Vegetable Crop Update

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

No. 15 – July 29, 2017

In This Issue

Calendar of Events

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 7/21
Antigo	Early 5/3	5/25	>104*	**62***	7/28	9
	Mid 5/15	6/1	>104*	**58***	7/28	9
	Late 6/1	6/15	>101*	**48***	7/28	9
Grand Marsh	Early 4/10	5/15	**523**	**75**	7/28	13
	Mid 5/1	5/22	**516**	**73**	7/28	13
	Late 5/17	6/1	**453**	**65**	7/28	13
Hancock	Early 4/15	5/18	**515**	**62**	7/28	13
	Mid 5/5	5/30	**452**	**52**	7/28	13
	Late 5/20	6/5	**414**	**52**	7/28	13
Plover	Early 4/20	5/20	**518**	**64**	7/28	13
	Mid 5/8	5/25	**493**	**53**	7/28	13
	Late 5/25	6/8	**397**	**52**	7/28	13

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

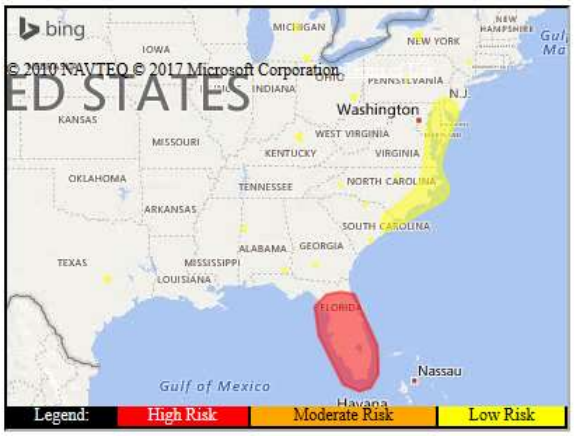
P-Days indicating early blight risk have exceeded threshold for several locations. Recall the threshold is 300 P-Days. Most commercial fields in central and southern WI are now showing symptoms of early blight and/or brown spot in the lower plant canopies. A number of fungicides are highly effective in limiting early blight and brown spot. For fungicide information: http://www.plantpath.wisc.edu/wivegdis/pdf/2017/July%208,%202017.doc.pdf

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 Waukesha Co. WI on tomato (US-23), NY (potato, US-23, Cattaraugus Co.) and ND (potato, Pembina Co.). Previous reports have come from FL, MI (potato, US-23), NC (tomato), NY (potato, US-23), ON, VA, and WA, as reported on the usablight.org website. In all reported cases, with the exception of the WA case, 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, KY, MI, NC, 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 3: Sunday, July 30



HIGH Risk for cucurbits along the FL peninsula. Low Risk for cucurbits in far eastern NC, far southeast VA, eastern MD, DE, and southern NJ. Minimal Risk to cucurbits elsewhere.

Forecaster: TK at NCSU for the Cucurbit *ipm*PIPE - 2017

Black Rot in Cabbage: Black rot disease in cabbage, caused by the bacterium *Xanthomonas campestris*, is problematic in some growing regions of Wisconsin at this time. Black rot caused significant crop losses in cabbage and other cole crops in past years due to above average rainfall and flooding of fields. Symptoms of black rot are most easily recognized by the presence of yellow to brown V-shaped areas extending inward from the leaf margins on outer leaves closes to the ground. Veins in affected areas of leaves are usually black in color. If infection occurred in a young seedling, the disease is usually much more severe since the main stem becomes infected and the disease becomes systemic in the plant. These plants remain stunted and the veins in the stems are black. The heads from these plants deteriorate rapidly after harvest.

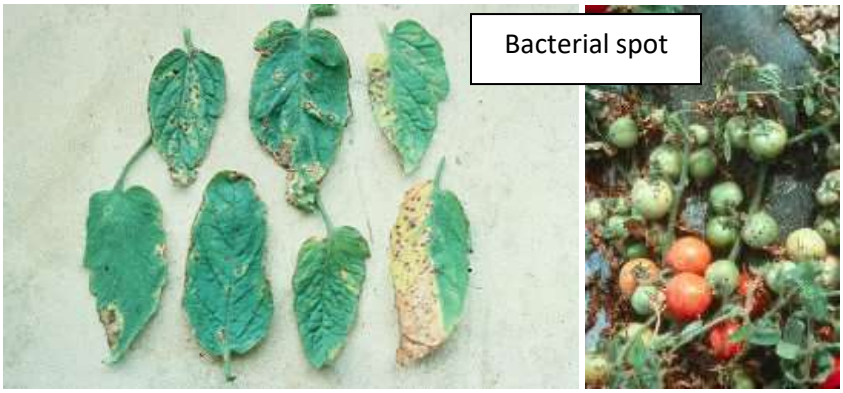
Although the distribution of diseased plants in the field may be quite uniform, the disease may be more common and severe in low-lying, wet, and shaded areas. If few infected seedlings were planted in the field, scattered diseased plants will appear early in the season. Diseased plants often appear in a single row of a field as a result of spread during cultivation or other field activities. Seedling infection is often hard to detect with symptoms of stunting and one-sided growth. The leaves may be light green, and lower leaves may drop prematurely and the vasculature may be black. The bacteria spread and cause most damage in wet, warm weather. The black rot pathogen does not typically spread in dry weather and is limited by temperatures below 50°F. The bacteria can survive in the soil for a year and may be spread in surface water or through irrigation. Black rot can affect most members of the crucifer family, such as mustard, collards, wild mustard, cauliflower, Brussels sprouts, kohlrabi, rutabaga, kale, rape, and Chinese cabbage. Commercial cabbage varieties do not have appreciable black rot resistance. The application of copper containing fungicides can limit the spread of black rot from head to head in the field.

The following management measures can help in limiting losses to black rot in cabbage:

1) Use disease free seed and transplants
2) Practice crop rotation (out of crucifers for 2 years) and avoid replanting in fields known to be heavily infested with the black rot pathogen
3) Limit spread of bacterium on equipment by cleaning and sanitizing equipment and tools between fields
4) Manage irrigation water and limit the occurrence of standing water in fields
5) Avoid activities in a black rot infected field as bacteria can be moved on clothing and equipment from affected to healthy areas of the field
6) When/where appropriate, copper application can limit spread from plant to plant in field

Cabbage black rot symptoms. Note V-shaped brown/necrotic lesions along leaf edges. For more information: http://learningstore.uwex.edu/assets/pdfs/A3181.PDF

Tomato bacterial diseases: Bacterial spot (causal agent: *Xanthomonas campestris* pv. *vesicatoria*), bacterial speck (*Pseudomonas syringae* pv. *tomato*), and bacterial canker (*Clavibacter michiganensis* subsp. *michiganensis*) tomato diseases have been seen in some fields (tomato and pepper). These bacterial pathogens are favored by moist conditions. Bacterial spot and canker are also favored by warm conditions (75-85°F), whereas bacterial speck is favored by cool conditions (65-75°F). Bacterial spot can cause moderate to severe defoliation, blossom blight, and lesions on developing fruit. Bacterial speck also causes these symptoms. Bacterial canker causes wilt, vascular discoloration, scorching of leaf margins, and lesions on fruit.



Foliar symptoms of bacterial spot and speck include small, water-soaked, greasy spots on infected leaflets. Lesions may be surrounded by yellow halos with brown centers that frequently fall out. Lesions may coalesce to form large, irregular dead spots. Spots may also appear on seedling stems and fruit pedicels. In some cases, blossom blight may occur, causing flower abortion. This is more severe with bacterial spot and may result in a split fruit set which is especially troublesome with determinate cultivars.

Bacterial spot lesions are small, water-soaked spots that become slightly raised and enlarged. The centers of these lesions become irregular, light brown, slightly sunken with a rough, scabby surface. In the early stages of infection, a white halo may surround each lesion, giving it the appearance of bacterial canker fruit spot. Small lesions are often confused with lesions of bacterial speck. Bacterial speck appears on immature fruit as a black, slightly sunken stippling, eventually causing lesions less than 1/16 inch in diameter. Mature fruit become more resistant to infection by bacterial speck.

Systemic symptoms of bacterial canker (from infections originating in seeds or young seedlings) include stunting, wilting, and vascular system may exhibit a thin, reddish-brown discoloration of the tissue, especially at the base of the plant. On young seedlings in the greenhouse, lesions may appear as raised pustules on leaves and stems. These plants rarely survive the season in the field. Secondary symptoms in the field include browning of the leaf margins adjacent to a thin band of yellow, and fruit lesions. Spots on fruit are small surrounded by a white halo. Canker bacteria may also invade internal fruit tissues, causing a yellow to brown breakdown. Bacterial canker can infect plants systemically. It is seedborne and can survive on infested plant debris in soil.

Controlling bacterial diseases in tomato includes 1) rotating away from tomatoes and other solanaceous crops for 2-3 years, 2) plant only seed from disease free plants or seed treated to reduce bacteria, 3) good field and greenhouse sanitation, 4) do not handle wet plants to avoid spread, 5) control irrigation to limit leaf wetness. Copper applications can provide some management of bacterial pathogens, but control is limited once there is an established infection.

The 2017 A3422 Commercial Vegetable Production in Wisconsin guide is available for purchase through the UW Extension Learning Store website: https://learningstore.uwex.edu/Commercial-Vegetable-Production-in-Wisconsin2017-P540.aspx

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

https://learningstore.uwex.edu/Assets/pdfs/A3422.pdf