



Vegetable Crop Update

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

No. 14 – July 22, 2017

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Calendar of Events

July 27, 2017 – UWEX Langlade County Airport Research Station Field Day, Antigo, WI
August 4, 2017 – UW-Lelah Starks Elite Foundation Seed Potato Farm Field Day, Rhinelander, WI (10AM to Noon Lunch to Follow)
January 21-23, 2018 – Wisconsin Fresh Fruit & Vegetable Conference, Wisconsin Dells, WI
February 6-8, 2018 – UWEX & WPVGA Grower Education Conference, Stevens Point, WI

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Current P-Day (Early Blight) and Severity Value (Late Blight) Accumulations (R.V. James, UW-Plant Pathology/R.V. James Designs): A P-Day value of ≥ 300 indicates the threshold for early blight risk and triggers preventative fungicide application. A DSV of > 18 indicates the threshold for late blight risk and triggers preventative fungicide application. **Red text in table below indicates threshold has been met/surpassed.** “-” indicates that information is not available. Blitecast and P-Day values for actual potato field weather from Grand Marsh, Hancock, Plover, and Antigo are now posted at the UW Veg Path website at the tab “P-Days and Severity Values.”

http://www.plantpath.wisc.edu/wivegdis/contents_pages/weather_%20list_2017.html

Location	Planting Date	50% Emergence	P-Day Cumulative	Disease Severity Value	Date of DSV Generation	Increase in DSV from 7/14
<i>Antigo</i>	Early 5/3	5/25	>104*	53*	7/20	3
	Mid 5/15	6/1	>104*	49*	7/20	3
	Late 6/1	6/15	>101*	39*	7/20	3
<i>Grand Marsh</i>	Early 4/10	5/15	468	62	7/21	8
	Mid 5/1	5/22	461	60	7/21	8
	Late 5/17	6/1	398	52	7/21	8
<i>Hancock</i>	Early 4/15	5/18	460	49	7/21	7
	Mid 5/5	5/30	397	39	7/21	7
	Late 5/20	6/5	359	39	7/21	7
<i>Plover</i>	Early 4/20	5/20	463	51	7/21	7
	Mid 5/8	5/25	438	40	7/21	7
	Late 5/25	6/8	341	39	7/21	7

Summary: Disease Severity Values (DSVs) and Late Blight Blitecast: All potatoes are at 50% emergence or greater. **All locations have reached threshold and should be considered for preventive**

fungicide application to manage the risk of late blight. *We are again having problems with weather station components – batteries and modems are causing data drops. We are making replacements and working through these concerns. In the meantime, I am using DSV data generated through our UW Vegetable Disease and Insect Forecasting web tool (<http://agweather.cals.wisc.edu/vdifn/maps>) to provide information for the Antigo location. The weather data which generates these values are from NOAA rather than in-potato-field stations; the values have been comparable this season prior to the station failure. Note that the site also now has insect phenological data available for several pests. Recall the maximum number of DSVs that one day can accumulate is 4. Once thresholds of 18 DSVs have been met, routine, protection of susceptible tomato and potato crops is recommended. Wisconsin commercial conventional fungicides for potato late blight control can be found at: www.plantpath.wisc.edu/wivegdis/pdf/2017/Potato%20Late%20Blight%20Fungicides%202017.pdf

P-Days indicating early blight risk have exceeded threshold for several locations. Recall the threshold is 300 P-Days. Most commercial fields in central and southern WI are now showing symptoms of early blight and/or brown spot in the lower plant canopies. A number of fungicides are highly effective in limiting early blight and brown spot. Last week's newsletter addressed fungicides for consideration.

National Late Blight Updates: <http://usablight.org> is a useful resource for the detection and characterization of late blight on tomato and potato crops from the U.S. Late blight was confirmed last week in MI (US-23 potato), NC (tomato), and NY (US-23 potato). Already this year, late blight has been confirmed on potato and/or tomato in FL, NC, ON, VA, and WA as reported on the usablight.org website. In all reported cases, the pathogen genotype was US-23. This has been the predominant genotype in Wisconsin, and across the U.S., in recent years. US-23 can still generally be managed well with use of phenylamide fungicides. No new state reports since July 14, as far as I'm aware.

National Cucurbit Downy Mildew Updates: <http://cdm.ipmpipe.org/> offers information on the detection and characterization of the cucurbit downy mildew pathogen from the U.S. (and often Canada). In this past week, confirmations of downy mildew have come from MD, MI, MS, NJ, NY, OH, PA, and SC. Prior confirmations of this year were from: AL, DE, FL, GA, MD, MI, MS, NC, NJ, NY, OH, ON, PA, SC, TX, and VA on a variety of cucurbits. The counties highlighted in red on map (below) have had disease reports within this past week; green counties indicate locations of confirmed disease this season, but greater than 7 days ago. No risk of movement of the disease to WI based on the current forecast (see risk map below).



Further details on use of fungicides in managing cucurbit downy mildew can be found at my previous newsletter #7 from June 3, 2017. Link below.

<http://www.plantpath.wisc.edu/wivegdis/pdf/2017/June%203,%202017.doc.pdf>

Risk prediction map for Day 2: Saturday, July 22



HIGH Risk for cucurbits in central and eastern MI, southern ON, northern OH, western NY, and western and central PA.
Moderate risk in central and southeast NY, eastern PA, NJ, western CT, Long Island, the NC mountains, FL, southwest GA, central and southern AL, MS, southeast AR, and the eastern 1/2 of LA. Low Risk for cucurbits in eastern MD, DE, eastern CT, MA, and RI. Minimal Risk to cucurbits elsewhere.

Cucurbit powdery mildew: It's that time of year again when powdery mildew is beginning to develop on more mature, lower leaves of cucurbit plants in southern and central Wisconsin. Symptoms/signs include white, talcum-like pathogen sporulation on all leaf surfaces and petioles (picture below with disease cycle). Early management of powdery mildew can greatly enhance your overall control, especially for long season cucurbit types such as pumpkins and winter squashes. Management not only leads to healthier foliage and better quality pumpkins, but also leads to stronger and healthier stems for enhanced marketability and shelf life post-harvest.

There are several newer fungicides that have activity against powdery mildew on cucurbits. In our Hancock ARS trials of the past several years, disease pressure has started in the middle of July and has been quite severe. As such, our 14-day calendar spray program was much less effective than our 7-day spray program. I recommend that once a powdery mildew spray program is initiated, applications should be made every 7-10 days, if weather is conducive to disease. Include a base protectant fungicide in each application to both broaden the spectrum of diseases controlled and to mitigate pathogen resistance development.

Torino (cyflufenamid, FRAC Group U6, Gowan), **Quintec** (quinoxifen, FRAC Group 13, Dow, not registered for summer squash and cucumbers, but is for all full season cucurbits such as pumpkins, melons, gourds, winter squash), and **Vivando** (metrafenone, FRAC Group U8, BASF) are most effective in controlling powdery mildew on cucurbits in trials from several states. In our Hancock ARS trials, Quintec routinely outperforms all other treatments. I have included a table with our 2014 results with Quintec, below. We have not yet tested Torino and Vivando.

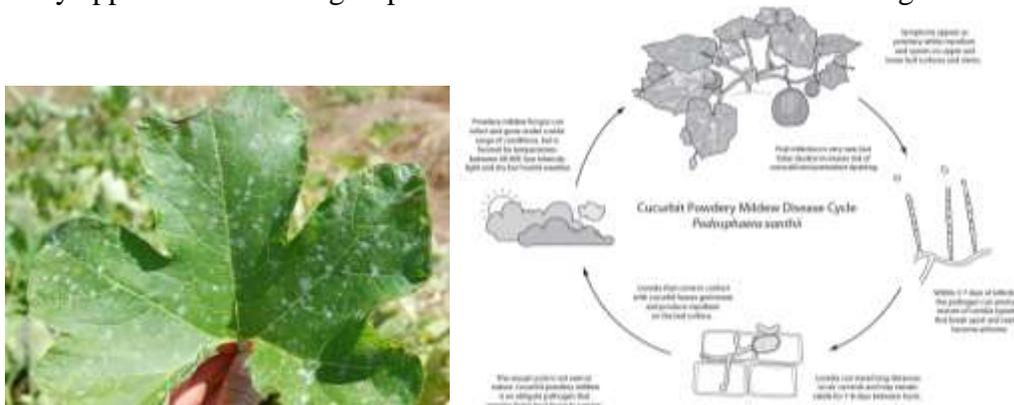
Luna Experience (fluopyram + tebuconazole, FRAC Group 7+3, Bayer), **Topguard** (flutriafol, FRAC Group 3, Cheminova), and **sulfur** (M2, many formulations and registrants) provide good control of powdery mildew.

Fair control of cucurbit powdery mildew can be expected with the following fungicides based on trial data from several states. In some cases, efficacy has dropped from the past due to development of pathogen resistance to the fungicide active ingredient. **Quadris Opti** (azoxystrobin+chlorothalonil, FRAC 11+M5, Syngenta), **Quadris Top** (azoxystrobin+difenoconazole, FRAC 11+3, Syngenta), **chlorothalonil** (M5, many formulations and registrants), **Switch** (cyprodinil+fludioxonil, FRAC 9+12, Syngenta), **Inspire Super**

(difenoconazole+cyprodinil, FRAC 3+9, Syngenta), **Luna Sensation** (fluopyram+trifloxystrobin, FRAC 7+11, Bayer), **Fontelis** (penthiopyrad, FRAC 7, DuPont), **Viathon** (tebuconazole+potassium phosphite, FRAC 3+33, Helena), **Pristine** (boscalid+pyraclostrobin, FRAC 7+11, BASF), **Monsoon** (tebuconazole, many others, FRAC 3, Loveland and many others), and **Procure** (triflumizole, FRAC 3, Chemtura).

Generally, mancozeb and copper formulations are poor in controlling powdery mildew on cucurbits. Due to resistance in many states, Rally (myclobutainl), Sovran (kresoxim methyl) and Topsin (thiophanate methyl) are not recommended. I have not trialed Sovran or Topsin specifically in Wisconsin, but since our powdery mildew typically moves in from more southern locations which do experience this fungicide resistance, I do not recommend these treatments for powdery mildew control. We have documented resistance to Rally in central Wisconsin over the past several years.

For organic producers, sulfur, copper, horticultural oils (such as JMS Stylet Oil), potassium bicarbonate, and biologicals (Actinovate, Double Nickel, Regalia, Serenade Opti, and Sonata) can be used to aid in powdery mildew management. In our experience at the Hancock ARS, weekly applications of this group of materials is essential for maintaining disease control.



Treatment and rate/A	Application Timing ²	Plot Yield (lb)	Handle Rating (%) ³	RAUDPC ⁴
Untreated Control	1-3	172.5	40.6ab	0.51g
JMS Stylet Oil 5.0 qt/100 gal water	1-3	151.3	42.3ab	0.36c-e
Microthiol Disperss 80DF 4.0 lb	1-3	160.4	53.8ab	0.30b
Rally 40WSP 5.0 oz	1-3	163.7	46.2ab	0.44f
Bravo WeatherStik 720SC 2.0 pt	1-3	163.4	51.1ab	0.30b
Bravo WeatherStik 720SC 2.0 pt	1,3	151.7	40.4ab	0.31bc
Bravo WeatherStik 720SC 2.0 pt	1,3			
Quadris 2.08SC 15.5 fl oz	2	169.7	61.0b	0.33bc
Quintec 2.08SC 6.0 fl oz	1,3			
Microthiol Disperss 80DF 4.0 lb	2	203.2	90.1c	0.22a
Kocide 3000 DF 0.75 lb	1-3	195.0	36.4a	0.39ef
Kocide 3000 DF 0.75 lb	1,3			
Microthiol Disperss 80DF 4.0 lb	2	186.3	39.5a	0.38d-f

²Fungicide application dates: 1=23 July, 2 = 6 August, 3= 20 August.

³Column numbers followed by the same letter are not significantly different at P=0.05 as determined by Fisher's Least Significant Difference (LSD) test.

⁴RAUDPC= Relative Area Under the Disease Progress Curve.