



Vegetable Crop Update

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

No. 10 – July 23, 2023

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- Cucurbit downy mildew updates
- Two-spotted spider mites, European corn borers, and caterpillar pests of cole crops

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

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Early blight of potato/tomato. Accumulations of P-days this past week were on average between 50-60 across the state of Wisconsin. In all locations with the exception of Antigo (later plantings) and Rhinelander, all potato fields have reached/surpassed 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 this past week, ranging from 0 to just 1 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. This website continues to provide a very useful mechanism for tracking this potentially destructive crop disease, but it's not comprehensive. OMAFRA specialists Amanda Tracey and Katie Goldenhar reported late blight on potato in Ontario (Simcoe County) on July 21, 2023. Sporangia of the late blight pathogen, *Phytophthora infestans*, have been detected in spore traps in tomato fields in Elgin and Essex counties Ontario. Fungicides for management of late blight in tomato and potato crops are provided: <https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin>

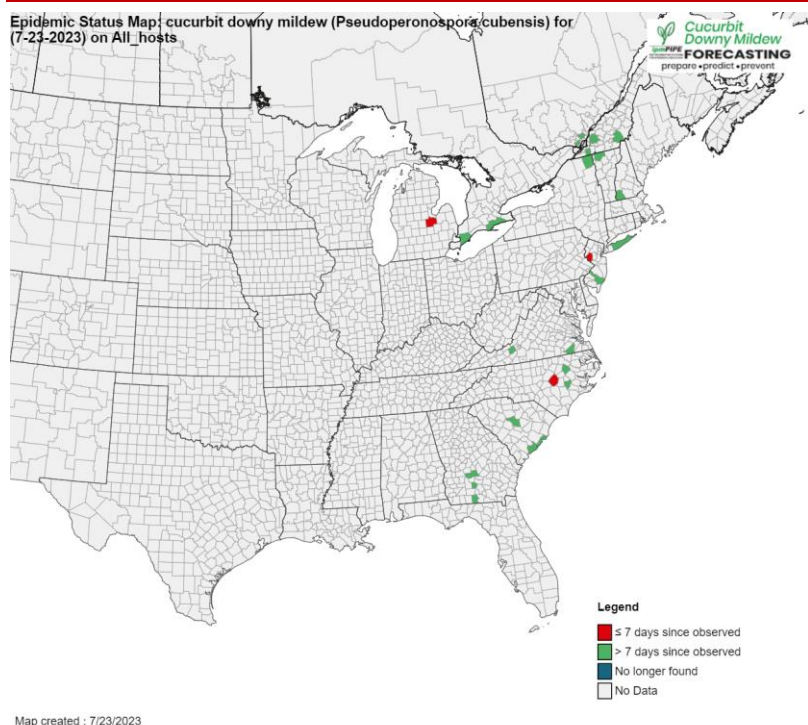
Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations. Many thanks to Ben Bradford, UW-Madison Entomology; Stephen Jordan, UW-Madison Plant Pathology; and our grower collaborator weather station hosts for supporting this disease management effort again in 2023. A Potato 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) <i>through 7/22/2023</i>	Potato Physiological Days (P-Days) <i>through 7/22/2023</i>
Spring Green*	Early	Apr 3	May 9	6	574
	Mid	Apr 17	May 12	6	552
	Late	May 10	May 23	6	483
Arlington*	Early	Apr 5	May 10	6	576
	Mid	Apr 20	May 15	6	538
	Late	May 12	May 25	6	478
Grand Marsh	Early	Apr 5	May 10	5	542
	Mid	Apr 20	May 15	5	509
	Late	May 12	May 25	5	457
Hancock	Early	Apr 10	May 17	5	508
	Mid	Apr 22	May 19	5	502
	Late	May 14	May 28	5	453
Plover	Early	Apr 14	May 19	7	495
	Mid	Apr 24	May 20	7	494
	Late	May 19	May 29	7	441
Antigo	Early	May 1	May 28	5	422
	Mid	May 15	June 3	5	374
	Late	June 7	June 23	5	238
Rhineland*	Early	May 7	June 1	3	389
	Mid	May 18	June 5	3	354
	Late	June 9	June 24	3	231

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 (stations are not situated within potato fields). 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, linked here: <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 the interception of cucurbit downy mildew spores in air/spore traps in several Michigan counties so far this season (clade 2 downy mildew in Bay and Monroe Counties this past week). **Cucumber downy mildew was confirmed in a commercial field in Saginaw County Michigan on July 19.** To date, there have been no reports of the downy mildew in home garden, commercial cucurbit fields, or in 2 sentinel plot locations (in Dane and Waushara Counties) 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.



On left, please find the most recent cucurbit downy mildew status map from the Cucurbit Downy Mildew Forecasting website. Red-colored counties represent the most recent findings of disease; green indicates older findings.
<https://cdm.ipmpipe.org/>

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

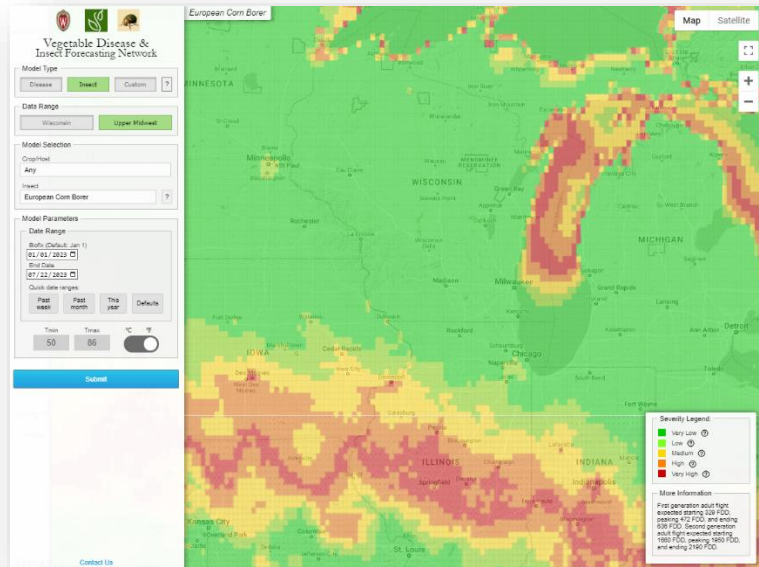
Vegetable Entomology Webpage: <https://vegento.russell.wisc.edu/>

Two-spotted spider mites – (<https://vegento.russell.wisc.edu/pests/>). Two-spotted spider mites (TSSM) continue to emerge as problematic pests. As we enter the coming week with forecast high temperatures in the lower to mid-90's and only sporadic chances for precipitation, it is critical to monitor for these pests. Know that TSSM will infest and feed on more than 300 species of plants, including all vegetables, fruits and ornamentals. Vegetables most often affected include cucumbers, snap beans, lettuce, peas, potatoes and tomatoes.

The first sign of infestation by TSSM is usually a chlorotic, stippled appearance on the leaves, as feeding mites remove leaf cell contents, including the chlorophyll that gives leaves their green color. Without the chlorophyll, those empty cells appear whitish or bronze. Heavily infested leaves turn completely pale, dry up, and fall off.



European corn borer – (<https://vegento.russell.wisc.edu/pests/european-corn-borer/>). In most of Wisconsin, two generations of eggs are laid on the undersides of leaves. First generation larvae typically cause damage only to leaves and stalks, unless the corn is already tasseling, in which case the larvae will enter the ear. In the adjacent image from the Wisconsin Vegetable and Disease Insect Forecasting Network, we can see that a second and potentially problematic populations is rapidly moving across central Illinois. Forecast temperatures and arid conditions will mean that this insect will enter southern Wisconsin by the end of the coming week. Begin checking early sweet corn for egg masses now by August 1 in southern Wisconsin and through the first week of the month. This second generation of larvae develop from eggs laid in early August and cause heavy infestations in sweet corn, and corn that does not have a transgenic event. The Vegetable Disease and Insect Forecasting Network (VDIFN) map of risk for infestation by European corn borer, (ECB),



<https://agweather.cals.wisc.edu/vdifn> (sourced 07/22/2023). Notice areas within the 'orange or red shaded' zones indicate high risk zone for adult moth oviposition, and these remain just to our south currently, but will be advancing into the state in the week to come. Sweet corn and green bean producers with susceptible crop stages (silking corn, pin-bean stage green bean) should be scouting for these mobile insects.

Caterpillar pests (cole crops) – (<https://vegento.russell.wisc.edu/pests/caterpillar-pests-of-cole-crops/>).

Imported cabbageworms (also known as cabbage whites or small whites), cabbage loopers and diamondback moths are the three most significant caterpillar pests of Wisconsin cole crops, with the Diamondback moth (DBM) increasing being the most significant.

Diamondback moths are worldwide pests of cole crops and leafy greens and have developed resistance to numerous insecticides. If producers are observing losses in control with products containing *Bacillus thuringiensis* subsp *kurstaki* (e.g. DiPel) or *B. thuringiensis* subsp. *aizawai* (e.g. Xentari), this should be no surprise as this insect has demonstrated the capacity for resistance to the *B. thuringiensis* products. The cabbage looper attacks beets, celery, lettuce, peas, potatoes, spinach and tomatoes, in addition to cole crops.

Vigilant scouting and response to established thresholds is important at this time of the season. The DBM has completed one full generation in much of southern and central Wisconsin and we are now observing adult activity which will result in new eggs laid and a new set of larvae. Treatment thresholds are well established and based on the percent of infestation by any lepidopteran species and vary based on the stage of crop development. From the time cabbage plants begin to cup until early heading, if more than 20% of plants are infested, treatment is warranted. From early heading until harvest, the threshold again drops to 10% to protect market quality of the produce. If broccoli, cauliflower and sprouts are setting florets, curds or buds, then the 10% threshold should be considered.



Biological control occurs regularly in Midwest fields and can be highly effective in controlling populations of these insect pests that feed on cole crops. The three caterpillar pests are all susceptible to parasitism and predation by natural enemies throughout the growing season, but later season biocontrol is especially helpful and possible if we incorporate the use of reduced-risk compounds. In addition to the *B. thuringiensis* products listed previously, registered compounds containing spinosyns are another reduced-risk insecticide option. Spinosyns are biologically based materials that are quite selectively active on caterpillar pests but are safe to beneficials and include registrations including Conserve® & Radiant®. Compounds in the IRAC Group 28 category containing chlorantraniliprole (Coragen®) and cyantraniliprole (Exirel®) should also be regarded as safe options which can help to conserve these later season natural enemies and enhance the potential for biological control.

Pest	When to scout
Imported cabbageworm	Late June – late Sept.
Cabbage looper	Early July – late Sept.
Diamondback moth	Mid May – late Sept.