

WISCONSIN PEST BULLETIN

Timely crop pest news, forecasts, and growing
season conditions for Wisconsin



STATE OF WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION PLANT INDUSTRY BUREAU
2811 Agriculture Dr. Madison, WI 53718 • <http://pestbulletin.wisconsin.gov>

WEATHER & PESTS

As the growing season began, cool, damp weather and soils delayed the start of planting and fieldwork. The spring planting pace was the slowest in more than a decade and farmers became concerned about diminishing corn yield potential as the optimal planting period expired. Conditions improved during the last half of May and considerable planting progress was made by month's end. June featured historic heat and record precipitation events, although the mild weather and adequate soil moisture levels were beneficial for emerging crops. July was one of the warmest on record. Relentless heat and humidity stressed summer crops, particularly the vulnerable pollinating corn crop. By August, most early-season planting delays had been offset and crop development was ahead of the 5-year average. An early and widespread frost arrived on September 14. At the close of another growing season, harvest reports are favorable, despite the many weather adversities of 2011. Wisconsin corn producers are expecting a record harvest of 525 million bushels, an all-time high for the state. The state soybean forecast of 75.2 million bushels is lower than last year but the second highest yield in the nation.

PEST HIGHLIGHTS

CORN ROOTWORM: The annual beetle survey in August showed a substantial increase in numbers as

compared to 2010. Populations increased in seven of the nine agricultural districts and 27% of surveyed fields had economic counts of 0.75-8.9 beetles per plant. The 2011 state average of 0.7 per plant represents a more than two-fold increase from the very low 2010 average of 0.3 per plant. Results of the survey indicate a high potential for root damage to continuous corn in southern and central Wisconsin next season.

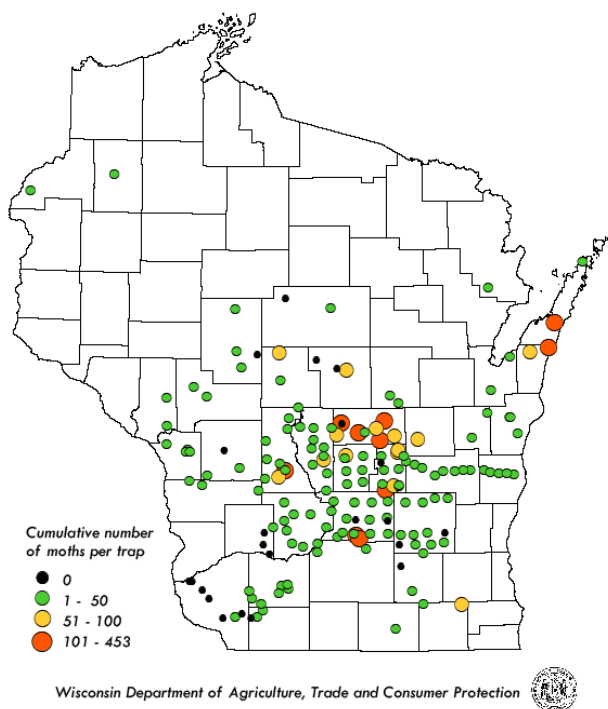
SOYBEAN APHID: Densities did not attain economic levels in the majority of Wisconsin soybean fields in 2011. Eighty six percent of the 142 soybean fields sampled in July and August had very low counts of 0-25 aphids per plant, 11% had 26-50 per plant, and only 3% contained moderate counts of 51-103 per plant. The state average density of 12 aphids per plant was the lowest since 2004 and the second lowest in the nine-year history of the survey.

BLACK CUTWORM: Delayed planting, late weed control and the largest moth migration in 10 years resulted in localized black cutworm problems this season. Larval progeny of the earliest migrants reached the destructive cutting stages by May 30 and infestations were noted in Dane, Dodge, Grant, Jefferson, Jackson, La Crosse and Vernon counties in early June. Damage estimates ranged from 3% cut plants to as high as 40% in exceptional fields. Insecticidal seed treatments labeled for black cutworm control proved ineffective in some instances and

rescue applications were necessary. The threat from this early-season pest diminished by late June.

WESTERN BEAN CUTWORM: Moth counts decreased significantly from the previous year, according to the statewide trapping program. The 2011 cumulative capture of 4,895 moths was a 55% reduction from 10,807 moths collected in 2010. Larval infestations resulting from the flight were also less prevalent and severe this year, although a few scattered fields had a fair number of larvae in the ears.

2011 Western Bean Cutworm Trap Counts



JAPANESE BEETLE: Adults appeared during the week of June 20 and were numerous by mid-July. Reports of extensive damage to fruit and shade trees, field crops and ornamental plants were common in July and August. Populations in the southeastern, south-central and northwestern counties were higher than normal this season. Above-average rainfall in 2010, which favored the larval stages, and absence of sufficient natural control organisms appear to have been the basic reasons for the abundance of beetles in 2011.

SPOTTED WING DROSOPHILA: A late-season trapping survey in October yielded two new county records. Six specimens were captured in an orchard near Gays Mills in Crawford County, 12 were collected at Stoughton in Dane County, and another two were trapped at McFar-

land in Dane County. The list of Wisconsin counties in which spotted wing drosophila has been found since 2010 also includes Racine County.

FORAGES

ALFALFA WEEVIL: Larvae were noted in Sauk County alfalfa on May 17, nearly three weeks later than in 2010. Development was accelerated by record-setting heat in late May and weevils were numerous by June 2. Pupation began at advanced sites two weeks later. Alfalfa harvest in early June prevented most of the larval population from maturing, but rainy weather and competing corn and soybean planting schedules delayed operations in some fields, permitting damage to intensify. By mid-June, any first growth alfalfa that had not been harvested had severe infestations of 3-11 larvae per sweep and 40-80% defoliation. Damage subsided by late June as the remaining larvae entered the non-feeding pupal stage.



Alfalfa weevil leaf feeding injury

Krista Hamilton DATCP

POTATO LEAFHOPPER: The first distinct arrival episode of 2011 occurred from May 21-23 and migrants were widely distributed over the southern two-thirds of the state by early June. Nymphs appeared in second crop alfalfa from June 8-15. Surveys in June and July found low to moderate numbers, with representative counts averaging below 1.8 per sweep statewide. Economic levels of 2.0 or more leafhoppers per sweep developed in a small proportion of fields in late July and early August, but chemical treatment was seldom required this year.

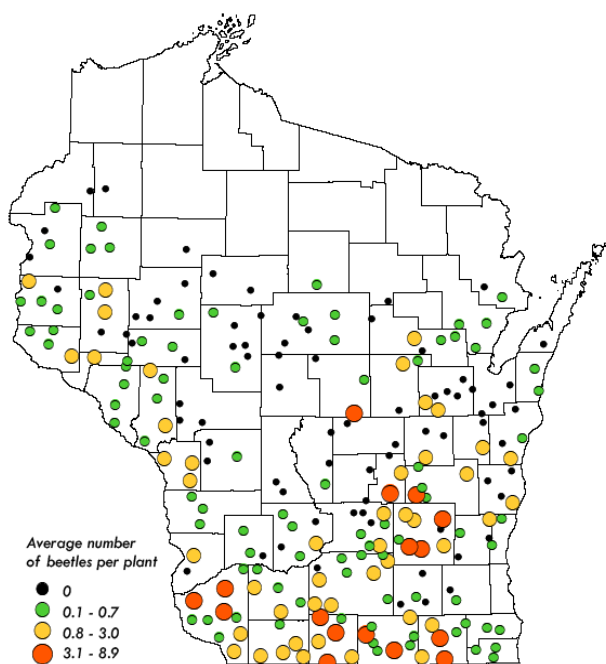
PEA APHID: Populations in alfalfa were comparatively low all season long. The highest count of 24 per sweep was found in a Washburn County alfalfa field on June 8,

but this was an anomaly. Surveys from May-August found average counts of 2-4 per sweep. Pea aphids were not abundant enough to be of economic significance this season.

CORN

CORN ROOTWORM: Results from the August beetle survey showed a marked population increase in the southern and central districts. The state average beetle count of 0.7 per plant represents a more than two-fold increase over the historic low average of 0.3 per plant documented last year. The largest increase occurred in the south-central district where the average escalated sharply from 0.3 to 1.4 beetles per plant. Population increases were also noted in the southwest, southeast, west-central, central, east-central and northeast districts. By contrast, beetle counts in the northwest and northeast areas were extremely low at 0.1 per plant. The survey findings suggest that southern and central Wisconsin corn producers will need to consider crop rotation or another form of rootworm management next year.

2011 Corn Rootworm Beetle Survey Results



Wisconsin Department of Agriculture, Trade and Consumer Protection

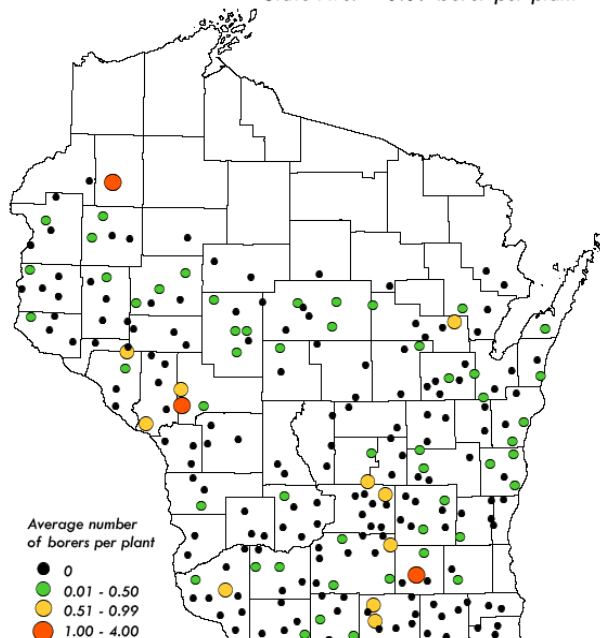


EUROPEAN CORN BORER: Larval populations remained historically low in 2011. The seventieth annual fall abundance survey in September revealed a state average of 0.09 borer per plant, the fourth lowest since record-

keeping began in 1942. Minor population reductions from 2010 were charted in the southwest, central and north-east agricultural districts and increases occurred in the south-central, southeast, east-central, north-central and northwest. Larval densities in the south-central area increased to 0.20 per plant, or 20 larvae per 100 plants. On the basis of the fall survey results, a continued low population trend is expected for 2012.

2011 European Corn Borer Survey Results

State Ave. = 0.09 borer per plant



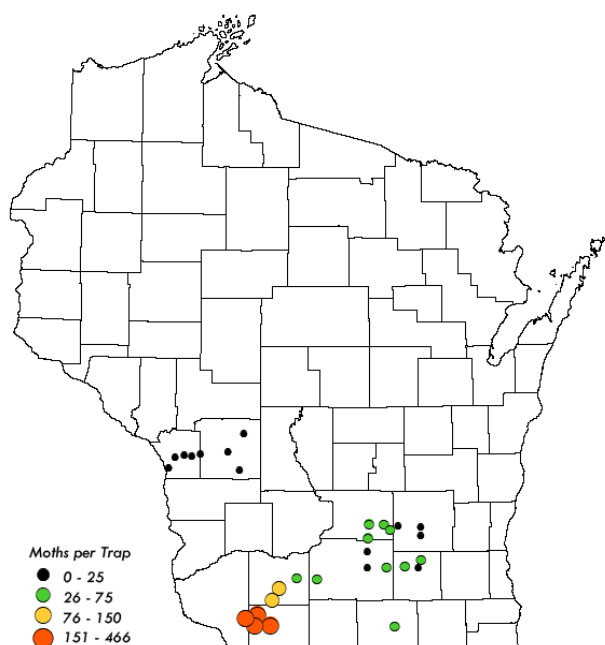
Wisconsin Department of Agriculture, Trade and Consumer Protection



CORN EAR DROP: Low to moderate rates of ear drop were documented in scattered corn fields this fall. The statewide average incidence was less than 4% and severity was 10%, but individual fields had severity levels as high as 28%. European corn borer shank tunneling appears to have been the leading cause, although drought stress in August accounted for much of the ear drop observed in south-central Wisconsin corn fields.

BLACK CUTWORM: Migrants were detected in the state by April 6 and an initial cutting date of May 30 was anticipated based on an April 11 biofix. The spring trapping survey registered 2,090 moths in 30 traps from April 1-June 1, with a peak occurring from May 5-9. Subsequent waves of migrants arrived from May 12-16 and May 21-23. As previously stated, localized infestations developed in corn by early June as a result of the large migration and various environmental factors. Summarized on the following page are the spring 2011 moth counts.

2011 Cumulative Black Cutworm Trap Counts



Wisconsin Department of Agriculture, Trade and Consumer Protection

CORN WILT DISEASES: The Plant Industry Laboratory tested 58 corn leaf samples from 271 seed plot acres for bacterial diseases of export significance. Goss's wilt infected 20 samples (34%) from fields in Columbia, Dane, Eau Claire, La Crosse and Rock counties. Results for Stewart's wilt were negative. Goss's wilt, a disease historically limited to the Great Plains, continues to spread across the Midwest. This is the second consecutive year that Goss's wilt was prevalent in Wisconsin seed corn fields.

SOYBEANS

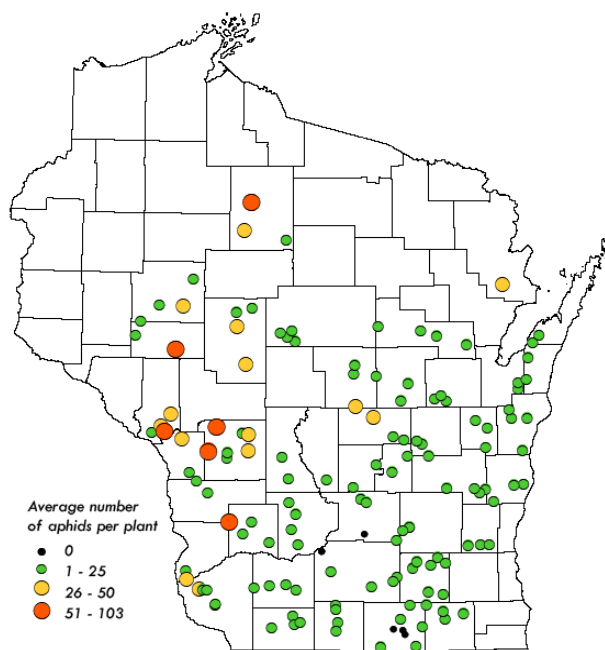
JAPANESE BEETLE: Adults became prevalent in flowering soybeans by late July and foliar damage surpassed economic levels during the first two weeks of August. Controls were applied to fields in Chippewa, Dane, Eau Claire, Kenosha, Rock and Walworth counties, with unsatisfactory results in a few cases. According to survey reports and observations, Japanese beetles were far more abundant this season than in the last several years. The largest populations were found on lighter soils in the southeast, south-central and northwest areas.

GREEN CLOVERWORM: Larval infestations were common in soybeans throughout the state again this year, but defoliation levels were less severe than in 2010 and

control measures specifically for this soybean pest were not needed.

SOYBEAN APHID: Densities remained below economic levels this season. The annual survey conducted in July and August showed the state aphid count to be 12 per plant. This average compares to 16 aphids per plant last year and is only marginally higher than the record low density of 11 per plant documented in 2004. Soybean fields were sampled in two intervals, first in late July and again in August, for a total of 284 observations in 142 fields. Aphid densities were below 103 per plant in all surveyed fields, with the exception of a single Portage County site which had an average count of 451 per plant on July 29. Natural control agents, insecticidal seed treatment, high temperatures, and several heavy precipitation events limited soybean aphid population growth in 2011.

Soybean Aphid Survey Results August 2011



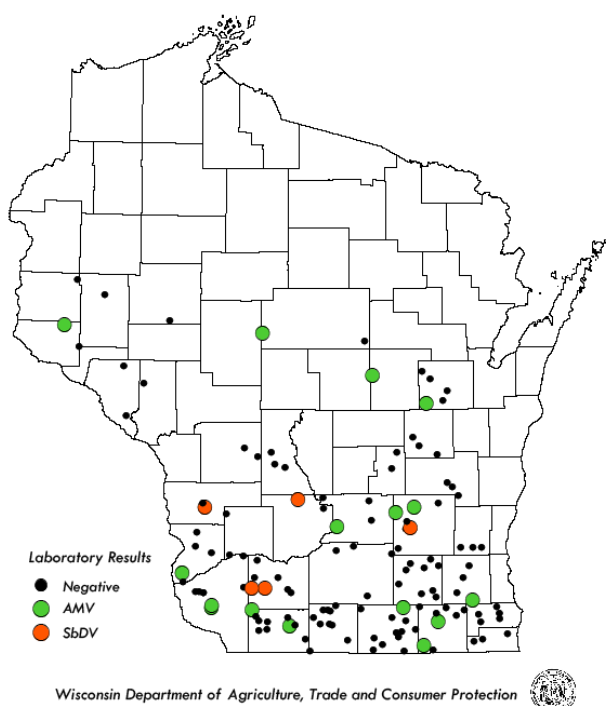
Wisconsin Department of Agriculture, Trade and Consumer Protection

SOYBEAN SEED INSPECTION: Analysis of leaf and soil samples from 12 soybean seed production fields (161 acres) in Jackson, Outagamie, Fond du Lac, Rock and Shawano counties found downy mildew at 11 locations, alfalfa mosaic virus at 5 locations, frogeye leaf spot at 3 locations, Phyllosticta leaf spot at 3 locations, soybean cyst nematode at 2 locations, and bean pod mottle virus at 1 location. Inspections were negative for anthracnose stem blight, bacterial tan spot, Cercospora leaf blight, southern bean mosaic virus, stem canker, tobacco ring-

spot virus, and tomato ringspot virus. Disease incidence in 2011 was comparable to that of 2010.

SOYBEAN VIRUSES: Illustrated in the map below are the locations of 135 soybean fields (R2-R7) sampled and tested for alfalfa mosaic virus (AMV) and soybean dwarf virus (SbDV) this season. Sixteen (11.9%) fields were infected with AMV in 2011 compared to 12.9% in 2010. Soybean dwarf virus was found in five fields (3.7%), a decline from 7.7% last year. Lower populations of the soybean aphid vector may partially explain the decrease in SbDV-infected soybean fields in 2011.

2011 Soybean Virus Survey Results



SMALL GRAINS

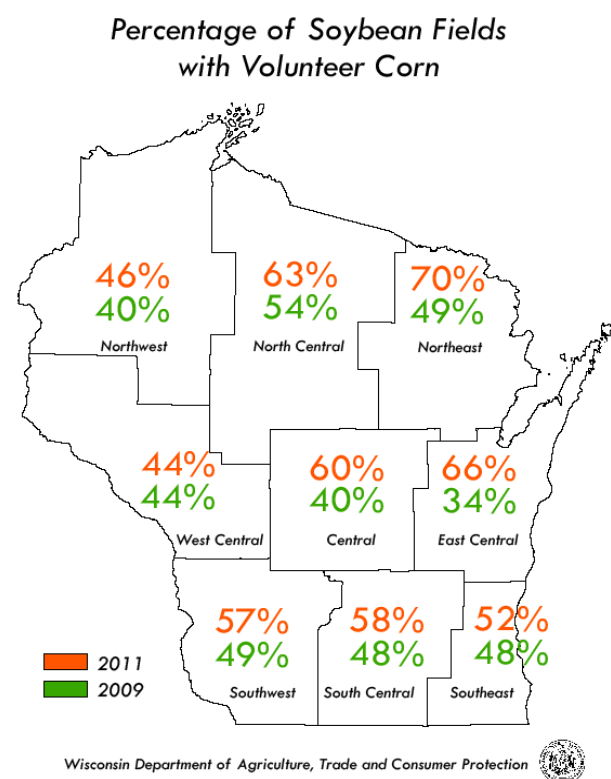
CEPHALOSPORIUM STRIPE ON WHEAT: The first case of *Cephalosporium* stripe on wheat in Wisconsin was confirmed in 2011, in Rock County. According to Craig Grau of the UW-Madison, infections have been suspected over the years but never verified by laboratory analysis. Isolates from samples collected from the positive field were conclusively identified by the Plant Industry Laboratory and confirmed by the UW. Symptoms were found in only one field of 45 surveyed.

STRIPE RUST ON COMMERCIAL BARBERRY: Stripe rust was identified from two barberry cultivars being offered

for sale in Wisconsin nurseries. Barberry cultivars must be resistant to stem rust (*Puccinia graminis*) to be legal in trade in the Midwest. The two cultivars that showed signs of infection, 'Emerald Carousel' and 'Golden Carousel', had been tested by the USDA Cereal Disease Laboratory (CDL) and were on the approved list. Upon investigation by the Plant Industry Laboratory and consultation with the CDL, it was determined that the aecia observed were of *P. striiformis*, not the regulated *P. graminis*. While stripe rust is not a regulated organism, the presence of *P. striiformis*-susceptible barberry in the state may pose some of the same concerns as with *P. graminis*.

WEEDS

VOLUNTEER CORN: More than half of the state's soybean acreage was infested with volunteer corn in 2011 according to the results of an August survey. Examination of 980 fields found volunteer corn in 57% of the soybean sites, a 13% increase from 43% in 2009 when the survey was last conducted. Approximately 26% of the fields were heavily infested with volunteer corn plants, 20% were moderately infested, and 11% had trace levels. These figures confirm that volunteer corn is not being effectively controlled in Wisconsin and may be causing major yield reductions in about one-quarter of soybean fields.

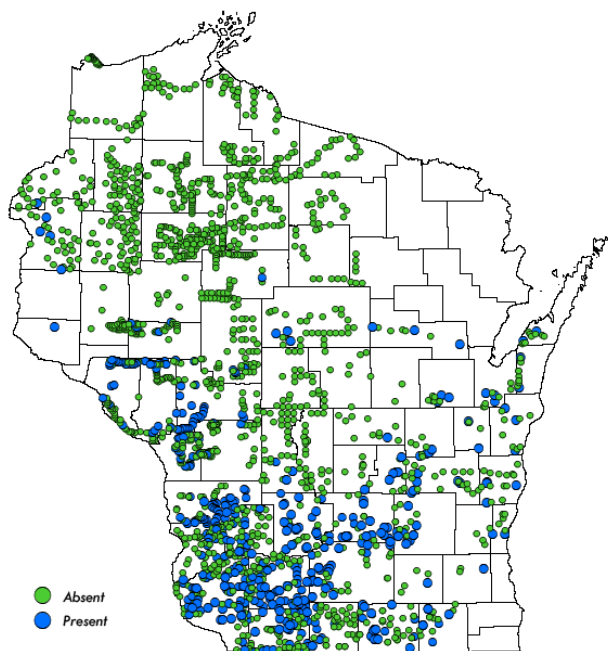


INVASIVE WEEDS: Statewide distribution records were collected in 2011 for three highly invasive weeds: poison hemlock, teasel spp., and wild parsnip. A total of 1,996 site observations were made in 62 counties. Baseline survey data is being used to refine existing distribution maps, forecast potential weed distribution, and guide future management programs.

As anticipated, wild parsnip was the most common of the species, observed at 23% of surveyed sites, followed by teasel (1%), and poison hemlock (0.2%). Most wild parsnip was noted in the southwest and south-central districts where an average of 44% and 49% of sites were infested, respectively. In the central and northern areas, invasion by wild parsnip was uncommon and only 2-9% of sites were infested. A map depicting the occurrence of wild parsnip is provided below.

Surveys for the other two species, teasel and poison hemlock, indicated that distribution is still very limited. Only 16 of the nearly 2,000 sites were infested. Poison hemlock was found at three sites in Crawford, Green and Marathon counties.

2011 Wild Parsnip Survey Results



Wisconsin Department of Agriculture, Trade and Consumer Protection



HERBICIDE-RESISTANCE: A survey for weed resistance in soybeans was initiated this season. Weed populations in 102 fields were examined and characterized for indicators of resistance, including: density, quantity and

diversity of weed species present (above canopy), weed distribution, growth patterns (evenness in height), signs and degree of herbicide injury to existing weeds, and presence of vigorous weeds next to dead individuals. Of the 102 fields evaluated, none had weed populations suspected of being resistant to herbicides. The survey is expected to continue in 2012.

FRUITS

BROWN MARMORATED STINK BUG: Surveys in 14 apple orchards failed to detect this insect. Pyramid traps containing an aggregation pheromone attractant were monitored from June through August and no stink bugs were collected. Several adult BMSB were reported in Wisconsin in 2010, but established populations have not been detected to date.



Brown marmorated stink bug

inaturer flickr.com

PLUM CURCULIO: The spring migration of beetles into orchards began by mid-May and the first oviposition scars were observed on May 25. Beetle activity peaked from June 2-8. Populations were variable, with high numbers occurring in several southeast and south-central orchards. Controls were applied during the first two weeks of June and the migration ended by June 16 at most locations. A cooperator from Dane County stated that this insect was far more numerous and damaging in 2011 than in previous years.

CODLING MOTH: Moths began appearing in traps from May 19-25. The spring flight peaked in the southern half of the state by June 16, although counts were high at many sites throughout June. Signs of larval infestation were evident from June 30-July 14. Summer moths

appeared in late July and controls were applied during the first two weeks of August. By most accounts, moth emergence was more predictable this season than last, resulting in better control.



Codling moth larval damage to apples

Patrick Clement flickr.com

APPLE MAGGOT: The first flies of the season emerged during the period of June 23-29, approximately 2-3 weeks later than in 2010. Counts remained mostly low until mid-August when activity surged. By early September, fruit damage was apparent in orchard blocks where controls were inadequate. Most second generation codling moth treatments also controlled early apple maggot flies but serious damage occurred in a few locations.

PEAR THRIPS: Economic damage attributed to this insect was reported from several apple orchards and vineyards in June. In Chippewa and Richland counties, standard insecticides were insufficient and damage in the form of abnormal leaf formation, leaf tatter, and flower injury resulted. Fruit growers in the state should become familiar with pear thrips and plan for scouting as part of their IPM programs for 2012.

VEGETABLES

CORN EARWORM: A lengthy flight began by July 27 and continued though September 21. The eight-week migration yielded a cumulative total of 4,571 moths at 15 sites, with a well-defined peak from August 4-10. Compared to 2010, the flight was smaller and moth activity was more concentrated in the south-central and central counties. Late sweet corn and other susceptible crops such as tomatoes and snap beans remained under a moderate to severe threat until mid-September.

NURSERY & LANDSCAPE

JAPANESE BEETLE: Beetle counts in Wisconsin nurseries increased sharply after a two-year decline. The nursery trapping survey yielded 37,829 beetles in 160 traps, a 57% increase from 16,079 in 2010. High counts of 201 or more beetles per trap were registered in Grant, Kenosha, Pierce, Racine, Rock, Sauk, Walworth and Waukesha counties. Moderate counts of 51-200 beetles were found in Columbia, Dane, Dodge, Eau Claire, Iowa, Jefferson, Manitowoc, Marquette and St. Croix counties. Twenty counties averaged fewer than 50 beetles per trap and eight counties reported no beetles.

ORIENTAL BEETLE: The number of Oriental beetles collected at garden centers also increased significantly this year, from 13 in 2010 to 55 in 2011. Twenty one were trapped in Racine County, 16 in Dane County, 10 in Milwaukee County, 6 in Ozaukee County, and 2 in Kenosha County. Surveys in 18 additional counties were negative.

VIRUSES: Plant viruses have become an increasing problem in the Wisconsin nursery trade. Nearly half (101 of 224) of the nursery stock samples collected this season were tested for viruses. Hosta virus X and tobacco rattle virus were again encountered most frequently. Other viruses found were Arabis mosaic virus, impatiens necrotic spot virus, rose mosaic virus and tomato spotted wilt virus. All nursery stock expressing viral symptoms was removed from sale and destroyed.

REJECTED NURSERY STOCK: Nursery inspections often detect plants infested with regulated insects or diseases, and stock which fails to meet pest cleanliness, labeling and quality standards. Such plants cannot be offered for sale. Included in this category in 2011 were daylilies with daylily rust, barberry with stripe rust, elm with gypsy moth, monkshood with root rot, non-viable stock, and pear with fire blight. A variety of trees and shrubs were rejected for having scale insect infestations and wood-boring insect damage. Also rejected this year were plants listed in the NR 40 Invasive Species Rule, such as autumn olive, leafy spurge, tansy, lyme grass, Oriental bittersweet, Russian olive and tartarian honeysuckle.

PHYTOPHTHORA ROOT ROT: Symptomatic Christmas tree samples, mostly balsam and Fraser firs, from 27 fields were submitted to the Plant Industry Laboratory for diagnosis this fall. Testing recovered Phytophthora

isolates from trees grown at eight of the 27 locations. All isolates were one of two newly-described *Phytophthora* species: *Phytophthora sansomeana* (2009) or *Phytophthora europaea* (2002).

The first of the two species, *P. sansomeana*, has a host range that includes several agronomic crops and weed species. *Phytophthora sansomeana* has been reported on corn in Ohio, soybean in Indiana, Douglas fir in Oregon, and weeds in alfalfa fields in New York.

The second species, *Phytophthora europaea*, is associated with European forest soils and has been recovered from oak forests in Minnesota, Pennsylvania, West Virginia and Wisconsin. It is considered a weak pathogen of oak. The Wisconsin Fraser firs from which *P. europaea* was isolated showed only mild foliar decline, but the extent of lower trunk decay indicated death was probable.

FOREST

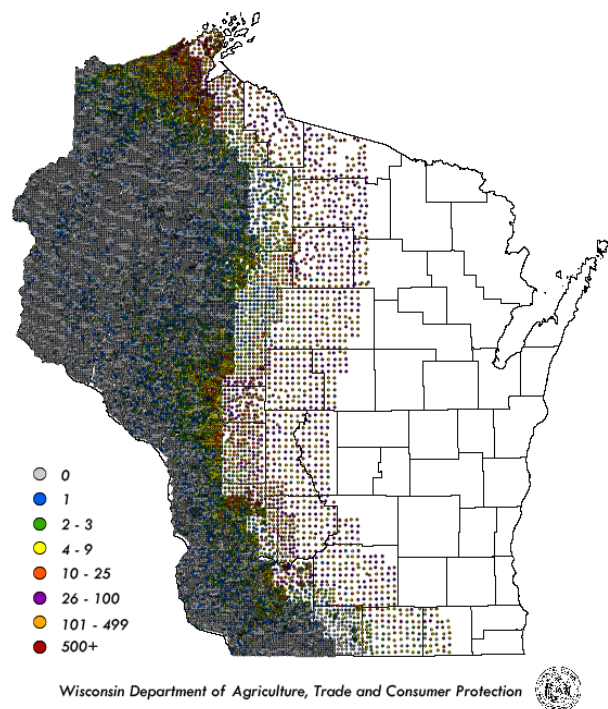
EMERALD ASH BORER: The 2011 detection survey included 5,341 traps distributed in 64 Wisconsin counties. Eleven beetles were captured on four separate traps in northern Racine County and six others were collected on one trap in La Crosse County. An infestation affecting six ash trees was also discovered in the City of Kenosha in July. Emerald ash borer has now been detected in nine Wisconsin counties, including Brown, Crawford, Racine, Kenosha, La Crosse, Milwaukee, Ozaukee, Vernon and Washington.

GYPSY MOTH TREATMENT: Larval emergence and the start of the treatment program were delayed by two weeks due to cool spring weather. Aerial applications began on May 23 and approximately 233,857 acres (82 sites) in 23 counties were treated during the eight-week control program. Btk treatments totaled 53,852 acres, Gypchek applications totaled 2,577 acres, and mating disruption totaled 177,158 acres. Applications were completed by July 19. Suppression activities were conducted by the DNR from May 24-June 2 in the quarantined eastern counties of the state. Btk was applied to 2,285 acres and Gypchek was applied to 600 acres. Counties treated were: Brown, Dane, Marinette, Menominee, Milwaukee, Rock, Sauk and Shawano.

GYPSY MOTH TRAPPING: Trapping program statistics documented a 52% increase in male gypsy moth counts

in 2011. The 25,001 pheromone traps deployed as part of the survey registered 233,990 moths, as compared to 142,409 last year. Significantly more moths were trapped in Ashland, Bayfield, Clark and Jackson counties this season, while counts in some southern and northwestern areas decreased from 2010 levels.

2011 Gypsy Moth Trap Counts



GYPSY MOTH DEFOLIATION: DNR aerial surveys found no apparent gypsy moth defoliation in 2011, despite higher larval populations. Last season larvae defoliated 346,749 acres, greatly surpassing the previous record of 65,000 acres set in 2003. Forested areas that suffered heavy defoliation in 2010 showed little or no tree mortality due in part to adequate rain late in the season, which helped alleviate tree stress.

BIOLOGICAL CONTROL: Biological agents for control of spotted knapweed and leafy spurge were introduced at nearly 200 new locations this year. An estimated 58,000 spotted knapweed weevils (*Larinus* spp.) were released in July at 147 sites along the Hwy 39/51 corridor from Portage to Wausau, and adjacent to Hwy 22 in Columbia, Marquette and Waushara counties. Another 43,000 leafy spurge agents were introduced in June at 43 sites in 11 counties. The objective of the biological control program, largely funded and carried out by the DOT and DNR, is to establish natural enemies of leafy spurge and spotted knapweed for eventual control of these invasive weeds.

CORN ROOTWORM BEETLE SURVEY RESULTS 1998-2011

AVE. NO. OF BEETLES PER PLANT

DISTRICT	1998	1999	2000	2005	2006	2007	2008	2009	2010	2011	*AVE.
NW	0.5	0.2	0.9	0.4	0.1	0.4	0.5	0.4	0.3	0.1	0.4
NC	0.1	0.2	0.2	0.8	0.9	0.7	0.9	0.4	0.1	0.1	0.4
NE	0.2	0.4	0.1	0.3	1.8	0.5	0.6	0.5	0.1	0.3	0.5
WC	0.5	0.8	1.1	0.8	0.8	0.4	0.6	0.5	0.4	0.6	0.7
C	0.2	0.4	0.6	0.9	0.7	0.8	0.5	0.4	0.4	0.8	0.6
EC	0.4	0.8	1.5	1.1	2.2	1.4	1.0	0.6	0.3	0.5	1.0
SW	0.9	0.6	0.7	3.2	2.2	0.4	1.1	0.7	0.3	1.1	1.1
SC	0.5	0.5	0.6	1.9	1.7	2.2	1.5	1.1	0.3	1.4	1.2
SE	0.3	0.3	0.2	3.8	1.4	1.0	1.6	0.3	0.2	0.7	1.0
STATE AVE.	0.4	0.5	0.7	1.6	1.4	1.0	1.0	0.6	0.3	0.7	0.8

Survey results based on average number of beetles per plant per 10 plants examined. *Survey was not conducted 2001-2004.

EUROPEAN CORN BORER FALL SURVEY RESULTS 2002-2011

AVE. NO. OF LARVAE PER PLANT

DISTRICT	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	10-YR
NW	0.44	0.20	0.13	0.01	0.27	0.24	0.12	0.06	0.08	0.15	0.17
NC	0.26	0.14	0.20	0.36	0.16	0.35	0.18	0.10	0.02	0.07	0.18
NE	0.75	0.23	0.22	0.33	0.23	0.07	0.12	0.12	0.19	0.13	0.24
WC	0.71	0.16	0.05	0.24	0.42	0.52	0.04	0.10	0.08	0.12	0.24
C	1.21	0.44	0.06	0.44	0.51	0.42	0.11	0.06	0.06	0.05	0.34
EC	0.44	0.20	0.22	0.25	0.11	0.21	0.20	0.09	0.01	0.03	0.18
SW	0.65	0.34	0.10	0.49	0.20	0.28	0.05	0.06	0.12	0.03	0.23
SC	0.86	0.51	0.05	0.67	0.38	0.33	0.07	0.02	0.07	0.20	0.32
SE	0.61	0.21	0.02	0.35	0.16	0.12	0.04	0.00	0.00	0.01	0.15
STATE AVE.	0.66	0.30	0.10	0.40	0.29	0.31	0.09	0.06	0.07	0.09	0.24

Survey results based on number of 4th and 5th instar corn borer larvae per plant.