2024 Langlade Agricultural Research Station Field Day
Department of Entomology, UW-Madison
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2024 Neonicotinoid alternatives PVY mgmt. trial

This year we established a trial funded by an SCRI grant to identify non-neonicotinoid products and management strategies to manage PVY risk in seed potato production. Tubers were planted May 17, with Trt 1-6 Umatilla Russet and Trt 7-8 Mackinaw, a potentially PVY-resistant cultivar. Plots measure 4 rows (12') wide by 30' long with 10' alleys between, arranged in 6 replicate blocks. Application A=in-furrow at plant, B-K are scheduled weekly foliar applications that were initiated on July 12. Delegate will be applied as required for Colorado potato beetle control.
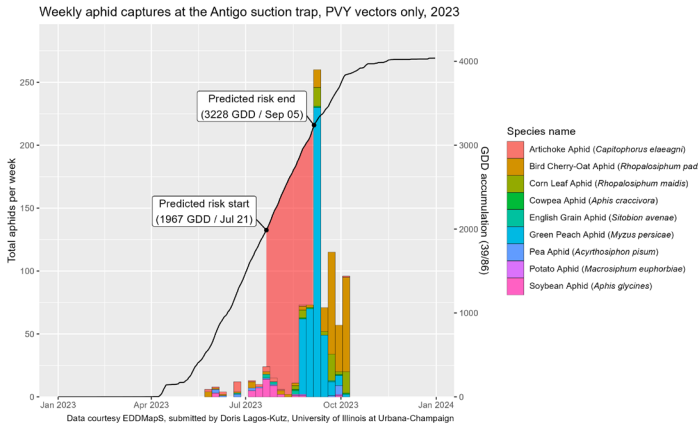
Cv.	No.	Product	Rate	A	B	C	D	E	F	G	H	I	J	K
	1	Untreated	-											
	2	Verimark	13.5 fl oz	X										
		PureSpray Green	1 gal		X	X	X	X	X	X	X	X	X	X
	3	Verimark	13.5 fl oz	X										
		PureSpray Green	1 gal		X	X	X	X	X	X	X	X	X	X
		Transform	1.5 oz			X	X							
		Movento	5 fl oz					X	X					
		Beleaf	2.8 oz							X	X	X		
		Exirel	20.5 fl oz										X	X
Umatilla Russet	**4**	Platinum	2.67 oz	X										
		PureSpray Green	1 gal		X	X	X	X	X	X	X	X	X	X
	5	Platinum	2.67 oz	X										
		PureSpray Green	1 gal		X	X	X	X	X	X	X	X	X	X
		Transform	1.5 oz			X	X							
		Movento	5 fl oz					X	X					
		Beleaf	2.8 oz							X	X	X		
		Exirel	20.5 fl oz										X	X
	6	Platinum	2.67 oz	X										
		Warrior II	1.92 fl oz			X		X		X		X		
Mackinaw	**7**	Platinum	2.67 oz	X										
		PureSpray Green	1 gal		X	X	X	X	X	X	X	X	X	X
	8	Untreated	-											

2024 Early vine kill PVY mgmt. trial

This trial, also funded by the SCRI grant above, is designed to illustrate how an early vine kill can be used to mitigate disease pressure in the seed crop while still producing a suitable yield. Vine kill will be initiated on Aug 10, or when test digs indicate we are nearing 50% set of 2.0 oz tubers. Treatment programs from Trt 1, 2, 3, 4, and 7 from the above trial will be repeated in this trial, plus the early vine kill date. Plots will be harvested and evaluated for yield, tuber size, and PVY incidence.

## Aphid captures at the Antigo/Langlade Suction Trap

A suction trap has been maintained at Antigo for many years and weekly trap catches are identified by Dr. Lagos-Kutz at the Univ. of Illinois-Urbana Champaign. In the figure below, note how there is an early flight of soybean aphid, and a later, much more substantial flight of green peach aphid, which is a major PVY vector. Such a flight is indicative of a large population present on crops in the prior weeks. Aphid captures are also compared with the start of the risk period as identified by the VDFIN model.

Weekly aphid captures at the Antigo suction trap, PVY vectors only, 2023

Predicted risk end (3228 GDD / Sep 05)

Predicted risk start (1967 GDD / Jul 21)

Species name: Artichoke Aphid (*Capitophorus elaeagni*); Bird Cherry-Oat Aphid (*Rhopalosiphum padi*); Corn Leaf Aphid (*Rhopalosiphum maidis*); Cowpea Aphid (*Aphis craccivora*); English Grain Aphid (*Sitobion avenae*); Green Peach Aphid (*Myzus persicae*); Pea Aphid (*Acyrthosiphon pisum*); Potato Aphid (*Macrosiphum euphorbiae*); Soybean Aphid (*Aphis glycines*)

Data courtesy EDDMapS, submitted by Doris Lagos-Kutz, University of Illinois at Urbana-Champaign

Predicting aphid flights and associated PVY transmission risk using VDIFN

Aphid flight models have been developed and are available at the Wisconsin Vegetable Disease and Insect Forecasting Network (VDIFN). To access this daily map, visit VDIFN and select 'Insect' for *Model Type*, then 'Aphid PVY Vectors' in the Model Selection box, then click the blue 'Submit' button. For more information on VDIFN and a QR code link to the site, see back of handout.

The risk of PVY transmission begins around 1838 FDD, peaks around 2515 FDD, and remains elevated through vine kill. 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.
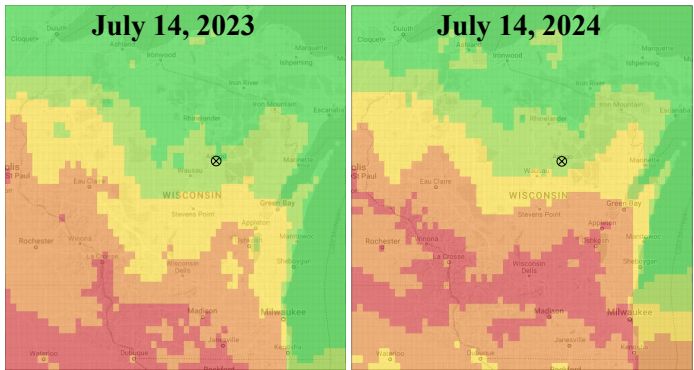
Current aphid risk model for PVY transmission in Wisconsin (right). Compared to this time last year (left), Antigo is about 2 days ahead. Last year the risk period for Antigo started July 16th and peaked on August 10th. Weekly paraffinic oil applications are recommended from the onset of the risk period through crop senescence to discourage aphid feeding and minimize the risk of PVY transmission.

Web resources from UW Madison Entomology & Plant Pathology

Ben Bradford, Russ Groves, and Amanda Gevens. For questions or more information contact bbradford@wisc.edu.

UW Extension AgWeather – agweather.cals.wisc.edu

This site provides easy access to several different types of weather data from our database. Data coverage extends across the upper Midwest, see map right.

- **Weather:** Min/max daily air temp, precipitation, dew point, vapor pressure, hours of high humidity, and mean temperature during periods of high humidity. Data sourced from NOAA.
- **Solar insolation:** A measure of the amount of solar radiation striking the surface of the earth, this data is sourced from the UW Space Science and Engineering Center and is used to compute potential evapotranspiration.
- **Evapotranspiration:** Useful in irrigation scheduling, these daily values are calculated from air temperature, solar insolation, latitude, and day of year.
- **Thermal models:** View/calculate degree day models and some disease risk models. Also available is an oak wilt risk model, essential if pruning oaks.
- **Email subscriptions:** Add sites of your choosing (home, field, etc.) and get optional daily weather updates, forecasts, and degree day models.
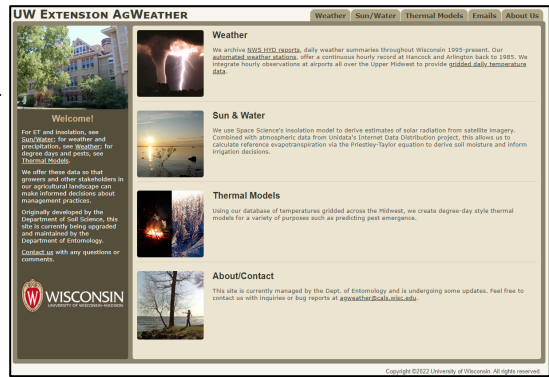

AgWeather offers weather data access via the web or a free API for integration into custom software.

Vegetable Disease and Insect Forecasting Network (VDIFN) – agweather.cals.wisc.edu/vdifn

VDIFN uses daily gridded weather data which are fed into various disease risk and insect developmental models and converted into daily disease severity values (or equivalents) or degree-days. These disease severity value and degree-day accumulations are then displayed on the map as color-coded risk scores based on the estimated risk to susceptible crops. Clicking on an individual grid cell brings up the daily history of weather data and disease severity values or degree-days for that location.

When you visit VDIFN you will see the navigation and settings pane on the left, the map and pest severity display in the center, and a legend on the lower right. You can switch between disease, insect, and custom model modes with the buttons across the top of the left panel. Pick a model using the Model Selection section and use the question mark box to get more information on the disease or insect. After selecting a model, note that the date range boxes populate with defaults for each model, but can be adjusted if desired. Click on an individual grid point to bring up more details for that specific location, including a detailed history of weather readings and daily and cumulative disease severity value or degree-days (depending on the model selected).
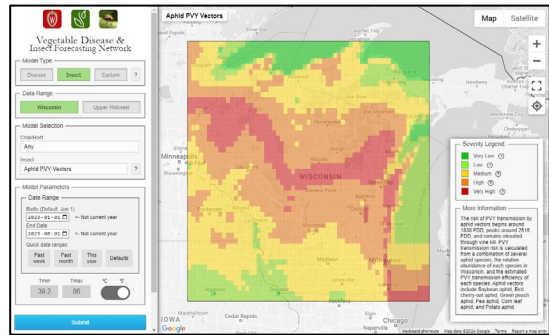

VDIFN showing estimated PVY transmission risk score based on an aphid abundance degree day model, Aug 1, 2023. Last year, PVY risk began increasing in mid July in Antigo, and weekly oil applications should have been initiated at that time to deter aphid feeding.

Irrigation Scheduling Program – wisp.cals.wisc.edu

A complete irrigation scheduling program for your farm, it uses a few simple initial and periodically updated conditions (soil moisture, crop, canopy cover) as well as weather and potential evapotranspiration values (automatically imported but can be manually adjusted). Create a farm, add pivot(s), each pivot can serve one or more fields, and each field can have one crop. Once set up it tracks water balance in the field and predicts soil water levels. It warns when a field crosses below the allowable depletion or experiences deep drainage due to excess water. Input your irrigation actions to update the model.

Wisconsin Environmental Mesonet – wisconet.wisc.edu

The Wisconsin Environmental Mesonet (Wisconet) is a growing network of weather and soil monitoring stations across Wisconsin, designed to provide high quality data at high spatial and temporal resolutions. There are currently 14 Wisconet stations with plans to expand to around 90 by 2026. Each Wisconet station provides more than one dozen measurements every 5 minutes. From 2017-2023 several of these weather stations were administered by Michigan State EnviroWeather; with the launch of Wisconet these stations will be back under UW management. The web services associated with these stations are still being developed and we hope to tie in these weather stations with our other insect and disease modeling and forecasting products in the coming months.
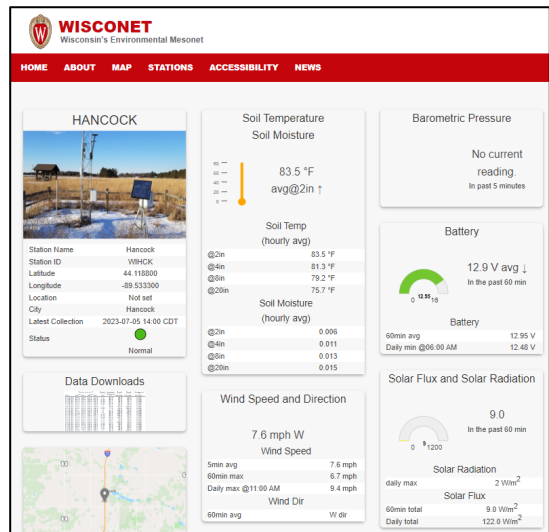
Vegetable Entomology

Vegetable Pathology

AgWeather

VDIFN

WISP

Wisconet