

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

The growing season of 2017 featured widely variable weather, ranging from persistently wet to abnormally dry. An abundance of rainfall in April and May significantly delayed spring planting, causing great disparity in crop development in the state. Early June heat accelerated crop growth and improved prospects, though a mid-month weather pattern change brought cool temperatures with frequent showers that interfered with alfalfa harvesting and other fieldwork. Summer heat and humidity returned in July, along with unprecedented flooding that damaged thousands of acres of farmland. July was the wettest on record for Afton, Burlington, Madison and several other Wisconsin locations. Unseasonably cold, dry conditions persisted throughout August, while September delivered critical warmth needed for late crops to mature. October rain restored depleted soil moisture reserves but kept grain moistures high, and left producers hurrying to harvest what remained of the corn and soybean acreage when the first snowfall arrived at the start of November. Of all the factors affecting crop production this season, excessive rainfall was the most influential, favoring plant diseases and insects such as the Japanese beetle.

PEST HIGHLIGHTS

CORN ROOTWORM: Beetle counts in August were the lowest in 47 years of annual surveys. The 2017 state

average of 0.2 beetle per plant was a substantial decline from last year's moderate average of 0.5 per plant and the lowest since surveys for adult corn rootworms began in Wisconsin in 1971. Excessive spring rain during egg hatch, continued high use of pyramided Bt-rootworm (Bt-RW) corn, and the layering of soil insecticides on Bt-RW hybrids at planting likely influenced this year's historically low beetle populations.

BROWN MARMORATED STINK BUG: Established populations of this invasive pest now occur in at least five Wisconsin counties. Dane and Rock have been generally infested for 2-5 years, while Brown, Jefferson and Waukesha counties were added to the list in 2017. Citizen reports indicate the actual distribution of brown marmorated stink bug (BMSB) in the state is much wider. Specimens have been confirmed by the UW and DATCP from 20 counties since 2010, with most reports concentrated near Madison, Waukesha and Green Bay. Densities in the Madison area of Dane County are high enough that BMSB can be considered an urban nuisance.

BLACK CUTWORM: Migrants arrived in extremely large numbers in April and May and larval feeding became evident in emerging corn by early June. Spring planting delays and late weed control created very favorable outbreak conditions, but cutworm damage was not as prevalent as expected. The spring cumulative count of 3,228 moths in 45 traps was markedly larger than last

season's capture of 1,835 moths in 43 traps and the highest in five years.

JAPANESE BEETLE: Above-normal rainfall, consistent soil moisture, and insufficient natural controls favored the grub stages and contributed to an overabundance of beetles. This destructive pest of over 350 species of plants was especially prolific this summer in Wisconsin and throughout the Midwest.

VIBURNUM LEAF BEETLE: Larvae were found in June on viburnum shrubs near Oshkosh in Winnebago County. Winnebago was the third Wisconsin county in which viburnum leaf beetle has been detected since 2009, following Milwaukee and Ozaukee. The infestation, confirmed by the UW, was thought to have originated from a local population and not from newly purchased nursery stock.



Viburnum leaf beetle larvae

Marcia Wensing DATCP

EUROPEAN CORN BORER: Larval surveys in the fall of 2017 found the second lowest population in 76 years, 0.03 borer per plant. The lowest state average was 0.02 borer per plant in 2015. Only 14% of the 229 fields surveyed showed evidence of corn borer infestation while the other 86% had no detectable population. The very low number of larvae observed during this year's survey is indicative of the ongoing extensive use of Bt corn, which continues to be an effective regulator of this once-primary corn pest.

ROSE CHAFER: These beetles were numerous this season and reports of severe damage to grapes, strawberries, fruit trees and landscape plants were common. Chafer feeding began by early June and continued for 6-7 weeks. Significant feeding on flower

buds and flowers in vineyards required chemical intervention before activity subsided in mid-July.



Rose chafer beetles

Krista Hamilton DATCP

EMERALD ASH BORER: Six new counties were quarantined for EAB this year, including Chippewa, Green Lake, Marathon, Marinette, Waupaca and Waushara. The addition of Chippewa and Marathon counties was based on infested trees discovered on private property, and the other four were the result of EAB beetle captures on survey traps set by the USDA-APHIS and the DNR. Emerald ash borer has been found in 47 of Wisconsin's 72 counties since 2008.

FORAGES & GRAINS

ALFALFA WEEVIL: Larval emergence began in southern Wisconsin by May 9. Counts increased throughout May to reach peak levels during the first week of June. Delayed alfalfa harvesting permitted weevil feeding to intensify from June 1-15 and economic defoliation exceeding the 40% threshold developed in a few fields. Pupae were observed on June 7. Carryover of larvae into the second crop was common, but defoliation was minor and the primary larval damage period ended by late June as remaining larvae pupated.

POTATO LEAFHOPPER: Populations briefly surged above threshold in early July, but were otherwise low or moderate throughout the season. Migrants began arriving in the state during the week of May 11-17 and nymphs first appeared around June 16. Counts in alfalfa averaged less than one per sweep until the latter half of June when a pronounced increase occurred in some western fields. Surveys from July 6-19 found late second-

crop fields with extremely high counts of 5-21 per sweep, though most sites sampled during that period had averages in the range of 1-2 per sweep. Abnormally heavy July rain and late harvesting quickly brought populations under control, and levels remained low throughout August. Economic counts of two or more leafhoppers per sweep were observed in fewer than 4% of the 538 alfalfa fields surveyed in 2017, and chemical control was generally not necessary after mid-July.

PEA APHID: Counts peaked at approximately 37 aphids per sweep from June 1-7 then decreased noticeably after the first cutting. Surveys found very low populations during the balance of the season and no direct yield impact to alfalfa was attributed to this insect in 2017.



Pea aphids

Krista Hamilton DATCP

CORN

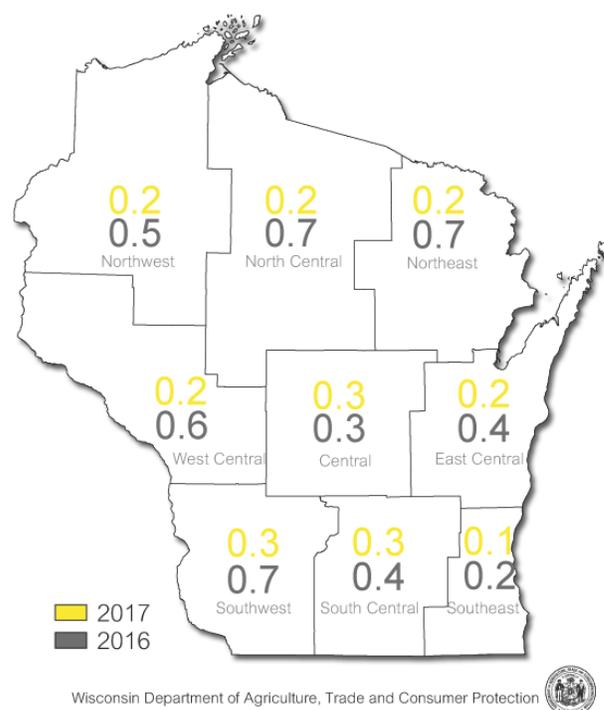
BLACK CUTWORM: Many corn acres were under a high threat of larval infestation in May and June. Delayed spring tillage and planting, wet field conditions, and late weed control all favored oviposition and larval development, while repeated heavy flights of 200-635 moths per week throughout April and May signaled an elevated risk for widespread, damaging cutworm problems. Larval feeding became noticeable in corn by early June, but most injury observed by DATCP surveyors was light and involved less than 1-2% of plants. Although the spring cumulative count of 3,228 moths in 45 traps was substantially larger than last year's capture of 1,835 moths in 43 traps, economic injury (>3% of plants damaged) was rare.

CORN ROOTWORM: Adult corn rootworm counts decreased to the lowest level since surveys for this pest began in Wisconsin in 1971. The annual survey con-

ducted from July 28-August 16 found a state average of just 0.2 beetle per plant, less than half of last year's average of 0.5 per plant and far below the 0.75 beetle per plant economic threshold used to inform rootworm management decisions for the following season. Numbers declined across all nine crop districts as compared to 2016, with district averages ranging no higher than 0.3 per plant. Only 24 of the 229 (10%) cornfields sampled had above-threshold averages of 0.8-2.9 beetles per plant, while 54 (24%) had below-threshold averages in the range of 0.1-0.7 per plant. No corn rootworm beetles were observed in 151 (66%) of the fields.

Reasons for the historic decrease in beetle abundance are unclear but likely include a combination of factors such as heavy spring rains that led to saturated soils during larval hatch in June, the significant use of pyramided Bt-rootworm (Bt-RW) hybrids, and the practice of overlaying soil insecticides on Bt-RW hybrids during planting. The unexpectedly low beetle pressure documented this season may have resulted in fewer eggs being deposited into cornfield soils, and an overall lower risk of larval root damage next summer.

District Average Number of Corn Rootworm Beetles per Plant

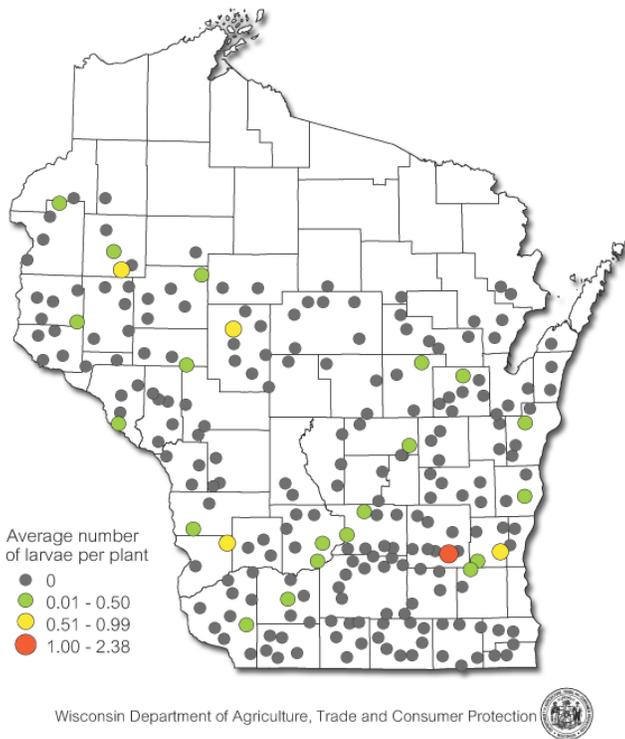


EUROPEAN CORN BORER: Larval populations declined to 0.03 borer per plant this fall, tying 2012 and 2014 as the second lowest state average in the survey's 76-year

history. The lowest recorded average of 0.02 larva per plant was documented in 2015. Minor population reductions from 2016 were found in six of the state's nine agricultural districts, while an insignificant increase was noted in the east-central area. The northeast and southeast district averages remained unchanged at 0.0 and 0.04 borer per plant, respectively. One hundred and ninety-six of the 229 (86%) fields examined showed no evidence of corn borer infestation. Results of the survey suggest that Wisconsin corn producers are maintaining a high Bt use rate which continues to provide overall effective suppression of European corn borer populations.

European Corn Borer Survey Results 2017

State Ave. = 0.03 borer per plant

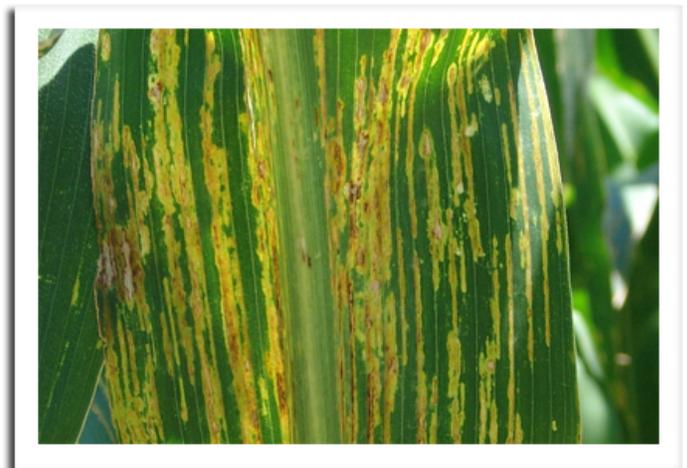


WESTERN BEAN CUTWORM: Moth counts increased from the previous year and larval injury to corn was slightly more common this season. The state trapping program captured a total of 1,856 moths in 70 traps (27 per trap average) from June 18-August 23, which was larger than last year's 1,530 moths in 75 traps (20 per trap average) and also higher than the 13-year survey average of 23 moths per trap. Larval infestations were found in approximately 10% of the 458 corn sites surveyed in August and September, compared to 9% last year.

CORN EARWORM: The late-season monitoring survey captured a cumulative total of 2,760 moths in 15 traps. Nearly one-half of the moths (1,284) were collected at the

Ripon location, most of which arrived during the last two weeks of September. Compared to 2016 when 6,402 moths were captured in 16 traps, this year's migration was much smaller, with the heaviest flights (>250 moths) limited to three sites in Columbia, Dodge and Fond du Lac counties. Twelve other pheromone traps in Dane, Grant, Manitowoc, Marathon, Rock, Vernon, Waushara and Wood counties all captured fewer than 100 moths from August through September. Corn earworm flights ended about October 9.

XANTHOMONAS LEAF BLIGHT: Corn leaf samples showing symptoms of leaf blight were collected from 125 fields between July 21 and September 29 and tested for *Xanthomonas vasicola* pv *vasculorum* at the Plant Industry Lab. *Xanthomonas* leaf blight was not detected in any of the samples. Other corn foliar diseases found during the survey, in order from the most to the least common, were: common rust, gray leaf spot, northern corn leaf blight, northern corn leaf spot, and anthracnose. A few samples also tested positive for *Septoria* leaf blotch, *Phyllosticta* leaf spot, *Phaeosphaeria* leaf spot, and smut. *Xanthomonas* leaf blight was first confirmed in the U.S. on August 26, 2016 and has to date been identified in nine states: Colorado, Illinois, Iowa, Kansas, Minnesota, Nebraska, South Dakota, Texas and Oklahoma.



Xanthomonas leaf blight of corn

cropwatch.unl.edu

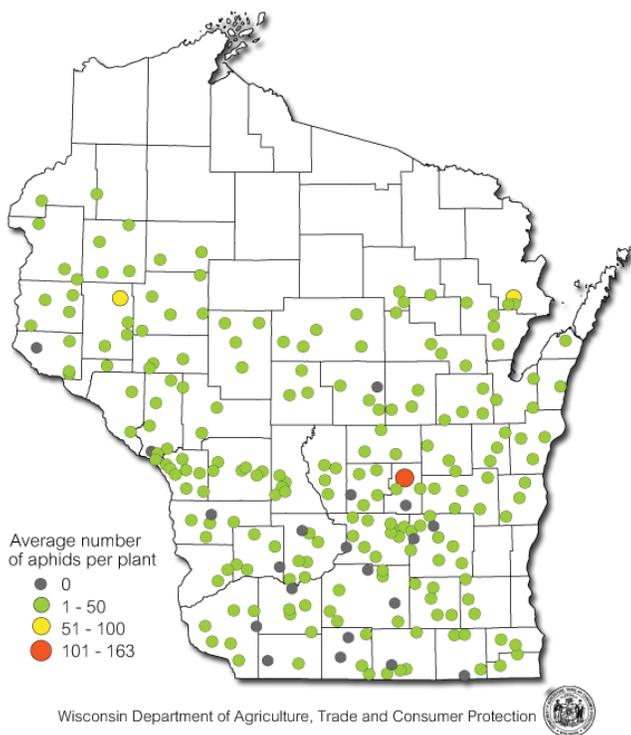
SEED CORN CERTIFICATION: Eleven growers in nine counties participated in seed corn field inspections for export certification in 2017. Samples from 52 fields were tested in the laboratory for the bacterial diseases Goss's wilt and Stewart's wilt. Six samples (12%) were diagnosed with Goss's wilt, a decline from 14% in 2016 and 39% in 2015. Counties in which Goss's wilt was found were Dane, Fond du Lac and Eau Claire. Stewart's wilt

was not detected in any seed field this year and has not been observed or reported in Wisconsin corn since 2010. All corn leaf samples were also checked for viruses, including High Plains virus, wheat streak mosaic virus, and maize chlorotic mottle virus. None were detected.

SOYBEANS

SOYBEAN APHID: Densities were the lowest since the first detection of soybean aphid in Wisconsin 17 years ago. The annual survey found a statewide average count of six aphids per plant, a slight decline from eight aphids per plant in 2016 and the lowest on record. Two hundred and twenty-eight soybean fields in the R2-R6 growth stages were sampled from late July through August. Aphid populations were below 50 aphids per plant in 96% of the fields and only 4% had moderate averages in the range of 51-100 per plant. A single Green Lake County field had the survey's highest average of 163 aphids per plant, while no fields sampled by DATCP had an above-threshold count of 250 per plant. Results of the survey confirm that densities were low in most fields this season and insecticidal control was generally unwarranted.

Soybean Aphid Survey Results 2017



JAPANESE BEETLE: Defoliation was observed in about 87% of the fields examined in late July and August,

indicating that Japanese beetle injury was more prevalent than ever in Wisconsin soybeans. Last season, 74% of sampled fields had some degree of feeding. Defoliation estimates were mostly below the 20% treatment threshold for reproductive soybeans, though chemical intervention was justified in some instances. Once primarily a fruit and landscape pest, the Japanese beetle has become a serious threat to Wisconsin's agronomic crops that soybean and corn growers must now factor into their pest management programs.

SOYBEAN LEAFMINER: This red and black leaf mining beetle was collected by a DATCP specialist from La Crosse County soybeans on August 1. Although UW-Madison Insect Research Collection (IRC) records had documented finds in five other Wisconsin counties since 1975 (Dane, Grant, Rock, Sauk and Waukesha), the soybean leafminer had not previously been found on soybeans in the state. The species feeds on various legumes and most of the 15 IRC records were from tick trefoil. It is not known to cause direct economic damage but can transmit bean pod mottle virus and contribute to the spread of this pathogen in soybean fields.



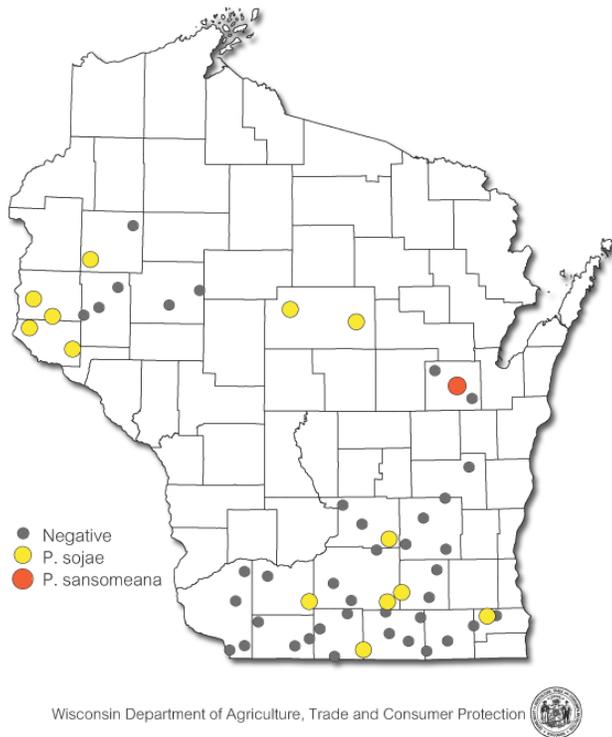
Soybean leafminer beetle

marlyandbiodiversityproject.com

SOYBEAN ROOT ROT: Fifty-five soybean fields were surveyed for seedling root rot diseases from June 9-30. Laboratory testing confirmed *Pythium* in 96% of the fields, and *Phytophthora sojae* in 24%. The 2017 prevalence of *P. sojae* was a decline from 32% of fields in 2016 and 38% in 2015. Development of both *Pythium* and *Phytophthora* is favored by wet spring weather, though *Pythium* is active in cold, saturated soils, while *Phytophthora* is active in warm, intermittently wet soils. DATCP surveys in the last decade have found *P. sojae* prevalence ranging from 13% in 2011 to 49% in 2014.

A second *Phytophthora* species, *P. sansomeana*, was also detected this season in an Outagamie County field. *P. sansomeana* was first identified in Wisconsin soybeans in 2012 and has now been documented in 10 counties: Calumet, Dane, Dodge, Dunn, Eau Claire, Green, Jefferson, Outagamie, Marathon and Sheboygan.

Soybean Phytophthora Survey 2017



THISTLE CATERPILLAR: Larvae became common in soybeans during the first half of July and again around mid-to late August. A few exceptional cases of defoliation in excess of 20% were reported, but in most fields populations were not particularly large. Treatment was discouraged since the mortality rates generally are high and the solitary caterpillars seldom cause significant damage. The adult stage of this insect, the painted lady butterfly, was very common through mid-October.

FRUITS

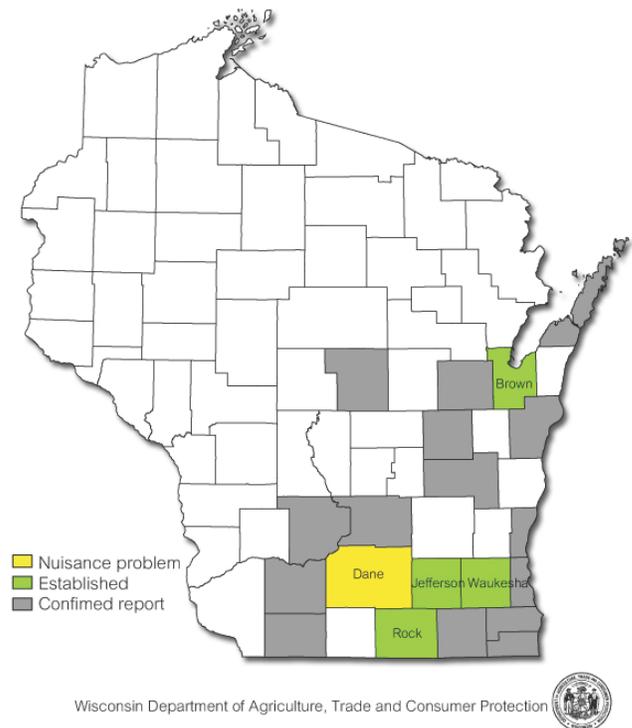
BROWN MARMORATED STINK BUG: DATCP, UW and the IPM Institute continued their BMSB monitoring program for the second season, setting 38 pheromone traps in 15 orchard and urban locations. As of early November, 17 of the traps at seven sites had collected a cumulative total of 268 specimens. The positive traps were in Dane, Door and Rock counties. The capture of an adult BMSB

near Sturgeon Bay on the Door Peninsula was a new county record and the first confirmed trap catch in the east-central area.

Compared to last year’s survey, the first documented capture of the season occurred much earlier (June 1 in 2017 vs. July 27 in 2016), more specimens were collected overall (268 vs. 185), and stink bugs were trapped in two additional locations. The season’s highest individual trap count of 122 BMSB in a Dane County orchard was an increase from last year’s 80 specimens.

Brown marmorated stink bug has been confirmed in 20 Wisconsin counties, with the largest populations concentrated near Madison, Waukesha and Green Bay. Apple growers in these areas could begin seeing BMSB in their orchards in the next 1-2 years. All Wisconsin fruit growers are advised to plan for BMSB scouting as part of their IPM programs for 2018.

Brown Marmorated Stink Bug Status in WI



APPLE MAGGOT: Emergence of flies began by July 5 at orchards in Dane and Fond du Lac counties. Counts were variable and mostly light for much of the summer, except during a three-week period from July 27-August 16 when a few monitoring sites reported weekly captures of 11-17 flies per trap. The season’s highest count of 17 flies on a baited yellow sticky trap was documented from

July 27-August 2. Apple maggot fly activity declined with the mid-August drying trend and serious damage was not reported.

PLUM CURCULIO: This insect was a persistent problem for apple growers this year. Downpours in May degraded petal-fall insecticide treatments and additional perimeter applications were needed to prevent further migration of plum curculio weevils into orchards. Oviposition scars became evident during the week of May 11-17. Some producers continued to note fresh feeding injury on the edges of blocks as late as June 15.

JAPANESE BEETLE: Reports indicated higher-than-normal populations in 2017. Beetles appeared by June 10 and a decline was not noted until mid-September. The largest numbers invaded orchards and vineyards during the latter half of July into August.



Japanese beetles feeding on grape leaves

Krista Hamilton DATCP

CODLING MOTH: The earliest moths of 2017 were captured in orchard traps on May 14, and most monitoring locations recorded the spring biofix from May 17-25. The first flight peaked in the southern half of the state during the week ending June 15, when one-half of the DATCP trapping network of apple orchards reported high or economic captures of 5-27 moths. Signs of larval injury became evident by late June.

Summer flights began by July 12 and trap counts generally peaked by mid-August. Large captures of 15-30 moths continued at several orchards throughout August, with additional late-season spot treatments required in orchard blocks where codling moths remained above-threshold. Larval hatch extended into September.

BLUEBERRY MAGGOT: A third season of survey work to determine the distribution of the blueberry maggot in Wisconsin resulted in no additional detections. In 2016, a new state record was established when adult flies were collected for the first time in Adams and Sauk counties. This year's survey consisted of yellow sticky traps set at 26 sites in 11 counties. The baited traps (enhanced with ammonium acetate) were placed in wild blueberries and checked every three weeks from June through August. Suspect blueberry maggot flies were captured in Marinette County, but USDA identifiers were unable to provide a definitive identification. Currently the blueberry maggot fly is known only from Adams and Sauk counties in central Wisconsin and it remains unclear if the species occurs more widely in the state.



Blueberry maggot larva

Dawn Clifford sercadia.files.wordpress.com

SPOTTED WING DROSOPHILA: The first flies of 2017 were captured on June 5 by the UW in Dane County, and most of the 16 DATCP monitoring sites recorded flies before the end of the month. The exponential population increase typical of SWD began during the week of July 5-11 when counts surged to 400-600 flies per trap in Trempealeau County (raspberry and mulberry), and one-half of survey traps reported catch rates of 50 or more flies. Peak activity and trap counts occurred at most sites from August 1-15. High counts for the season ranged from 800-1,000 flies per trap in Sauk County raspberries. Spotted wing drosophila continues to dramatically impact small fruit production in Wisconsin, causing insecticide use to soar, shortening pick-your-own seasons, and forcing many berry growers out of business.

APIARY INSPECTION: Apiary inspectors visited 210 beekeepers this year, opening 4,214 hives for inspection.

Based on these voluntary inspections, winter mortality decreased slightly from 48% in 2015-16 to 46% in 2016-17, which aligns with the 45% national average winter loss for backyard beekeepers. Varroa mite was detected in 64% of hives sampled for this pest, compared with 68% last season. Other pests and diseases found include American foulbrood in 0.1% of hives, chalkbrood in 4.2% of hives, European foulbrood in 0.2%, deformed wing virus in 19.8%, sacbrood in 5.8%, and small hive beetle (SHB) in 10.2% of hives. The incidence of SHB infestation was an increase from 7.5% last season and well above the five-year average of 5.0%, which should alert beekeepers to the need for early detection and effective management of this emerging pest. Inspectors issued 69 apiary inspection certificates for 29,901 migratory hives, primarily destined for California, Florida and Texas to be used for pollination services.

VEGETABLES

SQUASH BUG: This cucurbit pest was a common problem in home gardens and commercial vine crops. Two reports of injury to transplants caused by overwintered adults were received in June, and the nymphs were abundant enough in some plantings in July to damage flowering squash. Large numbers continued to be observed through October after the vines had died.



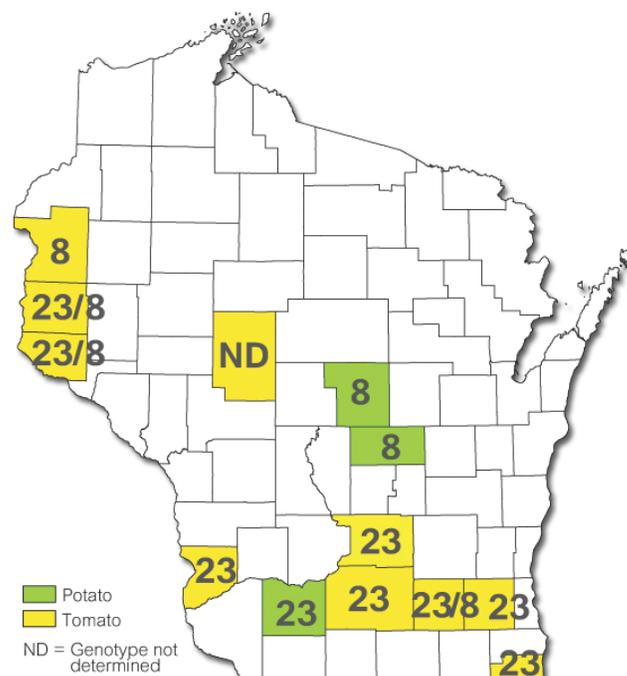
Squash bug nymphs

www.gardensimply.com

LATE BLIGHT: The state's first case of late blight in 2017 was confirmed by the UW Plant Pathology Department on Waukesha County tomatoes on July 26. Additional cases of the disease were identified in August and September in 12 counties: Columbia, Clark, Crawford, Dane, Iowa, Jefferson, Kenosha, Pierce, Polk, Portage,

St. Croix and Waushara. Compared to 2016 when only four counties had confirmed reports, late blight was more prevalent and widely distributed in Wisconsin this season. Characterization of the pathogen strains found that US-23 was the most common genotype, detected in nine counties, while US-8 was identified from six counties. Nearly all late blight that developed in the U.S. this year was the US-23 genotype, which is more virulent on tomato than potato and a primary reason why late blight has recently become a more severe disease of tomato.

UW Late Blight Confirmed Reports 2017 and Pathogen Genotype (US-23 and/or US-8)



Wisconsin Department of Agriculture, Trade and Consumer Protection



FALL ARMYWORM: Monitoring traps located near Janesville in Rock County detected a large, late-season flight from September 27-October 4. A total of 757 moths were captured in the pheromone trap during that period and 244 moths were collected in the black light trap. Fall armyworm larvae can cause severe kernel injury on both the tip and sides of corn ears, although significant damage is usually limited to years when the moths arrive early and in high numbers. The autumn flight occurred too late to produce a distinct generation of larvae.

POTATO SPINDLE TUBER VIROID: Thirteen varieties of peppers for seed production were tested for pospiviroids this year. All were determined to be virus-free. This group of viroids includes potato spindle tuber viroid, a pest of

concern for exporters of solanaceous crops such as potato, eggplant and tomato, which is not known to occur in Wisconsin.

PIGWEEED: Surveys for waterhemp, Palmer amaranth, and other pigweed species in field crops were conducted between late July and October of 2017. Of the 13 pigweeds (*Amaranthus* spp.) found in Wisconsin, Palmer amaranth and waterhemp are of greatest concern due to their aggressiveness and documented resistance to several herbicides. DATCP specialists surveyed a total of 579 fields (384 corn and 195 soybean), 27 of which were positive for waterhemp. The distribution of waterhemp in Wisconsin currently includes 54 counties in the southern two-thirds of the state, with St. Croix County added in 2017. Palmer amaranth was not found during the DATCP survey this season, but at least 10 separate populations have been confirmed by the UW at sites in Adams, Dane, Grant, Green, Iowa, Rock, Sauk and Waushara counties.

NURSERY & FOREST

NURSERY INSPECTION: Nursery Program personnel inspected 427 nursery grower fields in 2017, representing a large percentage of the production of the 632 licensed nursery growers in the state. Staff also conducted nursery dealer inspections at 627 sites selected from Wisconsin's 1,151 licensed nursery dealers. The top 10 insect and plant diseases found this season were, by total number of detections: viruses, leaf spots, powdery mildew, rusts, aphids, Japanese beetle, anthracnose, leafminers, apple scab and necrosis/dieback. Inspectors issued 125 Plant Health Certificates for the out-of-state shipment of nursery stock.



Lupine infected with cucumber mosaic virus

Anette Phibbs DATCP

SUDDEN OAK DEATH: Twelve rhododendron samples were tested for *Phytophthora ramorum*, the causal agent of sudden oak death (SOD). All were negative for this regulated disease. Eight of the samples were "trace forwards" from nurseries with confirmed SOD-infested stock. Sudden oak death has to date not been found in Wisconsin.

BOXWOOD BLIGHT: A major concern to the nursery industry and boxwood growers, this fungal disease was not found in any of the 10 boxwood samples submitted for testing in 2017. The symptoms were instead determined to be caused by either Volutella blight, Fusarium or Verticillium wilt. Boxwood blight was identified for the first time in the U.S. in 2011, and since then has been found in 18 states, including Illinois and Ohio.



Boxwood blight leaf lesions

Connecticut Ag Research Station

INVASIVE SPECIES RULE: Invasive plants prohibited or restricted in Wisconsin under the Chapter NR 40 Invasive Species Rule were documented by inspectors at 208 nursery locations this season, with 32 activity reports issued for violations. The most frequently intercepted invasives were Japanese barberry, woodland forget-me-not, Amur maple, Bishop's goutweed, burning bush, and ribbon grass. The phase-out period for selling restricted herbaceous plants and woody vines that were added to the list in 2015 will expire on May 1, 2018.

IMPATIENS DOWNY MILDEW: Several impatiens plants from a Sheboygan County grower tested positive for impatiens downy mildew (IDM) on May 22. The affected varieties, 'Accent TM Premium Red,' 'Accent TM Premium White,' and 'Double Impatiens Silhouette Salmon,' were promptly removed from sale. The UW

Plant Disease Diagnostic Clinic also confirmed one case of IDM from Marinette County in late June.



Impatiens downy mildew

Ball Horticulture Company

VIRUSES IN ORNAMENTALS: Nursery inspectors submitted a total of 140 annuals and perennials to the Plant Industry Lab for virus testing. The symptomatic plant samples were screened for up to 11 viruses, including two group tests for potyviruses and ilarviruses. Sixty-four percent of the plant samples (90 of 140) tested positive for at least one plant virus. Following potyviruses with 45 positives (41 on iris alone), other common disease-causing viruses were tobacco rattle virus with 13 positives, hosta virus X with 10 positives, viruses in the ilavirus group with seven positives, and cucumber mosaic virus with six positives. The specific potyvirus that infected many of this year's iris samples was iris severe mosaic virus, which is transmitted by probing aphids and mechanical inoculation (i.e., cutting tools). One iris cultivar, 'Mt. Fujiyama,' was infected with the tospovirus *impatiens necrotic spot virus*. Greenhouse producers, nurseries and retailers cooperated with inspectors by removing all infected plant material from sale. Results of the survey are summarized in the table on page 150.

GYPSY MOTH: Moth counts increased by 20% in 2017. The state trapping program recorded a total capture of 108,008 male moths in 10,878 traps. Another 1,329 moths were collected in traps set at the Ports of Green Bay, Marinette and Milwaukee, for an official total of 109,333 gypsy moths caught in the state this year. Program coordinators attribute the higher trap counts to increasing populations over much of eastern and central Wisconsin which are generally infested. By contrast, counts in the still largely uninfested western counties

were at or below last year's totals. The season's highest counts were in Bayfield (14,354 moths), Monroe (9,989 moths), Sauk (9,561 moths), and Juneau counties (9,109 moths). No surveyed county reported zero moths.

The DATCP Slow the Spread Program treated a total of 154,508 acres at 51 sites in 18 counties from May 15-July 17 in western Wisconsin. Btk was applied to 22,792 acres and mating disruption covered 131,716 acres. The DNR Suppression Program also treated five sites with Btk totaling 434 acres in Dane and Sauk counties. There were no eradication sites or NPV treatments this year, and no new counties were added to the 50-county Wisconsin Gypsy Moth Quarantine.

EMERALD ASH BORER: An additional 117 EAB finds were confirmed this season, for a cumulative total of 391 municipal detections in 47 counties since 2008. Most were near infested areas in the southern half of the state where EAB is already well established, although isolated infestations were also identified in northern Wisconsin.



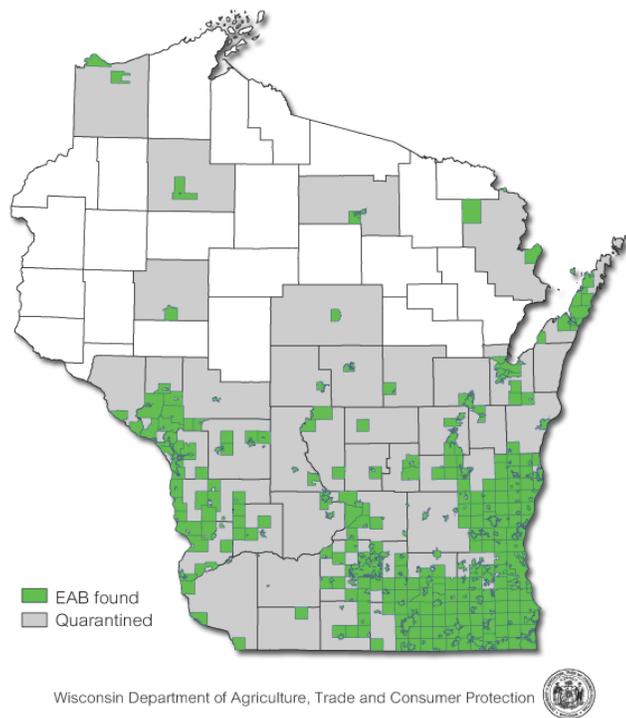
Emerald ash borer

www.ipm.illinois.edu

The cooperative EAB trapping survey conducted by state, federal, county and tribal partners consisted of 1,434 traps set primarily in the northern counties. Beetles were captured on survey traps in Green Lake, Marinette, Waushara and Waupaca counties for the first time, and EAB-infested trees were found in Chippewa, Iowa and Marathon counties this season, prompting an expansion of the state EAB quarantine to include six counties (Iowa county was quarantined in 2014 without an EAB detection). A map showing the 391 cities, villages, and townships with confirmed EAB finds, as

well as the state's 48-county quarantine, is provided below. Most of Wisconsin remains uninfested, including much of the northern half and the gray areas in all quarantined counties.

Emerald Ash Borer Detections 2008-2017



WALNUT TWIG BEETLE: A trapping survey was conducted in 17 counties to detect the walnut twig beetle component of thousand cankers disease (TCD). Survey locations were within the natural range of eastern black walnut in southern and western Wisconsin and included brush disposal sites and sawmills receiving black walnut logs from TCD-infested states. Twenty-one baited Lindgren funnel traps were set in Buffalo, Chippewa, Crawford, Dane, Dunn, Fond du Lac, Grant, Green Lake, Iowa, La Crosse, Lafayette, Pepin, Richland, Rock, Sauk, Trempealeau and Vernon counties, with no beetles found in the collection samples processed as of November 9. DATCP has conducted walnut twig beetle surveys for the last six years.

AMBROSIA BEETLE: The exotic ambrosia beetle *Anisandrus maiche* was collected in July from honey locust saplings at an Ozaukee County nursery, representing the first Wisconsin detection of this species. Protruding frass toothpicks along the main plant stem provided evidence of the infestation. Two other significant pests, the black stem borer, *Xylosandrus germanus*, and nectria

canker, were also found in association with the infested honey locusts.



Ambrosia beetle frass (toothpick-like projections)

Jiri Hulchr

VELVET LONGHORNED BEETLE: DATCP and the USDA APHIS confirmed the first detection of velvet longhorned beetle (*Trichoferus campestris*) in Wisconsin on July 13, in two Milwaukee County survey traps. The beetle had previously been intercepted last year in rustic hickory style log furniture manufactured in China, but never found in the Wisconsin landscape. Velvet longhorned beetle (VLB) infests a wide range of forest, orchard and urban trees and may have the potential to become a pest in the state. The specimens were collected as part of the national survey program for exotic woodborers and bark beetles. Seventy-seven other traps set at 32 municipal brush drop-off sites and commercial port locations in Brown, Dane, Douglas, Eau Claire, Fond du Lac, Kenosha, Manitowoc, Marinette, Milwaukee, Ozaukee, Racine, Sauk, Sheboygan and Waukesha counties were negative for 10 target beetle species.



Velvet longhorned beetle, *Trichoferus campestris*

Barry macroid.ru

CORN ROOTWORM BEETLE SURVEY RESULTS 2008-2017 AVE. NO. OF BEETLES PER PLANT

DISTRICT	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10-YR
NW	0.5	0.4	0.3	0.1	0.5	0.7	0.5	0.2	0.5	0.2	0.4
NC	0.9	0.4	0.1	0.1	0.3	0.2	0.2	0.5	0.7	0.2	0.4
NE	0.6	0.6	0.1	0.3	0.6	0.2	0.1	0.2	0.7	0.2	0.4
WC	0.6	0.5	0.4	0.6	0.4	0.4	0.6	0.3	0.6	0.2	0.5
C	0.5	0.4	0.4	0.8	0.5	0.2	0.2	0.5	0.3	0.3	0.4
EC	1.0	0.6	0.3	0.5	0.4	0.3	0.3	0.8	0.4	0.2	0.5
SW	1.1	0.7	0.3	1.1	0.8	0.6	0.9	0.8	0.7	0.3	0.7
SC	1.5	1.1	0.3	1.4	0.9	0.5	0.3	0.8	0.4	0.3	0.8
SE	1.6	0.3	0.2	0.7	0.9	0.8	0.4	0.7	0.2	0.1	0.6
STATE AVE.	1.0	0.6	0.3	0.7	0.6	0.5	0.4	0.6	0.5	0.2	0.5

Survey results based on average number of beetles per plant per 10 plants examined.

EUROPEAN CORN BORER FALL SURVEY RESULTS 2008-2017 AVE. NO. OF LARVAE PER PLANT

DISTRICT	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10-YR
NW	0.12	0.06	0.08	0.15	0.04	0.07	0.06	0.03	0.13	0.09	0.08
NC	0.18	0.10	0.02	0.07	0.01	0.02	0.04	0.00	0.08	0.04	0.06
NE	0.12	0.12	0.19	0.13	0.05	0.02	0.01	0.04	0.00	0.00	0.07
WC	0.04	0.10	0.08	0.12	0.09	0.06	0.12	0.03	0.15	0.01	0.08
C	0.11	0.06	0.06	0.05	0.01	0.01	0.00	0.01	0.24	0.02	0.06
EC	0.20	0.09	0.01	0.03	0.01	0.01	0.01	0.04	0.00	0.01	0.04
SW	0.05	0.06	0.12	0.03	0.03	0.06	0.00	0.03	0.14	0.04	0.06
SC	0.07	0.02	0.07	0.20	0.01	0.08	0.01	0.02	0.14	0.06	0.07
SE	0.04	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.04	0.04	0.01
STATE AVE.	0.09	0.06	0.07	0.09	0.03	0.04	0.03	0.02	0.11	0.03	0.06

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

SURVEY OF VIRUSES IN ORNAMENTALS 2017 PLANT INDUSTRY LABORATORY RESULTS

VIRUS SAMPLES	POTY ¹	TRV ²	HVX ³	ILAV ⁴	CMV ⁵	LLCV ⁶	CICMo ⁷	INSV ⁸	ArMV ⁹	TMV ¹⁰
No. of positives	45	13	10	7	6	3	2	2	1	0
No. of plants tested	58	39	24	27	44	3	8	39	11	38
Percent of positives	78%	33%	42%	26%	14%	100%	25%	5%	9%	0%

¹Potygroup viruses; ²Tobacco rattle virus; ³Hosta virus X; ⁴Ilarvirus group; ⁵Cucumber mosaic virus; ⁶Lilac leaf chlorosis virus; ⁷Clematis chlorotic mottle virus; ⁸Impatiens necrotic spot virus; ⁹Arabis mosaic virus; ¹⁰Tobacco mosaic virus.