



# WISCONSIN DATCP

REPORT TO THE CENTRAL PLANT BOARD



DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION • BUREAU OF PLANT INDUSTRY

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HIGHLIGHTS IN 2009

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## EXOTIC PEST UPDATE

### *Emerald Ash Borer*

Emerald ash borer was detected at five new locations in 2009 and now infests Brown, Crawford, Kenosha, Milwaukee, Ozaukee, Vernon and Washington counties. The accompanying map shows the quarantined areas of the state and the approximate detection sites.

### *Viburnum Leaf Beetle*

A new state record was established in Dane County on May 20, 2009 following the discovery of several defoliated viburnum landscape plants. This event represents the first detection of the invasive, European beetle in Wisconsin. There was no indication that infestations exist in other counties.

### *Beech Bark Disease*

This disease of American beech was found for the first time in Wisconsin in a rural forested area of Door County. The beech scale (*Cryptococcus fagisuga*) and *Nectria* fungi samples were collected last August by DNR Forest Pathologists and confirmed by USDA ARS taxonomists. Surveys conducted in the northeast in subsequent months have documented a light infestation of the scale over much of Door County and at sites in Kewaunee and Marinette counties. Populations appear to be heaviest near the initial Sturgeon Bay detection site and some beech mortality has been observed.

### *Sirex noctilio*

Extensive trapping yielded no European woodwasps in the 29 counties most likely to become infested by accidental importation or by natural spread from Michigan. The trapping survey, conducted by state personnel for the fourth consecutive year, included 143 Lindgren funnel traps and was the largest *Sirex* detection effort thus far. Continued surveillance is planned for 2010.

### *Banded Elm Bark Beetle*

Adults of this species were collected from Lake Kegonsa State Park in Dane County last summer. Verification by a USDA Forest Pest identifier was made on December 19. This is the first report of this exotic beetle in Wisconsin.

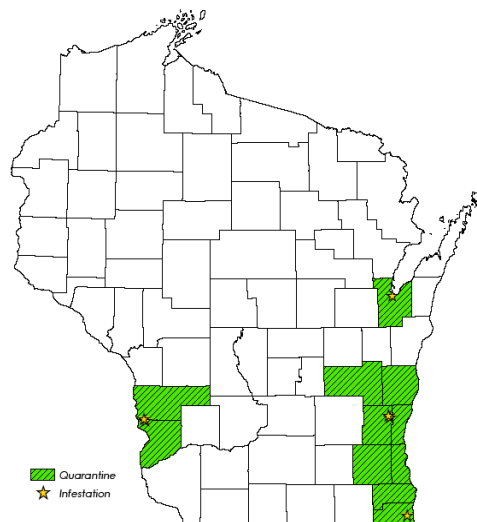


Figure 1. Emerald ash borer detection sites and quarantined counties, 2009.

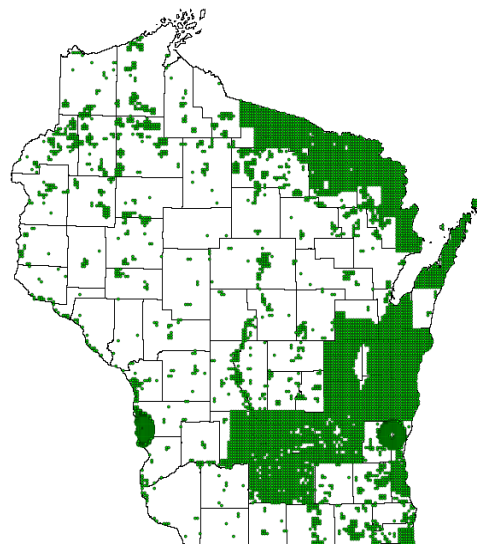
## EMERALD ASH BORER



*Emerald ash borer purple panel trap*

Emerald ash borer (EAB) was identified in the state on August 1, 2008 and is now known to occur in Brown, Crawford, Kenosha, Milwaukee, Ozaukee, Vernon and Washington counties. Infestations have been verified at seven locations: Franklin, Kenosha, Newburg and Oak Creek in the southeast, Green Bay in the east-central, and Victory in the southwest (Figure 1). A quarantine has been enacted 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 all 72 counties of the state in 2009, using a combination of purple panel traps and visual surveys. The detection tree method used in previous years was discontinued due to its high workload and cost.



*Figure 2. Emerald ash borer trap sites, 2009.*

Trapping by 40 forestry technicians resulted in the capture of seven specimens, one each in Brown, Kenosha and Vernon counties, and two each in Crawford and Washington counties. A total of 6,938 panel traps were deployed (Figure 2).

In addition to trapping, visual surveys were performed at EAB-infested sites in Brown, Kenosha and Milwaukee counties in August and September. Program staff worked in cooperation with municipal personnel from Franklin, Green Bay, Kenosha and Oak Creek to identify and remove suspect ash trees for peeling. Infested trees were found only in the municipality of Oak Creek. Dendochronological analysis of samples from 25 trees dated the Oak Creek infestation to 2005.

Emerald ash borer has killed over 50 million ash trees since it was first detected near Detroit, Michigan in 2002 and currently infests portions of 13 states.

## 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. Program statistics documented a 66% decline in moth counts last summer and a substantial reduction in the rate of gypsy moth spread.

### *Slow-the-Spread Treatments*

The Slow-the-Spread (STS) Program's strategy is to eradicate critical populations west of the "STS Action Zone" and delay spread of the gypsy moth within the zone to 10 km per year. In 2009, the program treated 150,259 acres at 54 sites. Aerial treatments of Btk totaled 22,495 acres and mating disruption totaled 113,464 acres. Applications began on May 15 and were completed by late July.



*Gypsy moth larva*

*Eleven Wisconsin counties are currently under quarantine to prevent the artificial spread of EAB.*

# GYPSY MOTH *continued...*

The average rate of spread across Wisconsin in 2009 was -15.82 km, a major decrease from 51.25 km in 2008 (Table 1). The reasons for the population decline are uncertain, but a combination of factors—unseasonably cool weather conditions, high egg and/or larval mortality, and the effectiveness of the annual spray program—was likely involved.

*Table 1. Rate of gypsy moth spread in Wisconsin (km), 2005-2009.*

Year	Northern WI	Central WI	Southern WI	State Average
2005	-32.72	-14.70	-0.69	-16.04
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	-15.07	-26.69	-5.71	-15.82



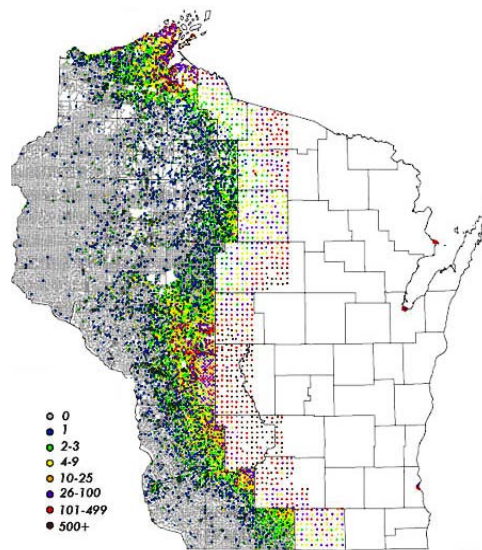
*Aerial spraying for gypsy moths in Wisconsin*

### 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 prevent significant defoliation. During the 2009 season, a total of 10,563 acres at 135 spray blocks in 23 counties were treated. Of these acres, approximately 9,618 were treated with Foray 48B and 384 received Foray 76B. The remaining 561 acres were treated with Gypchek. Suppression treatments were conducted from May 21-31.

### Trapping Results

The annual trapping survey in 46 counties revealed a considerable decline in the number of male gypsy moths captured, from 385,554 in 2008 to 132,275 in 2009. Population decreases occurred in all non-quarantined counties trapped, except Ashland where the Madeline Island count increased from 555 to 5,000 moths. Review of the male moth trap data showed a slight retreat in the STS Action Zone in the non-quarantined northern and southern counties and no change in the generally infested, quarantined central counties.



*Figure 3. Male gypsy moth trap counts, 2009.*

*The state average rate of gypsy moth spread decreased from 51.25 km in 2008 to -15.82 km in 2009.*

### Defoliation

Aerial surveys found only 3,620 acres of defoliation in 2009, as compared to 8,659 acres in 2008 and approximately 23,000 acres in 2007. Areas of defoliation were observed in Columbia, Dane, Kenosha, Marinette, Marquette, Milwaukee, Oconto, Racine, Rock, Sauk, Walworth and Waushara counties. The vast majority of the defoliation in all years has been light.



*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.

Program personnel inspected 516 fields of the 677 licensed nursery growers in the state in 2009, a minor increase from 502 in 2008. A total of 721 of the 1,651 licensed nursery dealers were inspected, compared to 570 in 2008. No new or exotic pests were found in association with Wisconsin nursery stock in 2009.



*Japanese beetles*

### *Japanese beetle*

The annual trapping program yielded 51,040 Japanese beetles in 114 traps, a 20% decline from 63,821 beetles collected in 2008. High counts of 201 or more beetles per trap were recorded in Dane, Kenosha, Marquette, Rock, Sauk, Walworth and Waukesha counties, while moderate counts of 51-200 beetles were found in Dodge, Grant, Iowa, Jefferson and Manitowoc counties. Eleven counties averaged fewer than 50 beetles per trap and six counties had zero beetles. Nurseries involved in the shipment of regulated host plants from Japanese beetle-infested areas are required to comply with certification requirements of destination states, as specified in the *Japanese Beetle Harmonization Plan*.

### *Oriental beetle*

The total number of Oriental beetles trapped at garden centers this year was 11. Nine were captured in Washington County and two others were trapped in Kenosha and Milwaukee counties. No beetles were collected in traps in Outagamie, Waukesha and Winnebago counties. While the count of 11 beetles is not particularly high, it does represent an increase from two beetles collected in Brown and Milwaukee counties during the previous year.

### *Hosta Virus X*

Standard inspections found an abundance of viruses this season. Hosta virus X (HVX) was encountered most frequently, noted on the hosta varieties 'August Moon', 'Gold Standard', 'Krossa Regal', 'Royal Standard', 'So Sweet' and 'Sum and Substance'. Other viruses detected were rose mosaic virus (RMV) on tea roses, potyviruses, and tobacco rattle virus (TRV) on bleeding hearts and hosta 'Undulata'. All nursery stock expressing viral symptoms was ordered removed from sale and destroyed.

*Trapping in 29 Wisconsin counties revealed a 20% decline in Japanese beetle numbers from 2008 to 2009.*

## PHYTOSANITARY CERTIFICATION

The Phytosanitary Certification Program serves Wisconsin exporters of plants and plant commodities by certifying their shipments free from regulated pests. Although demand for phytosanitary certification decreased from record levels in 2008, the program was responsible for the export of over \$757,861,781 of plant products in 2009. The number of certificates issued was 7,253, a 12% decline 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 in 2009 (Figure 4). Corn grain and soybean grain accounted for the largest percentages of phytos issued (25% each), followed by corn distillers dried grain (12%), lumber (9%), and nursery plants (8%). No Wisconsin commodities were rejected or destroyed at destination ports in 2009.



*Corn distillers dried grain (left), soybean hulls (right)*

# PHYTOSANITARY CERTIFICATION *continued...*

## Annual summary of certificates issued

A total of 7,253 certificates were issued in 2009

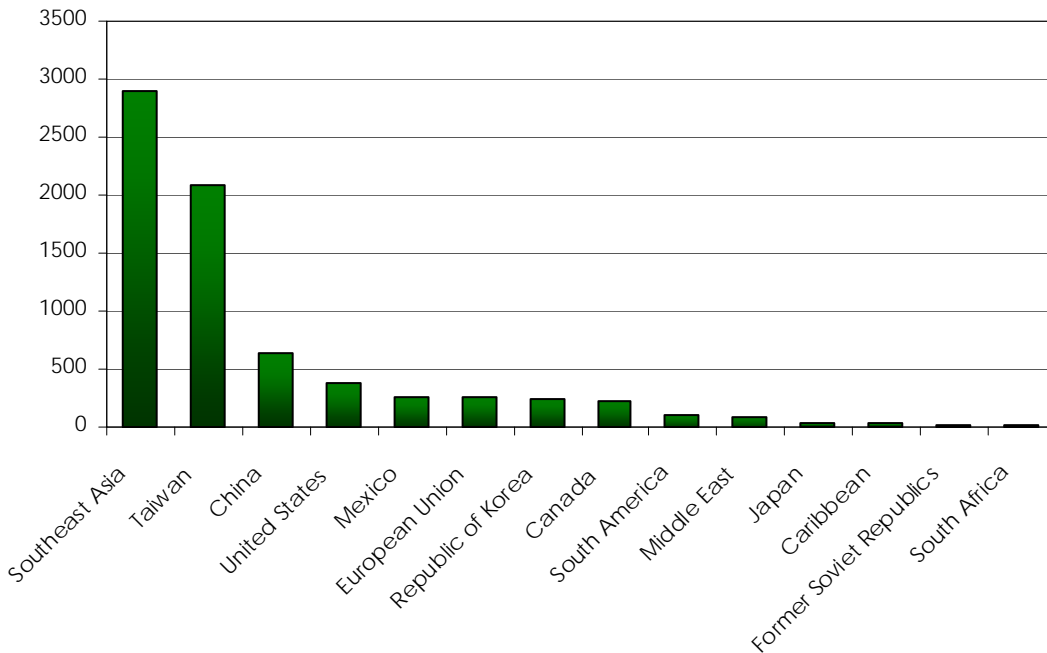
6,872 Federal Certificates

- 144 Processed Plant Product Certificates
- 6,710 Phytosanitary Certificates
- 18 Re Export Certificates

381 State Certificates

- 50 Phytosanitary Certificates
- 331 Plant Inspection Certificates

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



Corn harvest

Over \$757,861,781 in plants and plant products were exported from Wisconsin last year.

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

Country	Value	Country	Value
Taiwan	\$338,421,087	Republic of Korea	\$12,343,879
Southeast Asia	\$241,625,798	European Union	\$3,401,250
China	\$86,694,009	Mexico	\$1,593,003

## FIELD CROP PEST 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



Tarnished plant bug

## FIELD CROP INSECT SURVEYS *continued...*



*Western corn rootworm beetles*

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.

### *Corn Rootworm Beetle*

The annual survey in August documented a decrease in the state average number of beetles per plant for the first time in five years. Population declines were charted in every district, with the largest reductions occurring in the southeast, east-central and north-central areas. The state average of 0.6 beetle per plant compares to 1.0 in 2008 and a five-year average of 1.1 per plant. District counts were as follows: northwest 0.4, north-central 0.4, northeast 0.5, west-central 0.5, central 0.4, east-central 0.6, southwest 0.7, south-central 1.1, and southeast 0.3. Populations in 77% of surveyed fields were below the 0.75 beetle per plant level which indicates root injury potential in 2010 if some form of control is not used.

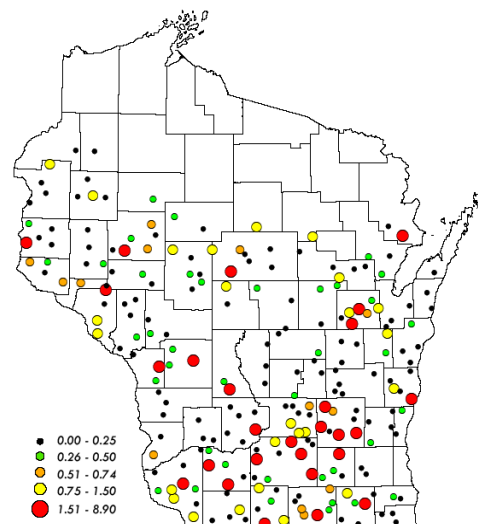


Figure 5. *Corn rootworm beetle survey, 2009.*

The causes of the decline in beetle numbers are not certain. It is presumed that widespread use of stacked Bt hybrids is a major contributing factor, both in Wisconsin and across the Midwest where populations of the western species were greatly reduced this season. Wet soil conditions last spring also may have caused some degree of larval mortality, thus lowering adult numbers. The map shown here illustrates the locations of 229 fields sampled in August. Areas with an elevated risk of root injury to non-Bt, continuous corn are represented by red and yellow circles.

### *European Corn Borer*

Examination of 229 corn fields between September 1 and October 31 found the second lowest population since the survey began in 1942. The state average of 0.06 borer per plant (6 per 100 plants) represents a decline from last year's very low average of 0.09 per plant, and is well below both the 10 and 50-year averages. Populations this fall exceeded 2008 levels only in the southwest and west-central districts. Less than 1% of the fields sampled had populations that met the treatment criteria of 1.0 or more borer per plant, and 75% had no detectable larval population. Survey data from 2009 and the previous 11 years continue to suggest that transgenic Bt-corn has become a major mortality factor among the European corn borer population in Wisconsin.

### *Soybean Aphid*

According to the results of the annual survey, the vast majority of Wisconsin soybean fields did not develop economically significant populations during the R2-R4 growth stages. Of the 247 fields examined in July and early August, 94% had non-economic densities of less than 250 aphids per plant. Economic populations were observed at scattered locations in Columbia, Dunn, Eau Claire, Marquette, Pepin, Pierce, Taylor, St. Croix and Wood counties, but these were exceptional. The survey found the state average density to be 53 aphids per plant, which compares to 72 in 2008, 164 in 2007, 69 in 2006, 118 in 2005, 11 in 2004, and 758 in 2003.



*Soybean aphids*

*The European corn borer survey documented the 2nd lowest fall population of borers since 1942.*

## FIELD CROP INSECT SURVEYS *continued...*

After the survey was completed, the soybean aphid situation intensified. Densities surged above treatment thresholds by mid-August and remained extremely high for the balance of the season. Swarms of winged aphids descended on urban areas across the Midwest during an unprecedented fall migration to buckthorn (winter host). Despite the magnitude of the flight, a fungal disease apparently decimated populations by October and caused egg counts on buckthorn to be substantially reduced.

### *Western Bean Cutworm*

This pest of corn and dry beans has become an increasingly serious threat to corn production in the state since about 2005, particularly in the sandy central counties. Until recently the western bean cutworm was limited in range to the western U.S. and had never caused economic damage to conventional corn in Wisconsin. However, widespread planting of Cry1Ab Bt-corn hybrids resistant to some ear-infesting caterpillars (e.g. European corn borer and armyworm) has favored this species by suppressing its competition. Western bean cutworm is not susceptible to the Cry1Ab endotoxin produced by the YieldGard and Agrisure hybrids. Instead, this corn pest is spreading rapidly eastward and now occurs as far east as New York State.

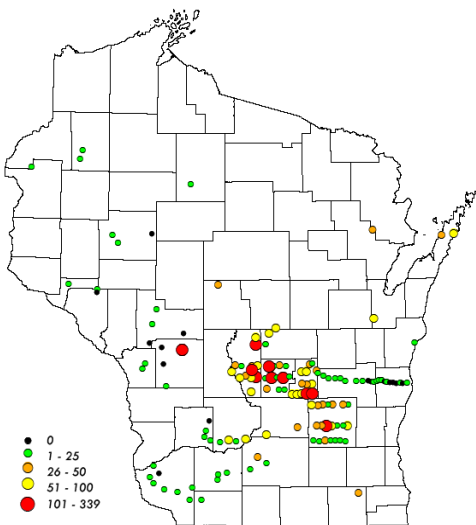


Figure 6. *Western bean cutworm* trap counts, 2009.

The Pest Survey Program has monitored the annual WBCW flight since 2005. One hundred and forty one pheromone traps were placed in 31 counties in 2009. The total number of moths captured in the state increased to 4,928 from 2,433 the previous year. While the overall count is not high, the 51% increase is cause for concern. The largest moth numbers were reported from the central counties of Adams, Green Lake, Juneau, Marquette, Monroe and Waushara (Figure 6), also where the heaviest larval infestations in corn were observed. High cumulative counts for the season were 339 moths in a pheromone trap and 350 moths in a black light trap, both near Grand Marsh in Adams County. Field observations and trapping survey results suggest that populations of this new corn pest are highest in the central counties.



*Western bean cutworm* larva

*Western bean cutworm* pheromone trap counts showed a 51% increase from 2008 to 2009.

## 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 certificates necessary for domestic and international export of certain plants.

In 2009, plant pathologists at the lab conducted several statewide plant disease surveys, sampling 101 snap bean fields for viruses, 97 soybean fields for *Phytophthora* root rot and viruses, 45 wheat fields for foliar diseases, and processing 150 tuber samples for corky ringspot disease. Laboratory specialists also diagnosed disorders on a total of 220 field crop, nursery stock and Christmas tree samples,



*Frog-eye leafspot* on soybeans



## PLANT DISEASE SURVEYS *continued...*

23 of which were pesticide compliance cases. Other noteworthy events in 2009 were the late blight outbreak in August and the first detection of powdery scab in Wisconsin during a survey for corky ringspot disease of potatoes.

### *Phytophthora Root Rot*



*Symptoms associated with Phytophthora root rot*

For the second year, the incidence of this root rot disease was assessed by a survey of 50 soybean fields. Cool spring weather conditions slowed soybean development and deferred the start of the survey to early July. From July 6-17, soybean fields in the early vegetative growth stages were sampled statewide. Although the fields were randomly selected, the seedling samples were collected from areas showing symptoms of decline within fields. Seedling roots were tested for *Phytophthora sojae* by culturing on semi-selective media and molecular methods. Nine of the 50 (18%) samples tested positive by polymerase chain reaction (PCR). Results were very similar to 2008 when 10 of 50 (20%) samples tested positive. Infected fields were found in all soybean growing areas of Wisconsin. Survey findings indicate that *P. sojae* infected about 20% of the state's soybean fields consistently over the last two years.

### *Soybean Viruses*

The soybean virus survey in 47 soybean fields from mid-August to early September found alfalfa mosaic virus (AMV) at 19.1% of the sites. This figure represents a marked increase from 8.8% in 2008 and is the highest percentage documented in six years of surveys (Table 3). Alfalfa mosaic virus is both aphid- and seed-transmitted. In combination with other soybean viruses (commonly soybean mosaic virus), AMV may contribute to yield loss and reduced seed quality.

*Table 3. Soybean virus survey results, 2004-2009 (% of fields testing positive for virus).*

<i>Year</i>	<i>No. of Fields</i>	<i>AMV %</i>	<i>BPMV %</i>	<i>CMV %</i>	<i>Potyvirus %</i>	<i>SbDV %</i>
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

*Phytophthora root rot infected about 20% of the state's soybean fields over the last two years.*

### *Snap Bean Viruses*



*Snap beans*

State plant pathologists, in cooperation with fresh market vegetable producers and processors, conducted a survey for snap bean viruses from July 6-August 13. One hundred and one fields at approximately 48 days post-planting were sampled. Ten leaves were collected from each of four locations per field. Disease symptoms were noted and soybean aphid counts were taken from 10 plants at each location.

Snap bean foliage was tested for the following viruses: alfalfa mosaic virus (AMV), bean pod mottle virus (BPMV), cucumber mosaic virus (CMV), and the potyvirus group that includes bean common mosaic virus (BCMV) and bean yellow mosaic virus (BYMV). Most of these viruses are seed transmitted to some degree, and may be spread by aphids.

# PLANT DISEASE SURVEYS *continued...*

Laboratory analysis was conducted using reverse-transcription polymerase chain reaction (RT-PCR) for AMV and enzyme-linked immunosorbent assay (ELISA) for all others. Of the 101 samples tested, seven were positive for AMV, zero were positive for BPMV, four were positive for CMV, and two were positive for potyviruses. Eleven fields had symptoms of white mold infection. Soybean aphid counts were found to be negligible during the sampling period. Results are summarized below.

Table 4. Snap bean virus survey results, 2003-2009.

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



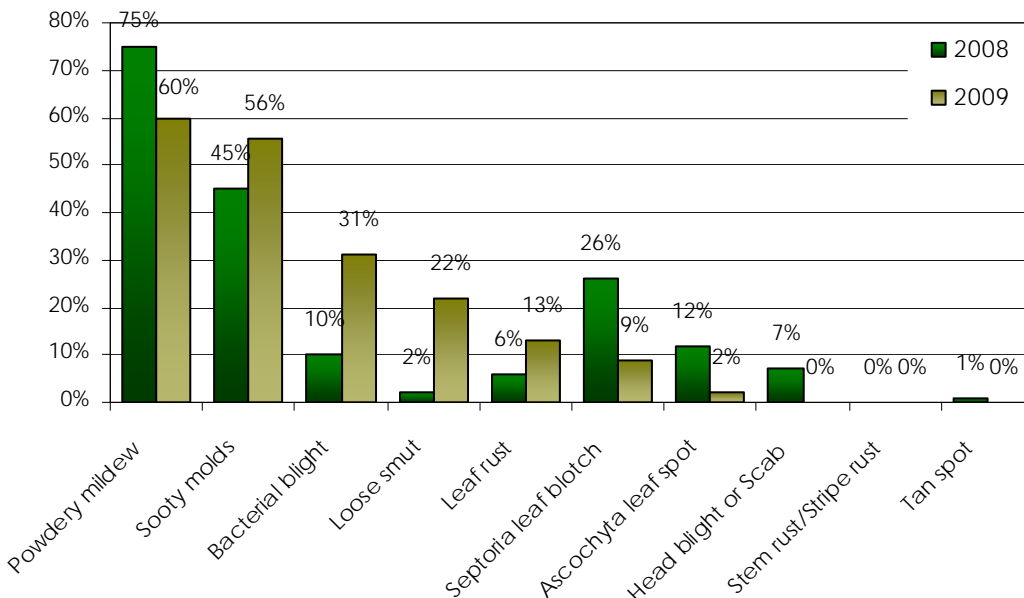
Virus symptoms on snap bean leaves

## Winter Wheat Foliar Diseases

DATCP specialists conducted a disease survey of winter wheat between May 8 and June 23, sampling 45 fields in 13 counties. Wheat fields ranged in maturity from Feekes Stage 8.0 (flag leaf visible) to Feekes Stage 10.5.3 (flowering complete to base of spike). Powdery mildew (*Blumeria graminis*) and sooty molds (various fungi) were observed in 60% and 56% of fields, respectively, but severity was very low. Bacterial blight (*Pseudomonas syringae*) was found in 31% of fields, while 22% were infected with loose smut (*Ustilago tritici*). Other diseases of significance and the percentage of fields affected were: 13% of fields with leaf rust (*Puccinia triticina*), 9% of fields with Septoria leaf blotch (*Septoria tritici*), and only 2% of fields with Ascochyta leaf spot (*Ascochyta tritici*). No scab (*Fusarium* spp.), stem rust (*P. graminis* f. sp. *tritici*) or stripe rust (*P. striiformis*) was found in any wheat field sampled this year. Disease incidence was generally very low in 2009.

The winter wheat disease survey found a very low incidence of foliar diseases in Wisconsin wheat fields in 2009.

Figure 7. Winter wheat disease survey results, 2008-2009.



Loose smut on wheat

## PLANT DISEASE SURVEYS *continued...*

### *Corky Ringspot Disease of Potatoes*

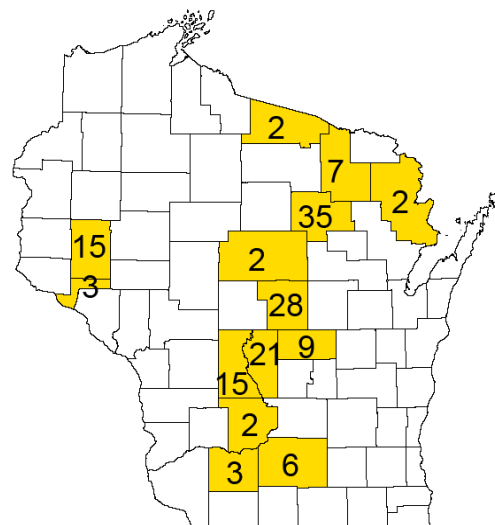
One hundred and fifty potato tuber samples collected from the 14 major potato counties in the state all tested negative for tobacco rattle virus (TRV), the causal pathogen of corky ringspot disease (Figure 8). Examination of tubers for internal necrosis symptoms also revealed no strong indications of TRV infection. Tubers were sampled at fall harvest from potato fields and during the spring and late fall from storage facilities. The survey will be continued in 2010.



*External symptoms of corky ringspot disease*

### *Late Blight*

Infected tomato plants were detected in Dane County on July 29, nearly one month after an epidemic of the disease started on tomatoes in the northeastern U.S. and spread to potatoes from Maine to Virginia. This was the first confirmed case of late blight in Wisconsin since 2002. Frequent reports of the disease were received throughout August, and by mid-September, infected tomatoes had been found in 26 counties (Figure 9).



*Figure 8. Number of potato fields sampled for corky ringspot disease, 2009.*

*A widespread outbreak of late blight on tomatoes and potatoes occurred in the state for the first time since 2002*

The first infections of potato plants were confirmed on August 18. Potato growers responded with protective fungicide treatments, and many fields were sufficiently advanced to allow vine killing. By contrast, tomato growers were hampered by the lack of effective control options with suitable pre-harvest interval restrictions. Several commercial tomato growers lost thousands of plants to the disease. The rate of new infections slowed with the dry weather in September, and killing frosts early in October ended the epidemic.

The pathogen strain involved in the 2009 outbreak was determined to be type US#14, mating type A2, which is resistant to the fungicide metalaxyl and highly virulent on potato. Since only the A2 mating type is believed to be present in Wisconsin, the organism is unable to produce the type of spore that overwinters outside of a living host plant.

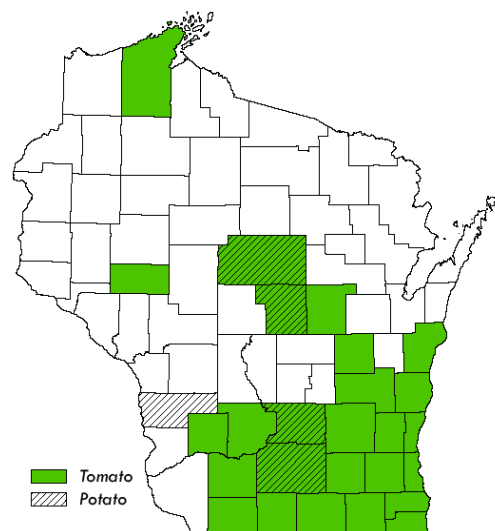
A detailed summary of late blight in Wisconsin last season can be obtained at: <http://www.plantpath.wisc.edu/wivegdis/>.



*Late blight leaf lesions on tomato*

### *Stewart's Wilt of Corn*

Inspections for export regulatory pests were performed on 62 sites in Columbia, Dane, Eau Claire, Grant, Pierce, Portage and Rock counties. Four locations in Dane and Eau Claire counties tested



*Figure 9. Late blight reports, 2009. DATCP and UW-Madison data.*

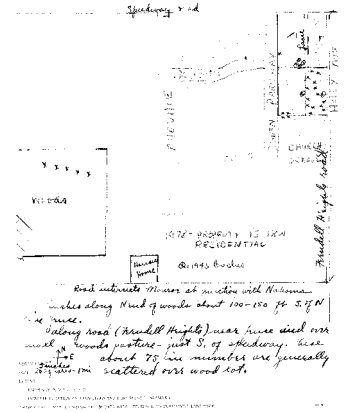
# PLANT DISEASE SURVEY *continued...*

positive for Stewart's wilt, while three sites in Dane County tested positive for Goss's wilt. During a general survey of corn fields, another field in Buffalo County tested positive for Goss's wilt.

## Barberry Survey

With concerns about increased risk from rusts of small grains fueled by the recent spread of Ug99 in Africa, Asia and the Middle East, DATCP began a very small-scale survey to assess the effectiveness of barberry eradication efforts, 34 years after Federal efforts ceased. Wisconsin has preserved the collection of original USDA "Form L" records from the Barberry Eradication Program, conducted jointly between USDA and the state from 1918 to 1976, and is using those records for survey.

Sites for follow-up were selected from the approximately 14,500 Form L records for Wisconsin by sampling every 30<sup>th</sup> record. This approach netted 486 potential sites for revisiting. Twenty-nine sites failed geocoding with no good match possible, mostly sites identified only by owner's name and municipality or with no-longer-extant street addresses. Sites identified with PLSS descriptions were located to the center of the quarter or quarter-quarter section. The 458 sites which were geocodeable will be visited over the next several years.



USDA Form L report from Barberry Eradication Program

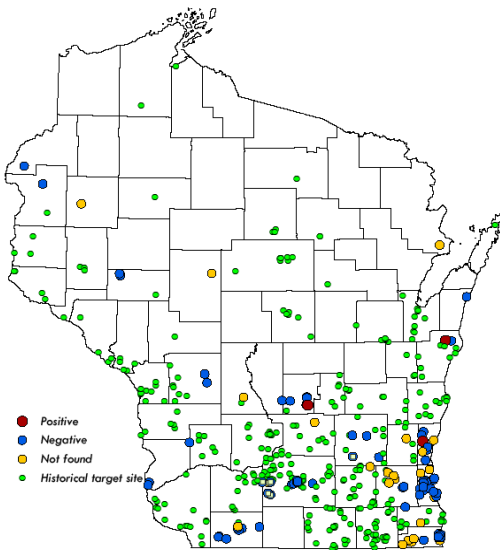


Figure 10. DATCP barberry survey results, 2009.

In 2009, action was taken on 75 sites, yielding:

- 52 sites located with no barberries found
- 20 sites not found (mostly PLSS descriptions with no good map or landmarks and multiple possibilities for original sites)
- 3 sites positive for common barberry

The three positive sites were all rural. One site had 14 bushes in a woodlot of approximately 40 acres, one site had 39 bushes in a roadside woods of 15 acres, and one site had at least 85 bushes in a pasture of 27 acres. Collections of stem rust *aecia* are planned for characterization by the USDA Cereal Disease Laboratory (St. Paul, MN). DATCP will also conduct additional wheat surveys on fields in the vicinity of known barberry bushes during the growing season.

DATCP is conducting survey to assess the effectiveness of barberry eradication efforts, 34 years after Federal efforts ceased

# 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.



Wisconsin beekeepers

Program statistics showed a decrease in imported colonies and nucleuses, from 40,684 in 2008 to 34,942 in 2009 (includes hives imported for pollination), and an increase in imported queens and

## APIARY *continued...*



*Apiary inspection*

packages, from 30,508 in 2008 to 52,869 in 2009. Imports of queens and packages were the highest in 12 years due in part to heavy winter losses.

The statewide survey of apiaries found an increase in varroa mite-infested hives, from 82% in 2008 to 92% in 2009 (Table 5). A total of 1,334 hives were inspected, 670 in the spring and 664 in the fall. Of the hives examined during the fall survey, small hive beetle (SHB) was found in 16 from four counties—Calumet, Dodge, Milwaukee and Vernon.

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 4.5%, EFB was found in 0.5%, chalkbrood was found in 5.6%, sacbrood was found in 1.6%, and DWV was found in 8.3% of hives (Table 5). No Africanized honeybees or *Tropilaelaps* mites were detected during the annual survey.

Inspectors also surveyed for Colony Collapse Disorder (CCD) this season by asking beekeepers a series of questions during hive inspections. Only one of the 148 participants (from Lafayette County) described having bee hives showing symptoms consistent with CCD.

*Table 5. Annual apiary inspection results, 2005-2009.*

<i>Year</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>
No. hives checked	918	999	971	1288	1334
Varroa mite	85%	75%	79%	82%	92%
Small hive beetle	0.1%	1.4%	0.3%	0.6%	2.4%
American foulbrood	3.5%	3.0%	4.5%	2.2%	4.5%
European foulbrood	0.2%	0.6%	1.4%	0.5%	0.5%
Chalkbrood	10%	14.3%	8.1%	6.4%	5.6%
Sacbrood	NA	several	2%	2.7%	1.6%
Deformed wing virus	NA	NA	8.1%	4.9%	8.3%

*Apiary inspections found an increase in Varroa mite, small hive beetle, American foulbrood and deformed wing virus in 2009*

## CHRISTMAS TREE INSPECTIONS



*Christmas tree field*

By licensing, inspecting and certifying Christmas trees as being reasonably free from injurious insects and diseases, the Christmas Tree Program provides a service to those growers who require certification to export 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.

Annual inspections begin after the gypsy moth egg mass deposition period, usually by early September. Besides 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 a plant health certificate are given priority.

## CHRISTMAS TREES *continued...*

In 2009, the number of fields inspected decreased by 16% (Table 6). While fields with gypsy moth declined from 2008, pine shoot beetle was detected at two sites compared to zero the previous year. White pine blister rust was the most prevalent disease encountered, followed by broom rust and *Rhizosphaera* needlecast on spruce. 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, 2005-2009.

Year	No. Fields Inspected	No. Fields with GM	No. Fields with PSB
2005	661	34	0
2006	836	13	0
2007	814	45	9
2008	736	39	0
2009	617	26	2



*White pine weevil injury*

*Top 10 Christmas tree pests found in 2009 (followed by number of fields affected out of 617):*

**DISEASES:** White pine blister rust (79), broom rust (70), *Rhizosphaera* on spruce (43), pine gall rust (39), spruce needle drop (37), *Rhizosphaera* on fir (31), *Lirula* needlecast (20), *Cyclaneusma* needlecast (11), root rot (10), and brown spot (4).

**INSECTS & ABIOTICS:** Balsam twig aphid (251), winter damage (87), white pine weevil (70), Eastern spruce gall adelgid (55), balsam gall midge (39), frost damage (38), Zimmerman pine moth (25), drought stress (25), aphids (23), and pine needle scale (21).

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

## POTATO ROT NEMATODE

During the 56-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 40 have been found in the last 46 years. 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.

In 2009, five potato fields totaling 201 acres were inspected for PRN. Two fields were released for certified seed potatoes after fumigation and two successive potato crops showed no evidence of the pest. The remaining three fields, all entering seed potato production for the first time, required inspection to be certified. None showed evidence of PRN.

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 commercial or seed potatoes from Wisconsin.



*Seed potato field*

## BIOLOGICAL CONTROL

Continued efforts were made to establish biological agents for control of the invasive plants, leafy spurge and spotted knapweed. Several thousand beneficial insects, including flea beetles, stem borers and seedhead weevils, have been introduced at select sites in Wisconsin since 1991. Last season their numbers were augmented by releases in 11 counties.



*Spotted knapweed*

### *Leafy spurge*

Releases of the flea beetles *Aphthona lacertosa* and *A. nigriscutis*, as well as the stem boring beetle *Oberea erythrocephala*, were conducted at sites in Burnett, Eau Claire, Iowa and Washburn counties. The former species (*A. lacertosa*) was introduced at five sites, while the latter two species were released at eight sites. Introductions in Eau Claire County were intended to reduce populations of both the leafy and cypress spurge species.

### *Spotted knapweed*

The seedhead weevil *Larinus minutus* was introduced at 19 sites in Burnett, Columbia, Eau Claire, Fond du Lac, Grant, Jackson, Polk, Portage, and St. Croix counties. A related species, *L. obtusus*, was released at 15 sites in the same counties, except Jackson. Permits for the release of the root boring weevil *Cyphocleonus achates* were approved for four sites in Grant, Jackson, Portage and St. Croix counties.

## 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, including evaluating labels for compliance, issuing stop sale orders, and collecting official samples for analysis.

Two hundred and eighty samples from 102 of 675 licensed labelers were collected by DATCP inspectors in 2009. Seed labelers with poor compliance records or an increasing number of violations were targeted for sampling. The annual violation rate was 10%, which represents a negligible decrease from last season. Of these violations, two were rated as *technical*, 10 were rated as *minor*, and 15 were rated as *serious*.

### SEED COMPLIANCE ACTIONS TAKEN IN 2009:

- **12** seed lots were relabeled to meet compliance standards
- **2** lots were removed from sale by the labeler
- **7** lots were returned to the labeler
- **3** lots were sold and planted before compliance actions could be taken

