

# WISCONSIN PEST BULLETIN

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



Wisconsin Department of Agriculture, Trade and Consumer Protection

Division of Agricultural Resource Management | Bureau of Plant Industry  
2811 Agriculture Dr., Madison, WI 53718 • <http://pestbulletin.wisconsin.gov>

## WEATHER & PESTS

Favorable spring planting weather paved the way for record-breaking crop yields achieved amid the global pandemic of 2020. After a milder-than-normal March, April warmth provided the earliest planting window in four years. Mostly dry May weather supported a rapid fieldwork pace, and corn and soybean planting was completed 1-2 weeks ahead of historical averages. June heat and rainfall accelerated crop development, while hot, humid July growing conditions maintained exceptional prospects. By July 31, over three-quarters of the state's corn, soybeans, small grains were rated in good to excellent condition. Drought intensified during August in parts of western and central Wisconsin, and crops matured quickly in September, 3-4 weeks ahead of last year and 1-2 weeks ahead of average. At the close of a season marked by uncertainty, Wisconsin producers expect to harvest an unprecedented 539 million bushels of corn (186 bushels per acre) and 110 million bushels of soybeans (55 bushels per acre), surpassing the previous record harvests of 2016.

## PEST HIGHLIGHTS

**CORN ROOTWORM:** Beetle counts in southern and western Wisconsin increased substantially from the historic low levels of 2017-2019. The annual survey in August found higher populations in seven of the nine

crop districts compared to last year, and a state average count of 0.6 beetle per plant, which represents a two-fold increase from 0.3 per plant in 2019. Approximately 27% of the corn sites sampled in August had above-threshold beetle pressure ( $>0.75$  per plant). Larval root damage could be elevated across the southern districts in 2021.

**BROWN MARMORATED STINK BUG:** Chippewa and St. Croix counties were the only additions to the Wisconsin brown marmorated stink bug (BMSB) distribution map this season. Populations continue to be highest in the Madison, Milwaukee and Fond du Lac to Green Bay areas, although this pest's range has also expanded into western Wisconsin. As of November 12, BMSB reports have been confirmed from 34 of the state's 72 counties.

**VELVET LONGHORNED BEETLE:** DATCP continued to gather information on the distribution of the velvet longhorned beetle (*Trichoferus campestris*) in Wisconsin. To date, 102 adult specimens of this exotic wood borer have been collected from 22 sites in six counties: Dane, Fond du Lac, Kenosha, Milwaukee, Rock and Waukesha. New county records in 2020 were established for Dane and Rock counties. The sites where this beetle have been detected are apple orchards and industrial areas. Additional information is provided in the **FRUIT** section.

**EUROPEAN CORN BORER:** Larval populations once again remained extremely low. DATCP's fall European

corn borer (ECB) survey documented a state average of 0.03 borer per plant, a minor increase from the all-time low average of 0.01 borer per plant found in 2019 and tying 2017, 2014 and 2012 for the third-lowest count since 1942. The main contributing factor to the consistently low ECB pressure is Wisconsin's continued high use rate of Bt corn, which accounted for 79% of planted corn acres in the state in 2020. This season marked the 25th year since commercialization of Bt corn.

**SPOTTED LANTERNFLY:** Surveys for this pest on tree of heaven at 53 urban sites in Dane, Jefferson, Kenosha, Milwaukee, Racine and Rock counties, as well as on fruit trees and grape vines in 18 apple orchards and 12 vineyards, yielded negative results. Spotted lanternfly has not yet been found in Wisconsin.



Spotted lanternfly

Dalton Ludwick USDA ARS

**WESTERN BEAN CUTWORM:** The June-August trapping program collected a cumulative total of 3,789 moths in 58 traps, or 65 per trap. This average ties 2019 for the second highest count since surveys began in 2005 and is well above the 16-year average of 28 moths per trap. The survey record of 79 moths per trap was set in 2010. Localized damaging populations resulting from this summer's relatively large flight were observed in 6% of cornfields sampled in August and September, with the most severe infestations noted in Eau Claire, Green Lake, and Marquette counties.

**LILY LEAF BEETLE:** Range expansion increased considerably this year, with new records established in Brown, Calumet, Clark, Milwaukee, Outagamie, Vernon, Vilas, Waukesha, and Waupaca counties. First detected in Marathon County in 2014, lily leaf beetle (LLB) has now been confirmed in 21 Wisconsin counties. The adult

beetles are bright red and conspicuous, while the larvae are found by inspecting Asiatic lily leaves for defoliation. The leaf damage caused by LLB can be lethal to plants.



Lily leaf beetle

Timothy Allen DATCP

## INDUSTRIAL HEMP

**HEMP PESTS:** DATCP hemp inspectors conducted the state's first official industrial hemp pest survey in 2020, documenting the prevalence of five leading hemp insects and diseases: Eurasian hemp borer, European corn borer, gray mold, leaf spot, and white mold. Inspectors recorded pest observations at 991 distinct locations.



Eurasian hemp borer larva

Krista Hamilton DATCP

Eurasian hemp borer (EHB), thought to be the most common and destructive hemp pest insect in the state, was found at 13% of the sites. Ten percent of those sites had light infestations impacting 1-10% of the plants, 2% had moderate infestations affecting 11-49% of the plants, and 1% had severe infestations (>50% of the plants). The

highest EHB pressure was observed in Dane, La Crosse, Lafayette and Sauk counties. Dane County had the most fields with EHB infestations rated as severe.

Inspectors also looked for signs of European corn borer (ECB), which was found at 5% of the sites this season. ECB pressure was low overall. Only two locations, one each in Dane and La Crosse counties, had heavy ECB populations affecting >50% of plants.

Of the three disease targets, hemp leaf spot was the most prevalent. Inspectors noted leaf spot symptoms at 41% of sites, followed by white mold in 7%, and gray mold at 2% of the sites. Hemp leaf spot was largely mild, with 30% of fields rated as having light symptoms, 8% having moderate symptoms, and 4% having severe symptoms (>50%).



Leaf spot on hemp

[hemp.cals.cornell.edu](http://hemp.cals.cornell.edu)

## FORAGES & GRAINS

**ALFALFA WEEVIL:** Counts in first-crop alfalfa were low in 2020. The first appearance of larvae was later than average and began in southern Wisconsin by May 22. Peak weevil feeding was predicted for June 11-24 across much of the state. Sweep net counts remained low (<1.0 per sweep) through late June, while leaf tip damage estimates did not exceed the 40% economic threshold in any surveyed field. The larval feeding window closed by early July without significant defoliation observed this year.

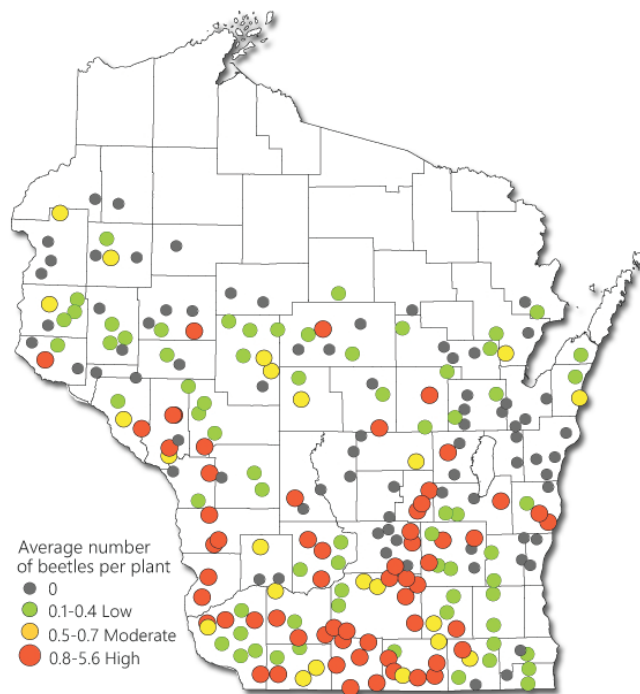
**POTATO LEAFHOPPER:** Alfalfa surveys found markedly lower leafhopper pressure this season compared to 2019. The first distinct migration occurred during the week of May 17 and nymphs appeared in second-crop alfalfa by June 22. The July monthly average count in 120

alfalfa fields sampled was 1.05 per sweep, significantly lower than the 2.04 average in 2019. Above-threshold counts (>2.0 per sweep) were recorded at 20% of sites compared to 47% last year. A few apple and vegetable growers noted carryover of leafhoppers into other crops as hay was harvested in July and August, but severe damage to alfalfa, fruit trees, nursery plants, and vegetables was not reported.

## CORN

**CORN ROOTWORM:** Beetle populations increased in 2020 to the highest levels recorded in five years. The annual survey in August documented a state average count of 0.6 beetle per plant in 229 fields, or twice the average found in 2019. The greatest increase was recorded in the south-central district (0.5 beetle to 1.3 beetles per plant), while counts were also relatively high in the southwest and central regions, at 0.6 and 0.7 beetle per plant, respectively. Cornfields with populations above the 0.75 beetle-per-plant threshold comprised 27% of this year's sites, compared to last year's 12%.

Corn Rootworm Beetle Survey Results 2020  
State Ave. = 0.6 beetle per plant



Wisconsin Department of Agriculture, Trade and Consumer Protection



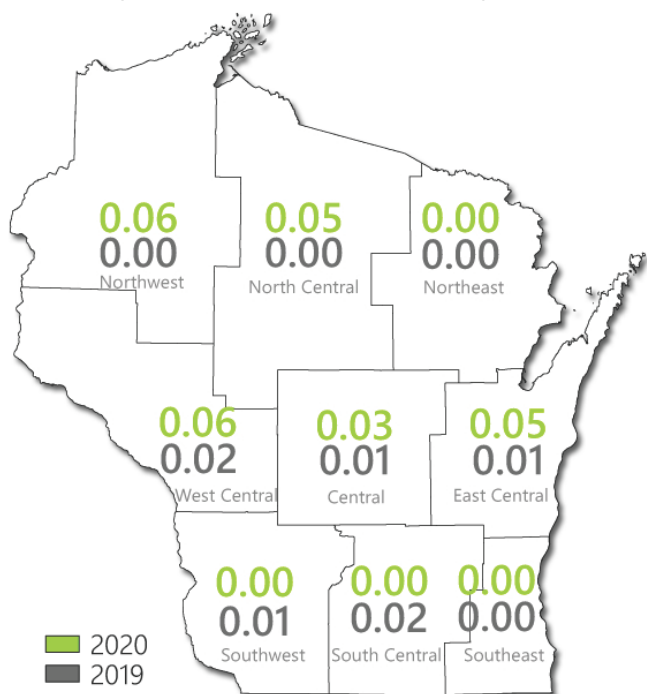
In addition, the 2020 total count of 1,332 beetles was 47% higher than the 711 beetles counted in 2019. Seventy percent of this season's beetles were northern

corn rootworm, which has been the predominant species in the state for seven consecutive years.

Based on the higher rootworm populations observed this season, southern Wisconsin corn producers are advised to closely review their rootworm management plans for 2021 and consider crop rotation if practical. Growers opting for a rootworm trait package for root protection are reminded that planting continuous corn with the same trait should be avoided.

**EUROPEAN CORN BORER:** Larval populations increased from historically low levels in 2018-2019, but remained extremely low. The state average count in 229 cornfields sampled this fall was 0.03 borer per plant, which is only marginally higher than the all-time low average of 0.01 per plant recorded during the two preceding seasons. All three of the state's southern agricultural districts showed averages less than or equal to 2019 levels, while negligible increases were noted in the central and northern areas. Larvae were absent from 90% of the fields sampled in September and October.

District Average Number of European Corn Borer Larvae per Plant



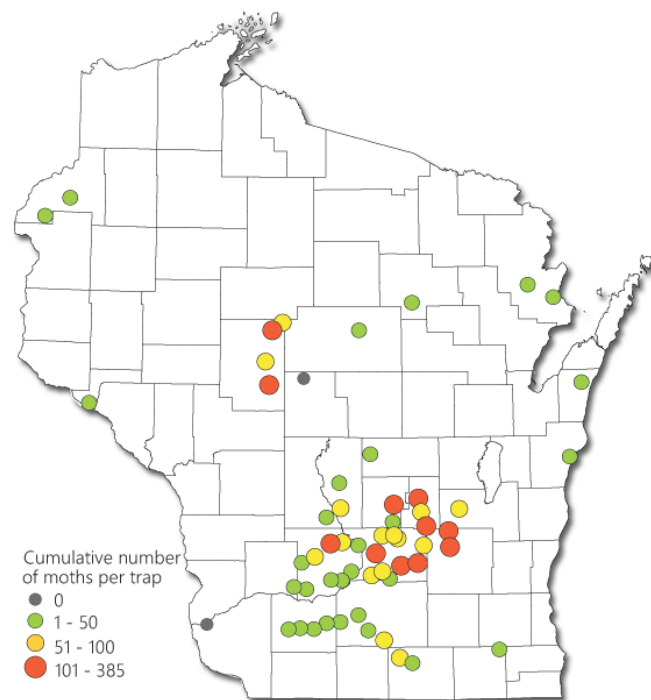
Wisconsin Department of Agriculture, Trade and Consumer Protection

The near-record low number of corn borers observed again this year reflects the continued prevalence of Bt corn, which accounted for 79% of the state's corn acres

in 2020. Another exceptionally small overwintering population indicates the spring moth flight and subsequent first generation of larvae are unlikely to pose a significant early-season threat to the 2021 corn crop.

**WESTERN BEAN CUTWORM:** Moth counts in 2020 were remarkably similar to those recorded in 2019. The annual trapping program from June-August registered an average of 65 moths per trap (3,789 moths in 58 traps), tying 2019 for the second highest average in 16 years. The survey record of 79 moths per trap (10,807 moths total) was set in 2010. The highest individual count for the 10-week monitoring period was 385 moths at Princeton in Green Lake County, the same location that collected the high count of 405 moths in 2019. This season's relatively large flight generated larval injury to scattered cornfields in the central counties in August and September.

Western Bean Cutworm Moth Counts 2020



Wisconsin Department of Agriculture, Trade and Consumer Protection

**CORN EARWORM:** Pheromone traps captured a cumulative total of 4,747 moths in 18 traps during the late-season monitoring program, with the largest flights recorded during the first week of September. The highest individual pheromone count was 433 moths at Beaver Dam in Dodge County from August 27-September 2. Compared to 2019 when 3,495 moths were collected in 15 pheromone traps, this year's total count was 26%

higher. The risk to late sweet corn from migrating corn earworm adults was also elevated in 2020, and the September moth flights produced localized larval damage to apples, corn and tomatoes. Earworm caterpillars were found in 10% of sites surveyed for ECB this fall.



Corn earworm larva

Krista Hamilton DATCP

**BLACK CUTWORM:** Early corn planting and a delayed moth migration resulted in a low risk of spring cutworm damage to emerging corn. Although migrants began appearing in survey traps by April 8, the first significant flights of nine or more moths in two nights did not occur for another month, until May 4. The April 8-June 5 trapping survey captured 1,355 moths in 44 traps, with a peak recorded May 13-19. Significant black cutworm injury was not observed or reported this season.

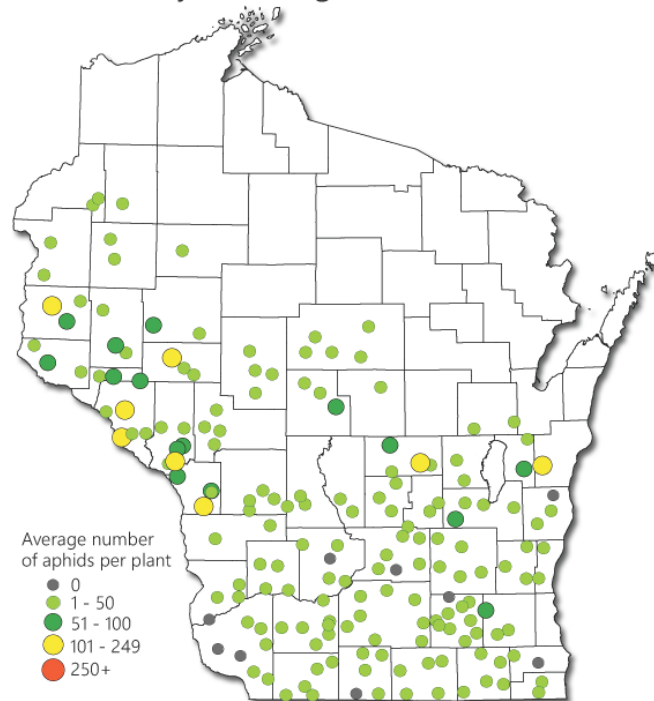
## SOYBEANS

**TWO-SPOTTED SPIDER MITE:** Leaf stippling and bronzing symptoms intensified in western Wisconsin soybeans in August with the late summer drought. For most fields, the mite infestations appeared after the R5 to R5.5 or full pod growth stage, which was too late for miticide treatment to be beneficial.

**SOYBEAN APHID:** Populations recorded during the annual survey were mostly low. Ninety-one percent of the 180 fields sampled from July 20-August 21 had average counts below 50 aphids per plant, 5% had 51-100 per plant, and only 4% had moderate populations of 101-175 aphids per plant. The 2020 state average count was just 15 aphids per plant, with no surveyed fields showing above-threshold populations of 250 aphids per plant. For comparison, the 2019 survey found a record-low average

of five aphids per plant, the 2018 average was 14 aphids per plant, and surveys from 2010-2017 documented average counts of 6-55 aphids per plant. Results of this season's effort suggest that while aphid pressure was slightly higher than in 2019, the soybean fields sampled did not meet treatment guidelines during the survey timeframe.

### Soybean Aphid Survey Results July 20 - August 21, 2020



Wisconsin Department of Agriculture, Trade and Consumer Protection



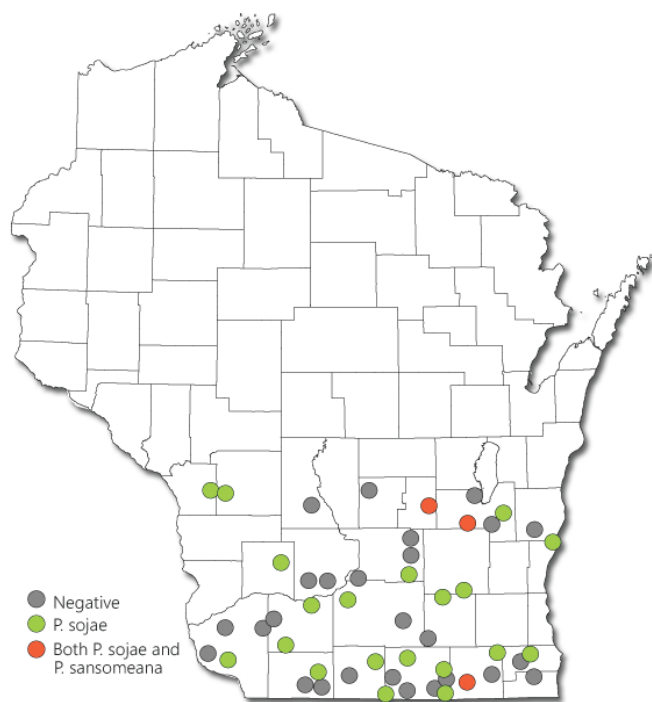
**SOYBEAN GALL MIDGE:** An emerging pest of Midwestern soybeans, the soybean gall midge (SGM) was not found in Wisconsin in 2020. Populations were confirmed this season in Iowa, Minnesota, Nebraska, and South Dakota. Larvae of the SGM, a member of the Hessian fly family (Cecidomyiidae), feed internally at the base of soybean stems and cause stem discoloration. Infested plants snap off near the ground and the orange or white maggots can be found feeding inside. Much remains unknown about this insect, including the exact species and whether it is a direct or a secondary soybean pest. Consultants and soybean growers are encouraged to remain alert for symptoms associated with SGM for 2021 and collect a sample for definitive identification if SGM is suspected.

**SEEDLING ROOT ROT:** DATCP surveyed 50 soybean fields from June 8-July 3 for seedling root rot disease

caused by *Phytophthora sojae*, general *Phytophthora* species, and general *Pythium* species. Testing at the Plant Industry Bureau Laboratory confirmed 46% (23) of fields were positive for *P. sojae*; 6% (3) of fields were positive for *P. sansomeana*; and 80% (43) were infected with *Pythium*. The *P. sojae* rate increased from the previous year when the pathogen was identified in 38% of fields. Surveys in the past decade have found *P. sojae* prevalence ranging from 13% in 2011 to 49% in 2014.

*Phytophthora sansomeana* was detected in Fond du Lac, Green Lake and Walworth counties this year. All three counties are new records for *P. sansomeana*, bringing the total Wisconsin counties where this root rot has been detected in soybeans to 18.

## Soybean Phytophthora Survey Spring 2020



Wisconsin Department of Agriculture, Trade and Consumer Protection



**JAPANESE BEETLE:** Defoliation was observed in 70% of the 180 soybean fields examined in August. Counts recorded during the annual aphid survey ranged from 1-138 beetles per 100 sweeps, with a state average of 17 per 100 sweeps (the 2019 average was 14 per 100 sweeps). The highest counts of 50 or more beetles per 100 sweeps were noted in the southwestern and west-central districts for the third year in a row (see table 3 page 165). Individual fields in Clark, Crawford, and Lafayette counties had counts exceeding 100 beetles

per 100 sweeps and defoliation levels well above the 20% economic threshold for this pest.



Japanese beetles

Krista Hamilton DATCP

## FRUITS

**CODLING MOTH:** Warm dusk temperatures spurred the first emergence of spring moths in southern Wisconsin apple orchards during the last week of May. Almost half of the apple orchards in the DATCP network registered a strong flight by May 24, while other sites recorded the spring biofix on June 1. Treatments targeting first generation larvae began around June 6, about two weeks earlier than in 2019.

Summer moths appeared in early July and variable pressure was reported throughout August. A few orchards experienced late, heavy flights that led to fruit injury. Eight of the 29 sites in DATCP's monitoring program used CM mating disruption (MD) this season with success.

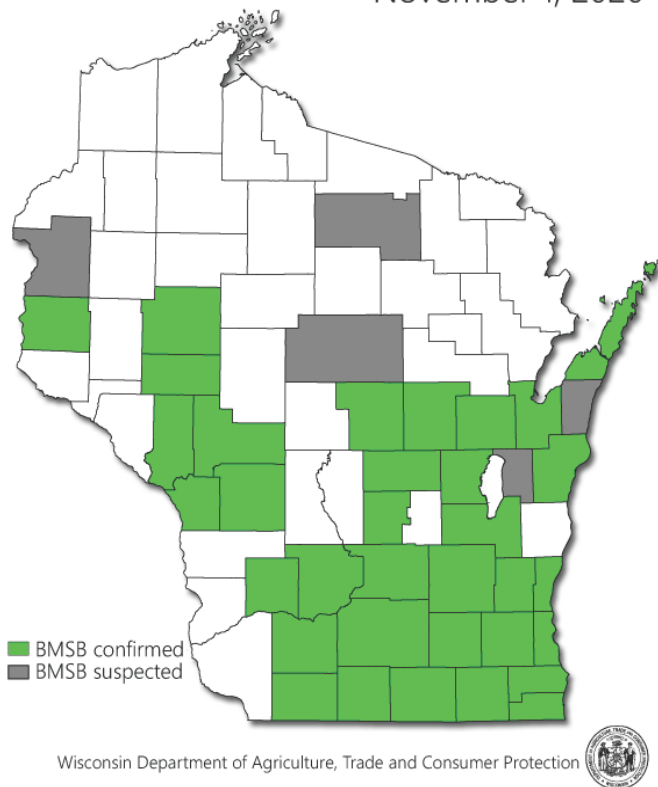
**VELVET LONGHORNED BEETLE:** Survey work continued in 2020 in response to the recent detection of this potential fruit and landscape tree pest in southeastern Wisconsin. The first velvet longhorned beetle (VLB) was trapped by DATCP in 2017 and surveys in the last four years have collected a total of 102 beetles in six counties: Dane, Fond du Lac, Kenosha, Milwaukee, Rock and Waukesha. The sites where VLB have been found include industrial areas near the Mitchell International Airport and apple orchards. The beetle has also been intercepted in Wisconsin in rustic hickory-style log furniture manufactured in China. In 2020, three orchard traps in Kenosha, Dane, and Rock counties each

captured a single VLB, with the latter two representing new county records.

The pest potential of this exotic Asian insect in Wisconsin is unclear. Although VLB is known to infest a wide range of forest, orchard and urban trees, in most states where it has been found, no local infestation or pest impact has been documented. The exception is in Utah, where the beetle's risk to fruit trees is currently being evaluated. Ongoing trapping is planned for 2021 to understand the threat, if any, that this new invasive pest may pose to Wisconsin orchards.

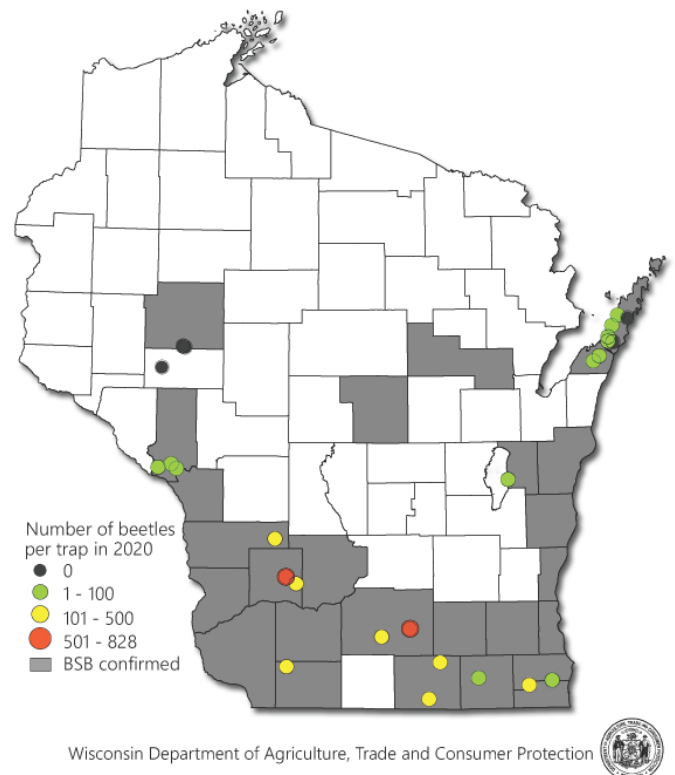
**BROWN MARMORATED STINK BUG:** Monitoring was carried out at 57 sites this season. DATCP cooperators and IPM Institute consultants placed clear sticky panel traps in 45 apple orchards and 12 vineyards. Seventeen trap locations in Chippewa (2), Dane (4), Fond du Lac, Green, Kenosha, Racine (2), Rock (2), Sauk, Walworth (2), and Winnebago counties captured BMSB. All traps collected fewer than 13 BMSB adults per week, with most capturing only 1-2 specimens for the season. Two new counties were added to the Wisconsin BMSB distribution map this year: Chippewa and St. Croix. Thirty-four of the state's 72 counties now have confirmed reports of BMSB.

Brown Marmorated Stink Bug Status in WI  
November 1, 2020



**BLACK STEM BORER:** Fifty-two Lindgren funnel traps deployed in apple and cherry orchards in Calumet, Dane, Door, Kenosha, Lafayette, Racine, Richland, Rock, Trempealeau, Vernon and Walworth counties collected this Asian ambrosia beetle (*Xylosandrus germanus*) in 2020. Twenty-two traps captured 1-100 beetles, 18 traps caught 101-500 beetles, and two traps collected 501-828 beetles, for a total capture of 6,632 beetles. Most were collected in the two weeks from June 1-15.

Black Stem Borer Detections 2013-2020



Until June of 2019 when an infested apple tree was identified in a Lafayette County orchard, there had been no confirmed cases of BSB apple tree damage in Wisconsin. Orchards in Michigan, Ohio and other northeastern states have had serious issues with this pest in the last few years, and in western New York, the beetles have killed large numbers of apple trees. Results of the 2020 survey provide further evidence of BSB's prevalence in the state and suggest future orchard monitoring is needed. Black stem borer has been documented by DATCP in 25 Wisconsin counties since 2013.

**APPLE MAGGOT:** Emergence of flies began in orchards by June 28. Counts generally peaked between July 22-28 in the south and August 12-18 in the north. A few monitoring sites also reported high counts (5-12 per trap)

during the last week of August, despite the long dry spell. The season's highest weekly count was 24 flies on red sphere traps in Fond du Lac and Kenosha counties.



Apple maggot fly

Thaddeua McCamant Central Lakes College

**EUROPEAN CHERRY FRUIT FLY:** A pest detection survey was conducted on the Door Peninsula of northeastern Wisconsin from 2018-2020 for the European cherry fruit fly (ECFF), *Rhagoletis cerasi*. First found in North America in Ontario in 2015 and two years later in New York, ECFF is a pest of economic and quarantine significance that poses a high risk to Door County's \$1.9 million dollar tart cherry crop. Surveys for ECFF were conducted at eight orchards, and included the placement of four yellow sticky traps (32 traps total) baited with ammonium carbonate attractant at each location. No ECFF were captured during the three-year survey.

**FIREBLIGHT:** This bacterial blight caused by *Erwinia amylovora* was common in 2020. The lab confirmed the disease on nine apple tree and three pear tree samples. The infected apple varieties were 'Candy Crisp,' 'Cortland,' 'Honeycrisp,' 'Firestorm™ Honeycrisp,' 'Jonathan,' and 'State Fair.' 'Anjou semi-dwarf CVI,' 'Parker' and 'Patten' pears tested positive for the bacterial blight.

**APPLE DISEASES:** Consultants from the IPM institute scouted 18 orchards as part of a multi-year collaborative survey that targeted nine apple diseases of special concern to agriculture in the state. Notable diseases found by the survey were crown gall (2 positives) and fire blight (2 positives). The positive samples were collected from sites in Chippewa, Portage, Rock and Trempealeau counties. Other apple disorders diagnosed this season were flyspeck, Phomopsis canker, and rust.

**APIARY INSPECTIONS:** Apiary inspections are still underway. Inspectors have to date visited 120 beekeepers, opening 1,128 hives for inspection. Preliminary results indicate that winter mortality decreased for the third year in a row, from 32% in 2018-19 to 21% in 2019-20, which is close to the 22% national average for winter loss. Varroa mite was detected in 59% of hives sampled for this pest, compared with 51% last season. Other pests and diseases found include American foulbrood in 0.4% of hives, chalkbrood in 6.9% of hives, European foulbrood in 0.9%, deformed wing virus in 7.4%, sacbrood in 8.7%, and small hive beetle in 0.1% of hives. These numbers will likely change once inspections are completed. As of November 12, inspectors have issued apiary inspection certificates for the movement of 16,267 migratory hives, primarily destined for California, Florida and Texas for pollination services.



Northern Wisconsin Apiary Inspector

Calista Thompson DATCP

## VEGETABLES

**VEGETABLE DISEASES:** DATCP plant pest specialists visited 29 CSA farms and community gardens near La Crosse, Madison, Milwaukee and Hudson on a biweekly basis this season to monitor for 30 new and invasive vegetable diseases and insects. Sixty-seven symptomatic vegetable samples were collected and submitted to the Plant Industry Bureau Lab for testing. Although none of targeted pathogens were detected, other notable diseases found in 2020 were: basil downy mildew on basil, tobacco ringspot virus (TRSV) on tomato, and squash mosaic virus on zucchini.

**TOBACCO RINGSPOT VIRUS:** Tomatoes with very striking virus-like symptoms were screened for several



viruses of concern to greenhouse growers and exporters. Three heirloom tomato samples from La Crosse County showing oval-shaped blisters on the fruits were diagnosed with tobacco ringspot virus (TRSV). Tobacco ringspot virus infects a wide range of woody and herbaceous plants, including many common ornamental plants and weeds. The virus is frequently seed-transmitted or spread by plant sap. Nematodes and honey bees can also vector TRSV. Unlike the emerging threat tomato brown rugose fruit virus which exhibits similar symptoms, TRSV reportedly causes only minor damage and does not spread rapidly.



*Tobacco ringspot virus on tomato*

*Krista Hamilton DATCP*

**BASIL DOWNY MILDEW:** This aggressive foliar disease was confirmed in late August in Pierce and St. Croix counties. Basil downy mildew spreads via wind-dispersed spores, rapidly infecting entire fields and causing complete plant loss. The pathogen is often present on greenhouse-grown basil in garden centers in the spring, though it may not progress until late summer. Purchasing disease-free plants, promoting airflow, and frequent monitoring of the crop so harvest can occur quickly once the mildew appears are all important controls. Planting resistant varieties (not sweet basil) is also recommended.

**SQUASH MOSAIC VIRUS:** Zucchini plants in a La Crosse County community garden tested positive for this virus. Squash mosaic virus (SqMV) is common on cucurbits and produces mosaic, rugosity, and distortion symptoms. SqMV also infects common lambsquarters and other weeds in the Chenopodiaceae family. This seed transmitted virus is spread by cucumber beetles and in plant sap on hands and tools. The virus can overwinter on perennial weeds. Disease management starts with using

clean seed, practicing good sanitation, minimizing weeds, and controlling insect pests.

**LATE BLIGHT:** Disease pressure decreased significantly in 2020 due to dry late summer weather, with detections in only three counties, compared to 18 counties in 2019. The state's first infected commercial potato field was confirmed in Adams County on August 10 by the UW Plant Pathology Department. Two additional cases of late blight, both on tomato, were diagnosed during the remainder of the season, one in Pierce County on August 20 and a second in St. Croix County on September 15. All samples tested by UW from Wisconsin were the US-23 pathogen genotype.

At the DATCP Plant Industry Bureau Lab, 24 tomato samples and two potato samples were also screened for late blight. This disease was not detected, but testing found septoria leaf and stem blight was very common on tomato (12 positives), followed by early blight (3 positives), and *Fulvia* leaf mold in a greenhouse (1 positive).



*Late blight lesions on tomato*

*Krista Hamilton DATCP*

**TOMATO BROWN RUGOSE FRUIT VIRUS:** Four symptomatic tomato samples were submitted by a local USDA APHIS PPQ inspector as part of a national survey for tomato brown rugose fruit virus (ToBRFV). The tomatoes were screened using immunostrips and no positives were found. In 2019, APHIS imposed import restrictions on tomato and pepper fruit, transplants and seed lots from all countries where ToBRFV exists. ToBRFV has caused significant economic losses in greenhouse production of tomatoes. This newly identified virus was detected and eradicated from Arizona and California greenhouses in 2018 and 2019.

**COLORADO POTATO BEETLE:** Overwintered beetles were unusually abundant this spring. Damaging populations were reported by May 25 from several western and northern Wisconsin CSAs where the beetles caused severe defoliation of young potato and eggplant crops. Control of the overwintered adults and resulting first-generation larvae required persistent scouting every few days until the peak colonization period ended in June.



Colorado potato beetle

Krista Hamilton DATCP

## NURSERY & FOREST

**NURSERY INSPECTION:** The Nursery Program licensed 582 nursery growers and 1,175 retailers this year, with staff performing 701 site inspections statewide. Annual inspections are prioritized for out-of-state shippers and those holding a Plant Health Certificate. The top 10 insects and diseases found were, by total number of detections: viruses, rusts, leaf spots, anthracnose, leafminers, aphids, Japanese beetle, powdery mildew, apple scab and spider mites. Summarized below are highlights from the 2020 inspections.

**VIBURNUM LEAF BEETLE:** Nursery inspections found 24 cases of viburnum leaf beetle in southeastern Wisconsin in 2020. This recently-established pest feeds exclusively on the leaves of viburnums, and both the adults and larvae cause extreme defoliation and eventual shrub mortality after successive years of infestation. Native viburnums are an important understory component of many Wisconsin woodlands and are at risk. Viburnum leaf beetle has now been found in 11 Wisconsin counties since 2009: Brown, Dane, Iron, Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, Waukesha, and Winnebago.

**LILY LEAF BEETLE:** The invasive red lily leaf beetle was documented in eight new counties this season: Brown, Calumet, Clark, Milwaukee, Outagamie, Vernon, Vilas, Waukesha, and Waupaca. First detected in Marathon County in 2014, lily leaf beetle has now been confirmed in 21 Wisconsin counties. Nurseries that grow lilies should become familiar with this beetle's life cycle and how to manage it, and pass the information along to their customers. Overwintered bright red adult beetles will begin feeding on foliage as soon as lilies break through the ground next spring.

**CONIFEROUS FIORINIA SCALE:** This nonnative scale pest was detected on hemlock nursery stock imported from the Mid-Atlantic region to southeastern Wisconsin in July. Coniferous Fiorinia scale (*Fiorinia japonica*) originates in Southeast Asia and had not previously been reported in the state. This insect has the potential to impact native evergreens, including fir, pine, spruce, hemlock, juniper (including red cedar), and Canadian yew. DATCP issued a Pest Abatement Order to prevent this potentially invasive species from becoming established in Wisconsin.



Coniferous Fiorinia scale on hemlock

Renee Pinski DATCP

**NR 40 INVASIVE PLANTS:** NR40 invasive plants were found at 46 separate nursery locations this season, down from 69 in 2019. The phase-out period for selling remaining inventory classified as "restricted" ended May 1, 2020. Inspectors issued orders for the invasive plants to be either removed from sale and destroyed or returned to the supplier.

**DAYLILY RUST:** This disease was significantly more prevalent in 2020 than in prior years. Daylily rust is not

known to overwinter in Wisconsin, but arrives by spores on southerly winds or on infected plants from out-of-state. Nurseries receiving daylilies infected with rust were allowed to either return the material to the supplier or cut back the foliage and apply a chemical treatment. Daylilies successfully treated could then be sold.



Daylily rust

DATCP Nursery Program

**PLANT INDUSTRY LAB:** As of November 10, the PIB Lab processed 427 nursery samples for plant diseases, nematodes and pest identifications. This decrease from 620 samples in 2019 was inevitable due to lab capacity limitations necessitated by COVID-19 safety guidelines. Results were as follows:

**GERANIUM WILT:** DATCP inspectors participated in the trace-forward investigation and national recall of *Ralstonia* wilt-infected florist's geraniums 'Fantasia Pink Flare' and 'Fantasia Salmon' from 28 Wisconsin greenhouses. Eighteen samples were screened at the PIB Lab. All tested negative for *R. solanacearum*.



Ralstonia wilt in geranium

DATCP Nursery Program

**RAMORUM BLIGHT:** During routine nursery inspections, staff collected 32 symptomatic plants from 18 locations. The PIB Lab tested five lilacs, one magnolia tree, one pear tree, two pieris plants, 22 rhododendrons and one viburnum. All were negative for *Phytophthora ramorum*, including seven samples that were infected with *Phytophthora* blights caused by other *Phytophthora* species.

**BOXWOOD BLIGHT:** This devastating fungal disease was diagnosed in two boxwood samples from a Milwaukee County residence in April. Sixty-eight other suspect samples collected by inspectors from 22 nurseries and retailers all tested negative this season. In 2019, boxwood blight was found in two Kenosha County nurseries, at two retailers in Dane and Portage counties, and on landscape boxwoods in Dane County. Boxwood blight remains an emerging threat that residents, retailers and the green industry should continue to be alert for.



Boxwood blight

Marcia Wensing DATCP

**NEMATODES:** Root knot nematodes (*Meloidogyne spp.*) were detected on Anemone 'Prince Henry' and Astilbe varieties 'Fanal,' 'Visions in Red,' 'Maggie Daley' and 'Younique Silvery Pink' at two nurseries in Jefferson and Washington counties. The roots, already weakened by the nematode damage, were colonized by fungal pathogens contributing to decay. The fungal pathogens *Fusarium*, *Phytophthora* or *Pythium* and *Thielaviopsis* were identified on the blackened roots. Foliar nematodes (*Aphelenchoides spp.*) were detected on anemone, hosta, and sensitive fern.

**RUSTS ON ORNAMENTALS:** Conditions were conducive for many rust diseases in 2020. Gymnosporangium rusts were detected on apple, crabapple, hawthorn, and

serviceberry. The striking elderberry rust (*Puccinia sambuci*) was detected on four occasions. Bracken rust (*Uredinopsis pteridis*), Eastern leatherwood rust (*Puccinia dioicae*), hawthorn rust (*Puccinia coronata*) and pine-oak rust (*Cronartium quercuum f.sp.banksianae*) were also noted during inspections.



Gynosporangium rust on serviceberry

Shanon Hankin DATCP

**VIRUSES OF ORNAMENTALS:** Nursery inspectors collected 125 ornamental samples for virus testing this year. Twenty-three of 24 iris plants tested positive for potyvirus, most likely iris severe mosaic virus. Besides iris, canna (2 plants) and sedum (3 plants) were infected with potyviruses.

Tobacco rattle virus (TRV) continued to be a common problem on bleeding heart and many astilbe varieties. TRV was also found on Celandine poppy, hosta, peony and phlox. Co-infections of TRV and a virus in the ilarvirus group, likely tobacco streak virus, occurred on astilbe varieties 'Fanal,' 'Freya,' and 'Red Sentinel.'



Tobacco rattle virus in bleeding heart

Tim Boyle DATCP

Single ilarvirus infections were found on astilbe 'Fanal,' 'Maggie Daley,' 'Purple Candles,' and 'Rheinland.' A different ilarvirus, possibly alfalfa mosaic virus, was found infecting pachysandra.

Other virus finds included two lilacs with lilac leaf chlorosis virus, one clematis plant with clematis chlorotic mottle virus, and one Stokes aster with impatiens necrotic spot virus.

**SPOTTED LANTERNFLY:** DATCP stepped up efforts this year to keep this highly invasive "hitchhiker" out of the state. Fifty-three sites with tree of heaven (*Ailanthus altissima*), the lanternfly's preferred host, were identified and surveyed for SLF life stages. Tree of heaven (TOH) was found in Dane, Jefferson, Kenosha, Milwaukee, Racine and Rock counties. In Milwaukee County, a limited number of baited circle traps were monitored from August-November. In addition, visual surveys were conducted at 12 vineyards and 18 apple orchards during the growing season. SLF has not been found in Wisconsin. More information about this pest is available at <https://youtu.be/wVmuKwreYdU> and <https://slf.wi.gov>.



Spotted lanternflies on grape vine

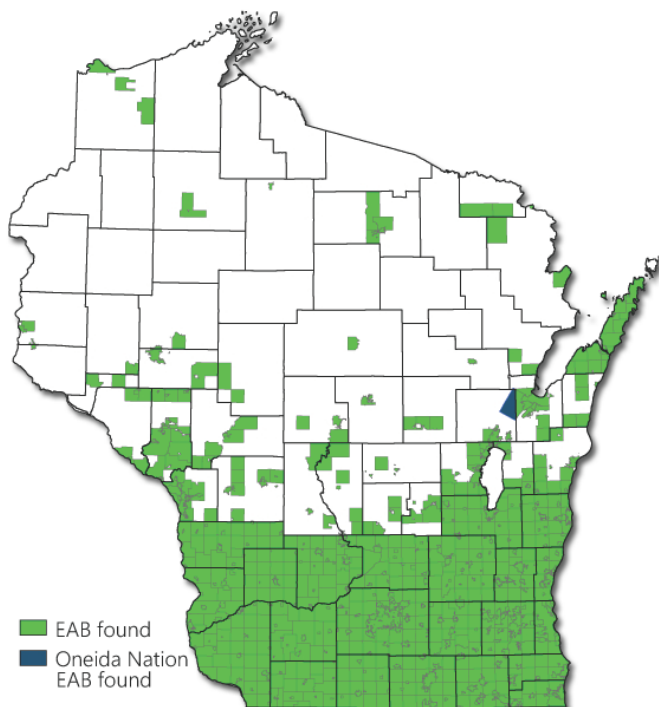
Eric H. Clifton Cornell University

**GYPSY MOTH:** Populations rebounded in 2020 following relatively mild winter and spring conditions. Egg hatch began on May 2 and male moths were first reported on July 8. Pheromone traps deployed mainly across western Wisconsin captured a preliminary total of 83,747 male moths (in 10,131 traps), putting 2020 statewide populations roughly on par with those reported in 2018. The advancing gypsy moth front in the state (10 moth line) moved an average of 5.9 km westward. This was largely driven by spread in the southern and central regions. Both DATCP and the DNR noted an increase in reports

of nuisance caterpillars this summer, largely from urban areas in the eastern portion of the quarantine region (Milwaukee, Green Bay, the Fox Valley, and Madison). There were very few scattered reports of defoliation. Currently, 50 of Wisconsin's 72 counties are now under quarantine for gypsy moth. No new counties were added to the quarantine in 2020.

**EMERALD ASH BORER:** Public and state agency reports of emerald ash borer (EAB) infested trees continue to be received and validated by DATCP. In 2020, these reports resulted in six new county detections (Dunn, Florence, Oconto, Pepin, Price and Shawano) and 268 city, town, or village detections within previously confirmed counties. Municipal detections now total 801 and encompass 34% of the state's total acreage. Emerald ash borer has become widespread across the southern third of the state, while infestations remain more isolated in central and northern areas, despite a noticeable increase in new detections this year. Since 2008, EAB has been confirmed in 58 of Wisconsin's 72 counties.

### Emerald Ash Borer Detections 2008-2020



Wisconsin Department of Agriculture, Trade and Consumer Protection



**FIR CONEWORM:** Several reports of damage to terminals of young plant stock and recently transplanted Fraser, Canaan, and balsam fir trees were observed in Grant, Jackson, Marquette, Portage, and Waushara

counties. Less common were reports of damage to white pine stems in Dane, Eau Claire, and Polk counties. Although typically a cone feeder, fir coneworm caterpillars can also bore downward through the center of terminal leaders, from the tip to the first whorl of branches. In white pine, the larvae have been found feeding just beneath the bark in the cambium of larger plant stock. Control is difficult because the caterpillars are protected within the cone or stem. Properly timed contact sprays applied just prior to egg hatch or systemic treatments can reduce overall numbers of this pest.



*Fir coneworm larva in white pine*

Konnie Jerabek DATCP

**COTTONY ASH PSYLLID:** A Wood County homeowner reported this seldom-observed exotic European pest of ash this season. Adult psyllids, also known as jumping plant lice, were found on the main trunk of a 12-year-old Mancana ash in late June, followed by nymphs within twisted and curled foliage by mid-July. This was the second report of cottony ash psyllid in Wisconsin, with the first detection confirmed by UW-Extension in 2006 on samples from St. Croix County.

Unlike native foliage pests such as ash plant bug or ash leaf curl aphid that cause mostly cosmetic damage, infestation by this pest over multiple years can be lethal to trees. Treatment options are limited and include applying an insecticide spray at egg hatch just before bud break.

**TABLE 1. CORN ROOTWORM BEETLE SURVEY RESULTS 2011-2020** AVE. NO. OF BEETLES PER PLANT

DISTRICT	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	10-YR
NW	0.1	0.5	0.7	0.5	0.2	0.5	0.2	0.2	0.1	0.2	0.3
NC	0.1	0.3	0.2	0.2	0.5	0.7	0.2	0.2	0.2	0.5	0.3
NE	0.3	0.6	0.2	0.1	0.2	0.7	0.2	0.4	0.1	0.1	0.3
WC	0.6	0.4	0.4	0.6	0.3	0.6	0.2	0.3	0.3	0.4	0.4
C	0.8	0.5	0.2	0.2	0.5	0.3	0.3	0.2	0.1	0.6	0.4
EC	0.5	0.4	0.3	0.3	0.8	0.4	0.2	0.2	0.2	0.2	0.4
SW	1.1	0.8	0.6	0.9	0.8	0.7	0.3	0.3	0.5	0.7	0.7
SC	1.4	0.9	0.5	0.3	0.8	0.4	0.3	0.3	0.5	1.3	0.7
SE	0.7	0.9	0.8	0.4	0.7	0.2	0.1	0.1	0.1	0.2	0.4
STATE AVE.	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>	<b>0.4</b>	<b>0.6</b>	<b>0.5</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>	<b>0.6</b>	<b>0.4</b>

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

**TABLE 2. EUROPEAN CORN BORER FALL SURVEY RESULTS 2011-2020** AVE. NO. OF LARVAE PER PLANT

DISTRICT	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	10-YR
NW	0.15	0.04	0.07	0.06	0.03	0.13	0.09	0.02	0.00	0.06	0.07
NC	0.07	0.01	0.02	0.04	0.00	0.08	0.04	0.01	0.01	0.05	0.03
NE	0.13	0.05	0.02	0.01	0.04	0.00	0.00	0.02	0.01	0.00	0.03
WC	0.12	0.09	0.06	0.12	0.03	0.15	0.01	0.05	0.02	0.06	0.07
C	0.05	0.01	0.01	0.00	0.01	0.24	0.02	0.02	0.01	0.03	0.04
EC	0.03	0.01	0.01	0.01	0.04	0.00	0.01	0.01	0.01	0.05	0.02
SW	0.03	0.03	0.06	0.00	0.03	0.14	0.04	0.00	0.01	0.00	0.03
SC	0.20	0.01	0.08	0.01	0.02	0.14	0.06	0.00	0.02	0.00	0.05
SE	0.01	0.00	0.01	0.00	0.00	0.04	0.04	0.01	0.00	0.00	0.01
STATE AVE.	<b>0.09</b>	<b>0.03</b>	<b>0.04</b>	<b>0.03</b>	<b>0.02</b>	<b>0.11</b>	<b>0.03</b>	<b>0.01</b>	<b>0.01</b>	<b>0.03</b>	<b>0.04</b>

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

**TABLE 3. SOYBEAN PEST SURVEY RESULTS 2020** AVE. NO INSECTS PER 100 SWEEPS

DISTRICT	Bean leaf beetle	Japanese beetle	Northern CRW	Southern CRW	Western CRW	Green Cloverworm	Grasshopper	Stink Bug
NW	3.1	5.6	0.6	0.2	0.0	3.2	2.5	0.5
NC	0.6	14.8	0.4	0.2	0.0	3.8	2.3	1.2
NE	NA	NA	NA	NA	NA	NA	NA	NA
WC	1.0	25.3	1.6	0.1	0.1	4.1	1.8	0.4
C	0.1	6.2	0.0	0.1	0.0	2.6	3.1	0.8
EC	0.1	1.4	0.7	0.0	0.0	3.4	0.6	0.1
SW	0.7	31.0	0.7	0.3	0.6	3.2	11.9	0.5
SC	0.6	17.2	0.8	0.2	0.5	2.8	3.1	0.4
SE	0.7	3.7	9.1	0.1	0.2	2.2	7.5	0.0
STATE AVE.	<b>0.8</b>	<b>16.8</b>	<b>1.6</b>	<b>0.2</b>	<b>0.3</b>	<b>3.2</b>	<b>4.6</b>	<b>0.4</b>

**TABLE 4. SURVEY OF VIRUSES IN ORNAMENTALS 2020** PLANT INDUSTRY BUREAU LABORATORY RESULTS

VIRUS SAMPLES	POTV <sup>1</sup>	TRV <sup>2</sup>	ILAR <sup>3</sup>	HVX <sup>4</sup>	LLCV <sup>5</sup>	INSV <sup>6</sup>	CICMoV <sup>7</sup>	TMV <sup>8</sup>	CMV <sup>9</sup>	TSWV <sup>10</sup>
No. of positives	28	21	19	3	2	1	1	0	0	0
No. of plants tested	40	50	39	18	2	17	1	20	18	17
Percent of positives	70%	42%	49%	17%	100%	6%	100%	0%	0%	0%

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