



Vegetable Crop Update

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

No. 13 – July 14, 2017

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Calendar of Events

July 20, 2017 – UW-Hancock ARS Field Day, Hancock, WI
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 7/7
<i>Antigo</i>	Early 5/3	5/25	>104*	50*	7/13	10
	Mid 5/15	6/1	>104*	46*	7/13	10
	Late 6/1	6/15	>101*	36*	7/13	10
<i>Grand Marsh</i>	Early 4/10	5/15	411	54	7/14	7
	Mid 5/1	5/22	404	52	7/14	7
	Late 5/17	6/1	341	44	7/14	7
<i>Hancock</i>	Early 4/15	5/18	405	42	7/14	7
	Mid 5/5	5/30	342	32	7/14	7
	Late 5/20	6/5	304	32	7/14	7
<i>Plover</i>	Early 4/20	5/20	408	44	7/14	7
	Mid 5/8	5/25	383	33	7/14	7
	Late 5/25	6/8	287	32	7/14	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: <http://www.plantpath.wisc.edu/wivegdis/pdf/2017/May%2022,%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 this past 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.

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 AL, MI, MS, NC, OH, PA, SC, and VA. Prior confirmations of this year were from: AL, DE, FL, GA, MD, MI, NC, NJ, OH, ON, PA, SC, and TX 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 3: Sunday, July 16



Forecaster: TK at NCSU for the Cucurbit ipmPIPE - 2017

Phytophthora in Cucurbits, Peppers, and Tomatoes: During wet and warm production years, many Wisconsin producers battle *Phytophthora* crown and fruit rot in vegetable crops. The disease is favored with current weather conditions. This potentially aggressive disease, caused by the soilborne water mold *Phytophthora capsici*, can infect a broad range of crops including summer squash, zucchini, winter squash, pumpkins, melons, cucumbers, peppers, tomatoes, and eggplant. Reports of this pathogen have also been made on snap and lima beans in commercial fields in the Midwest and Mid-Atlantic regions of the U.S. in the past decade. Symptoms of *Phytophthora* include water-soaking of lower stem or crown of a plant resulting in complete wilting of plants, and water-soaking on fruit often associated with white talcum-like pathogen sporulation on surfaces (see pictures below). Breakdown of plant tissues by this pathogen can be rapid and can occur on fruit post-harvest.

To avoid *Phytophthora*, the following measures should be taken:

- 1) do not plant susceptible crops on fields with recent history of this disease
- 2) provide good drainage (raised beds are beneficial)
- 3) avoid planting in low-lying areas of fields
- 4) practice good irrigation management to avoid standing water and extended periods of leaf wetness
- 5) apply effective protectant fungicides when conditions favor infection in known infested fields

Coming off of such a wet week, it is critical that growers of susceptible crops scout their vegetable fields for *Phytophthora*. Roguing of infected plants from the production field when disease is identified early can aid in limiting spread of disease. Do not allow infected fruit to sporulate and persist in production fields. Culls can continue to provide inoculum for remaining plants. Because *Phytophthora* is soilborne, soil from infested fields remaining on equipment should be removed prior to moving to a new or 'clean' field. Every effort should be made to avoid introducing this pathogen into non-infested fields.

Fungicides can be effective in managing *Phytophthora* when environmental conditions favor disease. The keys to making fungicides work best for you are:

- 1) select most effective fungicides with no known resistance in your field/area
- 2) make a thorough application particularly if fruit are to be protected and are beneath a dense foliar canopy
- 3) make frequent applications when conditions favor disease and crop growth is rapid

We have documented *Phytophthora capsici* resistance to the fungicide mefenoxam (active ingredient in Ridomil Gold, Ultra Flourish) in a few Wisconsin vegetable production fields during the past 6 years. However, there are still many fields in which the pathogen is very sensitive to Ridomil fungicides. This means that use of mefenoxam will likely control Phytophthora in that field. If your farm has no history of Ridomil use, it is likely that the fungicide will be effective for disease control. Please contact me if you have questions on resistance or need assistance in determining this status.

Fungicides with activity against Phytophthora crown and fruit rot include: Ridomil (mefenoxam, *for fruiting vegetables not cucurbits*), Ranman (cyazofamid), Forum (dimethomorph), Tanos (fanoxadone + cymoxanil), Presidio (fluopicolide), Aliette (fosetyl-al), Revus (mandipropamid), Zampro (ametoctradin+dimethomorph), Gavel (zoxamide + mancozeb), and Orondis Ultra/Opti (oxathiapiprolin+either chlorothalonil or mandipropamid). Fungicides should be tank-mixed with multi-site protectant such as chlorothalonil (ie: Bravo) or mancozeb (ie: Dithane). Tank-mixes of Presidio (fluopicolide) or Revus (mandipropamid) with copper hydroxide (ie: Kocide) have also been effective in trials on picking cucumber in MI: <http://www.veggies.msu.edu/Research/GLpickle2010.pdf>

And, more recent information from Michigan on use of biopesticides as well as Revus and Presidio used in drip irrigation system for Phytophthora crown and fruit rot management in cucurbit crops: http://msue.anr.msu.edu/news/watch_for_phytophthora_on_vine_crops

If you have any questions on symptoms, control, or fungicide resistance, please contact your county agent, crop consultant, the diagnostic clinic, or myself at UW-Plant Pathology. For further information on any fungicides that may be mentioned in this newsletter, please see the 2017 Commercial Vegetable Production in Wisconsin Guide A3422. An online pdf can be found at the link below or a hard copy can be ordered through the UWEX Learning Store. <http://learningstore.uwex.edu/Assets/pdfs/A3422.pdf>

Mid-Season Hop Production Update. Michelle Marks and Amanda Gevens. POWDERY MILDEW ACTIVE – Powdery mildew was seen for the first time in 2017 on July 13 in Dodge County. This marks the first time this disease has been seen by our lab in the southern part of the state; powdery mildew was documented last fall in Marathon County. Varieties infected included Galena, Cascade, and Southern Cross.

Hop powdery mildew is caused by the fungal pathogen *Podosphaera macularis*. The most characteristic symptoms of this disease are the white, fluffy fungal colonies that may occur on both the upper and lower leaf surfaces. These colonies may be discrete (individual) or coalesce into large areas of fungal growth. Infection on leaf undersides often leads to chlorotic spots on the top of the leaf. Blisters within leaf tissue can also form under certain conditions. Developing burrs are highly susceptible to infection and may become distorted and necrotic; cone infections can result in browning and poor overall quality.

Unlike hop downy mildew, this pathogen does NOT require free water (i.e. wet leaves) to infect plant tissues. Infection, growth, and sporulation occur optimally at temperatures of ~64-70 degrees F. Disease development is accelerated by low light, excess fertility, and high soil moisture (all factors related to increased succulent plant growth).

Cultural management of hop powdery mildew is similar to that of hop downy mildew; such as basal growth removal and carefully managing fertility and water. **It is important to note however that many of the chemical options available for control of downy mildew are NOT effective for powdery mildew control.** Active ingredients for powdery mildew control include pyraclostrobin/boscalid (Pristine, FRAC 11,7), trifloxystrobin (Flint, FRAC 11), tebuconazole (Tebuzol, FRAC 3), metrafenone

(Vivando, FRAC U8), myclobutanil (Rally, FRAC 3), quinoxyfen (Quintec, FRAC 13), and triflumizole (Procure, FRAC 3). As always, it is important to follow resistance management guidelines by utilizing fungicides with diverse modes of action. The link below provides a powerpoint presentation including updated fungicide information for downy mildew and powdery mildew.

http://buffalo.uwex.edu/files/2011/01/2017-IPM-Hop-Diseases-in-Wisconsin_AJG-.pdf

Unsure if you have powdery mildew? The University of Wisconsin Plant Disease Diagnostic Clinic here on campus at the UW-Madison is fully equipped to receive and analyze plant samples of all types for a small fee. Samples can be sent to:

**Plant Disease Diagnostics Clinic
Department of Plant Pathology
University of Wisconsin-Madison
1630 Linden Drive
Madison, WI 53706-1598**

For full sample collection/packaging instructions and additional information please visit the clinic website at <http://labs.russell.wisc.edu/pddc/> or contact Dr. Brian Hudelson at 608-262-286.



Hop leaves showing chlorotic lesions due to powdery mildew infections on the undersides of the leaves.



Hop leaf showing white, discrete powdery mildew colonies. Blisters resulting from infection are also visible.