



# Vegetable Crop Update

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

No. 12– June 5, 2015

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Disease forecasting updates – *Blitecast DSVs exceeding threshold of 18 in several locations*

Concerns with potato volunteers

Building fungicide programs for late blight control in conventional potato

## Calendar of Events

**July 15** – UW-Hancock ARS Field Day, 1:00PM, Hancock, WI

**July 17** – Rhinelander State Farm Field Day, Lelah Starks Elite Found. Seed Farm, Rhinelander, 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

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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 6/1
<i>Antigo</i>	Early 4/25	5/25	<b>30</b>	<b>4</b>	6/5	1 <sup>st</sup> calc
	Mid 5/5	6/1	<b>30</b>	<b>4</b>	6/5	1 <sup>st</sup> calc
	Late 5/15	NA	NA	NA	NA	NA
<i>Grand Marsh</i>	Early 4/5	5/10	<b>157</b>	<b>20</b>	6/5	1
	Mid 4/15	5/15	<b>147</b>	<b>19</b>	6/5	1
	Late 5/1	NA	<b>113</b>	<b>17</b>	6/5	1
<i>Hancock</i>	Early 4/10	5/15	<b>147</b>	<b>19</b>	6/5	1
	Mid 4/20	5/18	<b>122</b>	<b>16</b>	6/5	1
	Late 5/5	NA	<b>88</b>	<b>11</b>	6/5	1
<i>Plover</i>	Early 4/15	5/15	<b>148</b>	<b>23</b>	6/5	3
	Mid 4/25	5/22	<b>108</b>	<b>20</b>	6/5	3
	Late 5/10	NA	<b>46</b>	<b>4</b>	6/5	3

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.

***Volunteer survival 2014-2015:*** When soil temperatures do not get low enough to kill unharvested potato tubers, they can remain alive through the winter and emerge as unwanted volunteer plants in the spring. While the volunteers can create stubborn weeds in the following season, they can also harbor pathogens such as *Phytophthora infestans* in its asexual forms (sporangia, zoospores, and mycelia) and initiate the disease in the next year. A model for categorizing risk of survival of potato volunteers developed by researchers at Michigan State University categorizes risk based on accumulation of cold soil temperatures at 2 and 4 inch depths occurring between November 1 and March 31. This past winter in Wisconsin, we had accumulated hours of cold temperatures below -3°C (27°F) at 2 and 4" depths in some areas of the state. However, even in some of our more northern parts of Wisconsin, pockets of soils which were protected by early snowfall (ie: along tree lines) did harbor viable potatoes which have resulted in numerous volunteers in some of central and northern potato production counties. Indeed, risk will vary by location, soil type, vegetative ground cover, as well as snow cover, but the risk assessment provides helpful information in considering weed and disease management. Volunteer potatoes need to be managed to mitigate risk of late blight as well as other diseases that may reside on the plant tissue across the winter. Managing volunteers can be especially challenging given the vigor of these plants as well as limited herbicide labels for controlling the unwanted potatoes in the rotational planting. Please contact Dr. Jed Colquhoun, Professor & Extension Specialist in Specialty Crop Weed Control, UW-Horticulture, E-mail: [colquhoun@wisc.edu](mailto:colquhoun@wisc.edu), Phone: 608-890-0980, if you have questions pertaining to pesticides for potato volunteer control. Because late blight is a regulated disease in WI, an unmanaged field of volunteer potatoes is reason for regulatory intervention. Good stewardship of the volunteer potatoes to mitigate late blight in your production region is the best approach.

**Potato Early Blight Preventive Management:** P-Days have not yet reached threshold of 300 in any locations of Wisconsin.

**Late Blight Preventive Management:** The DSV 18 threshold has been met/surpassed for early planted/emerged potatoes in the Grand Marsh, Hancock, and Plover potato production areas. The threshold has also been met for mid-planted/emerged potatoes in Grand Marsh and Plover areas. 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 Wisconsin at this time on tomato or potato. In walking potato fields yesterday in Central WI, weather was cloudy and misty in some areas during the mid-morning hours, and hot and humid as the day progressed. Under both conditions, the moisture persisted and is highly conducive to late blight and other diseases.

**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.

**Under high late blight pressure**, fungicide programs with Revus Top, Forum, Curzate 60DF, Ranman, Tanos, Gavel, Previcur Flex, Zampro, Zing, or Omega should be used. Mefenoxam containing fungicides such as Ridomil Gold SL can also be highly effective in controlling late blight caused by the pathogen strain US-23. This strain been identified in most WI cases in 2014. The US-8 strain was also identified in a few fields last year. Note that Ridomil will not work to control the US-8 strain. Zampro and Zing! are newly registered late blight fungicides offering a novel mode of action in a pre-mix (Zampro) and a pre-mix of established fungicides (Zing!) for effective late blight control. Brief comments on each of these fungicides are listed below.

Revus Top contains mandipropamid (Group 40) for late blight and difenoconazole (Group 3) for early blight; excellent protectant on leaf blight; rainfast; translaminar and contact activity.

Forum contains dimethomorph (Group 40) for late blight; can be applied after vine kill; good protectant on leaf blight; good antispore activity; rainfast; translaminar activity.

Curzate 60DF contains cymoxanil (Group 27) for late blight; locally systemic; excellent curative activity; good protectant on leaf blight; rainfast in 2 hours.

Ranman contains cyazofamid (Group 21) for late blight; excellent protectant for leaf and tuber blight; rainfast; contact activity.

Tanos contains cymoxanil (Group 27) for late blight and famoxadone (Group 11) for early blight; excellent curative activity; good protectant on leaf blight; rainfast; translaminar and contact activity.

Gavel (zoxamide, Group 22+mancozeb, Group M3) is best used as a protectant and has been reported to reduce tuber blight; excellent protectant on leaf blight; rainfast; contact activity.

Zing! (zoxamide, Group 22+chlorothalonil, Group M5) is best used as a protectant and is excellent in protecting against leaf blight; rainfast; contact activity. This is Gavel's zoxamide, which is very effective against late blight, with chlorothalonil base protectant rather than the EBDC.

Previcur Flex contains propamocarb hydrochloride (Group 28); good protectant on leaf, new growth, and stem blight; good curative and antispore activity; excellent rainfast activity; systemic and contact activity.

Omega is a broad spectrum fungicide (fluazinam, Group 29) and especially effective at controlling the tuber phase of late blight (with added benefit of white mold control);

excellent protectant on leaf blight; good protection against tuber blight; rainfast; contact activity. Has special label for powdery scab in WI as of 2011.

Ridomil Gold SL contain mefenoxam (Group 4); excellent systemic movement in plant; curative activity; excellent control of stem, leaf, and tuber late blight; rainfast; can only be effective if you are controlling a sensitive strain such as US-23, US-22.

Zampro contains ametoctradin (Group 45) and dimethomorph (Group 40) both with activity on late blight; good preventative disease control; systemic and protective activity.

In Wisconsin, the QoI inhibitors Headline (pyraclostrobin, Group 11), Quadris (azoxystrobin, 11), and Reason (fenamidone, 11) have offered good late blight control at high label rates under moderate late blight pressure and should be used in a manner which mitigates pathogen resistance development - in tank-mix with protectant fungicides such as mancozeb or chlorothalonil-based products and do not apply in consecutive applications.

Headline (or the QoI component of Priaxor), Quadris, Reason, Revus Top, and Tanos, also provide good control of early blight in most potato fields in Wisconsin. There are fields/areas where the early blight pathogen population may have some resistance to the QoI fungicide group (11), but generally, this group of fungicides is still effective.

Phosphorous acid formulations such as Crop-phite, Fosphite, Phostrol, Propht, and Rampart can increase tuber protection to late blight and pink rot. However, rates must be high and multiple applications must be made for significant tuber protection initiating at dime-size tuber and following up with 2 more applications made 14-days apart. This group doesn't provide great foliar control of late blight.

Mancozeb used as a tank-mix partner in the final fungicide applications can provide some additional tuber late blight production. Research conducted in Washington and published in 2006 by Porter, Cummings, and Johnson indicated that soil application of mancozeb greatly reduced the incidence of tuber blight when compared to other fungicides. Additionally, in our early blight fungicide trial work at the Hancock Research Station we have often seen yield increases when we use mancozeb as the base protectant tank-mix partner in our final 2 applications.

In years when weather conditions do not favor severe late blight, programs based on chlorothalonil formulations and EBDCs can be adequate to reduce risk of late blight. The addition of TPTH 80WP to any of the protectant programs can enhance disease control particularly towards the end of the growing season. Our current weather conditions, while very hot, can promote disease development due to periods of rainfall, high humidity, and moderate overnight temperatures.

Timing and frequency of fungicide applications are critical elements in an effective disease control program. Five to seven day applications are needed to protect the crop under conditions of rapid growth and high disease pressure. Now that DSVs have reached 18 in several parts of

the state, protectant programs should be maintained until the end of the growing season as appropriate during disease risk periods.

If late blight is detected in a field, 'hot spots' should be destroyed to limit disease development and production of inoculum. A conservative approach to reducing spread from a hot spot includes destruction of 30 rows on either side of the newest lesions at the border of the late blight locus and 100 feet along the row (either side) are killed with Reglone or with Gramoxone (generic). Although harsh, trials at MSU have shown that the latent period between infection and symptom development is about seven days and although not visible, plants within this area are already infected. Fields with very few lesions across a broad acreage, must be intensively managed and consideration for early vine kill and harvest should be made to reduce overall risk.

Listing of 2015 WI potato late blight fungicides:

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

The 2015 A3422 Commercial Vegetable Production in Wisconsin guide is available for purchase through the UW Extension Learning Store website:

<http://learningstore.uwex.edu/Commercial-Vegetable-Production-in-Wisconsin2015-P540.aspx>

A pdf of the document can be downloaded or is available at the following direct link:

<http://learningstore.uwex.edu/assets/pdfs/A3422.PDF>