



Vegetable Crop Update

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

No. 19 – September 3, 2013

In This Issue

Late blight updates
Cucurbit downy mildew updates
Basil downy mildew

Calendar of Events

October 30-31, 2013 Potato Variety Harvest Expo, Storage Research Facility, Hancock Agricultural Research Station, WI

January 19-21, 2014 WI Fresh Fruit & Vegetable Conference, The Wilderness, Wisconsin Dells, WI

February 4-6, 2014 WI Potato & Vegetable Growers Association & UWEX Grower Education Conference, Holiday Inn, Stevens Point, WI

Vegetable Disease Update – Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist, UW-Madison, Dept. of Plant Pathology, 608-890-3072 (office), Email: gevens@wisc.edu. Vegetable Path Webpage: <http://www.plantpath.wisc.edu/wivegdis/>

Late blight status in WI and the U.S.: We had a few new late blight confirmations this past week, with a first report in Forest County. Table 1 includes further details. **In the past week, NY, OH, PA reported late blight on tomato and/or potato.** To date this production year, late blight has been reported in in FL, KY, LA, MA, MD, ME, MI, NJ, NY, OH, OR, PA, TN, WI, WV, and Ontario Canada. The website: <http://www.usablight.org/> indicates location of positive reports of late blight in the U.S. and provides further information on disease characteristics and management.

Table 1. Characterization of late blight from Wisconsin in 2013.

County	Host	Genotype	Date of First Confirmation in County
Adams	potato	US-23	28 Jun
Juneau	potato	US-23	29 Jun
Sauk	tomato	US-23	2 Jul
Dunn	potato	US-23	29 Jul
Portage	potato	US-8/US-23	29 Jul/6 Aug
Brown	potato+tomato	US-23	6 Aug
Langlade	potato	US-23	6 Aug
Racine	tomato	US-23	8 Aug
Waushara	potato	US-23	8 Aug
Milwaukee	tomato	US-23	22 Aug
Forest	tomato	US-23	28 Aug

As a reminder, US-8 is resistant to mefenoxam/metalaxyl fungicides and is an A2 mating type; US-23 is sensitive to mefenoxam/metalaxyl fungicides and is an A1 mating type.

Current P-Day (Early Blight) and Severity Value (Late Blight) Accumulations

P-Day of ≥ 300 indicates threshold for early blight risk and triggers preventative application of fungicide. DSV of ≥ 18 indicates threshold for late blight risk and triggers preventative application of fungicide. Red text in table below indicates threshold has been met. NA indicates that information is not yet available as emergence has yet to occur. http://www.plantpath.wisc.edu/wivegdis/contents_pages/pday_sevval_2013.html

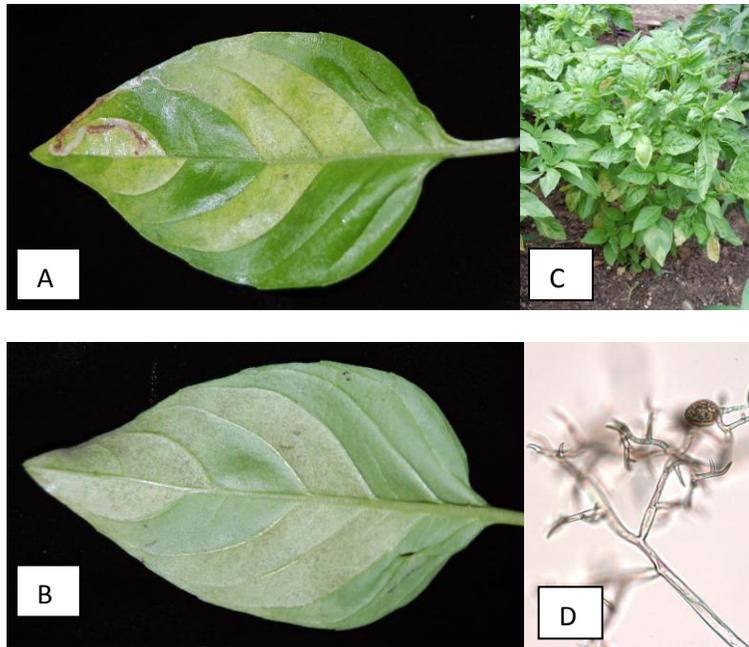
Location	Planted	50% Emergence	P-Day Cumulative (increase from 8/27)	DSV Cumulative (increase from 8/27)	Calculation Date
Antigo Area	Early 5/13	6/4	658 (60)	67 (14)	9/3/13
	Mid 5/22	6/17	581 (60)	59 (14)	9/3/13
	Late 6/7	6/29	483 (60)	43 (14)	9/3/13
Grand Marsh Area	Early 4/15	5/10	772 (53)	301 (16)	9/3/13
	Mid 5/1	5/21	737 (52)	301 (16)	9/3/13
	Late 5/15	6/5	646 (53)	274 (16)	9/3/13
Hancock Area	Early 4/20	5/15	857 (57)	93 (5)	9/3/13
	Mid 5/5	5/23	796 (57)	91 (5)	9/3/13
	Late 5/15	6/5	714 (57)	69 (5)	9/3/13
Plover Area	Early 4/22	5/17	814 (56)	216 (8)	9/3/13
	Mid 5/7	5/30	734 (56)	192 (8)	9/3/13
	Late 5/24	6/5	692 (56)	183 (8)	9/3/13

DSVs and Late Blight: From in-potato-field weather stations here in Wisconsin, we have exceeded initial threshold for Blitecast in all monitored locations. Accumulations of DSVs were moderate to low in most sites. A 5 to 7-day fungicide program is appropriate at this time given presence of pathogen in state.

In order to help better understand the epidemic at hand, **please submit samples to my lab** or work through your county agent and request that they send to me for genotyping. *Even if a sample has already been submitted from your county and determined to be US-23.* All we need to know is the county of sample origin. Identification of genotype at the county level would be very helpful in improving our understanding of this epidemic and potential future risks. Lab address is: Amanda Gevens, 1630 Linden Dr, Room 689, Plant Pathology Dept., University of Wisconsin, Madison, WI 53706. Please send infected leaves in a slightly inflated Ziplock bag with no paper towel. Overnight shipping is best.

Cucurbit Downy Mildew: No additional cucurbit downy mildew has been identified in WI since the Jefferson County confirmation of ~2 weeks ago. No downy mildew has been observed, to date, on cucumber, or in home gardens or our sentinel monitoring plots. **In the past week, many states reported cucurbit downy mildew including, IN, KY, NC, OH, and SC.** In summary this year, AL, CT, DE, FL, GA, IN, KY, LA, MA, MD, MI, NC, NJ, NY, OH, PA, RI, SC, TN, TX, VA, WV, and Ontario Canada have reported cucurbit downy mildew across multiple cucurbit hosts. I will continue to keep tabs on reports in the region and will provide updates in this newsletter. Limited forecasted risk of movement of spores to WI at this time. The website: <http://cdm.ipmpipe.org/> offers up to date reports of cucurbit downy mildew and disease forecasting information.

Basil Downy Mildew was confirmed on a sweet basil type in Madison WI last week. Basil downy mildew has made recent headlines nationally as a new disease in North America as well as Europe. First reported in FL in 2007, basil downy mildew was later found in field and greenhouse in Canada, Argentina, and in the US states of NC, PA, NJ, NY, MA, NC, KS, and MO in 2008. Reports continued in 2009 in the US, and the first report for WI came in 2010.



Basil downy mildew symptoms and signs. **A.** Topside of leaf (note yellowing or chlorosis and brown, dead lesions). **B.** Underside of leaf (note patches of gray-purple fuzzy pathogen sporulation). **C.** Portion of whole plant infected with downy mildew (note yellowing and curling of lower leaves, along with brown lesions). **D.** Branched sporangiophore (spore tree) and sporangia (spore) of basil downy mildew under 200X magnification.

Basil downy mildew is caused by the fungus-like pathogen *Peronospora belbahrii* and can be transmitted on seed, infected plant parts, and on the wind. This particular downy mildew can both ornamental and basil varieties grown as herbs. It is suspected that basil downy mildew has moved geographically on contaminated seed or leaves. The spores of basil downy mildew are produced on leaf underside prolifically and can be aerially dispersed long distances.

The management of basil downy mildew includes planting uninfested or ‘clean’ basil seed, selecting resistant or tolerant varieties, and applying fungicides when environmental conditions favor disease. Minimizing leaf wetness and humidity by any cultural means, including increasing plant spacing, will aid in downy mildew management as the pathogen is favored by moist conditions. It is known that sweet basil varieties are more susceptible than other basil species. Management information below was summarized from work of Dr. Meg McGrath of Cornell University, Long Island Hort Research Station.

Basil varieties susceptible to downy mildew	
Aroma 2	Italian Large Leaf
Genovese	Magical Micheal
Genoveser Martina	Mariden
Nufar	Opal Purple Variegated
Queenette	Poppy Joe’s
Superbo	
Basil varieties tolerant to downy mildew	
Amethyst Imp	Mrs. Burns Lemon
Red Rubin	Red Leaf
Sweet Adin	Lemon
Lemon standard	Lemon Mrs. Burns
Lemona	Lime
Basil varieties resistant to downy mildew	
Spice	Blue Spice
Blue Spice Fil	

Applying fungicides frequently and starting before first symptoms are considered necessary to control downy mildew effectively. Few fungicides are currently labeled for this new disease. Actinovate AG and OxiDate are OMRI-listed fungicide labeled for use on herbs and for suppressing foliar diseases including downy mildew. OxiDate is labeled for use outdoors and in greenhouses. The Actinovate label does not have a statement prohibiting use in greenhouses. There are two phosphorous acid fungicides, ProPhyt and K-Phite, that have downy mildew under herbs on the current label. These fungicides were effective in fungicide efficacy experiments with applications started before or after initial symptoms were found. Greenhouse use is not prohibited. Quadris is labeled for use on basil but not specifically for downy mildew; they have the same active ingredient, which has been shown to be effective for this downy mildew. Greenhouse use is not permitted with Quadris. Other fungicides are expected to be labeled for basil downy mildew in the future.

To determine when to initiate a fungicide program and also when it is warranted to consider harvesting early to avoid losses to downy mildew, growers should not only routinely check regional reports determine when downy mildew is occurring on basil nearby, but also regularly inspect their crop for symptoms. The cucurbit downy mildew forecasting web site (<http://cdm.ipmpipe.org>) might be useful for predicting when conditions are favorable for basil downy mildew since both pathogens likely have similar requirements for successful wind dispersal long distances (e.g. overcast skies) and subsequent infection (e.g. wet leaves). Summer is not a time to forget about this disease: unlike most other downy mildew pathogens, e.g. the ones affecting lettuce and cruciferous crops, which stop developing in summer, the basil downy mildew pathogen seems to develop best under moderate to warm temperatures while also tolerating cool temperatures. Basil crops should be disked under or otherwise destroyed as soon as possible after last harvest, or when abandoned because of disease, to eliminate this source of inoculum.



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Late blight status in WI and the U.S.: No new counties with late blight to report from this past week. In summary, we have confirmed the disease in 11 WI counties from both tomato and potato. For all but 2 samples submitted, the pathogen genotype has been US-23. In the past week, MA and OH reported late blight on tomato and/or potato. To date this production year, late blight has been reported to the usablight.org website from FL, KY, LA, MA, MD, ME, MI, NJ, NY, OH, OR, PA, TN, WI, WV, and Ontario Canada. The website: <http://www.usablight.org/> indicates location of late blight in the U.S. and provides further information on disease characteristics and management. Additional late blight detections may have occurred in other states, but are not reported on the usablight website.

Current P-Day (Early Blight) and Severity Value (Late Blight) Accumulations

P-Day of ≥ 300 indicates threshold for early blight risk and triggers preventative application of fungicide. DSV of ≥ 18 indicates threshold for late blight risk and triggers preventative fungicide. Red text in table below indicates threshold has been met. http://www.plantpath.wisc.edu/wivegdis/contents_pages/pday_sevval_2013.html

Location	Planted	50% Emergence	P-Day Cumulative (increase from 9/3)	DSV Cumulative (increase from 9/3)	Calculation Date
Antigo Area	Early 5/13	6/4	703 (45)	68 (1)	9/10/13
	Mid 5/22	6/17	625 (44)	60 (1)	9/10/13
	Late 6/7	6/29	527 (44)	44 (1)	9/10/13
Grand Marsh Area	Early 4/15	5/10	816 (44)	310 (9)	9/10/13
	Mid 5/1	5/21	781 (44)	310 (9)	9/10/13
	Late 5/15	6/5	690 (44)	283 (9)	9/10/13
Hancock Area	Early 4/20	5/15	904 (47)	96 (3)	9/10/13
	Mid 5/5	5/23	843 (47)	94 (3)	9/10/13
	Late 5/15	6/5	760 (46)	72 (3)	9/10/13
Plover Area	Early 4/22	5/17	858 (44)	218 (2)	9/10/13
	Mid 5/7	5/30	778 (44)	194 (2)	9/10/13
	Late 5/24	6/5	736 (44)	185 (2)	9/10/13

DSVs and Late Blight: From in-potato-field weather stations here in Wisconsin, we have exceeded initial threshold for Blitecast in all monitored locations. Accumulations of DSVs were low in all sites due to hot, dry prevailing conditions. A 5 to 7-day fungicide program is appropriate at this time for any green vines given presence of pathogen in state. This will be one of the last postings of DSVs and PDay accumulations for the production season in WI – as our host ‘Russet Burbank’ fields are soon to be harvested. *Thank you to our grower cooperators for hosting our stations and to R. Vaughan James for continuing to support this program by processing and posting disease severity values for our industry.*

In order to help better understand the epidemic at hand, **please submit samples to my lab** or work through your county agent and request that they send to me for genotyping. *Even if a sample has already been submitted from your county and determined to be US-23.* All we need to know is the county of sample origin. Identification of genotype at the county level would be very helpful in improving our understanding of this epidemic and potential future risks. Lab address is: Amanda Gevens, 1630 Linden Dr, Room 689, Plant Pathology Dept., University of Wisconsin, Madison, WI 53706. Please send infected leaves in a slightly inflated Ziplock bag with no paper towel. Overnight shipping is best. *To growers, consultants, and UWEX colleagues that have submitted samples to us through the Hancock Ag Research Station – thank you – and my apologies for any delays in getting genotype information to you. We aim for a ≤48 hr turn-around time. However, there have been some delays in getting samples to our lab in Madison and any samples received that are not sporulating require extra time to effectively process.*

Cucurbit Downy Mildew: No new counties have reported downy mildew on cucurbits since the Jefferson County identification approximately 3 weeks ago. We have not detected downy mildew on cucurbits in our disease sentinel or monitoring plots in Hancock and Sun Prairie, nor have we seen disease in home gardens or commercial cucumber fields. Likely, the hot, dry weather has limited development of this disease in cucurbit crops in WI. Unlike past years (and fortunately), we have not seen broad dispersal of this pathogen after its initial appearance– and we have not seen the cucumber crop affected. In the past week, many states reported cucurbit downy mildew including, MA, MD, MI, NC, NY, and SC. In summary this year, AL, CT, DE, FL, GA, IN, KY, LA, MA, MD, MI, NC, NJ, NY, OH, PA, RI, SC, TN, TX, VA, WV, and Ontario Canada have reported cucurbit downy mildew on multiple cucurbit hosts. I will continue to keep tabs on reports in the U.S. for the remainder of the season and will provide updates in this newsletter. **The southeastern corner of WI has a low forecasted risk of movement of spores at this time (east-northeast of Jefferson County). For Thursday, the risk is further reduced.** The website: <http://cdm.ipmpipe.org/> offers up to date reports of cucurbit downy mildew and disease forecasting information.