Vegetable Crop Update

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

No. 24– July 24, 2015

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Calendar of Events

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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Veg Pathology Webpage: http://www.plantpath.wisc.edu/wivegdis/.

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. 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

Location	Planting Date	50% Emergence	P-Day Cumulative	Disease Severity Value	Date of DSV Generation	Increase in DSV from 7/17
Antigo	Early 4/25	5/25	**392**	**67**	7/24	5
	Mid 5/5	6/1	**392**	**67**	7/24	5
	Late 5/15	6/15	**294**	**41**	7/24	5
Grand Marsh	Early 4/5	5/10	**541**	**95**	7/24	11
	Mid 4/15	5/15	**531**	**94**	7/24	11
	Late 5/1	5/21	**497**	**92**	7/24	11
Hancock	Early 4/10	5/15	**532**	**78**	7/24	7
	Mid 4/20	5/18	**507**	**75**	7/24	7
	Late 5/5	5/25	**473**	**70**	7/24	7
Plover	Early 4/15	5/20	**535**	**90**	7/24	7
	Mid 4/25	5/22	**496**	**87**	7/24	7
	Late 5/10	5/30	**434**	**64**	7/24	7

Potato Early Blight Preventive Management: P-Days have surpassed threshold of 300 in all potato plantings Wisconsin, with the exception of late plantings in Antigo. We are seeing early blight in lower potato plant canopies in commercial production fields of southern and central Wisconsin. Areas in which this threshold has been reached should be on a preventive program for control of early blight, especially on highly susceptible cultivars in areas of concentrated potato production. On May 8th, 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 Updates: The DSV 18 threshold has been met/surpassed for all plantings and locations. This threshold indicates that environmental conditions have been met to promote late blight disease activity. Accumulation of DSVs over the last 4 days has been low-moderate, however, the intense weather with rainfall that we have had in some areas, created favorable conditions for late blight.

In Wisconsin: Seven counties in Wisconsin have submitted samples which were confirmed for late blight in potato and/or tomato. In all cases in which we have tested so far, the *Phytophthora infestans* is of the US-23 genotype. Reports are listed below. The US-23 genotype is sensitive to phenylamide fungicides such as mefenoxam and metalaxyl. The lesions that I have seen on tomato plants in Fond du Lac, Columbia, and Waushara Counties are dime to quarter-sized in diameter and appear to be uniformly spread across smaller acreage fields. Where antisporulant fungicides have been applied, sporulation was not evident.

Fungicide comments: Ridomil applications have been working very well to dry up and limit infections. Phostrol or other salts of phosphorous acid products have been shown to provide systemic control of tuber late blight and pink rot in storage. These types of fungicides must be applied at 3X for this post-harvest effect. An application at dime-sized tubers followed by 2 applications spaced 14 days apart is an effective approach.

Date of Confirmation	County (general location)	Host	Late blight pathogen genotype
23 June	Adams (northern)	Potato	US-23
8 July; 24 July	Waushara (western)	Potato; Tomato	US-23
8 July	Wood (southern)	Potato	US-23
14 July	Marquette (central)	Potato	US-23
15 July	Portage	Potato	US-23
23 July	Columbia (north central)	Tomato	Not yet determined
23 July	Fond du Lac (north central)	Tomato	Not yet determined

Across the nation: There were new detections of late blight in ID, CT, and NY this past week www.usablight.org. To date, nationally, there have been confirmations of late blight in FL (US-23), CA (US-11), NC (strain not yet determined), TX (not reported on usablight.org/strain not yet identified), WA, MD, NC, NJ, NY (US-23), ON and QC Canada, PA, VT, and WI (US-23).

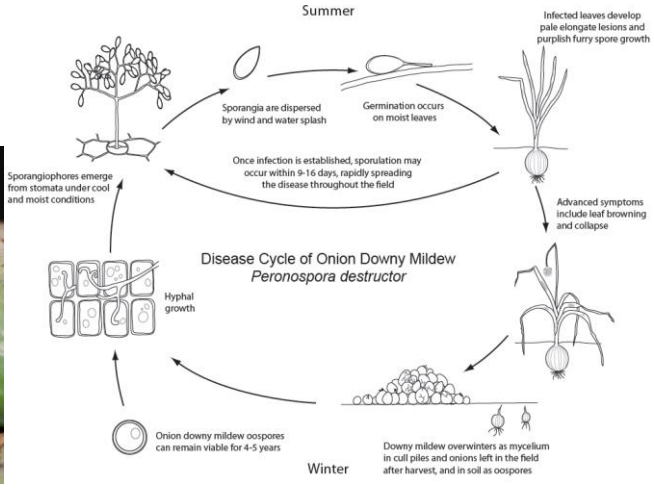
Fungicides are critical for protection of potato and tomato crops at this time.
There is not one recommended fungicide program for all late blight susceptible potato (and tomato) fields in Wisconsin. Fungicide selections may vary based on type of inoculum introduction, proximity to infected fields, crop stage, late blight strain, and other diseases that

may be in need of management. 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

If you suspect/detect late blight, have the disease confirmed (free diagnostics through my lab and the UWEX Plant Disease Diagnostic Clinic) and we can genotype for further information on the nature of the pathogen.

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.

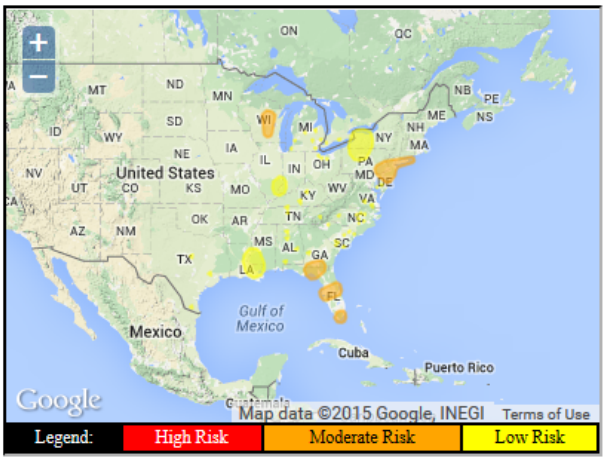
Downy mildew has been confirmed on onions in Wisconsin this week. Onion downy mildew can be very problematic in onion fields. This foliar disease is caused by a fungus-like pathogen called *Peronospora destructor*. Infection is favored by temperatures less than 72°F and high humidity and leaf wetness. The pathogen can overwinter in volunteer onion, culls, and wild Allium weed species if the pathogen was present in your location in previous years. Symptoms include pale or white elongated patches on leaves that start off small and can elongate and produce a purple-gray sporulation which appears "downy." Leaves can bend over and eventually die due to severe downy mildew infection. Please refer to picture below. This disease can impact bulb size, quality, and storability. Management recommendations include practicing a 3+ year rotation to non-hosts such as small grains and corn, eliminating culls and volunteers, avoiding dense planting, avoiding excess N and overhead irrigation, and orienting rows parallel to prevailing wind to avoid prolonged leaf wetness. Additionally, there are fungicides that can be effective for the management of onion downy mildew. Effective fungicides for Downy mildew control include azoxystrobin (Quadris, Amistar), pyraclostrobin (Cabrio), pyraclostrobin & boscalid (Pristine), cymoxanil + famoxadone (Tanos), dimethomorph (Forum), mandipropamid (Revus), fenamidone (Reason), azoxystrobin + propiconazole (Quilt Excel), fluazinam (Omega), mefenoxam (Ridomil Gold), phosetyl-aluminum (Aliette), fenamidone (Reason), mancozeb (Dithane, Manzate) and copper hydroxide (Kocide, Champ). Newer registrations with activity against downy mildew include Zampro (ametoctradin+dimethomorph) and Zing! (chlorothalonil+zoxamide). Although labeled for onion downy mildew, coppers and chlorothalonil are not very effective for disease control, and coppers can be phytotoxic to onions. Please see the 2015 Wisconsin Vegetable Production Guide A3422 for further details on application rates and specifications. If you suspect you have Downy mildew in your onions, please get a sample and contact your county agent, our disease diagnostic clinic, or myself for confirmation.



Cucurbit downy mildew updates: Our first report of downy mildew on cucurbits in WI occurred on July 20. Few lesions were identified on cucumber and cantaloupe in Dane County on a few plants that have been treated with fungicide. In the past week, downy mildew was confirmed in AL, IL, IN, KY, MI, NC, NJ, NY, OH, PA, SC, TN, TX, VA, and WI. Prior reports of the disease have been confirmed in AL, DE, FL, GA, LA, MD, MI, NC, NJ, NY, OH, ON Canada, PA, SC, TN, TX, and VA. For more information, visit: http://learningstore.uwex.edu/Assets/pdfs/A3978.pdf

Map of recent (red counties) and past (green counties) reporting cucurbit downy mildew in the U.S. through the http://cdm.ipmpipe.org/ website. The map was sourced at 4:28PM on July 24, 2015. There is moderate risk for disease spread in central Wisconsin for Sunday (see forecast map below). **We need to keep an eye out for this disease on cucurbits. Weather conditions have been prime for infection.**

Risk prediction map for Day 3: Sunday, July 26



Moderate Risk to cucurbits in east-central WI, southeast PAnorthern DE, NJ, Long Island, far southern GA, the eastern FL panhandle, central and far southern FL. Low Risk for southeast LA, southwest MS, northern PA, western NY, and near the IN / IL sources. Minimal Risk to cucurbits otherwise.

Snap bean diseases: bacterial foliar and pod diseases as well as white mold have been problematic in snap bean fields this past week. Bacterial brown spot (*Pseudomonas syringe* pv. *syringe*, photo below) is the most economically significant disease in processing beans in the north central region of the US. Symptoms are small, oval, necrotic lesions on leaves. A narrow yellow to green zone may surround the lesions. Bacterial exudate or ooze and water soaking are rarely observed prior to necrosis. The tissue around the lesion may appear puckered. Lesions can coalesce and their centers may fall out given a rough or tattered appearance. Pod infections result in symptoms which are small, dark brown and may cause pod malformation. The bacterium is typically not seedborne but rather survives in weed hosts. The bacterium can survive in debris for 1 year. Spread in field is by wind-blown rain or overhead irrigation. Overcast, cloudy, humid weather is favorable for this disease. Moderate and warm temperatures are conducive to disease development. Plants injured by high winds, hail or blowing sand are very susceptible to infection. Varietal resistance and crop rotation aid in management. In-season management with copper containing chemicals on a weekly basis after symptoms have been observed are recommended when weather favors disease.

White mold caused by the soilborne fungus *Sclerotinia sclerotiorum* is also very active in legume and other crops at this time in Wisconsin (photo below). White mold is a serious foliar and pod disease of snap beans grown for processing. The pathogen has a broad host range (more than 400 plant species), including carrots, peppers, tomatoes, potatoes, cabbage, squash, lettuce, beans, peas, and parsley.

The pathogen initiates disease with soilborne survival structures called sclerotia which can survive in soil for approximately 8 years. New infections occur when sclerotia near the soil surface germinate under the bean canopy and form apothecia (mushroom-like structures that make/spread spores). Each apothecium produces millions of ascospores which infect bean flowers which then spread to stems and pods. Successful infection of plant tissue requires a continuous leaf wetness period of 16 to 48 hours at 54 to 74°F. In other crops, such as cabbage, peppers, celery, and lettuce, the sclerotia can also germinate directly (without producing apothecia) and infect the host plant at or just below the soil surface. The fungus then grows throughout the plant.

Crop rotation (3-5 years), increased plant spacing to improve airflow, irrigation management, and chemical and/or biological control, should all be utilized to manage white mold. Avoid overapplication of nitrogen as that increases canopy and favors disease. Organic (and conventional) farmers can apply Contans, a biofungicide (*Coniothyrium minitans*), to reduce white mold inoculum density. For chemical control recommendations for, consult Page 49 of the A3422 Commercial Vegetable Production Guide for Wisconsin. For chemical control recommendations for, consult Page 49 of the A3422 Commercial Vegetable Production Guide for Wisconsin. http://learningstore.uwex.edu/assets/pdfs/A3422.PDF.