EMERALD ASH BORER PROGRAM

Emerald ash borer (EAB), an exotic and destructive pest of ash trees first detected in North America near Detroit, Michigan in 2002, has killed an estimated 25 million ash trees in Illinois, Indiana, Maryland, Michigan, Missouri, Ohio, Pennsylvania, Virginia, West Virginia, Ontario and Quebec. Since its initial detection, EAB has caused regulatory agencies and the United States Department of Agriculture (USDA) to enforce quarantines in these states and fines to prevent potentially infested ash trees, logs or hardwood firewood from moving out of areas where EAB occurs. The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) has conducted EAB surveillance and detection projects since 2006. The objective of the program is to establish an interagency effort to prevent the spread of this pest in Wisconsin and to other states. DATCP coordinates action with the USDA-APHIS, the Wisconsin DNR and the University of Wisconsin. Survey sites are based on proximity to known EAB infestations and high risk factors such as human transportation corridors, vacation homes, campgrounds and industrial corridors.

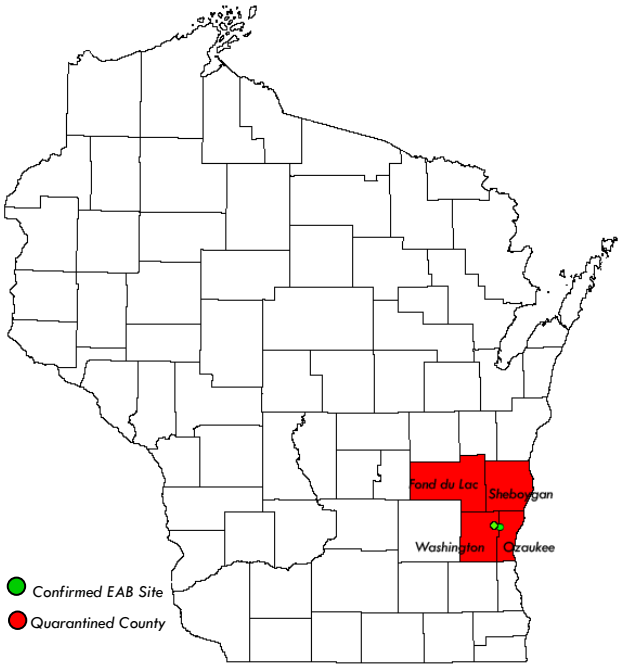


Figure 1. Status of EAB in Wisconsin, August 2008.

PRESENT STATUS OF EAB IN WISCONSIN

Emerald ash borer was positively identified in the state on August 1, 2008 and is now known to occur in Ozaukee and Washington counties in southeast Wisconsin. A quarantine area including Ozaukee, Washington, Fond du Lac and Sheboygan counties has been established for the purpose of limiting the artificial spread of EAB in ash nursery stock, hardwood firewood, timber or other articles (Figure 1). No EAB larvae have been detected outside of the generally infested area of Newburg, with the exception of two infested trees from a northern Illinois nursery that were discovered at a private residence in Kenosha County and promptly removed and destroyed. Emergence of adults from these two trees after arrival in Wisconsin appears to unlikely due to the late summer planting. A survey of several hundred acres in the surrounding area found no additional infested trees. Accordingly, this situation has been classified as a regulatory incident and no quarantine was issued for the county.

WISCONSIN DATCP EAB SURVEY & DETECTION

Detection work was conducted in all 72 counties of the state in 2008, using a combination of purple panel detection traps, detection trees and visual surveys (Figure 2). During the winter and early spring, field surveyors cut and peeled approximately 800 previously girdled ash trees. Work recommenced in September with an additional 719 trees removed and peeled in 29 counties. No EAB specimens were recovered during this effort. From June to September, DATCP participated in the USDA-APHIS purple panel trap detection survey, deploying approximately 3,800 traps as part of the nationwide initiative. Emerald ash borer adults were

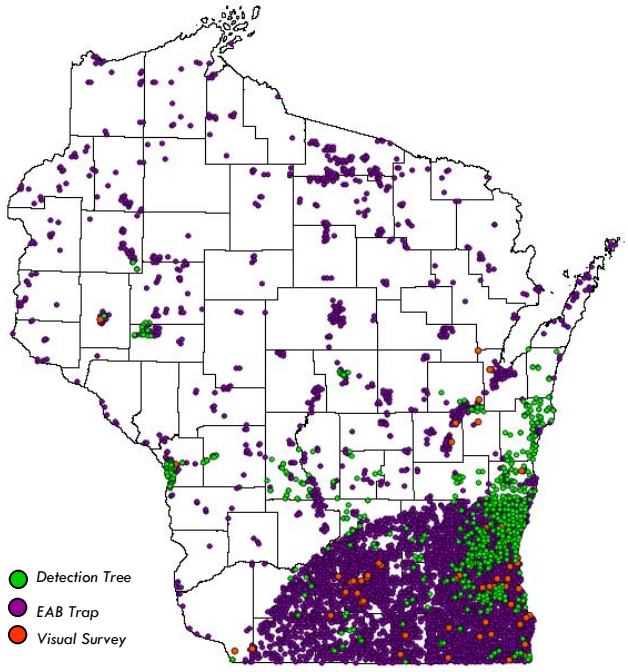


Figure 2. EAB survey and detection, 2006-2008.

recovered from one Washington County trap in August. No additional EAB specimens were captured using panel traps in 2008.

A rapid visual assessment survey within ten miles of the Village of Newburg during September and October 2008 found no infested trees outside of the immediate vicinity of the Village.

Delimitation survey work began in January of 2009. The area within a two-mile radius of Newburg was divided into 3,200 grids (330 feet x 330 feet each). All public and private property trees in this area were inspected by a team of six field personnel. Preliminary surveys have determined that the infestation is heavily concentrated along the Milwaukee River corridor near Newburg. A ten-mile radius was also established, with nine surveyors examining all ash trees located in yards, fencerows and other edge locations along township, county and state roadways. To date, no EAB infestations have been detected beyond the two-mile radius.

GYPSY MOTH PROGRAM

The two major events in the Gypsy Moth Program are field surveys to trap male moths and locate egg masses, and the subsequent application of control treatments to kill the young larvae. Statewide trapping and egg mass surveys indicate where significant populations of gypsy moths exist in the state, and the results are used to determine and prioritize treatment sites for the following season. In 2008, a total of 29,879 delta and milk carton traps were set in 52 Wisconsin counties. Egg mass surveyors inspected 418 sites covering approximately 1,300 acres. The principal objectives are to detect and treat potential heavy infestations and to prevent gypsy moth from spreading rapidly through the state for as long as possible.

SLOW-THE-SPREAD REGULATORY PROGRAM

Wisconsin's Slow-the-Spread (STS) Program is directed by DATCP. The STS Program treated 116,795 acres at 175 sites in 29 counties with Btk, nucleopolyhedrosis virus (NPV), or pheromone flakes in 2008. Aerial treatments of Btk totaled 31,064 acres, NPV treatments totaled 583 acres, and pheromone flakes totaled 48,865 acres. Applications began on May 15 and were completed by July 18. The program's strategy is to eradicate the most critical populations west of the "STS Action Zone," and to slow the spread of the gypsy moth within the "STS Action Zone" to 10 km per year. The average rate of spread across Wisconsin in 2008 was 51.25 km, a considerable increase from 30.20 km in 2007, 11.45 in 2006, -16.04 km in 2005, and -3.71 km in 2004 (Table 1).

Table 1. Rate of gypsy moth spread in Wisconsin (km/year), 2004-2008.

Year	Northern Wisconsin	Central Wisconsin	Southern Wisconsin	State Average
2004	8.93	-10.52	-9.53	-3.71
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

GYPSY MOTH TRAPPING PROGRAM

Trapping surveys in 52 counties revealed a population increase for the second consecutive year in the counties trapped. The total number of male gypsy moths captured was 385,554, which compares to 293,160 moths in 2007, 121,355 moths in 2006, 316,220 moths in 2005, and 373,656 moths in 2004. The state record of 703,060 moths was set in 2003, although traps were deployed throughout the entire state that year. A total of 29,879 traps were placed this season. DATCP seasonal trappers captured 369,671 moths, cooperators set 204 traps and captured 15,883 moths, and on the Apostle Islands, the National Park Service set 35 traps and reported 10,043 moths. Increases in moth populations were registered in all of the counties trapped in 2008. Counties with the most significant increases were Bayfield, Douglas,

Vernon and Green. Review of the male moth trap data suggests that most of these counties have a diversity of gypsy moth populations best characterized by widespread, low-density infestations. This pattern will make it difficult for the STS algorithm to identify treatment blocks for 2009. Captures of male gypsy moths in 2008 are summarized in the accompanying map (Figure 3).

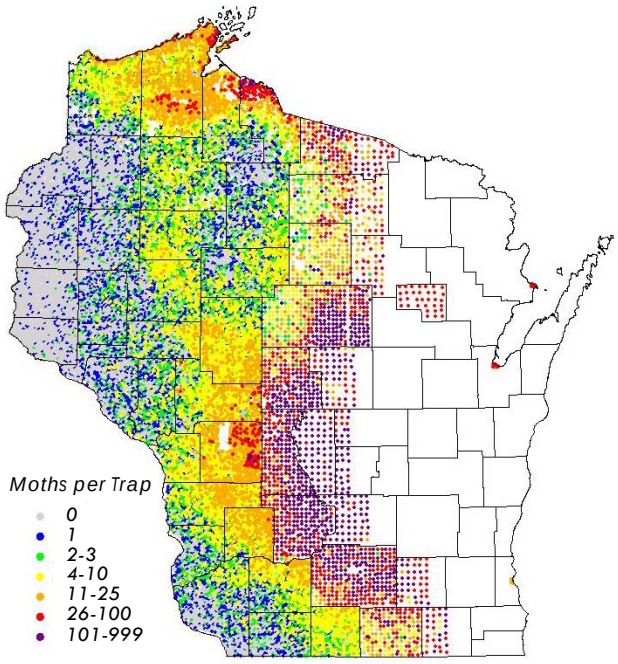


Figure 3. Wisconsin gypsy moth catches, 2008.

GYPSY MOTH SUPRESSION

Acreage treated in the suppression program increased from 1,235 acres in 2007 to 12,523 acres in 2008, reflecting population increases in central and northeastern Wisconsin resulting from favorable weather during the summer of 2007. A total of 133 sites were treated in 16 counties, including Adams, Brown, Columbia, Dane, Door, Green Lake, Juneau, Marathon, Marinette, Marquette, Menominee, Milwaukee, Outagamie, Rock, Sauk and Waushara. Of these acres, 11,940 were treated at 36 CLU's of Foray 48B and 583 acres at four sites were treated with Gypchek at $4x10^{11}$ OB/ac. Treatments were made between May 19 and June 2 by Al's Aerial Spraying of Ovid, MI at a cost of $29.71 per acre. Treatments of all but one block were successful in keeping defoliation below 50% on 80% of the trees in the block, meeting the suppression program's goal. A 27-acre spray treatment in Madison was considered unsuccessful due to reinvasion from outside the block. Three other spray blocks in southern Wisconsin showed some defoliation, but in these cases the level was below 50%.

Table 2. Wisconsin gypsy moth surveys and treatments, 2004-2008.

Year	No. of Traps	No. of Moths	Counties Treated	Acres Treated		
2004	30,089	372,058	17	85,972 *Btk*	225,525 MD	8,230 Gyp
2005	34,122	316,220	19	73,521 *Btk*	108,140 MD	15,578 Gyp
2006	31,813	121,355	22	38,868 *Btk*	123,602 MD	6,450 Gyp
2007	30,270	295,338	17	25,229 *Btk*	70,941 MD	3,501 Gyp
2008	29,879	385,554	29	31,064 *Btk*	48,865 MD	583 Gyp

* Btk = *Bacillus thuringiensis* var. *kurstaki*; MD = Mating Disruption; Gyp = Gypcheck (virus)

GYPSY MOTH POPULATION GROWTH AND DEFOLIATION

Aerial defoliation surveys mapped a total of 8,683 acres of defoliation in 2008, a decrease from 22,994 acres in 2007. Most of the defoliation was light, but some patches were moderately or heavily defoliated.

No defoliation was observed in Marinette County in northeast Wisconsin, where much of the defoliation occurred last year. The outbreak there appears to have largely collapsed. Poor hatch was widespread in central and northern counties, possibly due to fluctuating weather conditions this spring, which may have contributed to lower population and defoliation levels.

Widespread NPV and *Entomophaga maimaiga* mortality was observed across the quarantined counties. The parasitoid fly, *Compsilura concinnata*, was active at Rocky Arbor State Park in an area with exceptionally high numbers of gypsy moths in 2007 and where the population was moderately high again this past summer.

NURSERY INSPECTION PROGRAM

The Nursery Stock Dealer and Grower Inspection Program requires the inspection of the state's nursery growers and dealers to assure the production and sale of healthy nursery stock. Inspectors monitor the nursery industry to confirm that nurseries are licensed and complying with laws and regulations. Program staff also certify nursery stock to prevent the spread of serious plant pests and to facilitate the interstate movement of stock.

Nursery program personnel inspected 502 of the 1,978 (25%) licensed nursery growers in the state in 2008, an increase from 360 in 2007 (Table 3). A total of 570 of the 1,379 (41%) licensed nursery dealers were inspected compared to 497 dealers inspected in 2007. No new or exotic pests were detected in association with Wisconsin nursery stock.

Table 3. Acres of nursery stock and number of nurseries inspected, 2001-2008.

Year	*Acres Inspected*	*Increase*	*# of Nurseries Inspected*	*Change*
2001	8100	800	446	94
2002	9577	1477	400	-46
2003	16, 669	7092	398	-2
2004	*	*	426	28
2005	*	*	312	-114
2006	*	*	322	10
2007	*	*	360	38
2008	*	*	502	142

* Numbers no longer available due to change in database.

JAPANESE BEETLE

One hundred and six Japanese beetle traps were set in Wisconsin nurseries in 2008. Of these, 78 caught beetles. Captures were documented in 17 of 29 counties surveyed. The highest counts of 501 or more beetles per trap were recorded in Fond du Lac, Kenosha, Walworth and Waukesha counties, while Columbia, Dane, Dodge, Jefferson, Milwaukee, Ozaukee, Racine and Wood counties averaged 51-500 beetles per trap. The remaining 17 counties averaged fewer than 50 beetles per trap, with 12 of those counties registering zero beetles.

ORIENTAL BEETLE

The Oriental beetle (*Exomala orientalis*) is similar to the Japanese beetle in that it feeds on the roots of turf grasses, perennial plants and nursery stock. Unlike the Japanese beetle, Oriental beetle also infests containerized or potted plants; this is its principal means of long-distance travel. Oriental beetle in not a federally quarantined pest so little has been done to stop it from spreading westward. To date, it has been found as far west as Wisconsin and as far south as South Carolina. Wisconsin has monitored this pest using pheromone traps since 1999. Companies included in the trapping program are those nursery dealers receiving stock from the eastern U.S. In 2008, 14 traps were placed at garden centers in seven counties, including Brown, Kenosha, Milwaukee, Outagamie, Ozaukee, Waukesha and Winnebago. Two traps in Brown and Milwaukee counties captured one beetle each. Zero beetles were reported from Outagamie, Winnebago, Ozaukee, Waukesha and Kenosha counties.

HOSTA VIRUS X

This highly infectious hosta virus has become an increasing problem for Wisconsin nursery stock growers and dealers since it was discovered in 2004. The first HVX-infected plants were found at several garden centers in the state that year; the plants originated in the Netherlands and received USDA certification. This season inspectors from all regions of the state submitted hosta samples that tested positive for HVX.

DAYLILY RUST

This disease was detected for the first time in Wisconsin in 2001 at two sites, a commercial daylily facility and a residence. In subsequent years, daylily rust has been found at garden centers receiving stock from Georgia (2004) and at a single retail outlet in Vilas County (2006). In 2007, this rust was observed on 'Burgundy Velvet' daylily in Racine County and was found at two retail outlets in Milwaukee and Kenosha counties. The infected stock originated from Illinois and Oklahoma, respectively. Daylily rust cannot overwinter in Wisconsin; thus, its spores enter the state on infested nursery stock or southerly winds. The disease was not detected in any Wisconsin nursery or garden center in 2002, 2003, 2005 or 2008.

SUDDEN OAK DEATH

Standard nursery inspections since 2003 have included a search for symptoms of *Phytophthora ramorum*, a fungus-like pathogen that has killed thousands of oaks and tanoaks in the coastal counties of California and Oregon. The most extensive detection program in Wisconsin was conducted in 2005 when 54 nurseries importing stock from these states were surveyed and 300 samples were collected and processed. Inspectors continued surveillance for *P. ramorum* during routine nursery inspections in 2008. No nursery stock samples tested positive for *P. ramorum* and there has been no indication that it exists in the state.

*PLANT INDUSTRY BUREAU NURSERY INSPECTION REPORTS SHOW THE FOLLOWING **TOP TEN** INSECTS AND DISEASES WERE THE MOST FREQUENTLY ENCOUNTERED IN 2008.*

INSECTS

1. Aphids (various species)
2. Ash plant bug
3. Eastern spruce gall adelgid
4. Fletcher scale
5. Japanese beetle
6. Leafminers
7. Potato leafhopper
8. Spider mites
9. White pine weevil
10. Zimmerman pine moth

DISEASES

1. Anthracnose
2. Apple scab
3. Black spot
4. Cedar quince/hawthorn rust
5. Hosta Virus X/Tobacco Rattle Virus
6. Phyllosticta leaf spot
7. Powdery mildew
8. Rhizosphaera needlcast
9. Septoria leaf spot
10. Shot hole disease

APIARY PROGRAM

The Apiary Program monitors the beekeeping industry to prevent and/or control honeybee pests and diseases. Inspectors examine migratory bee colonies entering Wisconsin from such states as Alabama, California, Florida, Georgia, Michigan, Mississippi and Texas, as well as those leaving Wisconsin if they are destined for states that require colonies to be certified as free of diseases and parasites.

Apiary Program statistics showed an increase in imported colonies and nucleuses from 11,410 in 2007 to 40,684 (includes hives brought in for pollination) in 2008, and a minor increase in imported queens and packages from 30,186 in 2007 to 30,508 in 2008 (Figure 4). The annual statewide survey of Wisconsin apiaries found an increase in varroa mite-infested hives, from 79% in 2007 to 82% in 2008 (Table 4). A total of 1,288 hives were inspected.

Six hundred and seventy seven hives were opened and visually inspected for the small hive beetle (SHB), *Aethina tumida*. Of the 677 hives examined, SHB was found in a total seven hives from four counties, including Calumet, Columbia, Crawford and Fond du Lac.

Inspectors also surveyed for Colony Collapse Disorder (CCD) this season by asking beekeepers a series of questions during hive inspections. Of the 105 beekeepers who participated in the spring survey, six described having bee hives with symptoms consistent with CCD. The symptomatic hives were located in Calumet, Jefferson, Manitowoc, Racine, Waukesha and Waupaca counties.

In addition, hives were inspected for a number of honeybee pests and diseases, including American foulbrood (AFB), European foulbrood (EFB), chalkbrood, sacbrood, deformed wing virus (DWV), as well as Africanized honeybees. American foulbrood was found in 2.2% of hives, EFB was found in 0.5%, chalkbrood was found in 6.4%, sacbrood was found in 2.7%, and DWV was found in 4.9% of hives (Table 4). No Africanized honeybees were found during the annual survey.

Figure 4. Honeybee imports into Wisconsin, 1998-2008.

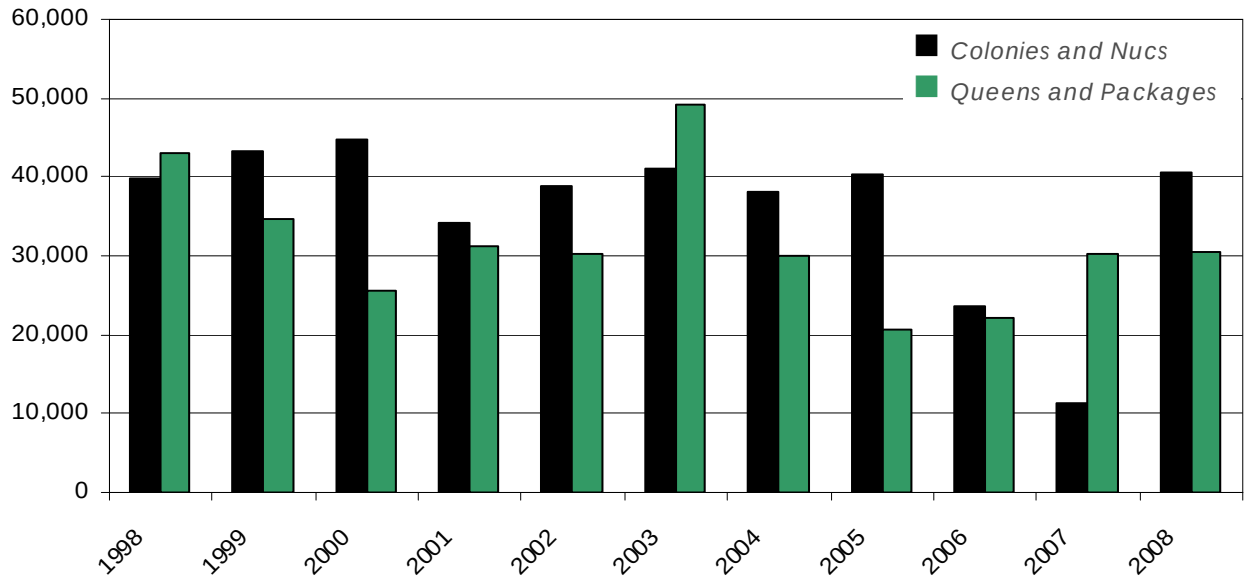


Table 4. Annual apiary inspection results, 2003-2008.

Pest	2003	2004	2005	2006	2007	2008
# Hives checked	1555	896	918	999	971	1288
Varroa mite	54%	54%	85%	75%	79%	82%
Small hive beetle	0.7%	0.3%	0.1%	1.4%	0.3%	0.6%
American foulbrood	1.2%	2.6%	3.5%	3.0%	4.5%	2.2%
European foulbrood	0.07%	0.9%	0.2%	0.6%	1.4%	0.5%
Chalkbrood	6.1%	10%	10%	14.3%	8.1%	6.4%
Sacbrood	NA	NA	NA	several	2%	2.7%
Deformed wing virus	NA	NA	NA	NA	8.1%	4.9%

PHYTOSANITARY CERTIFICATION PROGRAM

The Phytosanitary Certification Program is a cooperative program with the United States Department of Agriculture and with other states. It provides an integral service to shippers of plants and plant commodities by certifying their shipments are free of regulated pests before moving into international or interstate commerce. The program helps to prevent the spread of injurious plant pests from Wisconsin to other states or countries while serving the general public. In 2008, the program was responsible for the export of over **$953,241,942** of plant products from Wisconsin (Table 5).

Demand for phytosanitary certification escalated to record levels in 2008, primarily due to increases in shipments of grain, distillers dried grain (a by-product of ethanol production), and gluten meal sales to

Taiwan. The number of phytosanitary certificates (phytos) issued in 2008 was 8,203, a 19% increase from the number issued in 2007 (6,641), and a 68% increase from the number issued in 2006 (2,627) (Figure 7). Revenues from this program also increased markedly. There was a seasonal variation in demand for phytos, with peaks in January and March, and later in September (Figure 8). Increases in the production of distillers dried grains and gluten meal are expected to contribute to a high demand for certificates in the future. No commodities were rejected or destroyed at destination ports in 2008.

Taiwan, Southeast Asia (Indonesia, Malaysia, Philippines, Thailand, Vietnam), The Republic of Korea and China were the destination countries for more than 83% of the phytos issued in 2008 (Figure 5). The 26 countries in the European Union (Austria, Belgium, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Holland, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, Monaco, Netherlands, Poland, Portugal, San Marino, Spain, Sweden, United Kingdom, Vatican City State) were the destination countries for roughly 3% of the phytos. Corn grain accounted for the largest percentage of phytos issued (34%), followed by soybean grain (32%), lumber (8%), and distillers dried grain (7%) (Figure 6).

END-OF-YEAR SUMMARY

8,203 certificates were issued in 2008

TOTAL of 7,775 Federal Certificates

- 201 Processed Plant Product Certificates
- 7,574 Phytosanitary Certificates

TOTAL of 428 State Certificates

- 61 Phytosanitary Certificates
- 367 Plant Inspection Certificates

Figure 5. Total number of phytosanitary certificates issued by DATCP and country destinations.

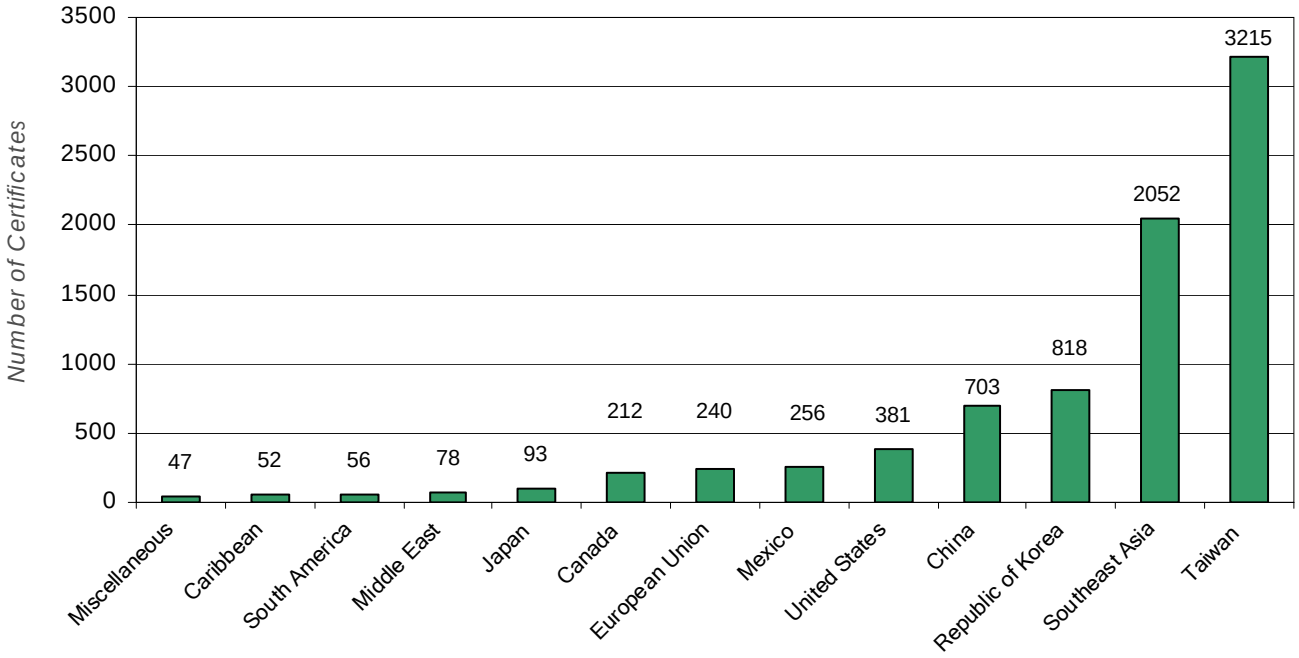
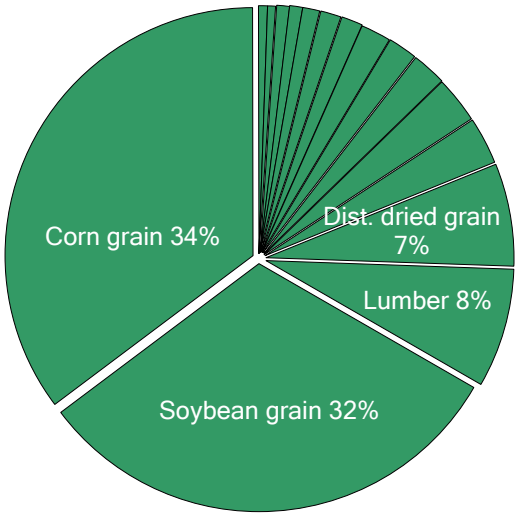


Table 5 on the following page represents 96% of the certificates issued in 2008; the remaining 4% were "Plant Inspection Certificates," which are not specific to a commodity or were shipments with no value. The table shows the total number of plant products and the estimated dollar values of those products for the certificates issued. The estimated values were collected from the industry representative from whom the certificates were requested.

Table 5. Phytosanitary certificates issued in 2008 and estimated product values.

Quantity	Product	Per Unit	Estimated Value All Exports	Estimated Value Wisconsin Exports
62,825,278	bushels soybean grain	$10.08	$633,278,802	$211,092,934
58,576,459	bushels corn grain	$4.17	$244,263,834	$81,421,278
122,674	metric tons corn DDG	$132.00	$16,192,968	$5,397,656
26,777	metric tons corn gluten meal	$498.00	$13,334,946	$4,444,982
34,712	metric tons soybean meal	$354.00	$12,288,048	$4,096,016
8,626,516	board feet kiln dried lumber	$1.35	$11,645,797	$11,645,797
2,408,977	board feet veneer	$4.65	$11,201,743	$11,201,743
990,973	square feet tongue & groove oak	$4.50	$4,459,379	$4,459,379
475,600	bushels wheat grain	$6.33	$3,010,548	$3,010,548
77,300	cut Christmas trees	$16.00	$1,236,800	$1,236,800
6,186	hundred weight kidney beans	$68.00	$420,648	$420,648
5,215	veneer logs	$70.00	$365,050	$365,050
464,000	pounds cranberry vines	$0.75	$348,000	$348,000
384,683	pounds cranberry fruit	$0.90	$346,215	$346,215
651,244	pounds horseradish	$0.51	$332,134	$332,134
1,780,524	pounds potato seed	$0.10	$178,052	$178,052
82,742	nursery plants	$2.00	$165,484	$165,484
986,325	pounds animal bedding	$0.05	$49,316	$49,316
37,500	pounds preserved plant material	$1.20	$45,000	$45,000
320,000	pounds oats grain	$0.13	$41,600	$41,600
33,726	pounds blueberry fruit	$0.90	$30,353	$30,353
3,277	pounds corn seed	$1.20	$3,932	$3,932
5,180	pounds soybean seed	$0.60	$3,108	$3,108
192	pounds vegetable seed	$0.96	$184	$184
	Estimated total dollars in exports		***$953,241,942***	***$340,336,210***

Figure 6. Commodities for which phytosanitary certificates were issued by DATCP in 2008.



Additional Commodities

Nursery plants	3%
Corn gluten meal	3%
Soybean meal	2%
Veneer	2%
Christmas trees	2%
Corn seed	1%
Veneer logs	1%
Tongue & groove floor	1%
Animal bedding	1%
Potato	1%
Wheat grain	1%
Soybean seed	1%

Table 6. Estimated total value of exports by country/region, top six countries/regions.

Country	Value	Country	Value
Mexico	$1,806,013	China	$121,082,440
European Union	$3,408,899	Southeast Asia	$160,127,487
Republic of Korea	$42,345,232	Taiwan	$599,305,223

Figure 7. Number of federal and state phytosanitary certificates issued over 10 years.

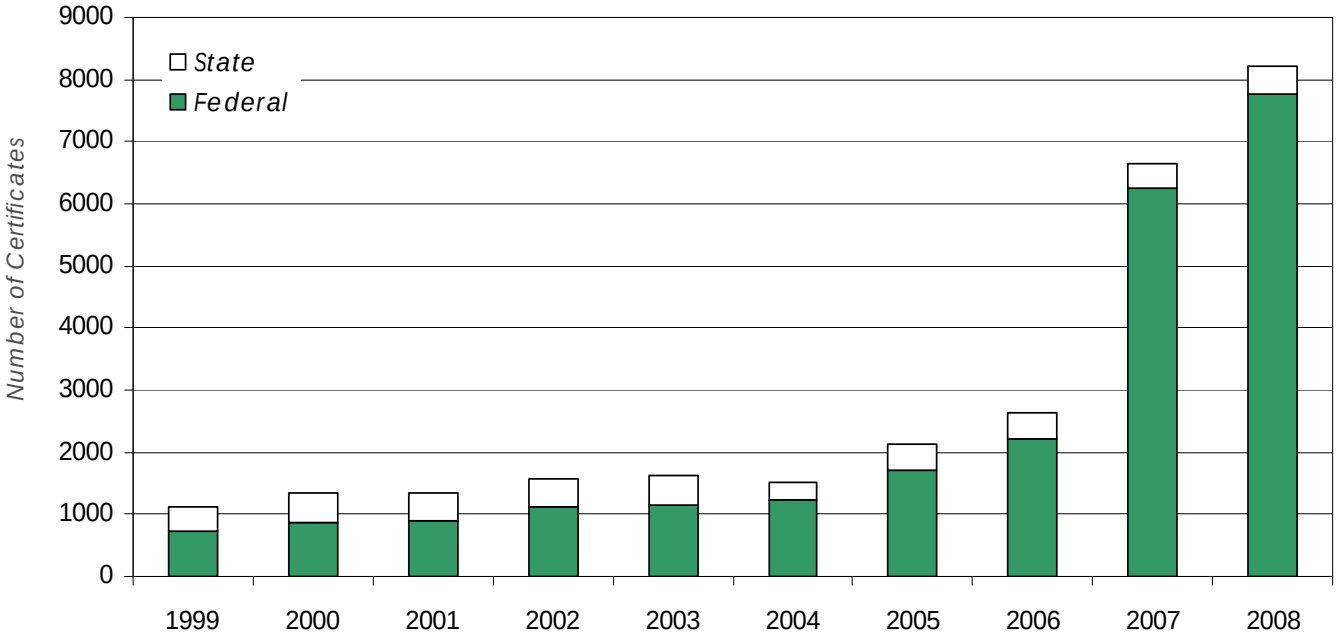
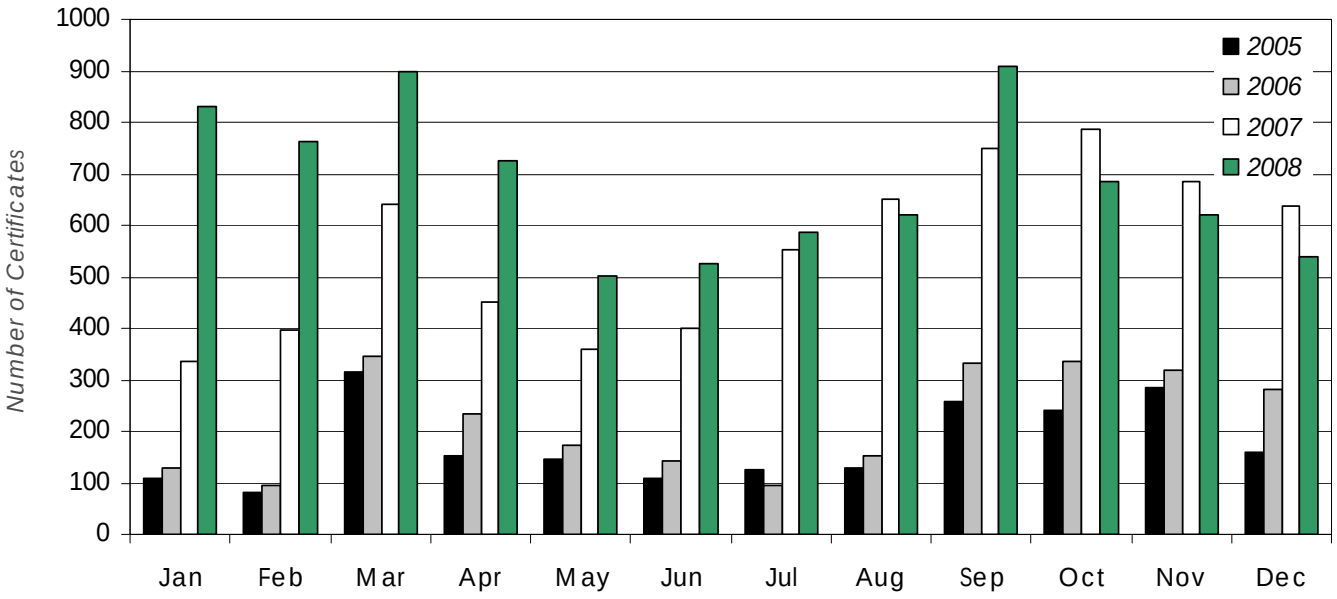


Figure 8. Total Number of phytosanitary certificates issued by month, 4-year trend.



PEST SURVEY PROGRAM: STATEWIDE FIELD CROP INSECT SURVEYS

The Wisconsin Pest Survey Program was established to detect new or exotic plant pests and to assess the distribution and abundance of endemic pests affecting Wisconsin agriculture. Plant pest survey data is analyzed and published in weekly issues of the Wisconsin Pest Bulletin, a compilation of timely plant pest information supported by the survey efforts of our entomologists, weed specialists and plant pathologists. Survey results are important to farmers, county extension specialists, orchardists, agronomists, horticulturalists, and consultants who must make appropriate and informed control recommendations. Accurate pest assessment enhances proper use of pesticides, contributes to integrated pest management, and promotes best management practices. Survey also provides information needed to certify certain export commodities as free of plant pests.

EUROPEAN CORN BORER

Flights of spring moths developing from overwintered larvae in May and June were distinctly lower than in the previous year, as egg and larval survival was apparently influenced by wet conditions in the southern half of the state. The magnitude of the second flight of moths was nearly four times lighter than in 2007.

Results of the fall survey of second generation larvae showed a sizeable decrease in population densities from 2007 to 2008. Populations were well below normal, averaging 0.09 borer per plant (9 borers per 100 plants), the lowest average since 1998. The state average is about one-third that of last season and the 10-year average of 0.31 per plant, and far below the 50-year average of 0.46 per plant. Counts in individual districts were also extremely low (Figure 9). The most drastic reductions were noted in the west central, central and south central districts.

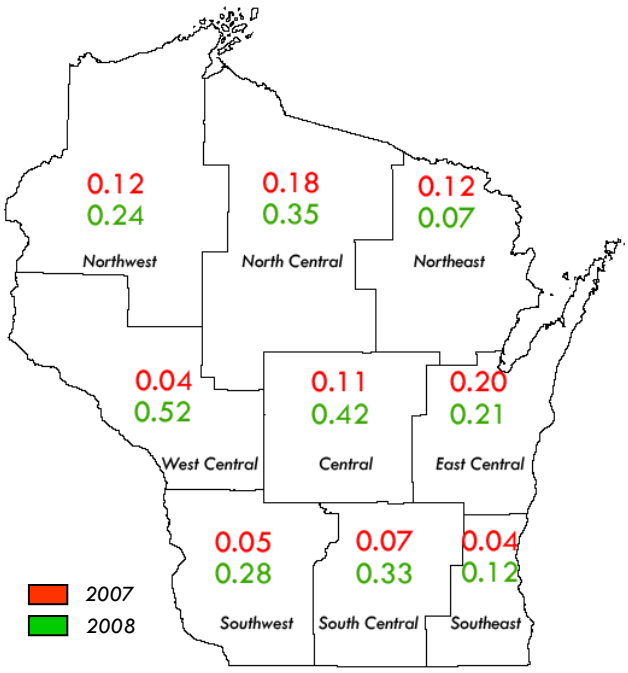


Figure 9. Average number of corn borers per plant.

Injury to corn from larval feeding was not detected in 64% of the grain corn fields examined, most of which were presumed to be Bt hybrids. Roughly 2.5% of the fields had populations exceeding 0.50 borer per plant and only 1% had populations above the economic threshold of 1.0 borer per plant. The fall abundance survey in 230 fields registered the third lowest population since 1942.

CORN ROOTWORM BEETLE

Field data from the annual survey of adult corn rootworms in August revealed an increase from 2007 populations in six of the nine agricultural districts, including the southwest, southeast, west central, northwest, north central and northeast, and a decrease in populations in the remaining districts. The state average was 1.0 beetle per plant, the same average as in 2007. Average populations by district were as follows: northwest 0.5; north central 0.9; northeast 0.6; west central 0.6; central 0.5; east central 1.0; southwest 1.1; south central 1.5; southeast 1.6. The western species

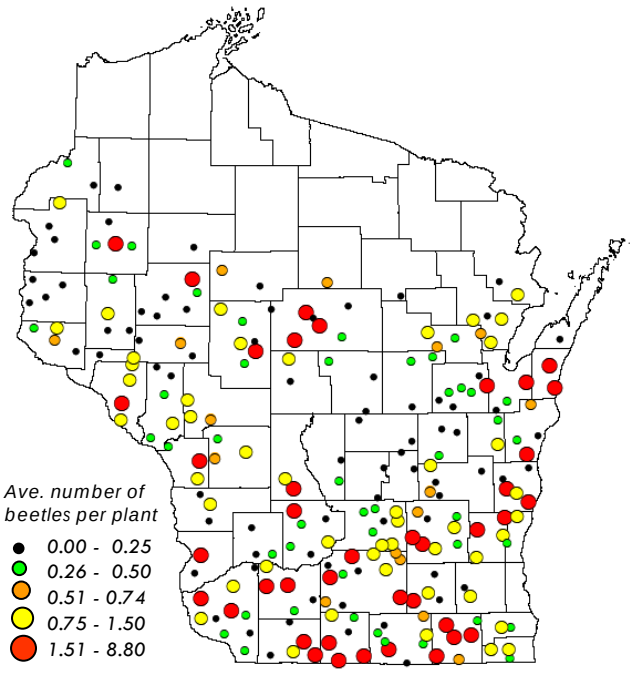


Figure 10. Corn rootworm beetle survey, 2008.

constituted 52% of the state average population, while the northern species made up about 48%. Research entomologists consider an average of 0.75 beetle per plant to indicate an elevated risk for root injury in continuous corn the following year if some form of control is not used, and 38% of 229 fields in the major corn growing counties had such a count or higher. The obvious conclusion from these results is that there is a high potential for rootworm damage to continuous corn next season.

The use of transgenic Bt corn rootworm hybrids was also measured for the third season. The percentage of survey sites that were Bt corn rootworm fields increased from 27% in 2007 to 40% in 2008. For the third year, Monsanto's YieldGard was the most prevalent of the technologies. The YieldGard Bt-Cry3Bb1 protein was detected in 28% of the fields, the Herculex Bt-Cry34/35Ab1 protein was detected in 11% of the fields, and the mBt-Cry3A protein from Agrisure was found in 1% of the fields. More Bt-rootworm corn was planted in the southwest and south central districts from 2006-2008 relative to the other districts. The map on page 10 (Figure 10) summarizes the results of the annual corn rootworm beetle survey.

WESTERN BEAN CUTWORM

The first moths were captured in a pheromone trap on July 2 in Fond du Lac County, with the peak of the moth flight occurring from July 25-August 6. Egg masses were noted near Westfield in Marquette County on July 29. Severe larval injury to corn from this flight was reported or observed in Adams, Columbia, Door, Green Lake, Juneau, Lafayette, Marquette and Sauk counties, where exceptional fields had 50-72% of the ears infested in late August. Moth activity declined to low levels by August 21. A cumulative high count of 327 moths for the July-August monitoring period was registered near Princeton in Green Lake County. The 112 Wisconsin pheromone traps captured a total of 2,433 moths in 2008, a minor increase from the 2,178 moths captured in 110 traps in 2007. Although the annual flight was comparable to last year, late season infestations were more prevalent and larvae were far more abundant.

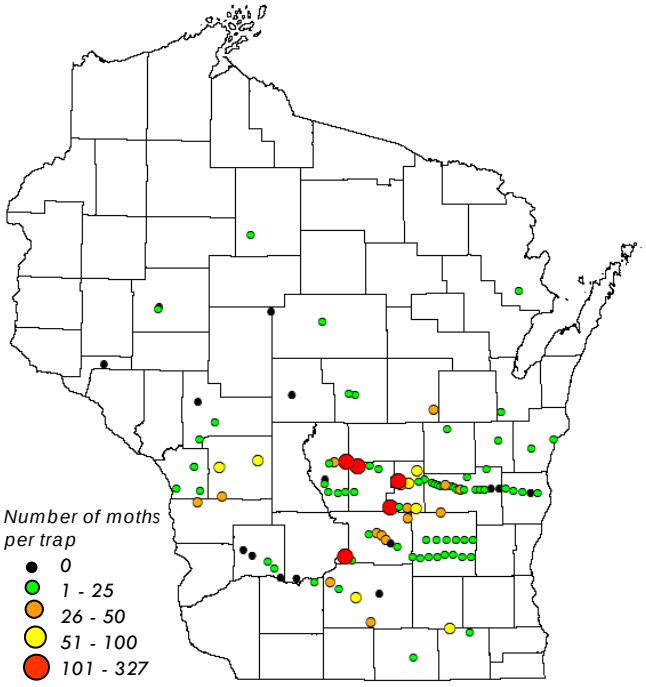


Figure 11. Western bean cutworm trap counts, 2008.

SOYBEAN APHID

Flooding in June caused a large proportion of soybeans to be planted late or replanted, and this historic event, in combination with cool temperatures in August, significantly impacted soybean aphid dynamics in 2008. Populations increased noticeably later than in other years and remained above economic levels into September. This development is not reflected in the low averages found during the annual survey, which appraised aphid levels at R2-R4, before peak densities were reached.

The annual soybean aphid survey conducted from July 21-August 21 showed 92% of the 299 soybean fields

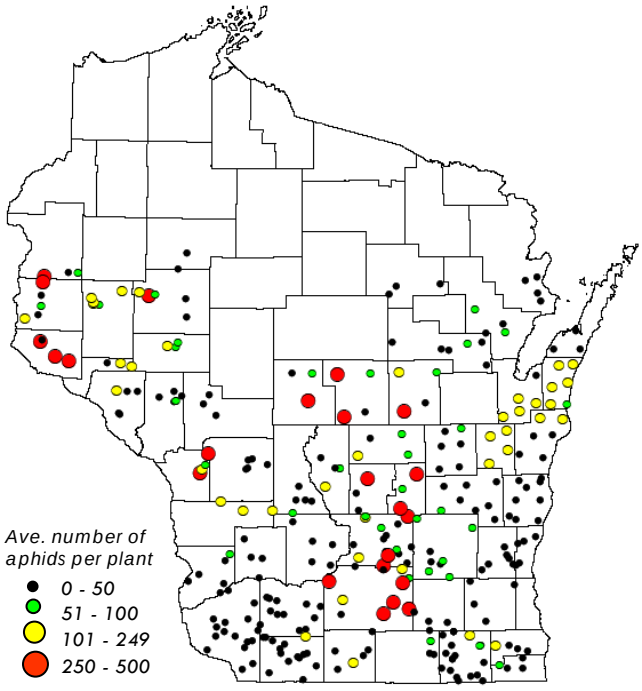


Figure 12. Soybean aphid survey results, 2008.

examined contained non-economic populations of aphids (Figure 12). Economic or high densities of 250 or more aphids per plant were found at 8% of the sites, distributed principally in the central and northwest districts. Low to moderate populations were observed throughout the southern, east central and northeast districts; numbers were particularly low in the southwest and northeast areas. Averages by agricultural reporting district were as follows: northwest 90 per plant; northeast 34 per plant; west central 121 per plant; central 142 per plant; east central 66 per plant; southwest 14 per plant; south central 98 per plant; southeast 23 per plant. The 2008 state average density of 70 aphids per plant is well below both the 2007 average of 164 per plant and the 6-year average of 198 per plant. The highest survey average of 758 aphids per plant was recorded in 2003.

SOYBEAN APHID BIOLOGICAL CONTROL

The parasitic wasp *Binodoxys communis* was released by University of Wisconsin-Madison entomologists at seven field locations to establish a biological agent for control of soybean aphids. On July 2, releases of 1,000 individuals per field were conducted in two separate fields at the West Madison Agricultural Research Station in Dane County (Table 7). On July 14, releases of 500 individuals per field were conducted in two separate fields in Dodge and Winnebago counties. Three additional releases of 1,000-3,000 individuals were made at three sites in Dane and Grant counties from August 5-18. Activities were conducted later than planned due to flooding and the late start to soybean planting. As a result, soybean aphid numbers surged later than normal and populations continued to escalate throughout August when populations typically stabilize or decline. Evidence of *B. communis* establishment was found in six of the seven release fields (Table 7). Although the numbers of parasitoids recovered were relatively modest, they indicate that parasitoid survival and reproduction had occurred. Nearly all (96%) *B. communis* mummies were found within three meters of release sites.

Table 7. Releases and recoveries of the soybean aphid parasitoid Binodoxys communis in Wisconsin, 2008. Aphid numbers are per soybean plant.

Release date	Location	County	No. Released	Initial Aphids	Peak Aphids	No. Recovered
July 2	W Madison 1	Dane	1,000	0.9	616	5
July 2	W Madison 2	Dane	1,000	2.2	540	1
July 14	Columbus	Dodge	500	7.1	981	62
July 14	Ripon	Winnebago	500	10.1	852	34
Aug 5	Muscoda	Grant	1,000	125	345	0
Aug 5	Lodi	Dane	1,000	92	260	40
Aug 18	Deerfield	Dane	3,000	152	239	7

CORN EARWORM

An early flight of migrant corn earworm moths from June 3-26 produced heavy infestations of larvae by mid-July and prompted the treatment of many sweet corn fields in the southern and central counties. Four successive weeks of large flights of moths in August led to a second round of serious late-season infestations. In terms of magnitude, this later flight was 23% lighter than the flight documented in 2007, although late larval infestations were much heavier this season. The cumulative seasonal capture was 5,624 moths in 2008, compared to 8,055 moths in 2007. Areas of heaviest infestation occurred in Adams, Columbia, Dane, Dodge, Jefferson and Marquette counties, and a few scattered locations in Rock County.

BEAN LEAF BEETLE

The first overwintered beetles were swept from a Walworth County alfalfa field on May 14, about two weeks later than last year. Winter mortality due to extreme cold temperatures was estimated to be high, ranging from 52-69%. The annual survey of 167 first crop alfalfa fields from May 14-June 4 substantiated this prediction, yielding just 21 bean leaf beetles, the fewest obtained since surveys began in 2003.

The map to the right provides an indication of the distribution of overwintered beetles last spring. Each black circle signifies a first crop alfalfa field, and each green circle signifies a field at which beetles were collected. Only 8% (13 of 167) of the first crop alfalfa fields surveyed contained beetles (Figure 13). Laboratory testing of the 21 beetles subsequent to the field portion of the survey showed all were negative for bean pod mottle virus (BPMV), suggesting a negligible risk for early season BPMV transmission to soybeans. This insect cannot be credited with causing any economic damage to soybeans in 2008.

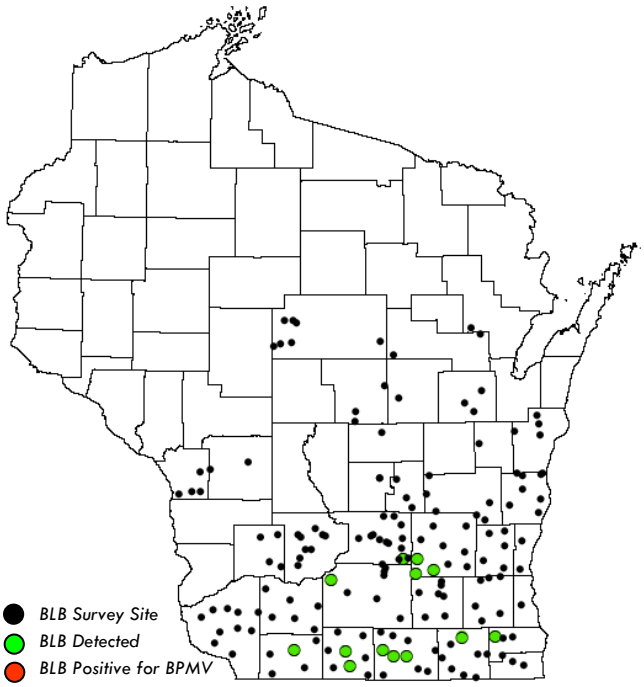


Figure 13. Bean leaf beetle survey results, 2008.

STATEWIDE WEED SURVEYS

CORN WEED SURVEY

Forty-eight corn fields in ten counties were surveyed at three-day intervals from June 5-July 3 to assess weed heights and densities until post-emergence herbicides were applied. The most prevalent species, or those present at the most sites, were common lambsquarters (96%), velvetleaf (96%), grasses (94%), dandelion (50%), and common ragweed (48%). The survey revealed that herbicides were applied during the four-week period from June 6-July 3, although most fields (52%) were sprayed from June 13-17. Of the 48 fields, 37 were glyphosate-resistant (Roundup Ready®).

SOYBEAN WEED SURVEY

Similar to the preceding survey in corn, weed densities and heights were estimated for 30 soybean fields examined every three days from June 19-August 8. The most prevalent weed species were common lambsquarters (93%), velvetleaf (73%), grasses (97%), dandelion (73%), and common ragweed (57%). Herbicides were applied from June 21-August 8, with a median spray date of July 7. An overwhelming majority of the 30 soybean fields (93%) were glyphosate-resistant.

FALL CORN WEED SURVEY

Results of a fall weed survey in corn indicate that weed management programs were very effective in 72% of the fields examined. Incidence and severity ratings were assigned for the total weed population in 230 corn fields and the results were as follows: *TRACE*-20 fields (9%); *FEW*-139 fields (61%); *COMMON*-52 fields (23%); *ABUNDANT* -16 fields (7%). Giant ragweed was observed at 34 (15%) of the locations, fewer than expected.

VOLUNTEER CORN

The presence or absence of volunteer corn in soybeans was recorded for 910 fields as part of an informal survey conducted from September 5-October 17. Results of the survey showed that 48% of the state's soybean fields (434) contained volunteer corn. Averages by district were as follows: southwest 42% (n=131); south central 45% (n=126); southeast 41% (n=111); west central 61% (n=171); central 41% (n=160); east central 22% (n=23); northwest 61% (n=77); north central 46% (n=61); northeast 54% (n=50). Volunteer corn was more widespread than anticipated, namely in the west central and northwest regions.

CAPS EXOTIC PEST DETECTION SURVEYS

The Cooperative Agricultural Pest Survey (CAPS) is a combined effort by federal and state agricultural organizations to conduct surveillance, detection, and monitoring of agricultural crop pests and biological

control agents. Survey targets include weeds, plant diseases, insects, nematodes and other invertebrate organisms.

USDA-APHIS PPQ provides national and regional coordination, funding, and technical support for federal and cooperative survey projects. State Survey Committees, comprised of members from various state agencies and scientific disciplines, work with State Survey Coordinators to direct individual state programs.

*THE PRIMARY PURPOSES OF **CAPS** ARE:*

- To detect exotic plant pests before they can become established in U.S. agriculture
- To support the export of U.S. agricultural products
- To facilitate the collection and management of survey data from cooperative PPQ programs

CAPS surveys in Wisconsin in 2008 were directed toward the detection of fruit tree tortrix moth, light brown apple moth, potato cyst nematodes, *Sirex noctilio*, the new honeybee malady known as Colony Collapse Disorder, as well as a range of exotic insects and diseases affecting soybeans. Results of the CCD survey are discussed under the Apiary Section (Page 5), and findings from the Soybean Commodity survey are provided under the Plant Disease Survey and Diagnosis Section (Page 15).

SIREX NOCTILIO WOODWASP

In 2008, the Wisconsin DATCP placed 110 Lindgren funnel traps baited with 70% α-pinene + 30% β-pinene lure to detect the European woodwasp, *Sirex noctilio*. Trapping was conducted in the 20 easternmost and northernmost counties of Ashland, Barron, Bayfield, Brown, Door, Douglas, Iron, Florence, Forest, Kenosha, Kewaunee, Manitowoc, Marinette, Milwaukee, Sheboygan, Oconto, Oneida, Ozaukee, Racine and Vilas. The regions of Wisconsin closest to known infestations and with substantial shipping received from Europe and Asia were surveyed. Placement of Lindgren funnel traps began on June 12 and was complete by July 30. Individual traps were checked five to seven times through October 31 and 209 samples were collected and examined for foreign woodwasps, longhorned beetles and bark beetles.

A total of 91 woodwasps were collected this season. Specimens were identified as the native species *Sirex edwardsii* (8), *Sirex nigricornis* (12), *Sirex nitidus* (3), *Urocerus albicornis* (12), or *Urocerus cressoni* (56). The map shown here illustrates the 110 Lindgren funnel trap locations.

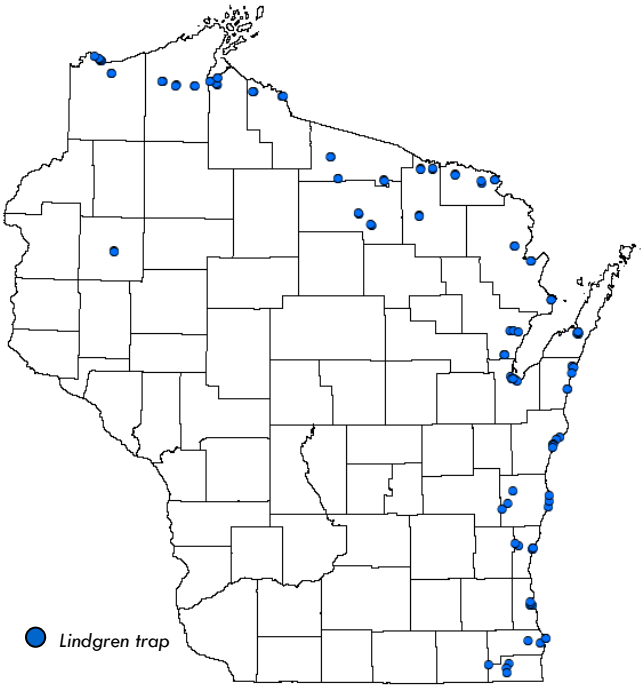


Figure 14. Sirex woodwasp survey sites, 2008.

LIGHT BROWN APPLE MOTH

Nursery Inspection Program staff, together with the DATCP network of apple growers, used pheromone traps to monitor the presence of light brown apple moth (LBAM) in 25 Wisconsin nurseries and 35 orchards. Trapping for LBAM was conducted for the second year in Wisconsin as part of a nationwide effort following the detection of this pest in several California counties in March 2007. Nurseries selected for trapping were those receiving nursery stock from California. Sites were identified through the DATCP licensing database, which tracks the source of nursery stock for all licensed nurseries in Wisconsin. Suspect LBAMs were captured in several orchards in late June and submitted to the DATCP entomologist for identification. All suspects were identified as the native Sparganothis fruitworm (*Sparganothis sulfureana*). Survey results for *Epiphyas postvittana* were negative.

PLANT DISEASE SURVEY & DIAGNOSIS

The Plant Industry Laboratory provides diagnostic support to the Pest Survey and Control Section as well as ARM Division's Environmental Enforcement Section. The lab maintains current and historical records of regulated nematodes and diseases occurring in the state. In 2008, the primary project was screening 610 soil samples for potato cyst nematodes (PCN). One plant pathologist and three part-time, seasonal interns processed a total of 1,418 samples, including 614 crop samples, 194 ornamental and Christmas tree samples, and 610 soil samples for PCN. One of two full-time plant pathologist positions was vacant during the peak survey season. Because of this staffing shortage, 33 samples were diverted to UW-Madison Plant Disease Diagnostic Clinic and most molecular testing was deferred until winter. A total of 64 host plant species were examined, diagnosing 57 pathogens (46 fungal and 11 viral pathogens) (Table 8). Agricultural crop survey results are summarized on pages 15-18.

Table 8. Plant, soil and insect samples received for diagnosis at the PIB Laboratory, 2006- 2008.

Survey Type	***2006***	***2007***	***2008***	***Purpose***	***Target Pest***
Exotic root-knot nematodes	173	107		CAPS Survey	* *Meloidogyne fallax* * *Meloidogyne chitwoodi*
Soybean viruses	188	227	238	CAPS Survey	AMV and SbDV
Soybean rust			10	CAPS Survey	* *Phakopsora pachyrhizi*
Pesticide investigation	10	4	1	Compliance	
Seed corn	57	75	84	Export Certification	Stewart's wilt, HPV, MDMV, WSMV
Soybean cyst nematode	24	28	47	Export Certification	*Heterodera glycines*
Soybean seed certification	13	20	42	Export Certification	BPMV, BSMV, TRSV, TRV, SCN, fungal diseases
Potato rot nematode	0	5	2	Export certification-State quarantine	*Ditylenchus destructor*
Spring soybean survey			50	Pest Survey	*Phytophthora sojae*
Spring wheat survey			106	Pest Survey	Rusts
Snap bean viruses	62		25	Pest Survey	AMV, BPMV, CMV, Poty, TSV, ToRV, TRSV
Bean leaf beetle	81	69	10	Pest Survey	BPMV
Christmas trees	94	66	52	Pest Survey	
Nursery stock	185	180	135	Pest Survey	HVX, TRV, CMV
Potato cyst nematode	173	1808	610	USDA-APHIS Survey	* *Globodera pallida* * *Globodera rostochiensis*
Sudden oak death	13	1	6	USDA-APHIS Survey	* *Phytophthora ramorum*
Misc.	88				
TOTAL	***1,161***	***2,590***	***1,418***		

**Not detected in Wisconsin in 2008 or any previous year.*

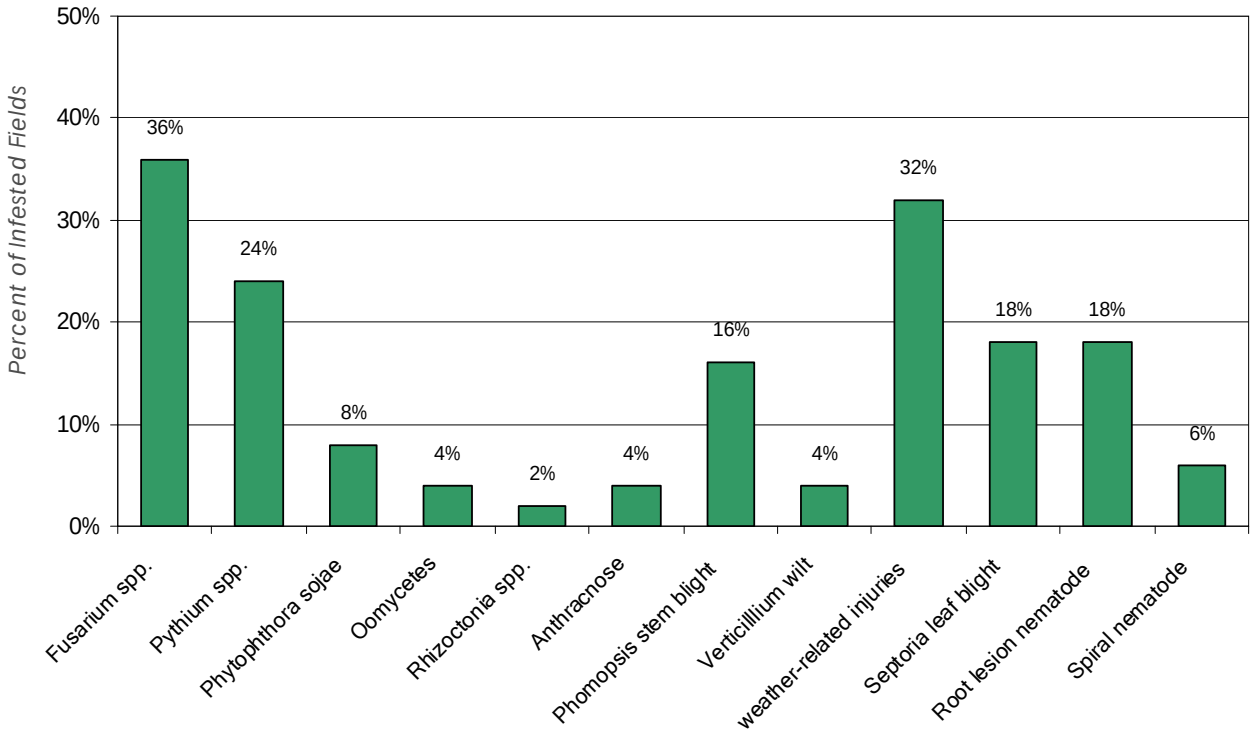
SPRING SOYBEAN DISEASE SURVEY

In response to flooding and unusual weather conditions, a spring survey of 50 soybean fields in the V2 and V3 stages was conducted from June 23-July 7, 2008. Fields were randomly selected, although surveyors targeted and collected whole plants that exhibited symptoms such as wilting, chlorosis and stem lesions. Samples were tested at the Plant Industry Laboratory for early-season fungal pathogens and nematodes (Figure 15).

Seedlings from 37 of 50 fields (74%) tested positive for a variety of root diseases. The following root rot diseases were diagnosed from 50 samples: *Fusarium* sp. 36%; *Phytophthora sojae* 8%; *Pythium* sp. 24%; unspecified oomycetes 4%; *Rhizoctonia* sp. 2%. Some isolates of *Fusarium* and *Pythium* probably represent secondary infections. Soybean plants from 12 of 50 sites (24%) exhibited diseases of the lower stem. Based on the total of 50 fields sampled, *Phomopsis* sp. accounted for 16%; anthracnose and Verticillium wilt each infected 4% of declining plants. Weather related injuries such as flooding, frost and high winds affected soybean seedlings at 32% of surveyed sites. Root lesion nematodes (*Pratylenchus* spp.) directly infested 18% of the samples and spiral nematodes (*Helicotylenchus* spp.) infested 6% of the root samples. Nematodes were observed emerging from root lesions of fine roots. Soil testing for soybean cyst nematode (SCN) was deferred until summer and fall.

Soybean disease survey continued through the growing season and early fall with an emphasis on collection of foliar samples for virus testing and a survey for Asian soybean rust (*Phakopsora pachyrhizi*). Two hundred and thirty-eight foliar samples were collected for laboratory analysis. Root rot and suspect foliar symptoms were observed at 36 surveyed sites. These plants were sampled and tested for pathogens at the laboratory. Two additional fields tested positive for *Phytophthora sojae*. *Fusarium* sp., *Phomopsis* sp., and anthracnose were identified from samples from four fields. Asian soybean rust was not observed in Wisconsin in 2008. The most common foliar disease was brown spot (caused by *Septoria glycines*).

Figure 15. Soybean disease survey results, June 23-July 7, 2008. Fifty fields, V2-V3 growth stages.



SOYBEAN VIRUS SURVEY

Soybean fields for sampling were randomly chosen using Visual Sample Plan statistical software and ArcMap. Sample numbers were based on relative soybean acreage by county, with a desired actual sample size of 230 fields visited statewide. The latter number of fields would allow for 90% confidence of detection with a 1% detection threshold. In each field, plant pathologists stopped at four sites and collected five leaflets from plants in the R2 to R6 growth stages. The leaves were kept on ice until delivered to Plant Industry Laboratory for testing. Foliage was tested using a molecular method, reverse transcription (RT) - polymerase chain reaction (PCR) (Harrison *et al.* 2005)(Martinez-Priego 2004). Figure 16 (Page 17) shows the location of 16 fields throughout the state that tested positive for soybean dwarf virus (SbDV). A total of 6.7% of fields were infected with SbDV in 2008 compared to 3.1% in 2007.

Soybean dwarf virus was found for the first time in soybeans in Wisconsin in 2003 (Phibbs *et al.* 2004). Since then, the number of infected fields has been slowly increasing. To the best of our knowledge, symptoms of dwarfing or chlorosis attributable to SbDV have not been observed in Wisconsin soybean fields. A total of 8.8% of 238 fields tested positive for alfalfa mosaic virus (AMV). This is a marked increase from 2.2% in 2007. Alfalfa mosaic virus can be transmitted by aphids as well as seed. Soybean dwarf virus is not known to be transmitted by seed and its aphid vectors are still being researched.

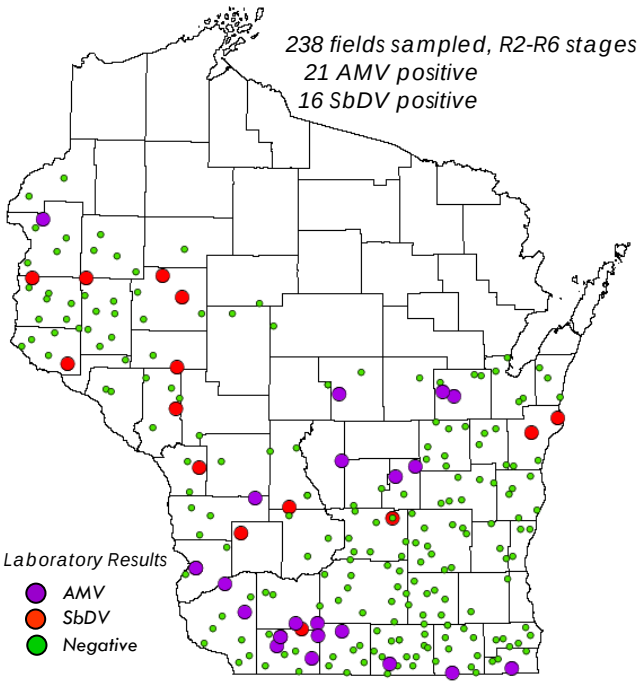


Figure 16. Soybean virus survey, 2008.

WINTER WHEAT DISEASE SURVEY

DATCP Pest Survey Specialists conducted a disease survey of winter wheat fields in the state between May 8 and June 19, 2008, sampling 106 fields in 11 counties which comprise 50% of the wheat acreage in the state (Figure 17). 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). Leaf samples were collected for laboratory confirmation of field diagnosis (Figure 18).

Powdery mildew (*Blumeria graminis*) was the most widespread disease encountered, occurring in 79 of the 106 fields surveyed (75%). Incidence, or the percentage of plants with symptoms in a field, ranged from 1-100%. Severity, or the average percentage of leaf area affected, ranged from trace-20%. Generally, severity was low.

Sooty molds (caused by a range of mostly-saprophytic fungi) were widespread throughout the sampled fields, always confined to the lowest leaves in the canopy. Sooty molds are rarely a problem for wheat in Wisconsin, unless harvest is delayed and the infections move to the heads. Twenty-six percent of all fields checked tested positive for Septoria leaf blotch (*Septoria tritici and S. nodorum*). Incidence and severity are difficult to estimate in the field because of the similarity of field symptoms with other foliar diseases. Septoria leaf blotch can be troublesome during wet growing seasons. Fond du Lac (6) and Door (5) counties had the highest number of infected fields.

Ascochyta leaf spot (*Ascochyta tritici*) was confirmed in 12% of fields. No control measures are generally required for this minor disease. Wheat leaves from 10% of fields tested positive for Pseudomonas leaf blight (*Pseudomonas syringae*) in the laboratory. Seven percent of fields displayed the bleached-head symptoms of scab or head blight, caused by *Fusarium* spp. The incidence in fields was low.

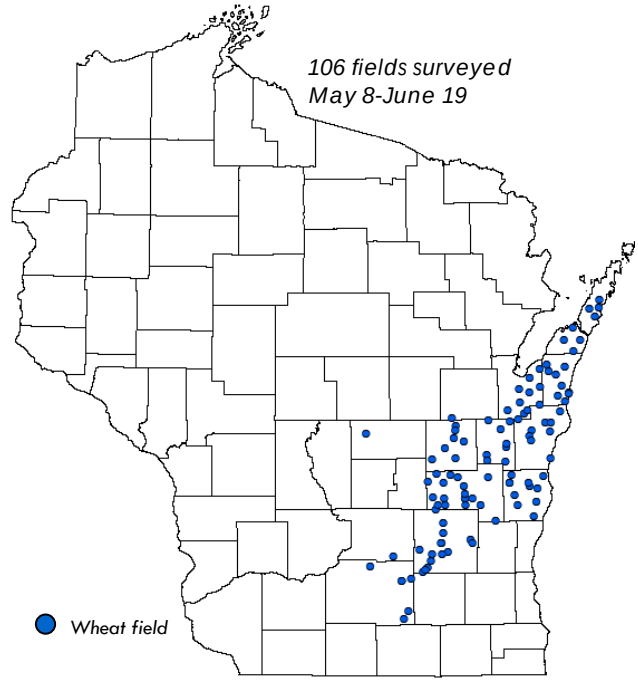
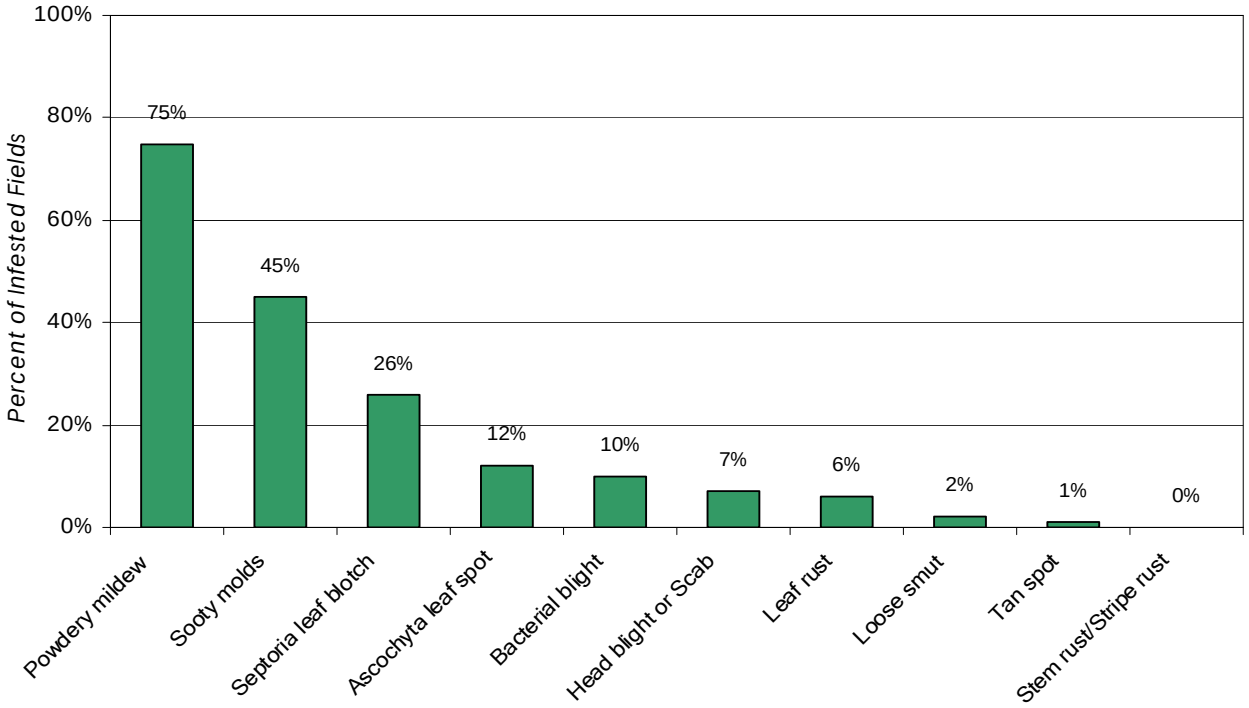


Figure 17. Winter wheat survey, 2008.

Leaf rust (*Puccinia triticina*) was found in 6% of fields at trace levels. Loose smut (*Ustilago tritici)* was found in 2% of fields, which was less than expected in most Wisconsin wheat seasons. The incidence

within fields was far below 1%. No stem rust or stripe rust was detected by DATCP personnel. One sample from a field in Dodge County was determined to have tan spot (caused by *Pyrenophora tritici-repentis*). The severity was below 2%, with infection limited to the lowest leaves.

Figure 18. Survey of foliar wheat diseases in Wisconsin, 2008.



References
1.) Harrison *et al.* Plant Disease. 2005. 89:28-32. 2.) Martinez-Priego. Plant Disease. 2004. 88:908.
3.) Phibbs *et al.* Plant Disease. 2004. 88:1285.

PLANT PARASITIC NEMATODE SURVEYS

Every year soil samples are collected from field crops and processed at the Plant Industry Laboratory to certify that a crop was grown in an area free of certain cyst forming nematodes. This certification is necessary to allow the export of plants or plant products to other states or foreign countries.

SOYBEAN CYST NEMATODE

The year 2008 marks 30 years of annual statewide surveys for SCN by DATCP and the University of Wisconsin. Soybean cyst nematode (*Heterodera glycines*) was first detected in the U.S. in 1954, in Hanover County, North Carolina. Survey efforts in 1957, 1958 and 1962 did not find the nematode in Wisconsin; the first report in the state was made in 1981, in Racine County. In 2008, SCN was detected in two new Wisconsin counties (Monroe and Calumet), bringing the total number of counties where the nematode has been found to 46 (Figure 19). Soybean acreage in the counties where SCN has been detected comprises 85.5% of the soybean crop in the state.

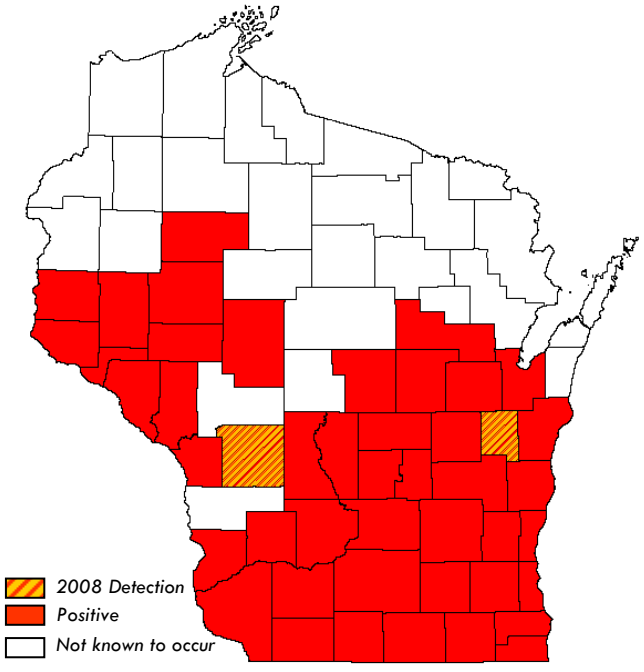
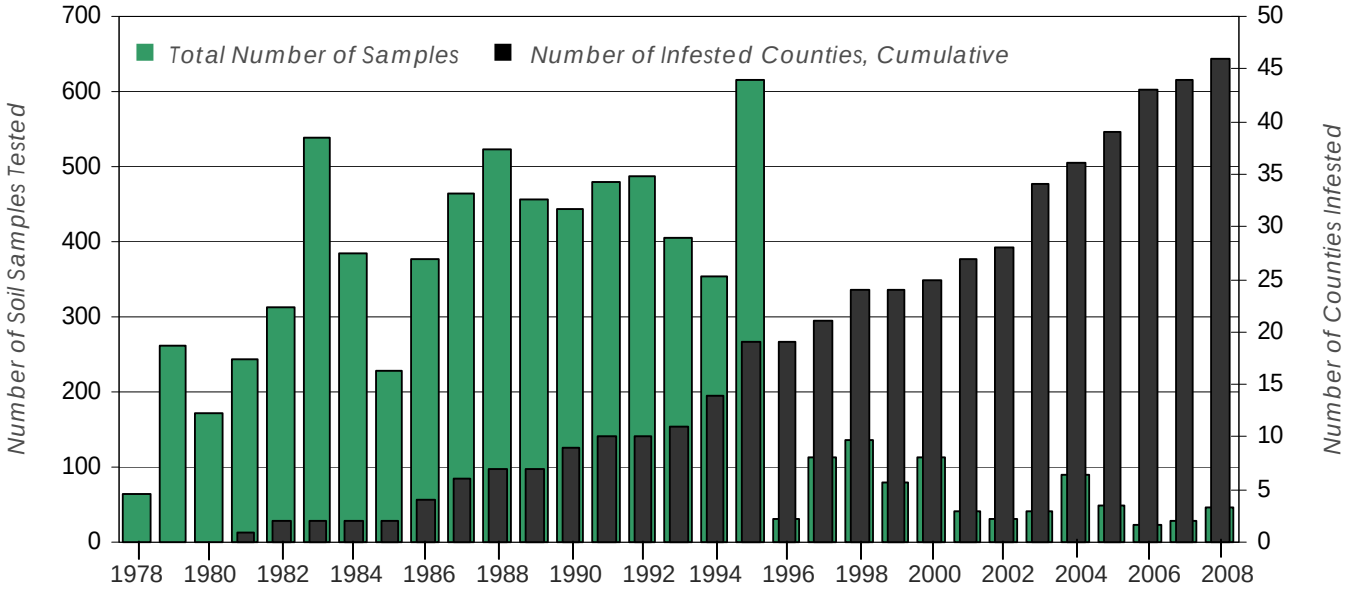


Figure 19. Soybean cyst nematode survey, 2008.

Soybean cyst nematode is the greatest yield reducing pest problem in the U.S. In 2007, SCN reduced yields in the U.S. by an estimated 94 million bushels (Wrather & Koenning). This is three times the loss attributed all seedling diseases combined, Phytophthora root rot and Sudden Death Syndrome. The role of the nematode in this loss is frequently overlooked, leading growers to defer management practices that would mitigate damage. Soybean growers in all parts of the state are urged to sample their fields for SCN.

Reference
J. A. Wrather, University of Missouri-Delta Center, P.O. Box 160, Portageville, MO 63873, and Steve Koenning, North Carolina State University, "Soybean Disease Loss Estimates for the United States, 1996-2007".

Figure 20. Soybean Cyst Nematode Surveys in Wisconsin, 1978-2008.



POTATO CYST NEMATODES

Intensive soil testing of Wisconsin seed potato fields in 2008 continued to show that fields are free from the potato cyst nematodes *Globodera rostochiensis* and *G. pallida*. In 2008, a total of 610 soil samples were collected from 3,050 acres of potato fields. This represents over 1.3 tons of soil screened for cysts by staff of the Plant Industry Laboratory (Figure 21). Field sampling and testing focused on seed potato fields to facilitate export of seed potatoes to Canada. The export of potatoes relies on the certification of potato fields and tubers as being free from these regulated pests. Wisconsin has conducted rigorous surveys for the potato cyst nematode for two successive years (2007-08) and for golden nematode periodically since 1982. These surveys varied in scope and were funded by the USDA Cooperative Agricultural Pest Survey (CAPS) Program. A total of 6,336 samples have been screened for PCN over the course of 27 years (Figure 22). No infestation of the pale potato cyst nematode or the golden nematode has been detected in the state.

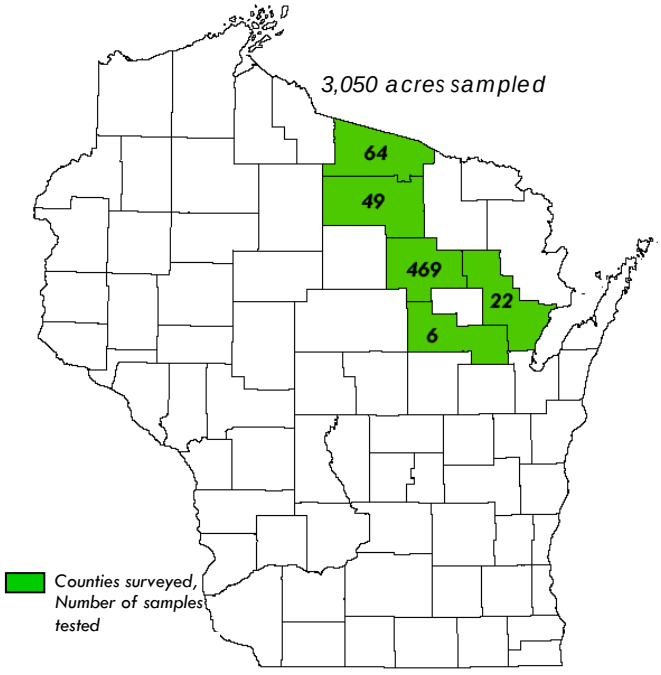
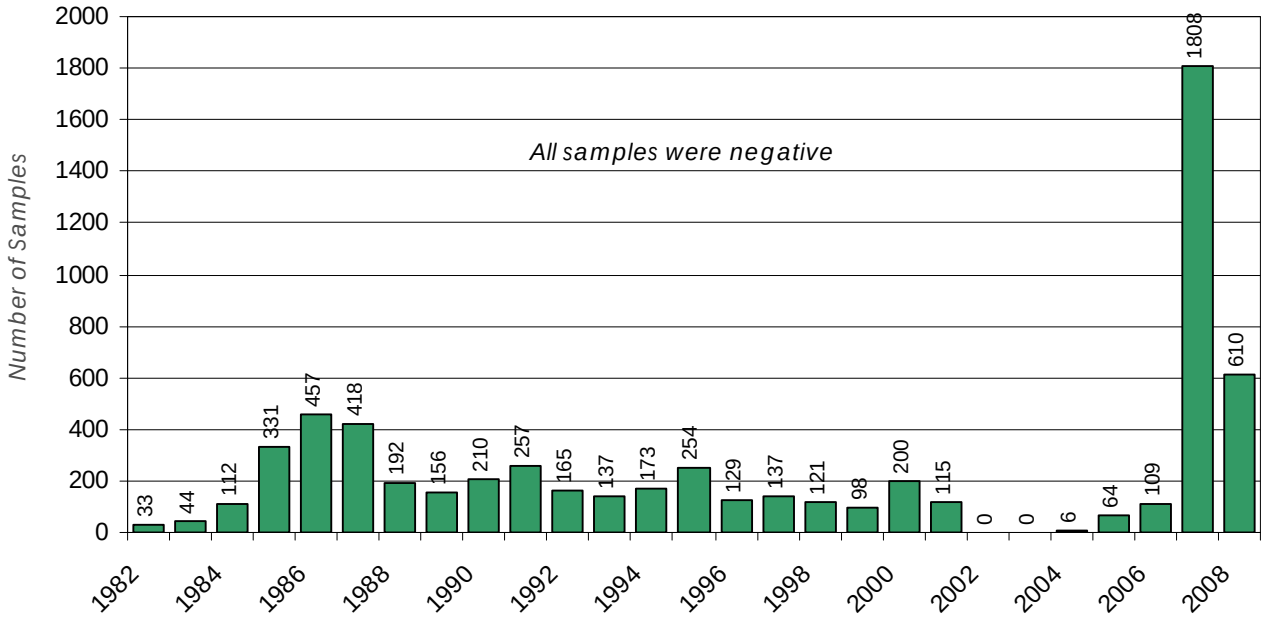


Figure 21. Potato cyst nematode survey, 2008.

Figure 22. Number of soil samples collected for detection of golden and pale potato cyst nematodes, 1982-2008.



POTATO ROT NEMATODE

Potato rot nematode (PRN) was first detected in Wisconsin in 1953, and today, approximately 3,014 acres have a history of infestation. To prevent its spread, 108 fields have been placed under quarantine and 21 fields still remain under state quarantine. Eight fields totaling 383 acres were inspected in 2008. Potato rot nematode was detected in one 55 acre field in Langlade County that had a previous infestation. Four of the inspected fields were released from quarantine. One field was released to certified seed based on fumigation and two successive potato crops that showed no evidence of the nematode. Two fields were released to table stock, seed pending, based on fumigation and one potato crop that showed no evidence of PRN. One field was released to table stock after two successive potato crops showed no evidence of PRN.

Table 9. Number of PRN acres and fields by county and current status.

County	***Current Status***	***Sum Of Acres***	***Count Of Field #***
Forest	Released not used for potato	15	1
Kenosha	Released not used for potato	1	1
Langlade	Infested	586.8	20
Langlade	Released not used for potato	197.8	9
Langlade	Released/certified seed	1284.9	43
Langlade	Released/table stock	538	23
Langlade	Released/table stock/seed pending	233	5
Lincoln	Released/table stock/seed pending	37	1
Manitowoc	Released/certified seed	9.3	1
Marathon	Infested	8.4	1
Marathon	Released/certified seed	64.5	2
Portage	Released/table stock	38.2	1

SEED FIELD INSPECTIONS

To facilitate certification of seed for export from Wisconsin, crops grown for seed export are inspected during the growing season. Fields are inspected for regulated pests such as Stewart's wilt, high plains virus (HPV) and SCN. The prevalence and severity of non-regulated pests are also assessed in each field.

Seed production field inspections in 2008 totaled 2,615 acres, including roughly 2,416 acres of corn (95 fields), 195 acres of soybeans (13 fields), and four acres of cucumber seed production (seven fields). For the fourth successive year, all corn fields inspected were sampled for *Pantoea stewartii*, the causal agent of Stewart's wilt. At least 23 countries worldwide currently prohibit the export of seed infected with this disease. *Pantoea stewartii* was detected in two of 95 corn fields.

To meet the import requirements of foreign trading partners, all corn fields were also sampled for high plains virus (HPV), maize dwarf mosaic virus (MDMV), and wheat streak mosaic virus (WSMV). Neither HPV nor WSMV was detected. The vector of HPV, wheat leaf curl mite (*Aceria tosichella*), is not known to occur in Wisconsin. MDMV can be transmitted by more than 20 species of aphids and is known to occur in the state. Two Columbia County fields tested positive for MDMV in 2008.

Soybean fields were sampled for anthracnose, bacterial pustule/blight, bacterial wilt, bean pod mottle virus, bean southern mosaic virus, brown stem rot, Cercospora blight and leaf spot, frogeye leaf spot, pod and stem blight, sudden death syndrome, soybean cyst nematode, tobacco ringspot virus, tomato ringspot virus and white mold. Six soybean fields in Rock County tested positive for SCN. Inspection results were negative for all other diseases.

Inspections of cucumber seed production fields were completed at seven sites in two counties. Trace amounts of angular leaf spot were observed in all seven fields, while trace amounts of bacterial wilt were noted in four fields. Laboratory analysis of leaf samples collected at each site confirmed anthracnose in two fields, powdery mildew in one field, and gummy stem blight in five fields.

CHRISTMAS TREE INSPECTION PROGRAM

Wisconsin's Christmas Tree Program licenses Christmas tree growers, inspects and certifies Christmas trees as being reasonably free of injurious insects and diseases. The program provides a service to interstate and international shippers of Christmas trees who require an inspection certificate prior to shipping. Growers who sell Christmas trees locally also benefit by receiving inspections to inform them of pests and diseases affecting their trees. In addition to trees, staff inspect wreath and roping producers in the state who request plant health certificates.

Table 10. Christmas tree field inspection finds, 2001-2008.

Year	# Fields Inspected	# Fields with Gypsy Moth	# Fields with Pine Shoot Beetle
2001	420	9	0
2002	487	35	0
2003	600	61	0
2004	703	20	1
2005	661	34	0
2006	836	13	0
2007	814	45	9
2008	736	39	0

Inspections of Christmas trees begin once the gypsy moth egg mass deposition is complete, typically after September 1. In addition to Christmas trees, staff inspect fence rows and wood lots adjacent to each field for evidence of gypsy moth life stages as well as indicators of pine shoot beetle. Christmas tree growers

who plan to ship trees interstate and/or request a plant health certificate are the focus of high-priority inspections.

Field location information is collected from growers and entered into a database. Support from the Gypsy Moth Trapping Program provides county-level gypsy moth trap count maps that are used to prioritize inspections and inform growers of gypsy moth populations in the area. Field inspection reports of pest incidence and severity levels, along with diagnoses for symptomatic plant samples submitted to the DATCP Plant Industry Lab, are provided to growers.

Figure 23. Top ten Christmas tree disease finds in 2008.

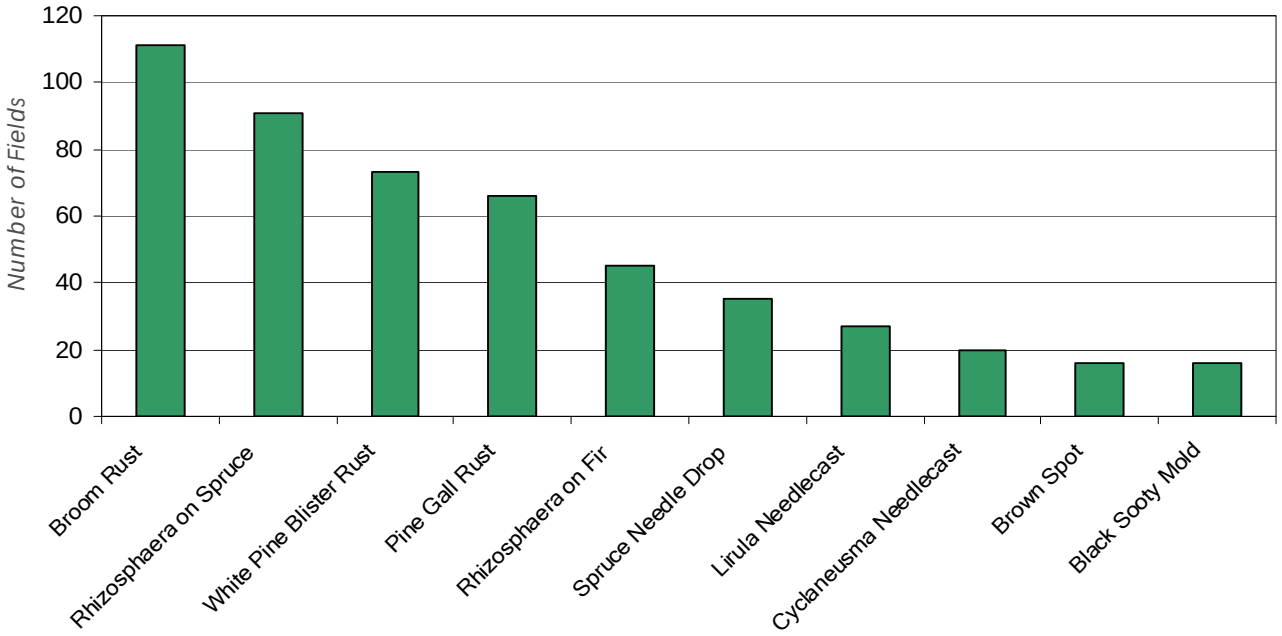
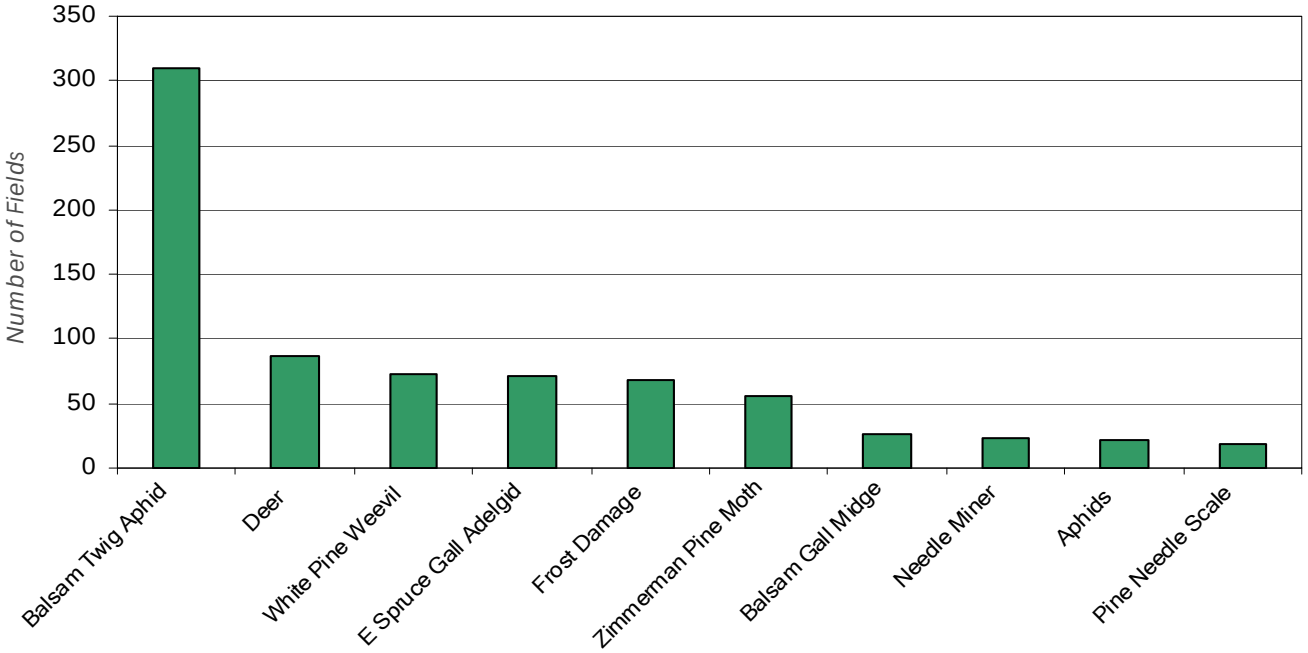


Figure 24. Top ten Christmas tree pest finds in 2008.



SEED CONTROL PROGRAM

The objective of this program is to assure quality seed is sold in Wisconsin by monitoring and enforcing the labeling, germination, and purity requirements including noxious weed content under the Wisconsin Seed Law and Rule, s. 94.38-94.46, Wis. Stats. and ATCP 20, Wis. Adm. Code. Field inspectors evaluate labels for compliance, issue stop sale orders, and collect official samples for analysis. In 2008, inspectors collected a total of 242 samples from 78 of 690 licensed labelers. Attention was focused on seed labelers with poor compliance records or an increasing number of violations. Five companies were targeted for priority sampling. Also targeted in the 2008 season were companies not sampled for two years and those supplying clover, lawn grass mixtures, oats, orchardgrass, pasture mixtures, rye and smooth bromegrass. The overall violation rate was 10%, a slight decrease from 12% last season (Table 13). Of these violations, ten were rated as *MINOR* while eight were rated as *SERIOUS*.

THE FOLLOWING COMPLIANCE ACTIONS WERE TAKEN:

- Twelve seed lots were relabeled in order to meet compliance standards
- Two lots were removed from sale by the labeler
- Seven lots were returned to the labeler
- Three lots were sold and planted before compliance actions could be taken

Table 11. Seed violations by class of seed in 2008.

Seed Class	***Germ***	***Purity***	***Noxious Weed***	***Technical***
Cereals	2	0	1	0
Grasses	5	1	4	4
Large Grain	0	0	0	1
Mixtures	4	2	1	0
Small Seeded Legumes	0	0	1	1
Total	11	3	7	6

Based on the following tables and compliance records, seed sampling efforts in 2009 will be directed toward mixtures of lawn grasses. Inspectors will again focus on labelers with poor compliance records and those who have not been sampled for two years.

Table 12. Problem seed in 2008.

Crop	***Samples***	***Violation %***	***Technical***	***Minor***	***Serious***
Clover	9	11%			1
Lawn Grass	48	24%	3	4	4
Pasture Mix	7	29%		1	1
Pea Mixture	8	50%		3	1
Smooth Bromegrass	6	33%		1	1
Wheat	5	20%		1	

Table 13. Number of germination, purity, noxious weed, and technical violations by major crop sampled.

Class of Seed	***Kind of Seed***	***Samples***	***Violations***
Cereals	Barley	4	0
	Millet	1	0
	Oats	17	0
	Rye	2	1
	Sorghum	3	0
	Wheat	5	1
	Rape	1	1
Total Samples/Violations for Class		**32**	**3**
Violation Percentage for Class			**9%**
% of Total Samples/%Violations for Year		**13%**	**12%**
Large Grains	Corn	27	1
	Soybean	25	0
	Pea	4	0
Total Samples/Violations for Class		**56**	**1**
Violation Percentage for Class			**2%**
% of Total Samples/%Violations for Year		**23%**	**4%**
Grasses	Fescue	4	0
	Kentucky Bluegrass	2	0
	Lawn Grass	48	11
	Pasture Mix	7	2
	Perennial Rye Grass	7	0
	Reed Canary	1	0
	Smooth Bromegrass	6	2
	Timothy	7	0
Total Samples/Violations for Class		**83**	**14**
Violation Percentage for Class			**18%**
% of Total Samples/%Violations for Year		**34%**	**60%**
Mixtures	Pea/Barley	1	1
	Pea/Oat	4	1
	Pea/Triticale	3	2
Total Samples/Violations for Class		**8**	**4**
Violation Percentage for Class		**-**	**50%**
% of Total Samples/%Violations for Year		**3%**	**16%**
Small Seeded Legume	Alfalfa	23	1
	Clover	9	1
Total Samples/Violations for Class		**32**	**2**
Violation Percentage for Class		**-**	**6%**
% of Total Samples/%Violations for Year		**13%**	**8%**
Vegetable	All Veggies	29	0
% of Total Samples/%Violations for Year		**12%**	**0%**
Flower & Prairie	All Flower/Prairie	2	0
% of Total Samples/%Violations for Year		**1%**	**0%**
Total Samples/Violations		242	24
Violation Percentage Total			***10%***

BIOLOGICAL CONTROL PERMIT PROGRAM

In Wisconsin, the release of biological control agents for the purpose of managing invasive plants is regulated by both federal and state permits. A total of 22 permit applications were approved for the release of biological agents to control the invasive plants leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea maculosa*) and St. Johnswort (*Hypericum perforatum*) in 2008.

Releases of the flea beetles *Aphthona cyparissiae*, *A. czwalinae*, *A. flava*, *A. lacertosa* and *A. nigriscutis* were approved for 12 sites in seven counties in an effort to minimize local populations of leafy spurge. New releases were conducted in Door, Douglas and Marathon counties in 2008. The larval stages of *Aphthona* feed on the roots of leafy spurge, whereas the adults consume the leaves and flower bracts.

The seedhead weevils *Larinus minutus* and *L. obtusus* were approved for release at 19 sites in ten counties. Releases were made for the first time in Columbia, Fond du Lac, Iowa, Marquette, Portage and Winnebago counties this season. Research has demonstrated that the larvae may destroy up to 100% of the seed in an infested knapweed seedhead.

Cyphocleonus achates, a small root boring weevil, was also approved for release at four sites in three counties, two of which were first-time releases (Columbia and Iowa counties). Adults of this species feed on young leaves of spotted knapweed and the larvae mine the root crown and tap root. Releases of this agent and both *Larinus* species have been conducted at a limited number of sites in the state since 2003.

Releases of *Chrysolina quadrigemina* and the closely related *C. hyperici* were made for the first time in Wisconsin at Fort McCoy in Monroe County. Both leaf beetle species are effective natural enemies of St. Johnswort. Approximately 1,750 individuals were released at four sites.

BIOTECHNOLOGY PROGRAM

The Biotechnology Program is responsible for three general areas concerning genetically engineered organisms: to assess environmental impact of field trials, to fulfill the requirements of the Wisconsin Notification Act (s. 146.60, Wis. Stats.) and to serve as a source of technical information. The primary regulatory responsibility resides with federal agencies, particularly the USDA-APHIS and the EPA.

In 2008, the department issued concurrence for 243 notifications and 26 permits for genetically engineered plants. All permit holders were inspected by the USDA-APHIS, often with the assistance of a DATCP Plant Industry Bureau representative. Herbicide tolerance and insect resistance continue to comprise most of the notification applications. Permit requests are on the increase for other altered plant qualities, including drought tolerance, increased yield and altered seed qualities.

* * * * * *