



# Vegetable Crop Update

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

No. 16– June 23, 2015

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## Calendar of Events

**July 15** – UW-Hancock ARS Field Day, 12:30PM, Hancock, WI  
**July 17** – Rhinelander State Farm Field Day, Lelah Starks Elite Found. Seed Farm, Rhinelander, WI  
**August 19** – UW-Arlington ARS Agronomy/Soils Field Day, 8AM, Arlington, WI  
**August 20** – UWEX Langlade County Airport Field Day, Antigo, WI  
**August 25-27** – Wisconsin Farm Technology Days, Statz Bros., Inc. Farm, Sun Prairie, WI  
**September 1** – UW-Arlington ARS Organic Agriculture Field Day, Arlington, 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  $\geq 300$  indicates the threshold for early blight risk and triggers preventative fungicide application. A DSV of  $\geq 18$  indicates the threshold for late blight risk and triggers preventative fungicide application. **Red** text in table below indicates threshold has been met/surpassed. NA 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/pday\\_sevval\\_2015.html](http://www.plantpath.wisc.edu/wivegdis/contents_pages/pday_sevval_2015.html)

| <i>Location</i>    | Planting Date | 50% Emergence | P-Day Cumulative | Disease Severity Value | Date of DSV Generation | Increase in DSV from 6/19 |
|--------------------|---------------|---------------|------------------|------------------------|------------------------|---------------------------|
| <i>Antigo</i>      | Early 4/25    | 5/25          | <b>165</b>       | <b>39</b>              | 6/23                   | 4                         |
|                    | Mid 5/5       | 6/1           | <b>165</b>       | <b>39</b>              | 6/23                   | 4                         |
|                    | Late 5/15     | 6/15          | <b>67</b>        | <b>13</b>              | 6/23                   | 4                         |
| <i>Grand Marsh</i> | Early 4/5     | 5/10          | <b>304</b>       | <b>52</b>              | 6/23                   | 6                         |
|                    | Mid 4/15      | 5/15          | <b>294</b>       | <b>51</b>              | 6/23                   | 6                         |
|                    | Late 5/1      | 5/21          | <b>260</b>       | <b>49</b>              | 6/23                   | 6                         |
| <i>Hancock</i>     | Early 4/10    | 5/15          | <b>292</b>       | <b>47</b>              | 6/23                   | 5                         |
|                    | Mid 4/20      | 5/18          | <b>268</b>       | <b>44</b>              | 6/23                   | 5                         |
|                    | Late 5/5      | 5/25          | <b>234</b>       | <b>39</b>              | 6/23                   | 5                         |
| <i>Plover</i>      | Early 4/15    | 5/20          | <b>294</b>       | <b>55</b>              | 6/23                   | 5                         |
|                    | Mid 4/25      | 5/22          | <b>255</b>       | <b>52</b>              | 6/23                   | 5                         |
|                    | Late 5/10     | 5/30          | <b>193</b>       | <b>36</b>              | 6/23                   | 5                         |

Further details on registered fungicides for WI vegetables can be found in the Univ. of WI Commercial Vegetable Production in WI Guide A3422, <http://learningstore.uwex.edu/assets/pdfs/A3422.PDF>. Disease indicator/forecast tools provide information based on pathogen ecology to help make management decisions. No tool replaces field scouting and disease observations.

**Potato Early Blight Preventive Management:** P-Days have surpassed threshold of 300 in early plantings in the Grand Marsh area. All other locations have not yet reached threshold. We are beginning to see early blight in lower potato plant canopies in commercial production fields of southern and central Wisconsin. In many cases, fungicides have already been going out in prevention of late blight. However, it is time to consider fungicide selection to best target and manage the pathogens causing early blight and brown spot in potatoes. On May 8<sup>th</sup>, I provided a summary of fungicides for control of early blight in conventional potato in this newsletter, please find the link to this information below.

<http://www.plantpath.wisc.edu/wivegdis/pdf/2015/May%208,%202015.pdf>

**Late Blight Preventive Management:** The DSV 18 threshold has been met/surpassed for all plantings and locations with the exception of late-planted potatoes in the Antigo area. This threshold indicates that environmental conditions have been met to promote late blight disease activity. At 18 DSVs, preventive applications of effective late blight fungicides is recommended. No late blight detections have been made in WI at this time on tomato or potato.

**Considerations for fungicide programs to manage late blight:** There is not one recommended fungicide program for all late blight susceptible potato fields in Wisconsin. Fungicide selections may vary based on type of inoculum introduction, proximity to infected fields, crop stage, late blight strain, and other diseases that may be in need of management. This article provides general guidance to assist in development of your fungicide program. Please see UWEX Veg Crop Updates article on fungicide selections from June 5 at link below.

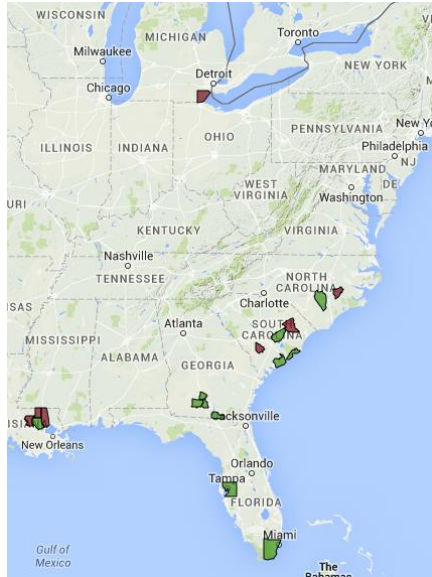
<http://www.plantpath.wisc.edu/wivegdis/pdf/2015/June%205,%202015.pdf> or a listing of 2015 WI potato late blight fungicides:

<http://www.plantpath.wisc.edu/wivegdis/pdf/2015/Potato%20Late%20Blight%20Fungicides%202015.pdf>

**Late blight updates:** Nationally, in the past week, there were no new diagnoses of late blight reported to [www.usablight.org](http://www.usablight.org). So far in 2015, there have been confirmations of late blight (US-23) in FL, CA (US-11), NC (strain not yet determined), and TX (not reported on [www.usablight.org/strain](http://www.usablight.org/strain) not yet identified).

**Cucurbit downy mildew updates:** We have had no reports of downy mildew on cucurbits here in WI at this time. Downy mildew has been confirmed on cucumbers in Monroe County, Michigan just today (June 23, 2015), and in Kent Ontario, Canada.

For more information on symptoms, disease cycle, and general management, please visit: <http://learningstore.uwex.edu/Assets/pdfs/A3978.pdf>



Nationally, in the past week, there were several new diagnoses of cucurbit downy mildew from LA, MI, NC, and SC reported to <http://cdm.ipmpipe.org/> So far in 2015, there have been confirmations of cucurbit downy mildew in LA, NC, FL, GA, SC, TX, and MI on various cucurbit types including summer and winter squash, watermelon, cucumber, and pumpkin. The Monroe County, MI and the Kent, Ontario Canada detections have not yet been included in the disease risk forecasting.

Preventive fungicides for cucurbits, particularly in cucumbers, should be considered for protection against both downy mildew (now that we know inoculum is in the region) and Phytophthora crown and fruit rot. Because both diseases are caused by oomycete, water-mold type pathogens, some of the same fungicides work in managing the two diseases.

Based on replicated research conducted by Dr. Mary Hausbeck of Michigan State University, a 7-day interval fungicide program is recommended for cucumber crops before disease is confirmed. The program should tighten up to a 5-day program after disease is confirmed. In other vine crops (cantaloupe, melon, zucchini, squash, pumpkin, and gourd), a 7 to 10 day program is recommended before disease, with a tightening up of the program to a 7-day interval after disease is confirmed. Fungicide selections should include Gavel 75WG (5 day PHI), Tanos 50WG (3 day PHI), Zampro 4.4SC (0 day PHI), Ranman 3.6SC (0 day PHI), and Zing! (0 day PHI). Previcur Flex 6SC (2 day PHI) and Presidio 4FL (2 day PHI) have also demonstrated efficacy in past years in trials. The previously listed fungicides should be alternated and tank-mixed with either mancozeb or chlorothalonil (unless one of these protectants is in a pre-mix formulation such as Zing! or Gavel).

Growers and researchers in the southeastern US, as well as in Michigan (in 2014 trials) have noted some resistance in the downy mildew pathogen population to Presidio and Previcur fungicides. As such, these fungicides should be tank-mixed with another downy mildew-specific fungicide as well as a base protectant of mancozeb or chlorothalonil. The cucurbit downy mildew that has been in MI over the past several years has also shown resistance to mefenoxam (ie: Ridomil), strobilurins (ie: Quadris, Cabrio), and mandipropamid (Revus). More

information from Dr. Mary Hausbeck at Michigan State University on cucurbit downy mildew can be found at the link below.

[http://msue.anr.msu.edu/news/cucumber\\_downy\\_mildew\\_makes\\_an\\_early\\_appearance\\_in\\_michigan?utm\\_source=Vegetable+-+MSU+Extension+News+-+06-23-15&utm\\_campaign=Vegetables+06-23-15&utm\\_medium=email](http://msue.anr.msu.edu/news/cucumber_downy_mildew_makes_an_early_appearance_in_michigan?utm_source=Vegetable+-+MSU+Extension+News+-+06-23-15&utm_campaign=Vegetables+06-23-15&utm_medium=email)

**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), and Gavel (zoxamide + mancozeb). 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 Michigan (see link below).

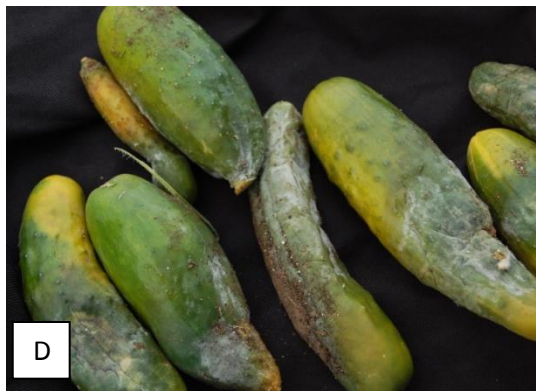
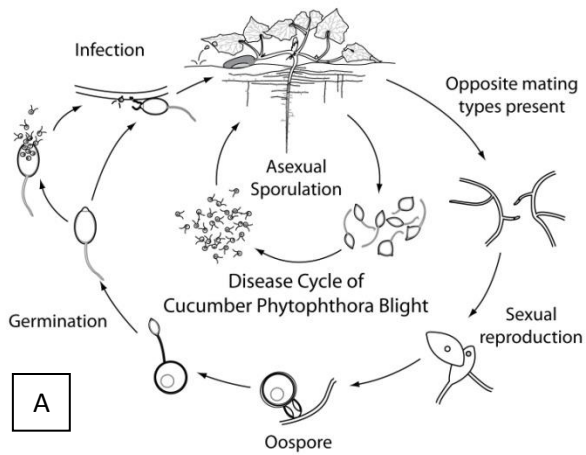
<http://www.veggies.msu.edu/Research/GLpickle2010.pdf>

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 is offered below.

[http://msue.anr.msu.edu/news/watch\\_for\\_phytophthora\\_on\\_vine\\_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 2015 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>



Phytophthora crown and fruit rot pictures include A: disease cycle on cucumber, B: symptoms on winter squash fruit, C: wilting symptom on winter squash plants, and D: fruit rot and sporulation on cucumber fruit.

**Aim received Special Local Need Registration (Section 24c) for use on hops in WI:** Earlier this spring, Aim EC herbicide from FMC Corporation (carfentrazone-ethyl) received special registration for use on hop suckers and broadleaf weeds (velvetleaf, pigweeds, lambsquarters) in WI hops. This special registration is in place from 2/17/2015 to 12/31/2019. Application instructions excerpted from the 24c label is provided below.

**APPLICATION INSTRUCTIONS**

| CROP | PEST   | RATE                       |
|------|--|----------------------------|
| Hops | Hops Sucker Control,<br>Velvetleaf,<br>Pigweeds, Lambsquarters | 2.0 Oz/A<br>(0.03 lb ai/A) |

**Timing and Method of Application**

**Post-Directed Application for Sucker Management**

AIM EC is a contact herbicide for directed spray application to the basal portion of the hop plant for the management of sucker growth. Apply AIM EC at 2.0 fl. oz (0.03 pound active ingredient) per acre per application in a minimum of 20 gallons of spray solution by boom-type ground application equipment only to the basal portion of the hop plant (approximately the lower 1.5 feet) and to the sucker mat which extends from the base of the plant to approximately 1.5 to 2 feet into the row.

**Downy mildew in hops** has been a significant challenge this production season for many growers. Those who have aggressively and preventively applied fungicides to the crop as well as have maintained weeds and plant density in the lower plant canopies through cultural and herbicide measures are experiencing limited sporulation and good downy mildew control at this time. Where fungicides were not initiated until after significant disease onset and sporulation was abundant, the disease has been especially hard to reign in.

A 2015 updated list of fungicides registered in Wisconsin for control of hop downy mildew can be found under the “Hops” tab of the UW Vegetable Pathology website located [here](#). Additional information regarding cultural management practices can be found in the *Field Guide for Integrated Pest Management in Hops*: a free resource available online [here](#).

As always, 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.