Vegetable Crop Update

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

No. 7 – July 2, 2023

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- Cucurbit downy mildew updates
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- UW Langlade County Extension Airport Ag Research Station Field Day – Antigo WI agenda

Calendar of Events:

July 6, 2023 – UW Langlade County Extension & WI Seed Potato Certification Program – Ag Research Station Field Day, Antigo, WI
July 13, 2023 – UW Agricultural Research Station Potato Field Day, Hancock, WI (1-4:30PM)
July 20, 2023 – WI Seed Potato Certification Program & WI Potato Coalition Early Generation Seed Potato Field Day, Lelah Starks Seed Potato Farm, Rhinelander, WI (*new date!)*
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 (recall these are influenced by heat) ramped up this past week and on average we saw roughly 60 P-days across the state of Wisconsin. In all locations with the exception of Antigo and Rhinelander, most early and mid-planted 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 to non-existent. Since emergence, potatoes in Wisconsin have seen between 1-5 DSVs indicating conditions generally unfavorable for the development of late blight. Overall, the weather has been very dry, with temperatures a bit too hot to promote the pathogen. 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. 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) *through 7/1/2023*	Potato Physiological Days (P-Days) *through 7/1/2023*
Spring Green*	**Early**	Apr 3	May 9	1	**398**
	Mid	Apr 17	May 12	1	**377**
	Late	May 10	May 23	1	**308**
Arlington*	**Early**	Apr 5	May 10	2	**395**
	Mid	Apr 20	May 15	2	**357**
	Late	May12	May 25	2	297
Grand Marsh	**Early**	Apr 5	May 10	2	**368**
	Mid	Apr 20	May 15	2	**335**
	Late	May 12	May 25	2	283
Hancock	**Early**	Apr 10	May 17	5	**332**
	Mid	Apr 22	May 19	5	**326**
	Late	May 14	May 28	5	277
Plover	**Early**	Apr 14	May 19	1	**322**
	Mid	Apr 24	May 20	1	**317**
	Late	May 19	May 29	1	268
Antigo	**Early**	May 1	May 28	3	259
	Mid	May 15	June 3	3	214
	Late	June 7	June 23	3	78
Rhinelander*	**Early**	May 7	June 1	2	229
	Mid	May 18	June 5	2	194
	Late	June 9	June 24	2	71

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. In mid-June, Dr. Mary Hausbeck reported the interception of cucurbit downy mildew spores in an air/spore trap in the Bay County area of Michigan, air samplers in Saginaw and Allegan Counties also resulted in the detection of spores. Through molecular biological testing, Dr. Hausbeck and her laboratory at

Michigan State University characterized the pathogen as the Clade 2 type of the cucurbit downy mildew pathogen which tells us that this type is likely to infect cucumber and melon crops. While Bay and Saginaw Counties are on the eastern side of MI, Allegan is in the southwestern corner of MI. In past years, when SW MI had cucurbit downy mildew in production fields, WI did see some movement of the disease into southeastern WI. For this reason, I am being vigilant in tracking reports of the disease in southern Michigan. To date, there have been no reports of the disease developing in cucumber fields in MI. If reports arise, we should be considering preventative treatment of cucumber and melon crops here in southeastern Wisconsin.

Again, to date, no symptoms of cucurbit downy mildew have been reported here in Wisconsin. The disease has been confirmed on cucumber in Quebec Canada (last week), NC and NJ; butternut squash and cucumber in SC; and watermelon, acorn/yellow summer squash, and cucumber in Georgia. These data suggest that there are both strain types of the pathogen active along the east coast. We should be watchful of all cucurbit crops. In past recent years, we have predominantly seen the cucumber strain types impacting cucurbits in Wisconsin.

Vegetable Insect Update – Russell L. Groves, Professor and Department Chair, 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/

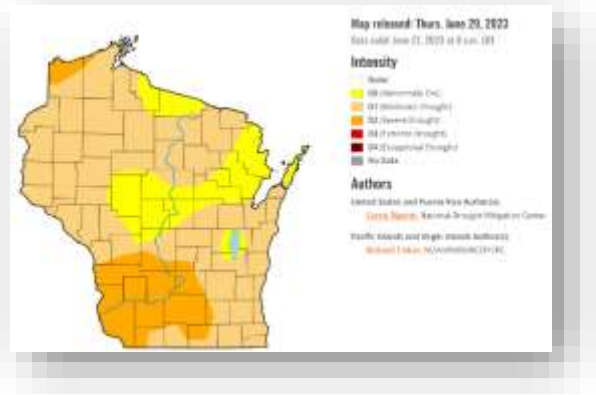
Striped cucumber beetle – (**https://vegento.russell.wisc.edu/pests/cucumber-beetles/**). Striped and spotted cucumber beetles continue to be sporadic in their damage within the state, but can continue to cause significant damage in vine crops through the remainder of the season. Because the striped beetle is more prevalent in Wisconsin, it is often considered more damaging.

Feeding from adults causes direct damage to leaves, flowers, and fruits, and adults can transmit the bacteria, *Erwinia tracheiphila*. Cucumbers and melons are particularly susceptible to bacterial wilt, and damage from this can be severe. To limit damage from bacterial wilt, it is critical to first diagnose the disease, and then respond appropriately which includes vine removal.

Several chemical insecticides are available when beetles exceed thresholds. However, chemical control will be limited if beetle populations are already high. Systemic neonicotinoid insecticides should be used with caution. Contact insecticides (including botanicals) should be applied to seedlings before transplanting and continued on a regular basis to keep numbers low. Cucumber leaves are sensitive and can be burned by chemical sprays. Spraying in the afternoon or evening is preferable to avoid killing beneficial insects and pollinators.

Onion thrips – (**https://vegento.russell.wisc.edu/pests/onion-thrips/**) Onion thrips (and thrips damage more generally) is increasing rapidly throughout many drought-affected regions of Wisconsin. Serious damage is generally limited to onions, but significant damage can also be expected in cabbage, cucumber succulent bean and other susceptible flowering crops. Feeding damage causes whitish blotches and dry, yellow areas on leaves, decreased pollen set, and, under heavy infestations, brown leaf tips and distorted leaves. Feeding by both adults and larvae can cause silvery streaking on leaves which becomes necrotic. Immature thrips prefer to feed on the youngest leaves and are most easily counted on the undersurface of leaves.

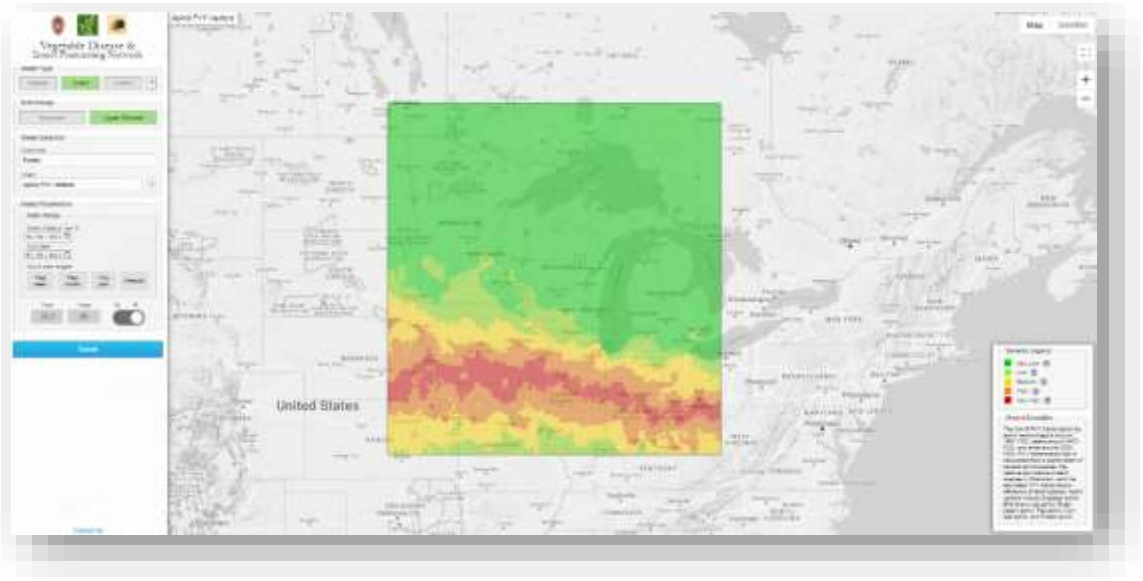
Since thrips prefer tight spaces, cabbage varieties with extremely dense heads are most susceptible to damage. Thrips are often found several layers deep within developing cabbage heads. Heavy thrips buildup may cause the cabbage head to become distorted. Red onions are particularly susceptible, while Spanish onions tend to be somewhat resistant. Cultivars with leaves tightly held to stem are more susceptible to thrips damage, while cultivars with more open growth, circular leaf structure, and glossy foliage suffer less damage.



Although some regions of the state received needed rainfall over the weekend, many areas are still lacking sufficient moisture and thrips populations can be expected to build with forecast warm temperatures.

Insecticide active ingredients that are part of management guidelines for onion thrips include spirotetramat (Movento), abamectin (Agri-Mek), spinetoram (Radiant), cyantraniliprole (Exirel, Minecto Pro), methomyl (Lannate) and lambda-cyhalothrin (Warrior). Many of these active ingredients are also available as generics and pre-mixes, so be cautious when developing your annual program of control and do not use similar modes of action (MoA) over successive generations. It is often recommended to use the same active ingredient as a series of two, successive applications (spaced 7-10 days apart) followed by a switch to a new MoA.

Potato virus Y (PVY) – (**https://vegento.russell.wisc.edu/pests/plant-pathogens/**). Potato Virus Y is a potyvirus that primarily infects plants in the Solenacea family. Aphid flight models have been developed and are available at the Wisconsin Vegetable Disease and Insect Forecasting Network (VDIFN). A screen shot from VDIFN (July 2, 2023) illustrates the risk of aphid activity across a range of colors (high to low, red to green). To access this daily map, simply visit VDIFN, and select 'Insect' in the upper left tab, followed by 'Potato' in the crop tab, and finally 'Aphid PVY Vectors' in the insect tab – then click the blue 'Submit' button. Once at the correct map, you are able to 'zoom in' on the image and click on any cell to obtain location specific estimates of the accumulated FDD and the associated risk. The risk of PVY



transmission by aphid vectors begins around 1967 FDD, peaks around 2473 FDD, and ends around 3228 FDD. Today's PVY risk map illustrates that peak risk for transmission is just entering southern Wisconsin, but will progress across the state in mid to late July.

Foliar applications of paraffinic oils have previously been shown to modify the feeding behaviors of non-potato colonizing, migrating aphids alighting onto the potato canopy as they move through the local landscape. Specifically, these investigations have revealed that aphids are discouraged from probing on leaves that possess residues of compounds containing (> 95%) of paraffinic oils, resulting in limited inoculation attempts. A portion of our applied research program has investigated the value of these paraffinic oils in limiting non-persistent PVY transmission, by (1) determining the periods of greatest risk for aphid movement and transmission, coupled with (2) experiments to evaluate the timing and coverage of these different oil-containing compounds.

Mode of Action Class (Group)[1]	Active Ingredient	Trade Names	Application / Delivery[2]
Nicotinic acetylcholine receptor (nAChR) agonists (4A, 4C & 4D)	imidacloprid[3]	Admire Pro®, Gaucho®, Provado®	IF, ST, F, SD
	thiamethoxam	Platinum®, Cruiser®, Actara®	IF, ST, F, SD
	clothianadin	Belay®	IF, ST, F, SD
	dinotefuran	Scorpion™	F
	acetampirid[3]	Assail®	F
	sulfoxaflor	Transform®	F
	flupyradifurone	Sivanto®	F
Selective Homopteran feeding blockers (9B)	pymetrozine	Fulfill®	F
Chordotonal organ modulator (29)	flonicamid	Beleaf®	F
Narrow-range mineral and paraffinic oils (UN)	petroleum oil	Aphoil™, JMS Stylet oil®, PureSpray Green®	F
Terpene constituents (C. album) (UN)	terpene	Requiem®	F
Inhibitors of acetyl CoA carboxylase (23)	spirotetramat	Movento®	F
Ryanodine receptor modulators (28)	cyazypyr	Verimark™, Exirel™	IF, F

[1] Insecticide Resistance Action Committee (http://www.irac-online.org)
[2] Application types include: in-furrow (IF), seed treatment (ST), foliar (F) and side-dress (SD)
[3] Several generic formulations exist

Langlade County Agriculture Research Station

Since 1975

Thursday
July 6
12:00 - 3:00

Antigo Field Day 2023

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

No Registration Fee

Langlade County
Agriculture Research Station
N3689 Langlade Rd
Antigo, WI 54409

Thank you to our local Businesses and Industries for your continued donations and support:

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Wisconsin Seed Potato Improvement Association
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Langlade County

Noon

- Load Wagons

Presenters

Welcome & Introductions - Agriculture Research Station Manager

- Niles Franc

WI Seed Potato Certification Lab

- Brooke Babler

UW Madison Department of Horticulture

- Yi Wang

UW Madison Department of Entomology

- Russ Groves

Timac Agro

- Rob Jarek

UW Madison Department of Plant Pathology

- Amanda Gevens

Proceeding the Presentations
Food & Refreshments Provided
by FS at East City Park