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

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Calendar of Events:

July 28, 2022 – UW-Rhinelander Field Day
November 29-December 1, 2022 – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center
February 7-9, 2023 – UW-Madison Div. of Extension & WPVGA Grower Education Conference & Industry Show, Stevens Point, WI

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/

Colorado potato beetle (CPB) – (https://vegento.russell.wisc.edu/pests/colorado-potato-beetle/). First generation larvae are completing development (1st generation) in southern and central Wisconsin. In production areas of southern Wisconsin, newly emerged adults have been observed in the past week. In central Wisconsin, many pupa are in the ground and adults will be emerging in the next 7-10 days. In northern Wisconsin, middle to later instar larvae continue to infest and defoliate potato (**Fig. 1**). Forecast moderate temperatures in the coming week will allow populations to progress.

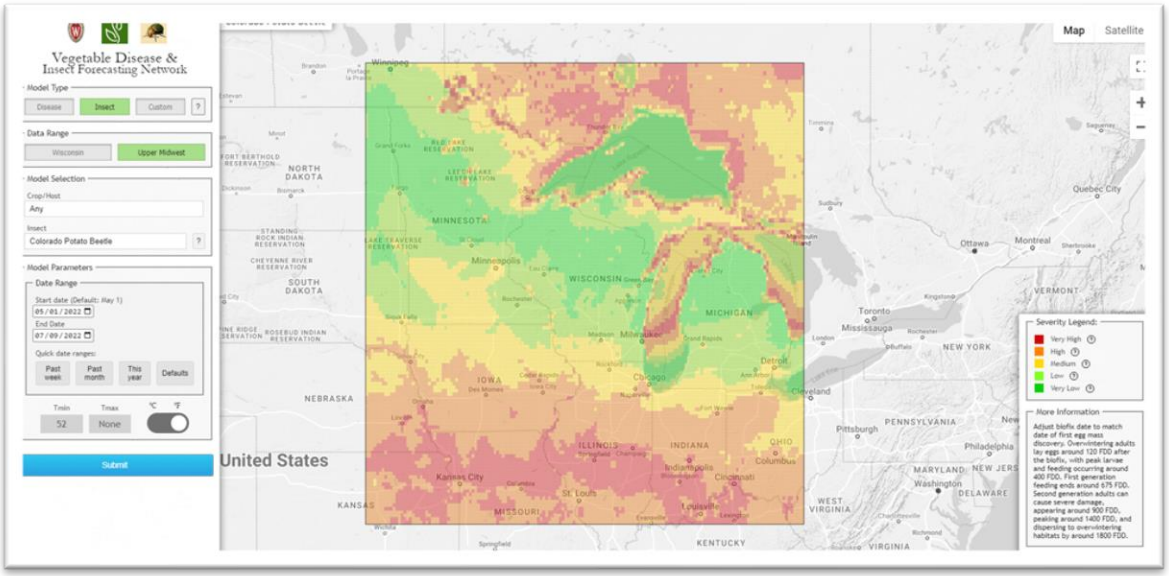


Figure 1. Vegetable Disease and Insect Forecasting Network (VDIFN) map of Colorado potato beetle population development, https://agweather.cals.wisc.edu/vdifn (sourced 07/10/2022). Notice we are at the midpoint between generations in much of Wisconsin. Areas within the 'orange or red shaded' zones indicate high risk zone where 1,200 FDD_{52} have been surpassed which signifies the predicted temperatures required for adult emergence and associated egg hatch into 2nd generation larvae.

Potato virus Y (PVY) – (**https://vegento.russell.wisc.edu/pests/plant-pathogens/**). Potato Virus Y is a potyvirus that primarily infects plants in the Solanaceae family. Present globally, this semi-persistant virus is transmitted by aphids. Once PVY is inside a host plant, it replicates by manipulating the potato cells into producing more virus. The effect of this is malformed plant tissues (leaf mottling, streaking, mosaic), reduced production of tubers, and plant tissue damage (necrosis, potato tuber necrotic ringspot disease). PVY infection also reduces storage quality of the tubers by decreasing the percent solids and increasing shrinkage.

Aphid flight models have been developed and are available at the Vegetable Disease and Insect Forecasting Network (https://agweather.cals.wisc.edu/vdifn?panel=insect&model=pvy-vectors). A screen shot from VDIFN (July 10, 2022) illustrates the risk of aphid activity across a range of colors (high to low, red to green). To develop this model, we examined historical aphid captures and modeled these against cumulative Fahrenheit Degree Days (FDD) to forecast aphid activity and the associated risk of PVY transmission.

To access this daily map, simply visit VDIFN (https://agweather.cals.wisc.edu/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 with risk. The risk of PVY transmission by aphid vectors begins around 1967 FDD, peaks around 2473 FDD, and ends around 3228 FDD. PVY transmission risk is calculated from a combination of several aphid species, the relative abundance of each species in Wisconsin, and the estimated PVY transmission efficiency of each species. Aphid vectors include Soybean aphid, Bird cherry-oat aphid, Green peach aphid, Pea aphid, Corn leaf aphid, and Potato aphid. 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.

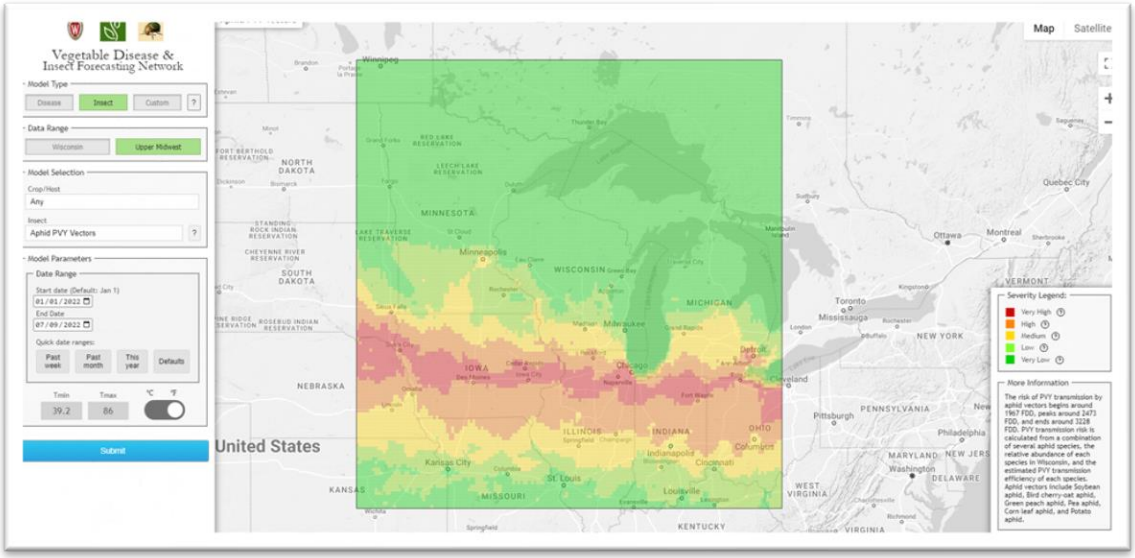
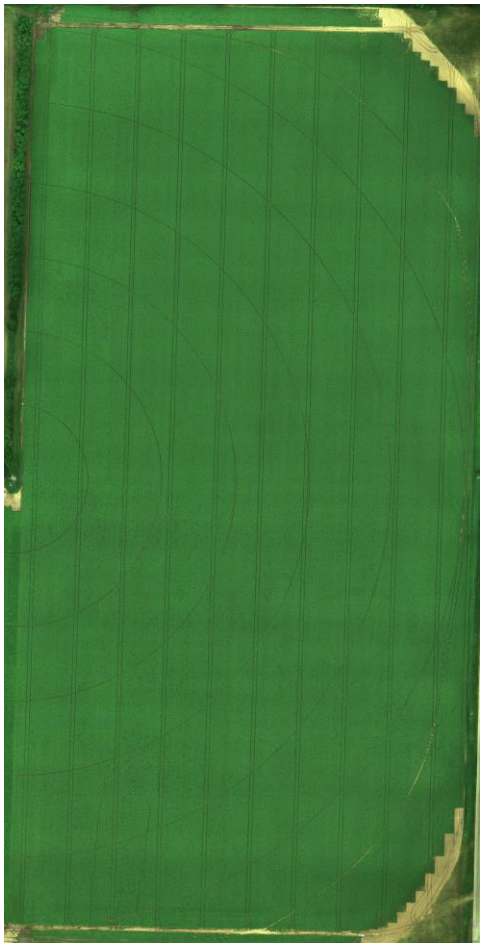


Figure 2. Vegetable Disease and Insect Forecasting Network (VDIFN) map of risk for transmission of Potato virus Y (PVY), https://agweather.cals.wisc.edu/vdifn (sourced 07/10/2022). Notice areas within the 'orange or red shaded' zones indicate high risk zone for transmission of PVY, and these remain to our south currently.

Yi Wang, Assistant Professor & Extension Potato and Vegetable Production Specialist, UW-Madison, Dept. of Horticulture, 608-265-4781, Email: wang52@wisc.edu.

So far we have been having a good growing season without extreme weather conditions. This week we identified *Pectobacterium spp.* and *Pectobacterium parmentieri* on one of our Colomba plants. Some field scouts reported that they have also found black leg problems on some fields.

This year we did not do well with the variety Colomba, as we had dry rot on the cut seeds after suberization, which caused poor emergence and plant stand issues. And now we see black leg on it. It turns out that this variety from the Europe might not adapt to the Wisconsin growing environment for consistent profitability.



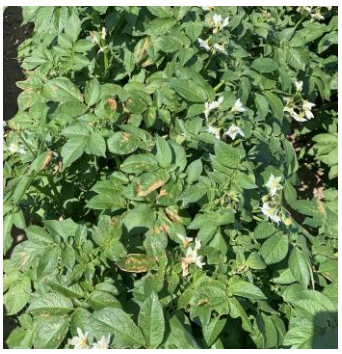
This week we can see the lush fully closed canopies of Lakeview Russet on the commercial field (picture on the left). All plants are in full bloom (purple colors as shown in the picture below). It is interesting to notice that even with the purple flowers, the overall color of the field is still bright green.

It took us 35 minutes to fly over this field with 80 acres, totally collecting about 400 images at 400 feet high and a speed of 15 mph. The resolution is 3.5 cm (1.4'') per pixel.

We collected petioles while we were flying so we can understand the relationship between field measured petiole nitrate-N level and the aerial imaging spectral signature with machine learning models.

On July 7th, we applied the first N spoon feeding to two seed potato varieties Snowden and Silverton through the sprayer at the Antigo research station. The treatments included 2, 4 and 8 gallons of 32% UAN.

We can see some mild burnt leaves under the 8 gallon treatment one day after the application (picture on the right), but not under the 2 and 4 gallon treatments. We do not think that this level of "burning" will cause reduced plant growth.



We will apply one more spoon feeding in two weeks and another one in four weeks.

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/

Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations. 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 2022. 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 will come from weather stations that are placed in potato fields in each of the four locations, once available. Data from an alternative modeling source: https://agweather.cals.wisc.edu/vdifn will be used to supplement as needed for missing data points. Data are available in graphical and raw formats for each weather station at: https://vegpath.plantpath.wisc.edu/dsv/.

Location	Planting Date		50% Emergence Date	Disease Severity Values (DSVs) 7/9/2022	Potato Physiological Days (P-Days) 7/9/2022
Grand Marsh	**Early**	Apr 5	May 10	**26**	**448**
	Mid	Apr 20	May 15	**26**	**407**
	Late	May 12	May 25	**26**	**349**
Hancock	**Early**	Apr 7	May 12	17	**389**
	Mid	Apr 22	May 17	17	**355**
	Late	May 14	May 26	15	**311**
Plover	**Early**	Apr 7	May 15	**43**	**383**
	Mid	Apr 24	May 20	**43**	**349**
	Late	May 18	May 27	**42**	**314**
Antigo	**Early**	May 1	Jun 3	8	267
	Mid	May 15	June 15	4	193
	Late	June 10	June 24	4	123

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.

We have reached thresholds for preventative fungicide treatment in potatoes to manage early blight in all potato plantings in Grand Marsh, Hancock, and Plover areas of Wisconsin. Potatoes should be on a preventative fungicide program with effective disease management selections to limit early blight. Thresholds have not yet been met in the Antigo area.

Grand Marsh and Plover potato fields have exceeded late blight disease risk thresholds and should be on preventative programs with effective fungicide selections to control late blight. Thresholds have not yet been met in the Antigo or Hancock areas. Hancock will likely reach/exceed thresholds over the next few days, however. A fungicide list for potato late blight in Wisconsin was provided in last week's newsletter and is available here: https://vegpath.plantpath.wisc.edu/2022/07/03/update-10-july-3-2022/

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 2022 Commercial Vegetable Production in Wisconsin Guide, Extension Document A3422, linked here: https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin

According to usablight.org there have not been recent diagnoses of late blight in tomato or potato crops in the US. For this year, there were just 2 reports entered back in March in southern Florida (US-23 clonal lineage/strain type).

Cucurbit Downy Mildew: During this past week, cucurbit downy mildew was confirmed in cucumber in NC, PA and VA. Previously in this growing season, the disease was confirmed in Alabama, Florida, Georgia, South Carolina, North Carolina, Pennsylvania, and New Jersey. No findings of cucurbit downy mildew in our Wisconsin-based sentinel plots in Dane County.

There are no confirmations of downy mildew on cucurbits in our region at this time, nor risk of spread of the pathogen to Wisconsin.

https://cdm.ipmpipe.org/

As a reminder, the pathogen is now known to have two 'strains' for clade types. The type (Clade 2) which infects cucumber, can als infect melon. Due to fungicide resistance within the downy mildew pathogen population, especially in Clade 2, selection of fungicides is important. Management of cucurbit downy mildew requires preventative fungicide applications as commercial cultivars are generally susceptible to current strains (Clades) of the pathogen. Management information can be sourced here: https://vegpath.plantpath.wisc.edu/2022/07/03/update-10-july-3-2022/