



Vegetable Crop Update

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

No. 9 – July 14, 2024

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- Potato and vegetable disease forecasting updates – thresholds met for late blight and early blight treatments
- Cucurbit downy mildew
- Corn Earworm, Cucumber Beetles, Colorado Potato Beetles updates and management

Calendar of Events:

July 18, 2024 – UW Langlade County Extension & WI Seed Potato Certification Program – Ag Research Station Field Day, Antigo, WI

July 31, 2024 – UW-Madison Rhinelander Agricultural Research Station Potato Breeding Farm Field Day, Rhinelander, WI (contact Becky Eddy)

December 3-5, 2024 – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center

January 13-14, 2025 – Wisconsin Agribusiness Classic, Alliant Energy Center, Madison, WI

February 4-6, 2025 – UW-Madison Div. of Extension & WPVGA Grower Education Conference & Industry Show, Stevens Point, WI

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<https://vegpath.plantpath.wisc.edu/>

Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations will be posted at our website and available in the weekly newsletters. Thanks to Ben Bradford, UW-Madison Entomology for supporting this effort and providing a summary reference table:

<https://agweather.cals.wisc.edu/thermal-models/potato>. 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. Data from the modeling source:

<https://agweather.cals.wisc.edu/vdifn> are used to generate these risk values in the table below. I've estimated early, mid-, and late planting dates by region based on communications with stakeholders. These are intended to help in determining optimum times for preventative fungicide applications to limit early and late blight in Wisconsin.

	Planting Date		50% Emergence Date	Disease Severity Values (DSVs) <i>through 7/13/2024</i>	Potato Physiological Days (P-Days) <i>through 7/13/2024</i>
Spring Green	Early	Apr 3	May 9	33	537
	Mid	Apr 17	May 12	33	520
	Late	May 10	May 25	28	419
Arlington	Early	Apr 5	May 10	15	530
	Mid	Apr 20	May 15	15	499
	Late	May 12	May 25	13	420
Grand Marsh	Early	Apr 5	May 10	31	513
	Mid	Apr 20	May 15	31	484

	Late	May 12	May 25	24	411
Hancock	Early	Apr 10	May 17	36	465
	Mid	Apr 22	May 21	34	436
	Late	May 14	June 2	29	355
Plover	Early	Apr 14	May 18	32	466
	Mid	Apr 24	May 22	28	434
	Late	May 19	June 7	24	316
Antigo	Early	May 1	May 24	29	384
	Mid	May 15	June 1	29	343
	Late	June 1	June 15	24	244
Rhineland	Early	May 7	May 25	13	373
	Mid	May 18	June 8	12	288
	Late	June 2	June 16	12	237

Late blight of potato/tomato. Late blight diagnostics are available at no cost to WI growers and gardeners. Dr. Brian Hudelson of our UW Plant Disease Diagnostic Clinic and Dr. Amanda Gevens of UW-Potato & Vegetable Pathology can offer confirmation of the pathogen. Dr. Gevens will also offer strain typing of the pathogen. The usablight.org website (<https://usablight.org/map/>) indicates no reports of late blight from the US so far in 2024. Please keep in mind that the site is not comprehensive. Outside of this site, I'm aware of 2 Ontario Canada confirmations of potato and tomato late blight (US-23), a Florida late blight sample from potato (March 2024) and a NY tomato late blight sample (from greenhouse in early May) with the confirmed genotype of US-23. This genotype is generally still responsive to phenylamide fungicides meaning that Ridomil and Metastar fungicides (mefenoxam and metalaxyl) can still effectively control late blight caused by this type.

We accumulated 0-6 Blitecast Disease Severity Values over the past week in WI. **All WI locations, with the exceptions of Arlington and Rhineland, are above the threshold for late blight disease severity values and should receive preventative fungicide application to reduce the risk of disease.**

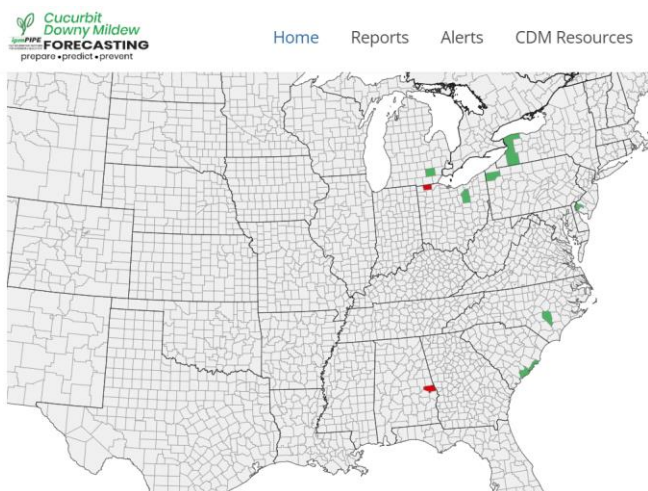
An updated listing of fungicides for WI potato late blight management for 2024 can be found at the link below. Base protectants such as chlorothalonil and mancozeb offer broad-spectrum control of fungal and oomycete (water mold – like late blight) pathogens. <https://vegpath.plantpath.wisc.edu/wp-content/uploads/sites/210/2022/07/2024-Potato-Late-Blight-Fungicides.pdf>

Early blight of potato. Antigo and southward, areas of production have reached the threshold for the application of foliar fungicides to limit early blight. Temperatures were optimal this past week for promoting early blight. <https://vegpath.plantpath.wisc.edu/diseases/potato-early-blight/>

Fungicides can provide good control of early blight in vegetables when applied early on in infection. Multiple applications of fungicide are often necessary to sustain disease management to time of harvest due to the typically high abundance of inoculum and susceptibility of most common cultivars. For Wisconsin-specific fungicide information, refer to the Commercial Vegetable Production in Wisconsin (A3422), a guide available through the UW Extension Learning Store website which is annually updated. <https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin> Or, for home garden fungicide recommendations, see Home Vegetable Garden Fungicides

(D0062), a fact sheet available through the UW Plant Disease Diagnostic Clinic website. Always follow label directions carefully.

Cucurbit Downy Mildew: Michigan confirmed downy mildew on cucumber in Washtenaw (7/2), Saginaw (7/12) and Tuscola (7/12) Counties. These counties are on the eastern side of the state of MI. Ohio and Alabama also confirmed cucumber downy mildew this past week. To date, downy mildew field infections, and spores from air sampling in MI, have been of Clade 2 - cucumber and cantaloupe strain type. No field disease confirmations were made in Wisconsin.



Confirmed reports of cucumber downy mildew this past week in Ohio and Alabama. In red, US counties with reports of cucurbit downy mildew during the past 7 days. Green counties indicate a former report of the disease greater than 7 days ago. From: <https://cdm.ipmpipe.org/>

Management information can be sourced here: <https://vegpath.plantpath.wisc.edu/2022/07/03/update-10-july-3-2022/>

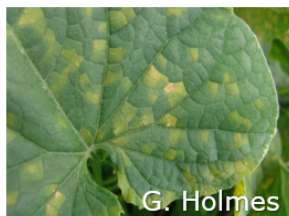
Fungicide Programs for Cucumber (Clade 2) DM

If program is initiated **before** disease onset: adhere to a **7-day** interval.

If program is initiated **after** disease onset: adhere to a **5-day** interval.



Recommendations based on multiple years of field research by Hausbeck, Michigan State Univ. & Quesada-Ocampo at NCSU



SE U.S. and MI (2014) have noted resistance in the downy mildew pathogen to several fungicides

Bold indicates best in MI

Use of highest labeled rate of products is recommended

Previcur Flex 6SC (2 day PHI), GH	propamocarb hydrochloride 28
Elumin SC (2 day PHI)	ethaboxam 22
Ranman 3.6SC (0 day PHI)	cyazofamid 21
Gavel 75WG (5 day PHI), GH	mancozeb M3 + zoxamide 22
Orondis Opti (0 day PHI)	oxathiapiprolin 49/chlorothalonil M5
Orondis Ultra (0 day PHI)	oxathiapiprolin 49/mandipropamid 40
Omega 500F (7 day PHI)	fluazinam 29
Zampro 4.4SC (day PHI)	ametoctradin 45/dimethomorph 40
Zing! SC (0 day PHI)	zoxamide 22 + chlorothalonil M05

Alternate products and mix each with either:

Dithane (mancozeb) 3 lb 5 day PHI, M3, GH; or Bravo (chlorothalonil) 2 pt 0 day PHI, M5

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

Corn earworm. (<https://vegento.russell.wisc.edu/pests/corn-earworm/>). First generation corn earworm larvae will likely appear in early planted sweet corn in the next 10-14 days. Flights of adult corn earworm (CEW) have been observed across southern and central portions of the state as measured by the Wisconsin Department of Agriculture Trade and Consumer Protection – ([Wisconsin Home Pest Survey](#)). Pheromone traps have been established at sites throughout Wisconsin to monitor migration flights of corn earworm moths. The results for the first week of July are provided and captures suggest elevated moth activity in some locations.



The best technique for monitoring earworms is through the use of pheromone traps. These traps use a special scent to attract male moths. Knowing when moths are present helps to determine when to treat fields. Pheromones should be changed every 2 weeks with the unused lures kept frozen until needed.

Another technique for monitoring earworms uses a black light to lure night-flying insects. However, black light traps are more expensive, less effective, and more difficult than pheromone traps to monitor. Counts in blacklight traps are consistently lower than those in pheromone traps in adjacent fields.



Moth counts 2024

County	Location	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Columbia	Pardeeville	0									
Dane	Fitchburg	69									
Dodge	Beaver Dam	4									
Dodge	Mayville	21									
Fond du Lac	Ripon	19									
Jackson	Taylor	10									
Marathon	Wausau E	0									
Vernon	Coon Valley										
Walworth	Burlington	25									
Wood	Marshfield	0									

Week 1 (July 5-11), Week 2 (July 12-18), Week 3 (July 19-25), Week 4 (July 26-August 1), Week 5 (August 2-8), Week 6 (August 9-15), Week 7 (August 16-22), Week 8 (August 23-29), Week 9 (August 30-September 5), Week 10 (September 6-12).

Number of Moths per night*

Treatment

Less than 5 moths/blacklight trap, or less than 10 moths/pheromone trap (per night)

No treatment needed

>5 moths/blacklight trap, or >10 moths/pheromone trap

Treat vulnerable corn (row tassel to 100% silk) with an effective CEW insecticide, reapplying every 2-5 days until brown silks appear.

25 moths/blacklight trap, or 100 moths/pheromone trap

Treat silking corn until brown silks. Corn should be treated on a 2-3 day schedule.

100 moths/blacklight trap, or 500 moths/pheromone trap

Treat silking corn with most effective CEW insecticide until brown silk. Corn should be treated on a 1-2 day schedule.

*Pheromone traps and lures for *H. zea* can be ordered at [Great Lakes IPM](#).

Corn earworm pheromone trap, 2024.

Cucumber beetles – ([Wisconsin Home Pest Survey](#)). Striped and spotted cucumber beetles are becoming very abundant and can cause damage in vine crops, but the striped beetle is more often implicated as a key pest in Wisconsin. Feeding from adults causes direct damage to roots, leaves, flowers, and fruits. Adults can also vector fusarium wilt and the bacteria, *Erwinia tracheiphila*, resulting in the disease condition known as bacterial wilt. Cucumbers and melons are particularly susceptible to bacterial wilt, and damage from this can be severe. Adults feed on foliage, pollen, petals, and fruit of a variety of cucurbits and can cause moderate to severe defoliation. Feeding on fruit can cause blemishes. Plants in the 1-3 leaf or cotyledon stages are especially vulnerable, and high adult cucumber beetle populations can completely defoliate the plants.

Striped cucumber beetle adults can transmit the bacterial wilt pathogen when they feed on infected weeds in early spring. The wilt is spread through the feces of beetles. A distinct wilting of individual lateral leaves is the first symptom of bacterial wilt followed by the entire plant wilting and dying. The disease causes plant death by plugging the water-conducting vessels. Cutting through the stem and holding the cut ends together for ten seconds can help diagnose the disease. Slowly pull the ends apart and look for white, viscous sap which is the bacteria reproducing in the xylem, or water-conducting tissue. Serious crop damage can occur if as little as 10% of the beetles are infected.

Plants infected with bacterial wilt will not recover. Therefore, it is important to control the beetles early in the season to prevent spread of the disease. Scout fields for adult beetles 2-3 times per week early in the season and weekly thereafter. Particular attention is needed in field edges where beetles congregate. The treatment threshold for cucumber beetles is 1 beetle per plant in melons, cucumber, Hubbard and Butternut squash, and younger pumpkins and 5 adults per plant in watermelon, other varieties of squash and older pumpkins. Beetle populations in excess of 20 per plant may transmit the bacterial wilt before insecticides have a chance to control the beetles.



Colorado potato beetles (2nd generation) – (<https://vegento.russell.wisc.edu/pests/colorado-potato-beetle/>). Second generation adults normally appear in mid-July and can cause severe defoliation of the crop. Generally, second generation adults will produce another generation of larvae. Under normal conditions, these adults may produce only a partial second generation and then seek overwintering sites as the crop begins to senesce. Typically there are two discrete generations of beetles per year in South-Central Wisconsin and only a single generation in Northern Wisconsin.

In an earlier newsletter we reported on the absence of frost in surface soils in southern and central Wisconsin which allowed for significant survivorship of volunteer potatoes. The same conditions allowed for survival of the adult beetles as well and we have observed many beetles developing on volunteer potatoes in areas where potato was planted in 2023. These insects have now completed a full generation on the volunteers and producers and scouts should be very aware of large numbers of adult beetles colonizing current season potato. Control options for 2nd generation CPB can be found on the [UW Vegetable Crop Entomology management site](#).

