

Annual Report

2005



Plant Protection Division

Invasive Species Unit

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Introduction

The Plant Protection Law (Minnesota Statutes Chapter 18G.12, subd.5) requires reporting on harmful species to the chairs of legislative committees having jurisdiction over environmental and agricultural resource issues. The following is the annual report of the Minnesota Department of Agriculture's (MDA) Invasive Species Unit accomplishments and activities during 2005.



Expenditures for the Invasive Species Unit for Fiscal Year 2005

Base funding for the MDA Invasive Species Unit is derived from general fund dollars. Additional funding is received from federal sources such as the United States Department of Agriculture (USDA) Cooperative Agricultural Pest Survey Program, the USDA Forest Service, and the gypsy moth Slow the Spread Foundation. Because this funding may not be received every year it is not represented in the following table. The majority of the general fund expenditures for management of invasive species are used for program coordination, survey activities and detection efforts across the state. The following information is taken from Fiscal Year 2005.

Fiscal Year 2005

Management (Program Coordination)

Salary and benefits	\$	227,327.28	
Training	\$	1,498.00	
Subtotal			\$228,825.28

Survey and Inspection (Pest Detection)

Salary and benefits	\$	214,061.68	
Materials and travel	\$	111,109.54	
Equipment	\$	10,162.80	
Subtotal			\$335,334.02

Outreach and Education

Salary and benefits	\$	44,761.71	
Printing, mailing, materials, etc.	\$	34,403.07	
Subtotal			\$79,164.78

Administration

Salary and benefits	\$	23,080.99	
Computers	\$	4,350.80	
Rent and other operating costs	\$	48,566.40	
Subtotal			\$75,998.19

Total **\$719,322.27**

Accomplishments in 2005



Hosta

New Plant Protection Division

Invasive exotic pests have been a problem for centuries. However, with the greatly increased movement of people and goods across state and national borders, this threat is growing at an alarming rate. According to a study by Cornell University, invading non-indigenous species in the United States (US) cause major environmental damages and losses adding up to more than \$138 billion per year. There are nearly 50,000 foreign species in the US and every year more arrive in wood shipping crates, plant materials, firewood and other products.

Invasive species such as gypsy moth, soybean rust and emerald ash borer are considered some of the most serious threats facing Minnesota's crops, forests and landscape plants. The MDA plays a significant role in monitoring for invasive terrestrial pests.

For years, the Plant Protection section of the Agronomy and Plant Protection Division has worked hard with our public and private sector partners to prevent the introduction of these pests and to find and eradicate them when they do show up. So far, we have managed to delay the full-scale invasion of gypsy moths, contain and eradicate a serious fungal disease that arrived on ornamental plants, and helped farmers prepare to fight soybean rust. However, the threats posed by these invasive species increase as time passes.

To help position the MDA to meet this growing challenge, Commissioner Gene Hugoson created a new Plant Protection division split effective on December 28, 2005. The Seed Potato Certification and Fruit and Vegetable Certification programs were also brought into this new division. The move will allow more efficient and effective use of resources, staff and equipment. Geir Friisoe will serve as Interim Director, and Assistant Commissioner Jim Boerboom will oversee the division.

What's at stake?

Minnesota's burgeoning global economy has opened an international expressway for harmful plants, agricultural pests and invasive species to enter the state. With more than 400 million tons of goods now moving through the state each year, invasive species will find it easier than ever to cross our borders. More than \$8 billion in agricultural commodities and nearly \$7 billion in forest products are at risk.

To protect our food crops, natural resources, and biosecurity, the MDA Invasive Species Unit is empowered to eradicate, prevent or otherwise regulate the introduction or establishment of plant pests that threaten Minnesota's agricultural, forest or horticultural interests or the general ecological quality of the state. This is accomplished through several methods:

- pest risk assessment
- survey and detection
- regulation and enforcement
- education

Pest risk assessments

The MDA, in cooperation with the USDA Forest Service (FS), began the development of pest risk assessments to evaluate potential new invasive species threats to Minnesota's agriculture, natural resources and urban environments. The assessment process involves identifying the likelihood of introduction, establishment, spread and economic impact potential to the state. The risk assessments provide science-based evaluations for regulatory decisions, and will be used to identify and prioritize pest entry pathways in Minnesota and provide accurate information for developing pest surveys.



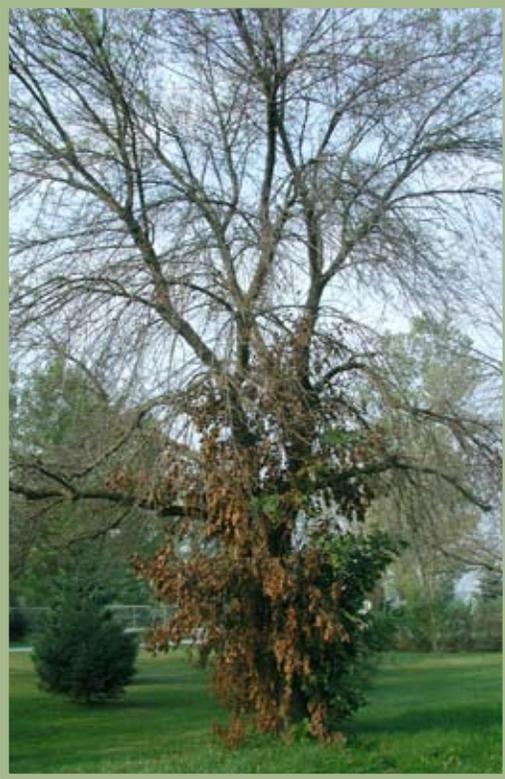
Emerald ash borer larvae

The initial pest risk assessment was for Siberian moth, considered the most important conifer pest in northern Asia. The assessment concluded that the high risks associated with Siberian moth introduction in Minnesota are due to climatic suitability and related likelihood of its establishment, and because of its potential to damage state conifer resources. It is thought that damage by this pest could far surpass that caused by gypsy moth. The MDA is currently evaluating possible pathways of entry and high-risk locations for future surveys of this potential pest.

Pest risk assessments are an important component of the MDA's developing strategy for a coordinated statewide invasive species management program. This proactive approach will help in the early detection of possible new pests that could cause significant economic damage to Minnesota resources. Species slated for pest risk assessments in the next year include emerald ash borer, garlic mustard, and oak ambrosia beetle.

Survey and Detection

State's first emerald ash borer detection tree survey



Emerald ash borer damage in Detroit

Invasive Species Unit staff completed the MDA's first emerald ash borer detection tree survey, supported by a cooperative agreement from the USDA FS. Emerald ash borer (EAB) is a non-native insect that was discovered near Detroit, Michigan in 2002, probably arriving with solid wood packing material shipped from Asia. Over 15 million ash trees in Michigan, Ohio, Indiana and southwestern Ontario have been destroyed by EAB since its arrival.

All native ash trees are susceptible to EAB infestation. Ash is planted extensively in urban areas and is one of the most common hardwood trees in Minnesota forests. Early detection and immediate eradication of EAB introductions are the best way to prevent serious economic and ecological damage to our natural resources.

In 2004, the MDA conducted a visual survey of 32,500 ash trees across the state, with no sign of EAB. In 2005, the MDA entered into an agreement with the USDA FS to conduct a survey using detection trees, currently the only EAB survey tool available. Following protocol established by the USDA FS,

54 ash trees were girdled in order to stress them, making them more attractive to adult EAB. MDA staff was assisted in the survey by Anoka County Department of Parks and Recreation, Carver County Parks, City of Duluth, City of Rochester, Minneapolis Parks and Recreation Board, Minnesota Department of Transportation, Ramsey County Parks and Recreation, Three Rivers Park District and Washington County Parks Division.

Detection trees were located in urban areas considered to be at high risk for EAB introduction in the seven-county metro area, Duluth and Rochester. In October, 2005, cooperators helped fell and peel the girdled trees. No evidence of EAB was found. Using the same methods, the Minnesota Department of Natural Resources conducted surveys in state parks around the state and also found no evidence of EAB. With one year of experience behind us, MDA hopes to repeat this proactive survey in 2006.

Exotic bark beetle survey

The survey was conducted as part of the USDA's Cooperative Agricultural Pest Survey program, designed for early detection of and rapid response to non-native species of bark and wood-boring beetles. Their entry into North America has the potential to cause widespread damage to trees both in forested and urban settings. Some species are already established in the continental US or in Canada but are not yet known to occur in Minnesota.

The target species surveyed for included banded elm bark beetle, European spruce bark beetle, Douglas-fir beetle, great spruce bark beetle, pine shoot beetle and six-spined spruce beetle. Possible pathways of entry or "hot spots" surveyed for these exotics included imported stone and granite dealers, warehouse facilities, container traffic marshalling yards, railroad yards and green waste sites. This year only the exotic banded elm bark beetle (12 specimens) was found among the native beetles in the traps, and is not currently a regulated pest.

Gypsy moth survey

The MDA's gypsy moth traps caught a record number of gypsy moths in this year, mainly along the North Shore of Lake Superior. The results raise new concerns about the possible spread of this destructive tree pest in Minnesota.

MDA's gypsy moth trapping program is designed to detect isolated populations of the moth so treatments can occur before the pests become widely established. In the past, annual numbers of moths fluctuated between 200 and 400, with a high of 953 trapped in 1998. But in 2005, more than 1,300 moths were trapped. Most of the moths captured were in Minnesota's Arrowhead region. This increase along the North Shore is an unexpected development, as increased moth numbers have been more common in the Twin Cities or in southern Minnesota. MDA is working closely with officials from the USDA FS, Minnesota Department of Natural Resources and the Grand Portage Reservation to address the dramatic increase in moths in Cook County. No decision on treatment efforts will be made until an environmental assessment is complete.

A localized gypsy moth infestation was detected this year in a 58-acre area of Brooklyn Park in Hennepin County. Moths were first trapped there in 2003, and in 2005 an egg mass was discovered in the same area. The MDA and the City of Brooklyn Park are working together to eliminate the moths before they become established in the area. MDA held a public meeting for residents to discuss why the gypsy moth is a threat to the community, and outlined a treatment for 2006.



Gypsy moth egg mass survey



Soybean rust

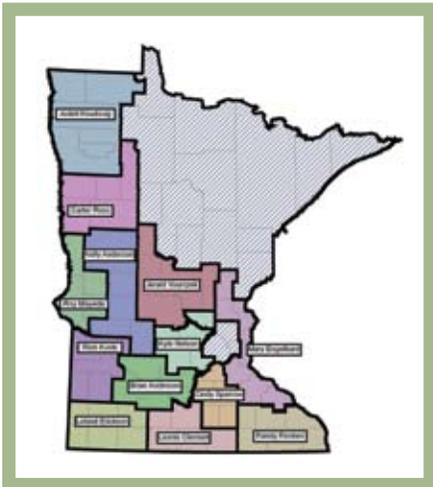
Plant Pest Survey program

During 2005, the Plant Pest Survey program was added to the Plant Protection section. The program's mission is to provide current information on the abundance and distribution of insect, disease and weed pests of Minnesota field crops. Regional trends are estimated from local data with the goal of reporting current pest conditions. During the growing season, surveys are conducted in five agronomic crops: corn, soybeans, small grains, alfalfa and sunflowers. Survey personnel select fields of each crop and in-field counts are taken using standard sampling procedures for each pest. All counties with significant acres of the target crops are surveyed approximately every week.

During 2005, 13 field staff (see map, lower left) sampled a total of 5634 fields (574 alfalfa, 2096 corn, 2211 soybean, 698 small grains and 55 sunflower). Over 50 insect species were inspected for across the five crops. These included serious endemic pests like soybean aphid (soybeans), corn rootworm (corn) and true armyworm (small grains); and also insects not yet known to occur in Minnesota such as brown marmorated stink bug and soybean pod borer (soybeans).

Survey staff also inspected for a range of disease symptoms in soybeans and small grains throughout the summer. As with insects, the symptoms inspected for included diseases commonly found in Minnesota, such as wheat leaf rust (wheat) and *Phytophthora* spp. (soybeans), and diseases not yet known to occur in Minnesota such as soybean rust (soybeans).

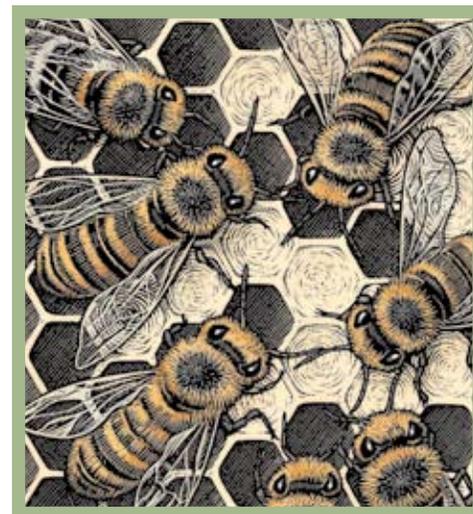
An annual agronomic weed survey has been conducted by survey staff since 2001. This survey is conducted in corn and soybean fields to track the abundance and distribution of common agricultural weeds throughout the state. Weeds are surveyed near the end of the growing season (after late-season herbicide applications) to look for weeds that will impact the seed bank. In 2005, over 70 different weed species were identified in crop fields.



Plant pest survey locations

Apiary inspection program

Minnesota is the sixth largest producer of honey in the US, producing 10.1 million pounds of honey valued at \$10.5 million. MDA records currently show 446 beekeepers managing 110,000 colonies of bees in the state. Beekeepers currently pay a registration fee of \$25 for 1 to 49 colonies and \$50 for 50 or more colonies. The Apiary law focuses on protecting honey bees from pests and diseases most of which are invasive species.



Seventy-eight percent of the beekeepers are hobbyists, managing one to forty-nine colonies of bees. Their bees provide valuable pollination, often in areas where commercial beekeepers don't keep them. Another eight percent of beekeepers are sideline beekeepers who keep from 50 to 299 colonies. The remaining beekeepers, 14 percent, keep 300 to 8000 colonies of bees. Approximately fifty of these are migratory beekeepers who take their bees to other states during the winter for pollination or to propagate new colonies. The bees travel to states including California, Texas, Mississippi, Louisiana and Oklahoma, often pollinating such valuable crops as almonds and oranges.

Type of Beekeeper	Number of Beekeepers	Number of colonies	Average number of colonies
Total hobby (1-49 colonies)	346	2,763	7.99
Sideline (50-299 colonies)	34	3,855	113.38
Commercial (300+ colonies)	66	103,023	1,560.95
Total beekeepers & hives	446	109,641	245.83
Beekeepers who live in MN	440	101,635	230.99
Beekeepers from other states	6	8,006	1,334.33
Percentage from out of state	1.36%	7.88%	

Apiary inspection program, continued



Counties where small hive beetle was detected

General survey inspections

Survey inspections for American Foulbrood disease (AFB) and small hive beetle began in early June, 2005. Africanized honey bee is also of concern but is only tested for if bees seem exceptionally difficult to handle. Survey inspections were mainly conducted on local, non-migratory beekeepers and interstate beekeepers that are inspected in other states.

Small hive beetle is an invasive species that eats honey and bee eggs in the hive. It was discovered during an inspection of an interstate beekeeper that had been inspected for interstate movement in another state before returning to Minnesota. Treatment was ordered and completed.

AFB is a very infectious and damaging disease of bee larvae, and appears to be a growing problem in northern Minnesota. The recent FDA approval of using Tylosin, an antibiotic, for the treatment of AFB should give some relief. No evidence of Africanized honey bees was found.

Interstate inspections

Most interstate health inspections are performed in September and October after honey has been removed from the hives. More than 42,000 individual colonies were inspected. Small hive beetle was found in 124 hives. Sixty colonies were infected with AFB. Five beekeepers were found to have small hive beetle during interstate inspections and two other beekeepers reported finding it in their colonies.

Apiary law

A new law effective July 1, 2005 requires at least one hive in each apiary to be clearly marked with the beekeepers name, address and phone number. This will help farmers and pesticide applicators locate beekeepers to prevent problems like spray damage to bees. Marking hives also helps landowners notify the beekeeper of problems such as bear damage, wind damage or swarming.

Regulation and enforcement

Pine shoot beetle quarantine

Because of the discovery of the exotic pine shoot beetle in Anoka, Dakota and Ramsey counties in the 2004 bark beetle survey, the MDA issued an emergency quarantine for these counties in March, 2005, regulating intrastate movement of pine material. The quarantine paralleled a federal quarantine, in place because of pine shoot beetle's ability to attack and damage several species of pine, mostly on Christmas tree farms. Because the regulatory quarantines to prevent movement of the beetle from county to county were shown to be ineffective, and due to lack of federal support, the emergency quarantine was repealed in August, 2005.

Gypsy moth treatments

In 2004, members of an egg mass survey team discovered a gypsy moth infestation eight miles northeast of Tower, Minnesota. This was the northern-most infestation on record. A treatment area of 640 acres was proposed, encompassing federal, state, county, city and private land. An environmental assessment was conducted for the site and a Tower public meeting was held in January, 2005. The proposal received positive support from local residents as well as environmental groups, and a treatment of the area with *Bacillus thuringiensis* var. *Kurstaki* was conducted in June, 2005. No gypsy moths were caught during the 2005 trapping season, and a second trapping is required to make certain the treatment was successful.

In response to the record number of gypsy moths caught in northern Minnesota in 2005, the MDA has proposed to use mating disruption for treatment in the spring of 2006, achieved by applications of plastic flakes embedded with pheromone. An Environmental Assessment is being completed to identify issues related to the proposed action in the project area. Potential collaborators will be contacted early in 2006 about the findings.



Gypsy moth life stages

Education

The Invasive Species Unit is also working on educating the public and industry workers on the threats of gypsy moth and emerald ash borer. The focus is on the movement of firewood, which can further the spread of many invasive species. Based on results of a 2005 survey of state park visitors on the North Shore, over 40% of the 307 respondents brought their own firewood from “home.” The North Shore area was home to only a handful of the 307 respondents; the others were from all areas of Minnesota as well as 13 other states and Germany, and their firewood could have harbored pests not native to the North Shore.

Even more significant than recreation-based firewood movement, large amounts of firewood may be moving through firewood distributors this winter in order to supply homeowners who choose to burn wood for heat instead of, or in addition to, using costly natural gas.

Urban trees and forests are pivotal to the ecology and economy of our state. Our goal is to change the behavior of individuals and groups who deal with firewood - its provision, acquisition, transport or use (burning) - in order to prevent the introduction and spread of invasive pest species that are moved by firewood.

Comprehensive State Plan for Exotic Species in Minnesota

On October 24, the Minnesota Invasive Species Advisory Council (MISAC) hosted a workshop to develop a comprehensive state plan on invasive species. The all-day workshop was sponsored by the University of Minnesota Sea Grant Program through a grant from the Great Lakes Commission in collaboration with MISAC, the Minnesota Department of Natural Resources and the MDA. The workshop brought together 70 people from diverse affiliations. Participants represented federal, state and local units of government, tribes, the University of Minnesota, non-profit organizations and private businesses, among many others.

A comprehensive plan addressing terrestrial and aquatic invasive species will provide a common structure for coordinating and guiding invasive species detection and response efforts and encourage input from partners. Benefits of a unified plan include increased access to funding, stronger partnerships among interested parties, reduced duplication of effort and development of a common vocabulary.

Workshop attendance and productivity were evidence of a strong desire for stakeholder connection regarding Minnesota’s response to the increasing number of invasive species issues in Minnesota. The combined state plan is anticipated to be completed in 2006.

Assessment of Future Needs

Invasive species exclusion from Minnesota

The increasing spread of gypsy moth and the introduction of new invasive species have heightened pressures on Invasive Species unit staff. MDA has submitted a supplementary budget request for \$283,000 for FY06 to fund four new full time employees (FTE).

Due to record numbers of gypsy moth found in Minnesota in 2005, additional staff members are needed to provide adequate resources for gypsy moth survey and eradication. By postponing the establishment of gypsy moth and other invasive species, investment in staff will save Minnesota significant funds for the next 25 years. Two current temporary staff, a GIS position and an information officer (2FTE), are funded through federal programs for one year. Without the temporary GIS and information officer in 2005, the program would have had additional costs in staff overtime and possible turnovers. These positions are needed as permanent, full time employees.

In order to meet overall program goals, an additional regulatory coordinator and a response coordinator (2FTE) are needed. A regulatory position is needed to respond to over 50 calls received yearly reporting a possible invasive pest, perform pest risk assessments on new species and evaluate survey information generated by survey staff. A response position is needed to design response plans for addressing pests once they are found in Minnesota and to assist in inspections and pest risk assessments.



Female gypsy moth and egg mass

Shade tree protection efforts

Dutch elm disease, an established invasive species in Minnesota, took a serious toll on urban forests in 2004 and 2005. In order to replace trees lost to this disease, the MDA has proposed a capital bonding bill of \$20 million dollars to fund tree inspection, removal, proper disposal, and replacement over the next four years.

In addition, the MDA is in the process of surveying tree care companies, municipalities and others involved in the industry about a proposed state licensing system for tree care companies. The MDA has received requests from tree care professionals for this type of licensing (as opposed to licensing through each municipality), and has chosen to survey in order to gauge the opinions of a wider audience.

Long-range plans and needs

The Invasive Species unit is focusing on its mission of keeping invasive species out of Minnesota. An evaluation of the program has exposed several program needs, including a database to track reports of pests, periodic updating of compliance agreements and development of a process under the new statute (Minn. Stat. Chapt. 18G and 18J, 2003) for enforcement. The unit is also experiencing a shortage in funding for response efforts. We are discussing license surcharges to fund an Invasive Species Emergency Response Fund to address costs incurred for control of invasive species new to Minnesota. The surcharge would be applied to certain MDA licenses, certifications and registrations that are related to plant health.



2005 gypsy moth treatment

While the current Invasive Species program focuses on the prevention and exclusion of new invasive species, current statutes do not include state authority for responding to invasive species that are already established. Due to severe budget shortfalls in 2003, the MDA's responsibility of enforcing the state noxious weed law was reduced significantly. The MDA has received comments from counties and others that state oversight and direction is needed in order to be effective. Additional work on getting public and stakeholder comments on established invasive species will be done in 2006.

The MDA is considering an Invasive Species Legislative Initiative in 2007. MDA plans to discuss with interested parties and regulated clientele the effective options for invasive species exclusion (for species not yet in Minnesota) and control (for established invasive species). The initiative would include, but is not limited to:

1. increased involvement of County Ag. Inspectors in all programs;
2. updates to Noxious Weed Law;
3. First Detector training;
4. invasive species emergency response fund; and
5. a request for positions not funded in the 2006 request.

These proposals will be based on and likely modified from data and opinions collected in 2006.

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