Vegetable Crop Update

A newsletter for commercial potato and vegetable growers prepared by the University of Wisconsin-Madison vegetable research and extension specialists

Extension UNIVERSITY OF WISCONSIN-MADISON

No. 11 – July 30, 2023

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Calendar of Events:

November 28-30, 2023 – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center
January 9-11, 2024 – Wisconsin Agribusiness Classic, Alliant Energy Center, Madison, WI
January 21-23, 2024 – Wisconsin Fresh Fruit and Vegetable Growers Conference, Kalahari Resort, Wisconsin Dells, WI
January 25-26, 2024 – Organic Vegetable Production Conference, UW Madison Division of Extension (Online)
February 2-3, 2024 – Organic Vegetable Production Conference, UW Madison Division of Extension, Alliant Energy Center, Madison, WI
February 6-8, 2024 – UW-Madison Div. of Extension & WPVGA Grower Education Conference & Industry Show, Stevens Point, WI

Amanda Gevens, Chair, Professor & Extension Vegetable Pathologist, UW-Madison, Dept. of Plant Pathology, 608-575-3029, Email: gevens@wisc.edu, Lab Website: https://vegpath.plantpath.wisc.edu/

Early blight of potato/tomato. Accumulations of P-days this past week were between 52-56 across the state of Wisconsin. In all locations with the exception of later plantings in Antigo and Rhinelander, all potato fields have reached/surpassed the threshold and should receive (and continue to receive) preventative fungicide applications for early blight management. Hotter days generate roughly 10 P-days per day if you are looking ahead to likely accumulations and planned preventative fungicide applications.

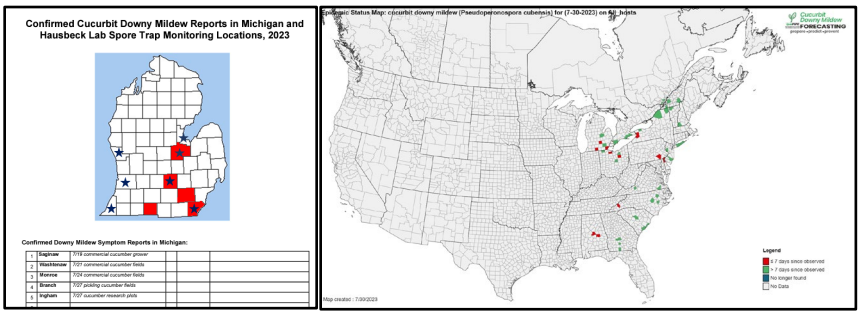
Late blight of potato/tomato. Accumulations of Blitecast DSVs have been low-moderate this past week, ranging from 0 to 5 (Antigo area) added DSVs statewide. The usablight.org website (https://usablight.org/map/) indicates no reports of late blight in potato or tomato from across the US in 2023. Ontario and Quebec Provinces of Canada have reported late blight over the past two weeks and the clonal lineage of the late blight pathogen from potato in Ontario was US-23. Fungicides for the management of late blight in tomato and potato crops are provided: https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin. A specific list of fungicides for potato late blight in Wisconsin was also offered in a special report shared via email on July 28.

Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations. Many thanks to Ben Bradford, UW-Madison Entomology; Stephen Jordan, UW-Madison Plant Pathology; and our grower collaborator weather station hosts for supporting this disease management effort again in 2023. A Potato Physiological Day or P-Day value of ≥300 indicates the threshold for early blight risk and triggers preventative fungicide application. A Disease Severity Value or DSV of ≥18 indicates the threshold for late blight risk and triggers preventative fungicide application. Red text in table indicates threshold has been met or surpassed. TBD indicates that data are To Be Determined as time progresses. Weather data used in these calculations is from weather stations that are placed in potato fields in each of the four locations, as available. Data from an alternative modeling source: https://agweather.cals.wisc.edu/vdifn will be used to supplement as needed for missing data points and for additional locations (indicated with *). Data are available in graphical and raw formats for multiple locations at: https://vegpath.plantpath.wisc.edu/dsv/.

	Planting Date		50% Emergence Date	Disease Severity Values (DSVs) *through 7/29/2023*	Potato Physiological Days (P-Days) *through 7/29/2023*
Spring Green*	**Early**	Apr 3	May 9	7	**626**
	Mid	Apr 17	May 12	7	**604**
	Late	May 10	May 23	7	**536**
Arlington*	**Early**	Apr 5	May 10	7	**631**
	Mid	Apr 20	May 15	7	**593**
	Late	May12	May 25	7	**533**
Grand Marsh	**Early**	Apr 5	May 10	5	**596**
	Mid	Apr 20	May 15	5	**563**
	Late	May 12	May 25	5	**510**
Hancock	**Early**	Apr 10	May 17	6	**563**
	Mid	Apr 22	May 19	6	**557**
	Late	May 14	May 28	6	**508**
Plover	**Early**	Apr 14	May 19	9	**551**
	Mid	Apr 24	May 20	9	**546**
	Late	May 19	May 29	9	**497**
Antigo	**Early**	May 1	May 28	10	**475**
	Mid	May 15	June 3	10	**430**
	Late	June 7	June 23	10	296
Rhinelander*	**Early**	May 7	June 1	4	**445**
	Mid	May 18	June 5	4	**410**
	Late	June 9	June 24	4	287

In addition to the potato field weather stations, we have the UW Vegetable Disease and Insect Forecasting Network tool to explore P-Days and DSVs across the state (https://agweather.cals.wisc.edu/vdifn). This tool utilizes NOAA weather data. In using this tool, be sure to enter your model selections and parameters, then hit the blue submit button at the bottom of the parameter boxes. Once thresholds are met for risk of early blight and/or late blight, fungicides are recommended for optimum disease control. Fungicide details can be found in the 2023 Commercial Vegetable Production in Wisconsin Guide, Extension Document A3422. https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin

Cucurbit Downy Mildew. The Cucurbit Downy Mildew forecasting webpage (https://cdm.ipmpipe.org/) is not forecasting the movement of the pathogen, but the group is offering reporting of findings of cucurbit downy mildew from the US. Dr. Mary Hausbeck reported **cucumber downy mildew in commercial fields in Saginaw, Washtenaw, Monroe, Branch, and Ingham Counties Michigan (7/19-7/27/23).** To date, there have been no reports of the downy mildew here in WI. If reports arise, we should be considering preventative treatment of cucumber and melon crops here in due to the likelihood of the disease resulting from clade 2 downy mildew.



PJ Liesch, Extension Entomologist, UW Insect Diagnostic Lab

Asiatic garden beetle: a new pest to have on your radar. There's a new insect pest to have on your radar in Wisconsin—the Asiatic garden beetle (*Maladera formosae; formerly Maladera castanea*). This species can feed on and damage a wide range of plants including, vegetable crops, field crops, fruit crops, turfgrass, and ornamental flowers, trees, and shrubs in nursery and landscape settings.

Origins and History: The non-native Asiatic garden beetle is originally from parts of eastern Asia and was first detected in the US (New Jersey) in 1921. It can now be found across much of the eastern US. Over the last two decades, AGB has become more common in the Midwest with crop damage being reported in Indiana and southern Michigan. It is also established in parts of northern Illinois. Asiatic garden beetles were first collected in Wisconsin in July 2021 in a residential yard in Dane County (Middleton). Small numbers of adults continue to be spotted at that site, although no feeding or plant damage has been observed to date. **In late July 2023**, Asiatic garden beetles were collected from a home garden in eastern Green Lake County; this is also the first confirmed report of plant damage in the state.

Appearance: Asiatic garden beetles belong to the Scarab family and the larvae (white grubs) resemble other species in the group (Japanese beetles, May/June beetle, etc.). Larvae have pale, C-shaped bodies with three pairs of jointed legs and a brownish-orange head capsule and chewing mouthparts. They have a pale, bulbous structure at the base of their mouthparts which aids in diagnosis (*no other white grubs in the Midwest have that feature*). Adults AGBs are approximately 3/8 inch long, brownish, and resemble small May/June beetles; their elytra (wing covers) are also slightly iridescent. Closely-related members of the native genus *Serica* can look almost identical in appearance and are best separated under the microscope. The structure of the hind legs and the number of antennal segments are important features used in taxonomic keys to separate AGB from our native *Serica* species, which are not considered pests.

Life cycle and Biology: The Asiatic garden beetle has a single generation each year. Adults have primarily been spotted in July in Wisconsin, although some specimens have been collected as late as September. Adults are nocturnal and feed almost exclusively after dark. If disturbed, they tend to tumble to the ground and hide. Adult AGBs are capable fliers and can come to lights in large numbers; blacklight traps can be a useful monitoring tool. In addition, adult flight activity is strongly associated with warm nighttime temperatures (70+˚ F). After mating, adult females lay eggs in soil. Reports from nearby states indicate that larvae may be more common in sandy soil compared to loamy areas.

Damage: Both the larvae and adults can feed on a wide range of plants. Adult AGBs tend to pack less of a punch than Japanese beetles, but can chew irregular notches out of leaves. The larvae can be more of an issue in crop fields when they damage roots and other below-ground structures (tubers, etc.). An abundance of AGB grubs can

lead to stunted plant growth in spring and below-ground wounds could serve as a potential entry point for pathogens. AGBs have been reported to damage 100+ different types of plants, including: beans and peas, cole crops, beets, potatoes, and carrots, corn and soybeans, Solanaceous crops, fruit trees, strawberries, caneberries, common weeds, and many other plants.

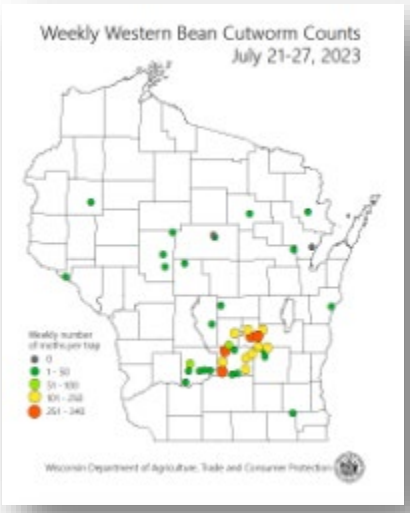
If you suspect that you've found Asiatic garden beetles, please collect a sample and submit specimens to the UW Insect Diagnostic Lab to confirm, as we're tracking this pest on a county-by-county basis. Sample submission instructions for the UW Insect Diagnostic Lab can be found here: https://insectlab.russell.wisc.edu.

July 30, 2023

Vegetable Insect Update – Russell L. Groves, Professor and Department Chair, UW-Madison, Department of Entomology, (608) 698-2434 (mobile), e-mail rgroves@wisc.edu

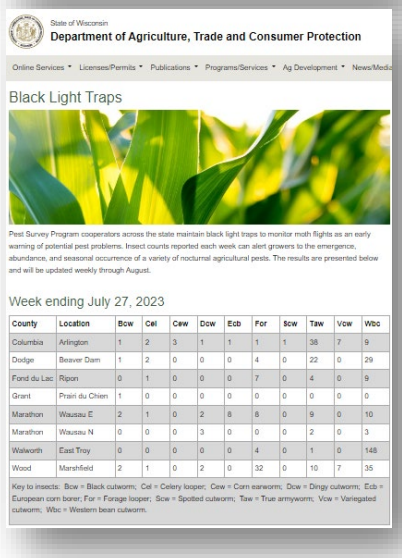
Vegetable Entomology Webpage: https://vegento.russell.wisc.edu/

Western bean cutworm – (https://vegento.russell.wisc.edu/pests/). Western bean cutworm adults are well into flight in southern Wisconsin and it is a good time to begin scouting for eggs. Foliar treatments are suggested when > 5% of the plants scouted possess an egg mass. On whorl stage corn, the best timing is to initiate applications when egg masses are dark colored which indicates that hatch will start soon and the corn has a developing ear that is forming. Captures from the Wisconsin Home Pest Survey confirm significant numbers of adult moths have been active over the past 7-10 days.



When given a choice, adult females prefer pre-tassel corn to lay eggs upon because the pollen being shed is an important food source for larvae prior to moving to the ear. Infestations are often aggregated within a field so thorough field scout is needed. Survey at least 5 different areas of a field and count egg masses on 20 consecutive plants in each of these 5 regions. Often eggs are found on the upper leaf surface on the uppermost leaves. Use the sun to backlight those leaves and look for the shadow of the egg mass(es). Later during the adult flight, also look for larvae that may have already hatched, and often these will be found in leaf axils feeding on pollen.

Included is an image of the western bean cutworm egg mass very close to hatching. Egg masses are initially cream colored and then mature to become purple in color approximately 24-48 hours before they hatch. As is often the case with many caterpillars, newly hatched larvae consume the egg shell, so egg masses are most evident before or immediately after hatch.



Pheromone traps (see capture data above) are a good method to document the timing of adult emergence, but the magnitude of these captures do not always predict risk of injury within a field. Again, scouting for egg masses is the best predictor of damage. If corn is pollinating or silking during scouting, it is also a good idea to inspect the tassel and silk for early instar larvae. Foliar insecticides are generally not recommended until after ear has started to form. Most insecticides will not control eggs nor will they kill larvae once in the ear. Therefore, timing of an application is important to improve control and reduce the chance for a second application. Control of Western bean cutworm using genetically engineered corn is challenging as only the Vip3A constructs will provide adequate control (eg. Agrisure Viptera). Other engineered traits originally developed for European corn borer provide insufficient control of Western bean cutworm. Blacklight captures (July 20-27, 2023) from the Wisconsin Home Pest Survey further illustrate captures of Western bean cutworm in many portions of Wisconsin, and addition to ongoing captures of True armyworm reported last week.

Tarnished plant bug – (https://vegento.russell.wisc.edu/pests/#bugs). Tarnished plant bugs (*Lygus lineolaris*) are 1/4 inch, tan to dark brown oval insects with piercing sucking mouthparts (adult inset). They attack more than 50 different economic crops but are most damaging to strawberries, peppers, tomatoes and all bean crops in Wisconsin. Feeding by these insects causes poor fruit set and gnarled fruit due to the toxic saliva they inject into the plant. They are highly mobile insects that overwinter in field debris and large numbers of adult plant bugs migrate out of alfalfa fields when hay is cut. As we are approaching 3rd cutting of alfalfa across many portions of south and central Wisconsin, it is time to be vigilant in terms of scouting for damage with these pests. In commercial beans, take 25 sweeps with an insect sweep net per sample site with at least 10 sample sites per 100 acres. When counts exceed one tarnish plant bug per sweep in a field, control measures are recommended succulent and dry beans.

Squash bugs (cucurbit crops) – (https://vegento.russell.wisc.edu/pests/squash-bug/). Squash bugs continue to be an emerging problem in Wisconsin. In recent years, these insects have become more prevalent, causing damage to vine crops in commercial fields and home gardens alike. The key to management is early detection. Squash bugs feed on all vine crops, but pumpkins and squash are the preferred hosts with gourds and melons favored next.

Adults are about ½ -3/4-inch long, brownish-black, flat, shield-shaped bugs. They are sometimes mistaken for stink bugs. Adults congregate and emit a strong odor when crushed. Immature squash bugs initially have red heads and legs with whitish-green bodies, but later have black heads and legs with gray bodies. Eggs are 1/16-inch, reddish orange to brown-colored and are laid in clusters on the undersides of leaves along the center vein.

Squash bug (Anasa tristis)
Photo: Jeffrey Hahn, Univ. of Minnesota

Squash bug nymphs
Photo: 'Pollinator' on Wikipedia

Squash bugs are a major pest of squash and pumpkins. Nymphs and adults feed on plant juices and release toxins into leaves. Feeding causes wilting, and leaves become dry and brown or black along the edges. This wilting may appear similar to bacterial wilt, but bacterial wilt is spread by the cucumber beetle. Early symptoms of infestation include yellow spotting on the leaves. Later in the season, adults will also feed on fruit, which can cease development and begin to rot. Young plants are more susceptible to severe damage.

Unmated adults overwinter in Wisconsin in protected areas. Eggs are laid in late June and early July when cucurbit vines begin to develop. Eggs hatch in about 10 days. The nymphal stage lasts 4-6 weeks. Nymphs undergo 5 molts before reaching maturity. Adults appear in late July and early August. There is one generation per year. The female lays eggs over an extended period of time, and all life stages may appear at once on the plant.

Because they are protected by the lower surfaces of leaves, squash bugs may be difficult to control. Although it is unlikely to find large populations of the adults early in the season, growers should check their transplants or new seedlings for the presence of adults. The

threshold for treatment is one egg mass per plant during flowering. Inspect the lower leaf surface for squash bug eggs. In terms of management, destroy crop residues in the fall to reduce the number of overwintering adults. Crop rotation will also reduce the incidence of infestation. Trellised plants are less susceptible to squash bug infestations. Young nymphs are the most susceptible to control practices, while adults are more difficult to control. In smaller plantings, adults can be congregated by placing boards on the ground near the plants as a hiding place. The squash bugs will aggregate at night under the boards, which can then be destroyed each morning.