MINNESOTA DEPARTMENT OF AGRICULTURE
PLANT PROTECTION

Plant Protection Annual Report
Calendar Year 2008

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Plant Protection Division

OVERVIEW

Geir Friisoe, Division Director

Plant Protection Division (PPD) regulates seed, noxious weeds, nursery stock and invasive/exotic pests. Division staff also provide inspection and certification services for fruit and vegetables, apiaries and agricultural products for export. In addition, PPD is responsible for survey, monitoring and eradication of new plant pests. This ensures that we promote and encourage global trade and at the same time protect our agricultural crops and our highly valued natural environment from unwanted exotic or invasive plant pests that are often an unwelcome byproduct of human global movement. Concurrently, importers or consumers of Minnesota agricultural products and commodities demand assurance or official certification that Minnesota products meet certain prescribed standards and requirements.

These activities have defined much of what the Minnesota Department of Agriculture (MDA) has as involvement in the front lines of commercial agriculture in Minnesota. PPD's programs are the result of legislative efforts to address market and supply chain needs as well as environmental monitoring and protection to ensure agricultural producers have access to reliable seed sources, both domestic and world markets, definition of market value and assessments of environmental threats. PPD activities also support urban forest health, farmland and roadway freedom from noxious weeds.

The existing programs in PPD are efficiently organized into unit structures designed to bring expertise to specific activities. Thus, managers, entomologists, botanists and surveyors all have their efforts dedicated to the current needs of their programs. PPD management has looked to these experts for expansion of dialogue and expertise across the spectrum of threats and current needs. The cross utilization of staff has begun with the development of a common position description which has broad application to most of the programs. Division-wide meetings to facilitate special training and certification have been initiated to prepare for the many negative potentials and to address seasonal demands.

Program direction for the future should include:

- Additional cross training and harmonization of position responsibility levels.
- Utilization of GPS technology across all units to better define documentation needs.
- Development of the existing PPD lab to support entomologic and plant pathology investigations.
- Branding of division activities to add value to Minnesota agricultural output, i.e. identity preserved, kind and variety identification, quality audits and good handling practices identified and tracked.
- Integration of activities within the Department, i.e. outreach, branding, and reaction to plant pest emergencies.

Past efforts for control of invasive species have included partnership with local, tribal, state and federal partners. These arrangements have included in-kind use of personnel and equipment, grants and outreach. This collaborative approach assists in the national strategy for invasive species management as well as the best use of all available expertise in resolution of state programs. The integration of the APHIS Slow the Spread (STS) partnership has proven to be an effective use of state and federal resources to track, regulate and treat gypsy moth outbreaks in the state. This effort is meant to limit the establishment of viable breeding populations of gypsy moth along the advancing edge of this spreading pest and can be demonstrated as having done so.

Nursery inspections assist in the identification of invasive and endemic pests which threaten that industry in the state. An industry advisory panel contributes meaningfully to the inspection process by defining weaknesses and needs of the industry and offers an open forum to discuss the regulatory process. This partnership ensures a transparent and universally applied program is well founded and understood. The industry is kept apprized of outside threats, local conditions and programmatic needs through this same relationship.

The seed and commercial potato industry participates in the development of seed standards and seed health testing through involvement of the Minnesota Certified Seed Potato Growers Association. This board meets semi-annually with PPD management and discusses industry issues ranging from import/export, current crop year disease, and seed supply to market pricing. This level of involvement also translates to action on sudden impacts to the industry such as floods and other natural disasters, including invasive pests. The current Seed Potato National Harmonization plan is working to define disease levels and the potato cyst nematode survey as part of a standard measurement of crop marketability.

Fruit and vegetable inspections are performed as part of a cooperative agreement with USDA-AMS to ensure consumers have access to imported food sources that are fairly priced on the basis of quality. This industry voluntarily uses these services to assist in the completion of contractual definitions of shipping and receiving quality parameters. The program also allows participants to select auditing services to supply proof of good agricultural and handling practices as required in the food chain of agricultural production. This program will have increasing importance for the safe handling of raw agricultural products. MDA should promote branding of this activity to assist local producers in maintaining and expanding their market share.

Seed sources in the state, for seed meant to be planted in backyards or farm fields, are required by regulation to undergo testing to national and state standards. Another advisory panel interacts with PPD management to review present and forthcoming issues. The seed regulatory program ensures crops may be planted in conditions and areas that are appropriate to label claims. Requirements for seed viability testing and purity also assist in that regard so producers are achieving good stands of mature crops. As the enhancement of crop genetics becomes more widespread, additional measurements of labeling claims and end uses will need to be identified to ensure producers are planting what they paid for.

The advancing front of invasive species represent the greatest threat to agriculture and the largest challenge to the agency. There are measuring capabilities being developed to assist in understanding the potential environmental and the monetary impact on our local environs. Unfortunately, the ability to understand the impact, or advertise the threats, only forestalls the eventuality of the establishment of these burdens on our economy. This area alone represents the largest segment of risk that may tax budgets and personnel in pursuit of base activities.

The PPD reports, which follow, serve to highlight the past year's efforts to achieve the goals of both the division and the Minnesota Department of Agriculture and to serve the various communities of the State.

Fruit and Vegetable *Unit*

OVERVIEW

Harley Olinske, Jr., Supervisor

The USDA Market Inspection Program has been in operation since 1917 and has helped to ensure that quality produce is being packed, shipped and delivered to markets world wide and that fair trade can be made using the uniformity of a national inspection program and national standards. The Minnesota Department of Agriculture (MDA) Fruit and Vegetable Inspection Unit operates under a cooperative agreement between the State of Minnesota and the USDA. The program inspects fruits, vegetables, raw nuts, and ornamental crops based on USDA-established U.S. standards for commodities and certifies the various grades for each commodity. Inspections are performed for any financially interested party in the world including growers, packers, shippers, brokers, transporters, and receivers. Inspections ensure that the commodities meet the specifications and/or grades based on the U.S. standard requirements. Providing unbiased third-party inspections ensures that the proper quality of produce is being delivered, and receiver and grower contracts are being met. This results in protection for both grower and receiver, and lower costs to the public.

Associated Minnesota Statutes

State Statute 27.07

Subd. 2. Certificates. The Commissioner shall provide for the issuing of certificates of inspection showing the grade, quality, and conditions of the produce, and may charge and collect a reasonable fee therefore, a schedule thereof to be adopted and published from time to time. Such certificates shall be prima facie evidence in court.

Subd. 3. Application for Inspector's Services. Any person who wants produce to be inspected may apply to the commissioner for the service of an inspector and, if it appears to the commissioner that the volume of produce is sufficient to justify the request, the commissioner may grant the service upon terms and conditions fixed by the commissioner and this section.

FAST FACTS FROM 2008:

- Inspected 2,600 lots, equaling 28,600,000 pounds of inspected and certified fruits and vegetables.
- Inspected and certified over 123,500,000 pounds of potatoes for processing.
- Inspected and certified 6,901,700 pounds of fruits and vegetables for export to Canada.
- Inspected and certified 9,500,200 pounds of fresh and seed potatoes.
- Provided audits for 100% of all growers and receivers that have requested to be audited per the USDA GAP (Good Agricultural Practices)/GHP (Good Handling Practices) program.

PROGRAM SUMMARY FROM 2008

The Fruit and Vegetable Inspection Unit staff is federally licensed by the USDA and has the authority to inspect all commodities from around the world. This program provides four different services to various geographic areas:

Fruit and Vegetable Inspections

The Fruit and Vegetable Inspection Unit conducts grading and certification of all fruits, vegetables, raw nuts, and ornamental crops that have been delivered to Minnesota, North Dakota, South Dakota, and western Wisconsin. An inspection may be needed if fruits, vegetables, raw nuts, or ornamental crops received are not the quality expected from the supplier or will not meet the specified grade that was purchased.

Inspections clarify:

- Defects
- Severity of defects
- Percentage of defects
- U.S. Grade is met

These inspections and certificates are the main documentation the PACA (Perishable Agricultural Commodities Act), a division of the USDA, needs to settle disputes and claims of bought and sold fruits and vegetables. Application for inspections must be requested within 24 hours of receiving the product. Generally, for all applications for inspection, an inspector will be scheduled to provide service within eight business hours of the request. Results of inspections are reported on USDA form FV 300.

Processed Inspection

Daily service is provided to a local processing potato firm. Staff inspect, certify, and give percentages for U.S. No. 1 or U.S. No. 2 quality potatoes. This is the basis for grower product compensation. Processing inspection is performed on submitted load samples at the processing plant prior to use. Grade percentages are determined and reported on certificate USDA FV 27.

Shipping Point Inspection

Inspections are provided to growers in the eastern half of Minnesota providing growers with mandatory potato inspection and certification for destinations in Canada. In addition, inspections are provided for seed potato growers needing mandatory inspections for destinations outside Minnesota. Shipping point inspection is conducted at the producer and as the product is being packed to determine if a grade is being met. This is reported on USDA certificate FV 184 or FV25.

Food Safety Audits

Food safety has become very important in the United States because vendors and consumers are demanding that preventative measures be implemented and audited to ensure safety of the fruits and vegetables they buy, sell, or eat.

The USDA has established a national audit-based program to meet these needs. The USDA Good Agricultural Practices/Good Handling Practices Audit Program was established to provide unbiased third-party audits of agricultural and handling practices of fresh fruits and vegetables. These audits help the fruit and vegetable producer or the handler of

fruits and vegetables to reduce produce contamination. Starting in July 1, 2007, the Commodity Procurement Branch of the USDA has announced that any company doing business with them must be successfully certified to the USDA GAP/GHP audit, including Part 7. Food Defense.

Many grower commissions and processors are starting to require all participants in their respective programs to have successfully complete a USDA GAP/GHP audit. The benefit of a nationally based audit is to provide uniformity no matter where the company is located. The State of Minnesota Fruit and Vegetable Inspection Unit staff is licensed by the USDA to provide these audits for any growers, shippers, receivers, and re-packers in Minnesota. These audits consist of asking questions, reviewing documentation, and onsite viewing of warehouse, storage, packing, and transportation facilities.

PROGRAM PLANS FOR 2009

- Develop a handout describing the four different services provided by the Fruit and Vegetable Inspection Unit.
- Begin development of a State of Minnesota, Fruit and Vegetable Inspection Unit, Good Agricultural Practices/ Good Handling Practices handbook describing food safety audits and information regarding regulations and contacts.
- Continue presentations and meetings with Minnesota growers and packers to inform and educate on Food Safety and the benefits of the audit-based program
- Develop an electronic note sheet and/or certificate for the inspection process.
- Switch to an electronic certification system for the terminal market inspection program by the end of 2009.

Gypsy Moth Unit

OVERVIEW

Lucia Hunt, Supervisor

Since 1980 the Minnesota Department of Agriculture has coordinated and overseen the treatment of more than 228,000 acres to delay, prevent or mitigate the adverse impacts directly or indirectly associated with gypsy moth infestation on our state's natural resources, citizens and industries.

FAST FACTS FROM 2008

- 38 seasonal staff set, checked, and removed over 20,000 traps.
- Record year for gypsy moth catches: 12,255 moths statewide.
- Treated over 85,000 acres along the North Shore.
- Two quarantine violations at nurseries.
- Five compliance agreements signed with mills and nurseries.

PROGRAM SUMMARY FROM 2008

The gypsy moth detection program is a cooperative effort between state and federal agencies including the Minnesota Departments of Agriculture and Natural Resources, USDA Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA APHIS-PPQ), and USDA Forest Service (USDA-FS). This cooperative effort has built a strong gypsy moth program in the state of Minnesota. Together, 20,188 traps were set across the state and a total of 12,255 male moths were caught.

Since 2004, Minnesota has been a formal member of the Gypsy Moth Slow the Spread (STS) Foundation. The STS Action Area moves annually based on trap catch data to cover the areas where moth populations are building. In 2008 portions of four counties (Houston, Winona, Lake and Cook) were included in the action area. This year set a record for moth numbers with high catches being identified over 100 miles west of the action area.

GENERAL SURVEY PROGRAM

In 2008 the MDA filled positions for 32 routes and 6 lead workers to oversee field operations. They were responsible for setting, checking, and removing gypsy moth traps all summer. The entire state is not surveyed every year. Trapping is typically conducted on a rotating basis throughout the western part of the state but to maximize the effectiveness of the program this year, only the eastern border, the Twin Cities metropolitan area and a portion of the St. Cloud/Brainerd corridor were trapped.

Standard grid densities differ according to the risk of introduction; smaller grid sizes yield higher trap densities which result in higher resolution of actual moth populations. Isolated traps with high numbers in 2007 were surveyed intensively in 2008 through site delimitation. This survey technique involves narrowing down a large area to find out if gypsy moth populations are persisting and if treatments should be administered.

Sharp increases in moth numbers along the North Shore since 2005 along with noticeable variations in moth size and an unusually long adult flight season led the MDA to request further research into the biology and behavior of northerly populations. A sentinel trap grid was established on areas of the existing grid along the North Shore to monitor male moth flight patterns. Sentinel traps were checked frequently by trappers who recorded the number of moths caught. In 2007, all male moths captured in detection traps in St. Louis, Lake, and Cook counties underwent wing length analysis. Preliminary results indicate the possibility that a portion of the males are immigrants from high-density populations. This study was continued for moths caught in 2008 in the same counties. To address the question of how temperatures over time affect lure release rates from traps, the MDA participated in a regional lure release study to measure these differences. These research projects are both coordinated through the USDA-FS Field Station in Morgantown, WV.

High-risk sites

A determination of risk for the introduction and establishment of gypsy moth is based on human activity levels, preferred habitat for gypsy moth, and the advancing gypsy moth front from the east. For example, wholesale nursery dealers and nursery growers that report stock sources from gypsy moth-quarantined areas or have a history of pest problems are considered high risk. Also, sawmills and pulp mills are considered high risk if it is known or likely that they have out-of-state sources and if they are within 100 miles of counties that trap fifty or more gypsy moths. Tourism and heavy recreational use by people living and vacationing on the North Shore puts the area at risk for artificial introductions of gypsy moth. It has been noted from years past that most of the gypsy moth activity seems to follow closely along the shoreline and drops significantly farther inland.

Trapping for the Asian strain of gypsy moth continued in 2008. Traps from pathway sites (ports of entry, warehouses or sites that receive/store containers) and around sites where specific gypsy moth strains were identified previously were sent to OTIS Laboratories for DNA analysis. No Asian gypsy moths have been identified in Minnesota at this time.

Trap results

Moth numbers were much higher in the southeast part of the state where three counties (Houston, Winona, and Wabasha) accounted for a substantial 2,481 moths (20% of the statewide total and 78% of the southern total). In recent years moth numbers there have been extremely low and the rapid increase may be attributed to increasing population pressure from western Wisconsin.

Two areas of concern, apart from the two nursery sites now under compliance, arose out of the southern trap data. The nursery sites will be treated by the companies and delimited by the MDA in 2009. Two other sites are located in Hennepin County, in the suburbs of Richfield and Minnetonka. After alternate life stage searches in 2007 yielded nothing at either site, they were delimited in 2008. Egg masses were recovered at both sites this year.

In 2008, St. Louis, Lake and Cook counties in the northeast corner of the state accounted for 64% of the moths in the entire state, another indication that the population front is moving closer to Minnesota. This year ushered in the first wave of moths into areas with previously low moth catches. Specifically, the shoreline of St. Louis County and south to Carleton and Pine counties experienced an unprecedented number of moths, accounting for a 66-fold increase in some places. The MDA will be working closely with the land stewards within these areas to align management strategies with increased moth populations. Many of the isolated positive traps will be further delimited and treatments will be proposed for these counties in 2009.

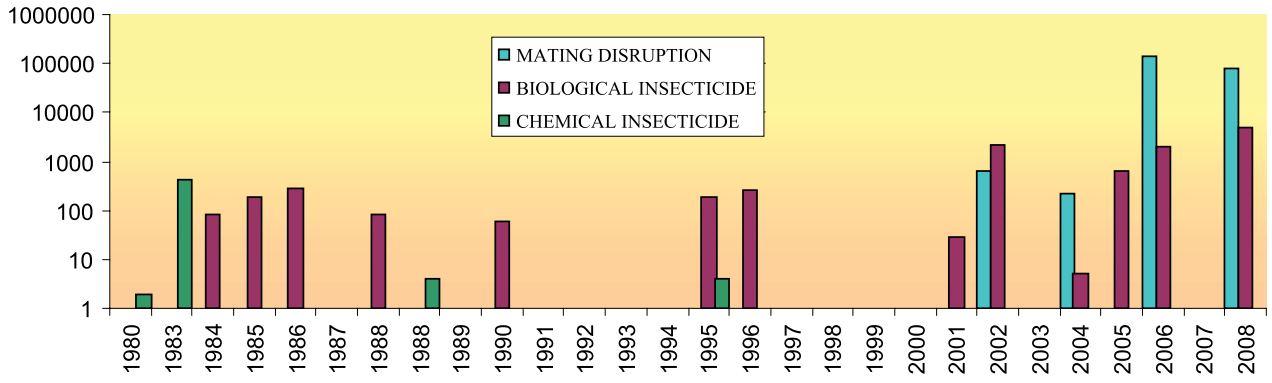
GENERAL TREATMENT PROGRAM

The Minnesota Department of Agriculture has coordinated and overseen the treatment of over 228,000 acres since 1980 (see graph). This year, 85,038 acres were treated, all within the STS Action Area. One regulatory site in Wright County was treated as a condition of a compliance agreement. As the gypsy moth front moves closer to Minnesota, treatment acreage is expected to increase to meet the statewide objective of decreasing spread rates from 15 miles per year to less than 6 miles per year.

Treatment Monitoring

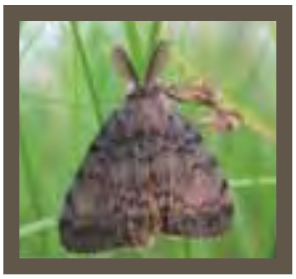
One 4,959-acre treatment block on the Grand Portage Reservation was evaluated in 2008. The area was delimited at a 500-meter grid density. Sixty-seven delta traps were set; 11 positive traps caught 14 moths in the entire area. The STS Decision Algorithm calculated the treatment success at 0.98 and colony presence at 0.13, both indications of a successful treatment.

Acres Treated for Gypsy Moth in Minnesota



2008 STS Treatments (85,038 acres)

Six treatment blocks along the North Shore were identified and treated based on historic trap catches in the area. Minnesota hosted the largest operational trial of Specialized Pheromone and Lure Application Technology (SPLAT) on nearly 12,000 acres of the Grand Portage Reservation. Treatments were in response to a record trapping year in



2007. Most of the high populations skirted the lakeshore so all treatment boundaries bordered the shoreline. One area of high moth concentrations appeared inland nearly overlapping a previous treatment in 2006.

Three separate environmental assessments were completed with three separate decision notices: one for both Btk and mating disruption treatments on the Grand Portage Reservation, one for mating disruption on 7,332 acres of the Superior National Forest, and one to cover all other public and private lands.

Egg mass surveys

Three surveys were planned in 2008. On August 5, 2008, a small informal search was conducted in Richfield. Staff were able to quickly identify and collect a dozen females and their egg masses. On September 12, several agencies responded to a high number of moths trapped in a delimit in the Minneapolis suburb of Minnetonka. Five egg masses were found at the site. Both urban sites have been identified for eradication treatment in 2009.

In addition to the egg mass surveys conducted in the Twin Cities metro area, sites surrounding high-find locations were surveyed along the North Shore. The third survey took place on October 15 in Lutsen along a 0.25 by six-mile stretch between Highway 61 and the lakeshore. Several traps in this corridor caught over 50 moths. No egg masses or alternate life stages were identified.

OUTREACH FROM 2008

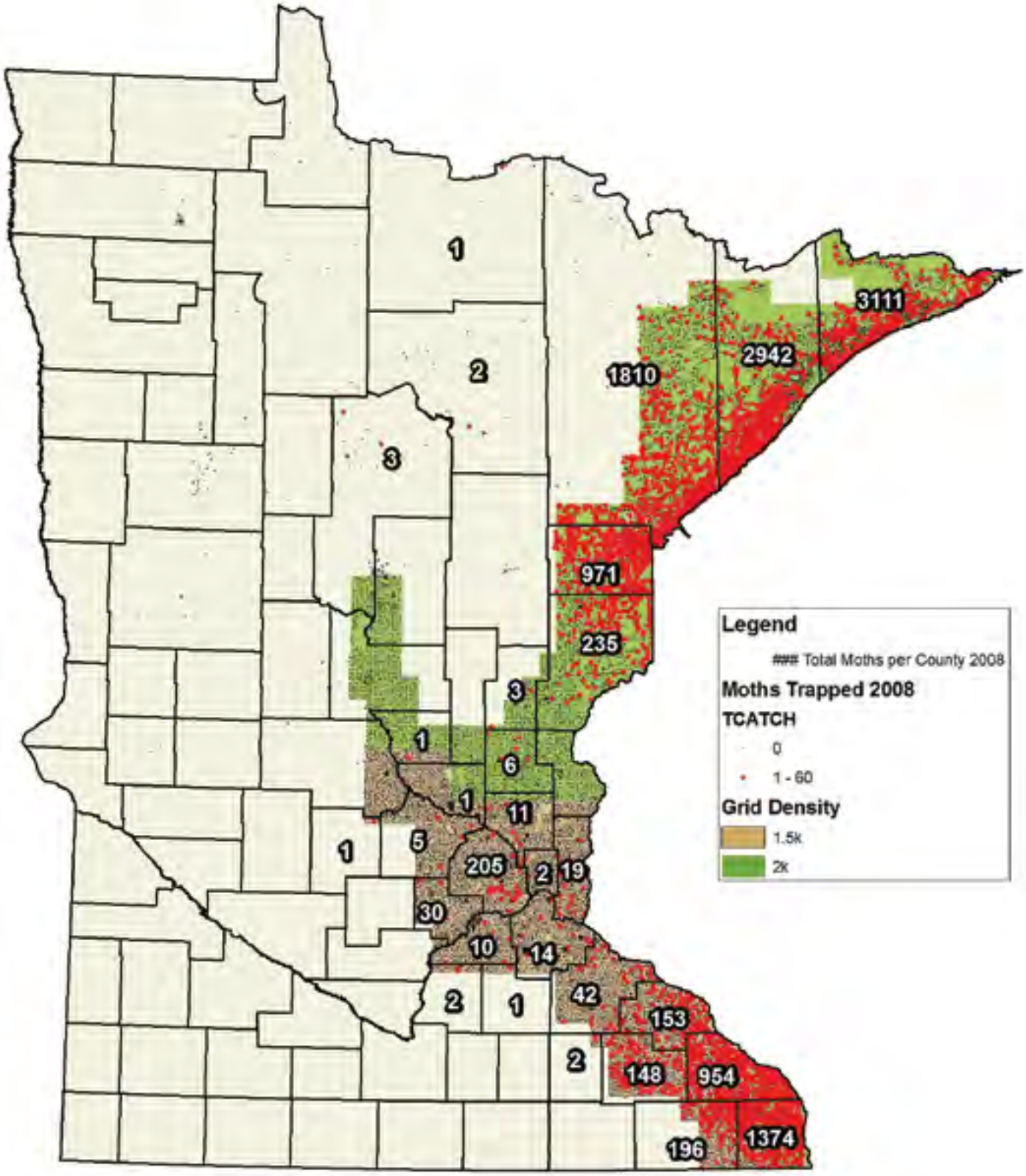
Outreach for 2008 treatments included press releases, several media interviews, public open houses, and direct mailings to affected residents.

A brochure with general gypsy moth information was given to landowners, business owners and interested parties throughout the trapping season this year. Survey staff also handed out two specialized brochures aimed at the nursery and mill industries to explain ways to protect their operations from the gypsy moth.

Presentations about gypsy moth were given at County Agricultural Inspector meetings, businesses holding compliance agreements, the Minnesota Invasive Species Conference, and national meetings.

2008 Gypsy Moth Results by County:

County	Trap Set	Moth Catch	% of Statewide Moth Total
Aitkin	6	0	0.00%
Anoka	561	11	0.09%
Becker	25	0	0.00%
Beltrami	8	0	0.00%
Benton	283	1	0.01%
Big Stone	2	0	0.00%
Carlton	796	971	7.92%
Carver	496	30	0.24%
Cass	104	3	0.02%
Chisago	335	0	0.00%
Clay	2	0	0.00%
Clearwater	5	0	0.00%
Cook	1,676	3,111	25.39%
Crow Wing	225	0	0.00%
Dakota	990	14	0.11%
Dodge	21	2	0.02%
Fillmore	499	196	1.60%
Goodhue	822	42	0.34%
Hennepin	1,114	205	1.67%
Houston	871	1,374	11.21%
Hubbard	4	0	0.00%
Isanti	359	6	0.05%
Itasca	37	2	0.02%
Kanabec	144	3	0.02%
Koochiching	31	1	0.01%
Lac Qui Parle	2	0	0.00%
Lake	1,781	2,942	24.01%
Lake of the Woods	13	0	0.00%
Le Sueur	56	2	0.02%
Lyon	2	0	0.00%
Mahnomen	7	0	0.00%
Marshall	30	0	0.00%
Meeker	13	1	0.01%
Mille Lacs	119	0	0.00%
Morrison	368	0	0.00%
Olmsted	708	148	1.21%
Otter Tail	8	0	0.00%
Pine	885	235	1.92%
Pipestone	7	0	0.00%
Ramsey	251	2	0.02%
Rice	39	1	0.01%
Roseau	2	0	0.00%
Saint Louis	2,141	1,810	14.77%
Scott	551	10	0.08%
Sherburne	498	1	0.01%
Sibley	18	0	0.00%
Stearns	430	0	0.00%
Stevens	6	0	0.00%
Todd	2	0	0.00%
Wabasha	687	153	1.25%
Washington	651	19	0.16%
Winona	836	954	7.78%
Wright	661	5	0.04%
TOTAL	**20,188**	**12,255**	**100.00%**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2
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1810
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971
235
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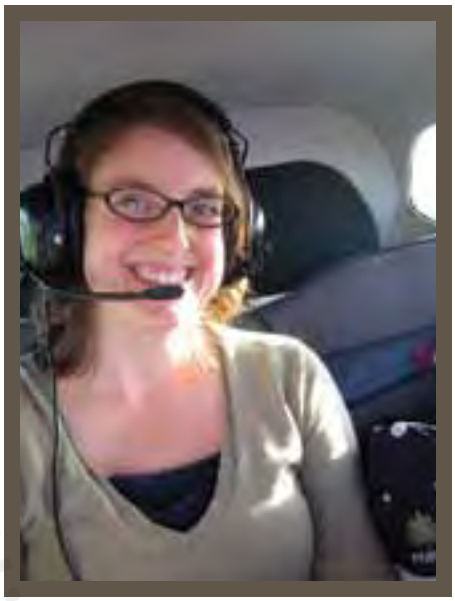
1
6
1
11
1
5
205
2
19
30
10
14
42
2
1
153
2
148
954
196
1374
Legend
Total Moths per County 2008
Moths Trapped 2008
TCATCH
0
1 - 60
Grid Density
1.5k
2k

PROGRAM PLANS FOR 2009

- Preparations are in development to survey the eastern border of the state again, concentrating on northern counties that showed higher gypsy moth activity in 2008.
- Two eradication sites have been proposed for treatment in the spring of 2009. Reproducing gypsy moth populations were found at the sites, both in Hennepin County.
- STS survey and treatment areas are being identified to track and treat isolated gypsy moth populations before they have a chance to become established.
- Outreach to high-risk businesses, industry groups, and the general public will continue.



INVASIVE SPECIES EXCLUSION *Unit*

OVERVIEW

Teresa McDill, Supervisor

The ISEU is Minnesota's first line of defense against new invasive species that threaten food crops, timber resources, and horticultural interests. In this manner, food safety and quantity, environmental resources and economic security are Unit responsibilities, along with the prevention of bioterrorism. With help from our federal partners, USDA Animal and Plant Health Inspection Service (APHIS), prospective new pests from other parts of the world are evaluated for possible threat. If the threat is high, then the National Strategy (Prevention, Early Detection and Rapid Response) is applied for new invasive species. The core focus is to stop new pests from arriving and establishing (Minnesota Statutes Chapter 18G and Chapter 18J). Invasive pests established in Minnesota and aquatic pests are addressed by other cooperating groups within and outside the MDA. The Unit interacts with stakeholders through several memberships.

FAST FACTS FROM 2008

- Emerald ash borer (EAB)
  - ~ The EAB Readiness Plan was completed.
  - ~ EAB was not detected on 250 purple prism traps and 800+ detection trees sampled.
  - ~ 167 EAB First Detectors were trained in 7 workshops around the state.
  - ~ 110 citizen reports of EAB were investigated and resolved.
- Potato cyst nematodes (PCN)
  - ~ Over 1,700 5-pound samples were collected and analyzed from 6,400 acres of land planted to potatoes in 2006, with PCN not detected.
  - ~ About 3,500 samples from 5,000 acres of fields planted to potatoes in 2008 have been collected and are awaiting processing.
- Risk of firewood movement
  - ~ 100,000 out-of-state hunters/anglers received a mailing asking them not to bring firewood to Minnesota.
  - ~ The 2005 North Shore Park Visitor Informal Survey was repeated to gauge public awareness of invasive species and behavior regarding firewood movement.
  - ~ Fifty-one inspections were completed at various entities selling firewood to monitor compliance with inter-state quarantines and labeling requirements.

- Plant pest survey
  - ~ A total of 2,959 corn, soybean, small grains, alfalfa and sunflower fields were surveyed for various invasive and native pests.
  - ~ The Minnesota Pest Report was published weekly through the growing season.
- Exotic wood borers. Trapping for exotic wood-boring insects conducted at 35 sites for exotic bark beetles and 38 sites for the Sirex wood wasp yielded a total of 1,939 samples. None of the target exotics have been detected.
- Light brown apple moth was not detected in the 50 traps deployed at nurseries.
- Swede midge was not detected in the 13 traps deployed in canola, cabbage, broccoli and cauliflower fields.
- Laboratory. A five-year plan was developed for continued program growth.
- Over 63 applications for federal import permits were reviewed.
- Apiary certification - An international certification of beeswax was the first in 10 years.
- Wildlife Damage Compensation Program - Wolf and elk damages depleted the $100,000 account by October 2008; additional claims continue to be submitted for payment.

Figure 1: Purple prism traps for EAB detection

PROGRAM SUMMARY FROM 2008

Emerald ash borer

Emerald ash borer (EAB) is an invasive wood-boring beetle that is found in 10 states, including Wisconsin. In preparation for the eventual arrival of EAB in Minnesota, the MDA led the development of the Minnesota Emerald Ash Borer Readiness Plan to coordinate EAB-related actions among agencies and groups. The Readiness Team continues to meet on a regular basis for planning and coordination of activities.

The MDA continued to lead risk-based detection surveys for EAB in Minnesota during 2008 with financial support from USDA Forest Service and USDA APHIS PPQ. The MDA, PPQ and the National Park Service collaborated on placing nearly 400 purple prism traps for EAB around Minnesota (Figures 1 and 2). This is the first year the traps have been available for use in Minnesota. The MDA also created 400+ detection trees during the spring of 2008 and when combined with detection trees left from 2007, 800+ trees were sampled by the end of 2008 (Figure 3). The detection surveys would not be possible without the aid of many cooperators including DNR Parks and Forestry, DOT and many counties and municipalities around the state.

The MDA, University of Minnesota and DNR collaborated on providing EAB First Detector Training in Minnesota during March and April, 2008. Seven full-day workshops on EAB were held at 6 locations around the state and 166 people attended and agreed to become EAB First Detectors. This was the first time that this type of training was offered for EAB in the U.S., and since then a number of states have requested information on how they might offer the same training.

EAB field staff investigated and resolved 110 citizen reports of EAB during 2008 and also made contact with over 50 brush disposal sites (mostly in the greater Twin Cities area) to provide outreach on recognizing signs of EAB infestation on incoming wood.

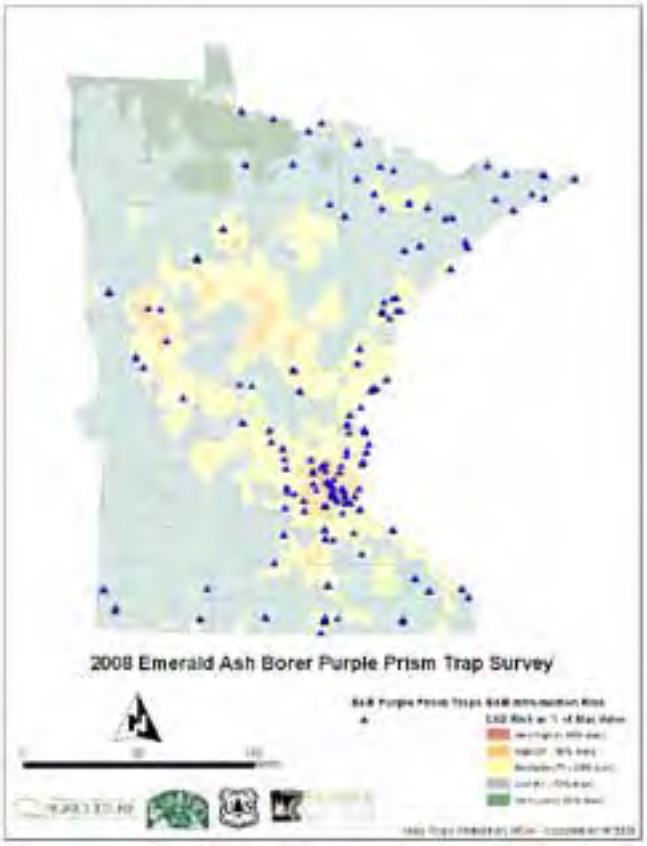


Figure 2: Trapping locations for the 2008 emerald ash borer survey.

Figure 3: Detection tree locations for the 2008 emerald ash borer survey.

Potato cyst nematodes

Potato cyst nematodes (PCN) (i.e., pale cyst nematode and golden cyst nematode) are microscopic worms that feed on the roots of potatoes causing up to 80% yield loss and are very difficult to manage. They are spread in soil on tubers and equipment and by water. Detection of PCN in a field can result in significant trade restrictions.

Following the first detection of the pale cyst nematode in the United States in Idaho in 2006, a survey program was initiated to perform surveys and analyses to achieve the earliest possible detection of PCN introductions in Minnesota in order to prevent further spread of these pests. Soil samples are collected by hand (Figure 4) or with a mechanical sampler (Figure 5).

A survey of fields planted to potatoes in 2006 was completed in June 2008. Over 1,700 5-pound samples were collected from 6,400 acres and analyzed (Figure 6) at the MDA East Grand Forks laboratory. Following the 2007 detection of golden nematode cysts on two seed farms in Alberta, sales records were traced back to show that in 2003 two seed potato growers in Minnesota had planted seed that came from these Alberta farms. Samples were collected from those fields and analyzed this spring and early summer. To date no PCN have been detected.

A survey of fields planted to potatoes in 2008 began in September. The sampling design was changed to require that more samples be collected than for the 2006 survey. Over 3,000 samples from 5,000 acres of fields planted to potatoes in 2008 have been collected (Figure 7) and are drying at the East Grand Forks facility. They will be processed this winter and sample collection will resume in the spring.

All of the commercial growers that we have approached this year have welcomed the survey. One-half of Minnesota's seed potato growers have volunteered for this survey, providing over 4,800 acres for sampling. At least two of these growers are considering shipping seed to Canada and are required to have the survey. Some seed growers do not want the survey because of the consequences of a find. While this is understandable, it would be best to survey all Minnesota seed fields as soon as possible, given the potential for spread and resulting economic and political consequences for the potato industry in Minnesota.

Figure 4. Collecting soil samples by hand

Figure 5. Collecting soil samples mechanically

Figure 6. Processing soil samples for PCN analysis.

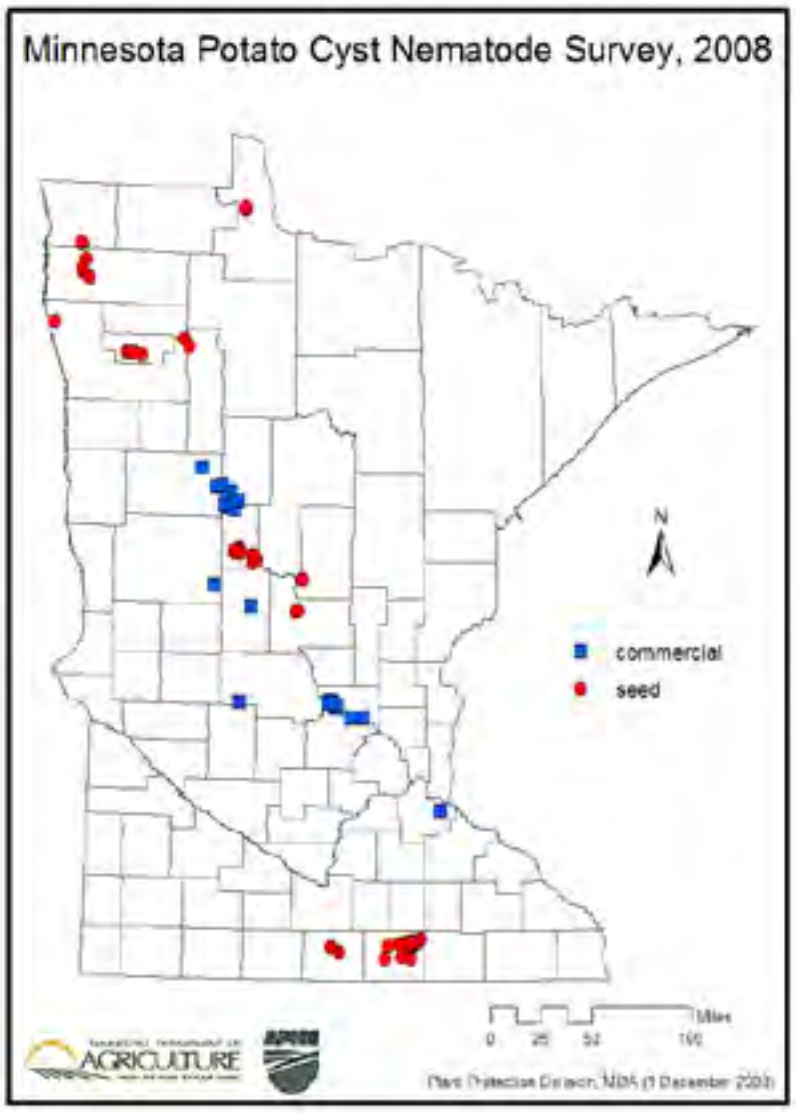


Figure 7: Fields sampled for survey of acres planted to potatoes in 2008.

Asian soybean rust

Asian soybean rust is a potentially devastating disease of soybeans, caused by an invasive fungus spread by windborne spores. Soybean rust is thought to have been blown into the southern United States from South America in 2004 by Hurricane Ivan. In the following years, soybean rust has moved northward. In 2008, it was detected in more than 376 counties in 16 states, coming as close as Illinois this year with positive finds in four counties. These finds were too late in the season to warrant treatment. Minnesota remains officially free of soybean rust and, unlike previous years, there were no spores detected in spore traps set up across the state.

To ensure that Minnesota soybean growers have the most effective tools available for dealing with soybean rust, organizations at the University of Minnesota and State of Minnesota collaborate in several areas. The University of Minnesota maintains a soybean rust-monitoring program in 20 sentinel plots established throughout soybean growing areas of the state. Plots are monitored weekly for foliar symptoms

of soybean rust and deposition of soybean rust spores. MDA field surveyors, trained in identification of soybean rust, monitor additional soybean fields as part of the plant pest survey. If soybean rust is detected in Minnesota, this information will be publicized through the MDA. Because resistant soybean varieties are not yet available, management of soybean rust relies on timely application of appropriate fungicides. The MDA has played a leading role nationally in pursuing Environmental Protection Agency registrations for a number of fungicides needed to combat this serious disease should it arrive in Minnesota at a time when soybean yields may be threatened.

Risk of firewood movement

Movement of firewood can transport invasive pests rapidly over long distances. As part of our goal of excluding new invasive species from entering Minnesota, in 2005 the MDA initiated a firewood program that began with an informal survey of visitors to North Shore state parks. The survey asked about invasive species awareness, behavior regarding movement of items that can spread invasive species like firewood, and media habits. The survey was repeated in September 2008 and the number of people who reported bringing firewood from home to their camping location decreased substantially since 2005.

A mailing was sent to 100,000 out-of-state hunters and anglers who purchased Minnesota licenses during the past year asking them to not bring firewood to Minnesota. This project was implemented jointly between the MDA, USDA APHIS PPQ and DNR and took many months to come together. The mailing was sent on October 31 to reach deer hunters before they traveled to Minnesota for the opening of deer hunting on November 8.

Firewood inspections were carried out at 50+ entities selling firewood. Businesses inspected ranged from big-box stores to more informal firewood sales by tree care companies. Inspections are conducted to determine the source and route of the wood, check for compliance with interstate quarantines and labeling requirements, identify individuals and businesses in the state distributing or offering firewood for sale, and educate sellers on risks of spreading invasive species in firewood. Inspections are focused on areas of Minnesota considered high risk for introduction of invasive pests.

The Interagency Firewood Group, made up of representatives from MDA, DNR, USDA APHIS PPQ and the University of Minnesota continued to meet to organize activities and share results. Because EAB is the pest of greatest concern at this time and because some of the objectives of both the Firewood and EAB programs overlap, the Interagency Firewood Group was recently incorporated into the EAB Readiness Plan program. This year, a collaborative project was initiated with University of Minnesota researchers who are conducting research on human-mediated spread of invasive species.

Plant pest survey

Fields of corn, soybean, small grains, alfalfa and sunflower were surveyed for numerous pests. Pests targeted in the survey include native and invasive insects and pathogens. Examples of targeted invasive pests can be found in Table 1. In addition, two soybean pathogen surveys and one corn pathogen survey were conducted in collaboration with the Plant Pathology Department at the University of Minnesota. Data from these various surveys were used to publish nine weekly reports on crop pest conditions throughout Minnesota. In addition, Plant Pest Survey staff supported the Export Certification Program by inspecting corn and soybean fields for pests of export concern.

Table 1: Invasive pests targeted in Plant Pest Survey

INVASIVE PEST	ASSOCIATED CROP
Alfalfa weevil	Alfalfa
European corn borer	Corn
Cereal leaf beetle	Small grains
Orange wheat blossom midge	Small grains
Soybean aphid	Soybean
Japanese beetle	Soybean
Brown marmorated stink bug	Soybean
Imported longhorn weevil	Soybean
Soybean pod borer	Soybean
Soybean rust	Soybean
South American fruit tree weevil	Alfalfa, Soybean
Cucurbit/Chrysanthemum beetle	Corn, Soybean
Wheat bug	Small grains

Swede midge

Swede midge is a tiny, invasive fly whose larvae feed on cabbage, canola and other related plants in eastern North America. The MDA collaborated with the University of Minnesota to place a total of 13 traps at 12 locations in Minnesota (Figure 8). In northwestern Minnesota, traps were placed in canola fields. In eastern MN, traps were placed in cabbage, broccoli and cauliflower fields. To date, Swede midge has not been detected in Minnesota. We have begun collaborating with University of Minnesota researchers who are conducting research on increasing landowner participation in surveys for Swede midge.

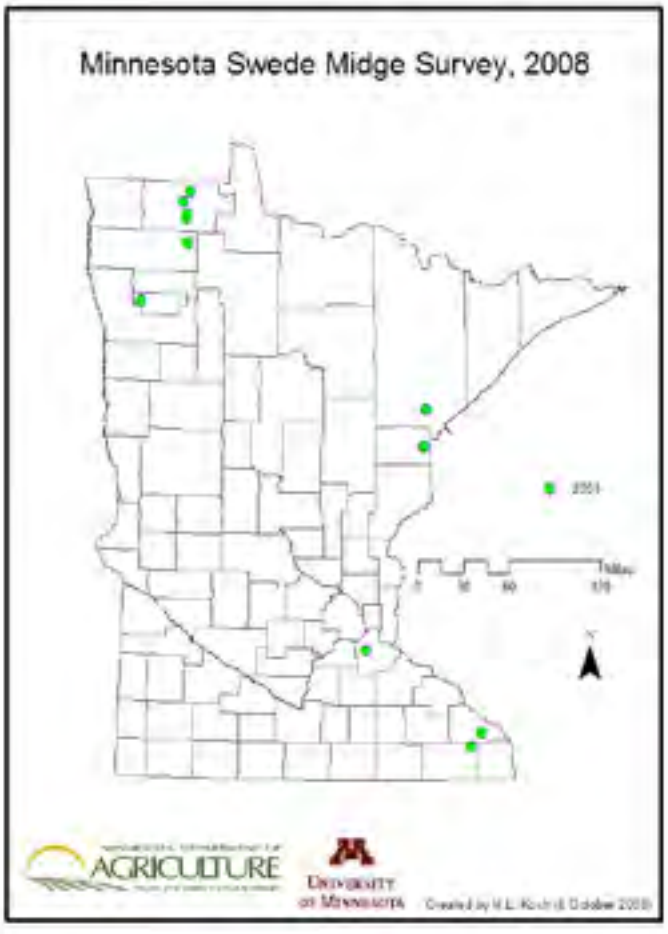


Figure 8: Trapping locations for the 2008 Swede midge survey. (The point in St. Louis County represents two survey locations.)

Exotic wood-boring insects

The Minnesota Cooperative Agricultural Pest Survey Committee (MDA, DNR, USDA APHIS PPQ, USDA Forest Service, and University of Minnesota) identified exotic wood-boring insects as being a high priority for survey because of their high risk for invading Minnesota and causing damage. Bark beetles rank among the most destructive forest pests, and the Sirex wood wasp has caused up to 80 percent mortality of pine trees in other countries. Trapping for exotic wood-boring insects was focused around the Twin Cities metropolitan area and the Duluth area because of the increased likelihood of the pests being introduced to these areas through the movement of solid wood packing material. A total of 70 bark beetle traps were deployed over 35 locations (Figure 9), and 77 Sirex wood wasp traps were deployed over 38 locations (Figure 10). Traps were checked every two weeks from April to October. In total, 1,939 samples were collected and processed. None of the targeted exotic wood borers were detected in 2008. In addition, 20 trap trees were established for the Sirex wood wasp at five locations (four trees per location) (Figure 9). These trap trees were chemically stressed to attract the Sirex wood wasp. The trap trees will be felled and dissected next spring to search for signs of infestation. This survey effort for exotic wood borers was coordinated with a survey being conducted by USDA APHIS PPQ (Figure 9 and 10). The cooperation of various land owners to allow us to trap on their property made this survey possible. The National Parks Service deployed and checked the traps in Chisago County. This survey was partially funded by the USDA Forest Service and USDA APHIS PPQ. Furthermore, a collaborative project was initiated with University of Minnesota researchers who are conducting research on increasing landowner participation in surveys for Sirex wood wasp.

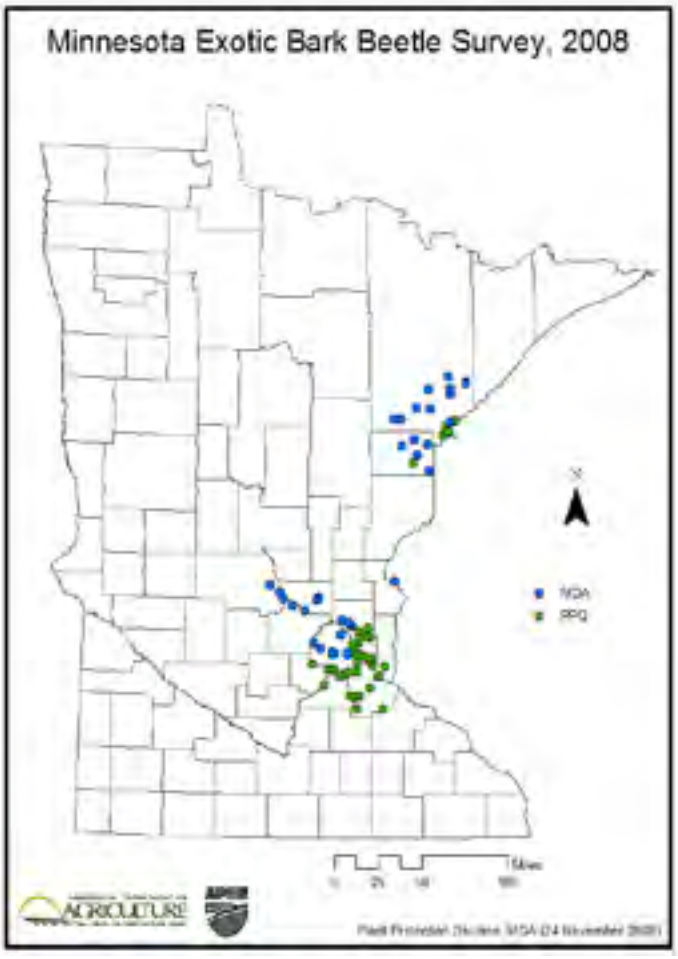


Figure 9: Trapping locations for the 2008 exotic bark beetle survey.

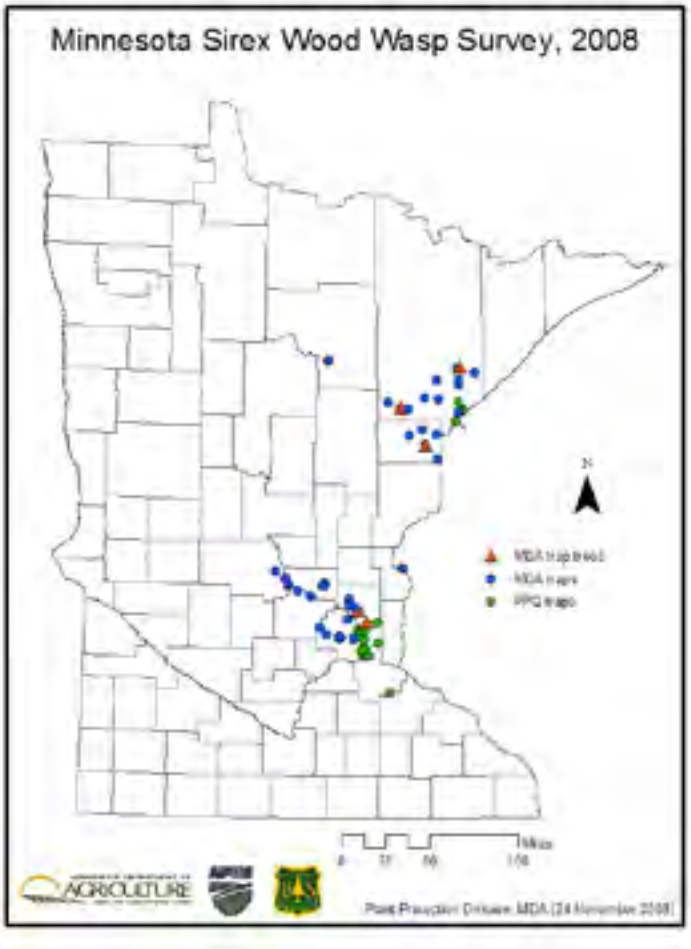


Figure 10: Trapping locations for the 2008 Sirex wood wasp survey.

Karnal bunt

Karnal bunt is a devastating fungal disease of wheat that has significant trade implications. The fact that the MDA has surveyed for and not detected this pest for over ten years has allowed Minnesota to continue exporting its wheat commodity. The survey for 2008 consisted of 57 samples taken from 11 counties (Big Stone, Chippewa, Grant, Kittson, Marshall, Norman, Polk, Pope, Red Lake, Stevens, and Wilkin) (Figure 11). Samples were collected by the MDA and sent to a USDA laboratory for processing and screening. Karnal bunt was not detected in Minnesota's 2008 wheat crop. The Karnal bunt survey includes staff from the Invasive Species Exclusion, Nursery and Export Certification, and Seed and Noxious Weed Units. This survey was partially funded by the USDA Forest Service and USDA APHIS PPQ.

Light brown apple moth

Light brown apple moth, currently established in California and Hawaii, is known to attack over 250 different species of plants. In Minnesota, trapping efforts for the light brown apple moth focused on nurseries as these facilities provide a likely means of transporting light brown apple moth to Minnesota from infested areas in other states. Priority was placed on nurseries reporting to have received stock from infested counties in California and then uninfested counties in California (Figure 12). A total of 50 Jackson traps (baited with pheromone) were allocated to Minnesota, deployed at rates of one to three traps per nursery at 29 nurseries. Trapping was conducted with assistance from field staff from the MDA's Gypsy Moth Unit from July to September. Light brown apple moth was not detected in Minnesota in 2008. This survey was partially funded by USDA APHIS PPQ.

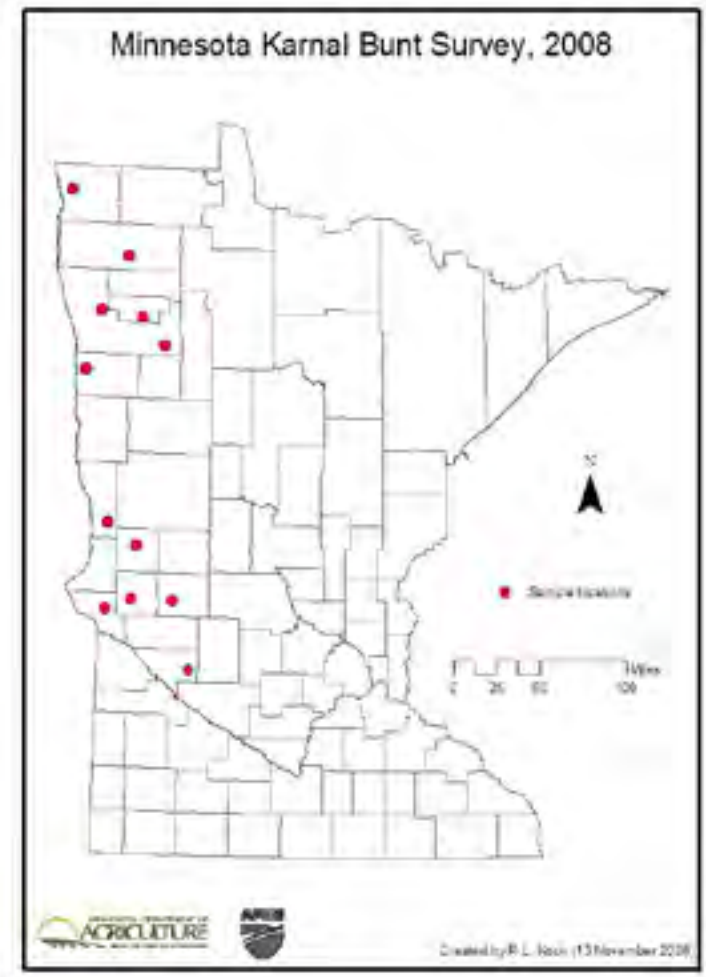


Figure 11: Sample locations for the 2008 Karnal bunt survey.

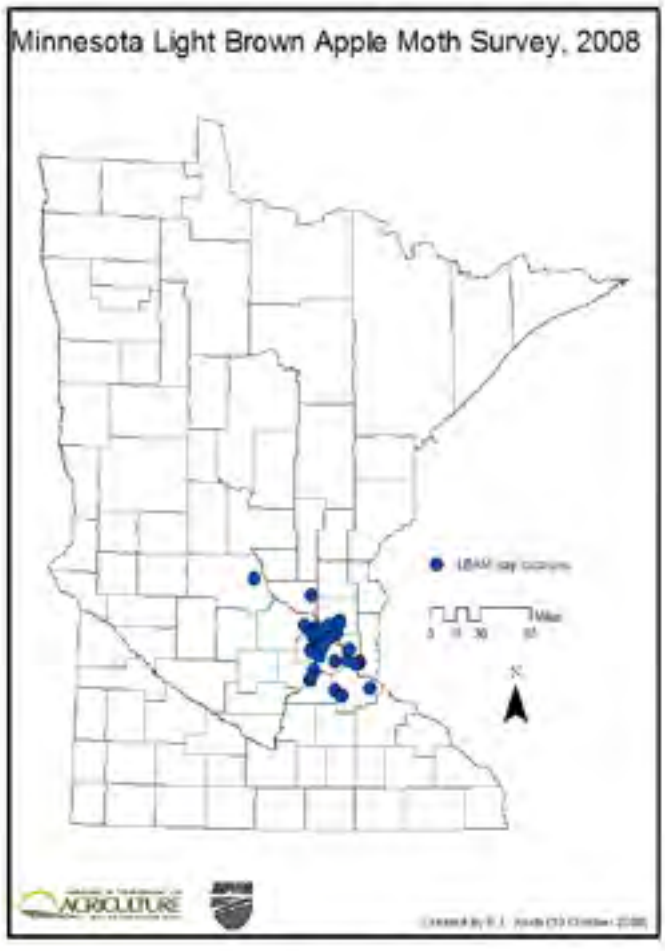
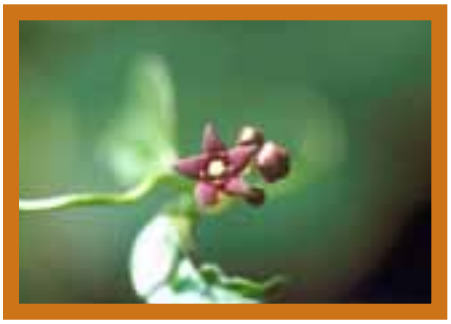


Figure 12: Trapping locations for the 2008 light brown apple moth survey.



Invasive plants

The largest landowner of a site infested with cut-leaved teasel was ordered to treat the weed on their property by mid-May. A follow-up inspection conducted in late May showed that the treatment was only applied to a narrow strip along the streets. In the small area treated, nearly all the teasel plants had been killed. An additional treatment was ordered on the remainder of their property, but the late-May timing resulted in a considerably lower control of the teasel plants and one fairly small area was missed in the treatment. As a result some of the teasel plants bloomed and some seed may have been produced. The MDA and Ramsey County officials conducted follow-up inspections and cut seed heads to try to prevent seed production, and the Ramsey County Cooperative Weed Management Area treated the site in October 2008 to kill the rest of the teasel plants. The site will need to be monitored for the next four years and any teasel plants killed to ensure eradication.

The Ramsey County Cooperative Weed Management Area was organized and cooperating members were trained on identification of "early detection" weeds of interest to the county and the MDA. The group is using the MDA GIS-based early detection reporting tool to help map detections of these species with the objective of following up with management of the isolated populations. This group has been very involved in the cut-leaved teasel eradication in Roseville.

A resident in south Minneapolis reported black swallowwort growing along a fence after finding information on the MDA website. A follow-up visit confirmed that it was black swallowwort and the resident was given information on how to control the plant.

Laboratory

Laboratory support continues in response to regulatory issues. In 2008, the laboratory responded to a trace forward USDA APHIS PPQ issued on stock from a California nursery potentially infected with the regulated organism, *Phytophthora ramorum*, the causal agent of sudden oak death. Final analysis showed the stock was free of *P. ramorum.* Other laboratory analyses include presence or absence of disease for export certification and nursery survey and licensing as well as plant pest surveys. The laboratory also provides protocol support, laboratory space and equipment to division staff.

Staff received training in molecular techniques for detection of federally regulated organisms, *Ralstonia solanacearum* and the potato cyst nematodes, *Globodera pallida* and *G. rostochiensis*.

Permit applications and inspections

The MDA reviews permit applications from businesses and individuals who want to import certain living organisms into Minnesota. This includes plant pest and biological control insects, plant pathogens and other fungi and bacteria, snails, certain plants, and soil. As part of the federal permitting process, the MDA reviews and comments on the organisms and the conditions under which they will be used and maintained once in the state, as well as their final disposal. If there are concerns, the MDA recommends changes to the permit. Once a permit is issued, the MDA is notified. A copy of the permit and the original application are stored in our database. Most of the permitting process is done through an online system supported by USDA APHIS PPQ. In 2008, over 63 permit applications were reviewed.

Some of the organisms for which permits were requested were for research purposes. For example, a plant pathogenic fungus may be brought into Minnesota for disease resistance research. Soils are brought in for various physical and chemical analyses. Other organisms, like certain butterfly species, are imported for sale or release at events.

Occasionally, a permit application review will require an inspection of the facility where the work is to be conducted. The MDA and USDA APHIS PPQ staff will participate in these together. For example, the MDA served on the review committee for the new BSL 3 facility at the University when they applied for a permit.

Apiary certification

Inspectors working statewide performed apiary health inspections for 30 beekeepers allowing them to move 36,765 colonies (e.g., Figure 13) to California, Texas and Mississippi. This was 4,900 less colonies certified than in 2007, but only one less beekeeper. This may partially be attributed to colony collapse-type losses incurred by several beekeepers during the winter of 2007-2008. Inspectors identified American foulbrood, deformed wing virus, sacbrood virus, small hive beetle, varroa mites and chalkbrood in colonies this year. Inspections are performed on a cost-recovery basis. Beeswax was certified for shipment to Germany for one beekeeper.

Figure 13: Bee colony

Wildlife Damage Compensation Program

A high volume of claims were received with a dramatic increase on elk damage claims compared to previous years. For the first time, elk damage claims have exceeded $50,000 (as of October) and additional claims continue to come in. Wolf claims have also been received at a high rate, resulting in total depletion of the $100,000 fund by the end of October. The MDA is pursuing additional funding from the legislature for this program, which helps reduce the economic impact of elk and wolves experienced by farmers in the areas where these animals are found in the state.

OUTREACH FROM 2008

First detections of invasive species in new areas are often made by the general public or practitioners in the field. Because of this, outreach and training on what pests to look for and how to report them is an important component of the early detection program. Example of some venues and groups targeted in 2008 include: travel information centers, nature centers, county agricultural inspectors, master gardeners, county fairs, out-of-state hunters and fishermen (as mentioned in the EAB section), Brainerd Raceway, We Fest, Voyagers National Park, U.S. Border Patrol, Superior National Forest, Green Expo, State Fair, MN Invasive Species Conference, Bell Museum of Natural History. Table 2 provides distribution data for some of the outreach materials.

Table 2: Distribution of invasive species outreach materials

ITEM DESCRIPTION	COPIES DISTRIBUTED
Emerald ash borer tent card	4,000
Emerald ash borer poster	1,500
Emerald ash borer plastic identification card	165
Firewood poster	15
“Don’t move firewood” bookmark	4,766
Firewood brochure (Industry)	200
Firewood brochure (Consumer)	110,956
TOTAL	**121,602**

Presentations

Staff created and provided 34 presentations such as talks, discussions, and demonstrations in 2008.

Publications

Eleven items such as fact sheets, checklists, questionnaires and articles were published.

PROGRAM PLANS FOR 2009

- Emerald ash borer. The EAB Readiness Plan will continue to be implemented by all participating groups. EAB detection surveys will continue with purple prism traps being the primary tool used. First detector training for EAB will be repeated with additional pests potentially added.
- Potato cyst nematode survey. Samples collected in fall of 2008 will be processed this winter and sample collection of 2008 fields will resume in the spring. It is likely that we will survey 2009 fields beginning in the fall of 2009.
- Risk of firewood movement. Inspection efforts will be increased as known EAB infestations creep closer to Minnesota. Outreach efforts will continue and expand to additional industries potentially affected by EAB quarantines.
- Plant pest survey. Returning field surveyors will continue to monitor invasive and native agricultural pests during the 2009 growing season. To increase efficiency, field surveyors will be cross-utilized among the various surveys.
- Exotic wood borers. Survey will focus on the Sirex woodwasp. Funds from USDA APHIS PPQ previously used for the exotic wood borers will be used for a new exotic cereal cyst nematode survey in 2009.
- Karnal bunt survey will continue in 2009 as in years past.
- Light brown apple moth survey will continue in 2009 if federal funding is made available.
- Laboratory. Updated protocols for current laboratory procedures will be provided and made available on the Laboratory Service Divisions document control system. Laboratory support will be provided for processing soil samples for the cereal cyst nematode survey included as part of the plant pest survey.
- Apiary certification. Inspections will continue as requested. The apiary website will be improved to better meet industry and MDA needs.

Nursery Inspection And Export Certification *Unit*

OVERVIEW

Mark Schreiber, Supervisor

The Nursery Inspection & Export Certification Unit administers Minnesota Statutes (2003), Chapter 18.H. These statutes were originally established in the early 1900's and formerly called The Plant Pest Act. Over the years, the language has been updated, fees established and in 2003, program funding became dedicated through program revenue. In 2005, dealer fees were adjusted to ensure adequate program funding. But the goal of the statutes has remained unchanged for nearly a century: through the statewide nursery inspection program, unit staff prevents the introduction into and spread within Minnesota of serious plant pests and ensure that nursery stock grown and sold in Minnesota is free of exotic plant pests.

The mission of the Export Certification program is to facilitate and expedite Minnesota's Agricultural Products into the domestic and international marketplace. Unit staff is responsible for inspecting and certifying agricultural products such as grain, seed, logs, lumber, nursery stock, and several processed products to ensure they meet the import regulations of the destination state or country. This program cooperates with the USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine program to issue federal documents for commodities entering foreign countries. Staff also serves as the important first contact for many exporters in their quest to establish a presence in the international marketplace. Staff is stationed in East Grand Forks, Bemidji, Staples, Nicollet, and St. Paul.

FAST FACTS OF 2008

Nursery Inspection Program

- Nursery inspection staff conducted over 850 inspections in 2008. All 8,180 acres of growing nursery stock held by 314 nursery stock growers were inspected and over 400 dealer inspections were conducted to confirm plants were certified at origin, free of serious plant pests and current certificates were on display. The inspections resulted in 333 violations involving 11,423 plants that were restricted or destroyed.
- Thirty-four notices of violation (NOV) were issued, primarily to firms operating without a 2008 nursery certificate. Several retail box store chains were issued second NOVs for selling packaged perennial plants that were either non-viable or in an actively growing condition.
- In 2007 the Minnesota Nursery and Landscape Regulatory Advisory Committee endorsed a resolution to add one additional nursery inspector position to be located in the metropolitan area, and one was subsequently hired. The committee did not formally meet in 2008 but maintained communications on significant issues via email. The membership's input was considered when draft technical language changes were proposed as part of 2009 division legislative initiatives.

Export Certification Program

- 4,630 acres spread over 114 fields were inspected for export certification. Primary crops continued to be corn and soybeans, with sunflowers, small grains and edible beans playing a secondary role.
- Based on the results of a survey sent to exporters prior to the growing season, we determined that only those fields needing inspection based on destination country would be inspected in 2008. This plan worked exactly as hoped and these figures represent a 47% and 34% decrease from 2007 figures. Staff was able to conduct their assigned work and incorporate the export field inspection work.
- Export staff issued certificates for 140 companies (up from 127 last year) to 59 countries. See the accompanying graphics for information about commodities shipped and major trading partners.
- 790 million pounds of agriculture commodities were shipped internationally with export certificates this year. 531 million pounds were soybeans and 185 million pounds were corn and dried distillers grains (DDGs). 1.5 million plants were issued export certificates, primarily for export to Canada.
- 3,103 export documents were issued. This is an increase from 2007 and is the first year since 2001 that more than 3,000 documents were issued.
- $324 million of corn was shipped to western states through compliance agreements and certificates for freedom from European corn borer. (Based on October 2008 domestic price of corn).
- Implemented the use of Phytosanitary Certificate Issuance & Tracking System (PCIT), a federal on-line program used to issue phytosanitary certificates.
- Three additional employees became authorized certification officials (ACOs) after passing the federal training program.

Agricultural Crops Shipped

Commodity	Part	Pounds
Soybean	Grain	443,029,007
Corn	DDGs	129,656,211
Soybean	Meal	74,566,616
Corn	Grain	54,097,417
Pinto Bean	Grain	23,403,610
Sunflower	Grain	21,012,789
Soybean	Seed	6,802,121
Soybean	Flour	6,678,985
Black Bean	Grain	5,999,700
Oat	Grain	3,916,375
Wheat	Grain	3,405,320
Yellow Pea	Grain	1,697,542
Barley	Malted Grain	1,051,653
Barley	Grain	917,354
Pea Bean	Grain	900,000
Kidney Bean	Grain	849,500
Corn	Seed	834,154
Wheat	Flour	685,422
Oat	Seed	551,163
Wild Rice	Grain	428,250
Mustard	Grain	388,460
Navy Bean	Grain	300,000
Ryegrass	Seed	222,001
Cranberry Bean	Grain	129,000
Kentucky Bluegrass	Seed	98,001
Lentil	Grain	89,738
Millet	Grain	83,992
Pink Bean	Grain	60,100
Reed Canarygrass	Seed	40,828
Flax	Grain	14,858
Flax	Meal	1,840
Quaking Aspen	Pelletized Seed	1,001
Almond	Grain	835
Barley	Seed	76
Wheat	Seed	42
Sorghum	Seed	20
White Spruce	Seed	11
Canola	Seed	0.2
Rice	Seed	0.1
	TOTAL	**781,913,993**

Processed Products

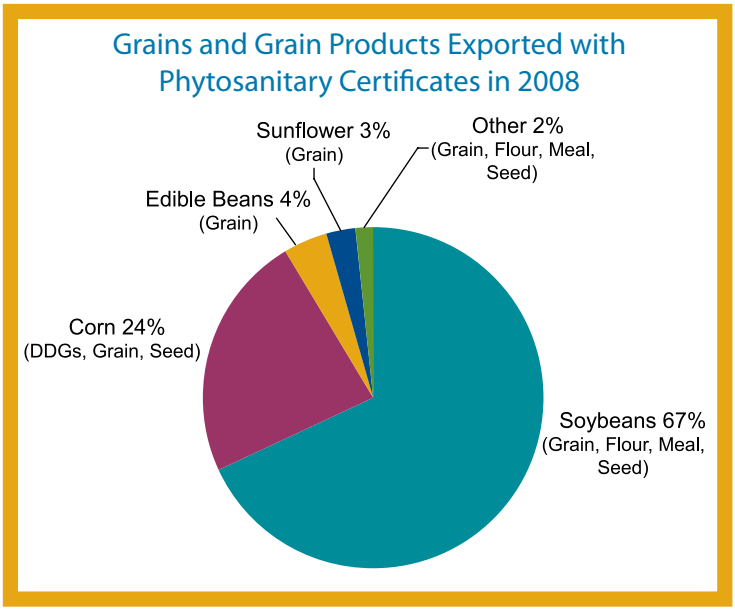
Commodity	Part	Pounds
Wheat	Feed	5,375,000
Sugar Beet	Pulp Shreds	131,760
Wood	Pressure Treated	200
	TOTAL	**5,506,960**

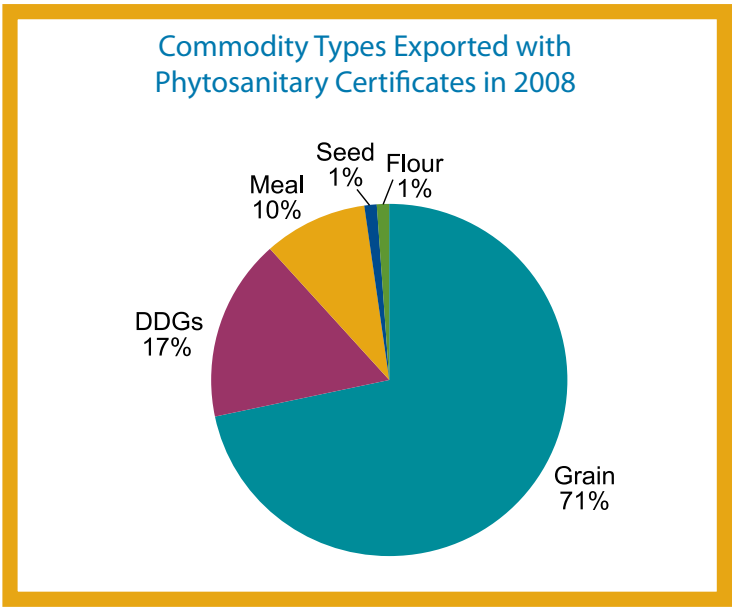
Plants

Commodity	Amount	Units
Plants	1,523,970	Individual
Peat	80,794	Pounds
Lumber	117,142	Board Feet
Logs	250 9,052	Logs + Board Feet

Re-Exports

Commodity	Amount	Units
Oats	432,400	Pounds
Coffee (raw)	8,105	Pounds
Rye Grain	766,624	Pounds
Rye Flour	1,195,000	Pounds
Corn Seed	5	Pounds
Eucalyptus Lumber	23,495	Board Feet





PROGRAM SUMMARY FROM 2008

Nursery Inspection Program

- Nursery inspectors conducted inspections ensuring certification of 8,180 acres of growing nursery stock held by 314 nursery stock growers and 209 dealers along with over 400 dealer inspections. These resulted in 333 violations involving 11,423 plants restricted or destroyed. Twenty-five notices of violation (NOV) were issued, primarily to firms operating without a 2008 nursery certificate.

- The 2008 inspection season started in early March well before most nursery stock began to arrive at Minnesota retail outlets. A reminder of proper care and holding of dormant stock was sent in February to corporate headquarters of several retail chains found in violation in 2007 to head off problems with the viability of packaged perennials and other plants in retail locations.

- Galls on oak trees continue to cause damage in Minnesota nurseries. In recent years galls forming on leaves, buds and stems have caused severe damage, destroying the marketability of oaks for shade tree growers. Most of these galls are caused by cinipid wasps.

- Borers continued to take advantage of trees stressed due to below-normal precipitation from April through September throughout most of the state. The linden borer, *Saperda vestita*, was reported often and found most commonly on little-leaf linden, *Tilia cordata*. Flat-headed borers (*Chrysobotthris* and *Dicerca*) attacked trees further stressed by mechanical injury and/or canker. Oak clearwing borer, *Paranthrene simulans*, and two-lined chestnut borer, *Agrilus bilineatus*, were found on young oak trees in the field and in containers. A clearwing borer, possibly *Synanthedon acerrubri*, was also found on *Acer freemanii*.

- Canker fungi associated with mechanical damage on deciduous trees were commonly reported, often along with borer activity. Some cankers were apparently caused by herbicide application too close to tree stems. Trees with greenish or very thin bark were most often affected.

- Trapping and soil sampling surveys continue to certify Minnesota exporting nurseries free of Japanese beetle (JB), *Popillia japonica*. This year marked the first time adult beetles were found in a Minnesota nursery. This site ships only within the state and is in close proximity to a golf course known to have a beetle population. Treatment is required before stock can move from this site. Reports of beetle activity were heavy in some areas of the Twin Cities.

  Based on the rapid and significant increase in JB, we have opened a dialog with our nursery industry on a proposal to rescind our external JB quarantine. If implemented, the quarantine would be dropped prior to the 2009 growing season.

- Numbers of hosta plants found infected with Hosta Virus Complex (HVC) declined again this year. Growers appear to be cleaning up the problem through virus testing and virus indexing and retailers are more aware of the problem and are choosing suppliers more carefully. When found, virus infected plants are ordered destroyed or held in quarantine pending negative results of laboratory testing. Staff is not aware of any plants removed from sale that tested negative for virus.

- Tobacco rattle virus has been found in bleeding hearts, *Dicentra*, and *Spiraea* has tested positive for spiraea yellow leaf-spot virus both in nurseries and in landscape plantings throughout the state. Negative effects of this *Spiraea* virus other than leaf yellowing have not been established; therefore, no regulatory action has been indicated for infected plants.

- Inspectors attended U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS), Investigative and Enforcement Services (IES) training to better understand evidence collection and documentation in support of IES investigations.

- Plants that are not reliably hardy in Minnesota were found at numerous sites. Lists of marginally hardy plants commonly found in Minnesota retail sites have been developed and are regularly reviewed by experts at the University of Minnesota and the Minnesota Landscape Arboretum. This list is used to inform retailers of marginally hardy plants being offered for sale. Hardiness claims must be supported. There is no violation unless the plants are mislabeled.
- Nursery inspectors conducted inspections of plant species identified by the USDA as high risk for plant pest introduction.
- Nursery inspectors audited certification documents for imported cut Christmas trees to confirm the trees meet all applicable state and federal plant pest quarantines and conducted visual inspections at random.
- Inspection staff, in cooperation with the USDA, administers the federal post-entry quarantine program. Plants imported under post-entry quarantine are required to be maintained in isolation and must be inspected for two years before they can be released. Inspections are done at a large rose growing operation and nursery sites on a regular basis.
- State nursery laws generally require that stock shipped interstate is certified free of injurious plant pests at origin. This is extremely important as pests such as Asian longhorn beetle, emerald ash borer, pine shoot beetle, gypsy moth and Japanese beetle infest parts of many eastern states supplying Minnesota nursery stock dealers. Auditing includes inspectors visiting nursery stock dealers who receive such stock, reviewing shipping documents, confirming the stock came from certified nurseries, providing proof of compliance for regulated plant pests, and inspecting the stock. If serious pest problems are found, treatment may be required or the stock be returned to the shipper.

Export Certification Program

- Over 3,100 various certificates were issued to 140 companies facilitating the export of nearly 800 million pounds of agriculture commodities and 1.5 million plants to 59 countries.
- Staff inspected and certified 4,630 acres over 114 fields to ensure compliance with foreign pest regulations.
- The 2008 Karnal bunt (a fungus disease of wheat) survey was completed in September; Minnesota remains free of Karnal bunt.
- Grain handling facilities shipping corn to west coast states and western Canadian provinces must be certified to comply with exterior quarantines established against European corn borer by those states and provinces and must have their screening facilities checked annually for compliance. Both this certification and the Karnal bunt survey are done by the Seed and Noxious Weed Unit.
- This year the Export Certification Program expanded its ability to help the exporter through new technology. The export program now has its own fax line and e-mail address, allowing customers to communicate directly with program staff. The program also implemented the federal on-line phytosanitary certificate program, PCIT, which allows customers the option to apply on-line, removing the need for MDA staff to transcribe information from paper applications to the computer, and to track the progress of their application. After a certificate is written, the customer can print a copy for their records. The original is printed at the MDA on official certificate paper, signed, and mailed, allowing customers to move forward with the business side of exporting. PCIT also has the capability of allowing staff to track certificates and to print progress reports on demand.

- Cooperative staffing arrangements allow Plant Protection staff to combine regular work with export inspections to reduce the certification costs. Seed and Noxious Weed Unit inspectors took official samples from exporting seed companies for inspection by export staff. Nursery Unit inspectors conducted inspections of nursery stock as well as firewood, logs, lumber, and grain. Seed Potato Certification Program staff issued 42 export certificates for soybean, edible bean, corn, and potato exporters in northwest Minnesota.
- Export Certification Program staff constantly monitor plant pest regulations and update their knowledge base because countries and states often change their entry requirements. Accurate information and education have become equally as important for our customers as the documents themselves.

OUTREACH FROM 2008

Nursery Inspection Program

- Regular discussion and distribution of plant pest information to individual nursery clients during routine site inspections.
- The newly fully staffed nursery inspection unit allows inspectors to spend more time inspecting and conduct better follow-up as needed, resulting in better, more effective service.
- Nursery staff participated in education and outreach display at the Minnesota Nursery and Landscape Association's (MNLA) Green Expo.
- Brochures describing each Plant Protection Division program were printed to provide details of regulatory requirements and services provided for distribution to regulated clients and the general public. The nursery publication is included with nursery applications along with a copy of the "Nursery Law."

Export Certification Program

- The export brochure was distributed to exporters and potential exporters as needed.
- Attended the Green Expo and promoted the program.
- Create handouts for customers to help them set up accounts, navigate, and apply for certification through PCIT.

PROGRAM PLANS FOR 2009

Nursery Inspection Program

- Propose new technical and important legislative language to enable inspectors to better enforce provisions of dormancy and viability of packaged plants in particular.
- Follow-up on repeat violations by retail operations failing to handle packaged plants appropriately.

Export Certification Program

- Fully implement PCIT to generate certificates electronically for all federal certificates issued in the St. Paul office.
- Continue to work with other programs' staff to best utilize staff resources.
- Train all ACOs outside of the St. Paul office to use PCIT.

Emerging Issues and Challenges

- In 2009 the USDA is planning to implement a per certificate surcharge of about $16 to cooperating agencies. Since the program is optional yet must be fee-supported in Minnesota, it is unclear how these costs may impact the program.
- Trading partners of the United States continue to move toward adopting the International Standards for Phytosanitary Measures (ISPM). A major challenge facing states will be to conduct various field and/or facility inspections necessary to achieve certification per the ISPM. In some cases, these are labor intensive or time sensitive. With limited resources, it may be difficult to meet some of these standards.
- Various plant pests continue to be found in the United States, requiring unanticipated surveys to establish "freedom from" status to retain export eligibility (e.g., potato cyst nematode, sudden oak death, emerald ash borer, soybean cyst nematode). Finding funding to meet these needs (conducted through our Invasive Species Exclusion Unit) is a challenge. Yet, without surveys the ISPM standards cannot be met and export options reduced.
- Existing export program staff is aging, reaching retirement eligibility. Backup training has been little discussed but should be.

Potato Inspection *Unit*

OVERVIEW

Mike Horken, Supervisor

The Minnesota Potato Program is headquartered in East Grand Forks (EGF), providing potato inspection as a service to the Minnesota potato industry, overseeing the maintenance of and increase in quality seed stock, and providing assistance in disease and pest control by enforcing the applicable regulations. The USDA/MDA potato inspection program is also in Park Rapids, where 38 temporary staff are hired as Agriculture Technicians for the period of the harvest.

Seed potato inspection and certification is pursuant to MN Statute 21.112 that says the commissioner shall provide the means and direct the work for the inspection, certification, promotion of quality, and creation of demand and sale of seed potatoes

FAST FACTS OF 2008

- Acreage for field inspection fell slightly to around 8,000 acres.
- The seed potato certification database was re-written by staff using Microsoft Access.
- A database for printing Potato Plant Health certificates and phytosanitary certificates was developed by staff, reducing the time spent on writing the certificates and searching for the necessary details.
- The Seed Potato Advisory Committee (members of the Minnesota Certified Seed Potato Growers Association Board) met three times with the Plant Protection Division director or assistant director during the past year to discuss staffing, an increase in fees, and measures to be taken concerning the possible impact the potato cyst nematode (PCN) may have on the potato industry in the state. The board members expressed their concern about the disastrous consequences for an area where such a quarantine nematode is found.
- Field Inspection Fees or Shipping Point Fees were the same as in 2007.

PROGRAM SUMMARY FROM 2008

The potato inspection program is divided into three different activities:

- Inspection of tubers at shipping point for processing.
- Inspection of tubers at shipping point for fresh and seed potatoes.
- Inspection, testing and certification of seed potatoes.

Tuber Inspection of Processing Potatoes

The largest component is the inspection of potatoes for processing. The inspection facility is a separate space, reserved for USDA/MDA, at the potato processing plant in Park Rapids, where samples are submitted for inspection to determine the grade, size, weight, specific gravity, tuber diseases such as rot, and defects such as hollow heart. Trained inspection staff performs the grading. Calculations of grades and sizes are automated.

In 2008 the harvest, which is always dependant on the weather, lasted eight weeks and was inspected by two eight-hour shifts of staff. There is no harvesting activity during rains or when the temperature is above 65°F.

Tuber Inspection of Fresh and Seed Potatoes

Fresh and seed potatoes are inspected by MDA staff under USDA license according to USDA grades, performed when potatoes are packed and shipped. Packing sheds, serviced by the EGF inspection staff, are in EGF and in Polk County. Other potato sheds are inspected by the St. Paul MDA staff.

The samples taken and submitted for total tuber inspection done through the EGF and Park Rapids staff represent about 9.5 million cwt (i.e., 950 million pounds).

Billing for the potato, fresh fruit and vegetable inspections is done from the EGF office.

Seed Potato Certification and Inspection

Applications for seed potato inspection in 2008 were made for 7,973 acres for fields in Lake of the Woods, Roseau, Kittson, Marshall, Polk, Red Lake, Norman, Clay, Wilkin, Crow Wing, Morrison, Wadena, Faribault and Freeborn Counties.

Field Inspections

The seed potato field inspections start in June and continue until mid-September. Each lot (field) is inspected three times during the growing season. The first two inspections are primarily looking for virus diseases, varietal mixture and general growing conditions, while the last inspection is made just before vine kill, at the optimal time for bacterial ring rot expression. A few seed lots are tested in the EGF laboratory for bacterial ring rot as an import requirement for Canada.

A total of 7,156 acres passed inspection in Minnesota. The primary reason for acres being rejected was by infection with Potato Virus Y (PVY) and acres being withdrawn from certification that are destined for processing markets instead. See Table 3 for details.

Post-Harvest Test – Oahu, Hawaii

Since most late primary virus infection is symptomless, tuber samples are planted in November in Hawaii, a reliable and economical location for this post-harvest, or winter, test, and evaluated in January. Most states provide winter testing as part of their certification process. Potential symptomless varieties are tested serologically using ELISA tests for PVY and/or Potato Leaf Roll Virus (PLRV) when plants do not show symptoms. Tables 1 and 2 show the results for 2007 and the previous year.

Table 1. Winter Test Crop Year 2007 by Seed Class

LOT INFORMATION						
Class	**Entered**	**Passed**	**Failed**	**Passed**	**Failed**	**2006 Passing**
N	16	15	1	94%	6%	91%
G1	14	13	1	93%	7%	57%
G2	48	40	8	83%	17%	80%
G3	66	32	34	48%	52%	74%
G4	57	32	25	56%	44%	46%
G5	19	11	8	58%	42%	17%
C	26	4	22	15%	85%	29%
PF1	0	0	0			
PF2	4	3	1	75%	25%	
F1	0	0	0			100%
F2	7	7	0	100%	100%	100%
Totals	**257**	**157**	**100**	**60%**	**40%**	**60%**

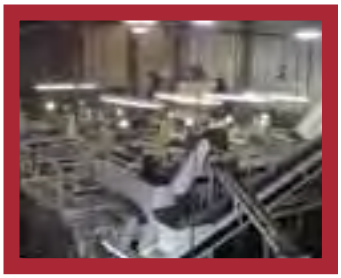


Table 2. Winter Test Crop Year 2007 by Seed Class

ACRES INFORMATION						
Class	**Entered**	**Passed**	**Failed**	**Acres Passed**	**Acres Failed**	**2006 Passing**
N	6.95	6.85	0.10	99%	1%	93%
G1	39.80	36.20	3.60	91%	9%	61%
G2	1,300.90	1,221.00	79.90	94%	6%	92%
G3	1,823.30	527.30	1,296.00	29%	71%	78%
G4	928.50	533.50	395.00	57%	43%	44%
G5	362.50	241.00	121.50	66%	34%	54%
C	558.50	152.00	406.50	27%	73%	30%
PF1						
PF2	4.01	3.01	1.00	75%	25%	
F1						
F2	93.00	93.00	0.00	100%	0%	100%
Totals	**5,117.46**	**2,813.86**	**2,303.60**	**55%**	**45%**	**68%**

Research

The University of Minnesota Potato Breeding and Entomology Programs under the direction of Dr. Christian Thill and Dr. Ted Radcliffe are also conducting research trials in Hawaii, looking at different levels of aphid transmission and new and existing insecticide products and rates. Also, advanced potato line selections are inoculated with Potato Virus Y and Potato Leaf Roll Virus and evaluated for disease expression. Clones that show latent symptoms to diseases are generally not acceptable to the industry.

Potato Virus Y strains

PVY has become a greater problem, partly caused by some of the potato varieties that are grown and are very susceptible to PVY without showing symptoms. In Minnesota PVYn (necrotic on tobacco) has not been confirmed, but some strains, although not PVYn positive, seem to be necrotic on tobacco. New strains, mixtures of PVYn and PVYo, are found in the US and Canada. There are reports from Europe that the intermingling of different strains of PVY, i.e. PVYn and PVYo, has resulted in strains that are more aggressive; potato varieties that were supposed to be resistant to PVY have become more susceptible.

Potato Cyst Nematodes (PCN) in the US

The finds of PCN in Idaho, Quebec and Alberta have mobilized the Plant Protection Division of the MDA. The potato inspection staff in EGF is working closely with staff in St. Paul to take measures to protect the industry and keep markets open through survey and certification of growing areas. Staff collected approximately 5,500 five-pound

samples representing 4,500 certified seed acres and 2,000 commercial acres soil samples from potato fields in 2008 and are examining them for PCN. Two new staff were hired to accommodate the extra workload.

Cooperation with USDA-APHIS

Seed potato certification is a state responsibility. For export purposes, negotiations are hindered by the fact that the country has so many different state seed potato certification programs. Because the blanket quarantine for potatoes will not be maintained by the USDA, security for the potato industry is based on specific quarantine issues at the border. This can only be done when there is a national overview of seed potato certification. To that effect the National Potato Council and the National Potato Board have developed a proposal for a memorandum of understanding (MOU) between the state departments of agriculture and the USDA-APHIS. This has been five years in the making. After Geir Friisoe, Director of the MDA/Plant Protection Division, became chair of the working group of the National Plant Board, states were more involved. Minnesota was one of the first states to sign this MOU, yet to be adopted.

Table 3. Acreages and Varieties Grown

Variety	2008 Acres Entered	2008 Acres Certified	2007 Acres Entered	2007 Acres Certified
Agata	0.01	0.01		
All Blue	2.02	2.02	2.00	2.00
All Red	1.00	1.00	1.00	1.00
Allianz	0.01	0.01		
Anoka	5.00	5.00	4.00	4.00
Anuschka	0.01	0.01	0.01	0.01
Arcona	0.01	0.01		
Astoria			0.02	0.01
Atlantic	121.00	121.00	84.01	84.01
Augusta	0.01	0.01	0.01	0.01
Banana	0.01	0.01	0.01	0.01
Bannock Russet	0.01	0.01	0.01	0.01
Belana			7.01	7.01
Bellarosa	0.01	0.01	0.01	0.01
Blazer Russet	0.01	0.01	0.01	0.01
Caesar			0.01	0.01
CalWhite	64.02	64.02	110.00	110.00
Canela	0.01	0.01	0.01	0.01
Caribe	0.01	0.01	0.01	0.00
Cascade	176.51	176.51	274.01	274.01
Castile			0.01	0.01
Chieftain	286.22	286.22	177.51	177.51
Dakota Crisp	44.00	44.00	30.00	30.00
Dakota Diamond	44.71	44.71	8.21	8.21
Dakota Jewel	0.51	0.51	79.41	79.41
Dakota Pearl	120.02	120.02	159.50	159.50
Dakota Rose	682.61	533.61	623.70	623.70
Early Ohio	0.01	0.01	0.01	0.00
Elfe	15.01	15.01	10.31	10.31
Europrima	0.01	0.01	0.01	0.00
French Fingerling	0.01	0.01	0.01	0.01
Gemchip	0.01	0.01		
Goldrush	18.21	18.21	51.61	51.61
Irish Cobbler	26.04	5.04	31.03	31.03
Ivory Crisp	0.01	0.01	0.01	0.01
Jacqueline Lee	0.01	0.01		
Jelly	0.01	0.01	0.01	0.01
Katahdin	6.00	6.00	7.00	7.00
Kennebec	240.01	240.01	293.20	293.20
La Tona	0.01	0.01	0.01	0.01
Laura	0.01	0.01	0.01	0.01
Mazama	0.01	0.01	0.01	0.01
Milva	31.00	31.00	14.01	14.01
Natasha	0.01	0.01		
Nicola	0.01	0.01	0.01	0.01
Norchip	102.20	102.20	10.61	10.61
Norland, Dark Red	825.09	809.09	777.78	777.78
Norland, Nebraska	116.00	116.00	47.00	47.00

Norland, Red	759.20	759.20	972.49	962.49
NorValley	63.00	63.00	55.00	55.00
Oscar			6.00	6.00
Premier Russet	0.01	0.01	0.01	0.01
Princess	0.01	0.01	0.01	0.01
Purple Peruvian	0.01	0.01		
Ranger Russet	18.00	18.00	230.00	24.00
Red Gold	0.01	0.01	7.01	7.00
Red Lady			2.00	2.00
Red LaSoda	374.24	374.24	263.28	263.28
Red Pontiac	73.16	52.16	182.04	182.04
Rio Grande	0.01	0.01	0.01	0.01
Rosara	0.01	0.01		
Rose Finn Apple	0.01	0.01	0.01	0.01
Russet Burbank	2,432.02	2,432.02	2773.51	2773.51
Russet Norkotah	10.10	10.10	6.08	6.08
Sangre	77.20	77.20	66.00	66.00
Satina	1.01	1.01	0.11	0.11
Shepody	93.01	93.01	105.31	105.31
Silverton	0.01	0.01	0.01	0.01
Snowden			60.00	60.00
Superior	5.00	5.00	11.00	11.00
Tachapi	0.01	0.01	0.02	0.02
Umatilla Russet	754.31	144.31	550.11	150.11
Ute Russet	0.01	0.01	0.01	0.01
Velox			0.01	0.01
Verona	0.01	0.01	0.01	0.01
Viking	43.00	43.00	41.00	41.00
Western Russet			0.01	0.00
Yellow Finn			0.01	0.01
Yukon Gem	0.01	0.01	0.02	0.02
Yukon Gold	208.82	208.82	250.11	250.11
A 093487-3R	0.02	0.02	0.01	0.01
A 88338-1	0.01	0.01		
A 9305-10	0.01	0.01	0.01	0.01
A 95109-1	0.01	0.01	0.01	0.01
AC 87084-3			0.01	0.01
AOA 95154-1	0.01	0.01		
AOND 95249-1Russ	21.51	21.51	3.41	3.41
C095051-7W	0.01	0.01	0.01	0.01
FL Varieties	97.00	97.00	106.90	106.90
MSL 228-1	0.01	0.01		
ND 2225-1R	8.50	8.50	0.89	0.89
ND 8229-3	0.01	0.01		
ND 8555-8R	0.01	0.01		
NDTX 4271-5R	6.71	6.71	0.94	0.94
NDTX 8-731-1R			0.01	0.01
W 2133-1			0.01	0.01
Totals	**7,973.42**	**7,156.42**	**8,496.52**	**7,880.46**

OUTREACH FROM 2008

- The seed potato directory was published in October, distributed in the U.S. and Canada, and displayed at conventions last winter in Grand Forks, ND, Detroit, MI, and Moses Lake, WA.
- Post-harvest test booklet. The results of the post-harvest test are provided to the Northern Plains Potato Growers Association, which distributes it as a booklet to seed potato growers and seed potato certification offices.
- Newsletter. Under the promotion program managed by the Northern Plains Potato Growers Association, the Minnesota seed potato newsletter is distributed annually with material about amended regulations, proposed surveys, and national and international issues.

PROGRAM PLANS FOR 2009

- EGF staff will continue cyst nematode extractions in the EGF facility and plan survey sampling of fields.
- Post-harvest test results will be communicated to the industry by mid-January 2009.
- Applications for field inspection are expected to be sent out in May.
- Although seed potato shipping point inspections have started, an increase in number of inspections begins in December and increases in January; most shipping point inspections for seed potatoes are expected in March.
- Evaluations for crop insurance and the statistical yield survey are expected to be done again this fall and winter.
- The tuber inspection for processing potatoes is requested again and happens during the storage season on an as needed basis until the fall campaign starts again in full force.
- PCN is a concern in the state for potential impact on markets. The potato inspection staff is assisting other Plant Protection Division staff in carrying out the necessary surveys to keep markets open. Absence of soybean cyst nematode (SCN) is also a certification need for potatoes moving to Canada. All growers who market their potatoes to Canada now must have a field survey to certify those acres as "Free of SCN and PCN."

Seed and Noxious Weed *Unit*

OVERVIEW

Stephen Malone, Acting Supervisor

Seed Regulatory Program
To inspect seed marketing facilities, sample seed, review advertisements, and take appropriate enforcement action in order to provide effective and uniform administration of the seed law and rules resulting in protection for consumers within the state and a fair and competitive marketplace for seed labelers to operate in.

Noxious Weed Program
To provide the initial training for county agricultural inspectors and maintain the state's noxious weed lists in order for county and local governments to be able to administer and enforce the noxious weed law resulting in protection for landowners in the state from the spread of noxious weeds.

FAST FACTS FOR 2008

- Completed the training materials for the Association of American Seed Control (AASCO) Officials Handbook on Seed Sampling; applied for copyright protection.
- Concluded two enforcement cases by Steele and Scott counties' attorneys with a fine assessed and a compliance agreement in place for each firm.
- Developed a voluntary compliance agreement with a national outdoor sports equipment retailer that will result in a fundamental change to their operation to ensure future compliance with the Minnesota Seed Law.
- Attended the mid-year and annual meetings of the AASCO in Tampa, Florida, in February and Nashville, Tennessee, in August.
- Attended the annual meeting of the American Society of Agronomy - Crop Science Society of America - Soil Science Society of America in Houston, Texas, in August. Steve Malone was elected Chair-Elect of CSSA seed division.
- Completed training new County Agricultural Inspectors in Brainerd in February.
- Participated in Minnesota Invasive Species Conference in Duluth in October.
- Established a successful educational campaign on wheat seed availability and compliance.
- Represented our unit with a booth and presentation at Farmfest in Redwood County.
- Taught Certified Crop Consultants the difference between a brand and a variety name on September 16, 2008, in Elrosa.
- Continued improvement in compliance with Minnesota's variety labeling and brand identification enforcement effort.
- Maintained successful sampling and inspection effort to encourage, monitor and document compliance with the state seed law.

PROGRAM SUMMARY FROM 2008

Seed Permits

There are 262 permanent seed permit holders, who must pay permit fees based on the total tonnage and kinds of seed sold in the state on a semi-annual basis. Permits are renewed on a calendar-year basis with fees (minimum $50) based on annual dollar amount of seed sales in the state. One hundred fifty-two of these firms are based in Minnesota or report sales through an in-state facility, and 110 firms are out of state but sell a significant amount of seed in Minnesota.

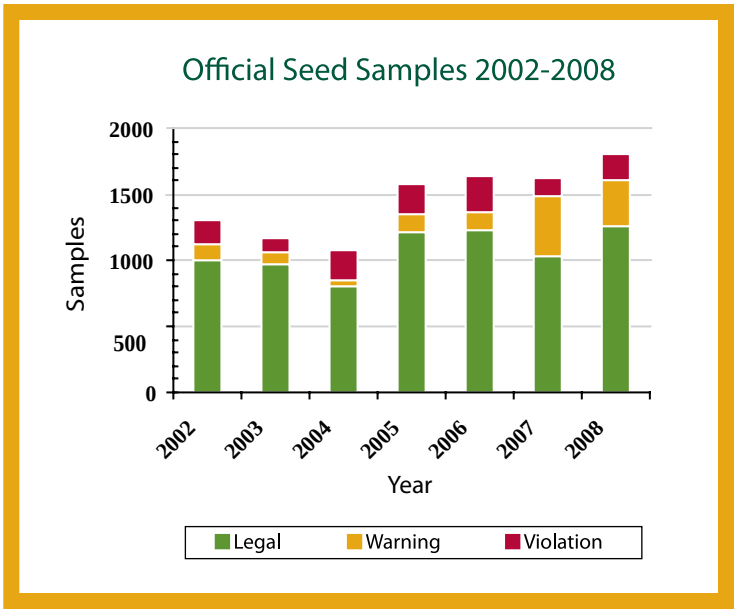
There are 281 annual permit holders, 90 in state and 191 out of state. The majority of these firms are flower and vegetable seed suppliers; others are suppliers of agricultural seed.

Brand Registrations

There were 404 brands (403 for soybeans, 1 for wheat) registered by 34 companies. The number of companies registering brands continues to decrease yearly as they discontinue the practice in favor of simply stating the variety name on the seed label as they are required to do in other states where they do business. Furthermore, consolidation in the seed industry has eliminated some companies that previously registered brands.

Seed Sampling

Unit staff and County Agriculture Inspectors (CAIs) collected 1,793 official seed samples in 2008. This represents a significant increase compared to recent years. Compared to other states in the North Central region, we collect about the same number of samples as Illinois, North Dakota, Kansas and Missouri, about 500 more than Nebraska, about 1,200 more than Wisconsin and Michigan, and about 400 less than Kentucky and Indiana. Most samples were collected as part of routine seed inspection of seed-processing plants, warehouses, or retail facilities. Samples were also collected as part of active investigations or specific complaints.



Violation notices were issued on 192 samples for non-compliance on factors that would be likely to affect the performance of the seed lot compared to label claims. These include out-of-tolerance or below-standard percent germination, percent pure seed, percent inert matter, percent weed seed, excess restricted noxious weeds or the presence of prohibited noxious weeds. In a few cases, apparent violations were issued for severely inadequate or misleading labeling. Warning notices were issued on 349 samples. Warnings were issued primarily for technical labeling violations with no likely affect on seed performance and include items such as incomplete labeler addresses or missing lot numbers. Warnings were also issued for minor discrepancies in percent inert matter, percent other crop seed, or variation in pure seed percentages of mixture components that were technically out of tolerance but lacking evidence of intent to mislead customers, possibly due to sampling bias, and did not significantly compromise quality. Warnings are issued in these situations to make the labeler aware of potential settling or separation problems in their mixing and bagging operations.

Soybeans

Soybeans were a specific point of emphasis in 2008. Five hundred eighty-eight official samples of soybean seed were collected during the spring selling season. Soybeans were emphasized for two reasons. First, the practice of selling soybeans by brand name instead of original variety name is done by almost all companies. Soybeans are sold by actual variety name by a few small companies dealing in public varieties and one major seed company. It was deemed important to have a larger-than-normal representation of this crop in order to monitor compliance with proper identification of brand names and compliance with variety identification. The latter may be accomplished by either stating the variety name on the seed label or by registering the brand name with the department and stating "Variety Not Stated" on the label. Brand/variety compliance in soybeans was approximately 94% based on labels submitted with official samples.

Based on reviews of 2008 seed catalogs and brochures from approximately 50 companies, compliance with brand identification in these types of advertising materials was about 60%. It should be noted that up until 2007 our emphasis had been primarily on label compliance. We have begun reviewing these materials again for the 2009 season. Brand identification on plot signs is behind that on other advertising materials and seems to be influenced by the diligence of a seed company's local reps and cooperation from dealers and co-ops.

A second reason for the emphasis on soybeans was the potential for low-quality seed due to weather conditions during the fall harvest of 2007. Several cycles of wetting and drying conditions had the strong potential to cause seed coat cracking and fungal development which would cause more-rapid-than-normal seed deterioration. Weather problems were especially notable in southwestern Minnesota and eastern South Dakota, major seed production areas for soybean seed sold in the state. Through our official samples, we detected and ordered stop-sales on 11 soybean seed lots for low germination. Furthermore, we are aware that several seed companies voluntarily removed lots from sale due to quality problems, although we do not know exactly how many lots were handled in this manner.

Seed Facility Inspections

Unit staff and CAIs conducted 575 official seed facility inspections. This does not include observational inspections that occur during sampling visits. Official inspections typically involve inspecting seed inventory with labeling and storage requirements. In most cases, staff informed facility management or personnel about correctable violations, which were either corrected while the inspector was present or were corrected and the correction confirmed by follow-up inspection. There was a concentrated effort concerning lawn and turf grass seed sold in local hardware stores, garden centers, and "big box" stores. The most common violation was expired germination test dates, which is easily correctable by having the local manager request updated labels from the seed supplier. Furthermore, St. Paul staff are involved in developing a nationwide stewardship training program designed to educate seed labelers and retailers on compliance with state seed laws as well as proper handling and storage of grass seed. The program committee is chaired by a former grass seed company executive and includes input from state and federal seed control officials, seed companies and trade associations.

Complaint Investigations

The unit received seven seed complaints in 2008:

CASE 1 involved poor germination of sweet corn. The company was cited on one lot for the poor germination and missing required label information on three additional lots. Since the company was located out-of-state and therefore interstate shipment was involved, the case was referred to the Federal Seed Regulatory and Testing Branch for investigation of Federal Seed Act violations. The labeler resolved the state case by supplying the grower with proper labels and replaced the poorly germinating lot.

CASE 2 concerned several lots of glyphosate-tolerant hybrid corn sold in several counties in southern Minnesota. Fields sprayed with glyphosate exhibited weakened or killed corn plants over a large percentage of the field. Fields sprayed with tank-mixed glyphosate appeared to be more severely impacted, and wet weather conditions in the area appeared to further exacerbate the problem. The seed company recalled all remaining portions of hybrids known to have the problem and voluntarily placed under stop-sale some suspected lots in their warehouse facility. In addition, cost of alternative herbicide application and replacement seed was offered to affected growers. The most significantly impacted growers were also offered some compensation for yield loss.

CASE 3 involved a farmer alleging that he was sold seed containing hoary alyssum, a restricted noxious weed. The county agriculture inspector and unit staff inspected the field to confirm the presence of the hoary alyssum. Three seed lots had been purchased in the spring of 2007 to seed a hay/pasture area – oats, alfalfa, and smooth brome. Since the seed was sold in 2007 and no remnant of the lots was available, we reviewed sample records from 2007 to see if we had sampled the lots involved. No hoary alyssum seeds were found in a Minnesota official sample of the oats or in a North Dakota official sample of the alfalfa lot. No state official sample results of the smooth brome could be located. A certified commercial lab report was obtained that indicated no hoary alyssum; it is unlikely that hoary alyssum would be found in smooth brome seed because of different times of seed maturation. It was learned that the seed company that produced the alfalfa had supplied the grower with replacement seed. It was determined that the hoary alyssum seed most likely came from manure application rather than from the purchased seed. A letter was issued to the grower, the

local co-op that handled the transaction, and the three seed companies outlining our conclusion that there was insufficient evidence to prove that the hoary alyssum seed was in the purchased seed lots.

CASE 4 concerned a corn grower in central Minnesota who noticed a two-week difference in tasseling on approximately 30% of his field. Unit staff took tissue and cob samples from the field. Representatives of the seed company also took samples and estimates of the area affected. Electrophoresis results confirmed that at least two different hybrids existed in the field. The labeler confirmed that a pollination problem had apparently occurred resulting in the late off-type in the lot purchased by this grower. This technically meant that the seed was mislabeled because it contained greater than 5% of the off-type. Our conclusions were provided to the labeler and the grower. They were able to come to an agreement on a compensation plan.

CASE 5 was an anonymous complaint concerning an individual allegedly selling seed and performing pesticide applications for restoration projects without proper permitting. Unit staff investigated and found the seed allegations to be unfounded. Information gathered concerning the pesticide application aspect was forwarded to the pesticide unit.

CASE 6 involved a firm selling wildlife food plot seed with inadequate labeling. This was considered a complaint investigation because it was reported by another seed firm. The plot seed firm also did not have a seed permit. The firm applied for and was issued a permit and received instruction from unit staff on proper labeling. Their remaining 2008 inventory was depleted, and lots prepared for 2009 will be closely monitored for compliance.

CASE 7 involves a native wetland restoration project planted in November 2007. Plan specifications called for a specific mixture to be installed by a subcontractor. However, field surveys conducted in the summer and fall of 2008 revealed that the site had few if any of the desired native species, but was instead dominated by alfalfa and alsike clover. Samples of a small remnant of the seed that supposedly was planted did not match the specifications or the labels supplied by the contractor. Seed was purchased from a firm with a history of serious violations, and some additional seed may have been purchased from another firm. Because of the complexity of the case, involving several seed firms, the subcontractor, general contractor, and a state agency, this case has required multiple interviews with several of the key players and will continue into 2009.

Cooperative Efforts

- Heading into the 2008 planting season, there was concern that wheat seed might be in short supply which would increase the potential for illegal seed sales, especially the practice of selling stored grain as seed and the unauthorized sale of varieties protected by the Plant Variety Protection Act (PVP). Unit staff met in early January with Minnesota Crop Improvement Association and counterparts from the North Dakota State Seed Department to develop an educational effort to limit the impact this might have on growers. It was determined that plenty of planting seed should be available but that seed of some of the more popular varieties might be hard to find in some areas. Posters and brochures explaining the PVP regulations, state seed law requirements, and sources of information on seed availability were developed and distributed to elevators, coops, and other locations in both states by unit staff, CAIs, and University of Minnesota Extension personnel. Press releases and radio spots were distributed to local media outlets. The response to the publicity campaign was very positive from growers and legitimate seed dealers, and we received no complaints from growers concerning poor quality wheat seed.
- The final version the Association of American Seed Control Officials (AASCO) seed sampling handbook was delivered to the association at the annual meeting in July held in Nashville, Tennessee. The association membership voted to approve the training materials and their use. Copyright protection has been applied for by AASCO to prevent unauthorized changes being made to the materials and because the handbook upon

which the training is based is copyright protected. The handbook and training materials have the potential to standardize the sampling procedures followed by both public and private entities in the U.S. and thereby significantly reduce the variability and errors currently being observed in seed sample test results.

- The unit submitted eight cases involving 14 seed lots to the Federal Seed Regulatory & Testing Branch for investigation of possible violations of the Federal Seed Act (FSA). In each case, the seed lot was shipped into Minnesota from another state and had significant labeling deficiencies or out-of-tolerance quality factors. Four of the cases led to a confirmation of an FSA violation. One case was determined to be out of Federal jurisdiction because it had been shipped directly from Canada into Minnesota. Three separate cases involving three lots from one seed company are being compiled into a larger Federal case including referrals from several other states. The most recent case submitted involving three lots of roadside mixtures is pending completion of the federal investigation.

Noxious Weed Law

The draft legislation, developed by a committee of various stakeholders, was delivered to a state representative for consideration. Since it was not acted upon by the legislature in 2008, it has been submitted as a proposed department initiative for the 2009 session.

Advisory Groups and Committees - Seed Program Advisory Group (SPAG)

The Seed Program Advisory Group met on March 13, August 14, and December 18, 2008. Agenda topics included:

- Program update including a year-to-date report of activities and budget information;
- Labeling brand and variety
- National issues involving seed regulation.

OUTREACH FROM 2008

- The unit developed a public awareness campaign concerning the wheat issue discussed above. In July, a press release describing how to file a seed complaint and the department's role in investigating complaints was issued and ran in several local media markets. In one of the complaint cases, this publicity was cited as a factor in the decision to contact the department. It is not known for certain whether this influenced any of the others.
- The unit organized required training for eight new CAIs from held February 4-5 in Baxter. Unit staff presented training sessions on the CAI's role in enforcement of the seed law and noxious weed law.
- Unit staff manned the MDA booth at Farmfest in August at Gilfilian Estate.
- For the first time in several years, staff operated an information booth at the Minnesota Crop Production Retailers Association trade show at the Minneapolis Convention Center, December 16-18.
- Unit fact sheets underwent major revisions in 2007; some minor edits were incorporated in 2008. Fact sheets are distributed to regulated clientele, seed customers, and the public as needed. They are quite useful as educational tools on specific topics such as labeling requirements for flower and vegetable seeds, labeling native seed, and requirements for selling seed in Minnesota.
- The unit's web page on the MDA site was updated to include all the new fact sheets, a copy of the seed law, and unit field staffs' contact information and map showing their areas of responsibility. Web page text was updated to provide a brief description of relevant topic with highlighted links to the appropriate document or forms.
- Presentations. The unit made day-long or longer presentations at four different locations throughout the state.

PROGRAM PLANS FOR 2009

- Plan and initiate a pilot project to demonstrate the feasibility of a seed law compliance effort focused on client compliance audits similar in concept to the International Organization of Standards' and USDA's "Process Verified Program."
- Update Unit's "Standard Operating Procedures" manual for seed law enforcement to reflect any needed changes brought about by the development of the division's "Investigative Guidelines."
- Continue the current seed law enforcement and compliance program at current levels.
- Begin planning for a national inspector training seminar for both new and existing inspectors with each having a separate curriculum, to be held in Minnesota and sponsored by the AASCO, AAFCO, and AAPFCO in either 2009 or 2010. Currently these seminars are held yearly in one of four regions of the US for new inspectors only.

ADMINISTRATION UNIT

Geir Friisoe, Director
Position: 2005-present, Plant Protection Division Director

Chuck Dryke, Assistant Director
Position: 2006-present, Plant Protection Division Assistant Director

Judy Wickham
Position: Office Manager

Lu Schmidtke
Position: 2005-present, OAS Principal
Previous experience: 1986-2005, Minnesota State Colleges and Universities, Administration, and Employment and Economic Development departments
Education: 3 years coursework toward B.S. in Horticulture; B.S., Medical Technology; A.A. Medical Secretarial

FRUIT AND VEGETABLE UNIT

Harley Olinske, Jr., Supervisor
Position: 2003-present, Fruit and Vegetable Inspection Unit Supervisor
Previous experience: 1988-2003, USDA Market Inspection Supervisor for Milwaukee, WI market office; 1985-1988, Inspector for the States of Wisconsin, North Dakota, Kentucky, and Florida

Abdel Boudlali
Position: 1991-present, Fruit and Vegetable Inspector
Previous experience: 3 years graduate and research in plant pathology
Education: B.S., Plant Protection

Alan Peterson
Position: 1978-present, Fruit and Vegetable Inspector
Education: B.A., Biology

Stephen Talley
Position: 1993-present, Fruit and Vegetable Inspector
Previous experience: 1983-1993, Inspector for the State of North Dakota and the USDA Chicago Market Office
Education: B.S., Agronomy

GYPSY MOTH UNIT

Lucia Hunt, Supervisor
Position: Supervise the GM Unit staff; coordinate statewide survey information and GIS resources; cooperate with regional federal and state partners.
Previous experience: 2003-2007, Ohio Dept. of Agriculture, Emerald Ash Borer Program Coordinator
Education: BS in Entomology and Conservation Biology, UW-Madison; AA in Geographic Information Systems, CVTC

Erich Borchardt
Position: Research Analyst Specialist (GIS)
Previous experience: 2000-2001, Metropolitan Council - GIS Tech
Education: BA in Geography and Anthropology, St. Cloud State University

Alison Boutin
Position: Research Analyst Intermediate (GIS)
Previous experience: University of Massachusetts-Environmental Engineering, Research Fellow, 2004-2006
Education: Geography Graduate Level Courses, University of Massachusetts; BS in Geography and Botany, Miami University, Oxford, OH

Philippa Stelter
Position: Office Administration Specialist through the fall
Previous experience: 2006-2007, OAS, Pollution Control Agency
Education: BA in English and History and a French Minor, College of St. Catherine

Kimberly Thielen Cremers
Position: Gypsy Moth Trapping Coordinator
Previous experience: 2001-2007, Gypsy Moth Program Team Leader
Education: GIS Graduate level courses, St. Cloud State University; BS in Biology-Zoology emphasis, St. Cloud State University

Terry Varing
Position: Office Administration Specialist since the fall
Previous experience: 2000-2008, Lab Operations Unit

INVASIVE SPECIES EXCLUSION UNIT

Teresa McDill, Supervisor
Position: 2004-present, Invasive Species Unit Supervisor
Previous experience: 2000-2004 Project Manager, MDA Ag Voluntary Investigation & Cleanup; 1990-1999 Project Manager, MDA Comprehensive Site Cleanups; 1988-1990 Pesticide Regulatory Specialist, MDA Enforcement Unit; 1985-1988 Soil Scientist, MN/DOT
Education: BS in Rangeland Ecology, University of Wyoming, 1984

Mark Abrahamson
Position: Lead Scientist, Entomology
Previous experience: 1999-present, MDA
Education: MS in Entomology, SUNY-Syracuse, 1997; BS in Biology, UW-Eau Claire, 1994

Brian Anderson
Position: Field Surveillance, South Central

Mary Engelhard
Position: Field Surveillance, Lead Worker

Nathan Goodell
Position: 1997-present, Field Surveillance, North East
Previous experience: 1979-1980 and 1997-2007, MDA Grain Inspection; 1998 National Forest Service forestry technician; MN DNR Forestry

Ardell Knudsvig
Position: Field Surveillance, Northwest

Robert Koch
Position: 2006-present, Lead Scientist, Pest Survey
Previous Experience: 2005–2006 Postdoctoral Research Associate, U of MN; 2000-2005 Graduate Research Assistant, U of MN
Education: Ph.D. in Entomology, U of MN, 2005; B.A. in Biology, St. John's University, 1999

Kathy Kromroy
Position: 2005-present, Lead Scientist, Plant Pathology
Previous Experience: 1999-2005, Post-Doctoral Plant Pathologist, USDA Forest Service; 1978-1998, Research Assistant, Res. Fellow, U of MN
Education: Ph.D. in Plant Pathology, U of MN, 1999; M.S. in Plant Pathology, U of MN, 1982

Rich Kvols
Position: Field Surveillance, West Central/Southwest

Roy Mayeda
Position: Field Surveillance, West Central
Education: BS in Soil Science, University of Wyoming, 1984

Janet Nelson
Position: 2007-present, Office and Administrative Specialist Senior
Previous experience: 1975-present, MDA

Daniel Pasche
Position: Field Surveillance, Lead Worker (2005-present, State Apiarist and 2006-present, Firewood inspection coordinator)
Previous experience: 1989-2004 MDA Apiary Inspector; 1982-1990 Self-employed

Randy Renken
Position: Field Surveillance, Southeast

Tina Seeland
Position: 2007-present, Lead Scientist, Laboratory
Previous experience: 2007, MDA Plant Health Specialist; 2006-2007, Asst. Scientist – U of MN, Dept. of Entomology; 2004-2006, Biological Technician – Microbiology, USDA Forest Service; 1999-2004, Jr. Scientist – U of MN, Dept. of Plant Pathology
Education: B.S. Plant Biology, U of MN

Cindy Sparrow
Position: Field Surveillance, South Central

Miranda Trebesch
Position: Field Surveillance, Southwest

Blane White
Position: Lead Scientist Weeds (2004-present, Agricultural Certification Official & 1997-present, Wildlife Damage Compensation program coordinator)
Previous experience: 2004-2006, Gypsy moth trapping coordinator; 1989-2004, MDA State Apiary Inspector; 1988, MDA Summer Apiary Inspector; 1985-1989, College Laboratory Assistant; & 1984-1989, Instructor General Biology & Microbiology Laboratory Classes, Anoka Ramsey Community College

Jerald Yourczek
Position: Field Surveillance, Central

Temporary staff

Bob Bade . . . . . Field Surveillance
Nick Boman . . . . . Field Surveillance
Katie Brown . . . . . Field Surveillance
Justin Conklin . . . . . Field Surveillance
Carrie Graf . . . . . Field Surveillance
Heidi Hagman . . . . . Field Surveillance
Jill Hergerg . . . . . Field Surveillance
Keri Hull . . . . . Field Surveillance
Peggy Hurley . . . . . Field Surveillance
Bennet Jordan . . . . . Field Surveillance
Gene Kern . . . . . Field Surveillance
Tiffany Pahs . . . . . Field Surveillance, Lead Worker
Jesse Roberts . . . . . Field Surveillance
Renae Smith . . . . . Field Surveillance
Michael Wadman . . . . . Field Surveillance
David Wray . . . . . Field Surveillance

NURSERY INSPECTION & EXPORT CERTIFICATION UNIT

Mark Schreiber, Supervisor
Position: 2000-present, Nursery Inspection & Export Certification Unit Supervisor
Previous experience: 1986-2000, Plant Protection Program Supervisor; 1983-86, Plant Health Specialist; 1979-83, Technical Service Program Lead Worker/Supervisor Plant Health Specialist; 1978-79, Minnesota Shade Tree Program Education: M.S., Plant Pathology, University of Minnesota; B.A., Biology, Hamline University

Peter M. Dziuk
Position: 2004-present, Plant Health Specialist, Nursery Inspector
Previous experience: 2001-2004, Exotic Species Program Coordinator & State CAPS Program Coordinator; 1996-2001, Gypsy Moth Program Coordinator; 1992-1996, Tree Inspector Certification Coordinator; 1987-1989, Plant Propagator, Bailey Nurseries, Inc.; 1978-1986, Owner, Crestwood Nursery and Landscaping; 1976-1978, Botanical Collection Specialist, MN Zoological Gardens; 1973-1976, Greenhouse Asst., U of MN Horticultural Greenhouse
Education: B.S. Horticulture, U of MN; B.S. Biology, U of WI-River Falls; Secondary Education Certificate, U of W-River Falls

Lorraine Englund
Position: 2001-present, Office Administrative Specialist, Intermediate.

Previous experience: 1990-2001, Department of Transportation; 1987-89, Clerk II Lead Worker; 1983-87, Clerk I with the Minnesota Department of Revenue

Deborah Davis Hudak
Position: 2006-present, Plant Health Specialist, Nursery Inspector, based in Bemidji

Previous experience: DNR Parks Division; Worked in private industry, responsible for inspection, certification and sale of plant material; and overseeing a NASA grant program at Bemidji State University.

Education: B.S., Environmental Science; B.A., English

James J. Jacobs
Position: 2008-present, Plant Health Specialist, Nursery Inspector

Previous experience: Graduate research assistant at the U of MN; technician in the Plant Disease Clinic, U of MN

Education: B.S., Forestry; M.S., Plant Pathology, both from the U of MN

Steven Shimek
Position: 1988-present, Coordinator of Nursery Inspection and Certification Program

Previous experience: 1986-1988, Plant Health Specialist with Shade Tree Program.

Education: B.S. Forestry and Resource Management, U of WI-Stevens Point

David M. Simmons
Position: 2001-present, Plant Health Specialist, Nursery Inspector, based at Staples with an office at the Central Lakes College, Ag Center.

Previous experience: 1998, BASF Chemical Co.; 1994-1997, Crop Consultant, Harvest States, Cenex Land O' Lakes Cooperative; 1988-1994, Crop Management Specialist, Farmland Industries, Inc.

Education: B.S., Entomology, NDSU; A.A.S., Crop Science, U of MN-Crookston

Stephanie Visker
Position: 2008-present, Export Certification Program Coordinator

Previous experience: 2007, Emerald Ash Borer Survey Coordinator, MDA; 2005-2006, Seasonal, Invasive Species Trapper, MDA; 2002-2006, Long-Term Substitute Science Teacher and Daily Substitute Teacher; 2003-2004; Science Teacher, ISD 281

Education: B.A., Biology, St. Olaf College, Teaching Certification - General Science, grades 5-8, Life Science, grade 9-12

Lola Youngblom
Position: 2000-present, Plant Health Specialist, Nursery Inspector, based in Nicollet

Previous experience: summer seasonal pest surveyor for the MDA for 11 seasons; 10 years, Minnesota Zoo as a horticulturalist and horticulture supervisor.

Education: B.S. in Horticulture, U of MN

POTATO INSPECTION UNIT, East Grand Forks

Mike Horken, Program Supervisor/Shipping Point Supervisor
Jackie Anderson, Office/Administrative Specialist, Intermediate
Darrell Anderson, Seed Potato Specialist
Michael Bothum, Plant Industry Inspector 2
Eric Byre, Plant Industry Inspector 1
James Horton, Plant Industry Inspector 2
Perry Paschke, Plant Industry Inspector 2
Cheryl Schmitz, Plant Industry Inspector 1
Charles Steinke, Plant Industry Inspector 2

SEED AND NOXIOUS WEED UNIT

Charles Dale, Supervisor
Position: 1978-present, Seed & Weed Unit Supervisor

Education: B.S. in Agronomy and Soil Science, U of MN

Kevin Ballman
Position: 2000-present, Agricultural Specialist

Previous experience: Agricultural Education Teacher, Maple River and Gibbon/Fairfax/Winthrop Schools; Turf Management, Turf Tech; Crop Management Specialist, Farmland Industries

Education: B.S. in Agricultural Education and Agronomy, University of Wisconsin River Falls

Robbin Lucker
Position: 1979-present, Office/Administrative Specialist Sr

Education: St. Paul Vocational/Technical Institute

Stephen Malone
Position: 2007-present, Agricultural Consultant

Previous experience: Postdoctoral Research Associate, Purdue University and USDA-ARS; Visiting Assistant Professor of Biology, Georgia Southern University; Assistant Professor of Biology, University of West Alabama; Development Scientist, RiceTec, Inc.; Seed Treatment Technology Manager, Syngenta Crop Protection

Education: B.S. in Agronomy, University of Arkansas, M.S. in Crop Science, University of Arkansas; Ph.D. in Crop Production and Physiology, Iowa State University

Duane Munter
Position: 1984-present, Agricultural Advisor

Previous experience: MDA Regulatory Specialist; General Manager, Fosston Farmers Cooperative Elevator

Education: Graduate, Fosston High School

Don Opdahl
Position: 1991-present, Agricultural Advisor

Previous experience: Manager, Agronomy Department, Prairie Land Cooperative; Field Agronomist, Land O'Lakes; Crop Consultant, Central Minnesota

Education: B.S. in Agriculture, North Dakota State University

Jeff Siira
Position: 1995-present, Agricultural Advisor

Previous experience: MDA Regulatory Specialist; Research Technician, Pioneer Hybrid International

Education: B. S. in Crop and Weed Science, North Dakota State University