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 28, 2024

In This Issue:

- Corn earworm, Western bean cutworm, Two-spotted spider mites, and European corn borer updates and management
- Potato and vegetable disease forecasting updates – thresholds met for late blight and early blight treatments
- Cucurbit downy mildew

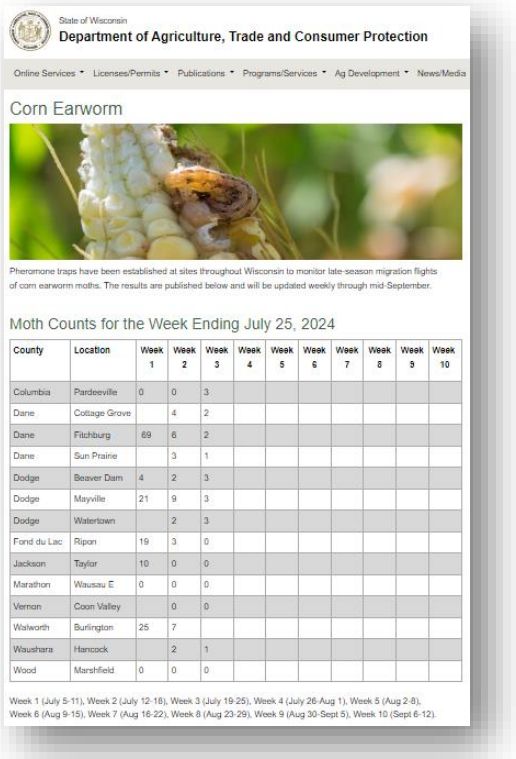
Calendar of Events:

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

Vegetable Insect Update – Russell L. Groves, Professor and Department Chairperson, UW-Madison, Department of Entomology, 608-262-3229 (office), (608) 698-2434 (cell), e-mail: rgroves@wisc.edu

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

Corn earworm – (https://vegento.russell.wisc.edu/pests/corn-earworm/).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Corn Earworm

Pheromone traps have been established at sites throughout Wisconsin to monitor late-season migration flights of corn earworm moths. The results are published below and will be updated weekly through mid-September.

Moth Counts for the Week Ending July 25, 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	0	3							
Dane	Cottage Grove		4	2							
Dane	Fitchburg	69	6	2							
Dane	Sun Prairie		3	1							
Dodge	Beaver Dam	4	2	3							
Dodge	Mayville	21	9	3							
Dodge	Watertown		2	3							
Fond du Lac	Ripon	19	3	0							
Jackson	Taylor	10	0	0							
Marathon	Wausau E	0	0	0							
Vernon	Coon Valley		0	0							
Walworth	Burlington	25	7								
Waushara	Hancock		2	1							
Wood	Marshfield	0	0	0							

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

https://datcp.wi.gov/Pages/Programs_Services/CornEarworm.aspx

Pheromone captures (as reported from the Wisconsin Home Pest Survey) continue to confirm low numbers of adult moths over the past 7-10 days. These captures are likely to increase in the coming weeks as a second generation of moths are expected to be present in southern Wisconsin by mid-August. Recall that few corn earworms are expected to survive winter in Wisconsin. Instead, they are hypothesized to overwinter as pupae buried in the soil in middle portions of the US, and are thought to overwinter near, or south of, 40°N latitude (just a bit south of Interstate 80).

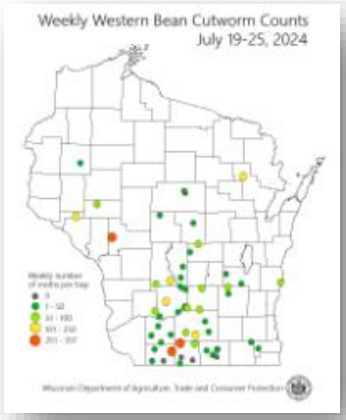
This year, the winter minimums necessary to result in direct mortality of corn earworm pupae were never reached. We suspect significant overwintering of the insect across many regions of southern Wisconsin. In late spring this year we observed pupae completing their development and the emergence of moths in mid- to late May. Some of these moths did migrate northward, flying mainly at dusk or during warm, cloudy days, and we observed greater than average infestation of the moths in the early planted sweet corn crop. Given that many pupae were assumed to survive the 2023-24 Wisconsin winter, sweet corn growers may find larger than average adult moth numbers in traps in the coming weeks. This overwintering generation has the potential to pose a problem in middle to later planted sweet corn as the 2nd generation emerges.

These more damaging adults will appear in early to mid-August and the potential for damage could last into early September when the second generation activity is completed and fresh market or processing sweet corn have past silking stages.

Once larvae enter the ear, they're protected from insecticides. Therefore, treatment timing is critical, and control must be targeted at the adults, eggs, and young larvae before they're protected. The amount of time for egg hatch varies with temperature, but during periods of hot summer days and nights, eggs can hatch within 24 hours after they're laid. Thus, each day's delay in treatment may reduce the number of clean ears by 10 to 15%.

Insecticides must be present on vulnerable silks when eggs hatch. The first application is the most critical and tank-mixes containing an ovicide (an egg killer) and a larvicide (eg. spinosad, spinetoram, chlorantraniliprole) are recommended. On sweet corn, treat every 3 to 4 days beginning when silks first appear and continuing until they are brown in color. Discontinue treatments 10 days before harvesting fresh market sweet corn as additional sprays will not improve product quality.

Western bean cutworm – (**https://vegento.russell.wisc.edu/pests/**). Western bean cutworm adults are well into flight in southern Wisconsin, and it is important to scout 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.



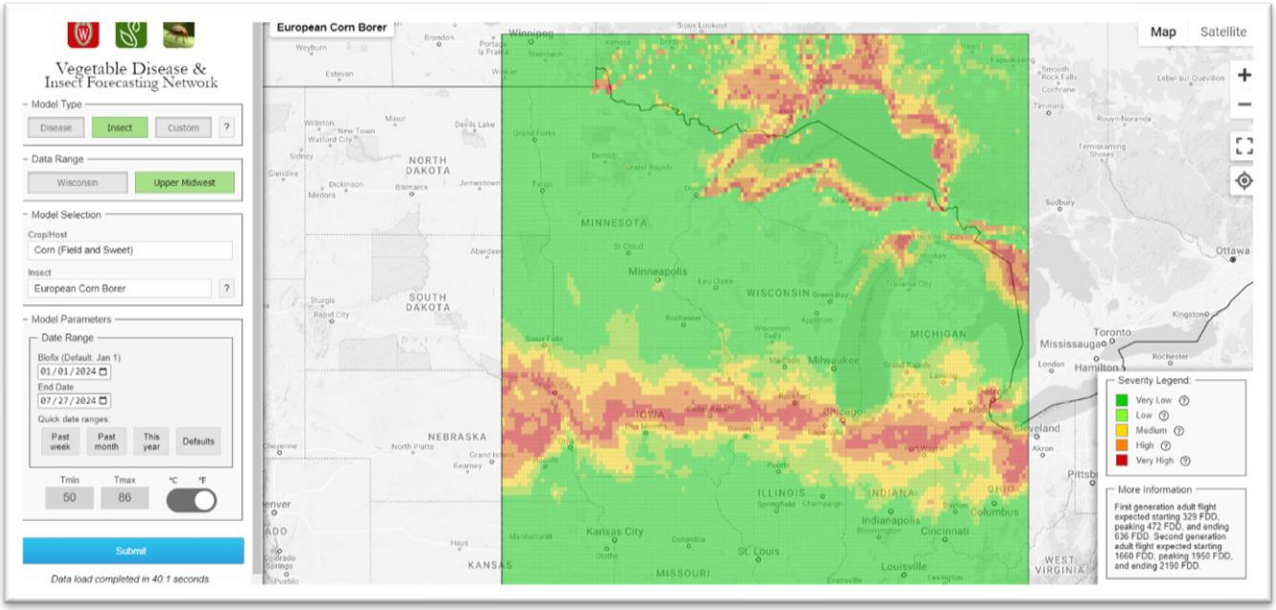
When given a choice, adult females prefer pre-tassel corn to lay eggs upon because the pollen being shed is an important food source for larvae prior to moving to the ear. Infestations are often aggregated within a field so thorough field scout is needed. Survey at least 5 different areas of a field 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 included) 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.

Two-spotted spider mites – (https://vegento.russell.wisc.edu/pests/). Two-spotted spider mites (TSSM) are small arthropods related to insects that are related to spiders, ticks, daddy-longlegs and scorpions. Vegetables that are often affected include cucumbers, snap beans, lettuce, peas, potatoes and tomatoes. Each female mite produces up to 20 eggs per day, and the larvae that hatch from these eggs after 2-5 days develop through 3 immature stages that can result in reproductive adults in as few as 5-8 days during hot, dry weather. Our forecast warm temperatures may predispose susceptible crops to infestation. 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. Insecticidal and miticidal soaps and botanical oils can be effective solutions when paired with conservation biological control strategies to limit developing populations. Maintaining the nutritional (fertility) and hydraulic (water) health of plants is also key to lessen the success of TSSM populations.

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 Southern Wisconsin, begin checking early sweet corn for egg masses now by August 1. Second generation larvae develop from eggs laid in early August and cause heavy infestations in late-planted corn, and corn that does not have a transgenic event.



Vegetable Disease and Insect Forecasting Network (VDIFN) map of risk for infestation by European corn borer, (ECB), https://agweather.cals.wisc.edu/vdifn (sourced 07/28/2024). 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.

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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/late blight in WI.

	Planting Date		50% Emergence Date	Disease Severity Values (DSVs) *through 7/27/2024*	Potato Physiological Days (P-Days) *through 7/27/2024*
Spring Green	**Early**	Apr 3	May 9	**40**	**663**
	Mid	Apr 17	May 12	**40**	**646**
	Late	May 10	May 25	**35**	**544**
Arlington	**Early**	Apr 5	May 10	**18**	**656**
	Mid	Apr 20	May 15	**18**	**625**
	Late	May 12	May 25	16	**546**
Grand Marsh	**Early**	Apr 5	May 10	**35**	**634**
	Mid	Apr 20	May 15	**35**	**605**
	Late	May 12	May 25	**28**	**531**
Hancock	**Early**	Apr 10	May 17	**42**	**586**
	Mid	Apr 22	May 21	**40**	**556**
	Late	May 14	June 2	**35**	**476**
Plover	**Early**	Apr 14	May 18	**34**	**582**
	Mid	Apr 24	May 22	**25**	**550**
	Late	May 19	June 7	**30**	**434**
Antigo	**Early**	May 1	May 24	**34**	**496**
	Mid	May 15	June 1	**34**	**454**
	Late	June 1	June 15	**28**	**356**
Rhinelander	**Early**	May 7	May 25	16	**483**
	Mid	May 18	June 8	15	**389**
	Late	June 2	June 16	15	**341**

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 a few reports of late blight from the US so far in 2024 including NY tomato (from GH earlier in the spring) and MI (US-23 from potato). 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), and a Florida late blight sample from potato (March 2024).

Mefenoxam (UltraFlourish, Ridomil) and Metalaxyl (Metastar, Metalaxyl) are good choices for managing late blight in potato – especially US-23. *Please note a few details about these labels*. Some labels specify the use and timing for "late blight" (ending at row touch) and some for "storage rots" (initiating at flowering and 2-week

intervals beyond). These uses may overlap. Note that mefenoxam is the R-enantiomer (mirror image chemical structures) of metalaxyl and at half the application rate, provides the same level of efficacy as metalaxyl. The table below offers a few examples. I point this out because these fungicides are not interchangeable and you need to check rates which may vary based on % AI and mefenoxam or metalaxyl selections.

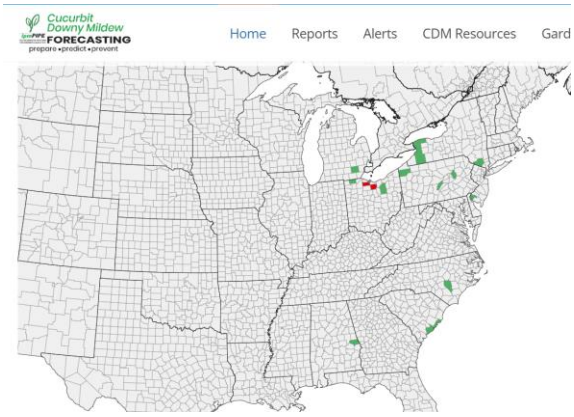
Phenylamide Active ingredient (AI)	Commercial Fungicide Name	Percent AI	Rate	Other fungicides in commercial pre-mix	Usage	Pre-harvest interval
mefenoxam	Ridomil Gold Bravo SC	3%	2.5 pt/acre	chlorothalonil	Do not apply more than 10 pt/A/year	14 days
mefenoxam	Ridomil Gold MZ	4%	2.5 pt/acre	mancozeb	Do not apply more than 10 lb/A/year	14 days
mefenoxam	Ridomil Gold SL	45.3%	3.2fl oz/acre	na	Do not exceed 9.6 fl oz/A/year	14 days
mefenoxam	Ultra Flourish	25%	6.4 fl oz/acre	Na	Do not exceed 1.6 pt/acre/year for foliar applications	14 days
metalaxyl	Metalaxyl 2E AG	23%	12.8 fl oz/acre	Na	For foliar use for storage rot control, apply at flowering and then 2 weeks later (and 2 week later as needed).	14 days
metalaxyl	Metastar 2E AG	23%	12.8 fl oz/acre	Na	For foliar use for storage rot control, apply at flowering and then 2 weeks later (and 2 week later as needed).	14 days

We accumulated just 1-4 Blitecast Disease Severity Values over the past week in WI. **All WI locations, with the exceptions of Rhinelander, 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. All 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/

Cucurbit Downy Mildew: Michigan confirmed downy mildew on **cucumber** in 11 counties so far this season (Washtenaw, Saginaw, Tuscola, Ingham, Bay, Iosco, Arenac, Muskegon, Sanilac, Midland, Clinton). These are primarily on the eastern side of MI. OH 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 OH. 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/