Vegetable Crop Update

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

No. 18 – August 27, 2013

In This Issue

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

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Growers are invited to see the results of the early potato dig from the Fresh Market Variety Trial at the Hancock Ag Res Station-Storage Research Facility. Potatoes are in Locker 3 and are set out for easy viewing. Any day 8:30AM to 4:00PM from Wed to Wed. Potatoes will remain in storage longer term, but there is no guarantee they will remain spread out as they are now. Data sheets will be available asking growers to rank their favorite red, russet, yellow, and specialty.

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 Milwaukee County.** Table 1 includes further details. **In the past week, ME, NY, OH, and Ontario Canada reported late blight on tomato.** 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

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 8/19)	DSV Cumulative (increase from 8/19)	Calculation Date
Antigo Area	Early 5/13	6/4	598 (51)	53 (3)	8/27/13
	Mid 5/22	6/17	521 (51)	45 (3)	8/27/13
	Late 6/7	6/29	423 (51)	29 (3)	8/27/13
Grand Marsh Area	Early 4/15	5/10	719 (45)	285 (15)	8/27/13
	Mid 5/1	5/21	685 (46)	285 (15)	8/27/13
	Late 5/15	6/5	593 (45)	258 (15)	8/27/13
Hancock Area	Early 4/20	5/15	800 (51)	88 (2)	8/27/13
	Mid 5/5	5/23	739 (51)	86 (2)	8/27/13
	Late 5/15	6/5	657 (51)	64 (2)	8/27/13
Plover Area	Early 4/22	5/17	758 (53)	208 (12)	8/27/13
	Mid 5/7	5/30	678 (53)	184 (12)	8/27/13
	Late 5/24	6/5	636 (53)	175 (12)	8/27/13

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.

Potato late blight symptoms are harder to identify in the field at this time given the senescence of the foliage and possibly advanced early blight infection. While it is hard to remove the 'background noise' of late season vine conditions to visualize late blight, the disease should continue to be scouted for as long as there is some green tissue remaining in the field. Identification of late blight in the crop at this stage is useful in considering your harvest and post-harvest management options. Pre-harvest checks for late blight in shallow tubers can further inform your management of a field. Wash tubers prior to checking for symptoms as early infections may be hard to see through even a thin layer of soil. (Tuber blight pics in Fig. 1)

Late season and post-harvest management of late blight: While most vines will die following the first kill treatment, lower stems may remain green especially in instances where potato vines were very hearty and green at time of vine kill. It is still important to continue to scout fields of this status and maintain fungicide programs on a 5 to 7-day schedule.

If late blight has been present in a field, be sure that vines are killed well prior to digging (waiting 2-3 weeks after last vine kill treatment). This will limit potential risk of active late blight pathogen coming in contact with tubers. Take care to limit damage to tubers through the harvest and post-harvest processes. While the late blight pathogen does not need wound sites, they are an easy and ready entry point for late blight and other pathogens.

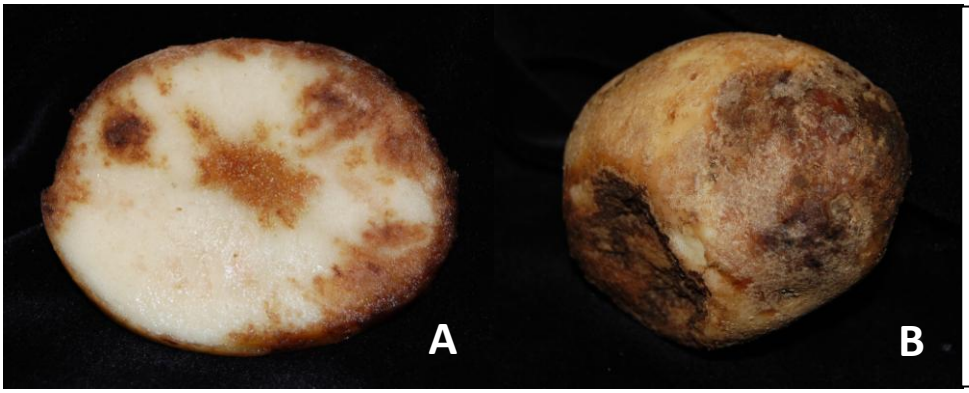

Figure 1. Symptoms of late blight infected potato tubers. Note brown, corky internal tissue (A) and sunken, dark external symptoms (B).

Recommendations for late-season potato late blight disease management should include the following:

1) Continue to scout fields regularly. Scouting should be concentrated in low-lying areas, field edges along creeks or ponds, near the center of center-pivot irrigation structures, and in areas that are shaded and protected from wind. Any areas where it is difficult to apply fungicides should be carefully scouted.
2) Avoid excess irrigation and nitrogen. If foliage is infected with late blight, spores can be washed down through the soil and infect tubers. Green vines can continue to be infected and produce spores even at harvest. Additionally, green and vigorous vines are hard to kill and skin may not be well-set at digging resulting in higher risk of post-harvest infection by late blight and other diseases.
3) Allow 2-3 weeks between complete vine kill and harvest. Fungicide applications should be continued until harvest. When foliage dies, spores of the late blight pathogen that remain on the foliage also die. This practice will prevent infection of tubers during harvest and development of late blight in storage. In many WI fields, even 3 desiccation treatments have not completely killed vines. As such, the continuation of fungicide use to protect tubers is critical.
4) Do not produce cull piles of late blight infected tubers. Such piles are a significant source of spores and centers of large piles may not experience freezing/killing winter temperatures which serve to kill tuber tissue and the pathogen. Culls should be spread on fields not intended for potato production the following year in time that they will freeze completely and be destroyed during the winter. Potato culls can also be destroyed in some other way such as chopping, burial, burning or feeding to livestock.
5) Keep tubers dry in storage. Air temperature and humidity should be managed so as to avoid producing condensation on tubers. Avoid or limit long term storage of tubers from fields

in which late blight was detected. Temperatures ≤45°F limit activity of the late blight pathogen, but are not ideal for curing during pre-conditioning. Condensation and warmer temperatures can promote spore production of the late blight pathogen in storage. Application of fungicides such as phosphorous acids (ie: Phostrol) on tubers entering storage can limit progress and spread of late blight. Carrier volume of fungicides should be no more than 0.5 gal water/ton of tubers.

The decision to make fungicide applications to potato tubers post-harvest is not trivial. The addition of water to the pile, even in small volumes necessary for effectively carrying fungicides, may create an environmental favorable to disease under certain conditions. Typically, post-harvest fungicides are applied in ≤0.5 gal water/ton (2000 lb) of potatoes. At this spray volume, an evenly emitted liquid will leave tubers appearing slightly dampened. If tubers appear slick or shiny with wetness, the spray volume is likely greater than 0.5 gal/ton or the emitter may not be properly functioning.

Under some circumstances, for instance when tubers come out of the field in excellent condition and field history includes little to no disease concern, additional tuber dampness may be unacceptable and seen as a bin risk that outweighs any fungicidal benefit. In other circumstances, tubers may come out looking rough or with harvest damage, and field history includes pink rot or late blight. A scenario such as this may benefit from a post-harvest fungicide and resulting dampness should be mitigated by appropriate ventilation and temperature control.

PDays and Early blight: P-Days have reached/surpassed the threshold of 300 in all plantings of potato in WI. Fungicide applications for the management of early blight are recommended at this time. Because of the dual risk of late and early blight, consider management options that control against both diseases. Symptoms of early blight are advancing in lower and mid-plant canopies throughout most of Wisconsin.

***Cucurbit Downy Mildew*:** was identified in Jefferson County Wisconsin in a commercial field on melon and squash over one week 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, LA, MD, MI, NC, NY, OH, RI, and TN.** 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 be keeping tabs on disease reports in the region and will provide updates in this newsletter. Limited forecasted risk of movement of spores to southeastern WI at this time. The website: http://cdm.ipmpipe.org/ offers up to date reports of cucurbit downy mildew and disease forecasting information.

Management information for cucurbit downy mildew can be found in UW Vegetable Crop Updates – Disease Supplemental #8:
http://www.plantpath.wisc.edu/wivegdis/pdf/2013/Disease%20Supplement%208%20Aug%2013%202013.pdf

Cucurbit powdery mildew: Powdery mildew has become very severe in pumpkin fields across the state. In average years, cucurbits can tolerate some powdery mildew without need for fungicides. However, when powdery mildew comes early, some cucurbits, particularly

pumpkins, may need a fungicide to maintain health and quality of vines and fruit. The use of fungicides for controlling this disease may be necessary to maintain fruit quality, quantity, and storability if disease level becomes high and you're raising a susceptible variety. While there is good varietal resistance in cucumber and watermelon, many pumpkin and squash varieties are susceptible to powdery mildew. Symptoms seen below in Figure 2 begin on lower, older leaves and can rapidly spread to petioles and 'handles' affected vigor and function of leaves. Infected stems can be very dry and brittle and often appear bleached out. Bleached and shattered or missing handles can impact marketability as well as storability of pumpkin fruit as the broken stem often leaves a wound site into which secondary and saprophytic microorganisms can enter and cause storage break down.

The timing of fungicide control measures is important, as some of the registered materials have reduced efficacy if applied after infection is well established. Among conventional fungicides labeled for squash and pumpkin powdery mildew, the following list includes those with good performance: Nova/Rally (myclobutanil), Procure (triflumizol), Pristine (pyraclostrobin + boscalid), Cabrio (pyraclostrobin), Topsin (thiophanate methyl), and Sovran (kresoxim methyl). It is recommended that the above-listed materials be tank-mixed and alternated with broad spectrum fungicides such as mancozeb or chlorothalonil to limit the development of pathogen resistance and to provide a fungicide program with a broad disease management scope. In organic production, there are products with some efficacy against powdery mildew: oils, bicarbonates, sulfur, and copper.

Figure 2. Powdery mildew on pumpkin. A. White powdery pathogen growth on pumpkin stem. B. Powdery mildew signs (white powdery spores) and symptoms (yellow/dying leaves). C. The spores of the powdery mildew pathogen that can be wind dispersed.