



WISCONSIN DATCP

REPORT TO THE CENTRAL PLANT BOARD

2011

EXOTIC PEST UPDATE

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HIGHLIGHTS OF 2010

- *Gypsy moth trap counts increase by 7%...pg 3*
- *Record number of phytosanitary certificates issued in 2010...pg 4*
- *Corn rootworm beetle populations decline to 40-year low...pg 6*
- *Soybean cyst nematode documented in 47 counties...pg 10*

Emerald Ash Borer

Beetles and infested ash trees were detected in two new locations in 2010, near Cudahy in Milwaukee County and West Bend in Washington County. Emerald ash borer currently infests portions of Brown, Crawford, Kenosha, Milwaukee, Ozaukee, Vernon and Washington counties. The accompanying map shows the quarantined areas of the state and the approximate infestation sites.



Figure 1. Emerald ash borer detection sites 2008-2010 and quarantined counties.

Brown Marmorated Stink Bug

Adults of this species were collected from Dane and Manitowoc counties and verified by UW-Madison entomologists in early November 2010. This is the first report of the brown marmorated stink bug (BMSB) in Wisconsin. This invasive species attacks a wide range of fruit, vegetable, ornamental and agronomic crops and is considered a nuisance pest due to its propensity for migrating indoors in fall. The BMSB was accidentally introduced into the U.S. from Asia in the mid-1990s. Human-aided transport is the likely cause of its recent spread into the state.

Gypsy Moth

Larvae defoliated 346,749 forested acres last season, greatly surpassing the previous record of 65,000 acres set in 2003. Aerial surveys documented severe defoliation in Langlade, Marinette, Menominee, Oconto and Shawano counties, and moderate defoliation in localized areas of Brown, Columbia, Dane, Juneau, Rock, Sauk and Waupaca counties. Rainy weather in June contributed to the spread of the Entomophaga fungus and NPV virus, causing larval populations to collapse abruptly by early July. Defoliation is expected to be less severe next season.

Spotted Wing Drosophila

This invasive fruit fly was collected from two Racine County sites last fall, constituting a new state record. One specimen was trapped at Sturtevant on October 2 and two others were captured nearby later in the month. Spotted wing drosophila infests intact, ripening fruit, posing a greater risk of fruit contamination at harvest than native fruit flies. A follow-up survey is planned for 2011.

Sirex noctilio

Extensive trapping yielded no European woodwasps in the 33 counties most likely to become infested by accidental importation or natural spread from Michigan. The trapping survey, conducted by state personnel for the fifth consecutive year, included 133 Lindgren funnel traps and was the second largest Sirex detection effort thus far.

Japanese Beetle

Damage by this insect was common in orchards, nurseries, home gardens and field crops as far north as Eau Claire County, but surveys indicated numbers in southern Wisconsin were down from previous years. The recent decline of Japanese beetles may be associated with the establishment of natural enemies in those areas of the state with a longer history of infestation.

EMERALD ASH BORER



Emerald ash borer trapper setting a purple panel trap

Emerald ash borer (EAB) was identified in the state on August 1, 2008 and now occurs in portions of Brown, Crawford, Kenosha, Milwaukee, Ozaukee, Vernon and Washington counties. Infestations have been verified in eight locations: Cudahy, Franklin, Kenosha, Newburg, Oak Creek and West Bend in the southeast, Green Bay in the east-central, and Victory in the southwest. A quarantine remains in effect in the seven counties listed above, and in the counties of Fond du Lac, Racine, Sheboygan and Waukesha, which border the infested areas.

The Department of Agriculture, Trade and Consumer Protection (DATCP) conducted EAB detection work in 71 counties of the state in 2010 using a combination of purple panel traps and visual surveys. New infestations were discovered near Cudahy and West Bend in southeastern Wisconsin, areas already impacted by the EAB quarantine.

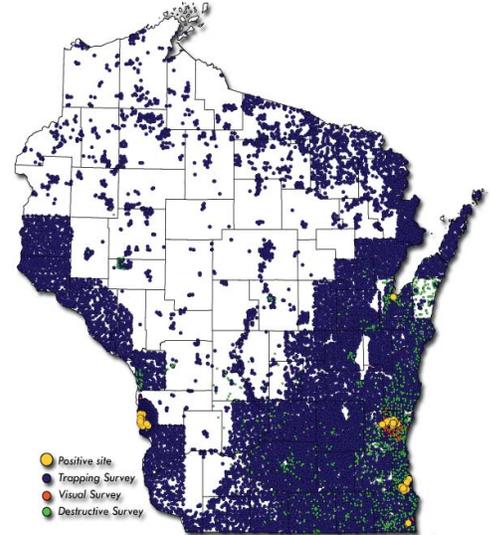


Figure 2. Emerald ash borer surveys, 2007-2010.

Trapping by 40 forestry technicians resulted in the capture of eight specimens, two each in Crawford and Washington counties, one in Kenosha County, and three in Milwaukee County. A total of 7,851 panel traps were deployed in 2010. To date, the program has set 18,376 panel traps, peeled 2,405 ash trees, and inspected 421 sites for EAB (Figure 2). Cumulative results over the last four years include 17 positive traps and 115 data points marking infested ash trees.

Emerald ash borer has killed over 50 million ash trees since it was first detected near Detroit, Michigan in 2002 and currently infests 15 states and two Canadian provinces.

Since 2007, DATCP has set 18,376 panel traps, peeled 2,405 trees, and inspected 421 sites for EAB.

GYPSY MOTH

The Gypsy Moth Program consists of field surveys to trap male moths and locate egg masses, and aerial treatments to kill young larvae or disrupt mating. Annual trapping survey results indicate population densities close to the leading edge of the gypsy moth's advancing front and are used to prioritize future treatment sites in western Wisconsin. Program statistics documented a 7% rise in moth counts and a minor increase in the rate of gypsy moth spread last season.

Slow-the-Spread Treatments

The Slow-the-Spread (STS) Program's regional strategy is to eradicate critical populations west of the "STS Action Zone" and delay spread of the gypsy moth into uninfested areas. In 2010, the program continued an aggressive approach, treating 228,291 acres (92 sites) in 20 counties. Aerial treatments of Btk totaled 75,949 acres, Gypchek applications totaled 1,066 acres, and mating disruption totaled 181,920 acres. Applications began on May 5, the second earliest start date on record, and were completed by July 9. The average rate of spread across Wisconsin in 2010 was 12.36 km (Table 1).



Aerial spraying for gypsy moth larvae

GYPSY MOTH *continued...*

Although parts of Wisconsin suffered severe defoliation by gypsy moth in 2010, the STS Program has successfully reduced the rate of spread in the last decade to an average of 14 km per year, a 50% reduction from 28 km in the years prior to the implementation of STS.

Table 1. Rate of gypsy moth spread in Wisconsin (km), 2006-2010.

Year	Northern WI	Central WI	Southern WI	State Average
2006	23.05	3.68	7.62	11.45
2007	63.85	10.46	16.30	30.20
2008	68.46	46.48	38.82	51.25
2009	-15.71	-26.69	-15.27	-19.01
2010	21.34	18.55	-2.87	12.36



Gypsy moth defoliation in Juneau County

Suppression Treatments

The Suppression Program is a voluntary, cost-shared aerial treatment program directed by the Wisconsin Department of Natural Resources in the quarantined areas of the state. Objectives of the program are to suppress larval populations and limit severe defoliation in targeted areas. During the 2010 season, a total of 5,574 acres (83 spray blocks) in 11 counties were treated. Of these acres, approximately 5,347 were treated with Btk and 227 were treated with Gypchek. Suppression activities were conducted from May 5-23. Subsequent evaluation of the sprayed areas found treatments were very effective in minimizing defoliation last year.

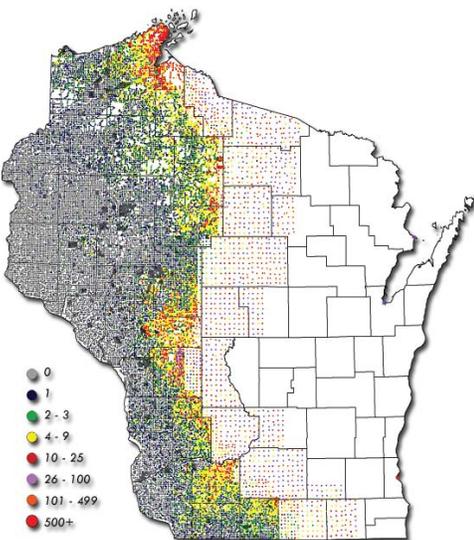


Figure 3. Male gypsy moth trap counts, 2010.

Trapping Results

The annual trapping survey in 50 counties revealed a slight increase in the number of male gypsy moths captured, from 132,275 moths in 2009 to 142,409 moths in 2010. Most of the counties trapped showed population increases, with the exception of a few southeastern Wisconsin counties. While there is no definitive reason for the increase, the unusually mild and dry spring was conducive to larval development and better trapping techniques may have contributed to the higher counts. The majority of the 28,150 pheromone traps were placed in western Wisconsin to measure the advance of the gypsy moth (Figure 3).

Defoliation

Aerial surveys found 346,749 acres of defoliation in 2010, as compared to only 3,620 acres in 2009 and 8,659 acres in 2008. Areas of defoliation were observed in Brown, Columbia, Dane, Iowa, Juneau, Langlade, Marinette, Menominee, Monroe, Oconto, Rock, Sauk, Shawano and Waupaca counties. Approximately 4,957 acres were lightly defoliated, 317,175 acres were moderately defoliated, and 24,617 acres were heavily defoliated. The previous record of 65,000 defoliated acres was set in 2003.

Gypsy moth traps registered 142,409 moths in 2010, a minor increase from 132,275 in 2009.



Gypsy moth delta trap

NURSERY INSPECTIONS

The Nursery Stock Dealer and Grower Inspection Program provides regulatory inspection of licensed retail and wholesale nurseries to ensure the production and sale of healthy, insect- and disease-free plants. Inspectors enforce licensing requirements and issue certificates needed to facilitate movement of nursery stock in trade.



Oriental beetle

Program personnel inspected 470 fields of the 710 licensed nursery growers in the state last season, a decrease from 516 in 2009. A total of 574 of the 1,824 licensed nursery dealers were inspected, compared to 721 in 2009. No new or exotic pests were found in association with Wisconsin nursery stock in 2010.

Japanese Beetle

Beetles counts at Wisconsin nurseries decreased for the second consecutive year. The annual survey yielded 16,079 beetles in 127 traps, a 68% decline from 51,035 collected in 2009. High counts of 201 or more beetles per trap were registered in Grant, Kenosha, Rock, Walworth and Waukesha counties, while moderate counts of 51-200 beetles were found in Columbia, Dane, Eau Claire, Iowa, Marquette, Racine and Sauk counties. Nineteen counties averaged fewer than 50 beetles per trap.

Oriental Beetle

The total number of Oriental beetles collected at garden centers this year was 19. Ten were trapped in Ozaukee County, four in Kenosha County, two each in Grant County and Milwaukee counties, and one in Washington County. No beetles were collected in traps in Brown, Columbia, Dane, Green, Green Lake, Iowa, Rock and Sauk counties. The annual total of 19 beetles represents an increase from 11 in 2009 and two in 2008.

Viruses

Standard inspections found an abundance of viruses again this season. Hosta virus X (HVX) was encountered most frequently, noted on the hosta varieties 'Albo marginata', 'Aurea marginata', 'Fortunei', 'Funkia', 'Sum and Substance' and 'Undulata'. Other viruses detected were arabis mosaic virus (ArMV) on hosta, cucumber mosaic virus (CMV) on astilbe and clematis, rose mosaic virus (RMV) on tea roses, tobravirus on clematis, and tobacco rattle virus (TRV) on anemone, barrenwort, bleeding heart, bluebells, Oriental lily and peony. All nursery stock expressing viral symptoms was removed from sale and destroyed.

Hosta Virus X was again the most common virus observed during routine nursery inspections.

PHYTOSANITARY CERTIFICATION



Corn distillers dried grains at an ethanol plant

The Phytosanitary Certification Program serves Wisconsin exporters of plants and plant commodities by certifying their shipments free from regulated pests. Demand for phytosanitary certification escalated to record levels in 2010, exceeding the previous record set in 2008. Last year the program was responsible for the export of over \$795,546,054 in plants and plant products. The number of certificates issued was 8,290, a 13% increase from 7,253 in 2009 and a 1% increase from 8,203 in 2008. Southeast Asia (Indonesia, Malaysia, Philippines, Thailand, Vietnam), Taiwan and China were the destination countries for more than 77% of the phytos issued (Figure 4). Soybean grain and corn grain accounted for the largest percentages of phytos (25% each), followed by corn distillers dried grain (18%), kiln dried lumber (12%), and corn gluten meal (6%). No Wisconsin commodities were rejected or destroyed at destination ports in 2010.

PHYTOSANITARY CERTIFICATION *continued...*

Annual summary of certificates issued

A total of 8,290 certificates were issued in 2010

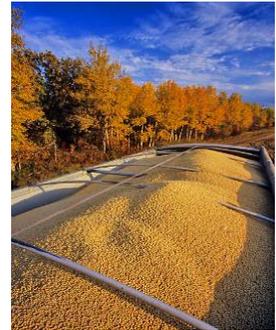
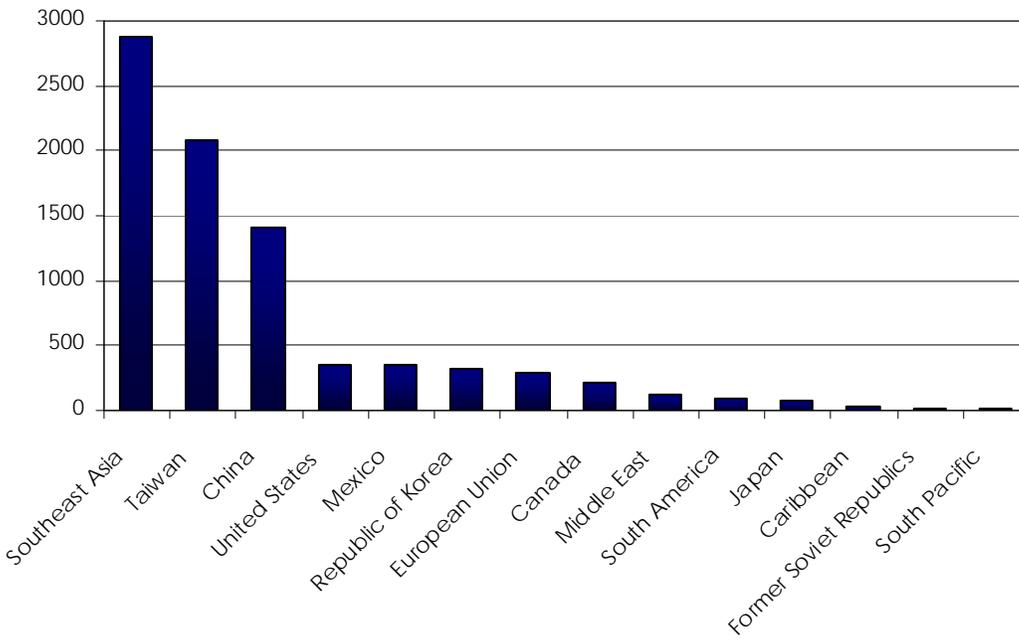
7,935 Federal Certificates

- 40 Processed Plant Product Certificates
- 7,861 Phytosanitary Certificates
- 34 Re Export Certificates

355 State Certificates

- 52 Phytosanitary Certificates
- 303 Plant Inspection Certificates

Figure 4. Total number of phytosanitary certificates issued by DATCP and country destinations.



Soybean grain

Wisconsin issued phytosanitary certificates for over \$795,546,054 in exports in 2010.

Table 2. Estimated total value of exports, top six countries/regions.

Country	Value	Country	Value
Southeast Asia	\$396,346,710	Republic of Korea	\$11,259,999
Taiwan	\$225,039,080	Canada	\$5,739,758
China	\$137,912,793	Japan	\$4,407,021

FIELD CROP INSECT SURVEYS

The Pest Survey Program was established to provide timely information on the abundance and distribution of important pests of Wisconsin field crops. During the growing season, surveys are conducted in alfalfa, corn, potatoes, small grains, snap beans and soybeans. Information acquired through these systematic surveys is used to alert growers and other agriculture professionals to pest



Bean leaf beetle

FIELD CROP INSECT SURVEYS *continued...*

occurrence and outbreaks, determine pest trends affecting agricultural management practices, and certify Wisconsin plants and plant products entering trade are free from regulated pests. The program also participates in plant disease and insect survey projects in cooperation with the United States Department of Agriculture and the University of Wisconsin.



Western corn rootworm beetle

Corn Rootworm Beetle

Beetle populations were the lowest in 40 years, according to the results of the annual survey in August. The state average of 0.3 beetle per plant is about half that of last season and the lowest since prior to 1970. District averages were uniformly low and did not exceed 0.4 beetle per plant. The most drastic reduction occurred in the south-central area, where the average count decreased from 1.1 beetles per plant last year to 0.3 per plant in 2010. Economic populations of 0.75 or more beetle per plant were found in only 10% of the 229 evaluated fields (Figure 5), compared to 23% in 2009.

Excessive rainfall and dramatically increased use of Bt-rootworm corn hybrids accounted for part of this historic decline in beetle numbers. Aerial treatments of both corn and soybean fields with insecticides and fungicides for other pests also may have contributed to the decrease. The map shown here illustrates the locations of the 229 fields sampled in August. Areas with an elevated risk of root injury to non-Bt, continuous corn are represented by orange and yellow circles.

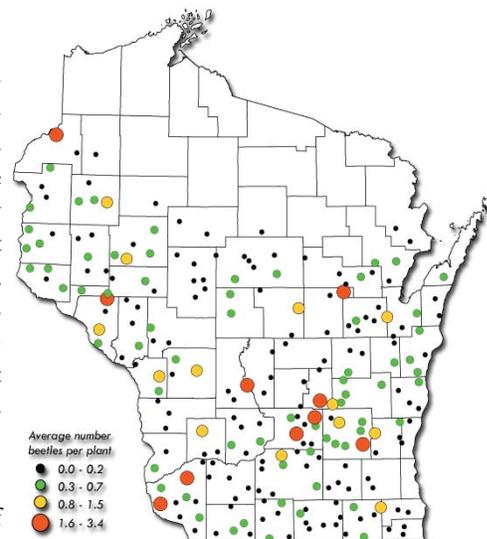


Figure 5. Corn rootworm beetle survey, 2010.

The annual corn rootworm survey found the lowest state average beetle population in 40 years.

European Corn Borer

Larval populations increased slightly in 2010. The fall abundance survey found a state average of 0.07 borer per plant in grain corn, a minor increase from 0.06 in 2009, but the third lowest average since record-keeping began in 1942. The northeast, northwest, south-central and southwest were the only districts to show higher larval numbers. Population reductions were charted in the east-central, north-central and west-central areas, while averages in the central and southeast districts remained unchanged. The largest decline, from 0.09 per plant in 2009 to 0.01 per plant in 2010, occurred in the east-central district. Non-economic infestations were observed in 99% of 229 fields surveyed this fall and only 1% of sites had economic counts of 1.0 or more borer per plant. The low population entering the winter of 2010-11 serves as the base for a potentially small flight of moths next spring.

Soybean Aphid

Populations in soybeans were the lowest since 2004. The annual survey found very low counts of less than 25 aphids per plant in 85% of fields, while only 15% showed moderate densities ranging from 26-146 per plant. Of the 168 fields examined in July and August, none had economic populations of 250 or more aphids per plant. The state average of 16 aphids per plant compares to 53 in 2009, 72 in 2008, 164 in 2007, 69 in 2006, 118 in 2005, 11 in 2004, and 758 in 2003. Abundant precipitation from June through August, unfavorably high temperatures, and natural enemies are thought to have suppressed aphid population growth last season.



Soybean aphids on soybean leaf

FIELD CROP INSECT SURVEYS *continued...*

True Armyworm

Larvae began concentrating in wheat and corn fields by June 16. Many thousands of acres, principally in the east-central and central counties, were treated with insecticides during the next two weeks. Based on reports from county extension agents and local cooperatives, areas of heaviest infestation occurred in wheat in Brown, Calumet, Fond du Lac, Green Lake, Washington and Winnebago counties, although numerous acres in Dane, Dodge, Manitowoc and Sheboygan counties were also affected. The armyworm outbreak subsided by July 2 due to pupation and chemical treatment of many fields. In most instances, the infestations were detected early and sprayed to prevent serious damage.

Western Bean Cutworm

The sixth annual trapping survey documented a 54% increase in western bean cutworm counts in the state, from 4,928 last season to 10,807 in 2010. Moths appeared in pheromone traps by June 17 and the first egg masses on corn were noted the following week. Larvae were present in scattered fields by mid-July. Approximately 5,000 acres of sweet corn were treated on July 22 in Adams County,

where individual fields showed 10-32% of plants with eggs and small larvae. Other counties reporting problems were Columbia, Dane, Green Lake, Marquette, Marinette, Monroe, Portage, Shawano and Waushara. Trap collections at most sites peaked from July 18-22 and activity subsided by mid-August. Western bean cutworm was again the most destructive pest insect of corn in Wisconsin.



Corn earworm larva

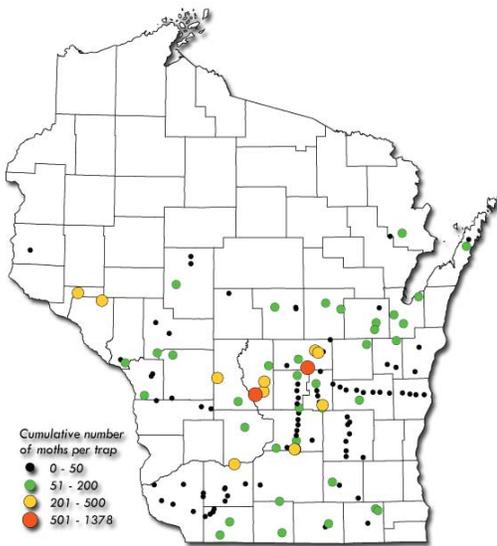


Figure 6. *Western bean cutworm trap counts, 2010.*

Corn Earworm

Moth collections increased sharply from July 20-27 and peaked by August 20. Four successive weeks of significant flights produced scattered infestations statewide. On the basis of pheromone trap counts, the primary migration occurred earlier and was almost five times larger than that of 2009. The cumulative seasonal capture was 4,867 moths in 2010, compared to 990 moths in 2009 and 5,624 moths in 2008.

Western bean cutworm trap counts have increased considerably in the last 6 years, by 54% from 2009 to 2010 alone.

PLANT DISEASE SURVEY AND DIAGNOSIS

The Plant Industry Laboratory provides plant disease diagnostic services to the Pest Survey Program, the Nursery and Christmas Tree Inspection Programs, as well as the Environmental Enforcement Section. Plant samples with diseases caused by pathogens including fungi, bacteria, viruses, and nematodes are submitted to the lab by DATCP field specialists. The lab also offers testing for phytosanitary certification necessary for domestic and international export of certain plants.

In 2010, plant pathologists and a summer field intern at the lab conducted several statewide plant disease surveys, sampling 78 snap bean fields for viruses, 200 soybean fields for *Phytophthora* root rot and viruses, 70 wheat fields for foliar diseases, and 242 tuber samples for corky ringspot disease.



Disease symptoms on soybeans

PLANT DISEASE SURVEYS *continued...*

Laboratory specialists also diagnosed disorders on 188 nursery stock and Christmas tree samples, and screened 114 soil samples for soybean cyst nematode. A total of 1,164 plant and soil samples were processed in 2010.



Phytophthora sojae root rot on soybean

Phytophthora Root Rot

The third annual survey of 45 soybean fields in 32 counties found 27% of fields showed some degree of infection with *Phytophthora* root rot (*Phytophthora sojae*). This represents an increase from 18% in 2009 and 20% in 2008. Counties in which the disease was detected include Buffalo, Calumet, Clark, Dunn, Green, Kenosha, Lafayette, Shawano and Winnebago. Results of the survey show a steady increase in the incidence of *Phytophthora* root rot in Wisconsin soybeans over the last three years.

Soybean Viruses

Below is a table summarizing the results of the soybean virus survey conducted from July 21-August 26. Twenty of 155 (13%) soybean fields in the R4-R6 stages tested positive for alfalfa mosaic virus (AMV) and 12 (7.7%) were infected with soybean dwarf virus (SbDV). Both viruses have become increasingly common since surveys began eight years ago. Alfalfa mosaic virus is aphid- and seed-transmitted and may contribute to reduced seed quality and marketability. SbDV, detected for the first time in Wisconsin soybeans in 2003, is spread by colonizing aphids and can cause significant yield losses. Recent studies have shown soybean aphid to be capable of transmitting SbDV among soybean plants.

Table 3. Soybean virus survey results, 2004-2010 (% of fields testing positive for virus).

Year	No. of Fields	AMV %	BPMV %	CMV %	Potyvirus %	SbDV %
2004	293	1.0	0.0	0.0	0.0	1.7
2005	276	NA	0.0	NA	0.0	1.4
2006	188	NA	0.0	NA	0.0	3.2
2007	227	2.2	0.4	0.0	0.4	3.1
2008	238	8.8	NA	NA	NA	6.7
2009	47	19.1	NA	NA	NA	NA
2010	155	13.0	NA	NA	NA	7.7

Phytophthora root rot infected an average of 22% of the state's soybean fields over the last three years.

Frogeye Leaf Spot

This foliar disease was unusually prevalent in 2010. Sixty-eight percent of leaf samples collected from 40 soybean fields in August showed lesions caused by the frogeye leaf spot pathogen (*Cercospora sojina*), while several other samples with similar symptoms were infected with the common leaf disease, brown spot (*Septoria glycines*). Frogeye leaf spot has occurred sporadically in the state since 2003. Humid, hot weather favored its development in Wisconsin soybeans last summer.



Frogeye leaf spot

Snap Bean Viruses

The Plant Industry Lab surveyed 78 snap bean fields during the 2010 season, testing samples for alfalfa mosaic virus (AMV), bean pod mottle virus (BPMV), cucumber mosaic virus (CMV), potyvirus group (POTV), southern bean mottle virus (SBMV), and tobacco ringspot virus (TRSV). Labora-

PLANT DISEASE SURVEYS *continued...*

tory analysis was conducted using reverse-transcription polymerase chain reaction (RT-PCR) for AMV and enzyme-linked immunosorbent assay (ELISA) for the others. Of the fields and viruses tested, only 5% were laboratory-confirmed to have virus. Four CMV-positive fields were detected in Waushara County, one of which was infected with both a potyvirus and CMV. The incidence of soybean aphid was 0% in all fields at the time of sampling. These findings suggest that further testing for new viral pathogens and strains is warranted. Results are summarized below.

Table 4. Snap bean virus survey results, 2003-2010.

Year	No. of Fields	AMV %	BPMV %	CMV %	Potyvirus %
2003	25	NA	0	72	4
2005	33	NA	0	3	9
2006	62	NA	0	0	0
2008	25	4	0	8	0
2009	101	7	0	4	2
2010	78	0	0	5	1



Tan spot on wheat

Winter Wheat Foliar Diseases

Seventy wheat fields in 16 Wisconsin counties were surveyed for disease presence from May 5-June 17. Wheat fields ranged in maturity from Feekes Stage 5 to 10.5.3. Powdery mildew was the most commonly observed disease, detected in 30 fields. Symptoms of tan spot were found in 25 fields, Fusarium head blight was detected in 11 fields, stripe rust was found in two fields, and traces of leaf rust were noted in one field. No stem rust was detected. Other diseases observed included loose smut in two fields and bacterial blight in two fields. Wheat foliar disease incidence was generally light to moderate in 2010, though Fusarium head blight continues to be a growing concern.

DATCP completed a two-year survey for corky ring-spot disease of potatoes in 2010, testing 392 tuber samples.

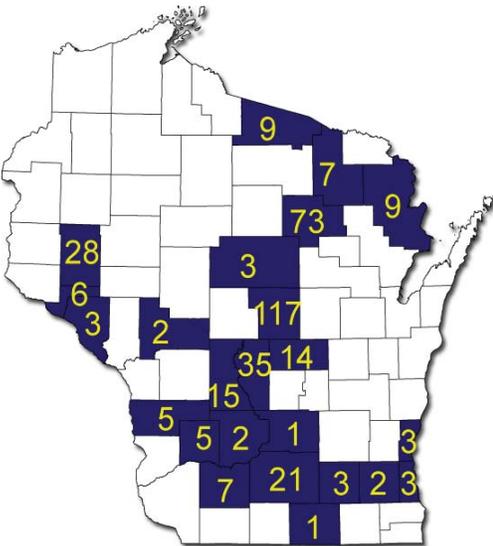


Figure 7. Number of potato fields sampled for corky ringspot disease, 2009-2010

Corky Ringspot Disease of Potatoes

A two-year survey for corky ringspot disease of potatoes was completed in 2010. Sixty-nine growers representing commercial processing companies, seed producers, and organic and conventional fresh market producers participated in the project. A total of 392 samples from 24 counties were diagnosed using RT-PCR (Figure 7).

Potato tuber samples from five farms tested positive for tobacco rattle virus (TRV), the causal pathogen of corky ringspot disease. Three farms in Adams, Langlade and Portage counties with no prior history of the disease showed very low infection levels. Significant corky ringspot disease problems were not observed in these fields. By contrast, samples from two farms in Buffalo and Dunn counties with a history of losses due to TRV tested



Crop scout surveying a potato field

PLANT DISEASE SURVEYS *continued...*



Late blight lesion on tomato

positive for the virus, and several tubers collected from these fields showed internal necrosis symptoms. Based on the 2009-10 survey results, corky ringspot disease is still rare in Wisconsin and prevention remains the best management strategy.

Late Blight

Late blight was observed in 14 Wisconsin counties in 2010. The first case was confirmed on July 14 in a Marquette County potato field, and weather conditions favored its development in subsequent weeks. By early September, potatoes afflicted by late blight had been confirmed in Adams, Langlade, Portage, Sauk and Waushara counties. Infected tomatoes were reported from Brown, Kewaunee, Manitowoc, Monroe, Ozaukee, Portage, Vernon and Waukesha counties. Many growers were proactive and began protective fungicide applications prior to late blight exposure. Fungicide treatments were continued at 5-day intervals through September.

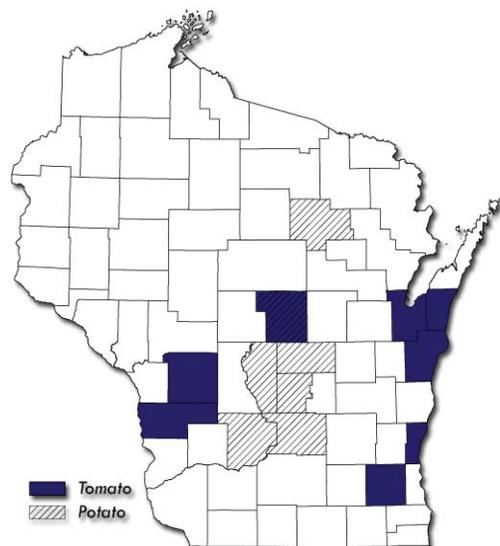


Figure 8. Late blight reports, 2010. DATCP and UW-Madison data.

Late blight on potato and tomato was confirmed in 14 Wisconsin counties last season.

Stewart's and Goss's Wilt of Corn

Inspections for export certification were performed on 58 seed corn production fields in eight Wisconsin counties. Stewart's wilt infected seven fields in Columbia, Dane, Rock and St. Croix counties in 2010, compared to four of 62 sites the year before. Goss's wilt was diagnosed from 36 sites in Columbia, Dane, Eau Claire, La Crosse, Rock and Sauk counties. The incidence of both regulated diseases increased from 2009, particularly Goss's wilt, which showed a 10-fold increase. Reports from Illinois and Iowa indicated that Goss's wilt was also more common in those states last year.

Soybean Cyst Nematode

Soil from 114 soybean fields was sampled last season for soybean cyst nematode (*Heterodera glycines*), the greatest yield-reducing soybean pest in the U.S. The accompanying map shows Wisconsin counties with known infestations, from the first detection in Racine County in 1981 to the most recent in Oconto County. The total number of Wisconsin counties with at least one SCN-infested field is now 47 (Figure 9). Soybean acreage in the counties where SCN has been detected comprises 90% of the soybean crop in the state.



Soybean cyst nematode on soybean roots

Powdery Scab Disease of Potatoes

Laboratory analysis of tuber samples from 338 Wisconsin potato fields confirmed the presence of powdery scab in 19% of 223 fields in 2009 and 3%

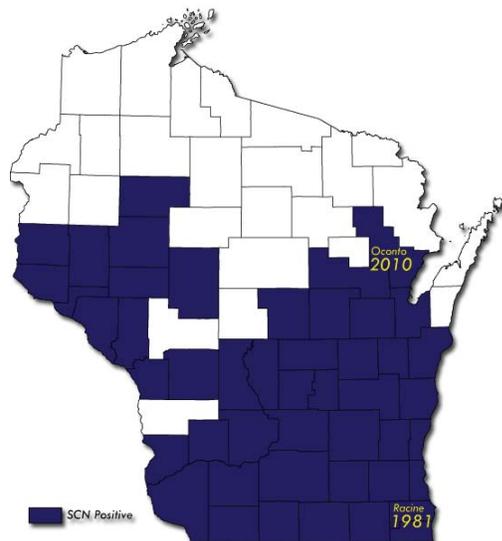


Figure 9. Status of soybean cyst nematode in Wisconsin, 2010.

PLANT DISEASE SURVEYS *continued...*

of 115 fields in 2010. Since surveys for this disease began in 2002, potato samples from Adams, Dane, Dunn, Oconto, Juneau, Langlade, Pepin, Portage and Waushara have tested positive. The majority of the state's potato acreage is still considered free from powdery scab.

Pumpkin Diseases

A disease survey of 14 pumpkin fields was conducted in Buffalo, Chippewa, Dane, Jefferson, Pierce, Kenosha, Walworth and St. Croix counties last September. Powdery mildew was found most often (10 fields), followed by anthracnose (5 fields), gummy stem blight (5 fields) and Fusarium wilt (3 fields). One pumpkin field and a nearby planting of peppers had been decimated by Phytophthora blight (*Phytophthora capsici*), a newly reported fungal disease of vine crops in Wisconsin. This blight is very difficult to control and can destroy many different vegetable crops, besides cucurbits. Symptoms include damping-off of seedlings, vine blight, crown rot and fruit rot. Rotating crops out of cucurbits for three years, selecting pathogen-free seed, and promptly tilling infected debris after harvest are the recommended controls.



Powdery mildew on pumpkin

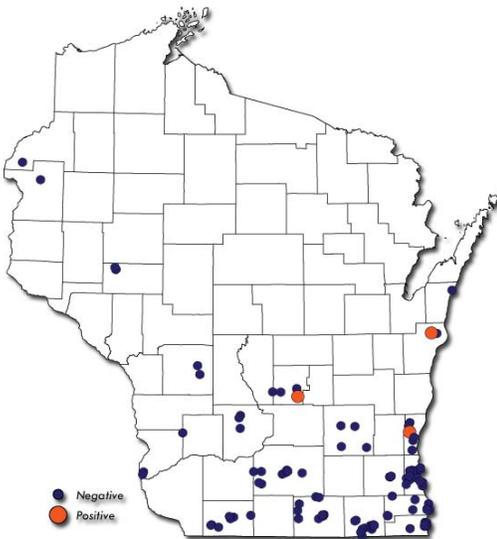


Figure 10. DATCP barberry survey, 2009-10.

Barberry Survey

In an attempt to stabilize the race structure of the population of stem rust (*Puccinia graminis*) in North America, USDA and Midwestern states conducted widespread eradication of common barberry, *Berberis vulgaris*, the alternate host of the rust fungus. During the years 1918-1980, an estimated one million barberry bushes were destroyed on some 8,000 sites in Wisconsin.

The recent emergence of the Ug99 race of stem rust in the Middle East has raised concerns about new races of stem rust, either introduced or arising endogenously. To assess the effectiveness of the 62-year-long eradication effort, DATCP personnel have drawn samples from the USDA records for revisiting. To date, 117 former barberry sites have been located and resurveyed; common barberry has been found at only three sites (Figure 10). Results of this continuing survey suggest that the threat to wheat from recombination of rust virulence on barberries is currently minimal.

Powdery mildew infected approximately 71% of pumpkin fields surveyed last September.

APIARY PROGRAM

The Apiary Program monitors the apiculture industry to prevent the introduction and spread of harmful honeybee parasites and diseases. Inspectors examine migratory bee colonies entering Wisconsin from states such as Alabama, California, Florida, Georgia, Michigan, Mississippi and Texas, and those leaving if they are destined for states which require apiary health certification.



Beekeeper examining hive

Program statistics showed an increase in both imported colonies and nucleuses, from 34,942 in 2009 to 36,031 in 2010 (includes hives imported for pollination), and imported queens and packages, from

APIARY *continued...*

52,869 in 2009 to 57,036 in 2010. Imports of queens and packages were the highest in 13 years due in part to heavy winter losses.



Apiary inspection

The statewide survey of apiaries found a decrease in varroa mite-infested hives, from 92% in 2009 to 89% in 2010 (Table 5). A total of 950 hives were inspected, 524 in the spring and 426 in the fall. Of the hives examined during the fall survey, small hive beetle (SHB) was found in 3.2% (30) from nine counties—Brown, Calumet, Columbia, Crawford, Dodge, Fond du Lac, Milwaukee, Racine and Waushara.

In addition, hives were inspected for a number of other honeybee pests and diseases, including American foulbrood (AFB), European foulbrood (EFB), chalkbrood, sacbrood, deformed wing virus (DWV), as well as Africanized honeybees and the Tropilaelaps mite. American foulbrood was found in 1.1%, EFB was found in 1.1%, chalkbrood was found in 2.4%, sacbrood was found in 1.1%, and DWV was found in 7.6% of hives (Table 5). No Africanized honeybees or Tropilaelaps mites were detected during the annual survey.

Table 5. Annual apiary inspection results, 2006-2010.

<i>Year</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
No. hives checked	999	971	1288	1334	950
Varroa mite	75%	79%	82%	92%	89%
Small hive beetle	1.4%	0.3%	0.6%	2.6%	3.2%
American foulbrood	3.0%	4.5%	2.2%	4.5%	1.1%
European foulbrood	0.6%	1.4%	0.5%	0.5%	1.1%
Chalkbrood	14.3%	8.1%	6.4%	5.6%	2.4%
Sacbrood	several	2%	2.7%	1.6%	1.1%
Deformed wing virus	NA	8.1%	4.9%	8.3%	7.6%

Apiary inspections found a decrease in Varroa mite, American foulbrood, chalkbrood and deformed wing virus in 2010.

CHRISTMAS TREE INSPECTIONS

By licensing, inspecting and certifying Christmas trees as being reasonably free from injurious insects and diseases, the Christmas Tree Program provides a service to interstate and international exporters who require certification to ship trees from Wisconsin. Growers of trees marketed locally also benefit by receiving routine inspections that identify incidence and severity levels of a wide range of non-regulated insects and diseases affecting their trees.



Balsam twig aphid

Annual inspections begin after the gypsy moth egg mass deposition period, usually by early September. In addition to Christmas tree fields, program staff closely examine fencerows and woodlots adjacent to fields for evidence of gypsy moth and pine shoot beetle. Growers who request plant health certification for interstate export of trees are given priority.

CHRISTMAS TREE INSPECTIONS *continued...*

In 2010, the number of fields inspected increased by 7% (Table 6). Fewer Christmas tree fields were infested with gypsy moth (GM) than in 2009, while pine shoot beetle (PSB) was detected at one site compared to two in the previous year. White pine blister rust was the most prevalent disease encountered, followed by *Lirula* needlecast and broom rust. The most common insects noted during inspections were balsam twig aphid, white pine weevil and Eastern spruce gall adelgid.

Table 6. Christmas tree inspection results, 2006-2010.

Year	No. Fields Inspected	No. Fields with GM	No. Fields with PSB
2006	836	13	0
2007	814	45	9
2008	736	39	0
2009	617	26	2
2010	663	20	1



Broom rust on fir

Top 10 Christmas tree pests found in 2010 (followed by number of fields affected out of 663):

DISEASES: White pine blister rust (65), *Lirula* needlecast (64), broom rust (59), *Rhizosphaera* on spruce (48), *Rhizosphaera* on fir (40), pine gall rust (29), spruce needle drop (17), *Lophodermium* needlecast (11), brown spot needle blight (9), and *Cyclaneusma* needlecast (7).

INSECTS & ABIOTICS: Balsam twig aphid (200), white pine weevil (76), Eastern spruce gall adelgid (52), balsam gall midge (34), deer damage (33), pine needle scale (28), gypsy moth (20), Zimmerman pine moth (16), pine shoot moth (13), and root collar weevil (11).

White pine blister rust and balsam twig aphid were the most common pests encountered in Wisconsin Christmas tree fields last year.

POTATO ROT NEMATODE

During the 57-year period since the potato rot nematode (PRN) was first identified in Wisconsin, the overall incidence of this pest has decreased significantly. From 1953-1963, a total of 68 infested fields were detected, but only 41 have been found in the last 47 years. Program specialists inspect an average of 13 fields per year and detect about one infested field annually. Today, there are a total of 3013.95 acres with a history of PRN infestation. Of these acres, 95% are located in Langlade County, the largest seed potato production area in the state.

Seven potato fields totaling 343 acres were inspected in 2010. One field showed evidence of PRN and was placed under quarantine. Another field was released for certified seed potatoes after fumigation and two successive potato crops showed no evidence of the pest. Two fields were released for table stock/seed pending, and the remaining three fields, all entering seed potato production for the first time, required inspection to be certified.

The Potato Rot Nematode inspection and quarantine program has played a major role in limiting spread of the PRN since 1953. Due to the program's effectiveness, this pest has never been intercepted in shipments of commercially grown potatoes or seed potatoes from Wisconsin.



Seed potato field

BIOLOGICAL CONTROL



Landowner releasing leaf spurge beetles

Continued efforts were made to establish biological agents for control of the invasive plants, leafy spurge and spotted knapweed. Several thousand beneficial insects have been introduced at selected sites in Wisconsin since 1991. Last season their numbers were augmented by releases in 26 counties.

Releases of *Aphthona* flea beetles were made at 19 sites in 10 counties, including new introductions in Ashland, Barron, Buffalo, Kenosha, Marinette, Oneida and Rusk counties. Attempts to introduce these agents for leafy spurge control were started in 2003 in Wisconsin and the beetles now occur at collectable levels at 13 sites. Another six locations in Burnett, Douglas, Marathon, Polk, St. Croix and Trempealeau counties are expected to have collectable populations by 2011.

Introductions of seed head-attacking weevils (*Larinus* spp.) were conducted at 46 sites in 19 counties as part of a 10-year spotted knapweed control study. Propagation of 18,000 weevils was carried out at WDNR insectaries across the state and the organisms were distributed to 25 individuals who performed the releases. *Larinus* weevils have become well established in approximately 68 locations in Adams, Burnett, Jackson, Juneau, Monroe, Portage, Washburn, Waushara and Wood counties in the last several years.

FIREWOOD CERTIFICATION

Firewood remained a focal point of regulatory efforts last year, as movement of infested firewood is the primary pathway through which invasive tree pests are spread to new areas. During 2010, regulatory staff made 490 site visits and certified 31 firewood vendors. The voluntary Firewood Certification Program also certified 10 kilns. A major advance in program operations was converting applications, inspection reports and photos into an accessible, online format. The program currently maintains an interagency database listing of over 775 firewood vendors.

SEED COMPLIANCE ACTIONS TAKEN IN 2010:

- 24 seed lots were relabeled to meet compliance standards
- 4 lots were removed from sale by the labeler
- 5 lots were returned to the labeler
- 5 lots were sold and planted before compliance actions could be taken

SEED CONTROL

The Seed Control Program monitors and enforces labeling, germination and purity requirements to assure quality seed is sold in Wisconsin. Field inspectors perform a range of duties, such as evaluating labels for compliance, issuing stop sale orders, and collecting official samples for analysis.

Three hundred and eight samples from 105 of 685 licensed labelers were collected by DATCP inspectors in 2010. Seed labelers with poor compliance records or an increasing number of violations, as well as those not sampled in the last two years, were targeted for sampling. The annual violation rate was 12%, which represents a 3% increase from last season. Of these violations, four were rated as *technical*, 16 were rated as *minor*, and 18 were rated as *serious*.

All licensed labelers in the state are sampled or inspected on a three-year rotation. The program currently inspects an average of 33% of the 685 labelers annually, and samples approximately 14%.

