Goals

- A. To inform the public about the hazard of standing dead elm trees and elm logs being saved for firewood.
- B. To remove and destroy all dead elm wood.
- C. To increase tree removal activities.

II. Methods

A. Public Education

1. Volunteers will be solicited through civic groups and businesses.
2. A training session will be given for volunteers to teach them how to identify elm wood, and give the basic background about Dutch elm disease control.
3. Volunteers will canvass the target area for one week prior to the pick-up. They will urge citizens to participate in the scheduled pick-up, answer questions, and assist homeowners in identifying the elm wood.

(over)

4. Information flyers will be left with homeowners as a reminder and as a notice to people not reached by the volunteers.

B. Curb-side Pick-up

1. Residents will stack elm wood along the curbs for pick-up and disposal.
2. Hauling vehicles and drivers will be provided by the National Guard and Highway Department. As the program expands, private businesses are expected to assist in furnishing transportation.
3. Initial target areas will be St. Paul, Minneapolis, Rochester, and Mankato. The program will expand to include all Minnesota communities affected by Dutch elm disease.
4. Pick-ups will continue on weekends throughout the fall and winter months.

C. Public Park Cleanup in the Twin Cities Metropolitan Area

1. Private companies in the metropolitan area will seek volunteers among their employees to assist in removing and disposing of diseased and dead elms in the 35 public regional parks in the metropolitan area.
2. The Governor's Office will work with the companies to assign park areas and develop work schedules.
3. Available company and agency equipment will be identified and assigned to tasks too complicated or dangerous for individual volunteers.
4. Hauling vehicles and drivers will be provided.

News from the office of the Governor Wendell R. Anderson

For Release 9:00 a.m.
Friday, September 3, 1976

From: Duane C. Scribner
130 State Capitol
St. Paul, Mn.
(612) 296-3391

Thirty-six metropolitan companies have agreed as of today to seek volunteers among their employees to help remove and dispose of diseased and dead elms in 35 public regional parks in the metropolitan area. Additional companies are expected to participate as well.

The companies include:

- | | |
|-------------------------------------|------------------------------------|
| Medtronic, Inc. | American Hoist & Derrick Co. |
| Dayton Hudson Corporation | The Pillsbury Co. |
| Minnesota Mutual Life Insurance Co. | Fingerhut |
| H. B. Fuller Co. | Piper Jaffray & Hopwood Inc. |
| Control Data Corp. | Northern States Power Co. |
| Honeywell Inc. | Munsingwear Inc. |
| Tonka Corp. | Peavey Company |
| Tennant Co. | Burlington Northern Inc. |
| 3M | E. L. Murphy Trucking Co. |
| Litton Industries | First National Bank of Minneapolis |
| Buckbee-Mears Co. | Deluxe Check Printers Inc. |
| Economic Laboratories Inc. | The Toro Co. |
| Northwestern Bell Telephone Co. | Cenex |
| General Mills Inc. | Webb Company |
| St. Paul Companies Inc. | McQuay-Perfex Inc. |
| Minnegasco | Land O'Lakes Inc. |
| International Multifoods Corp. | Green Giant |
| Hoerner-Waldorf Corp. | Donaldson Company Inc. Mfrs. |

United States of America



I, Joan Anderson Growe, Secretary of State of the State of Minnesota, do hereby certify that I have compared the annexed copy with the record of the original -instrument- in my office of

ARTICLES OF INCORPORATION
OF
Governor's Shade Tree Foundation, Inc.

and that said copy is a true and correct transcript of said -instrument-

and of the whole thereof _____



IN TESTIMONY WHEREOF I have hereunto set my hand and affixed the Great Seal of the State, at the Capitol in St. Paul, this 8th day of November A. D. 19 76.

Joan Anderson Growe
SECRETARY OF STATE

HARRISON A. WILLIAMS, JR., N.J., CHAIRMAN
JENNINGS RANDOLPH, W. V.
CLAIBORNE PELL, R.I.
EDWARD M. KENNEDY, MASS.
GAYLORD NELSON, WIS.
WALTER F. MONDALE, MINN.
THOMAS F. EAGLETON, MO.
ALAN CRANSTON, CALIF.
WILLIAM D. HATHAWAY, MAINE

JACOB K. JAVITS, N.Y.
RICHARD S. SCHWEIKER, PA.
ROBERT TAFT, JR., OHIO
J. GLENN BEALL, JR., MD.
ROBERT T. STAFFORD, VT.
PAUL LAXALT, NEV.

DONALD ELISBURG, GENERAL COUNSEL
MARJORIE M. WHITTAKER, CHIEF CLERK

United States Senate

COMMITTEE ON
LABOR AND PUBLIC WELFARE
WASHINGTON, D.C. 20510

October 2, 1975

Mr. Donald C. Willeke
O'Connor and Hannan
Attorneys at Law
38th Floor, IDS Tower
80 South 8th Street
Minneapolis, Minnesota 55402

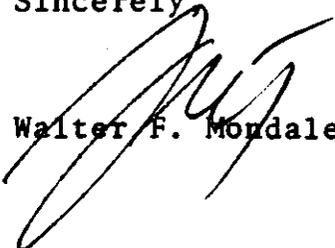
Dear Don:

Enclosed is a copy of the bill I introduced yesterday regarding the Dutch elm disease.

I appreciate your bringing the need for such legislation to my attention. If you have any further comments on this bill, please get back in touch with me.

With warm personal regards,

Sincerely,


Walter F. Mondale

October 1, 1975

October 1, 1975

By Mr. MONDALE:

S. 2442. A bill to establish a program for the prevention and control of Dutch elm disease. Referred to the Committee on Agriculture and Forestry.

Mr. MONDALE. Mr. President, I am today introducing legislation designed to help curb the epidemic of Dutch elm disease sweeping the Nation's 20 million elm shade trees.

The Dutch elm disease, unknown in America before 1930, has become the most destructive shade-tree disease in the United States. The disease has spread until it now occurs from the east coast to the Rocky Mountains and from North Carolina and Arkansas to Canada. The disease is causing extremely heavy losses of both wild and planted elms in many parts of this area.

This disease, which is caused by a fungus that chokes off the tree's vascular system, kills an estimated 400,000 elm trees in 30 States each year. Elms are being virtually eradicated in the cities, where they constitute most of the trees along the streets and in the parks; and a similar danger exists for elms in rural forests and park lands.

The U.S. Forest Service estimates that the Dutch elm disease will infect shade trees in all 50 States within the next 15 years because of its alarming and rapid spread.

The Dutch elm disease results in rapid wilting of foliage. Some trees die a few weeks after becoming infected. Other trees wilt slowly and survive for a year or longer. All native elms, including the American elm and all European species are susceptible to this disease.

If no control measures are used, almost all the elms may die in a short while, leaving naked cities, reduced property values and requiring the immediate expenditure of millions of dollars in removal costs.

In terms of real estate, an elm represents a large factor in the value of the home it shades. Where elms have fallen to disease, the value of costly property has fallen with them. The elm trees' cooling shade actually reduces summer temperatures 15° to 25° and the trees help purify the air by utilizing carbon dioxide and liberating oxygen. As a factor in noise abatement, tree-lined streets absorb a high percentage of sound, reducing the nervous strain from mounting city traffic.

It costs from \$100 to \$400 to remove a large elm such as the type usually found lining the streets and in the backyards of cities and towns across the Nation. The monetary losses and costs to such areas as Des Moines, Omaha, Minneapolis, and Kansas City—to name just a few—have been enormous. Proper control measures are not excessively costly, however, when compared with the cost of doing nothing.

At the present time, there is no known cure for Dutch elm disease. Infected trees must be destroyed. Until research provides a cure, proper control measures can help limit tree losses and, hopefully, the majority of the elm trees can be kept alive while orderly efforts to plant different types of trees take place.

The bill I am introducing would help

local communities institute control programs to halt the Dutch elm disease epidemic by authorizing the Secretary of Agriculture to conduct surveys, either independently or in cooperation with State or local governmental agencies, to detect and appraise the extent and nature of Dutch elm disease in both forest and urban areas and provide technical, financial, and other assistance for protecting, treating, or destroying trees which are infected with Dutch elm disease or which constitute a threat to other elm trees. It would also provide for an accelerated research program for discovering and developing methods of prevention and control of Dutch elm disease.

The appropriation is minimal, only \$5 million for the first fiscal year, \$7½ million for the second year, \$10 million for the third year, and such sums as may be necessary for the succeeding fiscal years. There is also an additional \$400,000 for each of 5 years for research into the control and prevention of this disease.

We must act now, or suffer the fate which has befallen so many municipal environments where elms were the predominant shade tree species.

Mr. President, I ask unanimous consent that the full text of my bill be printed in the RECORD.

There being no objection, the bill was ordered to be printed in the RECORD, as follows:

S. 02442

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Agriculture shall establish and maintain a program for purposes of preventing and controlling Dutch elm disease in forest, urban, and other areas. Under this program, the Secretary, subject to section 2, shall—

(1) conduct surveys, either independently or in cooperation with State or local governmental agencies, to detect and appraise the extent and nature of Dutch elm disease in forest, urban, and other areas;

(2) provide technical, financial, and other assistance in forest, urban, and other areas, in cooperation with State or local governmental agencies and subject to whatever conditions the Secretary deems necessary, for the purposes of protecting, treating, or destroying trees which are infected with Dutch elm disease or which constitute a threat to other elm trees; and

(3) accelerate research, either independently or in cooperation with State or local governmental agencies, for the purpose of discovering and developing methods of prevention and control of Dutch elm disease.

Sec. 2. The Secretary may not perform the activities authorized by this Act on any land owned by any entity other than Federal Government unless that entity contributes, or agrees to contribute, to the work to be done on its land in an amount and in a manner determined by the Secretary.

Sec. 3. (a) There are authorized to be appropriated, for the activities performed under paragraphs (1) and (2) of the first section of this Act, \$5,000,000 for the first fiscal year ending June 30, 1976, \$7,500,000 for the fiscal year ending September 30, 1977, \$10,000,000 for the fiscal year ending September 30, 1978, and such sums as may be necessary for the succeeding fiscal years.

(b) There are authorized to be appropriated, for the research conducted under paragraph (3) of the first section of this Act, \$400,000 for each of the five fiscal years be-

ginning with the fiscal year ending June 30, 1976.

By Mr. MOSS:

S. 2443. A bill to reduce unnecessary paperwork burdens placed by the Federal Government upon the American people, and for other purposes. Referred to the Committee on Government Operations.

GOVERNMENT FORMS JUSTIFICATION AMENDMENTS OF 1975

Mr. MOSS. Mr. President, we have allowed the bureaucrats to invade every facet of American life and in particular to allow a small businessman to be inundated in a sea of paperwork. During the August recess in Utah people all over my State complained to me about the ease with which the Federal Government slaps more and more requirements upon an already staggering citizenry.

The man-hours required to prepare and then to shuffle this mound of paper is absolutely staggering and in most instances appears to be totally unnecessary to meet the requirements of the law.

U.S. News & World Report for October 6 states that a company with 40,000 employees has to maintain 125 file drawers of records to meet Federal reporting requirements on personnel. This is ridiculous, and I want to put a stop to it now and without waiting for any study commission to produce more paperwork to tell me that there is too much redtape in Government.

This is a simple bill. It requires each unit of Federal Government to file each year a list of forms required to be filed with such governmental unit. The Office of Management and Budget, which ought to live up to its name, is mandated to declare obsolete and withdraw from further usage all forms which are not explicitly authorized by statute.

Mr. President, we could move on this bill right away and relieve the country from a paper tidal wave.

By Mr. PERCY (for himself, Mr. RIBICOFF and Mr. BELLMON):

S. 2444. A bill to provide for the orderly transition to the new October 1 to September 30 fiscal year; and

S. 2445. A bill to provide permanent changes in laws necessary because of the October-September fiscal year. Referred to the Committee on Government Operations.

ORDERLY TRANSITION TO THE NEW FISCAL YEAR

Mr. PERCY. Mr. President, today, along with Senators RIBICOFF and BELLMON, I am introducing legislation which will provide for the operation of governmental programs during the period of July 1 through September 30, 1976, and amendments to the statutes which are necessary because of the change in the fiscal year of the Federal Government.

With the enactment of the Congressional Budget and Impoundment Control Act of 1974, we made significant changes in the budget process and improvements in fiscal procedures. One change made by that act was to provide that the fiscal year of the Government begin on October 1. This provision takes effect in 1976 with a 3-month transition quarter bridging the old fiscal year to the new.

ARBORIST'S NEWS

LETTERS

Archives: You may be interested in the origin of the mast head of the Arborist's News. When I was Secretary of the Shade Tree Conference and with the Department of Plant Pathology at Rutgers University during the depression days, I had an artist working for me on WPA funds assisting in some work relating to a publication on some disease long since forgotten. We were just starting the Arborist's News then and we needed a mast head. I assigned to the job to him. The mast head was used from then to this time. I was never impressed with it but it stuck by for about 40 years.

I thought you might like to know of this historical background of the Arborist's News. *Dr. Richard P. White, Silver Spring, Md.*

Legislation: The Dutch elm disease (DED) has traditionally been viewed as a municipal problem. As such, the application of programs for its control has been uneven and the integration of new methods slow. Most importantly, political and fiscal limitations have resulted in disastrous discontinuities in sanitation programs. As a result, only a few municipalities in the northeastern and midwestern states have effectively protected their elms. Nevertheless, the American elm remains one of the most important, if not the principal, shade tree in most American cities. Owing to its contagious nature and the magnitude of its impact, DED is clearly a national problem for which a national program is warranted.

If you approve of the basic concept of HR 1049, we request that you call the bill to the attention of your representatives and senators. Your support as a researcher and expert will be influential. *Gerald N. Lanier, John B. Simeone, Robert M. Silverstein, Syracuse, New York.*

H. R. 1049

A Bill

To establish a program for the prevention and control of Dutch elm disease

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Agriculture shall establish and maintain a program for purposes of preventing and controlling Dutch elm disease in forest, urban, and other areas. Under this program, the Secretary, subject to section 2, shall—

(1) conduct surveys, either independently or in cooperation with State or Local governmental agencies, to detect and appraise the extent and nature of Dutch elm disease in forest, urban, and other areas;

(2) provide technical, financial, and other assistance in forest, urban, and other areas, in cooperation with State or local governmental agencies and subject to whatever conditions the Secretary deems necessary, for the purposes of protecting, treating, or destroying trees which are infected with Dutch elm disease or which constitute a threat to other elm trees; and

(3) accelerate research, either independently or in cooperation with State or local governmental agencies, for the purpose of discovering and developing methods of prevention and control of Dutch elm disease.

SEC. 2. The secretary may not perform the activities authorized by this Act on any land owned by any entity other than Federal Government unless that entity contributes, or agrees to contribute, to the work to be done on its land in an amount and in a manner determined by the Secretary

SEC. 3. (a) There are authorized to be appropriated, for the activities performed under paragraphs (1) and (2) of the first section of this Act, \$5,000,000 for the fiscal year ending June 30, 1976, \$7,500,000 for the fiscal year ending September 30, 1977, \$10,000,000 for the fiscal year ending September 30, 1978, and such sums as may be necessary for the succeeding fiscal years.

(b) There are authorized to be appropriated, for the research conducted under paragraph (3) of the first section of this Act, \$400,000 for each of the five fiscal years beginning with the fiscal year ending June 30, 1976.

Lloyd Burkholder IV

SHADE TREE DISEASE CONTROL

Statement of Rep. Donald M. Fraser to the House Interior Appropriations Subcommittee April 21, 1977

Mr. Chairman, members of the Subcommittee, I am appearing before you today to request an increase of \$4.5 million in the General Forestry Assistance fund for Fiscal 1978.

The purpose of this increase is to enable the Forest Service to expand its efforts to control the spread of shade tree diseases.

Currently, the Forest Service is spending \$553 million a year on forest protection and utilization programs. Of that amount, less than one half of one percent is devoted to combatting Dutch Elm disease and other maladies that infect our urban forests.

Dutch Elm disease is an immediate and critical problem for my state. We know that Minnesota's urban environment will be drastically altered if we let the disease run its course. The City of Minneapolis, alone, estimates that 95% of its elms will be lost by 1985 unless major disease control efforts are initiated. Luckily, the people of our state are alert to the problem and control programs are already underway. Our efforts represent an attempt to avoid the fate that has befallen many midwestern and eastern cities, whose denuded boulevards bear witness to the devastating impact of the disease.

USDA Dutch Elm Report. In an effort to get a clear nationwide view of Dutch Elm disease (DED) and the efforts now underway to combat it, Congress last year directed the Department of Agriculture to conduct a major study of the disease. The directive was included in an amendment to the 1976 Forest Management Act. The results of the study, submitted to Congress by Secretary Bergland on April 6 should provide useful data for your Subcommittee as you consider an expanded role for the Forest Service in the area of shade tree disease control.

The USDA reports shows a steady westward spread of the disease since it was first reported on the east coast in 1930. In all, 41 states are now reporting an incidence of DED. Thus far, only the states of Florida, Louisiana, New Mexico, Arizona, Utah, Nevada, Washington, Hawaii, and Alaska appear to have escaped infestation.

The incidence of DED is highest in the Northeast, where 12 states have lost 75% of the elms within their municipalities. The impact of the disease is just now beginning to be felt in many western and midwestern states. Of the 16 affected states west of the Mississippi River, 12 have lost less than 25% of their elms and 9 have lost less than 5%.

According to the USDA study, the percent of trees killed is closely related to the length of time DED has been present in a state. In states where the disease was first reported during the past ten years, an average of 95% of the elms still remain. In states where the disease was first reported from 21 to 30 years ago, an average of 32 percent of the trees are left.

Chart 1 included in the appendix to this statement shows the current distribution of the disease on a state-by-state basis. Chart 2 indicates the percentage of elms remaining in the affected states since initial detection.

Disease control techniques and costs. DED cannot be eradicated, but community-based control programs can reduce annual elm loss as low as 1%. To be effective, control programs should include extensive surveying to detect diseased elms, prompt removal of diseased and dead elms to prevent buildup of the disease-conveying bark beetle, spraying the entire elm population with the chemical methoxychlor, and severance of root grafts between diseased and healthy elms.

Communities with large elm stands find that they must pay for the disease regardless of what course of action they follow. Either they can do nothing to impede the spread of the disease and face sizeable tree removal costs after DED has taken its toll, or they can initiate a control program at a time when most of their elms are not yet infected.

A Forest Service study conducted by William Cannon and David Worley, indicates that the second alternative is clearly cost effective. Cannon and Worley surveyed expenditures in 39 cities over a 15 year period and found that control costs were from 37 to 76 percent less than the cost of removing dead trees where no control was attempted.

The Agriculture Department estimates that state and local governments are currently spending about \$30 million a year on DED control programs. Chart 3 in the appendix shows expenditures in 23 states. The chart indicates that Minnesota is now spending about \$6 million a year. This spending level will increase substantially under new control legislation now nearing final approval in our state legislature.

The federal role. As indicated earlier, the federal role in combatting DED is modest at best and limited largely to research. Proposed FY 1978 federal funding for DED research is \$1,369,400.

In its report to Congress, the Agriculture Department presented several alternative proposals for an expanded federal effort in combatting the disease. These proposals did not constitute departmental recommendations. Instead, they were merely options developed in response to a congressional directive in the 1976 National Forest Management Act.

The most extensive level of federal participation, included in the Department's list of options, involved provision of technical assistance to state and local governments, extension education and federal cost-sharing on 50% matching basis for state and local disease control activities. According to the Department, this level of federal involvement could protect about 40% of the elms in the country that are threatened by DED. The cost to the federal government would total \$115 million a year. A less extensive effort would involve a 25-75 federal-state cost sharing program, requiring a federal expenditure of \$35 million a year.

3-3-3

Eventually, Congress might want to consider a major expansion of Forest Service programs at the levels described above. Before doing so, the authorizing committees in both Houses might want to examine the issue of shade tree disease control more thoroughly than we have been able to do up to now.

In the short run, I think a modest increase in Forest Service efforts can be justified on the basis of the information that has been included in the USDA report to Congress.

My proposal for a \$4.5 million funding increase, over and above the Administration's FY 1978 request, will cover expanded Forest Service activities in the following areas:

Comparative field studies (\$2 million). The expanded Minnesota control program will have as its main thrust the removal and disposal of dead elms. State and local governments in Minnesota and elsewhere throughout the country must find ways of reducing the extremely high cost of these sanitation activities by developing more cost-effective control methods. Comparative field studies, supported by Forest Service, could point the way towards more cost-effective ways of proceeding with well-balanced and environmentally sound sanitation programs.

Comparative field studies could include

- ...intensified ground surveying techniques, followed by prompt removal or radical pruning of diseased elms
- ...applications of methoxychlor, pheromone, Lignasan BLP and other chemicals used at various stages in the disease control process
- ...further evaluation of root graft control methods in urban areas
- ...application of potassium iodide in wilderness areas and along river bottoms where tree removal is difficult
- ...intensive on-site loss studies of various management practices to develop the most appropriate mix of cost-efficient control methods.

A \$2 million expenditure could support a series of these field studies under a variety of conditions.

Wood reutilization (\$2 million). Thus far, sanitation activities have brought about a major disposal problem in Minnesota. Many local communities see no alternative but to dispose of diseased elm wood through open burning or in land fills. These practices have an adverse environmental impact by contributing to air pollution and other public health problems.

Wood reutilization represents an environmentally sound and energy efficient approach to the problem of disposal. Reutilization, moreover, can aid control efforts by generating revenue that can help defray the cost of sanitation.

Up until now, the development of effective reutilization systems has been hampered by the fluctuating market for wood chips and other materials recovered from elm wastes. The uncertainty of these markets makes capital investment in wood residue processing facilities risky. For this reason, the private market has not yet entered into the tree waste recovery business and local communities are reluctant to invest public funds in the construction of recovery facilities.

We need to demonstrate the economic and environmental merits of converting elm tree residue into a variety of wood-based products such as paper, charcoal, fuel, wood and furniture. A \$2 million appropriation could provide funding on a demonstration basis for several stationary and mobile waste reutilization facilities. This federal support could also be used in part to help develop a market for materials produced by the reprocessing facilities.

Public education (\$5000,000). Any DED control program, to be effective, must have the full support of an informed public. In communities where control programs have not been successful, public understanding and awareness of the programs have often been lacking.

In its report to Congress, the Agriculture Department has developed a 5-year outreach program designed to motivate people to cooperate in DED control efforts, involve local citizens in planning and conducting control programs, and demonstrate locally-adapted DED control practices. The Department has estimated that a five year program would require a federal expenditure of \$2.5 million. A federal outlay of \$500,000 in Fiscal 1978 would represent the first year cost of this national public education program.

Clearly, state and local governments will have to bear the major responsibility for protecting their urban forests by combatting the spread of Dutch Elm and other shade tree diseases. The federal government can play a role in preserving an important natural resource, however. It can provide limited financial resources to state and local governments for more adequate control efforts. It can provide scientific and technical expertise often not found at the local level. And it can provide a more coordinated and comprehensive approach on the national level to the problem of Dutch Elm disease.

XXXXXX

FIGURE 1
DISTRIBUTION OF DUTCH ELM DISEASE
IN THE UNITED STATES, 1976

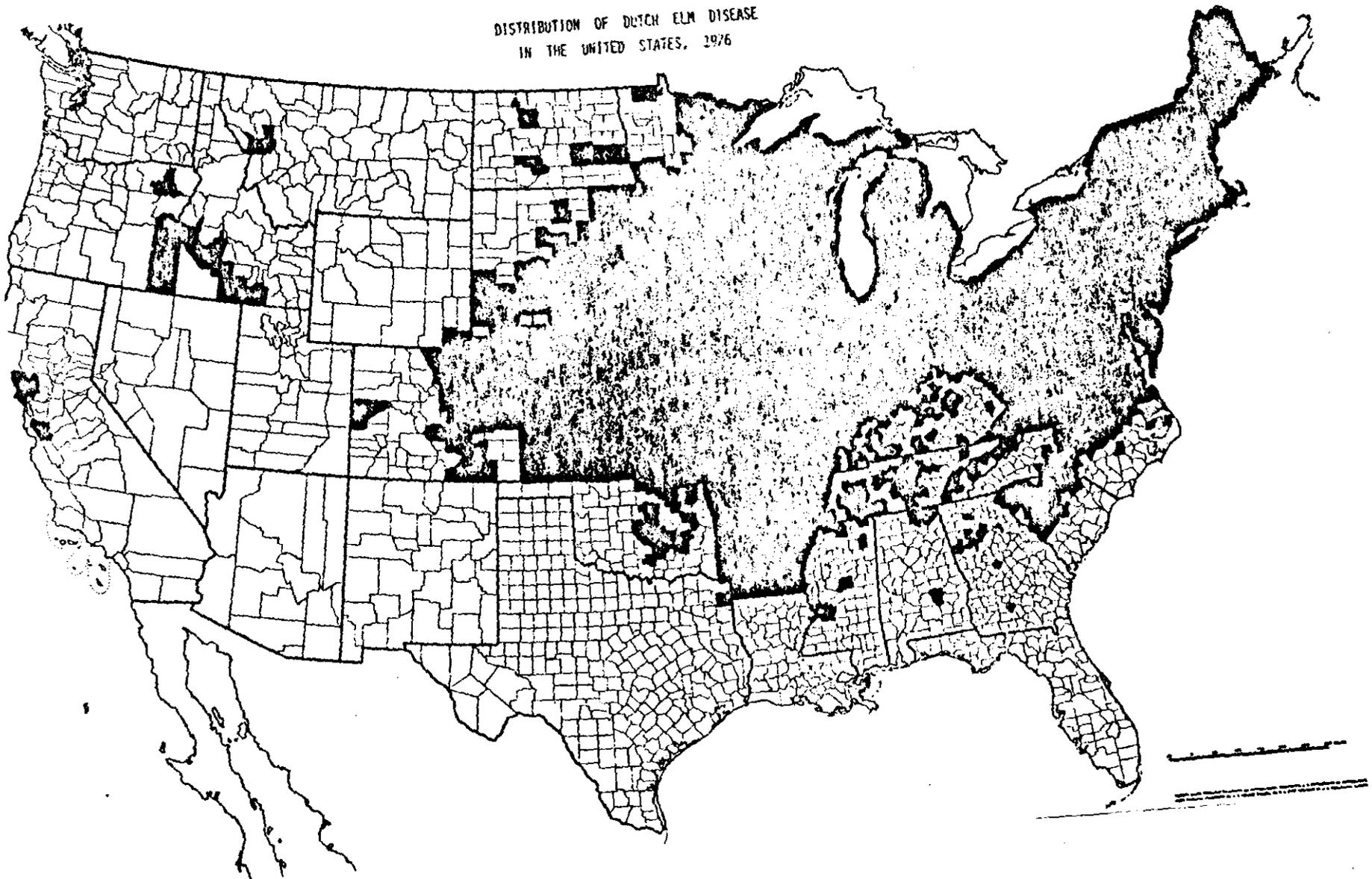


Chart 3

Annual Expenditures
of 23 States Reporting
for Dutch Elm Disease

<u>STATE</u>	<u>ANNUAL EXPENDITURE</u>
California	\$ 2,200,000
Colorado	963,000
Idaho	60,000
Indiana	250,000
Iowa	429,000
Kansas	400,000
Maine	50,000
Massachusetts	2,036,000
Michigan	18,000
Minnesota	6,460,000
Missouri	1,800,000
Montana	200
New Hampshire	84,000
New York	525,000
North Dakota	143,000
Ohio	60,000
Oregon	5,000
Pennsylvania	65,000
South Dakota	70,000
Vermont	100,000
West Virginia	3,000
Wisconsin	3,000,000
Wyoming	4,820
Total	<u>\$18,726,020</u>

NEWS

from **congressman donald m. fraser**

1111 House Office Building, Washington, D.C. 20515 • (202) 225-4755

FOR RELEASE: Sunday, April 17, 1977

U.S. STUDY SHOWS THAT DUTCH ELM DISEASE CONTROL LESS COSTLY THAN TREE REMOVAL, ANDERSON AND FRASER REPORT

Rep. Donald M. Fraser and Sen. Wendell Anderson reported today that a U.S. Forest Service study shows that local communities that take no action to control Dutch Elm disease may have to spend four times as much on tree removal over a 15-year period as other equivalent-sized cities and towns spend during the same period on programs to combat the spread of the disease.

The national cost study, conducted by the Forest Service in 39 cities, was included in a U.S. Agriculture Department report to Congress, released today by Anderson and Fraser.

The Agriculture Department report on Dutch Elm disease was authorized under an amendment to the 1976 Forest Management Act proposed by Fraser.

The two Minnesota lawmakers said that the 133-page USDA study represents the "most comprehensive survey to date" of disease control and treatment techniques, state and local expenditures for control activities and the nationwide incidence of Dutch Elm disease.

According to the federal study, Dutch Elm disease has spread to 41 states from coast to coast since the disease was first reported in the United States in 1930. Twelve states, all in the Northeast, have lost over 75% of their elms in their municipalities. Twelve states, including Minnesota, out of 16 affected states west of the Mississippi, have lost less than 25% of their elms to date. Nine states have lost less than 5%.

The Agriculture Department study goes on to report that the percentage of trees killed each year is closely related to the length of time Dutch Elm disease has been present in a state. In states where the disease was reported during the past ten years, an average of 95% of the elms remain. In states where the disease was first reported from 21 to 30 years ago, an average of 32 percent of the trees are left.

The study further reports that municipal control programs, costing an estimated \$30 million annually, now protect about 1.8 million elms out of an estimated 24.4 million that might be protected with additional resources. According to the Agriculture Department, a control program, to be effective, must be designed to reduce the mortality rate to 5% or less annually of the remaining elm population. Control programs must encompass all susceptible elms, public and private alike.

- more -

Fraser and Anderson said that the federal role in combatting Dutch Elm disease is "modest, at best." Currently, the U.S. Forest Service is spending about \$1.3 million a year on research projects dealing with chemical control of disease-bearing beetles, development of a disease-resistant elm strain and sanitation techniques.

"Research is useful," Fraser added, "but the time has come for the Forest Service to take a more active role in protecting our urban forests." The 5th District congressman said that, in response to a congressional directive, the Agriculture Department had laid out options for more extensive federal efforts in combatting the disease. One option, which involved a 50% federal matching program with the states for disease control, could protect about 40% of the elms nationwide threatened by the disease. The 50% cost sharing program would cost about \$115 million a year. Fraser said that the Department also developed less costly federal options that emphasized technical assistance to local communities and public education.

The 5th District congressman noted that the Agriculture Department's funding options, presented in the report to Congress, did not constitute a formal request by the Carter Administration for congressional appropriations to combat Dutch Elm disease. "The Department merely presented funding alternatives in response to our request for development of an action plan.

"Clearly, any major expansion of the Forest Service role in combatting Dutch Elm disease will involve a long-term effort. Hopefully, we can begin that effort by providing a modest increase in the Forest Service budget during the fiscal year that begins on October 1."

Anderson added that Dutch Elm disease control was a major concern of his while Governor and that he hoped to sensitize the Senate to the need for the Forest Service to become involved in disease control efforts in a more active way. "Shade tree disease control represents one area where we can help build an urban-rural alliance in Congress. Traditionally, the Forest Service has been oriented to the needs of rural America. This new study has been a useful exercise," Anderson added, "because it has helped the Agency to recognize more clearly its responsibility for helping to preserve urban as well as rural forests.

"With the new shade tree disease control program moving through the Minnesota State Legislature," Anderson continued, "we can make the point in Washington that Minnesota can serve as the laboratory for the nation in testing and evaluating new disease control techniques."

Fraser and Anderson said that they hoped to work with Governor Perpich, Secretary of Agriculture Bob Bergland and other members of the Minnesota congressional delegation in developing an expanded shade tree disease control program for the Forest Service.

CITIZENS LEAGUE REPORT



**SELECTIVE CONTROL
IS THE ONLY WAY
TO PROTECT ELMS**

**A proposal for neighborhood-city cooperation in controlling Dutch elm disease
in high-priority locations within the Twin Cities metropolitan area**

CITIZENS LEAGUE REPORT

SELECTIVE CONTROL
IS THE ONLY WAY
TO PROTECT ELMS

A proposal for neighborhood-city cooperation in controlling Dutch elm disease in high priority locations within the Twin Cities metropolitan area

Prepared by
Shade Tree Disease Committee
Solveig Premack, Chairman

Approved by
CITIZENS LEAGUE
BOARD OF DIRECTORS
March 2, 1977

CITIZENS LEAGUE
530 SYNDICATE BUILDING
MINNEAPOLIS, MINNESOTA 55402
338-0791

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SUMMARY

Our strategy can be summarized in these words:

- . Selective -- Identify locations where threatened trees are valued most highly and concentrate control efforts there. It's both unnecessary and wasteful to try to protect all trees.
- . Small -- Encourage control to be carried out through separate programs in relatively small geographic areas. Don't attempt a single comprehensive control program over the entire area where trees are being protected.
- . People -- Let the citizen/residents take the lead. The program serves them. Control won't work without their full cooperation and participation.
- . Traditional -- Follow the method of control with a proven record: Get rid of places near valuable trees where beetles can breed, and sever the root systems of adjacent trees. Supplement with other approaches.
- . Thorough -- Stress the importance of removing all dead and dying elmwood from a control area. Partial control is almost the same as no control.
- . Annual -- Prepare for a long-term battle. Dutch elm and oak wilt diseases can't be eradicated. The same efforts with the same degree of diligence must be repeated year after year for as long as trees are being protected.

Our central conclusions:

Trees should be protected because they are beautiful and because it makes sense economically to spread the expense of removal over many years.

Although Dutch elm and oak wilt diseases have established strong footholds in the Twin Cities metropolitan area, the battle by no means is lost, particularly if we select our priorities for control carefully.

Top priority areas for control should be (a) individual *elms and oaks* with unique historical qualities or in particularly valuable locations, such as Victory Memorial Drive or Summit Avenue, or the oldest and largest *elms and oaks* within a city; (b) residential areas and parks where *elms* make up a clear majority of shade trees and where their pattern of planting makes them esthetically pleasing; and (c) rural and urban forests and woodlots where *oaks* are dominant.

Our major recommendations:

- State assistance would be increased, but eligibility would be tied to local performance.
- Cities would be required to establish priority areas for control as a condition for receipt of state funds.
- Diseased trees would be marked with the date by which they are to be cut down.
- Citizens could petition if cities don't remove trees on time. Petitions would be relayed automatically to the State Department of Agriculture.
- Qualifying neighborhood associations could arrange for removal of public trees not cut down on time, with guarantee of reimbursement of expenses.
- Persons who sell, give away or store bark-on elm firewood would be subject to fines and other penalties.
- Better technical assistance would be given to citizens on use of Lignasan.
- Early decisions would be made on use of selected chemicals.
- Tree service firms would be licensed.
- Citizens and cities would act before April 1977 to remove remaining dead and dying elmwood from control areas.
- Contingency plans for disposal would be provided in case counties do not follow through as instructed.
- High priority control areas would receive first priority access to disposal sites.
- Cities would replant at least as many public trees as are removed or forfeit state funds.
- The broad informal alliance of interest groups in the shade tree disease problem would form, together, a private shade tree protection society to monitor progress in control to carry out public education efforts.

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

I. SEVEN THINGS WE HAD TO UN-LEARN ABOUT DUTCH ELM DISEASE.

Over the last five months many of our preconceived notions about Dutch elm disease have been dispelled and, in the process, we have developed a much deeper understanding of the disease and what should be done about it.

1. First, some of us were imagining swarms of beetles flying up the Mississippi River Valley, invading our metropolitan area, attacking every elm tree, and leaving nothing but devastation behind.

Yes, we have learned that the disease is very serious. It is present throughout the metropolitan area. We will lose hundreds of thousands of elms over the next several years. The disease cannot be eliminated. But there is hope. It is a blight not a plague. Dutch elm disease is not the same as a vision of 1930s-type-locusts blackening the sky and devouring midwestern grain fields. The elm bark beetle behaves quite differently, and to understand and control Dutch elm disease you've got to understand the beetle. It usually doesn't fly very far from its birthplace to infect a healthy elm tree.

2. Second, we had figured that if Dutch elm disease were uncontrolled in some parts of our seven-county metropolitan area, it would be futile to try to control the disease in other parts.

Nothing could be further from the truth. We *can* control the disease in some parts of the area and not others, and that is precisely the strategy we *should* follow (this leads to our third mis-conception).

3. We thought that if we at least make some minimum efforts to controlling the disease wherever it is identified in our seven-county area, we'd be able thereby to buy valuable time.

That kind of a strategy, we learned, buys nothing but disaster. There is no such thing as half-hearted control. We must identify high-priority locations and concentrate our resources there, which is the only way to hold back the disease in any part of the seven-county area. If we were to try to save all of our four million elm trees in the region, the job would be so immense--exceeding by far the most optimistic estimate of resources available--that we'd spread our resources too thin and probably save none of our valuable trees.

4. Fourth, we had a feeling that control only could be accomplished through coordinated metropolitan-wide action.

Yes, there are some significant metropolitan dimensions to the problem, particularly when it gets to finding places to dispose of trees once they're cut down. But it was most revealing to us to learn that the actual carrying out of a control program is intensely non-metropolitan, local and neighborhood, in character. Some localities or parts of localities will control the disease and others won't.

5. Fifth, we believed that the Dutch elm problem was up to government to solve.

Yes, government involvement indeed is necessary, in fact, critical. But what we failed to comprehend earlier--and what has come through as so central in recent weeks--is that Dutch elm is one problem where government will fail unless it has the wholehearted support and assistance of citizens in the neighborhood.

6. Sixth, we hoped or expected that a thorough Dutch elm disease control program carried out in one or two years would do the job.

It will, but only for that one or two years. We'll need all the enthusiasm and commitment we can muster year in and year out for as long as our disease-threatened trees are worth saving. There's no quick and easy answer.

7. Seventh, we thought our shade tree disease problem was almost exclusively confined to one kind of disease attacking one species of tree.

Yes, Dutch elm disease is the major threat today. But it's not our only battle. Another disease is slowly gaining a foothold: oak wilt. The disease is every bit as deadly to the oak as Dutch elm disease is to the elm. Our chances of containing oak wilt are much better, if we take corrective steps.

II. THE NEED FOR ACTION

A. Findings

1. Dutch elm disease became an epidemic in the Twin Cities area in 1976 -- Although first discovered in Minnesota in 1961 in St. Paul (one tree) and near Monticello (seven trees), the disease spread very slowly until about 1974.

* The loss in the seven-county area in 1976, about 80,000 trees, was almost three times the level of 1975, which itself had been three times the level of 1974, according to the State Department of Agriculture. On a cumulative basis, the seven-county metropolitan area has lost between 2% and 3% of its original elm population of about 4.5 million trees.

- * The loss substantially exceeded projections. In summary, state agriculture officials had expected the level in 1976 to be about double that of 1975, not triple.

- * About one-third of the metropolitan area loss in 1976 occurred in Minneapolis and St. Paul. Minneapolis lost about 7,100 (about 3% of its original elm population) for a cumulative loss of about 4.5%; St. Paul lost about 16,700 (about 16% of its original elm population) for a cumulative loss of about 22%.

2. Losses in 1977 and subsequent years are projected to be much greater --

- * Metropolitan area losses in 1977 may reach 288,000, more than triple the number in 1976, according to a Metropolitan Council staff report.

- * The city of Minneapolis projects a loss of 15,000 (about 6% of its original elm population) which would make its cumulative loss about 11%. St. Paul projects a loss of 22,000 (about 22% of its original elm population) which would make a cumulative loss of about 44%.

- * If losses continue to accelerate at present rates, fewer than 10% of the region's elms would likely remain after six or seven years, according to the Metropolitan Council.

3. Losses are more severe in some locations than in others --

- * Elm losses are felt most severely in areas where elms have particular historical significance or where, because of the pattern of planting, they are esthetically pleasing. Elm was planted almost exclusively as a boulevard tree along urban streets in the Twin Cities metropolitan area which were built up before the mid-1920s. Elm is virtually the only species of tree along boulevards of St. Paul and Minneapolis and in older suburbs. About 80% of the central cities' shade trees are elm.

- * Larger elms are more valuable, and their loss is felt more than smaller elms. Although about 56% of the elms in the entire seven-county area are larger than five inches in diameter, about 84% of the elms in Minneapolis and St. Paul and the first ring suburbs fall in this category, according to a consultant study prepared for the Metropolitan Inter-County Council.

- * The loss of large elms can be felt particularly where they have shielded older housing units which are more likely to exhibit exterior signs of deterioration.

- * In absolute numbers, elm losses may be high in some communities but the impact will not be as great as others because elm is mixed in with other species. A survey conducted by the Minnesota

Department of Natural Resources indicated approximately 36% of the total of all kinds are located in the seven-county metropolitan area, with elm making up about 10.6% of the total.

8. Conclusions

1. It's not too late to keep the disease at a tolerable level, in selected locations, if action is taken promptly.

- * Although Dutch elm disease has not been adequately controlled so far, there still is a chance to keep its incidence at a manageable level in those parts of the Twin Cities metropolitan area where the elm is valued most highly.

- * But unless major steps are taken in 1977, it is unlikely that much more than a mop-up job would remain. The pre-1977 control program is inadequate.

- * Dutch elm disease cannot be eliminated. We are going to have to learn to live with the disease, just as we have learned to live with crab grass and dandelions. No part of the Twin Cities metropolitan area is unaffected.

- * We should not give up and let the disease sweep through the Twin Cities area as would a torreado. Serious as it is, the disease can be controlled to such an extent that our most valuable elms will remain a major part of this region's beauty for at least 15 years and--depending upon our level of commitment--possibly 25 or 30 years. The critical point will not be the disease rate metropolitan-wide, nor will it be the percentage of trees which still survive. The critical point is which trees are kept alive. In total the trees that are most appreciated for their beauty make up probably no more than 10 to 20% of the total elm population of the metropolitan area.

- * While the lives of our most valuable elms can be lengthened, the elms are not immortal. Most of them probably will die of Dutch elm disease before they die of old age. We must come to accept the fact that thousands of elms will die from Dutch elm disease each year, even with the best control program we can devise. Some trees will die even along highly-valued boulevards, such as Summit Avenue. But removal of trees should be seen as an indication that the control program is working, not that we have failed.

- * Just as Dutch elm disease cannot be eliminated, the disease cannot eliminate the elm. While it will be ill-advised to replant elms along boulevards and in backyards, new elms will continue to grow in wild areas. Perhaps someday a way will be found to eradicate the disease so that young elms again can grow to become stately assets to the region's rural and urban forests.

2. It's worth trying to control Dutch elm disease because of the elm's beauty and because it makes sense economically --

- * Residential streets and parkways lined with elms are, simply, just very beautiful. They lend irreplaceable character to neighborhoods. It would be an absolute tragedy if we failed to take advantage of the opportunity which still is present to gain another decade or two of their presence and, in the process give other types of newly-planted trees the chance to have 10 to 20 years of growth as the elm population is gradually declining.
- * It just makes good practical sense to lengthen the life of the elms. Whether the disease is controlled or not, the money will have to be spent. The only question is when. Dead trees must be cut down. That is very expensive in an urban area. If the disease is not controlled, very high expenses will be incurred in a very short time. With a control program in effect, the expenses can be spaced out over many more years. A U.S. Forest Service study indicates that the total expenses of no control actually exceed the costs of a control program. (See page 20 for more discussion.)
- * We have other reasons for wanting to lengthen the life of the elms, such as the impact of trees on property values, their energy-saving shade in summer, their wind-protection in winter, and their oxygen-producing qualities.

C. Recommendation

We recommend an increase in state grants for the 1977-79 biennium, provided the Legislature enacts sufficient protection so that state funds are used to finance a control program, not a mop-up program.

We further recommend that state grants for subsequent bienniums be reduced or eliminated for those localities where good progress is not made in 1977-79. We believe "good progress" would be made in a given locality if no more than 5% of the original elm or oak population* becomes diseased in the year when the disease reaches its highest incidence in that locality, which means the trees would be phased out over at least a 20-year period. The State Department of Agriculture should be instructed--in its budget request for the next biennium--to recommend a guideline for determining further eligibility for funds.

We believe that state grants-in-aid should be used to help control shade tree disease, not just to help cities pay the expenses of large scale removal. Should control be unsuccessful and if hundreds of thousands of residential shade trees must be removed promptly, we believe that state loans, rather than grants, would be the appropriate state vehicle for assistance.

III. OAK WILT

A. Findings

1. Oak trees dominate the region -- A Department of Natural Resources Survey revealed about twice as many oak trees, 9 million, as elm trees in the metropolitan area. Oak trees are not dominant in the inner suburbs and central cities, but the number is very large in some localities. For example, Coon Rapids has an estimated 1.7 million oak trees, and Burnsville 750,000 oak, according to reports submitted to the State Department of Agriculture.
2. Losses from oak wilt are very low so far -- About 7,900 cases of oak wilt were reported by metropolitan area cities in 1976, 1,000 more than the previous year.
3. Oak wilt spreads mainly by root systems -- Oak wilt is caused by a fungus which develops in the outer sapwood of trees, mainly in the vessels that conduct water and nutrients from the roots to the leaves, according to University of Minnesota plant pathologists. Although the fungus is different, the oak responds just as the elm does to Dutch elm fungus. The oak, in attempting to protect itself from the fungus, produces resins and gums which cut off the tree's water supply, and the tree chokes itself to death.

The oak wilt fungus can be transmitted by a certain sap-feeding beetle which is attracted to open flesh wounds on oak trees. But this is a small reason for the spread. These beetles do not breed and feed in the same manner as do elm bark beetles; consequently they don't pose the same sort of threat to oaks as the elm bark beetle does to elms.

Oak wilt spreads from a diseased tree to a healthy tree mainly through the roots of the trees which have grafted together.

Once an oak tree is infected, there is no known way of saving it. Red or Black oaks are very susceptible and are killed rapidly by the fungus. Bur Oak is slightly resistant, while White Oak is reasonably resistant, according to University of Minnesota plant pathologists.

4. Oak wilt can be controlled by interrupting root grafts -- Spread through root grafts can be prevented by mechanically trenching around infected trees or by injecting a chemical into the ground which kills the roots where they are grafted but doesn't harm the tree, which is the same root graft control as is employed with Dutch elm disease.
5. Region apparently not seriously concerned about oak wilt -- Dr. David French, professor of plant pathology, University of Minnesota, who is perhaps best known as an authority on Dutch elm disease, believes that oak wilt is building a base in this region which could be devastating if action

* in the control areas

is not taken. He said he has seen a 40- to-80 acre oak forest wiped out in two years, despite the fact that control methods are relatively simple. All that is necessary is to identify the diseased trees and isolate their roots from those of neighboring trees. The loss of the region's oak forests could be more serious, he believes, than the loss of the elm. The elm loss is being felt most severely where the elm has been planted in a pattern. The loss of the oak would be felt by the absence of natural-growing oak forests now located in many parts of the region.

B. Conclusions

1. In our haste to control Dutch elm disease, we are failing to give adequate attention to oak wilt, which could be as serious a mistake as letting the elms die. The oak is probably a more valuable regional resource, because there are so many more of them and because of their dominance in the forest portions of the Twin Cities area. Moreover, oak wilt can be controlled much more easily.

C. Recommendations

Unless otherwise indicated, our recommendations for Dutch elm disease apply equally to oak wilt throughout this report.

IV. THE BASIC CONTROL STRATEGY

A. Findings

1. Dutch elm disease is caused by a fungus for which there is no known cure -- The disease is caused by a fungus which grows in the water-conducting vessels of elms. The tree reacts to the fungus by producing resins and gums to wall off the fungus. However, this action also prevents the circulation of plant fluids, causing the tree to wilt and die. No effective way has been found to eradicate the fungus.
2. Beetles carry the fungus from tree to tree -- Tiny beetles no longer than the height of the letters on this page carry the fungus. There are two types: the European elm bark beetle and the native elm bark beetle. The beetles feed *only* on healthy elm trees, no other tree. The European variety, much more numerous in southern Minnesota, feeds inside the crotch of small branches toward the top of trees. The native variety, less numerous in southern Minnesota but more likely to be carrying the disease, feeds on larger branches 4 to 10 inches in diameter or on the main stem. A beetle carrying the fungus is likely to deposit some of the fungus in the healthy tree while feeding.
3. Environmentally-acceptable chemicals to kill the beetles are not generally used -- Although DDT could kill beetles, it is unacceptable because of its damage to the environment. One chemical, methoxychlor, is somewhat effective in killing the beetle,

but has not been widely used in the Twin Cities area

4. The central control strategy is to eliminate places where the beetle breeds -- Since the fungus can't be eradicated and since all beetles cannot be killed, the central control strategy has been to get rid of places where new beetles can be born. Elm bark beetles breed in *only* one place, beneath the bark of dead and dying elmwood. If no places are available for the beetle to breed, then the overall population of beetles can be controlled and, thereby, the spread of the disease. Beetles can survive the winter only beneath the bark of elmwood

Beetles are attracted to dead and dying elmwood for places to breed. They burrow beneath bark and dig tunnels where eggs are laid. Beetles usually spend the winter in the tunnels in the larval stage or, in the case of the native elm bark beetle, also in the adult stage. Beetles begin to emerge in April, with a second generation possible in later summer. A new generation of beetles can invade a tree, breed, reach adult stage and emerge to infect other trees in as short a period as 20 days.

A tree that recently has been infected with the fungus and is now becoming a place for beetles to breed is an oak wood, regardless if the tree has Dutch elm disease, is a breeding site. The wood may be a dead branch on a healthy tree, a dead tree, a stump or a pile of wood such as firewood.

Once a piece of wood has been invaded and colonized with tunnels, it won't be used as a breeding site again.

If no bark is on the elmwood, it won't be invaded as a breeding site. Usually, if wood has been dead for two years the beetle will not invade the wood because it is dried out and because the bark no longer may be affixed tightly to the wood.

5. Beetles usually fly only a short distance from breeding sites to feed -- When an adult elm bark beetle emerges from a breeding site, it will seek healthy trees on which to feed usually within 100 to 300 feet, according to plant pathologists. This means that if Dutch elm disease occurs the same time on many trees in the same small area, the source of infection undoubtedly was some dead or dying elmwood within that small area. From time to time beetles will be blown long distances by wind. (That is essentially how the disease is introduced to a new area.) But infection caused by such beetles will only affect a few scattered trees. They won't cause an epidemic. An epidemic occurs because of a localized infection source.
6. The disease can travel from one tree to the next, when roots have grown together -- Once the fungus has been placed in a healthy tree, it travels very quickly

through the tree's vascular system. By the time a wilted branch is discovered at the top, it is possible the disease already has spread to the roots. Roots of adjacent boulevard trees are particularly susceptible to become naturally fused together because they were planted close to each other and because they are likely to have the same genetic background.

- 7. If root systems can be separated, the disease will not be transmitted by the roots -- Three methods are used for preventing the spread of the disease through root grafts. A chemical called Vapam is injected into holes in the ground midway between the diseased tree and the adjacent tree. The chemical kills all organic matter in the narrow area where it is inserted, including the common root system. A second method involves digging a trench about three feet into the ground, thereby physically cutting the roots. A third method involves cutting in about three inches all around the trunk of the diseased tree. This is called girdling. It must be done early, before the fungus has spread to the lower part of the tree.

By the time the disease is discovered in a tree, the fungus already may have traveled to the adjacent tree. Thus plant pathologists advise that a second root-separation take place between the first healthy tree and the next healthy tree, to be doubly safe.

Plant pathologists advise that treatment should take place two weeks before a diseased tree is cut down. If the tree is cut down before the treatment has time to work, the adjacent tree will suck the fungus from the roots of the diseased tree right into its own system.

Once interrupted, it takes root systems several years to grow back together. Thus Vapam or trenching techniques may be employed as preventive measure even before diseased trees are discovered. Care must be exercised in using Vapam. It can kill a tree if used improperly.

- 8. Cities have lagged in getting trees cut down and removed -- Major efforts have been under way in the winter of 1976-77 to cut down and remove all diseased trees that were identified as diseased last summer. As of November 15, 1976, according to reports filed by cities with the State Department of Agriculture, approximately 75,000 diseased trees in the seven-county metropolitan area had been identified, of which approximately 55,000 had been removed, meaning another 20,000 remained to be removed by April 1977, when beetles emerge from beneath the bark. The report filed by St. Paul revealed 6,900 of its 16,688 diseased trees had been removed. The report filed by Minneapolis revealed 4,300 of its 6,000 diseased public trees had been removed. As of late February 1977, both cities still were working on getting the trees taken down and on removing stumps.

B. Conclusions

- 1. Although Dutch elm disease is spread throughout the metropolitan area, we do not believe it is a metropolitan problem in the same sense as water pollution, for example -- Controlling Dutch elm disease is much more like controlling dandelions. It is essentially a local problem, subject to control at the city/neighborhood level. This point is fundamental: if an epidemic of Dutch elm disease occurs in a neighborhood, the source of the infection most likely is within the neighborhood itself. This means that to control the epidemic, the source of infection must be removed from the neighborhood. The beetle normally feeds (and, in the process, infects healthy trees) within 300 feet of its birthplace--the length of a city block. The disease initially is brought into the neighborhood from the outside, probably by beetles blown in by the wind. But the disease increases because of what happens within the neighborhood.
- 2. Control can succeed in some parts of the metropolitan area and not in others or in some parts of a city and not in others -- There is a widespread myth that if Dutch elm disease is epidemic in one community, trees in a neighboring community automatically are doomed. This myth must be destroyed.
- 3. We believe it is not practical--and probably it is well nigh onto impossible--to try to control Dutch elm disease in every square mile of every city, village and township and in every forest and river corridor in the seven-county metropolitan area -- If we tried to save all the trees, we'd probably end up saving none of them.
- 4. We think it is more likely control will be successful if it is decentralized in separate, highly-localized efforts, rather than centralized in one program for the entire metropolitan area. Each control program must be carried out very carefully and thoroughly and is more likely to be effective if the geographic area is not too large.
- 5. It is critical that priorities be set for control -- Money is limited. Obviously, if money were not limited, then we could do it all, but that is not the case. It is more important to save trees in some areas than in others.
- 6. We believe the metropolitan area should follow a basic, well-established strategy of controlling Dutch elm disease: eliminating places where the beetle can breed in and near the area where elms are being protected -- The beetle breeds only beneath the bark of elms which is dying or dead. The strategy can be carried out in different ways, depending upon location.

Within the highest priority control areas, we believe the following steps must be taken to carry out the basic control strategy:

- Identifying and mapping all trees to be protected.
 - Inspecting all trees regularly and thoroughly so that diseased trees can be found as soon as possible. This means no less than every two weeks during the growing season and once a week if possible. Twice-a-year inspection in first priority areas has proven to be inadequate.
 - Immediate root graft control between infected and surrounding trees as soon as the diseased tree is discovered and before it is cut down. Roots of elms can grow together even if trees are up to 60 feet apart. The disease spreads very rapidly to the roots of a tree, almost as quickly as the disease is noticed in the treetops. It then can infect the adjacent tree through root graft, unless the graft is interrupted. (Root grafts, once interrupted, take several years to grow back together. It would be desirable for root graft barriers to be inserted between healthy trees, before infection is detected.) We recognize that root graft control will only be partially effective. Sometimes the disease already will have infected a neighboring tree by the time it is discovered. Or root grafts may be only partially interrupted particularly if roots grow together under streets and sidewalks.
 - Cutting down diseased trees before beetles can breed beneath the bark and permit a new generation of infected beetles to emerge. The minimum time for this to occur is about 20 days. Failure to cut down diseased trees promptly is intolerable, not only because they are potential breeding sites but because of the negative psychological impact on residents.
 - Taking all dead elmwood from trees cut down, whether diseased or not, out of the control area immediately, before a new generation of beetles emerges. This must include the stump, or the stump must be debarked.
 - Trimming dead branches over two inches in diameter from healthy trees. A dead branch on a tree is as much a potential breeding site as a branch on the ground.
7. Control must be thorough to be effective -- Plant pathologists say that at least 90% of the breeding places for beetles must be removed from the area where elms are being protected and that a goal of 95% or higher is needed for control to be really effective. Moreover, anything less than 80% removal does no good at all. This points up the particular urgency for control to be thorough if it is to work. A lackadaisical approach means the disease will take over.
8. Within a control area, the same degree of effort must be applied to all trees, whether privately or publicly owned -- If private owners remove all their dead and dying elmwood promptly but public trees along

the boulevard are left standing, the control program can't work. Similarly, if the public trees are cut down as quickly as the disease is found, the remaining public trees won't be protected unless the private owners follow through in care of their own trees.

9. The prospects of public-private cooperation succeeding are best when the private property owners have taken the lead in a neighborhood and are seeking the city's cooperation -- But such neighborhood-city cooperation sometimes is difficult to attain. Ways must be found for neighborhood activity to trigger a response by the city. On the other hand, if the city is anxious to have a control program and the neighborhood fails to respond, the control program is in much greater jeopardy. While the city can exercise its police power to some extent, there is no way the city can save trees in a neighborhood if the people there don't have a commitment themselves.

C. Recommendations

1. Setting strict priorities on control -- We recommend that the legislature establish priority areas for control and require cities to identify such areas within a reasonable time or forfeit further state support. A reasonable time would be one or two months. The State Department of Agriculture would determine whether designated control areas are consistent with state law. Funds should be apportioned to the higher priority areas first, and then to the lower priority areas until funds are exhausted. We recommend the following priorities be placed in law:
- First, individual trees or selected groups of trees with unique historical qualities (e.g. largest oaks or elms in a city) or in particularly valuable locations (e.g. Summit Avenue, Victory Memorial Drive, the Capitol approach area.)
 - Second, residential areas and parks where elms make up a clear majority of shade trees and where their pattern of planting makes them esthetically pleasing and rural and urban forests and woodlots where oaks are dominant.
 - Third, residential areas and parks where elms and oaks may be numerous but are mixed in with and outshaded by other kinds of shade trees.
 - Fourth, woodlots within a few hundred feet of residential areas where elms are the dominant tree, followed by woodlots near other residential areas where elms are not dominant and are mixed in with other kinds of trees.
 - Fifth, elm in woodlots long distances from residential areas. No state funds should be expended in this category nor should owners of such woodlots be required to remove diseased elm from such areas.
2. Establishing standards for inspection -- We recommend that the legislature require inspection of all trees in first and second

priority control areas. We recommend that all trees be indicated individually on maps in first and second priority control areas. Records should be kept, perhaps by neighborhood groups if too expensive for the city, of type and frequency of care. We recommend the Legislature require cities to report their inspection practices in first and second priority control areas in their annual reports to the State Department of Agriculture.

3. Requiring trees to be marked with required date for removal -- We recommend that the State Legislature require that all public and private trees found to be diseased be marked immediately, in large, easily-recognizable painted numerals, with the dates the trees are to be removed. For example, if a tree is discovered to be diseased on May 1, 1977, it would be immediately marked 5-21-77, which would indicate to everyone that the tree is to be cut down by that date.
4. Requiring diseased trees to be marked for root graft control -- We recommend that a readily-identifiable mark be required by the Legislature to be placed on all diseased trees when root graft control has been conducted. It is critical that root graft control measures be taken as soon as possible after the diseased tree has been identified and before it has been taken down.
5. Giving citizens recourse if action is not taken -- We recommend that the Legislature give citizens the right to file complaints with their appropriate city offices in the event that diseased elms or oaks are not cut down or treated with root graft control on time in first or second control areas. A complaint should be in a form prescribed by the state. A copy of the complaint would be required to be sent by the city to the State Department of Agriculture. The Commissioner of Agriculture would be empowered to withhold a portion of state funds from a city's next-scheduled appropriation if the Commissioner felt a city was not carrying out its control program adequately.
6. Assuring adequate support to grass-roots neighborhood control efforts -- Because of the critical importance of a strong, small-area, private-citizen commitment to the success of a control program, we recommend that the Legislature give special recognition to neighborhood shade tree protection associations which meet certain requirements.

This recommendation is designed specifically to guarantee that control efforts on public trees in a neighborhood be applied with at least as much diligence as the private owners are applying to their own trees.

To achieve official recognition such an association first would need the agreement of at least 51 percent of the property owners in a given area, not to exceed a

certain size, perhaps on the order of 10-30 square blocks. Many already-existing neighborhood associations would be expected to seek recognition as shade tree protection associations.

Participants would commit themselves to carrying out essential control programs on private property. This would include (a) a pledge to remove diseased trees promptly, (b) a pledge never to store bark-on elmwood (c) a pledge to trim healthy trees regularly (d) a pledge for prompt root graft control around diseased trees, (e) a pledge to fully cooperate and assist elm watch efforts, (f) a pledge to help fertilize and water any new public trees that may be planted along boulevards, plus a program describing how the pledges would be carried out.

Official recognition would be given by an appropriate state agency, such as the State Department of Agriculture. When officially recognized, a shade tree protection association would be empowered to arrange for root graft control and removal of any public trees in the area covered by the association, if the public agency does not act within the time limit, with a guarantee of reimbursement from the city or the city would forfeit its receipt of state funds.

Such ability to require removal of public trees would be limited to first and second priority control areas or to areas which meet the criteria for a first or second control priority as determined by the State Department of Agriculture.

7. Encouraging cooperative control efforts at the neighborhood level -- In addition to the ability to require governmental cooperation, a neighborhood shade tree protection association would be able to contract on behalf of its resident/members for a variety of tree services, thereby taking advantage of economies of scale. Whatever arrangements the city may have made for cost-sharing of removal of public trees could be handled through such an association, too.

We recommend that such associations, when given official recognition, ask their respective city governments--as deemed desirable--for the right to contract for comprehensive tree management services on both public and private trees within their areas, consistent with whatever performance guidelines a city might require. An association could choose to contract with an appropriately qualified private contractor or with city employees.

An association would be uniquely equipped to arrange for comprehensive tree service programs encompassing trimming of healthy trees, spraying for insects, interruption of root grafts, removal of trees, replanting and maintenance of new trees and any other services an association felt was needed to protect shade trees in its neighborhood. It even is possible that such an association might be able to experiment with special

incentive arrangements. For example, a neighborhood might contract with a private firm or city employees for a set fee over a period of years. If the numbers of trees that need to be cut down is minimized, then the contracting party's costs would be less, and its net profit, greater. In effect, it could get a "reward" for good control.

8. Organizing city employees for small area control -- To assist neighborhood efforts and to further the concept of carrying out small area control programs, we recommend:

- The Legislature should require cities to report disease incidence rates by neighborhood. Such sub-areas would have to coincide with boundaries of any neighborhood shade tree protection associations.
- Cities should be requested to divide work forces up by neighborhood or community, irrespective of whether shade tree protection associations have been formed, consistent with economical deployment of personnel and amount of work load.

9. Assuring maximum control at lowest possible cost -- We recommend that individuals, neighborhood associations and cities recognize that the control programs will be particularly challenging because they must be so thorough to be effective. This means that they should adopt cost-effective approaches to stretch dollars as far as possible. They should be free to accept lowest responsible bids from among eligible bidders for trees services. They should not be saddled with procedures that would artificially inflate prices. For example, those adopted recently in St. Paul which require that wage rates paid to public employees also be paid to employees of winning bidders.

10. Make special efforts to dispose of remaining disease elmwood in high priority control areas before early April 1977 -- We recommend that cities and individual citizens undertake a crash program in the remaining few weeks before beetles emerge to rid their high priority control areas of all dead and dying elmwood. We recommend that individual citizens themselves take the bark off any elm stumps in their yards and boulevards before April.

V. THE PARTICULAR PROBLEMS OF ELM FIREWOOD

A. Findings

1. Temptations are strong to store elmwood -- Residents may feel they have a "right" to the wood from trees cut down in their own yards or boulevards. This feeling may be intensified if they have fireplaces in their homes and otherwise must buy their firewood. About one-third to one-half of homes in older cities may have fireplaces.

2. Misunderstanding may exist over threat which firewood presents -- Residents may feel that if the wood came from a tree which was not diseased then the firewood presents no threat. This is not true. Beetles are attracted to breed in dead wood, irrespective of whether it comes from a diseased or healthy tree.
3. Residents may fail to see the significance of storing even a small amount of elm firewood -- It is true that elmwood can be kept over the winter for firewood, so long as it is all burned or otherwise disposed of before beetles begin to emerge in April. But this magnifies the risk of accidental storage, either because some wood was forgotten or because a log rolls under the back porch, for example. A single firewood elm log can be a breeding site for 2,000 or more beetles. Also it doesn't matter if the wood is stored outside in a garage or in a basement. The beetles will find ways to get out when spring arrives.
4. Firewood is a more likely breeding site where beetles can survive the winter -- During the winter a high percentage of beetles normally die. For example, beetles in standing trees have only about a 10% chance of survival. With the particular cold winter of 1976-77, the chance of survival in standing trees above the snow dropped to about 1% or less, according to plant pathologists. However, where wood is covered with snow, the survival rate is much higher, even 30% this past winter, according to plant pathologists. A firewood pile is likely to have a snow cover and, therefore, be more likely to produce beetles in the spring than a standing tree.
5. Elmwood with the bark removed is completely harmless -- Ironically, when the bark is still on the wood, it is an ideal breeding site for beetles, but as soon as the bark is taken off, no place remains for beetles to breed. But removing bark from elmwood is not easy, particularly if the tree has recently been cut down.

B. Conclusions

The temptations to store elmwood are so great and the consequences so severe that we do not believe storage should be allowed, if bark remains on the wood -- We cannot tolerate any thing less than complete commitment to removal of elmwood from the control area. Surprisingly, even people who should know better--such as tree service firms and public tree care employees--have been reported to let resident keep wood from elm trees cut down in their neighborhoods. If someone hides elm firewood in a garage, neighbors or city inspectors might not find it, but the beetles will. If however, bark is removed, elm is harmless and can be stored for firewood.

C. Recommendations

Increasing firewood control -- Within a area where Dutch elm disease is being controlled, we recommend (a) stiff fine and revocation of license to any firm which gives away or sells elmwood which has not been debarked, (b) dismissal of any public employee who gives away or sells elmwood which has not been debarked, (c) stiff fine to any private individual who gives away or sells elmwood which has not been debarked (d) a stiff fine to any resident of a control area who refuses to allow the removal of elm logs from his property.

the chemical free except for shipping charges to neighborhood groups to treat public trees in their neighborhood.

* Plant pathologists fear that interest in Lignasan diverts public attention from the standard inspection-removal program.

* Lignasan is designed to save specific trees which are highly valued by their owners, in contrast to the established control program of elimination of breeding sites for beetles, which is designed to keep trees alive in general.

VI. THE USE OF LIGNASAN

A. Findings

Newly-licensed Lignasan is highly popular and highly controversial -- Instant, widespread public interest developed in the Twin Cities area when the Environmental Protection Agency (EPA) in 1976 approved Lignasan as a treatment chemical for Dutch elm disease.

* No central records were kept, but based on reports of firms which sold the chemical, it is possible that 20,000 or more trees were injected in the Twin Cities area in 1976 with Lignasan.

* Lignasan has been applied predominantly on private trees, without public involvement. Reports filed with the Minnesota Department of Agriculture indicated that fewer than 600 trees were injected with Lignasan by governmental agencies in the seven-county metropolitan area in 1976.

* Plant pathologists agree that Lignasan, when applied properly, can keep a tree from becoming infected with the Dutch elm fungus. Holes are punched into the tree and the chemical is injected. But there is widespread controversy over the appropriate concentration of the chemical, where in the tree the injections should be made, when during the year injections should take place, and how frequently a tree should be injected. There does appear to be agreement, however, that chances of success are enhanced if the ground is dug out around the base of the tree and the injections are made in the roots which flair out from the trunk. Also, it is clear that a single treatment does not guarantee protection for more than one year. Trees must be re-injected every year or every other year. Lignasan is not a vaccination.

* When volunteer labor is used, it is possible to reduce the cost of each injection to about \$15 or less, but if paid labor is used the cost is likely to be \$70 or more per tree for each injection.

* The Elm Research Institute, Harrisville, N.H., will provide a limited amount of

B. Conclusions

1. Lignasan supplements--it doesn't replace--the basic control programs -- Because of the large amount of work required on each tree, the use of Lignasan is likely to be successful where special efforts are desired to save particular trees, and mainly where volunteer labor can be utilized. A major program of Lignasan injection on trees in general would be prohibitively expensive.
2. Citizens need proper instruction -- Government should make certain that individuals receive adequate advice and training--which they are not now receiving--on appropriate dosages, frequency, time of year, length of time each injection should take and location on tree where injection should be applied. Government agencies themselves might choose to use the chemical in very selective situations, such as highly-valued trees on public malls.
3. Uncertainty about legal dosages must be removed -- Legal dosages as authorized by the EPA are below the levels used in detailed experiments by the Canadian Forestry Service over the past several years, where some of the most thorough experimentation on Lignasan has taken place. Higher-than-legal dosages were used on some trees in the Twin Cities area in 1976 because the lower dosages approved by the EPA were not deemed sufficient. It is critical that governmental agencies clear up the uncertainty about appropriate dosages before injections begin again this year. Some of the confusion may relate to how frequently a given dosage needs to be repeated.

C. Recommendations

1. Providing technical assistance to citizens on chemical injection -- We recommend that the Legislature require all cities to make it possible for their citizens to obtain information about correct application of Lignasan. We further recommend that the University of Minnesota expand its training courses for commercial firms and neighborhood volunteers on correct procedures for Lignasan application. These courses should be provided in the context of an expanded educational effort involving other Dutch elm control procedures, including inspection

of trees for disease, spraying, identification of elmwood piles, routine trimming, and root graft interruption.

- 2. Obtaining immediate decision on legal dosages -- We recommend the Minnesota Department of Agriculture obtain a formal decision from the EPA no later than April 1, 1977, on exactly what dosages are permitted and how frequently dosages should be repeated. If it is deemed that the EPA requirements are not adequate for protecting the trees, we recommend that the Department of Agriculture petition the EPA to review its present regulations to determine whether other dosages--specifically those used in Canada--are to be allowed.

VII. THE USE OF OTHER CHEMICALS

A. Findings

- 1. An environmentally-acceptable chemical, methoxychlor, can be used against the beetle -- Methoxychlor is used in Illinois and, perhaps elsewhere, but we were unable to determine if any Minnesota cities are using the chemical systematically. It may be easier to use in controlling the native elm bark beetle which does not feed more than about 10 feet off the ground than it would be in controlling the European elm bark beetle which flies to the tops of trees. In the northern two-thirds of the state the disease is spread almost exclusively by the native elm bark beetle.

Some entomologists question the use of methoxychlor because of the large amount of effort required to spray, the likelihood that not all parts of a tree will be sprayed, and the possibility that a beetle will infect a tree anyway before the chemical takes effect and kills the beetle.

- 2. Some chemicals can render a tree inactive as a breeding site, without requiring that the tree be cut down -- For the last three years the city of Bloomington has been experimenting with a chemical, potassium iodide, on its diseased trees in wooded areas. In such areas it isn't necessary to cut the tree down because a dead tree poses no threat to safety of citizens as does a dead tree in residential areas. The chemical can be applied quickly to a tree, as soon as it is identified, simply by cutting into the wood with an axe and pouring in the chemical. The chemical immediately kills the tree, and within 30-45 days the bark no longer is tight around the wood, so beetles will not breed there. The chemical's legal status is unclear, although it is being used in Illinois. Some communities reportedly are afraid to use the chemical in the absence of specific authorization.

- 3. Wood preservatives can make piles of wood uninhabitable by beetles -- Certain wood preservatives, such as pentachlorophenol, can be applied to piles of wood, making them inactive as breeding sites for beetles. It may be possible to spray large piles of elmwood prior to ultimate disposal or re-

covery of the resource value. This step could make certain disposal or recovery options more feasible, because it would even out the flow of elmwood over a longer period of time. It is less certain that it would be environmentally possible to spray household woodpiles.

B. Conclusions

Dutch elm disease is so severe in the Twin Cities area that all possible control avenues need to be explored as quickly as possible. Public and private leaders in control efforts deserve straight advice on what can and cannot be done.

C. Recommendations

- 1. Obtaining decisions on use of selected chemicals -- We recommend the Legislature instruct the Department of Agriculture to eliminate the uncertainty surrounding the use of several chemicals and to promote those which are acceptable. This means specifically that cities should be informed before July 1, 1977, as to the legality, acceptability and workability of potassium iodide and of wood preservatives. In addition, cities should be advised on the use of acceptable sprays for killing beetles.
- 2. Supporting applied research -- We recommend legislative support for research efforts specifically directed to improving present control methods. This means, for example, better ways of interrupting root grafts, treating diseased trees in woodlots and treating piles of dead elmwood. Results of the research should be made available immediately to the Department of Agriculture or other appropriate agency so that the best possible control methods can be utilized as soon as they are found acceptable. The research should include analysis of Vapam, Lignasan, methoxychlor, potassium iodide, and pentachlorophenol and the possibilities of girdling trees to prevent disease transfer by root grafts.

VIII. AVAILABILITY, ELIGIBILITY OF TREE SERVICE FIRMS

A. Findings

- 1. Licensing, regulation now spotty, inconsistent -- A spot check of some cities in the Twin Cities metropolitan area indicates that generally tree service firms are subject to few controls. Some cities require licenses; others do not. Cities usually require firms with which they do business to carry property/liability insurance, but coverage varies considerably.
- 2. Many firms likely to be doing business here -- Based on experience elsewhere widespread removal of diseased trees is likely to result in large numbers of small tree removal firms being formed or coming into the area.

- 3. Tree removal must be done carefully --
When trees are cut down in residential areas, serious risk exists that houses, lawns, sidewalks and power lines could be damaged. Even more serious is the risk of harm or death to residents.

B. Conclusions

The public needs better protection than it now has. We are not adequately prepared today to protect citizens and property when large-scale removal--which is almost inevitable even under the best control programs--gets going. But we also want to encourage many firms because that will produce competition and hold prices down. We just want to make sure the public is protected.

C. Recommendations

We recommend that all cities be required to license tree removal firms, and that the licenses include minimum property damage/liability coverage provisions.

We recommend that city governments be required to have similar insurance because of their own employees who will be removing trees on public and private property.

We recommend that the Minnesota League of Cities develop a recommended municipal ordinance for its member cities to follow on convenient licensing of tree removal firms.

IX. DISPOSAL OF ELMWOOD

A. Findings

- 1. Most dead wood is burned or buried -- Prior to 1976, trees were mainly buried. The relatively small number did not impose severe stress on sanitary landfills, according to the Metropolitan Council. But the large increase in 1976 led to a decision by the Minnesota Pollution Control Agency (PCA) to grant temporary open burning permits in about 24 locations in the metropolitan area. A Metropolitan Council report indicates that, of some 52,000 trees for which records were kept in 1976, 42% were burned, 37% landfilled, and 17% processed for wood fiber recovery (chipping primarily and some saw logs). The PCA burning permits expired March 1, 1977. Application must be made again if any permits are to be renewed. It is not clear what PCA policy will be.

Existing landfill capacity is sufficient to accommodate projected elm tree losses, according to the Metropolitan Council. But the Council points out that landfill disposal is the most expensive form of disposal, and it shortens the life expectancy of metropolitan area landfills for other solid waste.

- 2. Recycling (resource recovery) of elmwood is likely to increase in 1977 -- The major recycling centers in the metropolitan area in 1976 were two wood chippers operated by Hennepin County government. These chippers are capable of taking trees up to

22 inches in diameter. The chips are sold for wood fiber and mulch, according to a Metropolitan Council report. The two chippers have a combined capacity of about 18,000 tons of trees per year, although one of the two may not be working in 1977.

A large chipper--100,000 tons capacity, 48-inch trees--now is under construction at the Pig's Eye area in St. Paul, jointly owned by Minneapolis and St. Paul. This chipper is expected to be operational in 1977. Dakota County is planning a sawmill, which, if it becomes operational as planned in 1977, will have a capacity for about 10,000 tons per year.

The Metropolitan Council estimates that the two Hennepin County chippers, the new Minneapolis-St. Paul chipper, and the Dakota County sawmill will have a capacity to handle 71% of an anticipated 181,000 tons of tree waste in 1977. The remaining waste would be burned or buried.

- 3. Priorities on disposal currently are unrelated to where elm was cut down -- Currently no distinctions are made on access to disposal sites between elm which may come from a high priority control area or elm which may come from some rural woodlot. Current state regulations require that elmwood be disposed of within 72 hours, regardless of its origin.

B. Conclusions

- 1. Control of Dutch elm disease and disposal of elmwood are interdependent. Control won't be successful unless the wood is disposed of so it can't breed more beetles. Disposal won't work unless the control program is successful at slowing down the disease so that the disposal program doesn't get flooded with so much wood at one time that it can't be handled.
- 2. In contrast to the control program, disposal is clearly a metropolitan problem. An individual locality cannot handle the disposal of tree wastes by itself, any more than it can handle disposal of other wastes. Metropolitan leadership is critically needed.
- 3. The traditional means of disposal in the metropolitan area today are not appropriate or adequate for the long run. Outdoor burning and landfill, the most common types, have limited utility, although neither should be rejected out of hand. Burning reduces the level of air quality but may be acceptable in outlying areas to some extent. Tree waste doesn't damage a landfill or endanger the groundwater to the degree of some other forms of solid waste. But tree waste is very bulky, which reduces a landfill's potential for disposal of other solid waste. Landfill rates for tree wastes are likely to increase, making this option increasingly expensive.
- 4. Whenever possible the resource value of elmwood should be recovered -- It is possible that recovering the resource potential of elmwood will cost more than whatever price the material might bring on the market. But

if the net cost is equal to or less than other forms of disposal, then resource recovery can be justified.

- 5. Leadership is needed in identifying more extensive markets for utilization of materials from an elmwood resource recovery operation, particularly as the incidence of Dutch elm disease spreads and more elm trees are cut down. The private sector should be given incentives to make resource recovery an economical alternative to other disposal forms.
- 6. Elmwood from high-priority control areas must receive first consideration in disposal -- Priorities on disposal should be in line with priorities on control. It is urgent that elmwood which originates in a first or second control area be disposed of promptly. It is less urgent in lower priority control areas, and least urgent in the rural areas where no control program need be in effect.

C. Recommendations

- 1. Emphasize resource recovery in policy plan -- We recommend that the Metropolitan Council make resource recovery the central element in its policy plan for diseased tree waste removal.
- 2. Continually review operational capability of county governments in tree waste disposal -- We recommend the Metropolitan Council evaluate the implementation plans for solid waste disposal which it will require counties to submit by July 1, 1977. It is still too early to tell whether greater metropolitan involvement in development plans for disposal facilities is needed. Counties and the private sector still may respond.
- 3. Prepare contingency plans in case county response is not sufficient -- The consequences of inadequate disposal are too serious for the future of valuable elms in the metropolitan area to be left to chance. We recommend the Legislature instruct the Metropolitan Council's Waste Control Commission to develop a contingency plan for implementing the Council's tree waste policy plan in the event counties are unable to assure adequate facilities.
- 4. Keep open burning regulations tight -- We recommend the Pollution Control Agency should not consider any request for open burning permits for diseased tree control unless the request also has been considered by the Metropolitan Council.
- 5. Guarantee elmwood from high-priority areas first access to disposal sites -- We recommend that the State Department of Agriculture adjust its regulations on disposal, so that those parts of the metropolitan area with high-priority control of Dutch elm disease are guaranteed first access to whatever limited disposal sites may be available. As necessary, the 72-hour disposal limit should be eased for elm which may originate in low-priority control areas.

X. RESTORATION

A. Findings

- 1. Replanting under way -- In 1976, cities in the seven-county metropolitan area replanted about 45,000 trees, according to reports filed with the Minnesota Department of Agriculture. The report filed by Minneapolis indicates 9,500 were replanted, and by St. Paul, 3,050.
- 2. Considerable controversy exists over the size of tree that should be replanted -- This issue is spotlighted in the different practices followed by St. Paul and Minneapolis. St. Paul replanted with larger, more expensive, balled-and-burlapped trees, which were guaranteed for one-year replacement by the nursery which installed them. Minneapolis replanted with smaller, less expensive, bare-root trees, but without the guarantee of free replacement. We were unable to obtain accurate loss-of-tree figures, but officials in Minneapolis estimated a loss of about 15% of the newly planted trees, and St. Paul, about 5%.
- 3. Trees apparently are in good supply -- The Minnesota Nurseryman's Association reported in late November 1976 that about 150,000 trees were in stock in 10 of the 15 largest nurseries in the state. The Association also reported a surplus of nursery trees in the Chicago area and on the West Coast, although some imported trees are less likely to survive transplanting.
- 4. Some controversy exists over the plans cities have for replanting -- Foresters for major cities reported that they do follow plans for replanting, and that the type of trees will vary from neighborhood to neighborhood. However, we learned that a major officer in the Minnesota Horticulture Society is concerned that adequate attention to an overall design is not present.
- 5. The relative priority of replanting in overall Dutch elm control is not clear -- Some persons are advocating that the chief emphasis of a control program should be on the replanting aspect, because the only purpose of control, they say, is to make it possible to phase out the elm gradually, rather than all at once. Others argue that, if too much attention is given to replanting, the control program won't be carried out. There does appear to be agreement, however, that replanting takes time and won't really succeed unless the control program spaces out the removal of elms over a long period of time.
- 6. As trees are taken down, overall neighborhood appearance assumes increasing importance -- Large boulevard elms, creating an archway down residential streets, can mask effectively other defects in a neighborhood which can become readily obvious when the trees are gone. For example, when elms are gone, the condition of boulevard lawns and the exterior of housing will become more noticeable. Most

of the discussion on restoration has focused on replanting. Very little mention of other aspects of neighborhood appearance has come up.

B. Conclusions

1. Control of Dutch elm disease is incomplete without restoration of the areas which lose their valuable elms. By the same token restoration takes time and won't really succeed unless the control program spaces out the removal of elms over a long period of time.
2. Restoration means replanting trees, but it is not just replanting trees. It involves the overall appearance of the neighborhood when the elm is gone. This means particularly, that lawn and shrub care, house painting and exterior maintenance become increasingly important.
3. Replanting deserves high priority, equal to control. It represents an investment in the future. A much greater commitment to replanting in the region is needed.
4. Careful replanting is critical. It should not be done in the absence of a design plan and a strategy for implementing the plan. Replanting decisions will be with us for maybe 50 to 100 years. Coming generations will have no voice in the decision, but their reactions should be anticipated. It is not clear that adequate design plans have been prepared.
5. Not enough attention has been devoted to care of trees once replanted, such as watering, feeding and protection from vandalism, and what the relative responsibility of private and public parties should be.

C. Recommendation

Require restoration of elm-depopulated areas

1. We recommend that the Legislature:
 - * Require, as a condition for receipt of state funds, that a city replant at least as many public trees as are removed in the same year and, to the greatest extent practicable, in the same neighborhood where the trees were removed.
 - * Require cities to report survival rates of newly planted trees annually in their reports on shade tree disease control.
 - * Require cities to prepare plans for replanting with a guarantee of advance consultation and comment by horticulture interests, urban designers, and neighborhood groups.
 - * Impose a fine at least equal to the cost of the damage on persons convicted of mutilating newly-planted trees.
2. We recommend that cities:

- * Identify, early, neighborhoods most likely to be severely affected by the absence of elm shade trees, and propose other programs which can be coordinated with replanting. This should include, for example, priorities on the use of rehab loan and grant funds and large-scale house painting.
 - * Call on individual householders to assist in maintenance of newly planted trees.
 - * Contract with qualified neighborhood organizations for maintenance of newly planted trees.
 - * Plant both the larger balled-and-bur-lapped trees and the younger bare-root trees and keep records as to the cost and survival rate of each, to determine the most cost-effective way of replanting.
3. We recommend that neighborhood associations:
 - * Take the initiative in proposing replanting designs for neighborhoods and take other steps to improve neighborhood appearance.
 - * Offer to assist in the maintenance of city-owned trees within their areas.

XI. PUBLIC AWARENESS AND UNDERSTANDING

A. Findings

1. Public interest in Dutch elm disease has increased in direct proportion to the incidence of the disease -- In 1976 public interest in Dutch elm disease became higher than ever before. Large red paint marks were used to identify diseased trees, and, because so many trees on streets and parkways were discovered, the public naturally became more aware. In addition, private property owners in many localities were increasingly saddled with special assessments to pay for the expenses of removing their own condemned, disease elms. Dutch elm disease was reported to be a No. 1 campaign issue in many legislative races. Business involvement increased, particularly through one bank's sponsorship of a major public education program and through business sponsorship of elm clean-up efforts in various parks. The Governor's office called on the National Guard to assist cities in removing their trees.
2. But warnings had been sounded for the better part of two decades -- As early as 1957, before the disease was even discovered in Minnesota, Dr. David French of the University of Minnesota was calling for action. Nearby states' elms were being destroyed in the 1950s and 1960s.

The Citizens League in its 1967 report on the establishment of the Metropolitan Council cited the experience in Des Moines, Iowa, as an example of failure to carry out an adequate control program. The report recom-

mended the Metropolitan Council be charged with setting standards for control of Dutch elm disease and oak wilt in the Twin Cities metropolitan area. But the League largely ignored the issue between 1967 and 1976.

3. Not clear if high public interest will be sustained -- If, in fact, the Twin Cities area is successful in curbing the rapid spread of the disease, then trees will remain alive longer. It is possible the result would be a drop of public support for a control program. Syracuse, N.Y., for example, had a first-rate control program from 1957 to 1964, but then public support waned, the disease took over, and almost all elms died.

B. Conclusion

Unfortunately, although public awareness is high, public knowledge of what to do about the problem is woefully inadequate. Misinformation may be worse than no information at all. We must find a way to get correct information conveyed to the public and to public leaders.

C. Recommendations

Improving public education of the diseased tree problem.

1. We recommend the Legislature set aside a significant portion of state funds to finance improved public education, with the provision that a portion of the education funds be earmarked as matching funds to qualifying private groups.
2. We challenge the broad, informal alliance of interest groups in the shade tree disease problem to form, together, a private state Shade Tree Protection Society. These interest groups include nurseries, tree service operators, horticulture and garden interests, plant pathologists, entomologists, park boards, city councils, neighborhood groups and private citizens. Such a society should monitor, continuously, progress being made in implementing a good shade tree disease control program in this state and report to the Legislature on the progress being made. The Legislature will need a non-governmental group which keeps tab on shade tree disease control. Such a group would be eligible to apply for state funds for public education.

XII. A LAST WORD OF CAUTION

A one-time crash program of diseased tree control won't do the job. We will be fighting Dutch elm disease and oak wilt for as long as there are elms and oaks worth saving in this region.

If our cities do a thorough job of Dutch elm control in 1977, so as to reduce the number of beetle breeding sites to a minimum, we can't afford then to sit back and relax. Such an experience will demonstrate only that the disease can be controlled. The disease will always be with us. Only the highest degree

of commitment to control in those areas where our shade trees are most valuable will do the job.

It won't be easy to be effective in any one year, let alone 15 to 20 years in a row, but that is the commitment which is required.

DISCUSSION OF RECOMMENDATIONS

1. *What is the essence of the Dutch elm control strategy proposed in this report?*

Keep it small. That is, the Twin Cities metropolitan area is much too large to be considered one control area. No single control area need be larger than the borders of a city, and many cities should have separate control programs operating within their borders.

Much of the metropolitan area need not be in any control area. Little benefit--but probably a great deal of grief--will result from inspecting, marking and cutting down elms in farmers' wood lots several miles from the nearest residential area or park where elms are being protected. In one suburban township-turned-city a farmer four miles from the nearest subdivision simply bulldozed his entire woodlot after being faced with repeated expense to remove diseased elms. Theoretically, it makes some sense to remove breeding sites wherever they are found, but the cost of such a program far exceeds any conceivable benefit that would result.

Some cities or parts of cities may not have the will to follow through with a good control program, even though they would benefit. If a community doesn't want to have a control program of its own, no outsiders will be able to do the job instead.

So, we're likely to end up with several relatively compact "islands" of control in a sea of disease. Within such islands every conceivable breeding site will be sought out and removed, quickly. People will know exactly which trees they want to protect and maintain almost constant surveillance. At the first sign of infection, they'll remove the diseased tree and act to protect trees nearby. (If caught early enough, before 5% of the crown of the tree has begun to wilt, radical pruning of the diseased branches even may save the tree.)

To be sure, an area which is trying to protect its elms is going to be affected by disease-carrying beetles coming in from the outside. Eventually, almost all elms probably will die of Dutch elm disease, but the local residents will have been able to spread their removal expense over a longer period of time, gotten a head start on replanting, and received the benefit of the beauty of their elms for another decade or two.

2. *Is it too late to be able to control Dutch elm disease in the metropolitan area?*

No, unless we're talking about control everywhere in the seven counties. The real test of control won't lie in the total number of diseased trees. It is very possible that the most pessimistic projections will come true, with losses continuing to skyrocket until the vast majority of elms are gone. But, we must not be deceived by these numbers. The key test of control lies in whether the highly-valued elms in selected locations throughout the metropolitan area are protected. The total number of elms in this category is likely to be a small percentage of the total in the region.

3. *What are the chances of success, even if only in selected locations as this report recommends?*

We're not sure. We can't over-estimate the critical importance of a thorough control program, which means getting rid of diseased and dying elmwood throughout the control area as soon as it is found. This must be repeated year after year. It won't be easy. In fact, a risk exists that public support may wane at the very time it needs to be maintained.

But also we must not under-estimate the commitment of our cities and their citizens. Control has worked in other parts of the nation. It can work here. If the events of 1976 proved anything, they proved that people care about their elms and want to keep them alive as long as possible. The changes of success will be enhanced if people realize early enough that money will have to be spent whether or not there is control.

4. *What was the effect of the severely cold weather in the winter of 1976-77?*

Probably severe enough to give localities in this area a second chance to have an effective control program. In a normal winter, about 90% of the larvae in bark of standing trees not covered by snow don't survive. Because of the severe cold this past winter, plant pathologists at the University of Minnesota were able to find almost no surviving larvae above the snow line. But wood that is covered with snow has provided enough protection so that a very large crop of beetles is expected to emerge in April.

5. *How would state funds be apportioned to cities?*

We are recommending that cities satisfy several requirements to be eligible for state funds: (a) priority control areas would have to be identified, consistent with guidelines in state law (b) diseased trees would have to be removed promptly (c) a control program would have to be reasonably successful for a city to continue to qualify for funds (d) replanting must be a major part of the city's control program.

Beyond these requirements we did not specify any formula for distribution. We reviewed briefly--and have no basic quarrel with--the recommendations from the State Shade Tree Advisory Committee that the state pay 50% of each city's shade tree disease control expenses, for privately-owned and publicly-owned trees. If the state appropriation is not large enough to pay 50% of the expenses, a lower percentage would be derived, with each city then receiving that same percentage of its expenses.

Early in the 1977 Legislature it was not yet clear whether state funds would be made available in advance or if cities would be reimbursed for actual expenses incurred (the method used in apportionment of funds in the 1975-77 biennium.) One proposal being seriously examined was to pay each city one-fourth of its projected annual allotment at the beginning of each quarter. Adjustments in subsequent quarter allotments would be made based on actual expenditures in the previous quarter.

6. *Who should pay for removal of trees from private property?*

We leave that decision up to the individual city. Currently, in some cities the private owner picks up the total cost; in other cities the public picks up the total cost, and in still other cities a combination of public and private funds is used.

Some of us believe that the public should pay the total amount because, as a result, citizens would be more willing to report their neighbors' diseased trees. Also private trees are an asset to an entire neighborhood.

Others of us are cautious about committing too much public money for removal of private trees, because expenses could become so high as to drain funds from control programs elsewhere.

The state of Minnesota now will pay one-half of whatever public funds a city commits to assist in removal of private trees. This form of cost-sharing acts as an incentive for the public to assume at least a portion of the expense of removal of private trees.

7. *Would renters as well as homeowners be able to join neighborhood shade tree protection associations as recommended in this report?*

Yes. We did not discuss all the details of such associations. Renters clearly would be able to file complaints if trees are not being removed on time. Renters also could participate in all forms of voluntary control in the neighborhood, such as checking on firewood piles and keeping an eye on trees for signs of disease. A renter could not commit the property owner to carry out certain control measures on his own property, but this should not be necessary for a shade tree protection association to receive official recognition from the state.

8. *Is it likely that shade tree protection associations would be formed in many neighborhoods?*

Yes. In 1976 cooperative action was taken in several neighborhoods in the Twin Cities area, specifically for the purposes of Lignasan injection. Neighbors would get together to buy the equipment and chemical cooperatively and to help each other inject the trees. It is natural to expect that these beginning efforts would mature into more comprehensive tree care programs. Moreover, greater motivation to protect trees exists at the neighborhood level than anywhere else. Even before this report was issued in early 1977 we were made aware of grass roots neighborhood control groups being formed.

9. *What is the reason citizens and neighborhood organizations would be given special recognition in diseased tree control?*

We want to give maximum assurance that a city will respond when its own residents are committed to protecting their shade trees. And, if a city is unable to respond, we think the residents themselves need the tools to do the job. Therefore, we are recommending that any citizen be allowed to file a complaint, with the guarantee a copy of the complaint would be sent to the state, if any diseased tree is not cut down on time. In addition, we are recommending that neighborhood

associations which meet certain requirements would be able to contract for removal of public trees if the city is unable to respond, with a guarantee of reimbursement. It is possible a neighborhood association never would have to take such action, but the power to act would be available if needed.

Diseased tree control is, fundamentally, a program to help the people living closest to the elms. It is not just another public works employment program.

BACKGROUND

I. Dutch elm disease in the United States.

Dutch elm disease originally was discovered in northern France in about 1918 or 1919, according to David French, professor, plant pathology, University of Minnesota.

Dutch elm disease was first detected in the United States in Ohio in 1930, although it is thought that the disease probably was brought from France via imported elm logs in 1926 or 1927.

By 1959, the disease had expanded to Indiana, Illinois, Pennsylvania, Kentucky, Tennessee, Iowa, Missouri, Kansas, Wisconsin, Maryland, West Virginia, Delaware, New York, New Hampshire, Vermont, Massachusetts, Maine, Quebec and Ontario.

The first case of Dutch elm disease in Minnesota was reported in St. Paul in 1961. That same year seven cases also were reported near Monticello. The first four cases in Minneapolis were reported in 1963.

For the first several years, losses were very low. For example, from 1961 through 1967, fewer than 10 cases were reported each year in Minneapolis and St. Paul.

The disease is confined mainly to the southern one-third of Minnesota, although scattered cases have been reported throughout the state.

The biggest increase in incidence in both St. Paul and Minneapolis has occurred in the last three years. For example, St. Paul went from 585 reported cases in 1973 to 1,594 in 1974; to 2,682 in 1975, and to 16,688 in 1976. Minneapolis went from 235 reported cases in 1973 to 937 in 1974; to 1,628 in 1975, and to 7,100 in 1976.

II. Shade tree population in the Twin Cities metropolitan area.

Approximately 36 million trees of all types are located in the seven-county metropolitan area, according to a survey conducted by the Minnesota Department of Natural Resources.

A study conducted by National Biocentric, Inc., for the Metropolitan Inter-County Council (MICC) divided the seven-county area into five strata: urban (central cities and first ring suburbs), suburban (other suburbs), river corridor, rural, and small towns.

About 2.6 million trees, or 7.2% of all trees, are located in the urban strata; another 6.4 million (17.8), suburban; 7.5 million (20.8%), river corridors; 18.7 million (51.9%), rural, and .8 million (2.2%), small towns.

Approximately 4.9 million trees, about 13.6%, are elm, and 9.1 million, about 25.3%, are oak, according to the National Biocentric study.

Within each of the various strata, the distribution of elm and oak varies widely. For example, 43% of the trees in the rural area are oak, and only 10%, elm; within the urban area, 22% are elm and only 3%, oak.

Oak and elm trees in the urban and small town strata tend to be larger, according to the National Biocentric study. The study revealed that 84% of the elms in the urban stratum and 88% in the small town stratum are five inches or more in diameter, which is considerably higher than the percentage in suburban, river and rural stratas.

About 71% of the elms over 24 inches in diameter are located in the urban stratum, according to National Biocentric.

Standardized forestry inventory techniques were used in developing the metropolitan tree-population estimates.

The actual number of trees, by type, within individual cities or parts of cities, is not reliably known throughout the metropolitan area. Cities and counties are required to report elm and oak populations to the Department of Agriculture, but their methods of counting vary widely, according to a January 1977 report by the Metropolitan Council.

III. Projections of disease incidence.

If pre-1977 control practices continue, the Metropolitan Council projects that disease incidence in the seven-county metropolitan area will increase very rapidly over the next three years, reaching a loss of approximately 22% of the original elm population in 1980 alone, which would be about 1 million elms in that year. Only a residue of elms would remain after 1985, according to this projection.

Under an improved program, the maximum percentage loss would be 6.3% in 1989, according to the Council report.

Under what the Council calls the "best practicable control," losses would be 3.7% of the original elm population in the peak year, about 1997.

Based on elm losses in the last three years, the Metropolitan Council projects a loss of 288,000 elms in 1977, more than three times the loss in 1976. Approximately 152,000 of those trees would actually be identified and removed, the Council projects. In 1980, assuming pre-1977 control practices, approximately 600,000 trees would be identified and removed out of about 1 million actually diseased, according to the Council report.

The Metropolitan Council projections are similar to those made by National Biocentric, Inc., in a report prepared for the Metropolitan Inter-County Council in September 1976, except that the Metropolitan Council projections show losses accelerating faster than the National Biocentric report. The Metropolitan Council projections were able to take 1976 losses into consideration, which were much more severe than originally expected. Because it was prepared earlier, the National Biocentric projections were based only on losses through the year 1975.

Both the Metropolitan Council and the National Biocentric projections concern the entire urbanized portion of the metropolitan area. The reports did not project losses by city or neighborhood.

Although metropolitan-wide disease rates can be--and probably will be very high, it still will be possible for locations within the metropolitan area to have much lower disease rates, depending upon the degree of control.

In fact, it is likely that only a small percentage of the total elm population in the seven-county metropolitan area falls within high-priority control areas.

Consequently, the only meaningful loss rates are those which apply to specific locations where control programs are in effect.

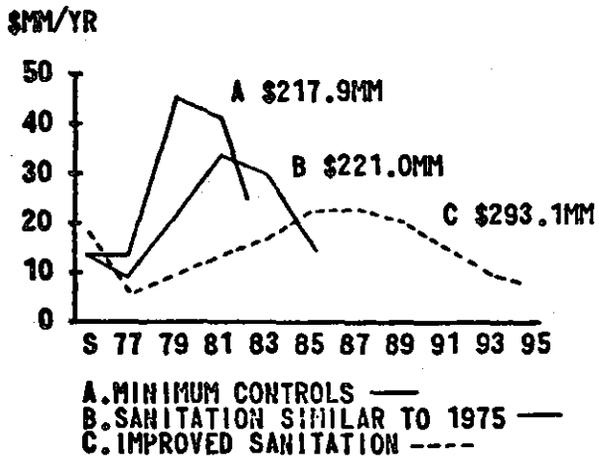
IV. Projected expenses.

Two recent studies indicate that heavy expenses will be incurred with or without a Dutch elm control program. Both studies agreed that the peak expenditures for a single year would be significantly higher under a no-control program. Regardless of the control program, trees die and must be removed from residential areas before branches fall off and cause property damage or harm to persons. One study projected that total expenses over a period of years would be slightly less under a no-control program; the other study projected that total expenses would be higher with no control.

One study was conducted by Thomas A. Rusin, who at the time was a commercial banking officer for the First National Bank of Minneapolis. Rusin since has left that position and more recently was employed at Onan Corporation. Rusin conducted the study for a Dutch elm disease conference sponsored by the bank in the fall of 1976.

Rusin projected total expenses in the seven-county metropolitan area at \$217.9 million without any control; \$221.0 million, minimum control, and \$293.1 million, improved control. Under the no-control scenario, expenses reach about \$45 million in the peak year; under minimum control, about \$33 million, and under improved control, about \$23 million.

PROJECTED YEARLY COSTS COMPARISON



Rusin's study was based on losses as projected by National Biocentric, Inc., in a study for the Metropolitan Inter-County Council in September 1976.

The other study was conducted by the U.S. Department of Agriculture Forest Service, Northeastern Forest Experiment Station, Upper Darby, PA, in 1976. That study did not provide expenditure estimates for specific locations; instead it estimated the cost of control and disposal over a 15-year period for a hypothetical area with 1,000 trees. With no control, the cumulative cost was projected at \$132,000; with varying degrees of control, the cumulative cost was projected between \$49,000 and \$111,000.

V. Present state laws and regulations.

In 1974 the Minnesota Legislature required that municipalities in the seven-county metropolitan area adopt shade tree control practices, consistent with rules and regulations of the Minnesota Department of Agriculture. This was the first involvement by the state in shade tree disease control.

In 1975 the Legislature expanded the state's involvement. It authorized \$800,000 for the two years ending June 30, 1977, in state matching funds to cities for removal of diseased shade trees from residential property. These funds may be used only to help cities subsidize the expense of removal of trees from private property. They may not be used for removal of trees from public property. The state will reimburse a city for 50% of whatever a city agrees to pay for removal of private trees. For example, if a city requires the property owner to pay one-half the cost, with the city paying the other one-half, then the state will help the city with its one-half. As a result, the property owner would pay one-half, the city, one-fourth, and the state, one-fourth.

On the other hand, if a city pays the entire cost, then the state pays one-half, and the net cost to the city is one-half.

Or if the city requires property owners to pay the entire cost, without any city share, the state will not share either.

Approximately 47 cities in the metropolitan area in 1976 were sharing at least some of the expense of removal of trees from private property, thereby qualifying the city for state aid, according to reports filed with the State Department of Agriculture. Another 92 cities in the metropolitan area had no city cost-sharing, thereby forfeiting state assistance. Minneapolis was not involved in cost-sharing in 1975 or 1976. St. Paul was not involved in 1975 but became involved in 1976. Reportedly, the city of Minneapolis forfeited its state funds because of the need to devote city dollars to the control program on city-owned trees. We understand that in 1977 Minneapolis will assume part of the expense of removing private trees and, thereby, become eligible for state matching funds, should they be made available for the next biennium. The city of Minneapolis will require the property owner to pay the first \$150 of removal expense (\$75 for senior citizens), with the city picking up the balance, of which the state would then pay one-half. In St. Paul the city picks up the entire expense of private tree removal, for which the state reimburses 50%.

The 1977 Legislature is considering a governor's budget request for more than \$20 million in state matching funds to cities for Dutch elm control in the biennium ending June 30, 1979. A State Shade Tree Advisory Committee to the Commissioner of Agriculture had recommended a \$45 million program. Both proposals urge that the state matching funds be used to help cities with all shade tree disease control expenses, whether for public or private trees. Essentially state funds would be apportioned according to the size of local budgets.

* In all cases where control has been successful, the basic elements are similar--prompt identification and removal of breeding sites for Dutch elm beetles. This means identification and removal of all dead and dying elmwood from the vicinity of the area being controlled.

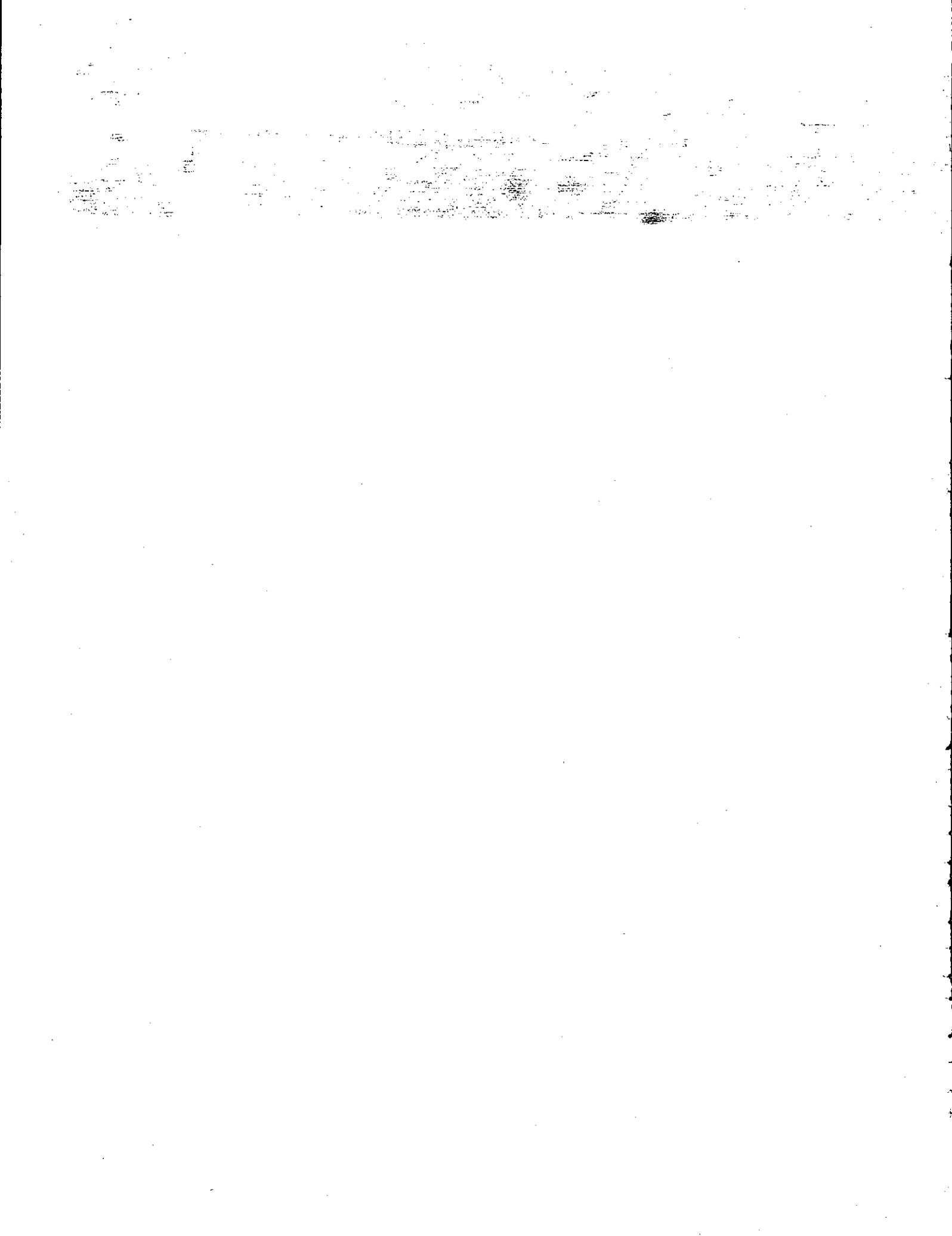
Cities in the seven-county metropolitan area reported total Dutch elm control expenditures in 1976 at \$4.8 million. These cities project their total expenditures in 1977 at \$14.9 million. The cities of Minneapolis and St. Paul, combined, account for more than two-thirds of the projected expenditures for 1977. Each are projecting 1977 expenditure levels in excess of \$5 million. This represents almost a tripling of expenditures by Minneapolis in 1977 over 1976, and more than a five-fold increase by St. Paul.

VI. Experience elsewhere.

* "Since 1961 when Dutch elm disease was first found in Fredericton, New Brunswick, strict adherence to a sanitation program (prompt removal of dead and diseased trees and periodic pruning of healthy trees) has held losses to 5.3% of an initial elm tree population of almost 6,000 trees (0.4% annually). By comparison, 60% of the trees are dead or dying from the disease in four areas without sanitation." Plant Dis. Repr. 60: 336-338, April 1976.

* "The municipal programs in Illinois for the control of Dutch elm disease continue to be effective. In many cities annual parkway elm losses for 15 years have averaged less than 2% of the original elm population." Plant Dis. Repr. 56: 460-462, May 1972. In a follow-up phone conversation in February 1977, Dennis Ceplecha, forester for the city of Evanston, Illinois, (which still has 13,000 of its original 18,000 parkway elms, after fighting the disease for almost 20 years), reported that control programs are continuing to be effective in many Chicago area suburbs and in some selective locations within the city of Chicago, such as Grant Park.

* Syracuse, N.Y., has been cited frequently as an example of the benefits of good control and the consequences of abandonment. Frank Kelly, commissioner of parks and recreation for Syracuse, reported at a Dutch elm disease conference in Minneapolis in September 1976 that Syracuse saw losses mushroom from one tree to 1,000 trees in a four-year period ending in 1957. Then strict control measures were instituted, which remained in effect for six years. During that time losses were held to less than 2% annually of the original elm population. Then in the mid-1960s the control program was abandoned and five years later more than 90% of the elms were gone. Kelly said main reasons for abandonment were a state Attorney General's opinion rescinding the authority of cities to remove trees on private property with public money and the fact that public support for the control program evaporated.



COMMITTEE ASSIGNMENT

When the threat of Dutch elm disease became widely visible in the Twin Cities area in the summer of 1976, the Citizens League Board of Directors amended its research program for 1976-77 to add a project on shade tree disease and to give the project higher priority than all others already approved for research in 1976-77.

A Shade Tree Disease Committee was formed to review the consequences, governmental and non-governmental, if nothing were done beyond existing control efforts. The committee was instructed to concentrate mainly on organizational and financial questions. The committee was asked to review the relative roles and capabilities of the private and public sectors in finance and organization, the distribution of responsibility among different levels and units of government, the process by which priorities are set for different strategies for coping with the disease, the source and amount of public funds and priorities on use of funds, geographic and by type of program.

COMMITTEE MEMBERSHIP

A total of 36 persons volunteered to serve, of whom 13 did not attend at all or dropped out after the first few weeks.

The 23 remaining members were: (asterisk indicates the member participated actively in the committee deliberations) Solveig Premack*, chairman; Harold J. Anderson*, Sandra Berthene*, Lewis Bloom*, Duane Bojack*, Eugene Coulter*, Tom Crocker*, Karla Ekdahl, John Finn, Will Gove*, Vance Grannis, Jr.*, Ruth Hauge*, F. S. Hird*, Charles Howard*, Richard Manning*, Susan Marrison, Peter Olin*, Valdemar Olson, Cynthia Rasp, Lawrence Sawyer*, Robert Shrum*, Don Sodman, and Donald Willeke*. In addition, William Schilling of Public Service Options participated regularly as a consultant to the committee. The committee was assisted by Paul Gilje and Paula Werner of the Citizens League staff.

COMMITTEE PROCEDURES

The committee began its work October 19, 1976, and held its final meeting, at which time the report was approved for submission to the League Board of Directors, on February 24, 1977.

A total of 19 meetings were held, almost all of them 2½ hour evening meetings. The committee alternated its meeting locations between St. Paul and Minneapolis, to be convenient for as many members as possible. Detailed minutes were taken of all meetings. A limited number of extra minutes are available on request at the Citizens League.

From mid-October until the end of December the committee obtained extensive orientation to the Dutch elm disease problem from respected authorities both in the Twin Cities area and elsewhere. The committee met with city and suburban foresters, plant pathologists, private tree service firms, governmental officials and others.

The committee was fortunate to begin its work about one month after a major Dutch elm disease conference sponsored by the First National Bank of Minneapolis. A transcript and summary of the conference was very helpful to the committee for background and for understanding issues in controversy.

The committee held its first meeting in the offices of KTCA-TV and viewed special programs on Dutch elm disease which had been produced by KTCA and WCCO.

Following is a list of documents and reports which were particularly useful to the committee:

"Dutch Elm and Oak Wilt Diseases in the Twin City Metropolitan Area," prepared for the Metropolitan Inter-County Council by National Biocentric, Inc. September 1976.

Transcript of Dutch Elm Conference sponsored by First National Bank of Minneapolis. September 1976.

"The Dutch Elm Disease," Agricultural Extension Service, University of Minnesota, 1974.

"Oak Wilt Disease," Agricultural Extension Service, University of Minnesota, 1974.

"Shade Tree Disease Control Activities--1975," Minnesota Department of Agriculture, 1976.

"Study of Regional Tree Waste Disposal and Utilization Systems," Metropolitan Council, January 1977.

"Dutch Elm Disease Projections for Five Cities in Minnesota," R. D. Shrum and D. W. French, 1976.

"Dutch Elm Disease Facts and Figures," Gary W. Botzek, Office of Senate Research, State of Minnesota, October 1976.

"Dutch Elm Disease Control: Performance and Costs," USDA Forest Service Research Paper NE-345, 1976.

"Municipal Control of Dutch Elm Disease in Illinois Cities," Plant Disease Reporter, May 1972.

"Sanitation: A Practical Protection against Dutch Elm Disease in Fredericton, New Brunswick," Plant Disease Reporter, April 1976.

"Insuring an Orderly Transformation of our Urban Forests," report of State Shade Tree Advisory Committee, 1976.

Certain staff members for the Department of Plant Pathology, University of Minnesota; Minnesota Pollution Control Agency, Metropolitan Council, Metropolitan Inter-County Council, city of Minneapolis, city of St. Paul, and Minnesota Department of Agriculture were extremely helpful in providing the committee with assistance both during and between committee meetings. Without their help this report would not have been possible.

Members and staff took a three-hour bus tour of Minneapolis and St. Paul, Bloomington and Fort Snelling in mid-October.

Following is a list of resource persons who met personally with the committee:

John Berends, Minnesota Department of Agriculture

Mary Blomquist, National Biocentric, Inc.

Larry W. Brokke, L & B Tree Service

James Brooks, Minnesota Department of Natural Resources

Lloyd Burkholder, forester, city of St. Paul

William Cass, forester, city of Maplewood

David DeVoto, forester, Minneapolis Park Board

James Dinerstein, research staff, Minnesota Senate

Donald Farb, environmental planning division, Metropolitan Council

David W. French, professor of plant pathology, University of Minnesota

Peter Gove, (then) director, Minnesota Pollution Control Agency

Peter Grills, administrator, shade tree disease control program, Minnesota Department of Agriculture

Michael Hunter, lumber broker, North American Veneer Corp.

Thomas L. Jahnke, Hennepin County Park Reserve District

Thomas Karl, arborist, city of St. Paul

Edward Kondo, Canadian Forestry Service (long-distance telephone hookup)

Donald Murray, Wright Tree Service, Inc., Des Moines, Iowa

Katherine Phillips, Elm Research Institute, Harrisville, N.H. (long-distance telephone hookup)

Robert Piram, Dutch elm disease control director, St. Paul

Glenn Ray, secretary, Minnesota Horticulture Society

Thomas Rusin, formerly with First National Bank of Minneapolis

Rich Sandberg, Minnesota Pollution Control Agency

Dennis Sederholm, executive vice president, West Suburban Chamber of Commerce

James Shipman, Metropolitan Inter-County Council

Glen Shirley, forester, city of Bloomington

Robert Shrum, assistant professor of plant pathology, University of Minnesota

Ward C. Steinstra, professor of plant pathology, University of Minnesota

Gordon Swanson, vice president, Minnesota Nurserymen's Association

... formed in 1952, is an independent, nonpartisan, non-profit, educational corporation dedicated to improving local government and to providing leadership in solving the complex problems of our metropolitan area.

Volunteer research committees of the CITIZENS LEAGUE develop recommendations for solutions to public problems after months of intensive work.

Over the years, the League's research reports have been among the most helpful and reliable sources of information for governmental and civic leaders, and others concerned with the problems of our area.

The League is supported by membership dues of individual members and membership contributions from businesses, foundations, and other organizations throughout the metropolitan area.

You are invited to join the League or, if already a member, invite a friend to join. An application blank is provided for your convenience on the reverse side.

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What The Citizens League Does

Study Committees

- 6 to 10 major studies are undertaken each year.
- Each committee works 2½ hours per week normally for 6-9 months.
- In 1974 over 250 resource persons made presentations to an average of 25 members per session.
- A fulltime professional staff of 6 provides direct committee assistance.
- An average in excess of 100 persons follow committee hearings with summary minutes prepared by the staff.
- Full reports (normally 25-50 pages) are distributed to 1,000-3,000 people, in addition to 4,000 summaries provided through the C.L. NEWS.

Citizens League NEWS

- Published twice monthly except once a month in June, July, August & December.
- Provides readers with general information, original data and League analysis on public affairs issues.

Information Assistance

- The League responds to many requests for information. Substantial amounts of staff time are devoted to explaining local developments to out-of-town visitors, providing background information to the news media, and serving as resource speakers to community groups.

Community Leadership Breakfasts

- Minneapolis Community Leadership Breakfasts are held each Tuesday at the Grant Exchange Cafeteria, 7:30-8:30 a.m., from September to June.
- St. Paul Community Leadership Breakfasts are held on alternate Thursdays at the Pilot House Restaurant in the First National Bank Bldg. 7:30-8:30.
- An average of 35 persons attends the 55 breakfasts each year.
- The breakfast programs attract good news coverage in the daily press, radio and periodically, television.

Question and Answer Luncheons

- Feature national or local authorities, who respond to questions from a panel on key public policy issues.
- Each year several Q & A luncheons are held throughout the metropolitan area.

Public Affairs Directors

- A Public Affairs Directory is prepared following even year general elections, and distributed to the membership.

Public Affairs

- Members of League study committees have been called on frequently to pursue their work further with governmental or non-governmental agencies.

(clip and return with check)

Application for Membership in the Citizens League

84 S. Sixth Street, Minneapolis, MN 55402 (338-0791)

Please check:

Individual - \$15 Student - \$5 Contributing - \$35 and up
 Family - \$25 or \$30 (for two separate C.L. NEWS mailings)

NAME _____ SPOUSE _____

HOME ADDRESS _____ PHONE _____

EMPLOYER'S NAME _____ POSITION _____

EMPLOYER'S ADDRESS _____ PHONE _____

SPOUSE'S EMPLOYER _____ POSITION _____

EMPLOYER'S ADDRESS _____ PHONE _____

Send mail to: Home Address Business address
 (Contributions are tax deductible)

NEWS RELEASE

October 25, 1976

FROM: The office of State Senator Nicholas Coleman
208 Capitol Building, St. Paul, MN 55155
612-296-4196

State Senate Majority Leader Nicholas Coleman today unveiled a legislative proposal which "would channel \$25 million into the fight against Dutch Elm disease over the next 16 months."

Coleman and Conrad Vega, candidate for state senate from the Hastings area, discussed the program during a news conference at Toby's Restaurant in Hastings.

"I am making this announcement in Hastings because of the particular need for preventive steps in this region," Coleman said. "A recent study clearly demonstrates the urgent need for state efforts to fight Dutch Elm disease. Additional information I have received from Conrad Vega, however, points out the special immediacy of the problem in this area."

"Decisive action to combat the disease must be taken soon in Hastings, Rosemount, South St. Paul, and other nearby cities along the Mississippi," Vega said. "The disease is known to travel up rivers, afflicting trees in communities along their banks.

"Meeting the Dutch Elm threat can be expensive," Vega said, "but the alternative of letting Dutch Elm disease run rampant would prove much more costly.

"We are proposing the removal of dead trees within the municipalities and the replanting with other species as soon as possible," Vega said. "Experts on Dutch Elm disease control agree

that a good sanitation program would spread disease losses over 25 years. By then replacement trees would be mature enough to provide energy-saving shade and windbreaks."

Coleman and Vega explained that the proposal calls for the state to pay for half the cost of removing public and private trees within municipal limits. In addition, the state would match 50 percent of the cost of replanting trees on public property; local governments would provide the rest of the funding.

"The state match is designed to aid local units of government in dealing with a very serious problem," Coleman explained, "and will continue the Legislature's efforts to hold the line on property taxes."

"The average cost of removing an elm and replanting another tree is estimated at \$250," Vega said. "Without state assistance local governments and, in turn, property owners, would be forced to bear the brunt of the financial burden."

"If we continue to approach the problem as we have been we will lose 95% of our elms in five to ten years," Vega added. "The corresponding reduction in property values could have an adverse effect on our property tax structure."

Vega also explained how the rapid loss of shade trees before substitute trees reach maturity could increase energy consumption.

"Without immediate action we will be faced not only with the removal and planting costs but with the price of additional energy needed to heat and cool our homes and businesses," he said.

Coleman added that this program should be adopted early in the 1977 legislative session.

"It is essential that adequate financing is available before the beetles fly next April," he said. "Passage of a good Dutch Elm control bill, perhaps as early as February, would help reverse a trend which would otherwise result in many communities being treeless within ten years."

Failure to act on this issue, Vega said, could put many Minnesota communities in the same position as cities and towns in other states where the number of remaining elms can be counted on two hands.

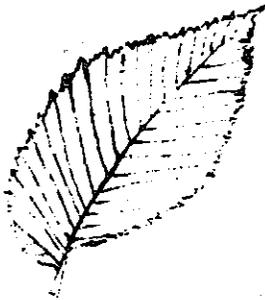
"Detroit is a good example of a city that is not doing enough to combat the beetle," Vega said. "Detroit now spends \$1.2 million a year on 150 square miles. The city once had 350,000 elms. It now has around 50,000.

"Other cities, such as Des Moines, Madison, or Champaign-Urbana spent little or no money to control the disease, and they lost most or all of their elms in a short time," he added.

"Senator Coleman and I are convinced that this disease control program will, in the long run, save Minnesotans money and help our communities maintain an adequate supply of shade trees over the next 30 years," Vega concluded.

APPENDIX J
Shade Tree Program Newsletters
1975-1982

J



MINNESOTA DEPARTMENT OF AGRICULTURE
DIVISION OF PLANT INDUSTRY
670 STATE OFFICE BUILDING
ST. PAUL, MINNESOTA 55155

TREE INSPECTORS NEWSLETTER No. 1

March 10, 1975

This is the first of a number of newsletters the Division of Plant Industry plans to send to metropolitan tree inspectors. The purpose will be to keep inspectors informed about matters pertaining to Oak Wilt and Dutch elm disease programs in the metropolitan area.

SHORT COURSES

Two short courses related to trees will be offered by the University of Minnesota this spring. The first is the Shade Tree Short Course, which will be held on April 4 at the St. Paul Campus. Subjects covered will be topics such as root pruning, moving trees, and updates on the shade tree disease situation. This course is designed for tree maintenance personnel, commercial arborists, and others.

The Metropolitan Tree Inspectors Short Course will be offered June 9 & 10th, also at the St. Paul Campus of the University of Minnesota. The first day will be classroom instruction and the second day will be a field trip. The topics to be covered are new research and biological information, tree identification, air quality and burning permits, and proper use of Vapam, wood disposal and a review of the rules and regulations and policies of the Shade Tree Disease Law. The course is mandatory for all tree inspectors in the seven-county metropolitan area.

TREE INSPECTORS EXAMINATION

The next tree inspectors examination is scheduled for March 27 & 28th. Please call 296-3347 to schedule your test. We have compiled a packet of information that would be useful in studying for the test. Please ask for this when you schedule your test.

Those inspectors who have taken and passed the test previously are not required to take the test again. Inspectors who were appointed on a provisional basis last season must take the examination now in order to be fully certified. Tree inspectors cannot serve on a provisional basis for more than six months.

COMPLIANCE

The beginning of a new disease season is almost here again, and the loose ends of last year's program should have been completed. With the mild winter we have just experienced and the possibility of good bark beetle survival, it is most important that all dead or diseased trees be removed before April 15th. Also, you are reminded that your annual survey for elm wood (firewood, log piles, etc.) must be completed by that time.

Municipalities have now had almost a year to make plans and to gear up for expanded tree disease control programs as mandated by the 1974 legislature. Of necessity, the Department of Agriculture was rather lenient in its 1974 enforcement activities, realizing the many budgetary and planning problems that were faced by local municipalities. In 1975, we definitely will be expecting a much higher degree of compliance and will be prepared to take whatever enforcement action is necessary in order to get the job done. The Department of Agriculture stands ready to help wherever we can - by working together we feel that much can be accomplished.

BURNING PERMITS & SOLID WASTE DISPOSAL

It would be well to prepare for the coming season by checking into the availability of burning permits now. Selecting a site that meets Pollution Control Agency standards is important. Check with your local fire chief or fire marshall for information and permits. If you are not sure who this person is contact:

Richard Sandberg
Pollution Control Agency
Air Quality Division
Telephone: 296-7274

For information on land disposal sites contact:

Gary Pufford
Solid Waste Division
Pollution Control Agency
Telephone: 296-7318

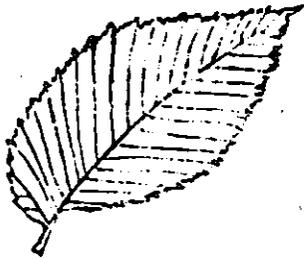
APPROVED REMOVAL & WOOD DISPOSAL PRACTICES

The Department of Agriculture is currently in the process of revising the "Approved Removal and Wood Disposal Practices" dated August 5, which were sent to metropolitan municipal officials and tree inspectors in mid-August, 1974. Meetings have been held with municipal, county and University people in order to obtain a consensus of opinion as to what changes might be desirable. The main change will be that 72 hours (rather than 24) will be permitted for the disposal of elm wood after it is delivered to the disposal site. Copies of the revised "Approved Practices" will be available from our office in the near future. Copies will be mailed to all tree inspectors - possibly with the next newsletter.

* * * * *

If you have any suggestions for future topics that might be included in this newsletter, please give us a call.

MINNESOTA DEPARTMENT OF AGRICULTURE
Division of Plant Industry
670 State Office Building
St. Paul, Minnesota 55155



MINNESOTA DEPARTMENT OF AGRICULTURE
 DIVISION OF PLANT INDUSTRY
 670 STATE OFFICE BUILDING
 ST. PAUL, MINNESOTA 55155



TREE INSPECTORS NEWSLETTER No. 2

April 22, 1975

SHORT COURSE

The Metropolitan Tree Inspectors Short Course will be offered June 5 and 6, at the St. Paul Campus of the University of Minnesota. Please note the changed dates from the previous Newsletter. For registration and program details, contact the Office of Special Programs, 405 Coffey Hall, University of Minnesota, St. Paul, Minnesota 55108. Telephone: 373-0725.

To maintain your certification, you are required to attend this short course. This, at the present time, is the only approved short course available in 1975.

TREE INSPECTORS EXAMINATION

The next examination for tree inspectors is scheduled for April 24, 1975. An information packet is available from our office for use in preparing for the examination. The packet contains a copy of the law, rules, and regulations, together with Extension Bulletin 363 - "Minnesota's Forest Trees", Extension Folder 211 - "The Dutch Elm Disease", and Fact Sheet 5 - "Oak Wilt and Its Control".

The passing of this examination qualifies you to become a tree inspector for one year. Certification is subject to your being actually hired by, or presently working as a tree inspector for a municipality.

NEW STAFF

The following new staff members have been added to the Division.

Dharma Sreenivasam
 Douglas Rau
 Sylvia Roman

STAFF RESPONSIBILITIES

The following lists the responsibilities of our staff in administering and assisting you in the control programs in the metropolitan area.

<u>NAME</u>	<u>COUNTY</u>
Milton Marinos	Carver, Hennepin
Dharma Sreenivasam	Dakota, Scott
Douglas Rau	Anoka, Ramsey, Washington

At the present time, Milton Marinos and Sylvia Roman will coordinate the Shade Tree Disease Laboratory. John Berends is the overall supervisor of the program.

All of the above named individuals will assist you in the operation of the Shade Tree Disease Control Program. Please direct inquiries to the appropriate staff member.

APPROVED REMOVAL & WOOD DISPOSAL PRACTICES

"Approved Practices" for the metropolitan area are in the process of revision. Revised guidelines for the movement and disposal of elm wood are available on request. As the guidelines for the movement and disposal of elm wood are a part of the "Approved Practices", you will receive a copy when the revision has been completed.

SHADE TREE LABORATORY

The laboratory will open officially on June 2nd this year. For samples that need checking before June 2nd, contact our office.

Take samples from branches showing wilt symptoms. Each sample should be six (6) inches long and $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter. Dry and dead branches are unacceptable as the fungus cannot be cultured from such samples. Place samples (4 per tree) in plastic bags, wrap them well and mail promptly with the report form to:

MINNESOTA DEPARTMENT OF AGRICULTURE
DIVISION OF PLANT INDUSTRY
670 STATE OFFICE BUILDING
ST. PAUL, MINNESOTA 55155

Tree tags and Dutch Elm Disease Report Forms are available from our office.

Oak samples can be taken and sent in the same manner and to the same address. Please be sure to mark "oak sample" on the form.

SEND SAMPLES ONLY WHEN THERE IS REASONABLE DOUBT AS TO THE DIAGNOSIS OF A GIVEN TREE. If you determine a confirmation is necessary for possible legal or other problems, then submit samples for laboratory diagnosis.

SUGGESTIONS

We welcome your response to the Newsletters. If you have any suggestions or information that might be included in the Newsletter, please give us a call at 296-3347.

Minnesota Department of Agriculture
Division of Plant Industry
670 State Office Building
St. Paul, Minnesota 55155

F I R S T C L A S S



MINNESOTA DEPARTMENT OF AGRICULTURE
DIVISION OF PLANT INDUSTRY
670 STATE OFFICE BUILDING
ST. PAUL, MINNESOTA 55155



Vol. 2, No. 1

TREE INSPECTORS NEWSLETTER

March 8, 1976

This is the first newsletter of 1976. The Division of Plant Industry will send additional newsletters to metropolitan tree inspectors to keep them informed about matters pertaining to oak wilt and Dutch elm disease programs in the metropolitan area.

SHORT COURSE

The Metropolitan Tree Inspector Short Course has been scheduled for Thursday, April 8th, 1976, at the St. Paul Campus of the University of Minnesota. For registration and program details, contact the Office of Special Programs, 405 Coffey Hall, University of Minnesota, St. Paul, Minnesota 55108. Telephone number (612) 373-0725.

To maintain your certification, you are required to attend this short course. This, presently, is the only approved short course available in 1976.

TREE INSPECTORS EXAMINATION

The next examinations for tree inspectors are scheduled for Thursday, March 25, 1976, at 9:00 a.m. and 1:00 p.m. To sign up for either of the two times please contact the Division of Plant Industry at (612) 296-3347. The passing of this examination will qualify you as a tree inspector for one year. State certification is subject to your being actually hired by, or presently working for a municipality.

An information packet is available from our office for use in preparing for the examination. The packet contains a copy of the law, rules and regulations, together with Extension Folder 211 - "The Dutch Elm Disease", and Extension Folder 310 - "Oak Wilt Disease".

ELM WOOD CLEAN-UP AND ANNUAL SURVEY

The beginning of a new disease season is almost here again, and therefore, it is most important that all dead or diseased trees be removed before April 1st. Also, you are reminded that your annual survey for elm wood (firewood, log piles, etc.) must be completed by April 15th.

GRANTS-IN-AID

A "Fact Sheet" and "Request for Information Card" are enclosed. Should you require any additional information or if you have any questions, please contact Peter Grills, administrator of the program.

STAFF RESPONSIBILITIES

The following lists the responsibilities of our staff in administering and assisting you in the control programs in the metropolitan area:

<u>Name</u>	<u>County</u>
Milton Marinos	Carver, Hennepin
John Tabet	Dakota, Scott
Douglas Rau	Anoka, Ramsey, Washington

John Tabet is a new staff member and he will be assuming the responsibilities Dharma Sreenivasam had. Dharma will be working on field crop insect surveys and mosquito control.

The Shade Tree Disease Laboratory will be coordinated by Sylvia Roman this year. John Berends is the overall supervisor of the program.

All of the above named individuals will assist you in the operation of the Shade Tree Disease Control Program in your municipality. Please direct inquiries to the appropriate staff member.

SUGGESTIONS

We would welcome your response to these Newsletters. If you have any suggestions on information that might be included in future Newsletters, please give us a call at (612) 296-3347, or write to the Division of Plant Industry, 670 State Office Building, St. Paul, Minnesota 55155.

TREE TRENDS

by Ms. Andrea Bockman, Public Information Coordinator
Minnesota Shade Tree Program • Dept. of Agriculture

Remember the tongue-twister that asks, "How much wood could a woodchuck chuck if a woodchuck could chuck wood?" We've never heard an answer to that question, but the Minnesota Department of Agriculture's Shade Tree Program has some pretty good "wood chucking" ideas.

The best idea is to "chuck" all dead or dying elm and oak wood you are storing for firewood – or anything else. This is not just a good idea. In many communities it is the law.

If you think that disposing of diseased elm and oak is wasteful, consider the reasons and the alternatives.

Elm bark beetles are the main transmitters of Dutch elm disease. After feeding on healthy trees in the summer, the beetles seek suitable breeding sites. **DEAD AND DYING ELM WOOD IS SUITABLE FOR BREEDING.** Over winter, the European elm bark beetle can be found as eggs under the bark of dead or dying elm wood. These eggs hatch in June, the adult beetles emerge and start infecting healthy trees. European elm bark beetles can survive the winter as adults and in April they seek dead or dying elm material for breeding. The native beetles also overwinter as eggs, and emerge in the spring. According to the University of Minnesota, a small fireplace elm log can produce up to 1,800 beetles! Do you have elm logs in your woodpile? If so, you are contributing to the spread of Dutch elm disease.

What about oak wood? Oak wilt disease is a fungus that is spread primarily through the tree's root system. Sometimes, though, the spores of the fungus are produced on the exterior of the trees especially if the oak is a Red Northern, Northern Pin, Black or Scarlet Oak. In this case, the storage of oak wood can be dangerous. If the oak has been cut down while the fungus is spreading through the tree, the disease can be spread. To find out if you have dangerous oak in your woodpile, call your local tree inspector.

So now you know why storing dead or dying elm wood and certain diseased oak wood contributes to the spread of the diseases that kill our trees. Are burning, burying or chipping the only alternatives? Practically speaking, yes.

The elm and oak wood presents no threat if the logs are debarked. An elm debarking tool, called a "spud" costs only \$16. But it takes hours and hours of hard labor to peel an elm log, even in May and June when flowing sap makes the bark easier to peel. You may have the money to buy the spud, but how many of us have the hours?

A wood waste utilization center in St. Paul is currently experimenting with large scale, commercial debarking. If the bark can be stripped economically, selling elm logs as firewood could be a good business, with one cord bringing about \$100. But right now, there is no inexpensive bark peeling method.

Elm and oak wood is not a problem if it is thoroughly dried out. Splitters, which split logs to a thickness suitable for rapid drying, cost anywhere from \$400 to \$3,000. Then, you must accurately weigh sample wood pieces every 10 days until you no longer have any weight losses due to decreasing moisture. Again, the time needed for this method is great.

What about storing the oak wood in plastic bags? It's been found that if the wood is too moist when it's put in the bag, a fungus will grow on the wood and, inevitably, spread. But heavy plastic bags do prevent the disease from being spread by the wind. If you must keep oak, this is the best way to store it, but even this is sometimes risky.

Chemical sprays have been found somewhat effective in stopping beetle breeding action. However, the sprays are toxic and very dangerous to use. It's better to have a few live beetles than one dead man or woman.

It seems, then that there is no way to keep dead or dying elm or oak wood without contributing to the spread of Dutch elm and oak wilt diseases. There are a few times during the year when it is less risky to keep this wood around, but are you willing to take the chance that your neighbors will burn every one of their elm logs by March 15? Suppose they don't – chances are there will be more cases of Dutch elm disease on your street next spring.

Check your woodpiles. Form groups, or ask your local 4-H club or Scout troops, to check neighborhood woodpiles. Get rid of all diseased, dead or dying elm and oak logs. Then we may be able to save a few more elm and oak trees next year. Get involved. Help keep Minnesota green.

IF YOU MUST STORE WOOD – HERE'S HOW

ELM WOOD

Elm wood can be stored from September 15 - April 1 of following year. After this period wood must be debarked or disposed of properly.

OAK WOOD

1. Oak wood can be stored if the tree has been dead for over a year – moisture content is too low for fungus survival.
2. White oak and bur oak can be kept at all times since spores rarely, if ever, form on these varieties.
3. Red oak wood that hasn't been dead for a year, can be stored if it's covered with 4 ml plastic sheets – this keeps spores from being spread by the wind.

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TREE TRENDS

by Ms. Andrea Bockman, Public Information Coordinator
Minnesota Shade Tree Program • Dept. of Agriculture

Last month, January, our noses were blue, our fingers were numb and we were stuck in the middle of winter. It's February now, and it seems like there's more reason to hope that it won't be winter forever and spring just might be around the corner.

So throw that last elm log on the fire, put your snowmobile on blocks and tune up that neglected ten-speed. And when you order the chicken wire for around your vegetable garden, order some flower seeds and window boxes, too.

Come spring, your street may look pretty bleak without the big old leafy elm trees that used to be there. Of course you should plant replacement trees, but those will look a little sparse for a few years yet. To get an immediate return on your planting investment, one that will perk up your house and street this summer, plant flowers, fill window boxes.

It might be a nice idea to get together with your neighbors to decide on a uniform style or color of window boxes for the houses along your street. You can buy fiberglass window boxes at garden and dime stores or you can use metal containers (loaf pans) as long as you make sure to punch holes in the bottom for drainage.

A popular, easy and economical way to get the kind of window box you really want is to build your own.

MATERIAL: boards, 1/2"-3/4" thick

wood screws or nails (wood screws hold the box together better)

The box should be of a suitable length and width to fit your window sills, the best length not exceeding 3 to 4 feet. Each box should be 8-12 inches deep and at least 10 inches wide. Be sure to drill drainage holes every 2 feet or provide drainage by leaving small spaces between the boards.

To prevent rotting, you can paint the inside of the boxes with asphalt paint or char the insides by burning straw or paper until the wood is burnt 1/8" down.

If your window sill slopes, push wedges under each end of the box to make it horizontal. Dark green or blue are good colors to paint your window boxes because the flowers show up well against dark colors.

Now that your box is ready, how and what shall you plant?

SOIL

Place a 2" layer of gravel or broken clay pot pieces on bottom of box

Cover layer with coarse leaves, straw or grass turfs (lay these upside down)

Mix thoroughly two parts good dark soil, two parts peat moss, compost or rotted manure, 1 part sand

Fill the box with soil mixture

Water well and allow mixture to settle (overnight or several hours)

Add more soil mixture, leaving 1 inch at top of box.

PLANTS

In a sunny spot, these plants will flower in summer: Geranium (pink, salmon, red, white blossoms), Ivy-leaved Geranium, Heliotrope, Petunia (purple, lavender, pink, white, yellowish), Sweet Alyssum (white, lavender, pink), Calendula,

French Marigold, Dwarf and Climbing Nasturtium (orange yellow blossoms), Morning Glory (blue, pink, white) ; others.

For a shady spot: Fuchsia (pink, white with purple centers), Wax Begonia (pink, white, or red), Creeping Jenny, English ivy, Coleus, Impatiens (salmon, pink, red, white flow all summer)

Set your plants out in May or June, when the soil and air are warm. You can grow your plants from seed in the house, or, as many Minnesotans do, buy little plants from garden stores.

Carefully, place small plants in the window box. Try not to knock soil from their roots when you take them out of the pot they came in. Set the plants in holes slightly deeper than what they were in before, 6-8" apart. Tamp the soil around the roots. Arrange dwarf plants along the front and sides of the box, the taller ones at the back and medium ones in the middle. Climbers (nasturtium, morning glory) should be planted at the ends of the box so they can be trained to climb wires or strings around the windows.

Keep the soil moist throughout the summer. In hot windy weather, you may have to water your plants several times a week; in cool weather, be sure you don't over water. When your plants are in full bloom, fertilize them occasionally. Remove flowers as they fade.

Of course, you can plant coleus, wax begonia, impatiens and other plants outside, too. Against the house or under a tree is often a good spot, and you plant and care for them pretty much as you would when they're in window boxes. In fall and winter, these plants can be brought into your house and grown near a sunny window.

Flowers are a nice way to brighten the area around your house that was once brightened by a tree. Shrubs offer color and substance, too. Check with your local nursery operator to find out what might grow well in your town. Better, yet, take a walk around your neighborhood and see what flourishes in your neighbor's yard. With a little care and attention, your street will flourish and bloom once again.

(The Shade Tree Program thanks Jane McKinnon and the University of Minnesota's Agricultural Extension Service for much of the above information.)

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TREE TRENDS

by Ms. Clare Rossini, Arbor Month Coordinator
Minnesota Department of Agriculture

"Plant Your Future" is the slogan selected for Minnesota Arbor Celebration '78, our state's biggest effort ever to celebrate trees and to encourage Minnesotans to plant more in their communities, and in their backyards. The Minnesota Department of Agriculture is sponsoring the celebration, which will kick off on Arbor Day, April 28th, and continue through the month of May.

The Dutch elm and oak wilt tree disease problems will lend a special urgency to Arbor Month observances in many communities. However, the Department of Agriculture is stressing the important contributions made by trees planted in any state community. In this way, all Minnesota communities, even those not greatly affected by tree disease, are encouraged to participate in Arbor Month activities.

Our Shade Tree Program field representatives have been working the last two months organizing Arbor Month ceremonies and tree planting projects throughout the state. To find out what's going on in your community, contact your Shade Tree Program field representative, local tree inspector, Department of Natural Resources forester, or Agricultural Extension Service.

Here's some basic tree planting information to help you and your family make your neighborhood or community a greener, more pleasant place to live.

CHOOSING YOUR TREE

Many communities participating in the Minnesota Shade Tree Program have received state money to help them replant trees lost to Dutch elm disease or oak wilt. Before buying a tree, check with your community's tree inspector or forestry department to see if there are funds available to help you plant your tree.

There are a number of different growing regions in Minnesota, and certain species of trees do better in one region than another. Also, the soil at your specific site will determine what kind of tree you will buy. In general, the tree you select should be tolerant of air pollution if you live in a city, resistant to disease, and able to withstand the extremes of Minnesota winters and summers. A tree's landscape value, or its appearance throughout the four seasons, is also an important factor to consider when choosing a tree. Your local nurseryman, tree inspector, Agricultural Extension agent or DNR forester can help you choose a tree which will do well at your site — one that you'll enjoy looking at too!

Another thing to keep in mind: avoid placing tall trees under power lines or any tree over pipe lines. Also, large trees should not be planted any closer than 40 feet apart, and it is best if they are 50 feet apart. Plan before you plant.

NURSERY STOCK

Now that you've chosen a tree that will do well at your site, you are ready to look at nursery stock. Trees may be purchased three ways: Bare-root, without dirt around the roots; container stock, with the roots growing in a wood, plastic, or metal container filled with dirt; or balled and burlapped, with the roots in a large dirt ball covered with burlap.

Each kind of nursery stock has its own advantages. Bare-root trees are less costly, but because their roots have been removed from the soil, they need more help to reestablish those roots. Bare-root trees are available in early spring. Container stock trees are available in spring, summer and fall. Their containers must be carefully cut away before planting, and their roots protected from injury when they are planted. Balled and burlapped trees are sold in both spring and fall. They are more expensive than bare-root trees, but require less pruning and suffer less from transplanting shock. Because of the size and weight of the dirt ball on balled and burlapped trees, it would probably be helpful to consult experienced nursery operators before planting one.

If you can't plant your tree right away, make sure it doesn't dry out or get exposed to extreme hot or cold. Bare-root trees are especially susceptible to temperature changes because their roots are not protected.

PLANTING YOUR TREE

Before planting your tree, have a hole dug at the site that is large enough and deep enough for the root system of your bare-root tree or the dirt clump of your container stock or balled and burlapped tree. If you are planting container stock, remember to remove the container carefully so you do not damage the tree's root system. After planting the tree, water it thoroughly and wrap and stake it for protection against injuries and high winds.

PLANTING YOUR FUTURE

The trees you plant will be around for perhaps a hundred years. They are a long-term investment; living things that need your care and protection. Make them part of your weekly routine. Set aside a certain day to water your trees, and be sure to mulch and prune them periodically. By doing so, you will plant the future — for yourself, and for generations of Minnesotans to come.

DUTCH ELM UPDATE: Be sure you have disposed of all elm wood on your property. Stockpiles of elm wood are favored breeding grounds for the beetles, and encourage the spread of Dutch elm disease.

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TREE TRENDS

Minnesota Shade Tree Program • Dept. of Agriculture

GETTING THE MOST FROM YOUR PLANTING DOLLAR

By Patricia Meyer, Shade Tree Program

Would you plant weeds in a vegetable garden? Dandelions in a flower bed? These seem at first glance to be silly questions. But many Minnesotans, faced with an unfamiliar lack of shade after losing their trees to Dutch elm disease or Oak wilt are insisting that the trees with which they replace their elms and oaks be 1) inexpensive, 2) fast-growing, and 3) that they require a minimum of care. Using this formula, everyone would be most likely to plant willows and cottonwoods. There would, of course, be advantages in that. Lawn mowing would no longer be a great chore since lawns would be greatly reduced or eliminated. And firewood would be easily obtained—it could be picked up right outside the door following every wind storm.

Like weeds, cottonwoods and willows can be grown almost anywhere. But, while they should not be eliminated completely from the environment, they are not the best trees in which to invest for street and yard planting. A tree should not be thought of merely as something that grows, but as an investment. Trees, in the right blend of species and the proper arrangement, can enhance property values. Well-placed trees can make your house easier to heat in winter, easier to cool in summer. Because trees remove pollutants from the air, a little thought now, at planting time, will help us all breathe easier in the future.

With any investment, a larger initial outlay of capital generally results in a larger return. Tree planting investments are no different. The longer-lived, more hardy tree species usually cost more than the fast-growing, easily damaged ones. Dealing with a nursery which offers more services and assurances that the stock it sells will survive is also likely to cost more. If the appearance and function of trees with which you surround your home is important to you, you will shop and plan very carefully.

And, lest the prospect of replanting seem as confusing as dealing with shade tree disease itself, here are some hints to get you started:

- 1) Consider trees already growing in your yard. Are they placed and spaced so as to provide a maximum amount of shade, without interfering with one another's growth? You may want to remove badly placed trees, which serve no purpose, in order to get the best effect from the new ones you plant.
- 2) Consider the size of your lawn. Trees, when mature, have a variety of foliage shapes. If space is limited an upright, pyramidal tree should be used. You do not want branches scraping the house.
- 3) Consider power lines and underground utilities. The appearance of a tree can change rapidly from good to bad if it has to

be topped or pruned away completely on one side to prevent interference with power lines. Also, removing a tangle of roots from water and sewer lines can be far more costly than a more carefully planted tree would have been.

- 4) Find out what trees your city plans to plant on public property adjoining your property. There should be a variety of trees planted so that a single tree disease will never be allowed to so completely devastate a city's tree population again. Speak with your neighbors about a neighborhood planting scheme in which the appearance of each lawn will benefit from the appearance of those nearby.

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Tree Inspector



Published as continuing education for Tree Inspectors and Program Managers

VOL. 1 NO. 1 August, 1978

CHEMICAL INJECTION — No magic cure, But it might help

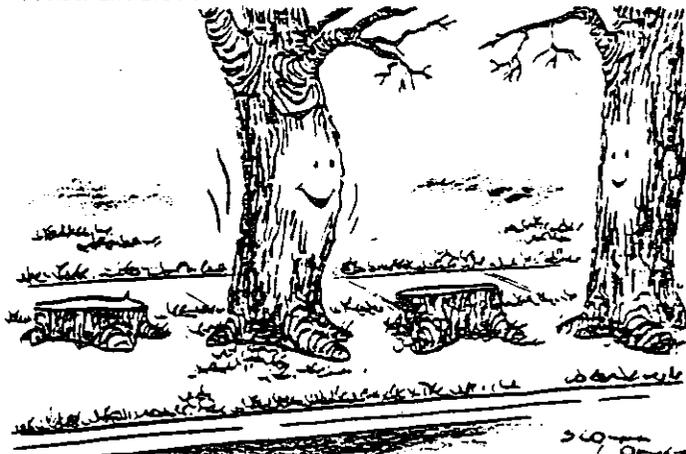
Sanitation is the only known effective method for controlling Dutch elm disease and oak wilt. There are chemicals, however, that can help individuals and cities protect special trees.

As a tree inspector or program manager, you will be asked many questions about these chemicals: their application, success, costs and drawbacks. Whatever the question, it is important for you to remind people that chemical injection is only a secondary weapon against shade tree diseases.

The two most common systemic fungicides currently in use are Lignasan BLP and Arbotect 20-S. Less frequently used are Hopkins Correx fungicide, which includes Lignasan BLP as its active ingredient, and Hopkins Elmpro, a dilute version of Arbotect 20-S. The table below compares some of the chemicals' characteristics.

A sufficient amount of chemical and an efficient injection method must be used to get a complete and even distribution in the tree crown.

"A new antibiotic! Pass the word!"



Cartoon reprinted with permission from The Minneapolis Tribune.

Root flare injection is the most effective injection method. It involves baring the major root flares at the trunk base for 8-12 inches below the ground line and 18-24 inches from the trunk base. The chemical is then injected into the exposed root flares.

(Continued on next page)

CHEMICAL NAME	MAX. PREVENTIVE DOSE PER 5 IN. DBH*		MAX. THERAPEUTIC DOSE PER 5 IN. DBH*		APPROX. COST/GAL.
	oz. chem.	oz. water	oz. chem.	oz. water	
ARBOTECT 20-S	2	80	4	160	\$195.00
HOPKINS CORREX	10	320	20	320	11.00
HOPKINS ELMPRO	40	40	80	80	17.00
LIGNASAN BLP	10	320	20	320	10.00

*DBH = Diameter at Breast Height

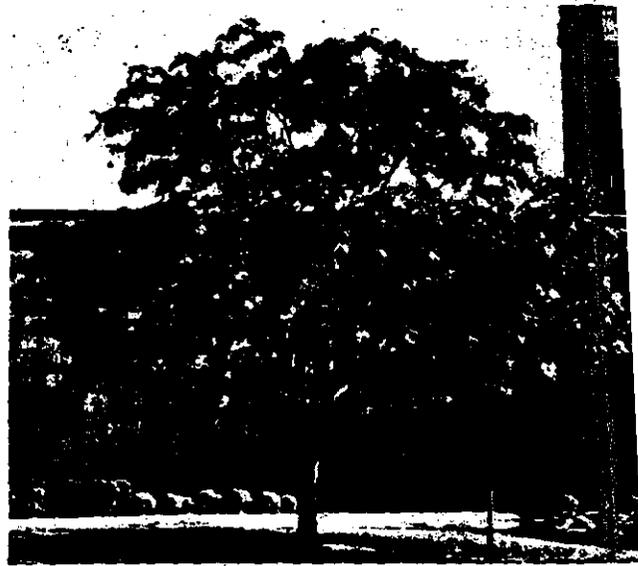
CHEMICAL INJECTION

(Continued from Page 1)

Systemic (affecting the whole tree) fungicides are best used as preventative chemicals in healthy elm trees. They may be used therapeutically for elm trees only in the initial stages of Dutch elm disease, when no more than five percent of the crown is wilted. If flagging is more extensive than five percent, the tree is not treatable and immediate sanitation measures should be employed.

The wounds left on the tree pose a potential drawback to chemical injection. Each injection site may act as a pathway for decay organisms to enter the tree and start decay from the inside. The various forms of heart decay may become so widespread after a few years of chemical injection that the tree may be girdled and killed from within.

Because these chemicals must be injected every year to be effective, decay potential increases through the years. To date, no systemic fungicide has shown sufficient carryover capacity to warrant complete elimination of annual injection.



Shademaster Honeylocust

Because of the spreading open spaces of the honeylocust listed, the trees are better suited to landscaped plantings, large spaces than on narrow boulevard strips. They are good shade trees for sitting areas and home lawns, particularly when they are protected by buildings from afternoon sun in winter. The honeylocust is very tolerant of salt, heat, drought and urban conditions.

Much of this information was excerpted from Minnesota Tree Line No. 2, 1977, published by the University of Minnesota Agricultural Extension Service.

TREE OF THE MONTH

The THORNLESS HONEYLOCUST (*Gleditsia triacanthos inermis*) can be a good choice for people's lawns and city parks. This fast growing tree will reach 75-80 feet. Its small leaves are round and spreading with open, airy canopies that cast light shade, permitting grass to grow. The honeylocust withstands city conditions and blends in well with most architecture.

The four common varieties or cultivars (Imperial, Shademaster, Skyline and Sunburst) are graceful, widespreading trees which turn yellow in fall. The sunburst is not recommended for planting, however, because it may lack hardiness and has irregular growth patterns.

Honeylocusts of various sizes can be transplanted, but can be seriously affected by bruising or wounding in handling. One should be careful when using lawn mowers or other garden tools. The trees can adapt to sandy soils if water is supplied in dry seasons.

They are less subject to tip dieback (damage to new growth in winter) when grown over turf rather than bare ground. Nonetheless, all honeylocusts should be wrapped against sunscald for several winters after planting.

The honeylocust is subject to few diseases. Plant bugs and leafhoppers can cause annual leaf destruction, which leads to dieback after several years. The whitemarked tussock moth can also be a local nuisance. Insecticide treatment should begin in early June, especially 2-3 years after transplanting when the new trees are most vulnerable.

OTHER OAK AND ELM ENEMIES

Elm leaf miner (*Fenusa ulmi* Sundeval) can be confused with Dutch elm disease. This introduced insect can cause leaf drop or spot browning of leaves. Incidence is generally confined to small areas due to the insects' limited mobility.

Trees generally recover from elm leaf miner and are usually attacked only once a year. A healthy elm can tolerate defoliation by insects and will re-leaf within 2-3 weeks.

Elm leaf miner occurs in southeastern Canada and northeastern United States as far west as the lake states. In Minnesota it attacks the American elm. Full grown larvae are about 6 mm long, flattened, and white with a green cast. The head is brown and the legs are encircled with brown.

The insects spend the winter as full-grown larvae in brown papery cocoons in the topsoil. Pupation occurs in the spring with the adults appearing in May, usually during the first half of the month. They then lay their eggs in the upper surface of leaves.

The larvae mine (or eat) the tissue between the leaf surfaces, causing blotches or blister-like mines. Several attacks may occur on a single leaf. When this happens, the various mines may coalesce and can hollow out the entire leaf. These leaves soon wither and fall. Where only a small portion of a leaf is mined, the surfaces dry out and crack leaving holes in the leaf.

The larvae usually mature in late June. They then vacate their mines, drop to the ground and burrow into the ground to spin their cocoons. There is one generation per year.

Chemical control of this pest on large trees is not recommended. If the problem is severe, trees up to 30 feet tall may be treated with an approved insecticide. For application methods and dosage rates consult your local nursery or county extension agent.

Edited in part from Eastern Forest Insects, Whiteford L. Baller, ed., USDA Forest Service Publication No. 1175, pp. 455-456.



Elm leaf miner



UPDATE

RULES AND REGULATIONS:

The new Shade Tree Program rules and regulations became effective August 14, 1978. They override the existing rules and regulations. Copies are being sent to every program manager.

TREE INSPECTORS' EXAM:

Dwight Robinson is in charge of administering the tree inspectors' examination. Future examination dates and locations will be listed in this newsletter when he has established who needs to take the test. If you have not yet taken the exam, contact Dwight immediately so he can establish a testing schedule.

The exam has been changed and, we hope, improved, to a multiple choice, true-false format. We think it's both a good test of the basics and a good learning experience.

PERSONNEL:

The last few months have brought several personnel changes to the Shade Tree Program. The changes are both good news and bad news.

Bad news is the expiration of federal funding for our field representatives, who did outstanding work in outstate communities by bringing the Shade Tree Program closer to Minnesota cities. This was especially critical in the early stages of the program as municipalities began to address the onslaught of Dutch elm disease and oak wilt in their own unique areas.

There's good news in two areas. Due, in part, to the field representatives' conscientious efforts, many municipalities have strong shade tree programs today. Much of their knowledge has been passed on to local administrators and residents.

There's good news, too, in St. Paul: Our staff is back to full strength. Plant pathologist Mark Schreiber and entomologist Dwight Robinson fill the regulatory staff vacancies left by Meg Hanisch and Doree Maser. Bruce Nelson takes over as Public Information Coordinator, replacing Andrea Bockman, who took a new job in March.

Arbor Month Coordinator Clare Rossini has joined the Shade Tree staff and will be bringing Arbor Month to even more communities in 1979. Roger Rutt represents the Shade Tree Program in the federally-funded Dutch Elm Disease Demonstration Cities Project, administered cooperatively by the University of Minnesota Extension Service, the DNR and Department of Agriculture.

Each is committed to visiting as many Minnesota communities as possible.

LAB SAMPLES:

Branch samples submitted for positive identification of oak wilt and Dutch elm disease should be sent to the following address only:

Shade Tree Disease Laboratory
670 State Office Building
St. Paul, MN 55155

We appreciate your comments and suggestions. Subscription to *Tree Inspector* is free of charge to those involved in state, federal or local shade tree programs. Send all correspondence to:

Minnesota Shade Tree Program
600 Bremer Building
St. Paul, MN 55101
OR CALL
612-296-8580



The Minnesota Shade Tree Program gratefully acknowledges the University of Minnesota Agricultural Extension Service, which provides much of the information used in *Tree Inspector*.

Tree Inspector



Published Quarterly as Continuing Education for Tree Inspectors & Program Managers

Vol. I No. 2, November, 1978

New Regulations Limit Storage and Movement of Elm Wood

Those who transport or store elm wood could be causing serious tree disease problems in their communities. And they could encounter serious legal problems as well. According to law, elm wood cannot be stored and transported in many situations.

State Rules and Regulations forbid the storage of elm wood with the bark intact between April 1 and September 15 in shade tree program cities.

Elm wood can be stored during the off months (September 15 to April 1), but only if the municipality takes one of two steps. The City must either issue firewood permits to individuals who use elm for firewood or pass an ordinance that specifies where elm wood can be stored.

The permit system allows a municipality to maintain a record of woodpile locations and owners, facilitates woodpile inspection prior to April 1, and gives a municipality some measure of control over the storage, utilization and removal of the woodpiles prior to April 1.

If a municipal ordinance is issued, important factors must be considered. The ordinance may be more stringent than the State rules and regulations by not permitting any woodpiles or allowing less time for storage. Local ordinances may not, however, be more lenient. If a municipality does not issue permits or pass an ordinance, elm wood with bark intact cannot be stored as firewood within a municipality.

Quarantine Restricts Transportation of Elm Firewood

The movement of elm for use as firewood has been severely restricted by a Department of Agriculture quarantine.

While allowing the movement of elm wood to sites for industrial use and disposal, the Quarantine prohibits the transportation of other elm wood (bark intact) into or through:

1. any home rule charter or statutory city, and
2. any designated disease control areas in the unincorporated areas of any country.

Therefore, elm wood cannot be gathered outside of a control area (in a park, wooded area, farm, etc.) and transported into a control area for stockpiling. The quarantine supercedes any municipal ordinance or permit pertaining to the movement of elm wood.

If you have any questions concerning this important aspect of Dutch elm disease control, **do not hesitate** to contact the Minnesota Shade Tree Program at 612/296-8580.

Reminder to Program Managers — Year end reports were due December 1st. If you haven't fill out and returned the two page form we sent you, please take time today to get it back to us. Your cooperation is essential to the program's future. The information you provide will be presented to the legislature, which will be examining the Shade Tree Program in 1979 and 1980.

OAK WILT: What To Look For — What To Do

There's been so much talk about Dutch elm disease lately that we tend to forget that the disease has a deadly double. But forgetting only makes things worse as oak wilt continues to chip away at many of the state's magnificent oaks.

While Oak wilt is nothing new, our awareness of it is. The disease has been in Minnesota for more than 50 years. But because it's slower moving than its Dutch counterpart, concentrations of oak wilt have so far been confined to the southeastern portion of the state. Small local pockets of the disease have occurred outside this area, but have been eliminated . . . so far. It is predictable that oak wilt . . . left unchecked . . . will steadily work its way into other regions of the state.

The threat is ever present. Statewide, there are more oaks than elms. And many communities—particularly metropolitan suburbs, small cities and farms—were built in and through stands of oak.

The purpose of this special issue is to help you better understand the nature of oak wilt and how to control it both in southeastern Minnesota and in likely new targets for the disease.

What is Oak Wilt?

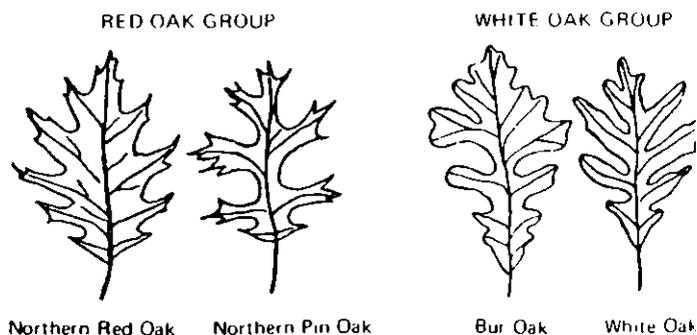
The culprit is a fungus called *Ceratocystis fagacearum*. The fungus moves from diseased trees to healthy trees through root grafts or by insects carrying fungal spores into fresh wounds. Once in the tree, the fungus invades the water conducting vessels (xylem) in the sapwood. The tree then tries to protect itself from the fungus by producing balloon-like projections, called tyloses, which extend into and plug the vessels, cutting off the tree's water supply. The foliage then wilts and the tree dies.

All tested species and varieties of oak have shown susceptibility to the oak wilt fungus, although red and black oaks are much more likely to get oak wilt than are white or bur oaks.

The leaves of red oaks turn a dull green, bronze or tan beginning at the tip of leaf edge and gradually wilt toward the base of the leaves. Wilting in red oaks generally starts near the top of the tree and then rapidly spreads over the entire crown. The tree completely wilts and dies within a few weeks after the first symptoms appear. At the same time the outer sapwood of infected branches changes from white to brown or black. Red oaks are not known to recover once infected.

White and bur oaks are much more resistant to oak wilt. They often remain healthy after surrounding red oaks have been killed. Although white oaks show the

same pattern of wilt and brown streaking as red oaks, they usually drop few leaves and only scattered branches show early signs of wilting. Infected trees may live for several years while the disease slowly spreads through the tree each year. Eventually the tree may die from oak wilt or be so weakened that something else kills it. White oaks have been known to recover in some cases.



These drawings were reprinted from University of Minnesota Extension Folder 310, Oak Wilt. Notice that red oaks have pointed lobes (like arrows) and white oaks have rounded lobes (like bullets). To keep things straight just remember, "Red man's arrows and white man's bullets."

How It Spreads

Oak wilt moves from infected trees to healthy trees in two ways: through root grafts and fresh wounds via insect vectors. Root grafts, the fungus pipeline over 90 percent of the time, often unites red oaks growing within 50 feet of one another. Such connections are less common among white oaks. Root grafts between white and red oak do not normally occur.

Insects can spread the fungus when spores produced on mycelial mats, called pressure pads, are formed between the bark and wood of infected red oaks. Pressure pads have a fermenting odor that attracts insects, especially sap feeding beetles known as Nitidulids or picnic beetles. As the insects crawl over the pressure pads, fungal spores adhere to them. They then may fly to other oak trees and feed on the sap flow from fresh wounds, thereby infecting new trees. Oaks are particularly susceptible in spring and early summer when new leaves are developing. For this reason do not prune oaks in May or June. Pruning is best left until fall.

OAK WILT CONTROL

To effectively control oak wilt it is necessary to detect diseased trees in the early stages of infection, isolate the diseased trees from surrounding healthy oaks, remove the diseased trees quickly and dispose of them in a rapid and proper manner.

Detection

It is important to detect and identify oak wilt as early as possible. If there is a question as to whether a tree has oak wilt, a sample should be obtained from an actively wilting branch and sent to the Shade Tree Disease Lab for positive identification.

Early detection is especially important in red oak stands because the fungus is already systemic by the time wilting becomes visible. Rapid implementation of sanitation procedures is the only method of preventing the spread of oak wilt to adjacent healthy trees.

Isolation

If an infected oak stands within 50 feet of an oak of the same species (i.e., red oak to red oak, white oak to white oak), the roots must be disrupted to cut off the fungus pipeline or **root grafts**. This, logically, is called isolation. Diseased trees can be isolated from healthy ones either mechanically or chemically.

Root grafts can be **mechanically** disrupted with a vibratory plow or mechanical trencher. In either case a trench 36-40 inches or deeper and at least 10 feet from a healthy tree (to avoid excessive root damage) must be dug around the diseased tree. Once completed, the diseased tree should be quickly removed. (Remember you must trench **before** removing the diseased tree. This will help prevent the fungus from being pulled from diseased roots into healthy trees.) This technique is not possible in areas where buried water, gas or power lines exist. In such cases chemical disruption is the best solution.

Chemical root graft disruption may be accomplished with the soil sterilant **Vapam**, which kills the roots at the point of contact. After determining barrier location, usually midway between diseased and healthy trees, bore or punch holes 1-1½ inches in diameter at least 3 feet deep and 6-8 inches apart. Mix one part Vapam with three parts water and fill the holes to within 2-3 inches of the surface. Immediately cover the hole with soil and tamp it shut. The soil must be warm, above 50° F., for effective action. Water-logged soils also reduce effectiveness of the treatment. If Vapam is used to disrupt root grafts, **you must wait two weeks** before removing the diseased tree. This gives the chemical time to complete its work.

Because Vapam is a soil sterilant, there are some side effects. Grass immediately surrounding the barrier often dies and shrubs nearby may exhibit some chemical injury. If Vapam is applied closer than 8 feet to healthy trees, they also may be injured. In most cases, these shrubs and trees will recover.

Removal and Girdling

Immediately after trenching or two weeks after applying Vapam, diseased oaks should be removed. If diseased trees are allowed to stand, fungal pressure pads may form, endangering nearby healthy oaks.

It is important to remove diseased trees. In wild areas, however, oaks can be girdled when removal equipment cannot be brought in immediately. (Trees should not be girdled near buildings or where people travel or congregate. A strong wind can fell the weakened tree.)

To girdle a tree, cut through the bark at least two inches into the wood with a saw or axe. Girdling, of course, kills the tree, but, most important, it causes the tree to rapidly dry out so that pressure pads can't form. Transmission might still occur, however, through the roots. For this reason it is still important to disrupt root grafts. The tree can then be removed at a later date.

Disposal

When red oaks are removed, great care must be taken to ensure that the wood is destroyed, recycled or properly stored. Ideally, diseased red oak trees should be taken to a disposal site where they can be rendered pest-risk free (i.e., burned, buried, debarked or chipped.).

If the wood is stored as firewood, however, one must do one of two things. Either debark the wood or completely wrap the wood in 4 mil. (heavy) plastic between April 15 and July 1 during the first year after removal. These precautions are necessary because the oak wilt fungus can live in the logs for another year and could produce pressure pads. Insect vectors feeding on these pads could then spread the fungus to healthy trees.

White oak wood can be stored without plastic because pressure pads do not form on this oak species.

What Does The Future Hold?

The prospect for oaks is much more optimistic than for elms. Because oak wilt is mostly transmitted through root grafts, the fungus can be stopped through isolation. And, if the diseased wood is properly removed and stored, the spread of oak wilt can be effectively controlled.

This article was written by staff plant health specialist Mark Schreiber, who provided the technical expertise, and Bruce Nelson, public information coordinator. Another fine pamphlet on the subject, Oak Wilt Extension Folder 310, is available from the Agricultural Extension Service at the University of Minnesota. Copies can be ordered from The Bulletin Room, Room 3, U of M. St. Paul, MN 55108.

THE BASICS OF OAK WILT CONTROL

1. Do not prune oaks in May or June. Wait until fall to prune and then immediately cover the wounds with a good wound dressing.
2. If an oak becomes infected with the oak wilt fungus, immediately disrupt all root grafts between it and nearby healthy trees of the same species. Use mechanical means or Vapam.
3. Remove the tree immediately after trenching OR two weeks after Vapam is used.
4. Destroy, recycle or properly store (in 4 mil. plastic) all red oak wood once removed.
5. Watch for the symptoms: wilting leaves in the tree crown and brown staining of the sapwood.

**QUESTIONS? CALL US AT
612/296-8580**



UPDATE

New Publication

We have a new, simple publication that you may find useful in dealing with the public. It is called **Ten Questions You Thought Were Too Dumb to Ask** and it may help you explain what you are doing while inspecting or removing trees. Also, on the back of this one-page sheet we have listed all other information available from us and the U of M extension services

For copies, write or call us at 612/296-8580.

Disease Lab Data In

The Shade Tree Disease Laboratory reported receiving fewer samples last summer than in 1977. Laboratory head Ron Sushak said the laboratory, which tests samples of trees that might have Dutch elm disease or oak wilt, analyzed 2,532 samples. Of that total, 1,929 were checked for Dutch elm disease with 1,208 turning up positive; 603 oak samples were tested with 210 oak wilt confirmations.

The number of submitted samples declined by 5,175 from the 1977 total of 7,707 (5,948 elm and 1,759 oak) because people have greater faith in tree inspectors' field diagnoses, Sushak said.

The laboratory also reported that Dutch elm disease was confirmed for the first time in Beltrami County. The laboratory will reopen in early June.

TENTATIVE TREE INSPECTOR WORKSHOPS — 1979

March 5	Rochester
March 7	Mankato
March 12	St. Paul
March 19	Marshall
March 20	Detroit Lakes
April 4	Grand Rapids

Remember, all Tree Inspectors must attend one continuing education course a year to maintain certification. Plan to attend one of these workshops. We'll fill you in on agendas as they're developed or any date changes.

Upcoming Issues

Regular features **Tree of the Month** and **Other Oak and Elm Enemies** will return in our next issue this February. Look for features on Linden trees and the adult lace bug and some interesting surprises.

Other special issues in the offing are **Arbor Month Tree Planning Special** in April and **Steps in Sanitation** in May.

Collector's Item

Did you get the first issue of *Tree Inspector*? Get the latest on chemical injection and check out our **Tree of the Month** and **Other Oak and Elm Enemies**. Write or call (612/296-8580) for free copies.



We appreciate your comments and suggestions. Subscription to *Tree Inspector* is free of charge to those involved in state, federal or local shade tree programs. Send all correspondence to:

Minnesota Shade Tree Program
600 Bremer Building
St. Paul, MN 55101
OR CALL
612/296-8580



The Minnesota Shade Tree Program gratefully acknowledges the University of Minnesota Agricultural Extension Service, which provides much of the information used in *Tree Inspector*.

Tree Inspector

Published Quarterly as Continuing Education for Tree Inspectors & Program Managers VOL. 1 NO. 3 March, 1979

Good News, Realistic News From State Cities

The incidence of Dutch elm disease has changed dramatically in most Minnesota cities since the state grant-in-aid program began two years ago. According to information provided by program managers in their year-end reports, losses to the disease dropped by about 1/3 from 1977 to 1978.

The decline comes after losses had doubled or tripled in most cities since about 1973.

This good news is largely due to normalization of the weather and the impact of the state grant-in-aid program. In 1977 trees felt the brunt of the 1976 drought, which caused higher than expected losses. The summer of 1977 was also the first time most cities had control programs. As a result these cities focused on designing their programs and reducing residual inoculum from previous years.

The news gets even better. According to best estimates, future losses in most cities will stay roughly at the 1978 level—if local programs are continued.

But experts caution that there could be bad news. A return to annual doubling and tripling in losses will reoccur by 1980 if programs are abandoned.

And there's realistic news. As every tree inspector and program manager knows, Dutch elm disease is here to stay. With no cure for the disease, all we can do is save time and money. The reports show that both could be considerable. By doing nothing most cities will lose some 80 percent of their elms within 4-5 years; with good programs they could still have a majority 15 years after confirmation of the disease. This would buy time for cities to smooth the transition from elm-lined streets to streets bordered by a mixture of other species.

Continued on next page

LOSSES TO DUTCH ELM DISEASE

Region	1977	1978	77-78	Change
Central	6,634	6,234	12,868	- 400
East Central	1,307	1,698	3,005	+ 391
Metropolitan Area	192,211	126,729	318,940	- 65,482
North Central	222	365	587	+ 143
Northeast	585	1,745	2,330	+ 1,160
Northwest	68	435	503	+ 367
South Central	16,550	13,527	30,077	- 3,023
Southeast	9,466	5,922	15,388	- 3,544
Southwest	10,324	6,408	16,732	- 3,916
West Central	2,541	3,149	5,690	+ 608
TOTAL	239,908	166,212	406,120	- 73,696

Cities will also pay—one way or another—for removal. The choice is paying for removal in a few short years or extending that outlay over time. In 1977, for example cities spent \$21,525,423 for sanitation.

The disease picture and forecasts do vary from region to region. Many southern-most cities have already lost the battle to Dutch elm disease, although there are several that retain large elm inventories. In the central and metropolitan regions nearly every city faces almost total devastation in 4-5 years if controls are stopped. With controls, these cities can keep most of their elm trees—and their costs down—for 10-15 years.

Northern Minnesota cities are in the best position to retain their elms. With a few exceptions, the disease has not taken many trees in these cities. By instituting controls at this early stage, these communities can save a majority of their urban elms for at least 15 years—indeed some may live out their natural lives. Without controls cities here will lose most of their very substantial elm inventories in a very few years.

Year-end reports showed that oak wilt was predominantly a rural problem confined to the southeastern (including metropolitan) area of the state. Newly developed cities were the hardest hit urban centers. Many of these communities were built in and through natural oak forests, making oak wilt their principal threat to local shade trees. As the metropolitan area continues to expand, many such newer cities will also be faced with this threat.

As expected, more trees were planted in cities that have suffered the most losses to Dutch elm disease. . . in the south and metropolitan areas. Nonetheless, few cities are as yet keeping pace with losses. Reforestation is expected to be given greater priority in many of these cities in the next two years.

UPDATE

Year-End Reports

Of the 540 cities and counties participating in the 1978 state Shade Tree Program, 380 have submitted year-end reports. The results were presented to the Legislature in our annual report and are summarized on Page 1 of this newsletter. We thank those Program Managers who sent in their reports.

The data are still incomplete, however, because many municipalities have not reported. We need this information to demonstrate program effectiveness to the Legislature. We would greatly appreciate your taking a few minutes to fill out this form.

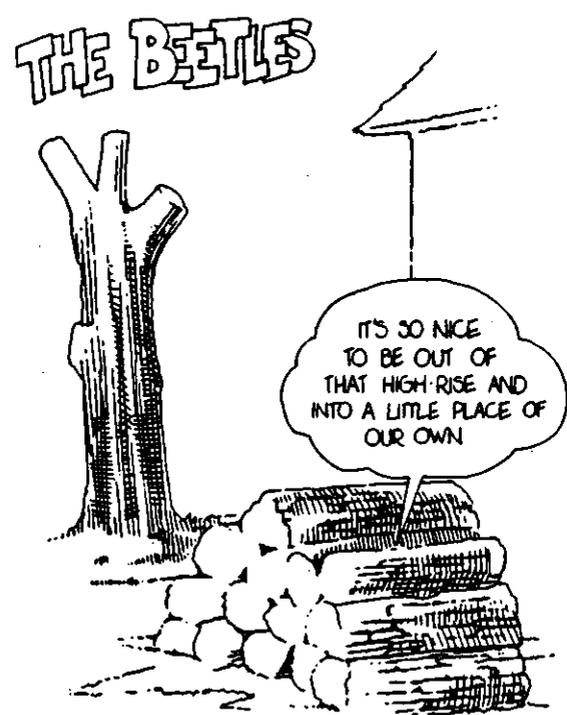
If you didn't receive or misplaced your year-end report form please contact us. We'll send you another copy.

Reminder . . .

Elm Firewood Must Be Burned By April 1st

Now is the time to plan your woodpile inspections. Those elm logs could harbor millions of bark beetles. If the logs aren't destroyed by April 1, those beetles could bring the disease causing fungus to many healthy elms. This would be a needless waste.

Be sure to alert people to this danger and encourage them to get cozy by the fireplace during the next few weeks and burn their remaining elm logs. One way to do this is to ask your local newspaper and radio stations to pass the word.



QUINDEN minneapolis tribune

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We appreciate your comments and suggestions. Subscription to *Tree Inspector* is free of charge to those involved in state, federal or local shade tree programs. Send all correspondence to:

Minnesota Shade Tree Program
600 Bremer Building
St. Paul, MN 55101
OR CALL
612/296-8580



Chris Tschida Named New Arbor Month Coordinator

Arbor Month activities are in able new hands. Chris Tschida replaces Clare Rossini, who has moved on to study creative writing. Chris is working with civic organizations, schools and the media in cities across the state to promote this year's major tree planting effort.

A newly planted tree is always cause for celebration. Appropriately this year's theme is **Celebrate Trees**. "The theme is carried through our beautiful Arbor Month poster, community action brochure and many helpful guides to tree planting and care," Chris said. "They're all available free to groups that want to get involved. I encourage every city in the state to plan a tree planting celebration."

The 1979 state ceremony will be held in the Elliot Park neighborhood in Minneapolis. For more information about the state ceremony or plans in your city, give Chris a call at 612/296-8580.

The next issue of *Tree Inspector* will be devoted to Arbor Month and replanting.

LEGISLATION UPDATE

Will There Be Funding in 1979 and 1980?

The Minnesota Department of Agriculture has submitted to the Legislature a request that the state Shade Tree Program be continued through the next two years. The department requested no changes in the law and asked for the same level of funding appropriated for the last two years:

Sanitation grants-in-aid	\$21,650,000
Reforestation grants-in-aid	\$ 4,400,000
Wood Utilization	\$ 550,000
Experimental Projects	\$ 400,000
Public Information	\$ 400,000
Public Information	\$ 199,600
Administration	\$ 333,600

As before, the sanitation and reforestation monies would be equally divided for each year.

The request must pass both the Senate and House and be signed by the Governor before funding will be available. In the House the request must be heard by the Appropriations Committee before consideration by all the members. Similarly, the Senate Finance Committee must hear the request before it goes to the Senate floor. Both committees are just beginning to hear testimony.

The Legislature is also considering a shade tree bill drafted by the League of Cities. The bill would significantly change the grant-in-aid program by combining sanitation and reforestation grant funds. Local units could then decide which activity they should emphasize: sanitation, reforestation or both.

In addition to the Appropriations and Finance committees, the bill must clear the Local and Urban Affairs Committee and the Taxes Committee in the House and The Agriculture and Natural Resources Committee and Taxes and Tax Laws Committee in the Senate. To date, the measure has passed only the House Local and Urban Affairs Committee.

It is possible that the bill and the department request will eventually be combined in some way. We'll keep you updated on the legislative picture in the newsletter and through correspondence.

We will also keep you posted on 1979 applications. If and when legislation is passed and signed, we will send grant applications to all cities and counties in the state as soon as possible.

T. I.'s Must Attend Workshop

Tree Inspectors must attend an annual workshop to remain certified. Because all municipalities participating in the state Shade Tree Program must have a certified tree inspector, failure to attend could jeopardize your local program.

These workshops will be your only opportunity to be recertified without retaking the exam. If you have any questions call Dwight Robinson at 612/296-8580.

REMAINING

1979 MUNICIPAL TREE INSPECTOR'S WORKSHOP

Date	Location	Time
April 4	Grand Rapids — Holiday Inn	12:30

The workshop will include the following program on shade trees:

P.M.

12:30	Registration
1:00	Planning and Selection — Richard Rideout, U of M Dept. of Horticulture Science and Landscape Architecture
1:40	Diseases — Asimina Gkinis, U of M Dept. of Plant Pathology
2:20	Insects — William Phillipson, U of M Dept. of Entomology, Fisheries and Wildlife
3:00	Refreshment Break
3:15	'79 Rules and Regulations - Dwight Robinson, Minnesota Shade Tree Program, Dept. of Agriculture
3:30	Review for Certification Exam — Dwight Robinson
4:15	Test — for people not certified

Please remember to register so we know you attended.



TREE OF THE MONTH

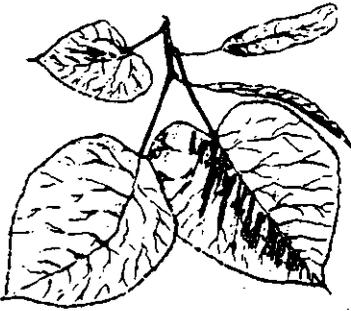
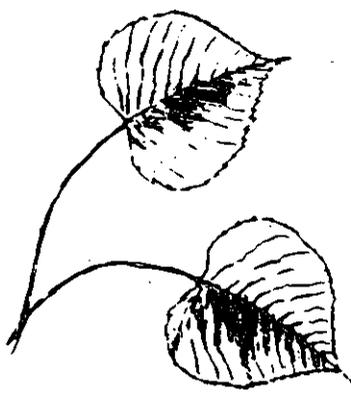
American Linden (*Tilia americana*), also known as basswood, is a winter-hardy, native tree that will reach 50-75 feet with a crown spread of 40-60 feet. American Linden is often strongly columnar, having an oval to round form that provides excellent shade. Its large, heart-shaped leaves are deep green in summer and turn gold in autumn. Fragrant blossoms that appear in early summer are extremely attractive to bees.

After initial transplanting, the tree usually requires little attention. The root system is spreading and descending. The tree should be placed in coarse, well-drained soil. The American Linden prefers moist, fertile soil, but adapts to most locations in Minnesota. The tree may develop with several stems, but single trunks can be maintained by pruning the tree when young.

This Linden is very salt sensitive, requires good drainage, is sensitive to early frost and is drought resistant. Except for its susceptibility to heart-rot and a few canker fungi, American Linden is generally disease-free.

Littleleaf Linden (*Tilia cordata*) and varieties Greenspire and Chancellor are medium-sized trees at maturity, reaching 40-70 feet high with a crown spread of 40 feet. The rounded crown is dense and foliage dark green. The leaves are smaller than those of American Linden. Greenspire grows to a dense, pyramidal shape while Chancellor has a compact and upright form. Littleleaf Linden tolerates city conditions but is salt-sensitive. The tree needs moisture and good soil drainage.

The slow-growing **Redmond Linden (*Tilia zenclora*)** has a strong pyramidal shaped suited to narrow boulevard spaces. Leaves are dark green, firm and glossy.

	NAME American Linden <i>Tilia americana</i>	HEIGHT 70' SPREAD 40'-60'	FORM Rounded	GROWTH RATE Fast	
	OTHER INFORMATION Fall coloration: yellow to brown. Leaf is large, heart shaped. Prefers well-drained soil.				
	NAME Littleleaf Linden <i>Tilia cordata</i>	HEIGHT 40' SPREAD 30'-40'	FORM Pyramidal	GROWTH RATE Moderate	
	OTHER INFORMATION Fall coloration: yellow. Blossoms are very fragrant. Prefers well-drained soil.				

Reprinted with permission from *City Trees* published by The City of Chicago, September, 1974.

minnesota

Shade Tree Program • Department of Agriculture • 600 Bremer Building • St. Paul, MN 55101 • 612/296 8580

Tree Inspector



Published Quarterly as Continuing Education for Tree Inspectors & Program Managers

Vol. 1 No. 4 May, 1979

celebrate trees

State Ceremony

Arbor Month got off to a great start at the official State Arbor Day Celebration in Minneapolis on April 27. Governor Al Quie's wife Gretchen read the Arbor Month proclamation and threw the first shovel of dirt. Commissioner of Agriculture Mark Seetin, Minneapolis Mayor Al Hofstede, and other state and local dignitaries enriched the once sparse triangle at Park Avenue and Tenth Street with Scotch and Austrian Pines, Green Ash, and a beautiful Canadian Red Cherry tree. Red Wolfe and his Dixieland Band helped make the ceremony a true celebration of trees.

The day after the state ceremony, the local Elliot Park neighborhood had its own neighborhood Arbor Celebration to finish planting the Arbor Day site with shrubs and flower beds. Similar city and community events are taking place across the state. It's not too late for your town. Invite the news media and enjoy the before and after photos on TV or in the newspaper.

See Arbor Ideas on page 3.

Arbor Day Is Older Than Our Local Elms

The history of Minnesota Arbor Month really begins in Nebraska, the first state to officially set aside a day "consecrated for tree planting." Arbor Day was quickly adopted by other states, including Minnesota, in 1876. Minnesota, like most other states today, celebrates Arbor Day on the last Friday in April.

In 1978, the Minnesota Department of Agriculture unofficially extended Arbor Day into May, and christened the new, longer observance Arbor Month. There were two good reasons for the month-long celebration. First, in many parts of Minnesota the ground is not sufficiently thawed for tree planting on the last Friday of April. Second, extending Arbor Day into Arbor Month gave schools, neighborhoods, and communities more time to plan and carry out tree planting projects.

Minnesotans responded enthusiastically to the state's first Arbor Month: 200,000 saplings were planted in 1978 by 350 schools and communities. Today, Arbor Month continues as an observance that makes people aware of the importance of trees and their planting. We need to keep the Arbor Month spirit alive in Minnesota.

Special Arbor Month Issue

Leave Luck Out of It; Plan Before You Plant and Your Tree Will Pan Out

Arbor Month is a time to invest in the future. And as with any sound investment it is important to think before you put your money on the line. . . or in this case, shovel in the ground.

The Program's regulatory staff offer a few tips on how make that investment pay off: to pick a tree that will survive, complement the surrounding area and reach maturity without interfering with the urban environment. So before you plunge ahead, make a mental—or written—checklist of the following considerations.

Location

One of the most important factors to consider prior to tree selection is site location: Determine where you want the tree. Choose two or three alternative sites should one prove unacceptable for reasons described below. At each prospective location determine what type of tree it is best suited for. **Do not have a specific species in mind**; you must let the planning process do this for you.

Look around the area surrounding the site and ask yourself: is the area free of overhanging power lines; is there sufficient room for root and crown development so the tree can grow normally; and are there sewer, gas and/or water lines located beneath the site?

The actual site(s) also presents important considerations: **soil type** (sandy, clay, loam, or a combination of these), **soil pH** (acidic or alkaline), **drainage** (poor, adequate, or excessive; an excess or deficiency of water can kill many tree species), **sunlight** (bright, partial, or shaded), **proximity to cement or asphalt** (streets, sidewalks, and driveways prevent water from entering the soil and will increase soil temperature), **proximity to house or garage** (these structures reflect sunlight and heat and may restrict root development), **proximity to street** (many tree species are sensitive to de-icing salt).

Each of these considerations provides a key to the eventual success or failure of tree planting. Always remember how the tree will look at maturity, not as a sapling. The small nursery stock will grow both in terms of height and width; it must be given adequate space to do so. For example: trees that reach a height of 30 feet or more at maturity should not be planted beneath power lines; trees with shallow root systems should not be placed on a narrow boulevard or near the intersection of a driveway and sidewalk; trees with descending (deep) root systems should not be planted near gas, water, and/or sewer lines; trees sensitive to de-icing salt should not be planted along boulevards; and trees requiring good drainage should not be planted in predominately clay soils.

Aesthetics

After establishing a site available for a tree, decide what services you want the tree to provide. The mature tree must be considered because shape and coloration often change as a tree grows. Foresight will reward you with complementary tree in the future.

Questions to consider are: is year-round color desired; is fall coloration important; what shape is best for the site (remembering the mature tree); what degree of shading is desired; what size is best for the site (a large tree can dwarf a small home while the impact of a small tree is lost beside a large house); are climatological factors involved (cooling shade, altered wind-flow patterns, etc.); is flower and fruit production important; and are seeds, fruit, and leaves a nuisance?

With a clear picture of the location and aesthetics in mind, the planner/planter can NOW look for trees that fill the bill. Most people have a general idea of what they want from a tree but this is not enough; specific information must be obtained to ensure satisfaction.

Tree Selection

After considering the requirements and aesthetics of the site, many tree species will be unavailable for planting. Careful tree selection must come from those species that remain. Again, information must be obtained: which hardiness zone is the site in (trees will not survive outside their hardiness zones; see map and ask your nursery man which trees are best suited to your area); is heavy snow, ice, and/or rain common in the area (many trees cannot withstand excessive ice and snow); is the tree you are considering susceptible to many diseases and if so, are they treatable; is the tree available from a local nursery; and is the tree readily transplantable?

After determining the specific tree species that best fulfill these requirements you should go to a licensed nursery to obtain nursery stock. Before your purchase ask your nurseryman, "Where was this stock grown?" Nursery stock grown in or around Minnesota is best suited to the state's climate and is often most resistant to the pathogens present. If the nursery stock is from out of state, a competent nurseryman will provide you with information pertaining to hardiness, disease resistance, maintenance requirements, and planting procedures to select and plant the correct tree for your site. Do not hesitate to ask questions; after planting you have to live with the choice. Or, if you took the time to plan, enjoy the fruits of your labor.

Continued on next page

Continued from page 2

The list of trees on the insert provides a check list of trees as they relate to these requirements. Cross-check your planning with these choices for good tree selection.

There are many fine publications that can help you, as a professional, plan and plant. Listed below are some of these guides published by the University of Minnesota Agricultural Extension Service. Copies can be obtained from your local extension agent or from the Bulletin Room, Room 3, Coffey Hall, 1452 Eckles Avenue, University of Minnesota, St. Paul, MN 55108.

Tree Selection

- Tree Line 1. "How to Buy a Tree"
- Tree Line 2. "Shade Trees for East Central Minnesota"
- Tree Line 7. "Shade Trees for Southeastern Minnesota"
- Tree Line 12. "Shade Trees for Southwestern Minnesota"
- Tree Line 13. "Shade Trees for West Central Minnesota"
- Tree Line 14. "Shade Trees for Northeastern Minnesota"
- Tree Line 16. "Shade Trees for North Central Minnesota"
- Tree Line 18. "Shade Trees for Northwestern Minnesota"
- Tree Line 23. "Shade Trees for South Central Minnesota"

Horticulture Fact Sheet 22. "Street Trees for Minnesota"

Extension Folder 298. "Fitting Trees and Shrubs into the Landscape"

Extension Folder 445. "Shade Tree Evaluation"

Tree Planting and Care

- Tree Line 3. "How to Plant a Tree"
- Tree Line 15. "Fertilizing Shade Trees"
- Tree Line 17. "Protecting Trees and Shrubs Against Winter Damage"
- Tree Line 19. "Minimizing Salt Injury to Shade Trees"
- Tree Line 20. "Trees for Modifying Home Energy Consumption"
- Tree Line 21. "Protecting Shade Trees from Construction Damage"

Extension Folder 402. "Planting Landscape Trees"

Ideas for Your Arbor Month Celebration

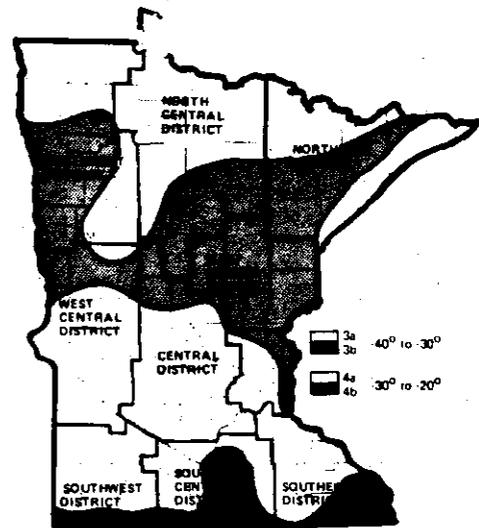
If you'd like help planning an Arbor Month event, the Minnesota Shade Tree Program has a booklet that will help you every step of the way. "Celebrate Trees... Making Arbor Month Come Alive In Your Neighborhood or Community" is available free of charge by writing to: Arbor Month Planning Booklet, 600 Bremer Building, St. Paul, MN 55101.

Many communities have expanded the Arbor Month idea and launched clean-up campaigns and city-wide beautification projects. Landscaping of new buildings takes on an added significance when a tree planting ceremony is held and the Arbor Day proclamation is read.

Clubs and organizations may wish to sponsor fundraisers to buy trees. It is a good idea to determine what trees you want to purchase and the price of each tree. When approaching businesses for a contribution, suggest they donate a particular tree for your Arbor Month program. Then, put a sign on or near the tree telling the name of the company that provided it.

Trees and planting materials should be cheaper in many parts of Minnesota thanks to the cooperation of the nursery industry. Many nurseries will be offering Arbor Day/Month discounts. Look for the "Celebrate Trees" poster at your local nursery.

PLANT HARDINESS ZONES



Map provided by University of Minnesota Agricultural Extension Division; numbers indicate temperature differences.

Free Arbor Materials

The Minnesota Arbor Month Office is distributing the following materials free of charge:

Arbor Month Instruction Kit

Double pocket portfolio with posters, pamphlets, Arbor Month stickers, and a 44-page **Teachers' Guide** with lesson plans relating to forests and trees. Adaptable to any grade level.

"Celebrate Trees" — Arbor Month Planning Booklet

Designed for schools and civic organizations that want to sponsor an Arbor Month ceremony or tree planting project. History of Arbor Month, tree planting instructions, and suggestions for several Arbor Month projects.

Arbor Month Poster (two sizes)

The official 1979 Arbor Month poster. Comes in two sizes: large poster for display, smaller poster with white space in which time and date of Arbor Month Ceremony or project can be written.

Arbor Month Stickers

Adhesive-backed stickers that students can put on notebooks, book bags, etc. One sheet has 25 stickers.

Arbor Month Stuffer

Utility bill stuffer, 6 1/4 by 3 1/4 with logo and Arbor Month Information. This size would also be useful as a bookmark.

We appreciate your comments and suggestions. Subscription to *Tree Inspector* is free of charge to those involved in state, federal or local shade tree programs. Send all correspondence to:

Minnesota Shade Tree Program
600 Bremer Building
St. Paul, MN 55101
OR CALL
612/296-8580





TREE OF THE MONTH

Canadian Red Cherry and Austrian Pine 'Different' Trees Planted at State Arbor Day Celebration

The state Arbor Day Ceremony marked the planting of two somewhat unusual trees for Minnesota. The ceremonial trees, donated by the Minnesota Nurserymen's Association, are the Canadian Red Cherry and the Austrian Pine.

Canadian Red Cherry

Canadian Red Cherry (*Prunus virginiana melanocarpa* "Shubert") is a medium-sized tree reaching a height of 15-25 feet with a maximum crown width of 25 feet. Its medium size makes Canadian Red Cherry valuable in ornamental urban locations where space is limited and structure-complementary trees are highly desired.

Canadian Red Cherry "Shubert" possesses a pyramidal shape with dense green foliage in the spring. The leaves turn reddish purple upon reaching maturity in summer. White flowers are produced in the spring and yield red fruits in mid-summer. This combination produces an exceptionally handsome tree throughout the growing season.



UPDATE

In the last *Tree Inspector* we reported on the emergence of two separate items in the Legislature pertaining to the Shade Tree Program: The Department of Agriculture budget request and a bill drafted by the League of Cities.

The Department request and Governor's recommendation of \$27 million for the biennium has been cut to \$17 million by a House Appropriations subcommittee. A Senate Finance subcommittee has recommended the full \$27 million, plus an additional \$2 million for reforestation. In both houses the full committee has concurred with subcommittee action.

The League's bill has passed the House Local and Urban Affairs and Tax Committees and the Senate Agriculture and Natural Resources and Tax and Tax Laws Committees.

The bill doesn't have dollar figures tied to it at this time. Appropriations may be added when the bill next goes to the House Appropriations and Senate Finance Committees. At some time in the future there will likely be a melding of the Department request and the League's bill. We'll keep you posted.

This species was developed with vigor in mind. It is extremely hardy and a good substitute for red leaved maples where hardiness is essential. It should not be planted near or among native plums and chokecherries as it is susceptible to the same pests and diseases common to these native *Prunus* species.

Information obtained in part from Street Tree Master Plan, City of St. Paul).

Austrian Pine

Austrian Pine (*Pinus nigra*), a widely planted ornamental tree species introduced from Europe, may reach a height of 50 feet at maturity. Under normal growing conditions this pine grows quickly, reaching 12-15 feet in 10 years. The needles on this two-needled pine are 3-5 inches long, stiff, sharp and dark green. The result is a dark, rich green tree.

Austrian Pine is one of the most symmetrical pines, taking a broad, pyramidal appearance at maturity. This species is not demanding as to soil type, growing well in sands, loam and clay. In Minnesota its range is restricted to the southern two-thirds of the state. Winter hardiness is easily its biggest problem in Minnesota. It often serves well as a windbreak since the dense foliage and stiff branches will withstand wind and the weight of ice and heavy snow. This species tolerates most adverse environmental conditions and is fairly disease resistant. It has shown some susceptibility to air pollution (ozone) and should be planted in an area receiving full sunlight. Vigorous nursery-grown specimens are apt to be the most reliably winter hardy.

(Excerpted from: U.S. Department of Agriculture Forest Service, Agriculture Handbook Number 386 and Evergreen Extension Bulletin 258, University of Minnesota Agricultural Extension Service, M.C. Eisel, et al., 1968).

Tree Facts

- Trees raise property value by adding to the beauty of yards and neighborhoods.
- Trees save energy; their shade cools buildings an average of eight degrees in the summer. . . when planted as windbreaks they save on winter fuel bills up to 40 percent.
- Trees reduce rural soil loss caused by wind and erosion, a problem that costs U.S. farmers over \$1 billion a year.
- Seventy-five trees provide enough oxygen to sustain a human being for a lifetime.
- Trees' leaves clean the air of pollution.
- Trees can cut traffic noise by 60 percent.
- Last year 200,000 saplings were planted by 350 schools and communities during Arbor Month!

minnesota

Shade Tree Program • Department of Agriculture • 90 West Plato Blvd. • St. Paul, MN 55107 • 612/296-8580

Tree Inspector

Published as continuing education for Tree Inspectors and Program Managers

Vol. 2 No. 1 October 1979

Some Changes Made By Legislature Important Dates For Local Programs

With the Legislature's appropriation of \$25 million for sanitation and reforestation grants comes some significant changes in the Program and important dates to mark on your calendar.

By and large, the procedures and basic principals of the Shade Tree Program remain the same. However, some important changes were made:

- 1) The sanitation and reforestation grants programs have been combined into one grant program. Eligible grant recipients will be reimbursed at just one rate, which may be up to 50 percent of eligible sanitation and reforestation costs.
- 2) Eligible cities, towns and counties may be reimbursed for planting any number of trees on public property. Reimbursement is no longer tied to the number removed during the previous year. The maximum reimbursement rate per tree has been raised from \$40 to \$50 per tree.
- 3) Grants to cities and certain metropolitan towns with populations of less than 4,000 may include 90 percent of the cost of the first 50 trees planted on public property, but not more than \$60 per tree.
- 4) Grants to any county may include 90 percent of the cost, but not more than \$60 per tree, of the first 50 trees planted on public property in towns of less than 1000 that do not have municipal powers, provided that the town has applied through a county with an approved shade tree program.
- 5) Each municipality must appoint up to seven residents or designate an existing municipal board or committee to serve as an advisory committee for the municipal reforestation program.

Grants may be made for eligible costs incurred after January 1, 1979. Call us at 612/296-8580 with any problems.

Mark Your Calendar

To ensure continued . . . and effective . . . programs in your locality it is crucial to take the right action at the right time. The following schedule is the key to keeping your program strong and functioning:

Sept. 15 to April 1: Elm firewood can be stored in control areas only if the municipality issues individual permits or passes an ordinance specifying where elm wood can be stored.

Oct. 15: Program applications for 1980 mailed to all municipalities.

Nov. 15: Municipalities' 1980 program applications must be postmarked by this date in order to be eligible for 1980 sanitation and reforestation grants.

Dec. 1: Completed year-end report forms must be returned.

Jan. 15: Grant award letters mailed to municipalities that will be in the 1980 program.

Feb. 15: Final Requests For Payment for 1979 must be postmarked by this date. Payment cannot be made on late RFP's.

April 1: Firewood inspections completed. All stored elm wood with bark intact must be disposed of by this date.



OTHER OAK AND ELM ENEMIES

Adult lace bugs are small (5-6 mm) white insects that live and feed on the underside of leaves. Their wings are often transparent and laced with dark veins, hence the name lace bug. The head is usually hidden beneath a large hood at the front of the body (the pronotum) and the abdomen is completely hidden by the lacey wing covers. The immature bugs, nymphs, are black and often covered with long spines.

The upper surfaces of infested leaves may be either whitened, brownish or dead in appearance. The undersurfaces are speckled with eggs, excrement and young insect skins, which are cast as the bugs mature. Eggs and nymphs are usually found in clusters with adults more scattered over the surface. Heavily infested leaves turn entirely brown and may fall off. The bugs produce two generations per year and spend winter either as adults in protected places (under bark, etc.) or as eggs cemented to the undersides of leaves or embedded in the leaf tissue.

There are many species of lace bugs. Each species confines most of its feeding to a single species of host tree or species closely related to it.

The oak lace bug (*Corythucha arcuata*) feeds on white, bur and chestnut oaks. Infested leaves appear to be scorched or dry. In Minnesota, entire stands of bur oaks were infested in 1978. Defoliation may result during dry weather.

The elm lace bug (*Corythucha ulmi* O.S.D.) feeds on American and Siberian elms in this region and is capable of defoliating its host. Other common lace bugs are the hackberry lace bug (*Corythucha celtidis* O.S.D.) and basswood lace bug (*Gargaphia tiliae* (Walsh)).

Treatment is not now recommended. If it should become necessary, contact your county extension agent.

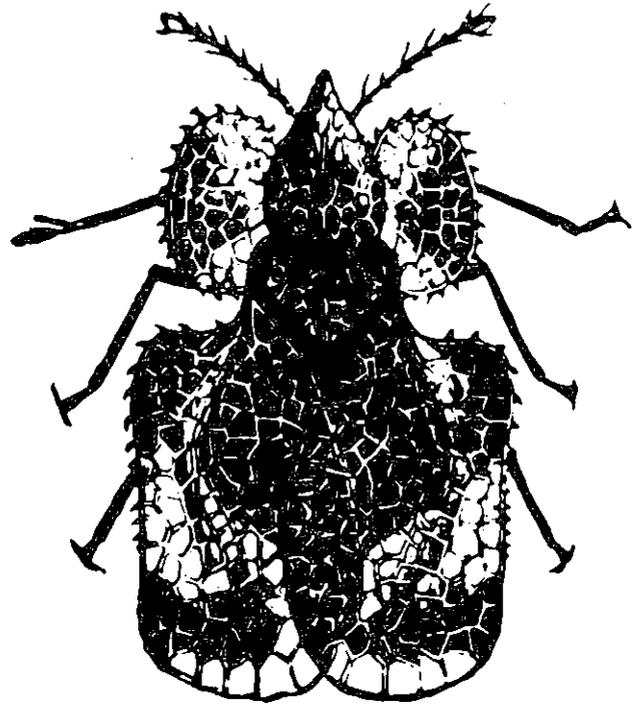
The information was excerpted in part, from Eastern Forest Insects. U.S. Department of Agriculture Forest Service. Miscellaneous Publication No. 1175.

We appreciate your comments and suggestions. Subscription to *Tree Inspector* is free of charge to those involved in state, federal or local shade tree programs. Send all correspondence to:

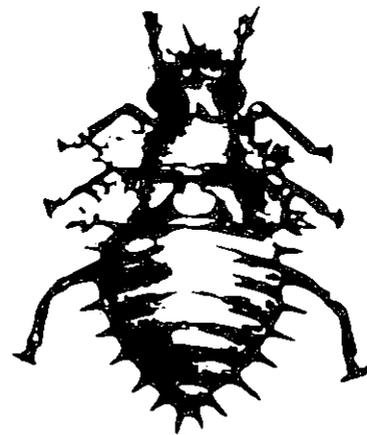
Minnesota Shade Tree Program
90 West Plato Blvd.
St. Paul, MN 55107
OR CALL
612-296-8580



The Minnesota Shade Tree Program gratefully acknowledges the University of Minnesota Agricultural Extension Service, which provides much of the information used in *Tree Inspector*.



Corythucha arcuata



Eggs and nymph of
Corythucha arcuata

Reprinted from Comstock: An Introduction to Entomology. Copyright © 1920 by Comstock Publishing Company. Used by permission of the publisher, Cornell University Press.

Contacts Are There For Tree Removal on State/Federal Lands

What Tree Inspector hasn't heard, "Why don't you do something about Dutch elm disease outside the city?" Well there are contacts you or citizens can make to get these trees removed.

The following contacts should be made for diseased elms on various public lands:

Trees on DNR property: Meg Hanish, 612/296-5958. Make sure to include the exact legal description of the tree's location (can be obtained at the county court house).

Trees located on DNR trails within DNR property: Bill Morrissey, 612/296-8397, or write 196 Centennial Building, St. Paul, MN 55155.

Trees on U.S. Fish and Wildlife Department lands: Harvey K. Nelson, 612/725-3563.

Trees on Army Corps of Engineers property: J. W. Murphy, 612/725-7041 (most federal land in Minnesota is owned by them).

Trees on state highway right-of-ways: If the diseased tree is located within the city, the city Tree Inspector should mark the tree and notify the appropriate office listed below:

DISTRICT 1A - DULUTH

William Croke
1123 Mesaba Ave.
Duluth, MN 55811
218-723-4809

DISTRICT 1B - VIRGINIA

R. D. Hartzberg
Hoover Rd., Box 949
Virginia, MN 55792
218-741-9322

DISTRICT 2A - BEMIDJI

Pat Hughes
Washington & 4th St. So.
Box 727
Bemidji, MN 56601
218-755-3805

DISTRICT 3A - BRAINERD

Ken Wasnie
301 Laurel St., Box H
Brainerd, MN 56401
218-828-2468

DISTRICT 4A - DETROIT LAKES

R. W. Wagner
1000 W. Hwy. 10, Box 666
Detroit Lakes, MN 56501
218-847-4401

DISTRICT 5A - GOLDEN VALLEY

P. L. Chandier
2055 No. Lilac Dr.
Golden Valley, MN 55422
612-545-3761

DISTRICT 6B - OWATONNA

D. J. Larson
1010 N.W. 21st Ave.,
Box 307
Industrial Park
Owatonna, MN 55060
507-451-1215

DISTRICT 7B - WINDOM

A. L. Sotebeer
County Road 26, Box 427
Windom, MN 56101
218-881-1666

DISTRICT 8B - MARSHALL

M. G. Gieseke
220 South 6th, Box 29
Marshall, MN 56258
507-537-6146

DISTRICT 2B - CROOKSTON

G. E. Ellinger
1301 So. Main St., Box 617
Crookston, MN 56716
218-281-3503

DISTRICT 3B - ST. CLOUD

W. N. Yoerg
3725-12th St. N., Box 370
St. Cloud, MN 56301
612-255-4231

DISTRICT 4B - MORRIS

James Elletson
2 South St., Box 410
Morris, MN 56267
612-589-1515

DISTRICT 6A - ROCHESTER

J. L. Spencer
North Hwy. 52, Box 6177
Rochester, MN 55901
507-285-7362

DISTRICT 7A - MANKATO

Art Bluhm
501 S. Victory Dr.
Mankato, MN 56001
507-625-6261

DISTRICT 8A - WILLMAR

N. R. Erickson
W. 10th & Pacific Ave.,
Box 758
Willmar, MN 56201
612-235-4554

DISTRICT 9A - OAKDALE

W. F. Murphy
3485 Hadley Ave., Box 2050
No. St. Paul, MN 55109
612-770-2311



UPDATE

Program Problems? Call Us

If you have any questions about the new program (see page 1), please do not hesitate to call the Shade Tree Program office at 612/296-8580. Regular hours are 8 a.m.-4:30 p.m., Monday to Friday, but there's usually some hard-working soul around from 7 a.m.-5 p.m.

We've Moved

The Shade Tree Program office has joined the Department of Agriculture in our new building. Our new address is:

90 West Plato Blvd.
St. Paul, MN 55107

All telephone numbers are unchanged.

Firewood Update

Several state cities lost some big elms to an early summer storm. There have been some reports of people gathering this wood for firewood. This makes your firewood inspections even more important. That wood, though probably not diseased, could be the breeding ground for millions of elm bark beetles.

Arbor Celebration

Arbor Month was again a great success...across the state and in many communities. Some 300,000 new trees were planted and 20 percent of all public and private schools participated through their school coordinators.

Elm Firewood: Is Penta The Answer?

Penta is the common trade name for a widely available wood preservative. Pentachlorophenol, the main active ingredient, is a moderately lethal chemical currently under investigation by the Environmental Protection Agency (EPA) because of its toxic properties and environmental persistence. Due to the widespread misuse of Penta on elm logs to be used as firewood, the following information has been compiled. Do you use Penta or know of anyone who does? If so, read on.

1. What is Penta?

Most Penta products consist of a 5 percent solution of pentachlorophenol in fuel oil and, hence, are flammable. The "-cidal" or killing properties of the active ingredient pentachlorophenol are well established. It has been used in various solutions as an insecticide, molluscicide (kills snails and slugs), herbicide, fungicide and bactericide. Some 861 Penta products are registered for use.

2. What is Penta used for?

Penta's prime label use is as a wood preservative. For best results, wood to be treated should be completely submerged in the 5 percent solution. Such treatment affords long-lasting protection from termites and wood-rotting fungi. As a result, Penta is primarily used on poles to be buried in the ground. Penta is often used instead of creosote because it is less irritating to skin and has a much milder odor. Uses, other than labeled uses, are illegal and potentially dangerous...this includes the spraying of elm logs.

3. Is Penta an effective treatment for elm firewood?

In general, no. Spraying of elm logs does not ensure adequate coverage. In fact, larger logs must be dipped or totally immersed in the Penta solution. Furthermore, proper application requires great care. No Penta should come in contact with skin and inhalation of vapors must be carefully avoided.

4. What are the possible hazards of using Penta?

Commercial Penta applicators work under rigidly controlled safety restrictions. Workers may be rotated every 2-3 weeks to avoid possible overexposure. Spraying of logs poses a constant hazard even if gloves are worn. The spray mist will be readily absorbed if it comes in contact with skin or is inhaled or swallowed. (If you can smell Penta [or any chemical] some molecules are free in the air.) Pentachlorophenol is an environmentally persistent, chlorinated hydrocarbon that is not even degraded by burning. As a result the handling and burning of treated firewood logs presents further risk of exposure.

5. What are the toxic risks of overexposure?

Symptoms of overexposure range from mild irritation of skin, eyes and upper respiratory tract to severe weakness, loss of appetite and weight, shortness of breath, headache, and dizziness usually accompanied by excessive sweating. Exposure can lead to death in 3 to 30 hours. The dosage necessary to produce illness is not known and varies with the individual, but is very close to the fatal dosage. Excretion is largely in the urine. Any kidney inadequacy will increase an individual's susceptibility to fatal poisoning. There is no antidote. Treatment is difficult and confined to relief of symptoms.

6. Why has the EPA withheld further registrations of pentachlorophenol products?

The EPA has put pentachlorophenol on the RPAR list (Rebuttal Presumption Against Registration). Simply put, this means there is sufficient evidence of risk for the EPA to withhold additional registrations. Proof to the contrary (rebuttal) rests with the manufacturer. Until such proof is submitted, registration of additional Penta products will not be granted.

Pentachlorophenol belongs to a biologically potent class of chemicals known to cause cancer and other serious changes in living tissues. The initial fear was that pentachlorophenol solutions might contain a DIOXIN called TCDD, one of the most lethal chemicals known. Although TCDD has not been found in pentachlorophenol solutions, pentachlorophenol is known to cause serious changes in the tissues of laboratory animals and humans, including cancer. The risk was deemed sufficient enough to withhold registration.

7. If Penta products can be so hazardous, why are there over 800 commercial preparations currently available?

Very likely most of these products were registered by the U.S. Department of Agriculture prior to 1969 — before the potential danger of such products was fully realized. Meanwhile, production of potentially harmful chemicals has been rapidly expanding in scope and volume. Increasing awareness of the personal and environmental hazards of some of these products, along with improved monitoring of such substances in the environment, has led to much tighter controls in the interest of health and safety.

The final word on pentachlorophenol is not in yet. An outright ban or severe restriction on the uses of products containing this chemical would not be surprising. **THOSE WHO USE PENTA FOR TREATING ELM LOGS SHOULD BE AWARE THAT THEY ARE DOING SO ILLEGALLY** and subjecting themselves and other users of such firewood to a very potent and possibly harmful substance. Last, but not least, even with proper precautions, bark beetles **MAY SURVIVE** in spray-treated logs. All of which make Penta an inappropriate chemical for the treatment of elm logs destined for use as firewood.

Tree Inspector

Vol. 2, No. 1

June/1980

Higher Arbotect Dosage Now Allowed

A Special Local Need Registration for the fungicide Arbotect 20-S has been issued by the Minnesota Department of Agriculture. The local need registration permits injection of Arbotect 20-S at a higher than previously specified dosage into both infected and healthy elms to assist in the control of Dutch Elm disease.

Agriculture Commissioner, Mark Seetin, stated that the increased dosage is based on more than two years of research by the University of Minnesota scientists which shows that the higher dosage is more effective in controlling the disease, as well as reducing the frequency of injections to once every three years.

The special local need registration that is now in effect is a temporary change in label specifications that will be reviewed in two years. Under the new local need registration, quantities of Arbotect 20-S purchased prior to this time may be used at the new dosage provided you have the new label in your possession when using the chemical.

Scientific evidence indicates that there is still no proven cure for Dutch Elm disease. Maximum application of proven tree sanitation practices must be continued in Minnesota's campaign to reduce losses of valuable shade trees to Dutch Elm disease, said Seetin. In addition, it is important to note that the Shade Tree Program does not reimburse communities for the cost of either preventative or therapeutic tree injection because of the experimental nature of the fungicide's use.

The University of Minnesota has established strict limitations for the use of Arbotect. According to Asimina Gkinis of the University of Minnesota, Arbotect is the best available chemical for injection treatment against Dutch Elm disease. However it is expensive and is not a guarantee against Dutch Elm disease. It should be considered only for highly valued elms and only if proper methods are followed .

According to the University of Minnesota, to obtain adequate distribution injection must be in the root flare area with approximately two injection points for each inch of the tree diameter at chest height. The chemical concentration should be 3,000 p.p.m. or lower to avoid phytotoxicity.

Tree Inspector is published for tree inspectors and program managers
by the Shade Tree Program, Minnesota Department of Agriculture,
90 West Plato Blvd., St. Paul, MN 55107 612/296-8580



Meet The Shade Tree Staff

The Shade Tree Program staff has undergone some personnel changes since the last newsletter. We hope the information below will help acquaint you with our staff.

Richard Haskett became director of the program in February. He is responsible for budgeting and appearing before the Legislature, as well as recommending the award of contracts to the commissioner of the Minnesota Department of Agriculture. Prior to this position, he was a district forester for the Hennepin County Park Reserve District.

Kris Caulfield joined the staff this month as a plant health specialist responsible for Anoka and Washington counties and east central Minnesota. She is also in charge of the Shade Tree display program. Previously she was a laboratory technician at the University of Minnesota, Plant Pathology-Entomology Department.

Amador Frances has been a plant health specialist with the program since June, 1977. His regulatory duties cover Ramsey county and southwestern Minnesota. He is also responsible for collecting and processing year-end report data. Prior to this position he was a grain laboratory aide in the Grain Inspection Division, Minnesota Dept. of Agriculture.

Tom Maier joined the program this month as a plant health specialist responsible for programs in west central Minnesota. Prior to joining the department, he worked on the lawn and garden city desk for R.L. Gould and Company.

Lyle Mueller is a plant health specialist responsible for programs in Hennepin and Dakota counties and southeastern Minnesota. He is also responsible for certifying tree inspectors. Prior to joining the department in October, he worked as a landscape designer/salesman for Windsor Landscaping.

Dwight Robinson is a plant health specialist responsible for programs in Scott County and south central Minnesota, as well as coordinating the Experimental Grants Program. Prior to joining the program in May, 1978 he worked as the assistant curator in charge of establishing a small animal and insect zoo for the Science Museum of Minnesota.

Greg Ustruck joined the staff this month as a plant health specialist responsible for programs in northern Minnesota and Carver county. Previously he was the city forester and director of parks and public property in Granite Falls.

Shari Schroeder is responsible for accounting duties for the Grant-In-Aid program and encumbering and disbursing monies to more than 470 participating municipalities. Prior to joining the department in February, she was an account clerk at Winona State Univ.

Lynn Schwartz joined the staff in April as public information coordinator. She is responsible for public service announcements, news releases, brochures and other material used to increase awareness of the Shade Tree Program and urban forest management. Previously she was editor of MINNESOTA magazine, published by the Minnesota Department of Economic Development.

Michele Gran joined the program in March as Arbor Month coordinator. She develops and coordinates the arbor program and produces all educational materials that support this reforestation promotion. Prior to joining the Shade Tree Program she worked as a public information officer for the State Council for the Handicapped.

Grace Jacobson joined the program in April as secretary and receptionist. Previously she was secretary to a local purchase buyer for Superamerica stores.

Shade Tree Lab Moves

The Shade Tree Disease Laboratory has moved into new facilities. Lab samples should now be mailed to: Shade Tree Disease Laboratory, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107.

The laboratory provides free testing for Dutch elm disease and oak wilt. In order to maximize the accuracy of testing, samples should be taken from an actively wilting or recently wilted branch. Remove four or five sections, 1/4 inch to 1/2 inch diameter in six inch lengths. Avoid sampling dead or barren branches because these will be too dry to culture successfully or determine the cause of casualty.

Lab samples should be wrapped in dry paper towels and mailed the same day the sample was collected. Include an enclosure stating your name, address and telephone number. If samples are submitted for more than one tree, be sure to identify each separate tree sample in the package. Lab analysis takes about ten days on elm trees and up to three weeks for oak. For more information about sampling or lab results call Mark Schreiber at 612/296-8388.

Elm Loss Bill Introduced

Senator David Durenberger has introduced a bill in the U.S. Senate (S. 1826) which provides that "for purposes of Sections 165 of the Internal Revenue Code of 1954, any loss of property resulting from Dutch elm disease shall be treated as a casualty loss." The act would apply to losses incurred in the taxable years beginning after Dec. 31, 1978.

The bill would allow property owners to claim a deduction for elms lost to Dutch elm disease in the same manner they now may claim a deduction for trees lost to storms, accidents and other casualties.

Senator Durenberger invites your comments on the bill. Comments should be forwarded to his office at 550 East Butler Sq. Bldg., 100 North Sixth St., Minneapolis, MN 55403.

Shade Tree Deadlines

In past years the Shade Tree Program has been lenient with communities that did not meet deadlines. However, in order to comply with State law, the Minnesota Code of Agency Regulations and the recommendations of the legislative auditor, the program will adhere to deadlines.

Communities may choose to request reimbursement for Sanitation and Reforestation Grants one, two or four times per year. However, Requests for payment must adhere to the deadlines listed below. (Communities that did not participate in the program may enroll anytime.)

Sanitation & Reforestation Grants

Deadline

First Quarter Request for Payment
Mid-year Request for Payment
Third Quarter Request for Payment
Year End Request for Payment

May 15
August 15
November 15
February 15 of
following year

The Year End Report for the Experimental Grants Program is due according to specifications in the individual contract. The Year End Report for the Utilization Grant Program is due December 31. There are no deadlines for applications for these programs.

Arbor Promotion Stresses Reforestation

"Plant A Tree, Minnesota - Now More Than Ever" was the theme for Arbor Month 1980. This year the Arbor promotion stressed the urgency of reforestation and trees' functional values. To carry the message statewide, Arbor Program Coordinator Michele Gran made 30 television and radio appearances in 25 communities and visited with county extension agents, state and federal foresters, local tree inspectors and other community officials.

The promotion of reforestation--and the availability of the program's free Planting Handbook--will continue into the fall.

New Newsletter Planned

Beginning in August, the Tree Inspector newsletter will become Overstory, a newsletter published jointly by the Minnesota Department of Agriculture Shade Tree Program, the Department of Natural Resources Forestry Division and the University of Minnesota Cooperative Extension Service.

By combining efforts we hope to better reach persons interested in urban forest management--municipal officials, tree inspectors, arborists, etc.--by providing them with information from all three organizations.

While subject to evaluation, initial plans call for Overstory to be published in August, October, December, February, April and June. If you have any suggestions for topics you'd like Overstory to cover, call Lynn Schwartz at 612/296-0339.

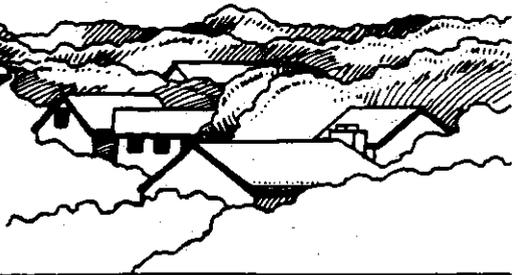


**MINNESOTA SHADE TREE PROGRAM
DEPARTMENT OF AGRICULTURE**

90 WEST PLATO BOULEVARD
ST. PAUL, MN 55107

OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 1, Number 1

September 1980

State Agencies Trim Spending To Offset Anticipated Deficit

The State of Minnesota faces a shortfall in anticipated revenues that could amount to approximately \$195 million. Since a balanced budget is constitutionally required, the state must trim its spending by that amount before the end of the fiscal year.

Therefore, Governor Al Quie has directed state agencies to trim their budgets. The Shade Tree Program's total budget reduction will be approximately \$7.6 million. This spending reduction still enables the Shade Tree Program to meet its financial obligations to communities currently in the program.

1981 Recommendations

The Commissioner of the Minnesota Department of Agriculture recently announced that he will request funding for the 1981 Shade Tree Program at the 1980 funding level. The Commissioner is also recommending that the legislature extend the local authority for special levy into 1981 and 1982. This levy allows communities to levy beyond levy limits for community programs to combat Dutch elm disease and oak wilt.

Budget Reductions

While the situation may change as more information about the budget deficit comes in, at this point it appears that the Shade Tree Program's budget will be changed in the following areas:

- The unencumbered \$5.6 million from the 1977-78 appropriation for treasury.
- The uncommitted balance of \$2 million from the 1979-80 appropriation for sanitation and reforestation grants will not be awarded. (\$2 million has been awarded).
- \$6,400 set aside for non-metropolitan wood utilization grants and \$13,000 for metropolitan wood utilization grants will not be awarded. (This

leaves approximately \$255,000 in wood utilization grant money still available to municipalities.)

- \$14,200 in experimental programs grant money will not be awarded, but approximately \$195,800 is yet to be awarded for experimental grants.
- \$10,686 in administrative money will not be used.
- \$501 in municipal pest supplies money will not be spent.

What Does It Mean?

What do these cuts mean for communities participating in the Shade Tree Program? "It means tighter accounting for communities, but basically no cuts in municipal programs," said Richard Haskett, Director of the Shade Tree Program. The \$7.6 million reduction in sanitation and reforestation grants is money that was available, but not committed, to communities. "It was money no one had applied for," Haskett said. "Instead of

being held in reserve for future use, this money will now be returned to the state's general fund."

"The Shade Tree Program will meet all its financial obligations to every community now participating in the Shade Tree Program" stressed Haskett. "What the budget reduction does is limit our grants to only those communities already in the program. No new applications can be accepted as a result of the cutback. In addition, no amendments to existing contracts will be accepted if the amendment would increase the state's financial obligation. If a community exceeds its budget, the state cannot reimburse any of the added expenditures."

"Communities should remain confident of their future with the Shade Tree Program and continued efforts in urban forestry," said Haskett. Anyone with questions should call the Shade Tree Program at 612/296-8580.

Newsletter Will Discuss Urban Forestry Issues

This is the first issue of *Overstory*, a newsletter devoted to issues in urban forestry. It is a cooperative effort of three agencies: the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources and the Agricultural Extension Service, University of Minnesota.

Why should three organizations combine resources to publish a newsletter? *Overstory* replaces the *Tree Inspector* newsletter, published by the Shade Tree Program, because all three organizations felt an expanded newsletter with a broader

scope would better serve our mutual interests and combined clients.

Overstory's readers include Shade Tree program managers, municipal officials, civic leaders, city foresters, tree inspectors, legislators, members of professional organizations such as the Minnesota Society of Arboriculture, educators and staff members of the three publishing organizations. Despite these different occupations, each reader is concerned with the future of Minnesota's urban forests.

Overstory invites readers' suggestions, letters and article submissions. For more information contact Lynn Schwartz at the Shade Tree Program (612/296-0339).

Spraying Dursban Augments Community Sanitation Efforts

Dursban[®] for control of overwintering native elm bark beetles may be used to augment Dutch elm disease sanitation efforts. The native elm bark beetle in Minnesota mainly overwinters as an adult at the base of healthy elms thereby eluding late summer sanitation efforts. This beetle is the major and in many instances, the exclusive carrier of Dutch elm disease in the northern two-thirds of Minnesota and an important carrier along with the smaller European elm bark beetle in the southern one-third of the state.

The native elm bark beetle's overwintering behavior provides a "weak-link" in the life cycle that can be readily exploited by the application of an appropriate insecticide such as Dursban[®] 2E and 4E. Applications conducted in the fall or the following April are effective in preventing overwintering beetles from emerging, feeding on healthy elms and spreading Dutch elm disease in the spring.

Application of Dursban[®] is not a technique to be used on a single tree to reduce that tree's chance of becoming infected with Dutch elm disease. Therefore, it is not recommended for individual homeowner use. Control must be handled on a communitywide basis to effectively reduce the beetle population.

Application is made to the base of healthy elms with a 0.5 percent spray in mid-September before the beetles have started their search for overwintering sites in late September. The trunk should be wetted thoroughly but not to the point of run off. Extra care should be taken to apply the aqueous spray to the basal six inches including the root flares since the beetles tend to concentrate in these areas. Clean leaves and grass from the root flares before application.

Although the insecticide is effective in killing beetles whether applied in September, October or the following April, a September spray is recommended because the beetles can transmit Dutch elm disease as they make their overwintering tunnels. Young elms up to eight inches in diameter and thin barked elms are especially susceptible to overwintering beetle transmission.

The smaller European elm bark beetle is not affected by this method since it overwinters as a larva in dead and dying elm wood. Sanitation efforts control all elm bark beetles overwintering in the larval stage. Spraying cannot be substituted for prompt removal and proper disposal of diseased elms. It is a recommended supplement to sanitation because of the native

beetles' overwintering habits.

Although the native elm bark beetle has statewide distribution, sampling techniques should be used to determine this beetle's presence in any area before spraying is initiated. (See article on sampling techniques in this issue.)

As a general rule in the southern one-third of Minnesota the native elm bark beetle tends to be found in wooded areas such as parks, river bottoms or wood lots; therefore, the sampling should be concentrated in these areas first. In the northern two-thirds of the state the beetle may be found either in wooded areas or on boulevard trees.

—By William Phillipsen
University of Minnesota

Sample Control Zone For Dust Boring Piles

Sampling a control zone for native elm bark beetles consists of counting the number of dust boring piles that the overwintering beetles make as they chew and penetrate the bark of healthy elms from late September through October. Dust boring counts may also be taken in the spring from mid to late April.

The beetles make these dust piles before they emerge. The wood dust produced and pushed out of the hole is fine grained and red-brown. The following sampling guidelines indicate the advisability of spraying.

Four different areas for every square mile of control zone should be sampled. In each area selected, dust boring counts

should be made on 20 trees. Often the beetles overwinter very low on the tree trunk and if insecticide application is indicated, spraying up to six feet may not be necessary. For this reason the sampler should count the number of dust boring piles in the lowest one foot. If dust piles are found at the one foot level, the sampler should then continue to count up to the six foot level.

The sampler averages the dust boring piles per tree in the area sampled in the control zone. If the average number of dust boring piles is greater than 10 per tree and the previous year's disease incidence was greater than five percent, application of Dursban[®] is recommended.

If the previous year's disease incidence is less than five percent and the average number of dust boring piles is greater than 20 per tree, trunk spraying is recommended. Remember, the height to which the insecticide is applied may vary between control zones according to where on the trunk the beetles were found. For example, if you sample up to six feet, spray to six feet. If you sample up to one foot, spray to one foot.

For more information contact either William Phillipsen at 612/373-1038 or Mark Ascerno at 373-1059.

—By William Phillipsen
University of Minnesota

OVERSTORY

Minnesota's Urban Forestry Newsletter

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Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

Do You Qualify?

Tree City U.S.A.

Awards for good service, good programs and the like are often far and few between. However, if your community has a good forestry program, it may receive an award plus national recognition.

The National Arbor Day Foundation in cooperation with the U.S. Forest Service and Minnesota's State Forester recognizes Minnesota cities that meet the standards of the Tree City U.S.A. Program. This award is not given for beautiful community trees, but for the local tree management program that results in a beautiful urban forest.

In order to be eligible for recognition as a Tree City U.S.A., a community must meet four standards. These standards require a structured forestry program, demonstrated success, and creation of an awareness and appreciation of trees among city residents.

The first standard calls for a legally constituted tree body. This body can be a department, commission, board or other authority. Many larger cities have a forestry department that acts as the tree body. In smaller communities, a tree board is formed. It is given legal status through the city's tree ordinance and is responsible for developing and administering the community's forestry program. In many small towns, the tree board not only plans the program, but carries it out as well.

Standard two calls for the adoption of a city tree ordinance. The ordinance provides for the formation of the tree board, outlining its duties and responsibilities. The ordinance also defines public and private tree care policies, planting

location specifications, suitable tree species for public planting and penalties for violating the ordinance.

The third standard demonstrates the success of an active community forestry program. It requires that the program be supported by a minimum of one dollar per capita in public funds. With the exception of federal or state funding for special projects, the cost of the tree program must be met and borne by the city's residents. When developing a forestry program, the tree board should first determine what can

be accomplished by volunteer organizations, individual homeowners and others. After that, the board can determine what funds will be needed from the city's budget to implement the forestry program.

If you feel your community qualifies for the Tree City U.S.A. award, contact your local DNR forester or write to: Urban & Community Forestry Supervisor, DNR — Forestry, Box 44, Centennial Office Building, St. Paul, Minnesota 55155.

—By Barbara Stephen

Department of Natural Resources

Fall Planting Pointers

Fall is a popular time for planting trees. There are, however, a few extra precautions and considerations necessary when planting at this time of the year.

First, evergreen and deciduous stock are handled differently. Balled and burlapped, and potted evergreens should be planted between August 15 and September 30 to allow the roots to establish before the ground freezes. Later planting results in increased winter burn and sometimes death. Container grown evergreens may be planted later providing the root system is left undisturbed.

Regardless of stock type, fall planting on exposed, windy sites often results in severe burn, so it is best to plant these areas in the spring. Anti-transpirants used to reduce winter burn are not consistently effective and in some cases are harmful when im-

properly applied. Experimenting on a few trees is useful before widespread application.

Deciduous trees should be planted after the leaves have turned color. Avoid planting after the ground has begun to freeze since backfilling with chunks of frozen soil creates air pockets leading to cold air penetration and subsequent root death. If planting must be done late in the season, dig the hole ahead of time, backfill and mulch heavily to prevent freezing. B and B, container grown and bare root trees may be fall planted, however, bare root trees have a poorer survival rate compared to spring planting when the fall is dry and the winter is harsh.

Keep fall planted trees well watered, but not wet, until the ground freezes. Mulching will extend the root growth period by maintaining a warmer soil temperature and preventing winter temperature fluctuations that can cause heaving. Staking, particularly in windy areas, will maintain good root-soil contact and prevent cracks in the backfill.

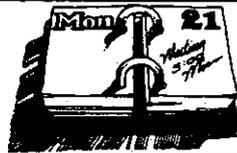
Wrap the trunks of deciduous trees to prevent sunscald damage. Thin barked species are particularly susceptible and it would be wise to re-wrap last year's plantings as well.

High value plantings should be protected from rodents. A cylinder of hardware cloth around the trunk extending two inches below the soil line and two feet above the anticipated snow line will give the best protection. Repellants containing thiram are effective but require repeated application throughout the winter.

—Richard Rideout

University of Minnesota

MEETINGS, EVENTS, ETC.



Open house and tour of the new Minnesota Department of Agriculture building will be from 9 a.m. to 3 p.m. on September 23 and 24. Governor Al Quie will dedicate the building, located at 90 West Plato Blvd., St. Paul, at 9:30 a.m. on September 23.

The Shade Tree Advisory Committee is tentatively scheduled to meet at 10 a.m., October 7 in the Minnesota Department of Agriculture building, conference room A. For more information contact Richard Haskett at 612/296-8580.

The Minnesota Society of Arboriculture's 1980 Annual Meeting will be from 8 a.m. to 4 p.m., October 29 at Castle Green Golf Course, St. Paul. Topics include: micronutrients and trees; trees and transmission lines; state and federal urban forestry programs; landscape architect's criteria for tree selection and a bracing and cabling demonstration; as well as a business meeting. Call Richard Rideout at 612/373-0344 for details.

19 Banks Distribute Brochures

Nineteen member banks of the First Bank System sent nearly 150,000 brochures entitled, "Trees. An Investment For Life" to customers in August bank statements. The brochure, prepared by the Shade Tree Program, details the benefits trees provide and encourages tree planting.

Explaining why First Banks provided this public service, Vice President Lloyd Brandt, said, "First Banks are local institutions and the community environment is the banks' environment. We'll all be happier ten years from now if we take seriously the challenge to plant trees today."

Minnesota Department of Agriculture Commissioner Mark Seetin commended the First Bank System's most recent effort noting that its past efforts with Dutch elm disease have made a significant contribution to urban forestry.

Banks in the following communities participated in the mailing: Edina, Spring Valley, Ivanhoe, Northfield, St. Paul, Robbinsdale, Paynesville, Benson, Windom, Blue Earth, Albert Lea, Worthington, Alexandria, Brainerd and St. Cloud.

Need A Handout?

Often community groups or visitors to your office ask questions about Dutch elm disease, tree planting or community shade tree programs. If you would like some brochures to distribute, the Shade Tree Program has a number of publications available to suit your needs.

Listed below are the titles and a brief description of each publication. Simply indicate which publications you need and the quantities desired. Send this article to Lynn Schwartz, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107 and we'll send you the publications at no charge. 

Publication	Description	Number Needed
<i>Planting Handbook</i>	16 page guide to tree selection, planting and care	_____
<i>Our Urban Forest</i>	4 page brochure on the elements of community shade tree programs	_____
<i>Watch Out For Shady Characters</i>	Flier with consumer tips on tree trimmers, tree injection and tree buying	_____
<i>Dutch Elm Disease & Oak Wilt — 10 questions</i>	Flier with facts about these diseases	_____
<i>Trees. An Investment For Life.</i>	Flier about the benefits of trees	_____
<i>Planting</i>	Flier with planting tips	_____
<i>Plant A Tree Minnesota.</i>	Colorful Arbor month poster	_____



Shade Tree Program

Minnesota Department of Agriculture
90 West Plato Boulevard
St. Paul, MN 55107 612-296-8580

OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 1, Number 2

November 1980

Inspections of 301 Communities Provide Indication of Local Shade Tree Efforts

Throughout the summer, the Shade Tree Program's six plant health specialists conducted inspection tours of communities throughout the state. These inspections are part of the regulatory responsibilities for disease control and reforestation which the legislature mandated to the Shade Tree Program, Minnesota Department of Agriculture.

In fulfilling their regulatory responsibilities, the specialists visited a record number of communities. Of the 462 participating municipalities, 301 had a specialist personally look at the local program. In addition, the specialists made return visits to 124 of those communities.

Inspection Process

Advance notice of these inspections was published in the July issue of the *Tree Inspector* newsletter. In some instances, specialists met with local tree inspectors and program managers. In other cases, they drove through communities looking for both marked and unmarked diseased trees, firewood piles with bark intact elm wood, tree stumps that had not been removed or debarked, and evidence of new plantings. "These spot inspections provide an indication of how well the community is keeping abreast of its disease control program," said Richard Haskett, director of the Shade Tree Program.

"These inspections are also part of our responsibility to monitor the use of state funds," added Haskett.

After the tour, the specialist followed up with a phone call and wrote a report on the community's activities. This report and a memo from the Shade Tree Program director were sent to each community with a request that the community respond to the report and its recommendations.

The Findings

In some instances, communities were praised for attractive plantings or otherwise doing an outstanding job. In other cases, communities were offered suggestions on how to improve an aspect of their program such as a better way to mark trees. In a few cases, communities

were informed that they were not in compliance with their own ordinances. Examples include repeated failure to remove high risk trees within 20 days, failing to mark diseased trees on private property, or evidence of elm wood in firewood stockpiles.

"These inspections helped us discover some very exciting things," said Haskett. "For example, one community is planting one tree for every citizen as part of its centennial celebration. Another community has a very aggressive Dutch elm disease program, yet it has no Dutch elm disease. This community is in the enviable position of being ready to deal with the disease when it arrives."

"We saw many highly qualified and

enthusiastic people on the local level. People who know what they are doing. People who know the biological aspects of disease control as well as the administrative aspects of running a program," said Haskett.

"Sometimes communities weren't aware that they were not in compliance or perhaps they did not fully understand the consequences of an action, such as allowing bark intact elm wood to remain in firewood piles. Sometimes all it takes is a suggestion. In a few cases, payment of grant-in-aid funds was withheld until the problem was corrected," Haskett said.

Reactions to the inspections varied. Communities that received commenda-

Continued On Page 2

Gypsy Moth Poses Threat To State's Urban Forests

The nation's most destructive shade tree insect—the gypsy moth—has reached Minnesota and poses a new threat to the state's urban forests.

The gypsy moth has an enormous appetite for tree foliage. The moths are much larger than cankerworms and can defoliate trees in a matter of a few days or weeks, endangering the life system of trees. An evergreen tree will die if the gypsy moths consume most or all of its needles.

The Commissioner of the Minnesota Department of Agriculture (MDA) recently prohibited importing trees supplied by three Connecticut nurseries after MDA officials confirmed that at least three shipments were heavily infested with gypsy moth egg masses. The prohibition against the nurseries is in effect until state and federal officials can certify their stock as disease and pest free.

In addition, 27 male moths were trapped this summer through an extensive cooperative state and federal trapping program aimed at monitoring the potentially devastating spread of this insect from the northeastern quarter of the nation. The

Division of Plant Industry suspects that the male moths collected this summer are the progeny of gypsy moths that arrived with shipments of nursery stock in 1979.

Since the early detection of the moth is important in control strategies, the Division of Plant Industry will soon be sending questionnaires to nurserymen and persons involved in government tree planting programs asking for the sources of tree stock planted in 1979 and 1980. Cooperation in returning the questionnaire and checking any new nursery stock known to have originated from Connecticut or other northeastern states will help the Department of Agriculture devise a control strategy.

The division is also planning extensive surveys to detect gypsy moth egg masses this winter and early spring.

If you don't receive a questionnaire and know of any Connecticut nursery stock planted in 1979 and 1980, please contact the Division of Plant Industry, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107 (612/296-3347).

What's An Urban Forest?

EDITOR'S NOTE: This is the first article in a series on urban forest management.

A new term has been appearing in the news, in publications and conversations — the URBAN FOREST. What is an urban forest and how does it relate to Minnesotans?

Every community, no matter what its size, has an urban forest. However, the size, type and purpose of this forest may vary between cities. By definition, an urban forest consists of forest vegetation, water, soil and wildlife found in populated areas and on adjacent lands. Specifically, the urban forest is found along city streets, in residential areas, community parks, greenbelts, buffer strips, cemeteries and golf courses, to name a few. It also includes natural forested areas surrounding the community and those found within its boundaries. Looking down over a city

from an airplane, the vastness of the urban forest is evident.

A healthy urban forest provides beauty and charm to a city. Trees and landscaping around buildings can reduce the monotony of concrete and asphalt. They can screen undesirable views and enhance desirable ones. This creates a more pleasant place to visit, live and work, thus attracting more business.

The urban forest modifies man's microclimate, making the city a more suitable place to live. Urban vegetation reduces air pollution, abates noise, provides shade from the summer sun and protection from winter winds.

The economic benefits provided by the urban forest are often much greater than one realizes. Trees increase property values substantially. Houses on lots with trees, for example, have sold for 10 to 20 percent

more than identical houses on treeless lots. Trees also reduce energy costs. Energy consumption, whether for heating or cooling, can be reduced if trees are properly located around buildings. When buildings are shaded in the summer, less energy is consumed for cooling. Likewise, buildings protected from winter winds will lose less heat in winter, thus reducing heating costs.

The urban forest as part of a community's watershed helps to provide fresh water, as well as reducing the speed and volume of water runoff. The urban forest also provides recreational environments and wildlife habitats. Opportunities may even arise for the production of wood products in the form of fuelwood, woodchips, wood pulp, Christmas trees and mulch.

The urban forest is a natural resource which belongs to and provides benefits for every Minnesotan. To maximize these benefits, we must keep this forest protected and well-managed.

— Barbara Stephan
Department of Natural Resources

Inspections (Continued From Page 1)

tions were, of course, pleased. Others had an "I didn't know that, but that's a good idea" reaction. Others felt that program staff were looking over their shoulder. "We regret that some communities feel that way, although it is understandable in light of the fact that some inspections were carried out without the plant health specialist stopping to see the local officials. One reason for this is that staff were visiting up to six communities in a single day. This practice is not only more efficient, but gives us an indication of the disease pressure in a region. When the disease pressure is uniform, variances in a community's problem may point to differences in their sanitation efforts," explained Haskett.

Winter Inspections

Inspections will continue throughout the winter. Plant health specialists will be

visiting communities again to help them work on problems revealed in the last inspection. In addition, they may visit additional communities for the first time and some random field audits may be conducted.

During the winter inspections the plant health specialists will be looking for potential firewood piles, checking to see how the community is progressing in removing low risk trees, and checking to see how the community is faring in its wood utilization efforts.

"We will be happy to visit any community that requests a visit. We can help them assess how their program is doing and provide suggestions on what can be done to improve it," Haskett said. Our staff is also available to help communities fill out their 1981 applications, plan their 1981 programs, write contract specifications, or talk to city council members."

Applications For 1981 Due Soon

Communities throughout Minnesota have received application forms for participating in the 1981 Shade Tree Program. These forms should be completed and returned to the Shade Tree Program office by December 1, 1980.

"As you well know, the Legislature will meet to appropriate funds for the 1981 Shade Tree Program in early 1981. We are asking communities to submit applications with the expectation that they will again receive the maximum 50 percent reimbursement for eligible shade tree management expenses," said Richard Haskett, Shade Tree Program director.

Haskett explained that the information from the application forms will be used to support a funding request of the Shade Tree Program's grants-in-aid to communities. "We base our request to the Legislature on need. We will be using the applications as a gauge of local need and commitment to community forest management and for an estimate for the financial requirements necessary to carry out that commitment."

Communities with questions about the application forms should call the Shade Tree Program Office at (612) 296-8580.

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Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

Bark-Intact Elm In Firewood Stacks Can Undo Disease Control Progress

Now that the home heating season is underway, many Minnesotans are stocking up on firewood. That, of course, creates an enforcement duty for tree inspectors so that those firewood stacks don't spread Dutch elm disease.

"Consumers who have elm wood stored with the bark still intact can undo much of the progress that has been achieved so far in controlling Dutch elm disease," said Richard Haskett, director of the Shade Tree Program, Minnesota Department of Agriculture.

Haskett reminds tree inspectors and program managers that communities participating in the Shade Tree Program are obligated to have adopted and to enforce a local ordinance on bark intact elm wood. Municipalities may choose to pass a specific ordinance which prohibits the storage of such wood at all times even though adopting the state rules by reference does include a ban on storage of bark intact elm wood.

Or, municipalities may decide to allow the storage of bark intact elm wood but only from September 15 to April 1, provided the communities adopt one or both of the following:

1. A municipal ordinance which **must** contain the following provision:

The storage and stockpiling of any bark intact elm wood is allowed from September 15 through April 1.

2. A permit system which should include the following:

- a. Numbered certificates or permits which can be issued to those storing bark intact elm wood from September 15 through April 1. The owner's name and the location of the stored wood should be on the permit.
- b. The local inspection date, the deadline for storing such wood, and the penalty for storing this wood past this deadline should be

on the permit or an attached paper.

Remember, stored wood is subject to inspection prior to April 1. Any bark intact elm wood not used by April 1 must be removed and disposed of by the municipality in accordance with the state Rules and Regulations.

In addition, there is a state quarantine which restricts transportation of bark intact elm wood. Plant Quarantine #78-1 prohibits the movement of bark intact elm wood into or through any home rule charter or statutory city and any designated control area in an unincorporated area of any county. Bark intact elm wood can never be brought into the control area for use as firewood.

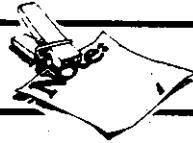
Elm wood from trees cut within the boundaries of the control area can be kept after September 15, and until April 1, if allowed by a municipal ordinance or the permit system. The movement of elm wood intended for industrial use (other than firewood) is not prohibited by this quarantine as long as its movement continues uninterrupted through any control area.

Firewood transported in violation of the quarantine must be destroyed or returned to the point of origin at the owner's expense. In addition, the carrier of such wood is subject to misdemeanor penalties set forth by law (fines up to \$500).

Tree inspectors, when discussing the local ordinance with homeowners, can stress more than the fact that their compliance will help protect the community's elm trees. Tree inspectors might also remind consumers that elm wood cut this year may not be ready to burn. Elm wood, just as any firewood, needs to be cured to avoid producing a creosote build-up in chimneys. The best advice for consumers is to encourage them to remove the bark and allow the logs time to cure before burning. Once the wood is debarked, it no longer violates any ordinance or threatens to spread Dutch elm disease.

Tree inspectors might also tell consumers how to remove the bark from elm wood. And they might remind consumers to burn the wood as soon as possible once the wood is brought into the home so they aren't faced with thousands of beetles emerging from the wood into the consumer's home.

Of Interest



The first issue of *Overstory* offered free publications to readers who needed materials to hand out to visitors. To date, the Shade Tree Program has sent nearly 11,700 publications in response to reader requests. The Shade Tree Program is now out of copies of the brochure, "Ten Questions About Dutch Elm Disease and Oak Wilt." This publication is being revised. When completed, copies will be mailed to those of you who asked for this publication but have not received it yet.

Shade Tree Program Plant Health Specialist **Dwight Robinson**, responsible for programs in Scott County and south central Minnesota and for coordinating the experimental grants program, has been promoted to a new position as intermediate plant health specialist. Robinson will assume the position previously held by Paul Scherman. In his new job, Robinson will be responsible for supervising the work of the Shade Tree Program's plant health specialists and for disbursing grant-in-aid payments to participating municipalities.

Richard Rideout, assistant extension specialist in arboriculture, for the University of Minnesota has moved to a new job in Wisconsin. In his new job as forestry technician with the City of Milwaukee he will be responsible for studying the city's shade tree management techniques and advising the city on its shade tree program. During his three years at the University, Rideout was responsible for meeting with communities, training tree inspectors, and writing extension fact sheets.

The 1980 Year End Shade Tree Program reports are due no later than December 1, 1980. Communities should have received their Shade Tree Program Report form during the first week in November. The form asks municipalities to state their 1980 sanitation and reforestation costs, tree inventory, tree species planted, and wood disposal and/or utilization practices. Completing these forms helps the Shade Tree Program meet its reporting obligation to the Minnesota legislature. In addition, during the upcoming legislative session these reports will be helpful to document the accomplishments of municipal urban forest management activities. If you have questions about the form, contact Amador Frances at 612/296-8580.

Arbor Month Planning Underway

Work has begun on the 1981 Arbor Month Program. Arbor Program Coordinator Michele Gran has been visiting communities to discuss plans for local spring planting activities. Gran is hoping for widespread participation by communities currently in the Shade Tree Grant-in-Aid Program. To date, she has met with program managers, city foresters, and interested community members in Duluth, Bemidji, Moorhead, Alexandria, Winona, Olivia, Mankato, and Fergus Falls. She is planning to begin work with Brainerd late this month.

The 1981 Arbor Month Program encourages local communities to examine their reforestation needs, plan for the future, and take immediate action toward their reforestation goals. Gran said, "Through Arbor Month I am hoping to establish a public commitment to preserving the state's urban forests."

Some activities a community might consider for Arbor Month include:

1. Planting a memorial park or children's park on public or quasi-public land.
2. Landscaping a local hospital, nursing home, or day care center.
3. Organizing neighborhood "tree buys."
4. Conducting neighborhood or community planting workshops.
5. Coordinating a tree tour or "discovery walk" of the community's urban forest.
6. Establishing an Arbor Month fund for future planting.

"I am encouraged by the interest in the Arbor Program so far," said Gran. She has obtained the official endorsement of the Minnesota Jaycees and the Minnesota Chamber of Commerce Executives Association. "The local membership of these two groups could do much to activate citizen participation," she said.

"Public support and commitment are essential to sound urban forest management. Arbor Month," she maintained, "is a good way for local leaders to garner public support for their shade tree program."

If you would like some ideas on how to plan an Arbor Month celebration in your community, contact Gran at the Shade Tree Office at (612) 296-6909.

Advisory Committee Issues Legislative Recommendations

The Minnesota Shade Tree Advisory Committee will soon be issuing its 1980 Report to the Legislature which documents the need for on-going community forest management activities and outlines the levels of state funding required to meet those goals.

Organized in 1976, the committee is comprised of interested and informed citizens appointed by the Commissioner of the Minnesota Department of Agriculture. The committee is charged with advising the administration and the legislature about issues relating to shade trees, evaluating existing programs, and recommending feasible and effective courses of action that will help Minnesota preserve and enhance its urban forests.

The committee is chaired by Don Willeke, an attorney with the firm of Nichols and Willeke. The committee's 27 members represent many fields of en-

deavor concerned with urban forestry, including educators, researchers, municipal officials, tree inspectors, nurserymen and members of professional associations.

For the past months the committee has been examining the contributions of the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources; and the Agricultural Extension Service, University of Minnesota. The committee's upcoming report will discuss how these organizations can most effectively work together to aid municipal shade tree programs, outline the costs and accomplishments of sanitation, reforestation and wood utilization programs, and recommend funding levels for these activities during the coming biennium.

The next issue of *Overstory* (January) will carry a summary of the committee's report.



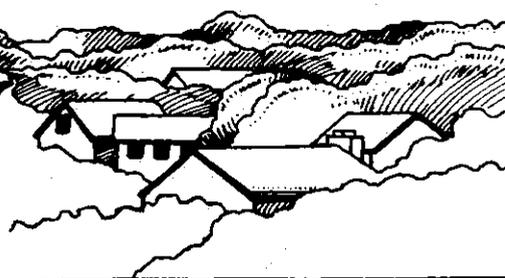
Shade Tree Program

Minnesota Department of Agriculture
90 West Plato Boulevard
St. Paul, MN 55107 612-296-8580

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OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 1, Number 3

January 1981

Urban Forest Management Issues Under Consideration by Legislature

Issues concerning community forest management are now before the 1981 Minnesota Legislature in the form of appropriation requests and bills to amend existing statutes.

All state agencies have submitted funding requests to Governor Al Quie. The Commissioner of the Minnesota Department of Agriculture has submitted his funding recommendation for the Shade Tree Program. The governor considers each department's appropriation request in preparing his budget message to the legislature.

During the legislative session which began January 6, the legislature takes action on the state's budget for the 1982-83 biennium. Finally, the budget will return to the governor's desk for his action.

In addition to the commissioner's recommendation for funding of the Shade Tree Program, the State Shade Tree Advisory Committee, submitted its recommendations to the governor and the legislature. The committee's recommendations for the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources; and the University of Minnesota appear on page 3.

The Department of Natural Resources, Division of Forestry has included in its budget request an appropriation for the Urban & Community Forestry Program. If funded, this will allow the division to continue providing technical assistance in urban forest management.

In addition, the Minnesota Department of Agriculture is requesting two shade tree related amendments. One asks the legislature to repeal the expiration date of municipal special levy authority for shade tree disease control efforts. The other requests that references in the law to the 1970 census be updated to the 1980 census.

After introduction into the House and the Senate, and assignment of House and Senate file numbers, bills are referred to committee. The bills will probably be discussed by the Senate Agricultural and

Natural Resources Committee's subcommittee on environmental protection and by the House Local and Urban Affairs Committee and possibly others. The Shade Tree Program's appropriation request is likely to be heard by the Senate State Department's division of the Finance Committee and the House State Departments division of the House Appropriation Committee.

The Division of Forestry has recommended that the appropriation request for the Urban & Community Forestry Program be considered by the Legislative Commission on Minnesota Resources.

7 Workshops Planned

Seven Tree Inspector Workshops will be held throughout Minnesota in March and April to enable tree inspectors to gain or maintain their required certification.

Workshop topics will vary with each of three audiences. Sessions for new tree inspectors will cover Dutch elm disease, oak wilt, and other shade tree diseases; general information about the Shade Tree Program; and tree and wood identification. Following the workshop sessions, this audience will take the written tree inspector test.

The second audience will be previously certified tree inspectors who wish to renew their certification. Topics for this group include: what's new at the Shade Tree Program?; arbor month and public information activities for local implementation; pointers on native elm bark beetle control; current shade tree problems, such as gypsy moth, maple decline, and native elm wilt; workable wood utilization programs; other communities' experiences; research in progress; and pointers on buying nursery stock.

Program managers and city administrators make up the third audience and will participate in sessions on: what's new at the Shade Tree Program?; local arbor month and public information ac-

After file numbers are assigned, copies of individual bills are available upon request. The number in the Senate is (612) 296-2343 and the number of the Chief Clerk of the House is (612) 296-2314. For information about the status of a bill, contact either the House or Senate Index office. These offices help callers properly identify a bill and its author(s), and determine its legislative status (in committee, awaiting floor action, passed or defeated). The Senate Index Office number is (612) 296-2887 and the House Index Office is (612) 296-6646.

tivities; administrative concepts, such as cost/benefit of local shade tree programs and long term projections; and administrative mechanics, such as budgeting and record keeping. Following these sessions, Shade Tree staff members will be available for consultation with individuals who want help with shade tree problems in their particular community.

Below is the tentative Tree Inspector Workshop schedule:

- March 19 — Metropolitan area, Lakewood Community College
- March 24 — Waseca, University of Minnesota Technical School
- March 25 — Marshall, Southwest State College
- March 26 — Alexandria, Arrowwood Lodge
- March 31 — Metropolitan area, Landscape Arboretum
- April 14 — Crookston, University of Minnesota Technical School
- April 15 — Grand Rapids, Holiday Inn

For more information, contact Lyle Mueller at the Shade Tree Program at (612) 296-8580.

Urban Forests Need Management

EDITOR'S NOTE: This is the second article in a series on urban forest management.

Like other forests, the urban forest needs management to insure continuation of the many benefits it provides. Management of the urban forest may involve only one or several organizations or groups within a community depending upon the community's resources.

Within the Twin Cities metropolitan area, for example, the urban forest is widely diversified. It includes a state park, forested park reserves, river corridors, city

parks and streets, private woodlands, residences, commercial property and other areas. Management of these different resources is taken care of by cities, state and federal agencies, county governments and private citizens.

Most cities, however, have an urban forest which is much smaller in size and complexity — namely street and park trees and other public trees and shrubs, as well as privately owned trees. These resources are often managed by a single body such as a Parks and Recreation or Forestry Department, Public Works Department,

Tree Board or Tree Advisory Committee.

When dealing with the management of the urban forest, one of the first considerations is the needs and concerns of the community's residents. For example, are vacant lots within the city in a state of rapid decline? Are many city streets void of shade? Are urban wood wastes being utilized, or are they being destroyed needlessly? Is there a need for more recreation areas? Does the main entrance into town need beautification? Are the city trees in need of pruning?

Once these needs or concerns have been identified, the community considers ways to approach the problems. How can they be corrected? Goals are then identified and priorities are set. The community, for example, may decide that reforestation of the city streets has priority over cleaning up vacant lots or that more recreation areas should be developed before beautifying the main entrance into the city. The concerns and goals are unique to each community; and what one community sets as a priority may not be a high priority for another.

Once this step is complete, the community must determine what its urban forest resources are, its condition, and specific needs. This may include an inventory of specific resources, such as a street tree inventory. If the goal is to develop more recreation areas, the inventory may assess all recreation opportunities currently existing within the community.

Once the resource inventory is complete, a summation and analysis of the data is performed. After the inventory and analysis has been completed, a management plan is developed. This plan can include annual targets, budget, and work activities to correspond with the goals and targets previously set.

A community which manages its urban forest resources in a systematic and organized manner will find that its program dollars will be spent more efficiently and effectively. For example, one community decided its street trees needed better care. It set a goal to prune all young trees adjacent to city streets within five years. The city completed a street inventory, identifying the location of trees needing pruning. The city was then able to prepare work plans and budgets so that needed pruning was done early and in an orderly fashion. This avoids larger pruning wounds that would have been created in later years pruning.

—Barbara Stephan
Department of Natural Resources

Demonstration Project Aids City Foresters

Replacing damaged, diseased, overmature, and dying street trees is an important part of community public tree management.

City foresters today are faced with a different set of problems than were their predecessors who planted many of the now mature trees lining the streets of Minnesota communities. Planting areas are more restricted with numerous utilities, disturbed soils, and poor drainage. Traffic has increased and moved closer to the tree line — interfering with natural branching patterns, adding to air pollution, and spraying salt on the trees during the winter months. Increasing urban-related stresses coupled with the ever present insect, disease, and climatic factors make today's job of establishing and maintaining a healthy street tree population a challenge to all street tree managers.

As Minnesota communities are beginning to take a serious look at the management of street trees, different ideas and ap-

proaches to replanting are being tested. Some communities are developing master street tree plans to assure that the total population will be distributed among several tree species. Others are replanting only as existing trees are removed, with little consideration for the new problems of establishing healthy vegetation in today's urban environments.

The Street Tree Demonstration Project has been implemented to help city foresters and others develop street tree planting and management plans. The project, located in the Twin Cities, presents a variety of ideas for replanting and managing street trees in three typical situations:

- 1) Residential area with narrow planting strip and a heavy street tree loss due to Dutch elm disease,
- 2) Residential area with center median (boulevard), a moderate street tree loss due to Dutch elm disease, and many ex-

(Continued on page 3)

OVERSTORY

Minnesota's Urban Forestry Newsletter

Published jointly by the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources; and the Agricultural Extension Service, University of Minnesota.

Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

Advisory Committee Recommends Continued Urban Forestry Funding

Now is not the time for a funding cut-back.

That's the message the State Shade Tree Advisory Committee recently gave Governor Al Quie after studying state and local efforts aimed at preserving and enhancing Minnesota's community forests. The committee presented its report, "Continuing to Save Money and Trees," to the Governor, Minnesota Legislature, Minnesota Department of Agriculture, Minnesota Department of Natural Resources and the University of Minnesota.

This is the fourth biennial report issued by the 27-member committee. The committee is composed of interested and informed Minnesota citizens appointed to advise the state about the care and future of its shade trees. Its members represent many fields of

endeavor concerned with urban forestry including educators, researchers, municipal officials, tree inspectors, nurserymen, and members of professional associations.

The committee recommends continued funding of urban forest programs in order to maintain Minnesota's successful record of disease control and reforestation. It urges a long range sustained effort at urban forest management and specifically recommends the following:

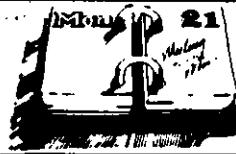
- Funding for the Minnesota Department of Agriculture Shade Tree Program continue at the same level as for the 1979-1981 biennium. The 1979 appropriation was \$25,557,900, and the same amount is recommended for the 1981-1983 biennium.
- \$250,000 be appropriated to the Min-

nesota Department of Natural Resources for removing diseased trees from department lands adjoining community disease control areas.

- \$375,000 be appropriated for the Urban and Community Forestry Program in the Department of Natural Resources to replace federal funds.
- The legislature support continuation of federal funding to the Federal Dutch Elm Disease Demonstration Cities Project, now in its third year, through its planned five years.
- The special tax levy authority for municipalities be continued.
- The legislature adopt an urban forestry policy that defines goals for state and local programs, suggests responsibilities for various agencies, and defines the state's financial and technical commitment to these programs.
- The legislature direct that current level appropriations to the University of Minnesota Agricultural Experiment Station and Agricultural Extension Service be used for funding and support of distinctive positions with responsibilities for shade tree pathology, entomology, and management.

For more information about the committee's report, contact Donald Willeke, chairman of the Shade Tree Advisory Committee at (612) 338-1919.

MEETINGS, EVENTS, ETC.



February 15 is the deadline for nearly 470 Minnesota municipalities to submit their final Shade Tree Program request for payment of sanitation and reforestation costs incurred in 1980. Once the community's program manager or city clerk presents the Shade Tree Program with the actual costs for shade tree disease control and reforestation during 1980, these municipalities can receive reimbursement. Questions about the request for payment should be directed to Dwight Robinson, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, Minnesota, 55107, or (612) 296-8580.

In order to aid communities in preparing contractor specifications, the Shade Tree Program has asked communities to send in sample specifications that could serve as guidelines for other municipalities. So far, the Shade Tree Program has received specifications for tree removal and disposal; stump removal; tree planting; tree pruning and staking; purchasing nursery stock; and purchasing new equipment. The office is still in need of more examples of bid tabulations, especially from communities north of the Twin Cities. This information is being catalogued and will be available at the 1981 Tree Inspector/Program Manager Workshops.

The Minnesota Nurserymen's Association's 1981 Winter Workshop will be held in the Holiday Inn in St. Cloud on February 1, 2, and 3. Workshop topics include: effective design communication, legal and ethical aspects of the design/build approach, practical aspects of the design/build approach, recharging your merchandise picture, the importance of plant nutrition, and practical approaches to plant nutrition. For more information, contact the MNA at (612) 633-4987.

The Wisconsin Chapter of the International Society of Arboriculture will meet February 9 and 10 in Olympic Resort, Oconomowoc, Wisconsin. For more information, contact Richard Haas, superintendent of Parks & Forestry, City of Wauwatosa, 7300 Chestnut St., Wauwatosa, Wis. 53213 or (414) 258-3000, ext. 310.

Project

Continued from page 2

- isting elm trees.
 - 3) Commercial/light industrial area with extremely limited planting strip and heavy exposure to salt spray.
- Cooperators in the Street Tree Demonstration Project are: Ford Motor Company, City of Minneapolis, City of St. Paul, Minnesota Department of Natural Resources, and the Forest Service-U.S.D.A. For more information, contact Barbara Stephan, Urban and Community Forestry Program, Minnesota Department of Natural Resources, Centennial Office Building, 658 Cedar Street, St. Paul, MN 55155 or (612) 297-2108.

—Joanne Gallaher
USDA Forest Service

Winter Oak Pruning Advised

Oaks can be trimmed successfully during the winter. In fact, oak trees should never be pruned or trimmed during the spring. This is when oaks are most susceptible to oak wilt disease because the trees are highly attractive to the beetles that carry the fungus.

In Minnesota, transmission of oak wilt by beetles takes place primarily if trees are wounded between May 15 and June 15. That is when oaks produce large vessels in the newly forming wood, facilitating infection by the fungus and rapid fungal spread within the wood cells. Unpublished reports from Wisconsin also mention the possibility of oak wilt infection due to wounding throughout the growing season. Wounds that are one week old or more are not as receptive to the disease-causing fungus. If you absolutely must prune oaks during the growing season, use a wound dressing to cover the pruning cut or other wounds.

Once tree trimming is completed, you will be faced with the decision of how to dispose of logs and branches. Unlike elm wood, all of which must be debarked to prevent the spread of Dutch elm disease, oak wood may be handled in a number of ways. Only a portion of wood from oak wilt infected trees will spread the disease, depending on the oak species and the time of year the tree wilted. Wilted oaks in the red oak group are the only hazardous trees in Minnesota for overland disease transmission, and among those, primarily the ones that wilt in July and August. Dead or dying bur or white oaks have rarely been

observed to produce spore mats in Minnesota. Red oaks that wilted in July or August last year will be producing spores in the early spring, during the most susceptible period for all oaks.

Consequently, only wood coming from these red oak trees has to be burned, buried, chipped or debarked before it has the chance to produce fungal spores next spring.

Unlike elm wood, oak can also be stockpiled for later use as home firewood by wrapping it tightly in thick (four millimeter) plastic before May 1 and until July 1. It can then be unwrapped and seasoned for burning or other use with the bark on, since it will be beyond the stage of spore production.

Bur and white oaks from diseased trees

can be stored at any time with the bark intact.

For more information on oak wilt, you can request two excellent free publications, one on the disease and its control entitled "Oak Wilt" by D. W. French and W. C. Stienstra, Extension Folders 310 from the Bulletin Room, Room 3, Coffey Hall, University of Minnesota, St. Paul, Minnesota, 55108, (612) 373-1615. The other is a new in-depth review of the disease transmission entitled, "The Transmission of Oak Wilt" by J. N. Gibbs and D. W. French, 17-PP, Research Paper NC-185, from the North Central Forest Experiment Station, 1992 Folwell Avenue, St. Paul, Minnesota, 55108, (612) 642-5207.

—Asimina Gkinis
University of Minnesota

Federal Funding Reduced

For the third year in a row, the federal government has authorized and provided funds for urban forestry assistance. The funding for federal fiscal year 1981, however, has been cut. Funding in 1980 was \$3.6 million, whereas funding for 1981 has been reduced to \$1.8 million.

The funds are part of the U.S. Forest Service's (USFS) budget. The USFS is authorized to provide technical and financial assistance to state foresters through its Urban Forestry Assistance Program. This assistance is to aid in the development of state urban & community forestry

programs.

In 1979, Minnesota first took part in the federal program through the Division of Forestry in the Department of Natural Resources.

Minnesota's allocation of federal urban forestry funds has been reduced substantially for federal fiscal year 1981. Unless additional funds are located, the program may be cut back considerably. In an effort to keep this area of technical assistance available to cities and others, the division is now looking for alternate funding assistance.

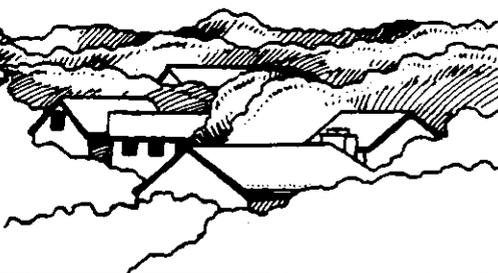


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OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 1, Number 4

July 1981

Reduced Legislative Appropriation Means Less Money for Cities

Because of the \$7.0 million legislative appropriation, there will be less state money available to Minnesota municipalities through the Shade Tree Program, Minnesota Department of Agriculture in both 1981 and 1982. Since 1977, nearly 500 communities have received assistance from the Shade Tree Program to control Dutch elm disease and oak wilt, and plant new trees.

"However, the reduced legislative appropriation will mean the reimbursement rate to communities will drop from 50 percent to 25 percent for 1981," said Shade Tree Program Director Richard Haskett. He added that the reimbursement rate for 1982 will likely be less than that.

During the last biennium, the Shade Tree Program administered grant-in-aid

funds of more than \$25 million. This year, the Minnesota Department of Agriculture's legislative request was \$21 million.

Because communities submitted shade tree program applications based on a 50 percent reimbursement rate, communities may now want to re-evaluate their applications. For that reason, new application forms and contracts are being mailed to communities so they may revise their applications if they so choose.

The funding reduction also affected two other Shade Tree Program grant funds. There will be no wood utilization grant monies available. Wood utilization grants have been used in the past to help communities find new ways to use diseased wood. There is \$200,000 available for experimental grants for one year only. (During the last biennium \$400,000 was available.) The experimental grants are used to evaluate the effectiveness of various shade tree disease treatments, find new avenues of disease control and develop better reforestation techniques.

Funding reductions have also affected the Minnesota Department of Natural Resources, Urban and Community Forestry Program. The urban forestry staff

will drop from three persons to one. However, the field foresters will still be available to provide communities with technical assistance. (See related article on page 5.)

According to William Phillipson of the University of Minnesota's Agricultural Extension Service, their shade tree program efforts have been funded for the next 12 months. Unless federal support is received, extension shade tree work may have to be reduced after July, 1982, according to Phillipson.

"What affect the reduction in state and federal funds will have on local shade tree programs is still unknown," said Haskett. "How communities adapt remains to be seen. Municipalities have many choices to make based on local priorities. Some of the possibilities include special assessments to pay for shade tree management, reducing or eliminating subsidies for removing diseased trees from private property, planting fewer or no trees, or relying more on citizens to report diseased trees, and care for newly planted trees."

If you would like help in evaluating your shade tree program in light of reduced funding, contact the Shade Tree Program office at 612/296-8580.

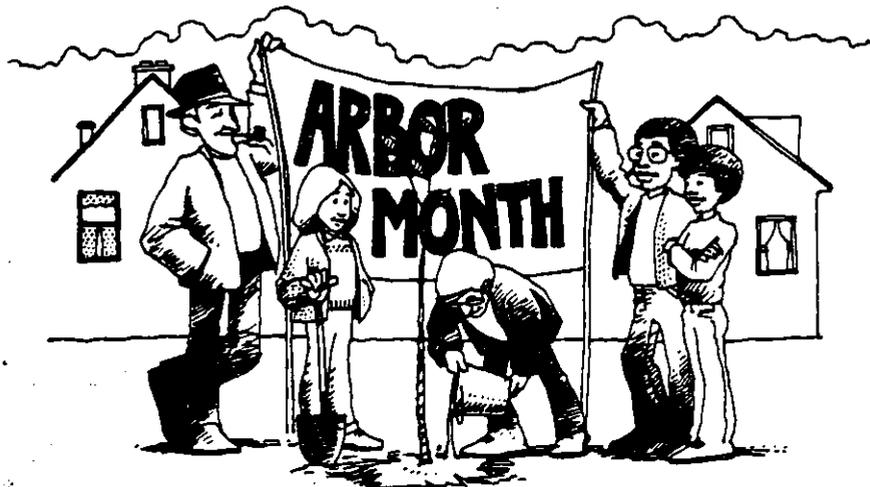
Gov. Attends Arbor Day Ceremonies

Three communities hosted Governor Al Quie, Agriculture Commissioner Mark Seetin, State Shade Tree Advisory Committee Chairman Don Willeke, and others at special Arbor Month celebrations held May 1.

The Governor's party flew from St. Paul first to Brainerd where City Forester, Bonnie Muzik, and Park Superintendent, Larry Haines, welcomed them. They then joined Mayor C. Elmer Anderson and community residents in planting a half dozen Norway pines, the state tree, at Gregory Park.

Next the dignitaries flew to Olivia where they were met by more than 200 students, civic leaders, and other community residents at a newly designated visitors' park. A green ash was planted in honor of Arbor Day and in memory of five residents who died in a recent plane crash. Plans are to

Continued on page 4



Comprehensive Tree Management Offers Lasting Community Benefits

EDITOR'S NOTE: This is the third, and final, article in a series on urban forest management.

A comprehensive community tree management program takes into account many factors. Not only is diseased tree management important, but so is general tree planting, care of existing trees, removal of hazardous trees, utilization of wood wastes, and development of public awareness.

Tree Board

The first step toward developing a more comprehensive tree program is to identify who in the community will be in charge of the program. Most small cities cannot afford to hire a full-time forester to oversee the program, so they generally depend on a **TREE BOARD**. This is a group of interested citizens who are given legal authority through a tree ordinance to administer the tree program. In some instances, the tree board may even do some of the tree work. Generally, however, the board will contract to have the necessary work completed.

Ordinance

The first function of a newly formed tree board is to develop a **COMPREHENSIVE TREE ORDINANCE**. The ordinance is the foundation of the city's tree program. It establishes the tree board as the administrative body responsible for the program. It also identifies the duties of the board and the members' terms of office. The ordinance also outlines public tree care policies which may include spacing and location of street trees, tree species to be planted, treatment of diseased trees,

stump removal, tree topping, etc. Another section of the ordinance might deal with the licensing and bonding of arborists, review of the forestry program by city council, and the penalty for interfering with the tree board.

Inventory

After the ordinance is complete, a **STREET TREE INVENTORY** is conducted. The inventory must be completed to identify what the city has. Without this information, a city cannot properly manage its city trees. The inventory can be designed to meet the needs of any community and can range in complexity from a simple mapping of trees to a computerized listing. Inventories usually include information on each street tree and each available planting site. Tree species, size, condition and location are the basic items usually covered for every tree. Planting site descriptions may include type of area, e.g. residential or business, size of planting space, building setback and presence of utilities or street signs.

Plan

The information obtained from the inventory is then used by the tree board to develop a **COMPREHENSIVE COMMUNITY FORESTRY PLAN**. In the plan, the board can identify specific goals and objectives for the future as well as immediate needs of the city's forest. From the plan, a list of annual work activities can be developed. These can include such items as trees to be planted, trimmed, and removed. Often times the work plans are presented yearly to the city council for approval who then appropriates funds for completion of the activities.

Funding

Cost of the forestry program may be the biggest concern of the city council. It has been estimated that nationwide, the average per capita cost for a comprehensive urban forestry program is \$1.63. For a community of 1,000 people, this amounts to \$1,630.00. When a community first starts a program, a smaller amount may be budgeted, with a slight increase each year until the desired level is reached. Initially, funds should be used for work on existing trees and some new plantings. Too often, funds are used for new plantings with no money left over or budgeted for future maintenance.

A city may not have to rely totally on tax dollars for financing the program. Many cities have garden clubs, civic clubs, and other organizations willing to donate time and/or dollars for specific projects such as tree planting. This would then allow the city to use its budgeted program dollars for maintenance.

Public support is very important. Special plantings such as Arbor Day are excellent ways to bring attention to the urban forestry program. Tree City USA recognition is another good public relations tool.

Assistance

For a community interested in initiating a comprehensive urban forestry program, there are many sources of assistance available. Funding for such activities as tree planting and diseased tree removal are available through the Department of Agriculture Shade Tree Program. Technical assistance with all phases of a tree management program is available through the Department of Natural Resources, Division of Forestry. The Cooperative Extension Service provides tree management information as well as educational assistance. Consulting urban foresters and arborists also offer tree management help on a fee basis. Local tree care companies are available to assist communities in carrying out their work activities. Other sources of advice can include local nurserymen, landscape contractors, horticulturists, and city foresters from nearby larger cities.

A comprehensive community tree management program can provide lasting benefits to any city. If your city doesn't have such a program, now is the time to consider developing one.

—Barbara Stephan
Minnesota Department of Natural Resources

OVERSTORY

Minnesota's Urban Forestry Newsletter



Published jointly by the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources; and the Agricultural Extension Service, University of Minnesota.

Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

Tree Planting Rate Rises While Losses To Dutch Elm Disease Decline

In December communities participating in the Shade Tree Program turned in their year-end figures for disease loss and reforestation. Those figures have been compiled in the 1980 Report to the Legislature, issued by the Shade Tree Program, Minnesota Department of

Agriculture.

The report offers some good news about Minnesota's urban forests. Once again, losses to oak wilt and Dutch elm disease have dropped. Minnesota municipalities are now planting more trees than ever before. In fact, for the first time, more trees

are being planted on public property than are being lost to disease.

According to the report, 474 Minnesota communities had active shade tree disease management programs and received partial reimbursement through the Shade Tree Program in 1980. Disease loss in control areas has dropped to approximately 108,000 elms and oaks in 1980. That's down from previous figures of 128,000 trees in 1979; 181,000 in 1978; and 251,000 in 1977.

In 1980, approximately 144,535 trees were planted on public property. That's up from 111,500 trees in 1979; 103,000 in 1978; and 75,000 in 1977.

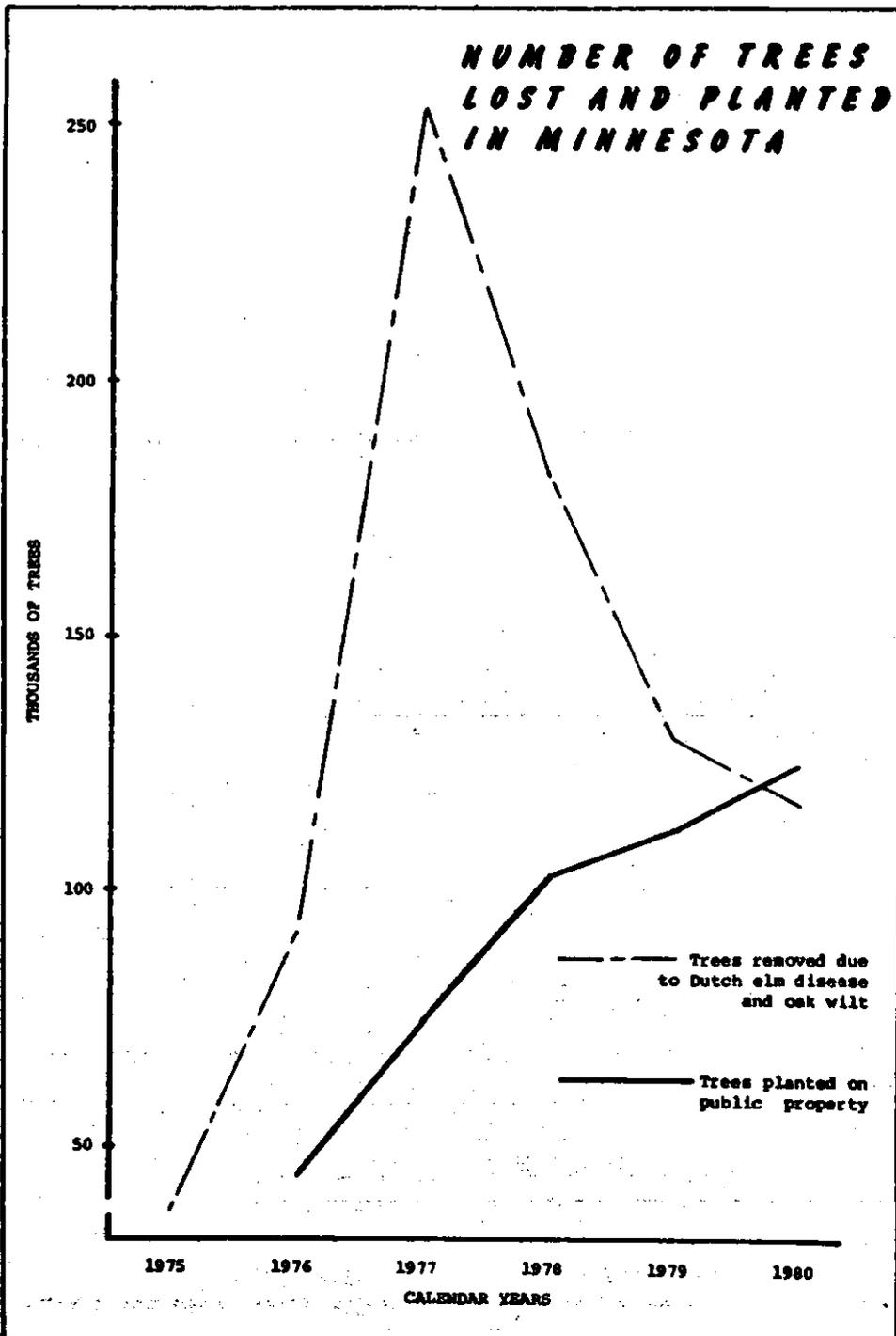
According to the 1980 report, the total local and state costs associated with disease control and reforestation was \$21,047,741 in 1980. That is down from expenditures of \$23,137,029 in 1979; \$29,733,514 in 1978; and \$24,784,402 in 1977.

"The devastation that Dutch elm disease brings to our urban forests is providing Minnesotans with a valuable lesson. We can't afford to take our urban forests for granted," said Mark Seetin, commissioner of the Minnesota Department of Agriculture. "We have learned—the hard way—that our urban forest needs care. Properly managed—just as any other municipal resource—our urban forests will be here for many generations to enjoy."

The 1980 Report provides information about the Shade Tree Program's grants for sanitation and reforestation, wood utilization and experimental projects. It contains preliminary state and local data on disease loss for elms and oaks, and sanitation and reforestation costs. It also shows the total number and species of trees planted statewide.

For more information, or a copy of the report, contact the Shade Tree Program at 612/296-8580 or 90 West Plato Blvd., St. Paul, MN., 55107.

—Lynn Schwartz
Shade Tree Program



Elm Pruning Affects DED Control

Pruning elms can either help or hinder a Dutch elm disease (DED) management program, depending on the kind of pruning and when it is done. There are three basic kinds of pruning: aesthetic, sanitation, and therapeutic.

Arbor Day

Continued from page 1

complete the memorial park with yearly plantings. Olivia coordinators were Christina Gilchrist and Richard Nash.

The third ceremony was conducted in Winona where eight service organizations donated trees for Arbor Day planting in the city park. City forester, Bruce Fuller, who coordinated Winona's ceremony, said the program "brought into the public eye the need for public support of tree planting programs."

Michele Gran, Arbor Program Coordinator at the Shade Tree Program, worked with 11 local communities for nine months to help prepare for Arbor Month activities. "A great effort was made to initiate activities outside the Twin Cities area to recognize the statewide impact of our urban forests," she said.

Gran said that she knew of at least 20 other communities that conducted various public education and awareness raising activities during the months of April and May. For example, Minneapolis cooperated with the Shade Tree Program in conducting the annual State Arbor Day ceremony on April 24.

Bemidji organizers conducted three celebrations, two on Arbor Day and one on April 25 in an industrial park. Crystal conducted a two week "tour of trees" showcasing the many species of trees growing in that community. Rosemount held a very successful "tree buy" and offered a variety of trees to the public at wholesale prices.

Gran said she is very interested in hearing from other communities that conducted Arbor Day/Month events, as well as persons who would like to learn more about the activities communities can plan for this fall or next spring. Contact her at the Shade Tree Program, 90 West Plato Boulevard, St. Paul, MN 55107 or call 612/296-6909.

Aesthetic pruning is part of the maintenance regularly scheduled for all trees in a community. Its purpose is to give trees desired structure and appearance. In a DED management program, aesthetic pruning of healthy elm limbs should not be done during spring and summer, because the pruning wounds attract elm bark beetles and DED infection may result. Community foresters should schedule aesthetic pruning only during the beetles' inactive period from mid-October to the end of March.

Sanitation pruning is the removal of elm branches that are dead or dying from any cause. This type of pruning reduces the number of breeding sites for elm bark beetles and is therefore an integral part of the community's DED management program. Although sanitation pruning is conducted all year, it is safer if done in the fall and winter, when the beetles are inactive. However, summer storms or other events causing tree damage may make spring and summer pruning unavoidable. In such cases, the risk of attracting beetles to the pruning wounds is minor compared with the benefits of removing potential beetle breeding areas.

Therapeutic pruning is the removal of branches already infected with Dutch elm disease in order to save the tree. It is conducted during the spring and summer when disease symptoms appear. Therapeutic

pruning works only if the elm has been infected via beetles and not through root grafts. It is most effective on large trees with small infections. Homeowners are more likely to use this control technique because they are able to watch their elms daily and detect Dutch elm disease in its early stages.

Therapeutic pruning is most successful in communities with good DED management, where populations of elm bark beetles are small and beetle-carried infections are few. The degree of success also depends in part on the pruning technique used. The distance from the pruning cut to the nearest brown or blue-gray discoloration of Dutch elm disease in the pruned branch should be 10 feet or more. If there are at least 10 feet of unstained wood on the pruned branch, up to 85 percent of the pruned elms will survive. If the stain-free distance is less than 5 feet, less than 15 percent of the elms will survive. Of course, if the infection reaches the main trunk, the tree is lost.

Tree wound dressings applied to pruning wounds made during the spring and summer help render the elms less attractive to the beetles. Wound dressings are not needed when elms are pruned between mid-October to the end of March.

—William Phillipsen
University of Minnesota

16 Cities Achieve "Tree City" In 1980

Every year Minnesota is outdoing itself. For the third year in a row we have increased our number of Tree City USA recipients. We've gone from one community in 1978 to 16 cities in 1980. These 16 cities include Austin, Cloquet, Coon Rapids, Fergus Falls, Granite Falls, Hopkins, Hutchinson, Kasson, Litchfield, Little Falls, Minneapolis, Robbinsdale, Rochester, St. Cloud, St. Louis Park, and Winona. We should congratulate these communities on their achievement.

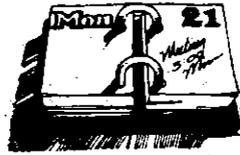
Now is the time to think about 1981, however. Will your city qualify as a Tree



City USA? To be eligible, a city must fulfill four standards. Briefly, they include 1) a legally constituted tree body; 2) a comprehensive tree ordinance; 3) an active community forestry program supported by a minimum budget of \$1 per capita; and 4) an Arbor Day proclamation and tree planting ceremony.

For more information about the Tree City USA program, contact the Urban & Community Forestry Program, DNR — Division of Forestry, Box 44, Centennial Office Building, St. Paul, MN 55155.

REMINDERS



Just a refresher. . . Free laboratory testing for Dutch elm disease and oak wilt is provided by mailing samples to the Shade Tree Laboratory, Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, MN 55107. In order to maximize the accuracy of testing, samples should be taken from an actively wilting or recently wilted branch. Remove four or five sections that are one-quarter to one-half inch in diameter and six inches long. Avoid sampling dead or bare branches, because these will be too dry to culture successfully or determine the cause of casualty. Laboratory samples should be wrapped in moist paper towels and secured with a rubber band. If samples are submitted for more than one tree, be sure to identify each separate sample in the package. Mail samples the same day they were collected and enclose a piece of paper stating your name, address, and telephone number. Laboratory analysis takes about seven days on elm trees and up to two weeks for oak. The lab will accept samples through September 30. For more information on sampling or laboratory results, call Mark Schreiber at 612/296-8388.

Because of the change in reimbursement rates, communities will soon be receiving new application forms from the Shade Tree Program. This was done to allow municipalities a chance to amend their applications in light of the changed budget situation. Don't forget to mail back either a new or revised application along with all copies of the community's signed contract.

With summer's arrival, Shade Tree Program staff members step up their inspections of local programs. Each of the program's six plant health specialists is responsible for monitoring disease control efforts and compliance with the law in a region of the state. In some cases, staff members meet with local officials while on an inspection. But, in other cases, they just drive through communities to take a personal look at the local program. While on inspection, they look for marked and unmarked diseased trees, firewood piles containing bark intact elm wood, tree stumps that have not been removed or debarked, and evidence of tree planting. They then follow up the inspection with a written report which is sent to the community. Staff members are available to work with local officials on any aspect of a community Shade Tree Program, ranging from paperwork to disease control. If you would like to arrange a visit or have a question about a recent inspection, call the Shade Tree Program at 612/296-8580.

Tree inspectors have more to deal with than trees. There are people to contend with. So don't overlook your community's public relations needs. You can be using the "fill-in-the-blank" news releases and handout materials that were distributed at the Tree Inspector Workshops (entitled "Shade Tree Public Information Ideas for Local Programs"). Materials that are timely include: the pre-printed handouts concerning Dutch elm disease inspection results (Appendix A-2), the news release on Dutch elm disease (Appendix B-3), the artwork entitled, "Watch for Dutch Elm Disease" (Appendix C-5), and the radio public service announcements on Dutch elm disease (Appendix D-2).

If you have misplaced the workshop handout, call Lynn Schwartz at 612/296-0339, and she will mail you another one.

Communities participating in the Shade Tree Program can choose whether they want to be reimbursed on a quarterly or annual basis. Municipalities that opted for quarterly payments are reminded that their first Request for Payment (RFP) is due August 15. The RFP is submitted by the program manager or city clerk and shows the community's actual eligible cost for sanitation and reforestation during April, May, and June. Questions about the Request for Payment should be directed to Shari Schroeder at the Shade Tree Program office at 612/296-3064.

DNR Forestry Staff Reduced

The urban forestry program is alive and scaled down in the Division of Forestry, Minnesota Department of Natural Resources. The urban forestry staff has dropped from three to one specialist position providing technical aid for municipal tree programs. This is not to say that the Division of Forestry's assistance to cities will be reduced by two-thirds. The Division's technical assistance in urban forestry has always relied heavily on its more than 250 field foresters scattered throughout the State. These people will continue to be available to assist cities and individual landowners who want help with their trees. As in the past, efforts will be made to upgrade the urban forestry training and expertise of this field staff.

The Division's community forestry specialist will continue to work on his own and through the field staff with cities requesting urban forestry assistance. The areas of assistance include:

- developing a comprehensive tree management plan,
- tree ordinances,
- tree inventories,
- insect and disease prevention and control,
- protecting trees during construction,
- tree and site selection and planting,
- proper tree care and protection,
- wood waste utilization, and
- public education and involvement.

If you want more information or help in one of these areas, call Doug Rau at 612/297-2108 or contact your local DNR forestry office.

800 Attend Workshops

More than 800 students, tree inspectors, urban foresters, and program managers attended the 1981 series of Tree Inspector Workshops offered by the Shade Tree Program. This was the first year that the Shade Tree Program organized the workshops, handling details such as registration, facility arrangements, program content, handout materials, and speech making.

Eight workshops were held throughout Minnesota to qualify or recertify individuals and tree inspectors in municipalities participating in the Shade Tree Program.

Is Your Community Affected By 1981 Legislative Actions?

What impact will the actions of the 1980 Minnesota Legislature have on your city's shade tree program?

That depends on many things but mainly on the desires of your city and citizens. Most communities acknowledge that reduced state financial assistance will create problems, but in the end local government will still set priorities and do the best it can. Some of the cost reducing methods being suggested are:

1. Decreasing public funding of boulevard tree planting. Homeowners are being asked to pay part or all of the cost of boulevard planting.
2. Decreasing the size of the disease control area. Areas that are zoned industrial or commercial are not receiving the same sanitation effort as residential or park areas.
3. Increasing the use of voluntary or in-kind services. Citizens are asked to donate time for services toward the community. In towns of less than 1,000 population these services may

qualify for state reimbursement.

4. Increasing use of joint powers agreements with adjoining communities. Many communities already share a tree inspector but may now consider joint contracts for removal services, tree planting, and diseased wood disposal, etc.
5. Finding new ways to finance local programs. One community added a surcharge to utility bills. Another issued park development bonds to finance a tree planting program.
6. Promoting Arbor Month activities with civic and commercial groups. If these groups are willing to sponsor plantings in parks, neighborhoods, and along streets, malls, and parking lots, cost to the city can be reduced and citizen involvement increased.

Another legislative action requires that population figures for determining eligibility for special incentives to small communities will now come from the 1980 federal census (instead of the 1970 census).

Cities under 4,000 in population are able to receive 90 percent reimbursement of the cost of planting its first 50 trees (up to \$60 per tree). Cities of under 1,000 in population may also receive reimbursement for donated in-kind services and voluntary work.

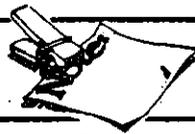
Currently all communities in the seven county metropolitan area are required to have a shade tree disease control program. Communities in all other counties of the state can have a program if they apply and qualify. At the one day special session in June, the Legislature lifted the metropolitan area mandate. Beginning January 1, 1982, metropolitan communities will have to decide whether to continue, modify, or discontinue their shade tree program. Because the action of one community can impact on the disease control success of adjoining cities, good communication between neighboring communities will be needed. Metropolitan communities already work together on bridges, streets, sewer districts, and other matters of mutual interest so the groundwork for cooperation is already in place.

The most confusing legislative matter relates to the authority of local government to special levy beyond mill levy limits in order to finance its shade tree disease control program. Minnesota Statutes 1980, Chapter 18.023, subdivision 6, allowed for a special levy beyond levy limits, "...terminating with the levy made in 1980, payable in 1981." Laws of Minnesota 1981, Chapter 261, amended the statute to read, "...made in 1982, payable in 1983." Later, however, at the June 6, 1981, special session of the Legislature, H.F. 1 passed containing an eight percent limit on increased property taxes payable in 1982. Another section of the same bill may have nullified this overriding provision. The matter is yet to be resolved. Watch for more details in future issues of *Overstory*.

What does it all mean? Mainly it means that communities with good disease control programs will have to be a little bit more resourceful than in past years. It also means that we have to look at our priorities more closely, be better informed of citizen needs and desires, and continue to deliver the high quality service that Minnesotans have come to expect from their community forestry personnel.

—Richard Haskett
Shade Tree Program Director

OF INTEREST



Have you ever thought it would be helpful to know what other communities are paying for contracted services such as tree or stump removal, or tree trimming? Plant Health Specialist, Kris Caulfield, has compiled a sampling of bid tabulations from throughout the state for these services. If you would like to see these figures, contact her at the Shade Tree Program 612/296-6755.

Asimina Gkinis is no longer with the Plant Pathology Department at the University of Minnesota. In April, she began working as a technical service representative for American Cyanamide Pesticide Company. Her territory is southern Minnesota and northern Wisconsin and she deals with field crops instead of trees. Barbara Stephan is on maternity leave from the Urban Forestry Program at the Minnesota Department of Natural Resources. On May 8, her son Michael Frederick was born.

All Minnesota market television and radio stations have received public service announcements on Dutch elm disease. The announcements ask citizens to watch for yellowing or wilting leaves and report these symptoms to their tree inspector.

We are seeing evidence of active public relations efforts made by local programs. The "fill-in-the-blank" news releases have appeared in newspapers in Princeton, Kenyon, Pipestone, Ivanhoe, Janesville, and Waconia. Eden Prairie city forester, Stuart Fox, had a guest column in the Eden Prairie newspaper throughout Arbor Month. In addition a number of communities, including Belgrade and Pelican Rapids, created utility bill stuffers from the materials available at the Tree Inspector Workshops. If you would like to expand your public relations efforts, call Lynn Schwartz at 612/296-0339.

CURA Study Highlights Factors Influencing Shade Tree Programs

In order to increase its effectiveness, the Shade Tree Program wanted to learn how municipalities feel the state program is meeting their local needs. The program staff also wanted to find out how citizens regard their trees and what social, political, and environmental factors influence a local shade tree program's success.

To begin answering these questions, a study was conducted by the Center for Urban and Regional Affairs (CURA), University of Minnesota. The study entitled, "Community Shade Tree Programs in Minnesota. A Study of Participation and Effectiveness," was completed in January 1981.

Many of the findings are pertinent to tree inspectors and program managers who want a better understanding of the factors influencing local shade tree management efforts. A summary of the report appears below. For more information about the study, contact Lynn Schwartz at 612/296-0339.

- Citizens prefer a healthy community forest. (Ninety percent surveyed said that trees are either very or extremely important.) More than two-thirds of those surveyed said they are willing to pay additional taxes to achieve this.

- Sixty-two percent consider Dutch elm disease to be a major or important threat to community forests. Yet, only a minority of citizens surveyed said they have elms on their yards or boulevards.

- Most survey respondents indicated substantial uncertainty about features of their local Shade Tree Program. For example:

- Less than one-half were definite

(answering yes or no) about the existence of a special phone number for reporting suspected trees, financial assistance for removing diseased private trees, existence of a penalty for slow removal of infected trees, or financial assistance for replacing trees lost to Dutch elm disease.

- Most community residents are not clear about the emphasis given to three major activities in the local program: (1) chemical treatment, (2) removal of infected trees, and (3) replacement of lost trees.

- Fifty-seven percent of citizens provided a great deal and thirty-two percent provided some care for the trees on public property in the great majority of cities.

- Government coordinates the selection of replanting species with citizens in most cities: great deal (30 percent) or some (40 percent) of the time.

- Even in cities not participating in the replanting program, citizens are interested in replanting. Citizen or neighborhood groups call and request replantings frequently or occasionally.

- Ninety percent of the firewood in a typical city is inspected. Citizens resent this inspection to some extent: a great deal in 13 percent of the cities, some in 52 percent of the cities, and not at all in 35 percent of the cities.

- Major factors that are both under the influence of local Shade Tree Programs and affect the loss of elm trees include: citizen awareness and support for the preservation of elms, effective operation of the local program (adequate equipment and systematic inspection of existing elms), and use of firewood by local citizens.

- Two factors which most immediately affect a city's ability to mount a replanting program are: (1) size of the city, and (2) form of government. Smaller cities may have trouble planting any trees at all due to lack of finances and city staff. (This is despite the 90 percent reimbursement rate to cities under 4,000.) Form of government may also have an impact on the replanting rate. Statutory cities which have professional managers are more likely to participate effectively. Generally, cities with appointed clerks do considerably better in replanting than do cities with elected clerks.

- Replanting appears to be an activity which communities feel they can defer. A city must fight Dutch elm disease when it first hits and disease control expenditures cannot be postponed. However, when this crisis is past, communities then turn to replacing lost trees. The decision to plant is more complicated than the decision to fight Dutch elm disease.

- Reliance on volunteers to do replanting is not always conducive to much planting. Cities using this method might be encouraged to, as finances permit, contract with nurseries or provide city employees to do the planting.

- The case studies pointed out the value of citizen enthusiasm in small towns. In larger cities there are some very successful replanting programs where citizens do not seem to care about or have knowledge of the program. However, if that attitude is present in small towns, the program tended to be unsuccessful. In the more successful small communities, citizens helped by reporting trees as diseased, and watering newly planted trees thereby stretching the already thin financial resources of the community. Public relations and informational campaigns in small communities apparently make a substantial difference.

- The CURA study recommended that cities conduct the local program under existing state rules to the extent possible. Control of the use of firewood and complete regular inspections yielded improved results.

- The CURA study recommended that cities promote citizen awareness and support for their Shade Tree program. Cities where citizens are involved have greater success.

—Lynn Schwartz
Shade Tree Program

RESOURCES



The University of Minnesota Agricultural Extension Service can provide you with information and advice on a variety of urban forestry issues. Listed below are staff members, their area of specialty, and phone numbers.

Entomology	Bill Phillipsen/Mark Ascerno	612/373-1038
Horticulture	Jane McKinnon	612/373-1100
Forest Products	Harlan Peterson/Lew Hendricks	612/373-1211
Forestry	Pat Weicherding	612/373-0720
Plant Pathology	Ward Stienstra/David French/Fred Baker	612/373-0937
Publications/slides/etc.	Louise Jones	612/373-1785

Hand Debarking Proves Feasible

With costs of debarking equipment in the neighborhood of \$80,000, many communities cannot afford a mechanical debarker as a means of wood utilization. However, there is an alternative to expensive debarking equipment — hand debarking.

The city of Montevideo conducted an experimental wood utilization project to determine if hand debarking elm wood is economically feasible and to explore which tools would most effectively do the job. Montevideo learned that hand-debarking may be slightly less cost effective than mechanical debarking in producing a cord of wood. However, considering the high cost of debarking equipment, a small community can operate a hand-debarking project for 15 to 20 years and still spend less than if it purchased a large mechanical debarker.

During the summer of 1980, Montevideo tried five tools or methods of hand-debarking:

1. Ice scraper or ice chipper;
2. Chain saw;
3. Two inch wide wood chisel and hammer;
4. Old lawn mower blade and hammer; and
5. Draw knife.

Montevideo found that all methods did debark elm logs, although the first four methods were very slow, inefficient, and sometimes too dangerous. The most efficient and easiest method of hand-debarking elm wood involved using a draw knife. They found that an average log of six inches in diameter and five feet long takes

about ten minutes to debark using a draw knife. The only disadvantage was that the length of the blade limited the diameter of the log that could be debarked. Montevideo used a standard 14 inch blade and this limited log size to about 12 inches, otherwise the debarker's knuckles rubbed against the bark.

One important factor was confirmed by the Montevideo project. Elm wood is easiest to debark within 48 hours of felling.

Montevideo was able to debark about 18 cords of elm wood during the last half of the summer. Their costs per cord were about \$97, and they sold the wood for roughly \$49 per cord. These figures reflect the fact that Montevideo paid their laborers \$4.65 per hour. By reducing this to the minimum wage of \$3.50 per hour, they estimate that the cost per cord would drop to about \$75.

Montevideo feels that it is possible to come very close to breaking even if the community sorts out its good quality saw logs and sells them to a company for processing. By doing this, the city estimated that its cost would be about \$35 per cord of wood produced. This is not a bad investment considering the excellent public relations that can be gained for the program by making firewood available to the public.

Although the Montevideo project did not prove to be a profit-making venture, it did point out that hand debarking is a feasible alternative to mechanical debarkers.

If you would like to learn more about the Montevideo program, contact Doug

Spray, Montevideo park director, Senior High School, 13th Street and Williams Avenue, Montevideo, MN 56265 or telephone 612/269-5026.

We're Late

What happened to *Overstory*? A number of our readers have asked why they have not received an issue of *Overstory* since January.

The answer has to do with the state's budget deficit. The March issue was ready to go to press when a freeze in government spending prevented publication of the newsletter. The freeze was ordered in response to a \$195 million budget deficit that faced the State of Minnesota. All state agencies were restricted in hiring, purchasing, and traveling in order to save money. The freeze was in effect for Fiscal Year 1981 funds. Since the state's fiscal year runs through June 30, 1981, *Overstory* could not be published in March or May.

We are aware that our inability to publish this newsletter has caused concern for some communities. The Shade Tree Program wants to assure every participant that communicating with you is a job we take seriously. We were reluctant to miss these issues. We hope to now return to *Overstory's* every-other-month publishing schedule.

—Lynn Schwartz
Shade Tree Program



c/o Shade Tree Program
Minnesota Department of Agriculture
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St. Paul, MN 55107

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OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 2, Number 1

September 1981

New Use For Dursban Approved

University research has led to a state label for an insecticide that may now be used in a new manner to help control both native and European elm bark beetles in cut elm logs with bark intact.

University of Minnesota scientists William Phillipson, Val Landwehr and Mark Ascerno have been studying ways of rendering wood utilization methods compatible with disease management programs through a grant from the Minnesota Department of Agriculture Shade Tree Program. Until now the approved methods included promptly chipping the elm wood or debarking it.

Now, should chipping or debarking operations fall behind schedule or prove unfeasible, a back up system using the insecticide Dursban[®] 2E is available. This product is to be used only at waste wood utilization-disposal facilities operated by municipal personnel conducting a shade tree disease management program. Application of the insecticide is to be made under the supervision of personnel who have successfully completed pesticide applicator training workshops offered jointly by the Agriculture Extension Service and the Minnesota Department of Agriculture. This method is not to be used by individual homeowners.

Elm logs should be treated with a coarse low-pressure spray to the entire bark surface. To prepare the spray, thoroughly mix 2 2/3 fluid ounces of Dursban 2E with water to make up a total of 1 gallon of mixture (equivalent to 2.1 gallons in 100 gallons of water). Spray should be applied thoroughly and uniformly to the point of runoff. (One gallon of mixed spray will cover a 32 inch diameter log, 20 feet long.) A single application will provide season long control of elm bark beetles in the bark of stored logs. The special local needs label must be in possession of the user at the time of pesticide application. This method is approved for use in Minnesota only.

—William Phillipson
University of Minnesota



State Fair Exhibit

Plant health specialist Tom Maier answers questions at the Shade Tree Program's exhibit at the 1981 Minnesota State Fair. The exhibit pointed out the practical and aesthetic reasons for planting trees near homes, offices and throughout the community. Municipalities that participate in the Shade Tree Program may borrow this exhibit by contacting Lynn Schwartz, Shade Tree Program, at 612/296-0339.

Dutch Elm Disease Rising After Years of Decline

After several years of decline, Dutch elm disease appears to be on the increase throughout the state.

After Shade Tree Program staff observed an apparent increase in the disease incidence while on inspection tours, a telephone survey was conducted by the Shade Tree Program, Minnesota Department of Agriculture.

In mid-July 20 communities were asked to compare the number of trees lost this year as compared to the number lost by the same date last year. According to the survey, only four of the 20 communities did not show an increase in disease incidence over 1980.

Increased losses ranged from three to 200 percent, with the average increase in Dutch elm disease between 25 and 30 percent. Some communities had already exceeded their total losses for 1980 by mid-July of 1981.

In addition, a few Minnesota communities—Ada, Warren, Thief River Falls,

Pelican Rapids and Gary—reported their first case of Dutch elm disease. Red Lake County also confirmed its first case of the disease in the county.

Entomologists from the University of Minnesota indicate a major cause for the increase this year is the rise in the elm bark beetle population. Studies over the past few years indicate that the beetle population has risen by a factor of three as a result of two consecutive mild winters, according to William Phillipson, extension entomologist.

Final data from Shade Tree Program participating communities will not be available until January. Communities are required to report their total 1981 losses by December 1. This information is compiled in the Shade Tree Program's Report to the Legislature issued in January.

—Richard Haskett
Shade Tree Program

Autumn Planting Requires Planning

Autumn is becoming increasingly popular as a second planting season for shrubs and trees. There are several good reasons to consider fall planting. Sometimes it is the first planting opportunity after a summer construction project. For some cities it is easier to schedule planting for the fall rather than the spring. There may also be an opportunity to reallocate funds from other uncompleted projects to autumn planting before the next fiscal year.

Whatever your reason, fall planting requires careful planning because timing is critical. When planting in the fall, you are working with a deadline imposed by winter. In order to meet that deadline, the earlier you can order your stock the better. If the stock you are planting is in containers, you can plant in early fall and have the rest of this ideal season for the plants to reestablish themselves.

If your project involves bare root nursery stock, then you will have to wait until after the plants go dormant and can be safely dug. Either way, make your arrangements early. In fact, autumn is also the best time to order your planting stock for next spring.

What type of nursery stock you decide to use will be important in determining what species you can plant in the fall. All container grown stock is suitable for fall planting. There are also few problems encountered with balled and burlapped deciduous planting stock.

However, particular caution is advised when fall planting balled and burlapped evergreens and bare root deciduous trees. The evergreens should be planted as early in the fall as possible so they have the remainder of the season to reestablish themselves. Because planting has to be done later with bare root deciduous trees, there are some varieties that should not be fall planted. The following varieties are not recommended for bare root fall planting.

Silver maple
Norway maple and varieties

Red maple and varieties
Birch varieties
Sunburst honeylocust
Russian olive
Poplars and cottonwood
Hackberry
Plum and cherries
Apple varieties
Pear varieties
Swamp white oak
Red oak
Pin oak
Willow varieties
European mountain ash

After your stock is ordered, there are several things you can do to prepare for planting. First, make sure you have your planting sites located. Schedule the necessary equipment and labor, and make arrangements for bark chips, stakes and water. Keep in contact with your contractor or tree supplier and let the company know you want to get your trees planted as quickly as possible. This can help you

avoid being the last project done or receiving the last nursery stock shipment before winter.

If buying nursery stock from a larger wholesaler, it often helps speed things along if you pick up the stock yourself. To do this, tell the nursery when placing your order that you wish to be notified when your order is ready. Be sure to take hay or other packing material as well as a tarp on the truck.

If all your planning and prodding fail to get the job done, or winter comes early, you can still plant past normal freeze-up by heavily mulching your planting sites with hay or barkchips. If you are planting past freeze-up, you ought to think seriously about postponing delivery of the stock until spring.

Some planting practices take on particular importance during fall planting. A wood chip mulch around the base of the tree insulates the soil and promotes root growth.
Continued on Page 3

Special Levy Authority Modified By Legislature

Local government's authority to special levy beyond mill levy limits has enabled many Minnesota communities to conduct shade tree disease control and reforestation programs. However, the authority was repeatedly modified during the 1981 session of the Legislature.

Some confusion exists concerning how 1981 legislative action affects special levy authority available to finance local shade tree programs for 1982.

There are three important considerations that affect a city's calendar year 1982 shade tree levy.

1. Any amount up to an eight percent increase over the 1981 levy that a city levies

to finance its shade tree program must now be considered a general levy. Even if the 1981 levy was a special levy, it must now be considered a general levy for 1982 and is therefore subject to the eight percent increase limit.

2. If a city wishes to increase its program costs more than eight percent it may do so. In this case, the amount above the eight percent increase is considered a special levy and is not subject to levy limitations.

3. Any amount that a city levies beyond 108 percent of its 1981 total levy (shade tree and most other levies combined) is not eligible for homestead credit.

Local shade tree program managers received a letter in July from Shade Tree Program Director Richard Haskett outlining some of the implications of 1981 legislative action on levy limits. "Levies and levy limits are extremely complex matters. I encourage program managers and tree inspectors to discuss local needs with their city clerks," said Haskett. "In addition, staff from Shade Tree Program and the Minnesota Department of Revenue can also answer questions." For more information call Richard Haskett at the Shade Tree Program at 612/296-8580 or the Local Government Aids Division of the Minnesota Department of Revenue at 612/296-2246.

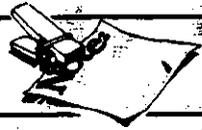
OVERSTORY

Minnesota's Urban Forestry Newsletter

Published jointly by the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources; and the Agricultural Extension Service, University of Minnesota.

Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

OF INTEREST



More than 100 male gypsy moths were trapped during the 1981 season, compared to 27 moths in 1980, according to the Plant Industry Division of the Minnesota Department of Agriculture. As in 1980, most of the moths were located in the Twin Cities area. Although data is still being collected and analyzed, this pest is not considered to be established in Minnesota at this time. The trapping program is a cooperative effort of the Minnesota and U.S. Departments of Agriculture. In 1981, the gypsy moth defoliated a record 10 million acres of trees in the eastern United States.

Whether walking, bicycling or riding in a city truck, tree inspectors are versatile when it comes to transportation for Dutch elm disease detection. Reggie Redetzke, tree inspector in Osakis, conducted many inspections this year on yet another mode of transportation—the horse. Redetzke's other city duties weren't leaving time for tree inspection during regular work hours. His solution was a horseback ride through town during the early evening hours. "It's worked out beautifully," he said. "It's a good way to exercise our horses and provides good exposure for the Dutch elm disease program. People really take notice when you're on horseback. It draws attention to the program and it makes the job fun."

The Minnesota Society of Arboriculture will hold its annual meeting on October 19 in the Holiday Inn South in Rochester. The program topics include: trees and distribution lines, municipal nurseries, pruning the new city forest, laws on trees, and leasing vs. purchasing equipment. For more information, call Jim Herman at 612/822-2126.

A Symposium and Workshop on Dutch Elm Disease will be held October 5 - 8 in Winnipeg. The program is sponsored by Environment Canada and the Province of Manitoba. Topics include Dutch elm disease identification, elm bark beetle monitoring, tree injection, biological actions to control DED, and elm utilization. For more information phone 1-204/477-4619 and ask for a registration kit.

At last, a portable debarker? Perhaps. In July the City of Minnetrista was awarded an experimental grant from the Shade Tree Program to develop a portable debarker. This innovative wood utilization machine could be transported to residential sites for "on site" processing of downed elm trees. Specifications call for a machine that:

1. has the capacity to debark and split 6" to 32" diameter logs,
2. is easily and legally transportable as an integral trailered high speed unit,
3. takes no more than two people to operate, and
4. is cost effective.

Minnetrista has until June 30, 1982 to complete the project.

After September 1 the Minnesota Department of Natural Resources, Division of Forestry, accepts orders for tree seedlings. Order early since some varieties are in short supply. For more information call 612/296-4479.

Many Minneapolis citizens and organizations donated funds to the Minneapolis Parks Foundation to restore greenery to the city after a tornado touched down in June. Three groups made special contributions. The Men's Garden Club of Minneapolis provided assistance to restore the plant collections surrounding the Lake Harriet Rose Gardens. WAYL radio, in conjunction with Fotomat stores, promoted a Green Tree project with contributions going to Minneapolis, St. Paul and Roseville—all hit by the tornado. In addition, the group Twist and Shout which plays at the Lake Harriet Bandstand donated concert proceeds to the Parks Foundation.

Sunscald Protective Measures Evaluated

Large and rapid temperature fluctuations can cause considerable sunscald injury on thin barked tree species.

Through a grant from the Minnesota Department of Agriculture Shade Tree Program, Dr. Margaret Litzow and Dr. Harold Pellet of the University of Minnesota are testing a number of protective materials to determine which measures best prevent rapid temperature fluctuations in cambial tissue.

Of the eight materials tested, preliminary data indicate that white paint and common commercial tree wrap did not significantly reduce the rate of temperature fluctuation over that of an unprotected tree. These materials may not be the most effective protective measures.

Reflective materials such as aluminum foil demonstrated the slowest rate of temperature change. Foil, such as Foylon 1, may be the best wrap to use. Foylon 1 is a shiny silver-colored fabric-like material. Currently it is not sold as a tree wrap, but is used in greenhouses to reduce heat loss at night.

Research is still underway and Drs. Pellet and Litzow will continue monitoring tree wraps throughout the coming winter to determine if evidence continues to point to foil as the best material available to prevent sunscald.

For more information, contact Dr. Pellet or Dr. Litzow at the University of Minnesota Landscape Arboretum at 612/443-2460.

Autumn Planting

Continued From Page 2

reestablishment as well as retains moisture. Adequate watering is just as important in the fall as it is during the summer. Letting your plants go into the winter in a water stressed condition invites problems. Finally, if you have the option, avoid fall planting on windy and exposed sites. Save those sites for early spring planting.

— Doug Rau
Minnesota Department of
Natural Resources

Marketing Trees As Sawlogs Can Save Your City Money

Some elms and other trees removed as part of your community's Dutch elm disease sanitation program are potentially valuable. Marketing these trees as sawlogs can save, rather than cost, your city money.

While not all trees removed can be sawed into lumber, it is possible, with adequate planning, to use many trees as logs. What is necessary is an understanding of what type of logs a sawmill will buy and the ability of your crews or tree removal contractors to recognize potentially valuable trees.

The first step is to locate a sawmill, preferably close by, that is willing to buy your sawlogs. Don't assume that the nearest sawmill is two hundred miles away. There are mills located throughout the state. Many of these mills saw woodland elm as a matter of course, but rarely work with trees grown in the city.

City trees have a justifiably poor reputation with many sawmills. Nobody is going to risk a thousand dollar saw blade if he thinks there is a chance of nails, lag bolt or concrete in the logs. You may have to convince the sawmiller that your logs are of high quality and that they are usually metal free. Fortunately, there are usually a number of visual indications if there is a problem with a particular log. Sometimes the form or location of the whole tree will

suggest that you should not send it to a mill. Hand-held metal detectors have also proved useful. As a general rule, if in doubt about a particular log, reject it rather than risk losing a buyer for your logs.

When you find a mill willing to buy your logs, it is important that you learn what sizes, lengths and quantity the mill wants. You should also find out what the mill is willing to pay for elm logs. Generally, elm brings anywhere from \$40 to \$80 per thousand board feet at the mill with "risky" city trees usually on the lower end of the scale.

Be sure you understand what does and does not qualify as a sawlog. The following table will give you some indication of the minimum requirements for length, form and condition of a sawlog. Be sure the removal crew is familiar with specifications for valuable logs and that there is a procedure for saving valuable logs when trees are removed. Special markings for trees you wish to save might be helpful.

What It Takes To Make A Sawlog

1. Smallest end diameter inside bark is 10" or larger.
2. Generally 8'-8" or 16'-8" long (check with mill about desired lengths).
3. Free of crotches, large branches, frost cracks.

4. Minimal internal rot (this is important in smaller diameter logs).
5. Free of metal, concrete, etc. (be particularly careful in the vicinity of main crotches).
6. Free of ring shake (separation between annual rings).

In addition to selling your logs, another option is to hire a mill to custom saw them and the city keeps the lumber. It is a rather inexpensive way to get hardwood lumber for everything from park benches to bangboards for city trucks. If you have your elm cut for city use, you should take particular care when drying it. Careful drying can overcome elm's natural tendency to warp and check. Properly dried, elm is a very tough, durable and beautiful wood, with many uses.

If you need help in locating sawmills in your area and organizing a log sale, contact your local Minnesota Department of Natural Resources (DNR) forester or county extension personnel.

If you produce only a few logs at a time and want to accumulate enough to sell in truckload quantities, see the article on page 1 about a new use for Dursban[®] 2E.

— Doug Rau
Minnesota Department of
Natural Resources



c/o Shade Tree Program
Minnesota Department of Agriculture
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St. Paul, MN 55107

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OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 2, Number 2

November 1981

Preventive Measures Can Minimize Winter Road Salt Damage To Trees

Metropolitan dwellers in Minnesota have demanded and have become accustomed to dry pavements for safe traffic movement during winter months. In order to obtain dry pavements quickly, deicing salts are applied in combination with sand.

The most common deicing salt used on Minnesota roads and streets is sodium chloride. Another salt, calcium chloride is used only during extremely low temperatures. Both are detrimental to woody vegetation. However, because of its far greater use and the sodium component, sodium chloride stands out as the main culprit.

PROBLEMS

Salt can damage plants in a number of ways. One way is by changing cellular processes upon entering plant cells through roots or twigs. Another way is by breaking down soil aggregates and thus increasing soil compaction. Still another way is by reducing the cold resistance of hardwood twigs thereby producing twig dieback. For a good physiological explanation of salt damage see Technical Bulletin 303 entitled, "Effect of Deicing Salts On Woody Vegetation Along Minnesota Roads" by University of Minnesota forestry professor Dr. Edward Sucoff. (Photocopies available by calling 612/296-0339.)

Symptoms in woody plants depend upon whether spray salt or soil salt is involved. Spray salt symptoms include: 1) dieback of the previous year's growth and 2) delayed leafing out in the spring. Soil salt symptoms include; 1) reduced plant vigor, 2) marginal browning of leaves, 3) premature fall coloration and in some situations, 4) tree death.

SOLUTIONS

1. Better training of maintenance personnel and using improved spreading equipment can reduce the quantity of deicing salt. To illustrate, the Golden Valley Maintenance Area of the Minnesota Department of Transportation reports a

reduction in salt use from a high of 0.58 tons per lane mile per occurrence in winter 1968-69 to a low of 0.17 tons last winter. Of course, last year we had a mild, "open" winter.

2. Plant woody vegetation that is tolerant of spray salt and soil salt. (See Technical Bulletin 303 for a detailed list.) Some plants that have performed well in salty highway locations include:

Tolerant Trees: Austrian pine, Black Hills spruce, Colorado spruce, robusta poplar, imperial honeylocust, Norway maple, and Russian olive.

Tolerant Shrubs: buffaloberry, Zabel's honeysuckle, Siberian peashrub, VanHoutte spirea and Jackmann potentilla.

Tolerant Vine: Virginia creeper.

3. Don't plant in areas suspected of having soil salt problems unless a soil test

reveals acceptable levels of soluble salts. The University of Minnesota Soils Lab (612/373-1060) is equipped to run soluble salts tests for a nominal fee.

4. Avoid planting in low areas or depressions near roadways where salt is applied. This may mean eliminating watering saucers around newly planted trees.

5. Increase the vigor of damage planting by improving soil moisture and fertility.

6. Flush sodium from the soil by applying gypsum (CaSO_4) to the soil surface around damaged trees. Little if any work has been done along this line in Minnesota. However, researchers in the eastern United States have shown benefits from such treatments.

—Paul G.A. Walvatne
Forester, Landscape Unit
Minnesota Dept. of Transportation

U. Of M. Plans To Offer Urban Forestry Degree

At its October 15 meeting, the University of Minnesota Board of Regents approved a proposal that will enable the College of Forestry to offer a new baccalaureate degree program in urban forestry.

Following the board's approval, the proposal was forwarded to the Higher Education Coordinating Board for review.

According to Professor Gregory Brown, head of the Department of Forest Resources, the college plans to offer the four year degree program to freshmen beginning next fall. The new curriculum will offer students a greater variety of coursework in areas such as horticulture, city planning, forestry, landscape design, business, plant pathology, and entomology. While most courses already ex-

ist in other colleges within the university, Dr. Brown mentioned that the college hopes to add a few new courses specifically directed at urban forestry to round out coursework in the new program.

Additionally, should funds become available, the college hopes to add a new faculty member.

Why the new degree program? Dr. Brown noted that the university has been interested in urban forestry for nearly ten years. "There is a demand for individuals in this field. An urban forester's duties are varied, and the new degree program will better meet his or her needs on the job."

For more information about the new program, contact the College of Forestry at 612/373-0840.

Potassium Iodide Use Can Reduce Disease Pressure In Control Areas

Areas of wild elms, within or adjacent to a control area, can threaten a community's Dutch elm disease control program. These wild elms may become infection sources for Dutch elm disease and may need to be removed in order to lower disease pressure. Unfortunately, removal is not always feasible because the areas are sometimes difficult to work in or inaccessible.

When removal is not feasible, some communities have turned to killing trees with potassium iodide (KI).

Injecting potassium iodide into infected—not dead or completely defoliated—trees or into healthy elms, removes the need to fell and remove these trees. Potassium iodide not only kills the tree, but dries it out so quickly that the bark falls off in a very short time. If properly done, this rapid drying makes the tree unsuitable as a breeding place for the elm bark beetles (*M. Stennes*, unpublished study, University of Minnesota).

A program of potassium iodide injection should be added to a community's control program only after careful study. This technique should be used only in wild areas or places where removal is extremely difficult. Potassium iodide should never be used on trees near buildings or in parks near public-use areas since the rapid drying may weaken the tree so it might fall and cause injury or damage.

When first considering the use of potassium iodide, you may feel the cost is prohibitive. Although potassium iodide may appear to be an expensive chemical, it may prove to be a very economical way of rendering wild and otherwise inaccessible elm trees pest-risk free and reducing the disease pressure on your community's elms.

As with all chemicals, buying in bulk can result in substantial savings. Depending on tree diameter, the cost per tree ranges from

\$6.58 to \$9.07 per tree if a 100-pound drum of KI is used. If the one-pound bag is used, the cost per tree ranges from \$34.85 to \$46.77. Compare this price to what it would cost to have the trees removed by a contractor, even if the contractor gets the wood. In many cases, KI use is cheaper.

As a guideline, you should expect to treat 160 16-inch DBH trees per 100 pounds of KI or about 210 12-inch DBH trees.

The use of potassium iodide cannot be claimed as a reimbursable expense on the Shade Tree Program's Request for Payment forms. Any money expended for labor or materials is strictly a local cost.

For more information call Greg Ustruck at 612/296-7999.

— Greg Ustruck
Shade Tree Program

Dursban Use Monitored To Determine Effectiveness

In Little Falls and Fergus Falls, Dutch elm disease incidence was monitored and native elm bark beetles were caught with sticky traps to determine whether Dursban[®] (chlorpyrifos) spraying of elm trunks had an effect on disease rates and the number of beetles.

The City of Little Falls treated the trunks of all elm trees in the city with chlorpyrifos in April 1980 except for elms in four areas which were left as untreated controls. Each untreated area was about 40 acres in size and had approximately 140 elms. Beetles were trapped and disease incidence was estimated in each control area and adjacent treated area.

In the treated areas, the chlorpyrifos applications reduced the number of native beetles that were active on healthy elms during 1980. Furthermore of the ten communities where native beetles were trapped in 1979 and 1980, Little Falls was the only community that experienced a decrease in the number of beetles per sticky trap. The average number of *H. rufipes*/trap at 3

sites was 20.7 and 5.4 in 1979 and 1980, respectively. The trunk spraying also caused a significant reduction in the rate of Dutch elm disease. Disease incidence in the untreated areas did not change between 1979 and 1980, while there was a substantial decline in the treated areas.

The results of community-wide spraying were less encouraging in 1981. In Little Falls the number of *H. rufipes* caught on sticky traps during April through June declined from 29.9 beetles per trap in 1980 to 12.1 in 1981. Despite the apparent decline in *H. rufipes* abundance, there was a small increase in Dutch elm disease from 6.48 percent in 1980 to 7.60 percent in 1981.

During April 1981, the City of Fergus Falls treated the bases of all its elms with chlorpyrifos. Spraying appears to have affected the population size of the native elm bark beetles because significantly fewer were caught after spraying than during the previous year. The number of beetles per trap was 8.7 and 2.0 in 1980 and 1981, respectively. Also significantly fewer beetles were trapped in treated areas than in untreated areas just outside the city. In spite of fewer beetles in 1981, the incidence of Dutch elm disease in Fergus Falls also increased slightly (from 0.39 percent in 1980 to 0.58 percent in 1981.) However, the increase in Dutch elm disease during 1981 at Little Falls and Fergus Falls was small compared to other areas in the state. Disease incidence increased in 21 of our 22 other study areas by an average of 45 percent. Unfortunately, 1981 was a good year for the DED fungus.

- Bill Phillipson
University of Minnesota

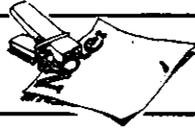
OVERSTORY

Minnesota's Urban Forestry Newsletter

Published jointly by the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources; and the Agricultural Extension Service, University of Minnesota.

Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

OF INTEREST



Help Keep *Overstory's* mailing list accurate. Are you receiving more than one copy of this newsletter? Is your address incorrect? Do you want to be dropped from the mailing list, or do you know someone who should be receiving *Overstory*? If so, please contact Lynn Schwartz at the Shade Tree Program office at 612/296-0339.

Communities throughout Minnesota will soon be receiving application forms for the 1982 Shade Tree Program. You should receive these forms in November, and they must be completed and returned to the Shade Tree Program Office by December 31, 1981. If you have any questions about the application form, call the Shade Tree Program office at 612/296-8580.

Dates for the 1982 series of Tree Inspector Workshops are tentatively set. The workshops, sponsored by the Shade Tree Program, are held to qualify or recertify tree inspectors. Tentative dates are: March 2, Marshall; March 5, Eden Prairie; March 9, Hibbing; March 11, Thief River Falls; March 12, Fergus Falls; March 23, White Bear Lake; March 25, Rochester; and April 3, St. Paul.

To be considered for this year's award, Tree City USA applications must be submitted by December 31. Send applications to Doug Rau, Box 44, Minnesota Department of Natural Resources, Centennial Office Building, St. Paul, MN 55155. For more information or an application form, call 612/296-8609.

It's not too early to think about spring Arbor Month projects. Arbor Program Coordinator Michele Gran notes that planning a successful community planting project takes many months of preparation. In light of recent budget cuts, special projects are especially important ways to garner support for local shade tree efforts. A detailed Arbor Month community planning guide is available from the Shade Tree Program office. This guide offers suggestions on how to plan a variety of public events, obtain publicity, write an Arbor Month proclamation, and involve community members. If you would like a copy of this booklet or want help in planning a tree planting project, contact Michele Gran at 612/296-6909.

The 56th annual Minnesota Nurserymen's Association Convention will be held November 29, 30 and December 1 in Bloomington. Topics include: selling landscape design, practical approach to production control, University of Minnesota research, and high yield management. For more information call the nurserymen's association at 612/633-4987.

The Shade Tree Program is publishing two new brochures designed to present basic information on Dutch elm disease and oak wilt to the general public. The brochures stress the importance of early identification and support of local shade tree disease control efforts. The single page, multi-color brochures may be handed out by tree inspectors or included in local utility bills. Large quantities of the brochures will be available to inspectors attending the 1982 series of Tree Inspector Workshops.

Community Year-End Reports Due Soon

The year is nearing an end. That means it's time to complete year-end reports.

Communities should have received their 1981 Year-End Report forms this month. These forms are due back at the Shade Tree Program office no later than December 1, 1981. The single page form - which is considerably shorter than in past years - asks municipalities to state their 1981 expenditures for sanitation and reforestation, the number of elms and oaks identified for removal on both public and private property, the number of trees planted, and the species used in reforestation.

This information is compiled by the Shade Tree Program to meet its reporting obligation to the Minnesota legislature. In its 1981 Report to the Legislature, issued in January, the Shade Tree Program will report the disease incidence, number of new trees planted, and program expenditures for more than 400 Minnesota municipalities.

If you have any questions about completing the Year-End Report form, contact your regional plant health specialist at 612/296-8580.

Since you are already compiling year-end data, this is an excellent opportunity to let your community know about your city's urban forestry management accomplishments. This is the best time to issue a news release to your community newspaper, and possibly the local radio or television station stating the number of trees lost to Dutch elm disease, and the number of trees planted in your community.

Since your community's shade tree program relies primarily on local funding and thus, community support, it is important that citizens be informed about local disease control and reforestation efforts.

If you are interested in writing a release, a good starting point is found on Appendix B-4 of the handout from the 1981 Tree Inspector Workshop entitled, "Shade Tree Public Information Ideas for Local Programs."

If you would like help writing a news release, contact Lynn Schwartz at the Shade Tree Program at 612/296-0339.

Pruning Is Advisable When Trees Are Least Susceptible To Infection

Some plants are susceptible to disease invasion if pruned at the wrong time. These plants should be pruned when they are least likely to become infected.

The majority of trees should be pruned during the winter months.

1. Oaks and elms should be pruned during November, December, January, or February to minimize the chance of oak wilt and Dutch elm disease infection. (Any summer pruning necessitated by storm damage or therapeutic pruning should be covered immediately by a wound dressing.)
2. Apples, flowering crabapples, pears, mountain ash, hawthorns, and cotoneasters should be pruned between the time they go dormant in the fall and the time growth starts in the spring. This minimizes the spread and chance of infection by a bacterial disease called fireblight.

Some trees have a free flowing sap and will "bleed" if pruned in late winter or early spring. Although this "bleeding" causes little or no harm to the plant, it may cause concern to homeowners. To prevent "bleeding", this group of plants can be pruned anytime that they are actively growing; early in the growing season is

best. The "bleeding" trees include:

1. all maples, including the boxelder;
2. honeylocusts;
3. butternuts and walnuts;
4. birch, ironwood, and blue beech.

Trees and shrubs that bloom early in the growing season on old wood should be pruned immediately after they finish blooming. Any winter injury should be eliminated as soon as possible after the plants come into leaf.

PRUNING GUIDELINES

Advise homeowners not to attempt to prune near electrical and utility wires. The utility companies should be contacted to do the work.

For most landscape effects the natural form of the plant is best, and consequently plants should not be sheared to tight geometrical forms. The form of trees and shrubs should be altered only if the plant is being confined or trained for a specific purpose.

Never leave stubs because these serve as entryways for disease organisms to invade the plant. Heading back or topping trees is not recommended because the cut stubs never completely heal. It is often better to

remove trees that have outgrown their usefulness on the space available to them.

Pruning can maintain the health and quality of established plants. Maintenance pruning on established trees is usually done every three to five years.

For more information on pruning rationale and techniques, see the University of Minnesota Extension Folder 317, "Pruning Trees and Shrubs," by Mervin Eisel. (Available at no charge by calling the U. of M. Bulletin Room at 612/373-1615.)

- Bill Phillipsen
University of Minnesota

New Forestry Newsletter Published

A new national urban forestry newsletter has been introduced by the American Forestry Association. The newsletter, entitled *National Urban and Community Forestry Forum*, is available by writing the American Forestry Association, 1319 18th Street NW, Washington, D.C. 20036.



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OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 2, Number 3

January 1982

Dutch Elm Disease Remains Stable In 1981, But Tree Planting Declines

Despite midsummer indications that Dutch elm disease would increase this year, losses to the disease remained stable in 1981.

Figures reported by 429 Minnesota communities show that 111,694 elms and oaks had to be removed in 1981 due to Dutch elm disease and oak wilt. This is nearly identical to 1980 losses when 111,256 elms and oaks had to be removed due to disease. Losses have declined each year since 1977, when the state lost 251,000 elms and oaks to disease.

While losses seem to be stabilizing, planting of replacement trees declined significantly. In 1981, 91,817 trees were planted on public property—down from 144,500 trees planted in 1980 when 144,500 trees were planted. Not only is this a decline in the total number of trees planted, but also is an indication that not all the trees that died this year were replaced.

In addition, Dutch elm disease is spreading to the few remaining areas of the state that have previously been untouched by the disease. For the first time, Red Lake County confirmed a case of Dutch elm disease. In addition, the communities of Ada, Warren, Thief River Falls, Pelican Rapids and Gary reported their first instance of the disease in 1981. While the disease incidence in the metropolitan area declined from 78,000 trees removed in 1980 to 76,688 trees removed in 1981, the disease incidence in the non-metro areas rose from 33,000 in 1980 to 35,000 in 1981.

The stabilization of disease loss is especially noteworthy this year, according to Richard Haskett, Shade Tree Program director. He noted that, "1981 was a difficult year for the communities participating in the Shade Tree Program. In past years, the Shade Tree Program reimbursed communities for 50 percent of the costs of controlling Dutch elm disease and oak wilt, as well as planting new trees. In 1981, the reimbursement rate dropped well below that rate because of state budget reductions. Nonetheless, state and local governments spent more than \$19 million

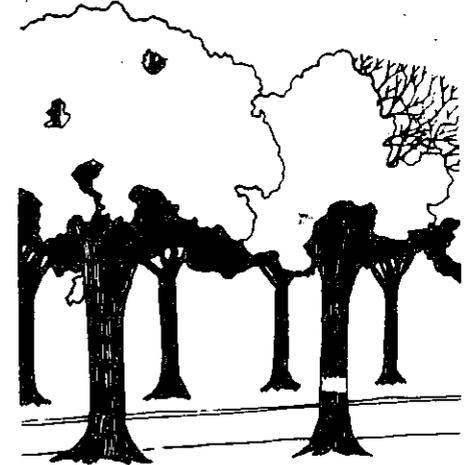
controlling Dutch elm disease and oak wilt, and on reforestation. The state's share of this cost is less than \$4 million."

"And, the uncertainty about the reimbursement rates caused by changing budget reduction estimates was very frustrating to communities trying to operate local shade tree programs," added Haskett.

"In addition," he continued, "communities had to deal with a vastly enlarged population of elm bark beetles. Two successive mild winters resulted in a near tripling of the beetle population causing an increase in disease pressure."

"I think communities can feel proud of their accomplishments in 1981," said Haskett. "It's apparent that Minnesota communities believe the trees in their communities are a valuable asset worth preserving. Ten years ago, few Minnesota communities had programs that could effectively deal with urban trees. Today, many

communities not only diagnose and control Dutch elm disease and oak wilt, but they also provide quality maintenance for boulevard and park trees, and they are planting a healthier mixture of trees for the future."



Trees Wall Off Pruning Wounds

When making a pruning cut, remember that you are creating a wound in the tree.

Trees have evolved a physiological system to deal with wounds and the fungi and bacteria that invade them. In this system, a tree does not repair or replace damaged tissue. Instead, it attempts to wall off or compartmentalize the infected area to prevent the infection from spreading to the remainder of the tree.

A model has been developed by Dr. Alex Shigo of the U.S. Forest Service to describe this process. Entitled CODIT (Compartmentalization Of Decay In Trees), this model uses the idea of four walls produced by the tree to compartmentalize invading micro-organisms. The weakest wall which Dr. Shigo labels as the #1 wall prevents spread upward or downward. The most effective wall (#4) prevents outward spread of decay into new layers of growth produced after the time the wound is inflicted.

Inward (#2) and lateral spread (#3) of decay are inhibited by walls of intermediate effectiveness.

The living hollow tree is an example of how much more effective the #4 wall is than the other three walls. Obviously, even the weaker walls are usually effective in compartmentalizing healthy trees. Otherwise, almost all our trees would be hollow and minor pruning would likely be fatal.

This brief introduction to tree wound physiology suggests a few things about pruning wounds. First, they should be limited in size so that the area the tree must wall off is as small as possible. This will increase the likelihood of successful compartmentalization. They should also allow rapid callusing over of the wound surface to promote the completion of wall #4 and limit the time period during which infec-

Continued On Page 4

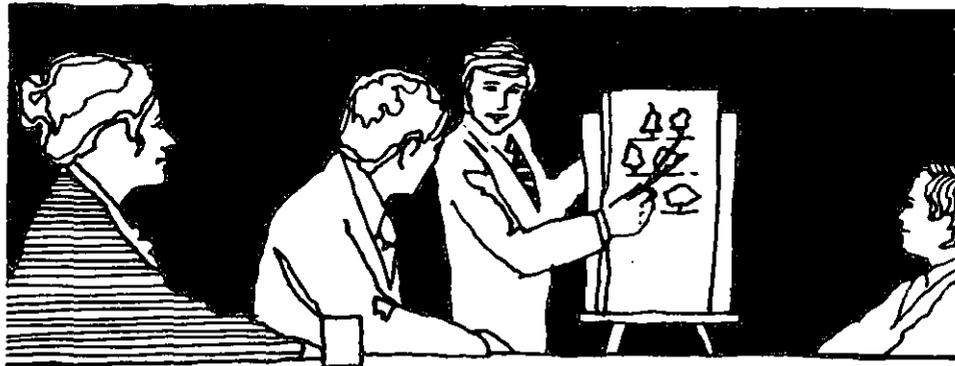
1982 Tree Inspector Workshops Promise Variety

The 1982 series of Tree Inspector Workshops promises variety. The upcoming workshops will cover topics ranging from the basics of Dutch elm disease to managing local shade tree programs with less money.

The workshops, sponsored by the Minnesota Department of Agriculture Shade Tree Program, enable tree inspectors to gain or maintain their required certification. (Minnesota law requires annual recertification of tree inspectors. Even municipalities that do not receive grants from the state Shade Tree Program are required to use only certified tree inspectors as long as they operate local programs under the authority of Minnesota Statute 18.023. The Tree Inspector Workshops are the only programs offered this year to meet this continuing education requirement.)

There are a number of incentives for communities to send a representative to one of the workshops this year. In addition to maintaining tree inspector certification, inspectors who are currently licensed pesticide applicators can renew their license (trees and ornamentals only) by attending the special chemicals session at the workshops.

This year city foresters, tree inspectors and program administrators who attend the workshops will receive the guidebook, "Community Forestry" at no additional charge. (After the workshops, a fee will be charged for the remaining notebooks.) This new notebook, published by the Shade Tree Program, outlines the components of operating a local shade tree or ur-



ban forestry program. Subjects covered include: urban forest management, tree maintenance, tree pests, chemicals, wood utilization, tree planting, community relations, Arbor Day celebrations, program administration, and highlights from successful shade tree programs operating in Minnesota communities.

The workshops will be held in eight locations throughout the state in March and April. Each workshop begins at 8 a.m. and ends at 4 p.m. Workshops are scheduled for:

March 2	Marshall, Southwest State University
March 5	Eden Prairie, South Hennepin Technical Center
March 9	Hibbing Community College
March 11	Thief River Falls, Northland Community College
March 12	Fergus Falls Community College
March 23	White Bear Lake, Lakewood Community College
March 25	Rochester Community College
April 3	St. Paul, University of Minnesota

Two separate sections will be offered at the workshops. Section A is for individuals who want to become certified tree inspectors. Section A sessions cover: Shade Tree Program introduction; Dutch elm disease; oak wilt; the law, and regulations concerning municipal shade tree disease manage-

ment; dealing with the public; tree and wood identification; and other tree problems and diseases. After attending all sessions in Section A, participants may take the Minnesota Tree Inspector Certification Examination.

Section B of the workshop is designed for people who are already certified tree inspectors. This section is for people who are city foresters, tree inspectors, community leaders, city clerks, mayors, and persons who administer local shade tree or parks programs.

An update on the state Shade Tree Program and how cities can run local forestry programs with less money will start the day for participants in Section B. Then, participants will be able to choose which sessions they wish to attend. Choices are:

Improving Community Relations	or	Upcoming Shade Tree Problems
Preparing for Arbor Month	or	Reducing Tree Mortality
Buying Contractor Services and The Legislative Process	or	Tree Inventory
Refresher Course on Dutch Elm Disease & Oak Wilt	or	Master Planning and What's New In Chemicals

Cost of the workshop is \$15 per person and covers all workshop sessions, handout materials, tests and lunch. **PRE-REGISTRATION IS REQUIRED.** Individuals who register early for Section A will receive study packets in advance of the workshop.

Registration pamphlets were mailed in January and completed forms and fees are due in February. If you have not received a registration form or have questions about the workshops, contact Lyle Mueller at the Shade Tree Program (612/296-8580).

OVERSTORY

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Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

Of Interest



Just a reminder that communities seeking reimbursement for their 1981 shade tree program expenses must turn in their RFPs no later than February 15. Communities received their RFP forms (Request For Payment) in January. RFPs must be turned in by the deadline—no extensions can be granted. Communities are also reminded that they are to submit their RFPs even if they have not received their 1981 contracts yet.

The 1982 Horticulture Industries Conference will be held February 22-24 in the Earle Brown Center, University of Minnesota, St. Paul Campus. Conference sessions are: Plant Breeding Technology in the 1980's, Growing More In Less Space With Less Work, Chemical Control of Diseases, and Best Plant Materials For Specific Uses. Workshops are also planned and these cover: Tree Insect Identification, Tree Identification, Shade Tree Disease Identification, and Tree Propagation. Other sessions discuss fruits, vegetables, turf, bedding plants and nursery production. The conference is an annual event sponsored by the Department of Horticultural Science and Landscape Architecture through the University's Office of Special Programs. Program brochures and registration materials are available by writing the Office of Special Programs, University of Minnesota, 405 Coffey Hall, 1420 Eckles Ave., St. Paul, MN 55108 or by calling 612/373-0725. Cost of the conference ranges from \$25-\$40, depending on days attended.

It's not too soon to inspect firewood stacks. There are many advantages to inspecting firewood stacks for bark-intact elmwood in January and February. One advantage is improved community relations. Early inspections give citizens plenty of time to burn any of their bark-intact elmwood before the April 1 deadline. This helps avoid hard feelings and makes the tree inspector's job easier and more pleasant. Another advantage is that less inspections will have to be made in late March. Since your early inspections will have told you which stacks contained elmwood, you will only have to return for one last check to the stacks that contained elmwood. Remember, your local ordinance requires that wood be properly disposed of by April 1.

Last fall many communities received a questionnaire asking about their plans for 1982 Arbor day or month celebrations. If you haven't returned your questionnaire, please complete it and send the form to the Shade Tree Program Office. If you did not receive a questionnaire and want help planning an Arbor day celebration or activity, call Michele Gran, Arbor Program Coordinator, at 612/296-6909. Gran reminds Arbor day planners that this month is when communities should be finalizing their Arbor day celebration details and starting work on pre-event publicity.

Urban forestry efforts in Minnesota will be represented at the upcoming national conference "Urban Trees and Forests: Pest Management Problems, Needs and Prospects," scheduled for April 19 and 20 in East Lansing, Michigan. The following papers were accepted for presentation at the conference: "A Case Study — Minnesota's Shade Tree Program," Richard Haskett, Minnesota Department of Agriculture; "Public Information Support for Local Urban Forest Pest Management Programs," Lynn Schwartz, Minnesota Department of Agriculture; "Development and Implementation of High Level Dutch Elm Disease Management Programs in Six Minnesota Communities," Meg Hanish, Minnesota Department of Natural Resources; and "Preserving Our Shade Trees — Minnesota's Experience," William Craig, Virginia Gray, and Paul Davidson Reynolds, University of Minnesota.

Cities Seek Alternative Tree Funds

As the availability of federal and state dollars dwindle, cities must find ways to provide services to citizens with less money.

Fortunately, there are options that can be used to enhance the more traditional fund raising sources of property assessments and general and special levies.

Below are some activities cities could consider to raise money for tree programs. This listing is taken from the guidebook "Community Forestry", a new 200-page notebook that will be available to tree inspectors and city foresters attending the 1982 series of Tree Inspector Workshops.

- **Voluntary contributions.** Perhaps an organization can sponsor a breakfast, raffle, bake sale, etc. to raise funds for trees that will be planted on Arbor Day or in a new city park. Businesses might be willing to coordinate a project to plant trees in an industrial park or to landscape parking lots. Neighborhood groups, clubs, scout troops or other organizations might donate labor to plant trees.

- **Surcharges.** Many communities have revenue generating operations—city owned utilities, municipal liquor stores, trash collection services—to which they might add a surcharge to help finance a municipal shade tree program.

- **Ordinances.** Your ordinance can help your city plant more trees. City councils can adopt or amend their existing ordinance to require that developers plant boulevard trees in new subdivisions or on industrial property.

- **Memorials.** The city may wish to designate a park where citizens may contribute money for commemorative tree planting. Citizens might plant a tree in memory of a friend or relative who has died, or to mark special occasions such as weddings and births.

- **Wood Products.** Debarked elm wood can be sold as firewood and woodchips sold as mulch. A city can also sell some of its better logs from diseased trees to nearby sawmills.

- **Capital Funds Bonds.** Cities can include tree removal and planting as part of any major street, utility or construction project. That way you can pay for this work through capital funds bonds.

Shade Tree Program Grants Cut

During January, the third special session of the 1981 Minnesota Legislature passed a bill that cancelled grants-in-aid to communities operating shade tree disease control programs in C.Y. 1982. The House, Senate, and Governor agreed to the reduction in the Shade Tree Program and the bill is now law.

Specifically, that reduction called for eliminating \$3,671,200 from the \$7.0 million appropriated for the 1981-83 biennium.

The plan eliminated all grants-in-aid to communities for calendar year 1982, reduced the \$4.0 million appropriated for 1981 sanitation/reforestation grants by nearly \$1.3 million, halted the awarding of experimental grants although \$82,500 remained in the appropriation and cut the administrative and public education budget by \$156,000.

A funding cut was the only shade tree item in the bill. No language changes in the shade tree statute were contained in the bill. Therefore, the Minnesota Department of Agriculture will have to continue providing the following services:

1. Adopt and amend rules relating to shade tree disease control in any municipality.
2. Establish acceptable treatments for diseased trees.
3. Determine if a local ordinance is more stringent than the adopted rules, in which case the local ordinance applies.
4. Apply the state rules to all land controlled by state agencies which is ad-

acent to or within a community disease control area.

5. Appoint tree inspectors for communities which have failed to do so.
6. Determine that tree inspectors are qualified and certify them.
7. Operate an oak wilt and Dutch elm disease diagnostic lab.
8. Cooperate with the University of Minnesota.
9. Report to the legislature.

All, communities, on the other hand, now have the option of operating or not operating a control program. If they

Pruning Wounds

Continued From Page 1

tion and reinfection take place.

With those two ideas in mind, one of the worst pruning practices is to leave a stub. This almost always introduces some decay into a tree. The stub usually dies and acts as an avenue for colonizing decay organisms. In addition, the dead stub physically prevents the callusing over of the wound and delays the formation of the stronger #4 wall.

The negative effect of leaving a stub is greater on larger branches. "Stubbing" is a problem not only with branch trimming. You might also think of a "topped" tree as a trunk with a lot of large stubs left on it. Aside from aesthetic considerations, the reason "topping" is so bad, is the same reason why leaving a branch stub is so bad. Decay is almost certain to follow. If the

tree survives topping, you will have a lot of vigorous shoots weakly attached to decaying limbs.

Too flush a cut also creates a problem. Cuts should not be so flush as to remove the branch collar. The branch collar is the swelling at the base of a branch or the area inside a line bisecting the branch angle of a living branch. Cutting into the branch collar breaks the compartmentalization around a dead branch and, in general, retards the callus formation process on all cuts. Upon healing, a proper cut will usually leave a swelling on the parent limb instead of a smooth flush surface.

Choose to conduct a program, the law remains unchanged and they may do so only after submitting the program to the Commissioner of Agriculture for his approval. The program must be at least as stringent as the adopted rules. By operating within such an approved plan, communities qualify for authority to levy taxes to support their program. In addition, they qualify for special levy and special assessment authorities.

Call the shade Tree Division at 296-8580 for our most current information.

—Richard Haskett
Shade Tree Program

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—Doug Rau
Minnesota Department of Natural Resources

OVERSTORY

Minnesota's Urban Forestry Newsletter

c/o Shade Tree Program
Minnesota Department of Agriculture
90 West Plato Blvd.
St. Paul, MN 55107

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OVERSTORY

Minnesota's Urban Forestry Newsletter

Volume 2, Number 4

March 1982

By April 1 - Inspect Firewood Stacks And Remove Diseased Elms And Oaks

When snow is still on the ground the last thing tree inspectors want to think about is inspections. However, the Shade Tree Program Rules and Regulations require that you must have *completed* your firewood inspections by April 1. Completed, not started!

The April deadline is not an arbitrary date picked by a bureaucrat. There are some very good biological reasons for this date.

There are three things that inspectors must complete by April 1. First, all tree inspectors must check for bark-intact elmwood logs or stumps. Any found during an inspection must be rendered pest-risk free or disposed of by the April 1 deadline. This is necessary because native elm bark beetles begin emerging from logs, trees and stumps in late March or early April. If inspectors wait until April 1 to begin their inspections, this emergence will occur and an opportunity to reduce the beetle population will be missed. If the beetles emerge from infected wood, they will certainly be carrying the Dutch elm disease fungus to healthy trees.

Second, all diseased elm trees detected and/or marked from last season must be removed by April 1. Many of these trees will have beetle larvae developing under the bark. Unless the trees are removed by April 1, most, if not all, of the larvae will develop into beetles and emerge. There is no doubt that each of these beetles will be carrying the disease fungus. As they feed, they will transfer the disease to healthy trees. Removal and disposal of all bark-intact elmwood and all diseased trees by

April 1 will greatly reduce the "normal" spring explosion of disease.

Third, any red oak tree that died of oak wilt the previous year must be removed and properly disposed of (including stumps) by April 1. This provision in the Rules and Regulations is very important because infected red oaks will very likely produce spore mats under the bark this spring. These mats attract sap-feeding beetles which pick up the fungus spores on their bodies and carry them to healthy trees.

What you do now can have a very definite effect on your disease control program this year. Also, by starting your inspections early, you give people who have bark-intact elmwood, diseased elms or red oaks sufficient time to dispose of the wood. You can make your firewood inspections easier by using the sample notice for homeowners found in the Community Forestry notebook being distributed at the Tree Inspector Workshops.

— Greg Ustruck
Shade Tree Program



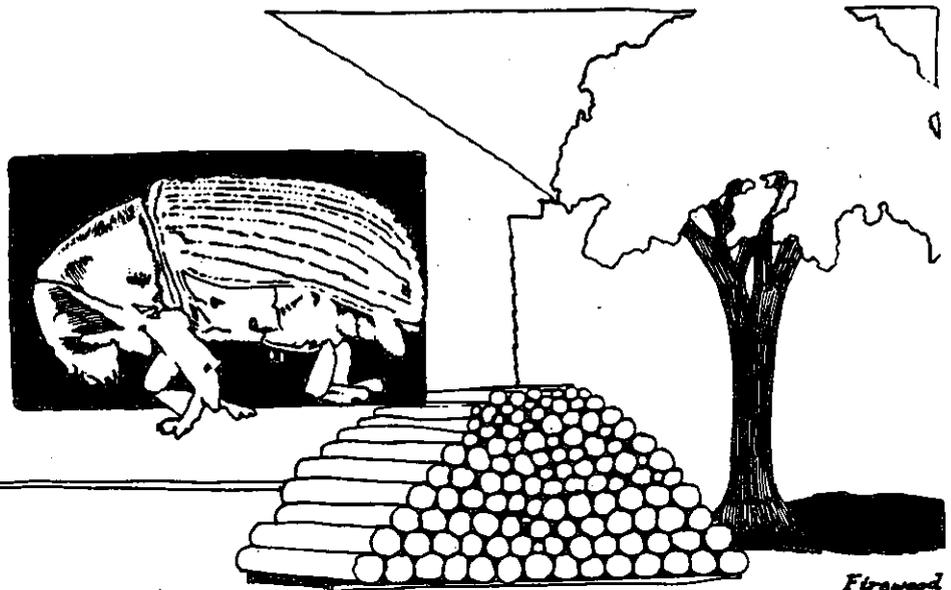
23 Cities Designated "Tree City"

Twenty-three Minnesota cities were recently designated recipients of 1981 Tree City U.S.A. awards by the National Arbor Day Foundation.

The award recognizes cities that have active tree programs and a demonstrated willingness to promote trees in their town.

The cities honored again this year are Austin, Cloquet, Coon Rapids, Fergus Falls, Granite Falls, Hopkins, Hutchinson, Kasson, Litchfield, Little Falls, Minneapolis, Robbinsdale, Rochester, St. Cloud, St. Louis Park and Winona.

Cities receiving the award for the first time are Anoka, Brainerd, Duluth, Eden Prairie, Oak Park Heights, St. Paul and White Bear Lake. Congratulations to these towns for their outstanding tree programs and this national recognition.





Street Tree Inventory Provides Needed Data

The goal of an urban or community forestry program in any city is proper management of tree resources. However, before a management program can be developed and initiated, basic information about the resource has to be collected and quantified.

Designing, completing, and maintaining a street tree inventory is not an easy task. Before beginning an inventory, a city needs to ask whether an inventory is really necessary. Numerous questions regarding inventory systems immediately arise.

- Should specific trees be identified?
- What data should be collected for each tree?
- If work is needed on any tree at the time of the inventory, how should that be noted?
- If work is done after the inventory has been completed, how can the data be updated?
- Who will conduct the inventory? How much will it cost? How long will it take? Should it be computerized? How accurate will it be? How long will it stay accurate?
- Can you tie your inventory system into those of other city government agencies? For example, the City Engineer's Office.

The amount of information desired, method of collection, and the degree the information is used will vary from city to city.

Generally, the initial impetus for an inventory centers around the need to:

- 1) Determine the extent and nature of the resource that is to be managed and perhaps its value. This information is useful not only for the application of various management techniques, but also to convince both citizens and city officials that a tree resource exists and needs to be managed on a systematic basis.
- 2) Determine what types of problems exist.
- 3) Develop sound data upon which budgets can be developed.
- 4) Develop information about vacant tree spaces.
- 5) Know about potential energy or wood product uses of the resource.

Obviously, if you decide an inventory is needed you must also decide who should conduct it. In larger communities with good funding support and a professional staff this is not a problem because the expertise exists to either directly implement it or to conduct a training program for selected staff. Very often actual inventories are accomplished by hiring third or fourth year forestry or horticulture students for the summer. In communities, where staff and budget are limited you can get help from the Minnesota Department of Natural Resources (612/296-8609) or the Min-

Continued On Page 4

Boulevard Inventory Is Quick Alternative

A total tree inventory is a useful tool for helping you manage your city's trees. An inventory can help you assess tree planting and maintenance needs.

Unfortunately, inventories frequently don't get done because they are time-consuming and therefore expensive. In the meantime, no effective planning is accomplished. Because there is no plan, many tall trees are planted under powerlines, large growing species get planted in narrow boulevards, and so on.

If you cannot do a complete inventory, a quick way to assess your planting needs is to do a "boulevard inventory."

When doing a boulevard inventory, you inventory and classify entire blocks (i.e., the south side of Lake Avenue), but not individual trees or tree spaces.

Boulevards are classified by the size of tree that will "fit" on them. Two important factors to consider when classifying sites are the presence of utilities above or below ground and the width of the boulevard. Any number of additional factors such as building set-back, aesthetics, traffic volume, or even solar access can also be considered, but it is usually best to keep it simple.

With your classification criteria in mind, you can assign size class limits while systematically driving around town. It is easiest to do the classification directly on a city street map using color pencils as a code. By this method, a small city can be inventoried in less than a day. Once you have inventoried and classified your city in this manner, you have a general planting plan for all city streets.

To complete the plan, put together a list of recommended tree species to go with each size classification. This planting guide can be used by city departments; or if included in an ordinance, it can be used to direct all plantings, both public and private, on city boulevards.

A boulevard inventory will not provide the same information or allow for the same thorough planning as a complete tree inventory. However, it is a quick way to get some planning done that will benefit your city for decades.

— Doug Rau
Minnesota Department
of Natural Resources

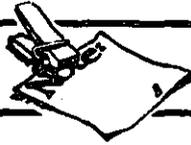


OVERSTORY
Minnesota's Urban Forestry Newsletter

Published jointly by the Shade Tree Program, Minnesota Department of Agriculture; Division of Forestry, Minnesota Department of Natural Resources; and the Agricultural Extension Service, University of Minnesota.

Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

Of Interest



Arbor Day, which is always the last Friday in April, is on April 30 this year. And all of May is Arbor Month. What are you doing to celebrate?

April is a good time to spray your community's elm trees with Dursban to control overwintering adult native elm bark beetles. If Dursban is applied to tree bases in April, it will kill the beetles as they emerge from trees. In addition, the chemical will remain active for about two years, so it is not necessary to reapply it in September. If you did not spray all the elms in the control area last fall, you can finish the job this spring. If you have questions call the Shade Tree Program at 612/296-8580 or the University of Minnesota at 612/373-1038 for more information.

Effective May 27, 1982 the Minnesota Special Local Needs label for Arbotect 20-S will expire. However, the manufacturer of Arbotect has applied for, and may well receive, federal EPA registration at the triple rate allowed under the current special Minnesota label. Latest information is being passed along at the Tree Inspector Workshops.

A Second National Urban Forestry Conference is scheduled for October 10 to 14 in Cincinnati. It is sponsored by the American Forestry Association, the U.S. Department of Agriculture Forest Service, the U.S. Department of Agriculture Extension Service and the Ohio Forestry Association. Four full days of discussion, workshops, special events, exhibits and tours are planned. For more information write to Richard Pardo, the American Forestry Assn., 1319 18th St. N.W., Washington, D.C. 20036 or call 202/467-5810.

It's not too late to print a year's supply of informational materials you can give to homeowners while inspecting firewood, checking for Dutch elm disease, or after planting a new boulevard tree. See the Community Relations Appendix of the new notebook, "Community Forestry", for details. The notebook is being distributed free of a charge at the Tree Inspector Workshops.

Don't miss the opportunity to attend one of the Tree Inspector Workshops. Conference topics include: conducting forestry programs with less money, upcoming tree problems, reducing tree mortality, master planting plans, Arbor Month and more. And, participants will receive free of charge a new 200 page notebook, "Community Forestry". Contact Lyle Mueller at 612/296-8580 for more information.

Minneapolis Forestry Division Wins Award

"Through very innovative advertising and public relation ideas, you have brought to light what the individual citizen can do to help care for Minneapolis' Trees".

With these words the National Arbor Day Foundation proclaimed the Minneapolis Park and Recreation Board Forestry Division winner of the 1981 "Corporations and Institutions" advertising award.

This award is presented annually by the Foundation to the organization most successfully communicating the story of trees to the general public. In 1981, Minneapolis did just that with a comprehensive and far-reaching public information campaign designed to re-ignite media interest and community concern for a "City of Trees".

The need for arousing renewed public interest had, by this time, become all too evident. On the one hand, losses to Dutch elm disease had been stabilized, posing the age old problem of public apathy. On the other hand, trees were still being planted in record numbers throughout the city.

This "double whammy" presented the Park Board Forestry Division with a formidable communication task. In order to accomplish this task within budget constraints, the Park Board's strategy used existing art materials and other program resources.

For example, "Adopt-A-Tree", a program which for some time had been firmly planted in the minds and hearts of citizens, was given added dimension during 1981 with guest appearances by "Elmer, the Elm Tree" in the city's public schools. Special events, including a memorial planting to commemorate the city's reforestation effort, were carried out during the year and received wide-spread acceptance.

In addition, there were news releases, television and radio appearances and many other activities which all contributed to a successful public information program.

Whether bank displays, buttons, billboards, brochures, or tee-shirts, these endeavors have become an integral part of the Minneapolis Park and Recreation Board's Forestry Program.

— Jim Hermann
Minneapolis Park and Recreation Board

Use Volunteers For Arbor Ceremony

One out of every two Minnesota adults is a volunteer. Senior citizen and civic groups make up the bulk of these organizations.

Obviously, valuable free help is available to anyone thinking about organizing a community project. So why not consider volunteers when planning your Arbor Month program? Don't overlook the resources in your community.

However, don't assume that people will simply come forth. It could be that they are unaware of your plans or don't know how they can participate. It's essential that you make the first contact. This can be done through a phone call, letter, or a radio or newspaper public service announcement. In this way, you can let people know that their help is needed, as well as outline the specific activities they can volunteer for.

For instance, you could ask a high school art class to make fliers and posters to publicize your Arbor celebration. A senior citizens group could sew a banner or conduct a bake sale to raise funds. An FFA or Jaycees group could sell T-shirts. A scout troupe could solicit contributions door-to-door. Perhaps a women's group

would hold a benefit garage sale. Or your County Extension Agent, DNR Forester, or local nursery or garden store owner could offer a free tree planting and care seminar.

Elected officials and other community leaders make excellent organizers and spokespersons for your program. It is likely that they belong to business associations that may provide financial support and word-of-mouth publicity. Perhaps one civic group would like to take on the Arbor celebration as a chapter project. Consider appointing one of these leaders honorary chairperson of your committee. Several new volunteers may result.

And don't forget the "personpower" required on the day of the Arbor ceremony. You will need people to dig the holes; plant, mulch, stake and water the trees; distribute programs; greet participants; provide refreshments; and help with details.

All this adds up to quite a bit of work for a small committee. Don't try to do it all yourselves. Arrange to use your human resources to their greatest potential. Find out what various people's specialties are.

Then ask them to volunteer for your committee. Don't leave any possibility unexplored.

And remember, when it is all over, thank your committee and all your volunteers personally, either by letter or a phone call. This way, you maintain contacts and assure yourself eager and experienced volunteer help with your next project.

— Michele Gran
Shade Tree Program

Inventory

Continued From Page 2

Minnesota Department of Agriculture (612/296-8580).

For more information, refer to "A Guide to Urban Tree Inventory Systems" by Christopher J. Sacksteder and Henry D. Gerhold, 1979, School of Forest Resources Research Paper No. 43, Pennsylvania State University, University Park, Pennsylvania.

— Pat Weicherding
University of Minnesota



c/o Shade Tree Program
Minnesota Department of Agriculture
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St. Paul, MN 55107

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OVERSTORY

Minnesota's Urban Forestry Newsletter



Volume 2, Number 5

May 1982

State Shade Tree Program Eliminated

The Minnesota Shade Tree Program has been eliminated.

In the final hours of the 1982 legislative session, members voted to eliminate the Shade Tree Program in response to the state's budget situation.

No later than July 1, 1982, the office will close. At that point, there will be no grants for communities to help them control

Dutch elm disease or oak wilt, or plant new trees. There will also be no Shade Tree Program staff in the Minnesota Department of Agriculture to answer questions, monitor compliance with state law (which remains on the books), or certify tree inspectors.

In other words, cities must now pick up all the costs of controlling Dutch elm disease and oak wilt, as well as reforestation.

Shade Tree Program Director Richard Haskett reminds cities that they are not without resources. "Remember, Minnesota Statute 18.023 remains on the books. This allows cities to levy taxes to support their local shade tree program. It also qualifies communities for special levy and special assessment authority."

Inspectors attending the 1982 series of tree inspector workshops received a notebook, "Community Forestry". Haskett reminds inspectors to "use this resource". The notebook lists applicable laws, offers guidelines for running a local shade tree program, lists sources of information and help, and has nearly ready-to-use public information materials.

In addition, Haskett urges city foresters and tree inspectors to rely on each others' expertise. "Contact each other for help," said Haskett. In addition, he urges that city foresters use the continuing services of the Minnesota Department of Natural Resources and the University of Minnesota's Agricultural Extension Service. More information about these services appears on this page.

Urban Forestry Help Available Through U of M and DNR

Although the Shade Tree Program has been eliminated, the Shade Tree Laboratory run by the division of Plant Industry in the Minnesota Department of Agriculture will continue to operate. City foresters and tree inspectors can use this free testing service for laboratory confirmation of Dutch elm disease and oak wilt. (See the "Of Interest" column on page 3 for details.)

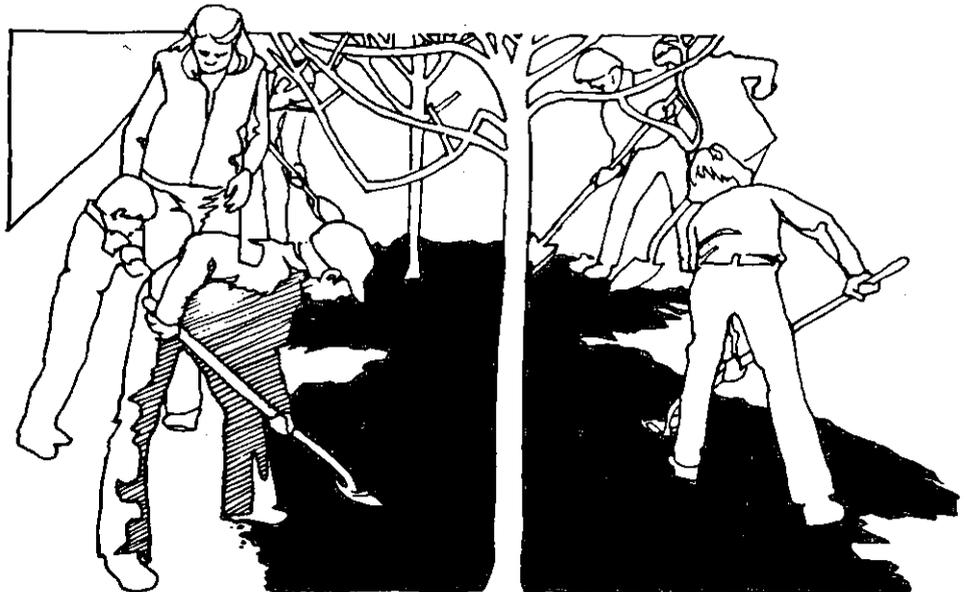
Help is also available to communities from the University of Minnesota and the Minnesota Department of Natural Resources.

The University of Minnesota's Agricultural Extension Service will continue to advise homeowners and community personnel about shade trees, Dutch elm disease, and urban forestry. Community foresters are urged to contact the following individuals for advice:

The Minnesota Department of Natural Resources (DNR) can also provide city foresters and tree inspectors with technical assistance through its network of district foresters. For help, start with one of the six regional DNR offices. These offices have

Continued On Page 2

Name	Telephone
Jane McKinnon, Horticulture	(612) 373-1759
Lewis Hendricks, Forest Products	(612) 373-1211
Mark Ascerno, Entomology	(612) 373-1059
William Phillipsen, Entomology	(612) 373-1038
David French, Plant Pathology	(612) 373-0852
Fred Baker, Plant Pathology	(612) 373-0937
Pat Weicherding, Forestry	(612) 373-0720
Harlan Peterson, Forest Products	(612) 373-2393



May Is Arbor Month!

Cities Receive Reimbursement Payments

Reimbursement rates for Calendar Year 1981 are 12.5 percent for the seven county metropolitan area communities and 16.35 percent for non-metro communities. By the time you receive this issue of *Overstory*, you should have received your 1981 reimbursement payment. All checks were mailed out the last week in April.

State budget deficits took a heavy toll on the Shade Tree Program throughout 1981; and finally in March, 1982, the Legislature eliminated all remaining funds.

To review briefly, prior to the 1981 legislative session, the Shade Tree Program requested budgets from participating communities, as in past years. Without knowing how much the Legislature would appropriate, we asked communities to estimate their expenses based on the previous year's reimbursement of 50 percent.

However, the Legislature then appropriated only one-third of the amount proposed—\$7 million for 1981-82. Sanitation/reforestation grants for 1981 and 1982 were to be \$4 million and \$2,133,400, respectively. Since the appropriation was well below amounts of past years, communities were then asked to revise their budgets based on a more realistic 25 percent reimbursement rate. Instead of reducing local budgets as expected, many communities raised them. This

made 25 percent reimbursement impossible. As these applications were being returned, the Legislature once again cancelled \$1,375,340 from the 1981 sanitation/reforestation grant budget and the entire \$2,133,400 allotted for 1982.

The Shade Tree Program was left with a total of \$2,624,600 in grant money for 1981 only. By this time, to ensure maximum payment with minimal paperwork, the final reimbursement rate was based on total 1981 eligible expenditures as reported on all municipalities' Request(s) for Payment. In short, that's how the reimbursement rate was calculated and how it dropped to present levels.

All sanitation/reforestation grant

money for 1981 has been used for reimbursement to participating communities.

Metro and non-metro reimbursement rates are not the same because state law requires that no more than 67 percent of the annual appropriation be allocated for the seven county metro area and the remaining 33 percent for the remainder of the state. Despite the higher metro amount, metro area expenses are considerably higher due to more concentrated populations of elms and a large number of participating municipalities. As a result, metro area reimbursement rates for 1981 are lower than non-metro rates.

— Dwight Robinson
Shade Tree Program

Dear Colleagues,

Most of you know that the Legislature voted to eliminate the Shade Tree Program. This is difficult to accept. Difficult for those who are losing their jobs, for those who have come to depend upon the Shade Tree Program for assistance, and for those of you just beginning to deal with shade tree problems. Nonetheless, we must carry on without a sense of failure.

In some respects, the elimination of the Shade Tree Program is a sign of success. Minnesota communities have reduced their annual losses to Dutch elm disease and oak wilt from 250,000 trees in 1977 when the state program began to operate, to 111,000 trees in 1981, the last full year when the program will operate.

We view this with a sense of accomplishment and pride. We're satisfied that the program has helped you cut the disease rate in half, bought time to help cities reforest, saved cities from staggering tree removal costs, increased Minnesotans' awareness of the value of trees and the fragile nature of the urban forest, and created local programs that can now care for a \$5 billion resource—urban trees.

We are proud of what the state has done. We're also proud of what the people in each community have done to ensure healthy community forests for years to come. You, your colleagues, and your neighbors have developed, carried out, and will now carry on some of the best shade tree programs in the nation.

We hope that the problem-solving session offered at the 1982 series of Tree Inspector Workshops demonstrated the tremendous resource that you are to each other. You, as city foresters and tree inspectors, are the experts. You should continue to call on each other for advice and assistance. While the state Shade Tree Program staff will not be here, you and your colleagues will. Talk to one another. We cannot afford to squander the wealth of experience and knowledge that you possess.

Lastly, we want to tell you what a pleasure it has been to work with you. The friendships and respect that have developed over the years will not end, nor will the concerns we have come to share.

Sincerely,

Kris Caulfield
Amador Frances
Michele Gran
Richard Haskett
Tom Maier
Lyle Mueller
Dwight Robinson
Shari Schroeder
Lynn Schwartz
Greg Ustruck

Forestry Help

Continued From Page 1

foresters and a pest control specialist on staff.

Name	Telephone
Region One, Bemidji	(218) 755-2891
Region Two, Grand Rapids	(218) 327-1718
Region Three, Brainerd	(218) 828-2616
Region Four, New Ulm	(507) 354-2196
Region Five, Rochester	(507) 285-7420
Region Six, Metropolitan Area	(612) 296-8609

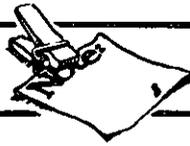
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Address inquiries to Lynn Schwartz, editor, Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Blvd., St. Paul, MN 55107. Telephone: 612/296-0339.

Of Interest



Do you need to hire a tree inspector? If so, be sure to list your job opening with the Job Service. This is a statewide employment listing service with regional offices throughout Minnesota. There is no charge for employers to place a listing with the Job Service. To list a job opening, send a brief job description to your local Job Service office. Be sure to include the requirements for holding the position, the salary, work location, duration of the position if temporary or seasonal, and a contact person. To find out if there is a Job Service office in your community, look in the phone book under "Minnesota State Offices". The listing will then appear under "Economic Security-Job Service Office". If you have any questions call the Job Service office in St. Paul at (612) 296-8400. Individuals looking for tree inspector jobs should also contact the nearest Job Service office.

Free laboratory testing for Dutch elm disease and oak wilt is still available through the Minnesota Department of Agriculture. Just send samples to the Shade Tree Laboratory, Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, MN 55107. In order to maximize the accuracy of testing, samples should be taken from an actively wilting or recently wilted branch. Remove four or five sections that are one-quarter to one-half inch in diameter and six inches long. Avoid sampling dead or bare branches. These will be too dry to culture successfully or determine the cause of casualty. Laboratory samples should be placed in a plastic bag and secured with a rubber band. If samples are to be submitted for more than one tree, be sure to identify each separate sample in the package. Mail samples the same day that they are collected and enclose a piece of paper stating your name, address, and telephone number. Laboratory analysis takes about seven days for elm trees and up to two weeks for oaks. The lab will accept samples from now through September 30th. For more information call Mark Schreiber at (612) 296-8388.

Nearly 700 people attended the 1982 series of Tree Inspector Workshops throughout March and April. The workshops were sponsored by the Shade Tree Program, with assistance from the University of Minnesota, and enabled Minnesota tree inspectors to gain or maintain their required certification. **Tree inspector identification cards have been mailed.** If you have not received your identification card or have any questions about your certification, call Lyle Mueller at (612) 296-8580 as soon as possible.

The Minnesota Department of Agriculture may be recommending **changes in shade tree legislation** to the 1983 Minnesota Legislature. If you have a change you would like to see made in the law, write to the Commissioner's Office of the Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, MN 55107 or (612) 296-9310. Your suggestion must be received before July 1, 1982.

For sale: Two complete tree injection units. 15 gallon fiberglass tanks, hoses, tees, and hand pumps are available by contacting Jim Crawford, Golf Course Road, Mountain Lake, MN 56159 or (507) 427-2539 or 427-3478.

Since the Shade Tree Program has been eliminated, **this will be the final issue of Overstory.** The Community Forestry notebook you received at the Tree Inspector Workshop lists other urban forestry publications you may wish to subscribe to (see Section 1 Appendix, page 2). It's been a pleasure serving you.

Debarker Nears Completion

Energy shortages and rising fuel prices are creating a renewed interest in firewood use.

Although Dutch elm disease has increased the supply of available wood, current disease control measures prohibit the storage of bark-intact elm wood.

Unfortunately, elm wood is not easily debarked. Few communities can afford debarking machines that cost \$80,000. Clearly, the need for a less expensive debarker exists.

Through a grant from the Shade Tree Program, the City of Minnetrista is developing a small, portable, yet inexpensive debarker. The prototype unit is to be completed by June 30, 1982. It is intended for on-site processing of diseased elms into firewood lengths for homeowner use.

The debarker will be legally transportable on city or state roads. At approximately 14 feet long and 8 feet wide, a three-quarter ton truck can easily pull it. The unit will be equipped with a boom to pick up firewood length logs and set them on debarking drums. The machine will debark logs up to 32 inches in length and 6 to 32 inches in diameter. The boom will then transfer the debarked log sections to a splitter located at the rear of the unit. The splitter head is innovatively designed to split logs into two or four pieces. A 56-horsepower industrial engine powers the unit. It carries a 20 gallon fuel tank and a 30 gallon hydraulic fluid tank. Operating speed is yet to be determined, but design objectives call for at least three 16 inch long by 16 inch diameter logs to be processed in one minute.

The unit will be ready for shake down testing in early June. Any necessary revisions or adjustments will be completed by June 30, 1982. Total production costs have not been determined, but will be under \$22,000. All machinery and parts were purchased in the Twin Cities metropolitan area. If arrangements can be made, the machine will be demonstrated at the Minnesota Society of Arboriculture's autumn meeting.

The Shade Tree Program will offer detailed construction drawings and specifications of the entire system enabling communities to build their own. For more information, contact the Shade Tree Program at (612) 296-8580.

— Kris Caulfield
Shade Tree Program

What's Ahead For Minnesota's Elms?

What will happen to Minnesota's remaining 10,417,106 urban elm trees now that the Shade Tree Program has been abolished?

The concern is well founded. Municipalities which have worked diligently since 1977 (or before) to control Dutch elm disease certainly don't want their remaining elms to die quickly due to a resurgent epidemic of Dutch elm disease.

The incidence of Dutch elm disease is dependent on the interaction of five elements:

1. Environment.
2. The fungus.
3. Elm bark beetles.
4. The elm population.
5. Community control activities.

We have no control over the environment. Mild winters tend to increase beetle survival, and harsh winters tend to decrease beetle numbers. We also have little control over the disease fungus. Its virulence and life cycle are well established in Minnesota. There is no totally effective fungicide that can stop Dutch elm disease. Nor do we have much control over the elm population, the disease's host. The number of elms in each community is set.

However, we can control the quality of the host by pruning out deadwood and keeping other elms growing as vigorously as possible. This will reduce beetle brood wood.

Fortunately, the most important element, peoples' activities, can be controlled. Communities face important decisions. Cities must decide whether to drop disease control programs or continue operating these programs.

Although municipal and state budget cutbacks make program expansion unlikely, the consequences of dropping control programs make that choice extremely unwise. We have learned from other states what happens when Dutch elm disease control programs are no longer enforced or eliminated. The infamous figures from Syracuse, New York, also are comparable for Ames, Iowa; Detroit, Michigan; and a score of Illinois communities.

In the greater Chicago area from 1957 through 1966, for example, five municipalities without disease control programs lost 80 to 94 percent of their elms. In the same area, 28 municipalities with comprehensive programs lost only 5 to 15 percent of their elms (Dan Neely, Plant Disease Reporter, Volume 51, No. 6).

Any community not operating a strict sanitation program should expect to lose 80 to 95 percent of its total elm population within 10 years. For Minnesota, that would be devastating.

Applying these statistics to Minnesota communities creates a gloomy forecast. The 1977 initial base inventory of 11,199,418 elms has been reduced by 782,312 diseased trees. This leaves Minnesota with 10,417,106 elms in municipal control areas. A low estimate of just an 80 percent loss within 10 years, means that 8,333,684 trees would die by 1992. The Shade Tree Program's 1981 year-end report data show that the average statewide removal cost per tree is \$134.18. Multiplying removal costs by the number of trees means Minnesota could face a \$1,118,213,179 bill for removing diseased

elms if all control programs were discontinued. This cost divided equally over the 10-year span sets each year's removal cost at \$111,821,371 or 7-1/2 times what statewide tree removal cost was in 1981. Disease loss will not occur at an even rate throughout the years, however, but instead in an uneven bell-shaped curve.

With no control, as many as 20 percent of the remaining elms may be lost in peak years. That translates into a removal cost of \$279,553,456 in one year or 19 times the 1981 statewide cost. Replanting just half of the number of trees lost within 10 years at the average 1981 price of \$47.81 would cost almost \$250 million dollars.

How many communities can afford that? Clearly, though not inexpensive, current Dutch elm disease control programs are effective. These programs spread out removal costs and allow new trees to become established before all the elms are gone.

Fortunately, the outlook for Minnesota is not all that bleak.

In December, 1981, the Shade Tree Program office received 418 Notices of Intent to operate local shade tree programs in 1982. Despite later budget cutbacks, many communities are still operating disease control programs. If communities faithfully continue their control programs over the years and get help from more cold winters, Minnesota elms can avoid becoming an unpleasant statistic.

— Kris Caulfield
Shade Tree Program



c/o Shade Tree Program
Minnesota Department of Agriculture
90 West Plato Blvd.
St. Paul, MN 55107

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APPENDIX K: SHADE PROGRAM HUMOR
(A Partial Compendium)



LADY, IT WAS NECESSARY TO DESTROY THIS BLOCK OF ELMS IN ORDER TO SAVE IT'

82.1
7-16-27
slu



Guindon

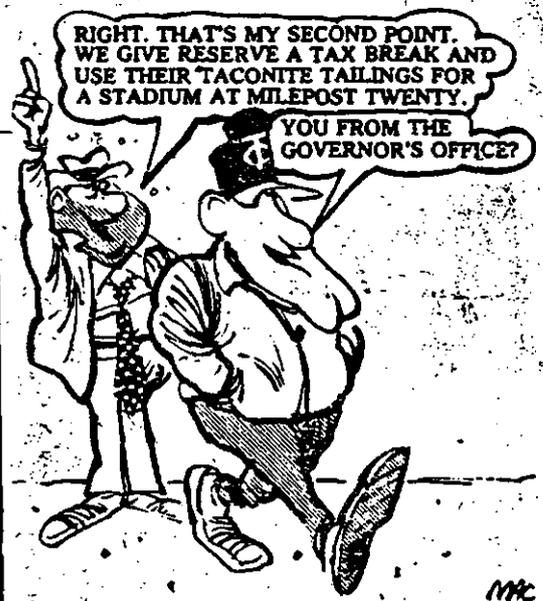
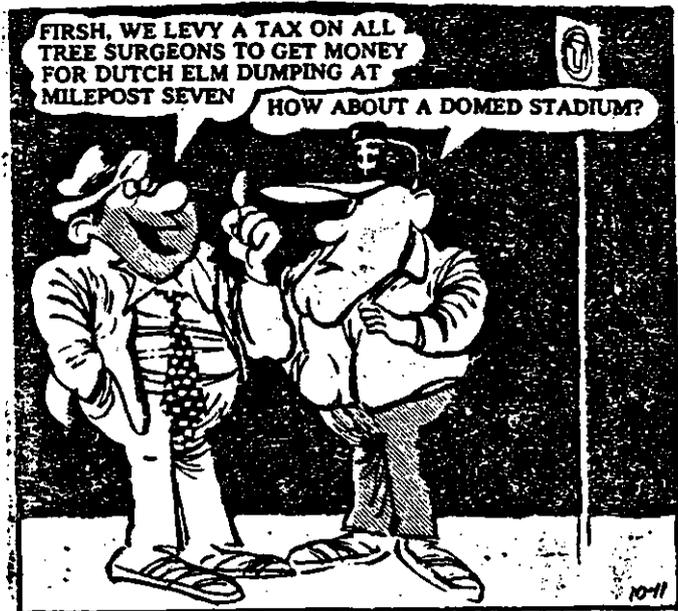


"Two blocks down and take a left. You can't miss it. It's the street with the tree on it."

'A new antibiotic! Pass the word'



GUNNAR



NYC

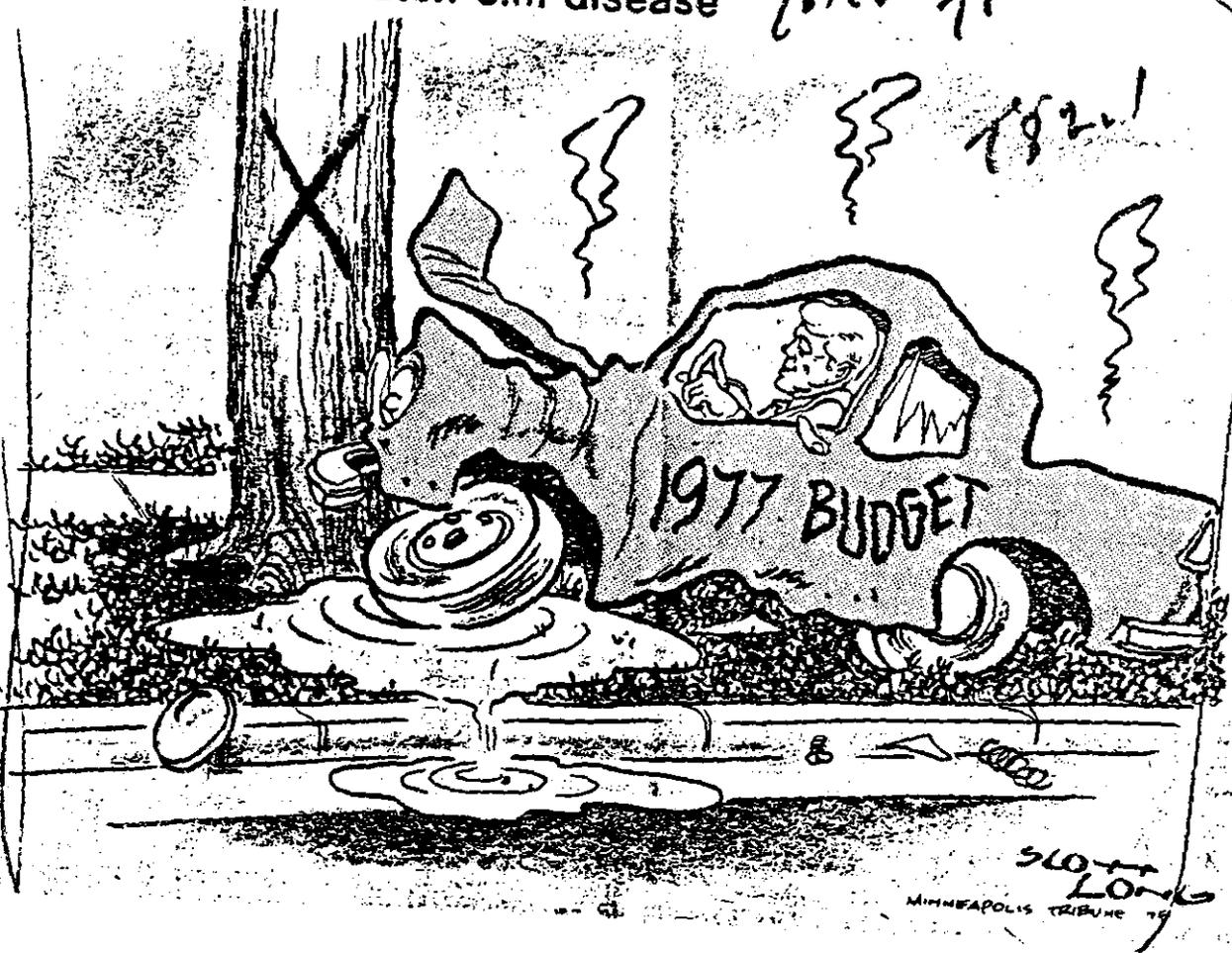
'RELAX, WE'RE JUST MARKING INADEQUATE RESPONSES TO DUTCH ELM DISEASE'





Stenvig fights Dutch elm disease

10/1/72



MINNEAPOLIS TRIBUNE

Guindon



Guindon
Minneapolis Tribune

"When does Fall begin and Dutch Elm end?"

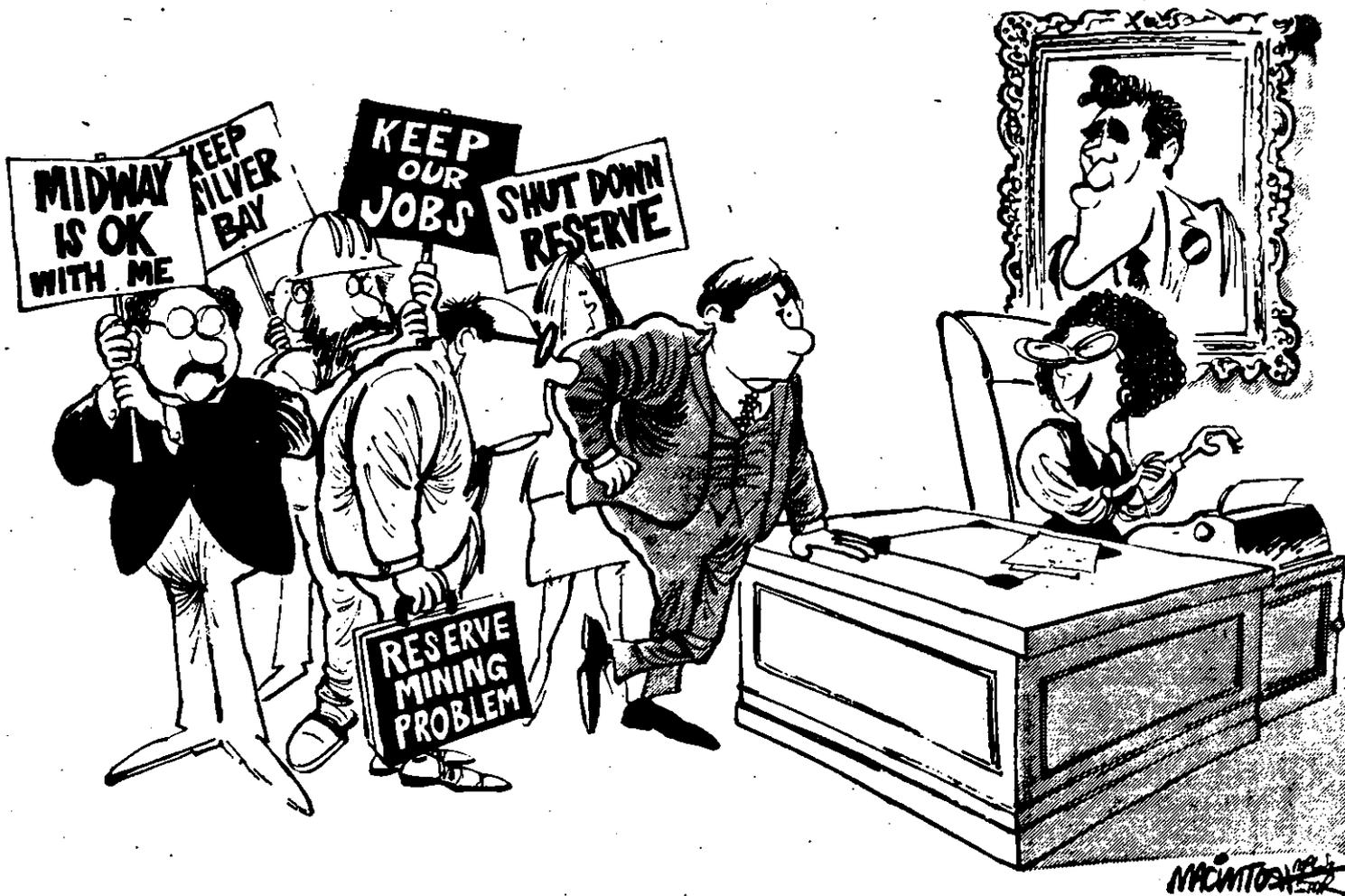


**'I HAVE BEEN ADVISED THAT WHILE WE HAVE BEEN TALKING
OUR CONFERENCE TABLE HAS CONTRACTED DUTCH ELM DISEASE'**



SHADE TREE PROGRAM HUMOR

**'I'M SORRY, THE GOVERNOR IS OUT ATTACKING DISEASED ELM TREES
—HOWEVER, IF YOU'D CARE TO LEAVE YOUR NAMES ...'**



SB 436 .H57 1982

History of the Minnesota
Shade Tree Program

SB 436 .H57 1982

History of the Minnesota
Shade Tree Program

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