

2023 Langlade Agricultural Research Station Field Day

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<https://vegento.russell.wisc.edu>

Predicting aphid flights and associated PVY transmission risk using VDIFN

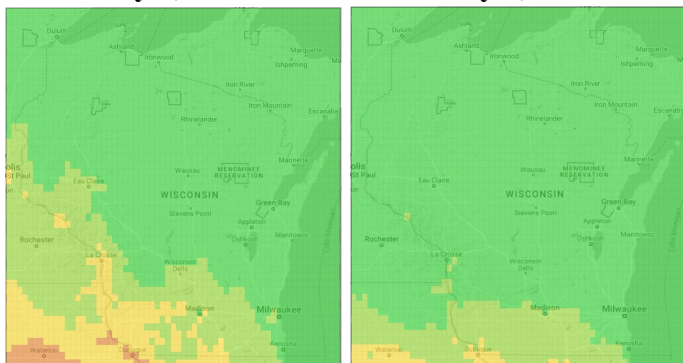
Aphid flight models have been developed and are available at the Wisconsin Vegetable Disease and Insect Forecasting Network (VDIFN). A screen shot from VDIFN (July 4, 2023) illustrates the risk of aphid activity across a range of colors (high to low, red to green). To access this daily map, visit VDIFN 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 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.

Once at the correct map, you can zoom in on the image and click on any cell to obtain location specific estimates of accumulated Fahrenheit Degree Days (FDD) and the associated risk. Yesterday's PVY risk map illustrates that peak risk for transmission is just entering southern Wisconsin and will progress across the state in mid to late July. When comparing this year's weather progress with last year, we are ahead by 160 degree days (approx. 1 week). Last year, aphid risk was estimated to begin increasing in Antigo on July 24; this year that date may be closer to July 19 depending on the weather over the next two weeks.

July 4, 2023

July 4, 2022



Current aphid risk model for PVY transmission in Wisconsin (left). Compared to this time last year (right), we are about 1 week ahead. Last year the risk period for Antigo started July 24th, peaked on August 12th, and ended on September 12th. 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. Models are available at <https://agweather.cals.wisc.edu/vdifn>.

2023 PVY Management Trial with Systemics

This year we established a trial to demonstrate several full-season PVY management programs that include a systemic for beetle and leafhopper control. Trt 1 is an untreated control with no insecticide or oil applications. Trt 2-3 received Verimark (cyantraniliprole) at hilling, and both will receive 8 weekly applications of PureSpray Green. Trt 3 will receive an additional rotation of insecticides to control insects throughout the season. Trt 4-5 are similar to Trt 2-3 except they received Platinum (thiamethoxam) at-plant instead of Verimark at hilling. Trt 6 begins with Platinum at-plant, and will receive 8 weekly applications of Silencer (lambda-cyhalothrin) for insect and aphid control.

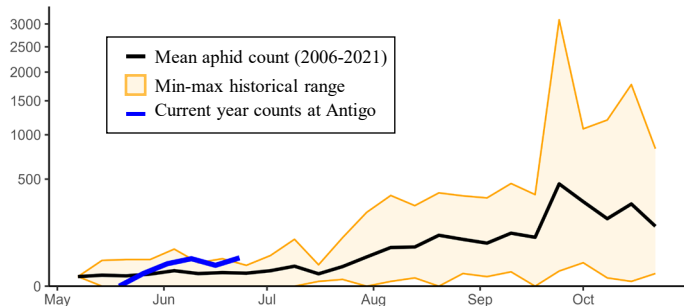
Treatment No.	Product	Rate	Application Code																	
			A	B	C	D	E	F	G	H	I	J								
1	Untreated																			
2	Verimark	13.5 fl oz/a	X																	
	PureSpray Green	1.5 gal/a		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	Verimark	13.5 fl oz/a	X																	
	PureSpray Green	1.5 gal/a		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Transform WG	1.5 oz wt/a		X	X															
	Movento HL	2.5 fl oz/a				X	X													
	Fulfill	5.5 oz wt/a							X	X										
	Exirel	20.5 fl oz/a																	X	X
4	Platinum 75SG	2.67 oz wt/a	X																	
	PureSpray Green	1.5 gal/a		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Platinum 75SG	2.67 oz wt/a	X																	
	PureSpray Green	1.5 gal/a		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Transform WG	1.5 oz wt/a		X	X															
	Movento HL	2.5 fl oz/a				X	X													
	Fulfill	5.5 oz wt/a							X	X										
	Exirel	20.5 fl oz/a																	X	X
6	Platinum 75SG	2.67 oz wt/a	X																	
	Silencer	3.84 fl oz/a		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Application A=at-plant (May 18). B=hill drench (June 21). C-J are weekly foliar applications starting at PVY risk threshold (1,967 degree days) and continuing through crop senescence.

Aphid Suction Trap Captures vs Historical Avg.

The North Central Suction Trap Network is administered by the University of Illinois at Urbana-Champaign and collects weekly aphid captures across the Midwest. Below, this year's Antigo captures (blue) are illustrated against the historical average (black) and historical range (orange). Historical counts represent data from 2006-2021.

Total Aphids, Langlade/Antigo Suction Trap



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

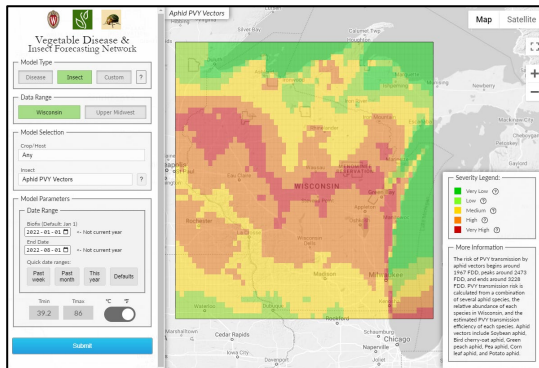
This site provides easy access to several different types of weather data from our database. Data coverage extends across the upper Midwest, see map right.

- **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.

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 icon 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, 2022. Last year, PVY risk began increasing in late 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.

NEW! 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