Vegetable Crop Update

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

No. 29– August 28, 2015

In This Issue

Calendar of Events

September 1 – UW-Arlington ARS Organic Agriculture Field Day, Arlington, WI
September 8 – UW-West Madison ARS Organic Vegetable Field Day, Verona, WI
December 1-3 – Midwest Food Processors Assoc. Convention & Processing Crops Conference, Green Bay, WI
January 12-14, 2016 – WI Crop Management Conference, Madison, WI
January 25-26, 2016 – WI Fresh Fruit & Vegetable Growers Conference, WI Dells, WI
February 2-4, 2016 – WPVGA & UWEX Potato Grower Education Conference, Stevens Point, 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 8/21
Antigo	Early 4/25	5/25	**637**	**115**	8/27	1
	Mid 5/5	6/1	**637**	**115**	8/27	1
	Late 5/15	6/15	**540**	**89**	8/27	1
Grand Marsh	Early 4/5	5/10	**780**	**133**	8/27	0
	Mid 4/15	5/15	**770**	**132**	8/27	0
	Late 5/1	5/21	**736**	**130**	8/27	0
Hancock	Early 4/10	5/15	**602 (8/2)**	**102***	8/27*	0*
	Mid 4/20	5/18	**577 (8/2)**	**99***	8/27*	0*
	Late 5/5	5/25	**543 (8/2)**	**94***	8/27*	0*
Plover	Early 4/15	5/20	**789**	**129**	8/27	2
	Mid 4/25	5/22	**750**	**126**	8/27	2
	Late 5/10	5/30	**687**	**110**	8/27	2

Potato Early Blight Preventive Management: P-Days have surpassed threshold of 300 in all potato plantings Wisconsin. Early blight pressure is especially heavy this year. We have noted primarily *Alternaria solani* (early blight) in field, with just minor findings of *Alternaria alternata* (brown spot). 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: Late blight has been detected in several additional fields of potato and tomato this past week. And, many reports are now coming in from home gardeners in counties along the western side of WI (near Twin Cities) and the southeastern corner of the state (Walworth & Kenosha Counties). Weather was not favorable for late blight over this past week, with accumulations of Disease Severity Values ≤2 for the entire week in most locations. Recall that 4 DSVs per day is the maximum accumulation. Our Hancock weather station has not been functioning properly over the past few weeks. In this newsletter, I included DSVs as generated for the Hancock location by our web-based disease forecasting tool (annotated in the above table with asterisks). This weather data is generated from NOAA environmental data and is not from an in-field weather station.

Continued management of late blight is critical to maintain healthy potato tubers below ground. In field with foliar late blight, assess stolon ends of tubers for symptoms of late blight to determine if tuber blight has already set in. This disease can have a long latency period from time of tuber infection to symptom development.

Late season and post-harvest management of late blight: While most vines will die following the first or second kill treatment depending upon the vigor of the crop, temperature, and moisture level, 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.

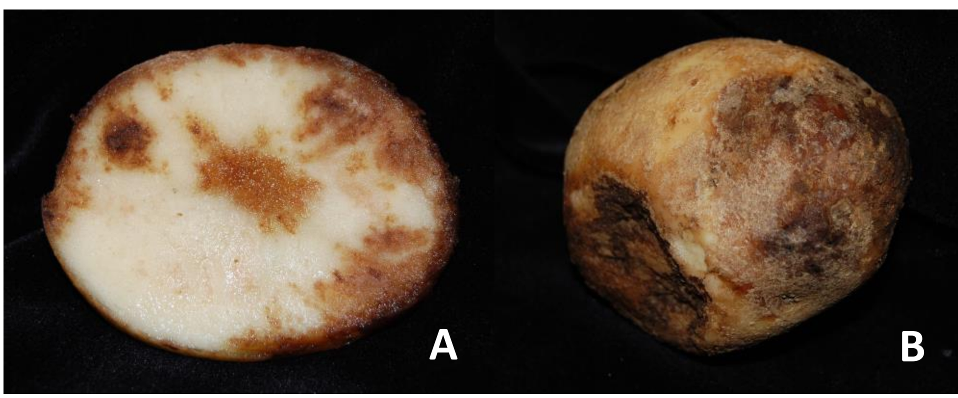


Figure 1. Symptoms of late blight infected potato tubers. Note brown, corky internal tissue (A) and sunken, dark external symptoms (B).

<u>Recommendations for late-season potato late blight disease management should include the following:</u>

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 some years, 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.

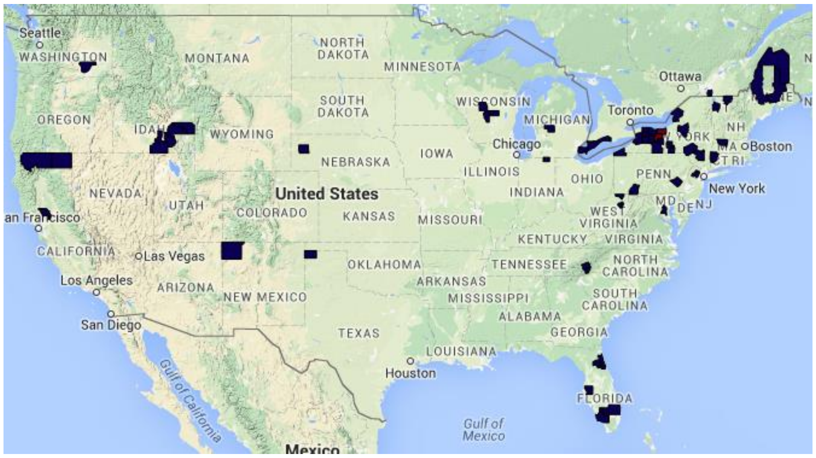
The decision to make fungicide applications to potato tubers post-harvest is not trivial. The addition of water to the pile, even in small volumes necessary for effectively carrying fungicides, may create an environmental favorable to disease under certain conditions. Typically, post-harvest fungicides 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.

In Wisconsin: Fourteen counties in Wisconsin have submitted samples which were confirmed for late blight in potato and/or tomato. While I don't maintain a comprehensive list of how many fields were infected by county, the disease has been detected in several fields within each of the counties I have listed below. In all cases in which we have tested, the *Phytophthora infestans* is of the US-23 genotype. Reports are listed below. The US-23 genotype is sensitive to conventional phenylamide fungicides such as mefenoxam and metalaxyl (ie: Ridomil Gold SL). The use of antisporulant fungicides (ie: Forum, Previcur Flex, AgriTin, Revus Top, Zampro, Ridomil) is critical to manage late blight in a field. In organic systems, copper containing fungicides continue to prove most effective and provide greatest broad spectrum disease control in tomato and potato. EF-400 and BacStop (Anjon Ag) also provides control of late blight as seen in replicated open field trials in MI in recent years. While our previous lab and greenhouse investigations with Zonix indicated efficacy of the rhamnolipid for late blight control on tomato with a single inoculation, open field evaluations in PA and NC have not shown good control. Copper fungicides were, in most cases, 2X better at controlling late blight than the Zonix treatments (based on season-long disease or AUDPC).

Date of Confirmation	**County (general location)**	**Host**	**Late blight pathogen genotype**
23 June	Adams (northern)	Potato	US-23
8 July; 24 July; 29 July	Waushara (western)	Potato; Tomato	US-23
8 July; 28 July; 18 August	Wood (southern, central)	Potato; Tomato	US-23
14 July	Marquette (central)	Potato	US-23
15 July; 28 July; 18 August	Portage (central)	Potato; Tomato	US-23
23 July	Columbia (north central)	Tomato	US-23
23 July	Fond du Lac (north central)	Tomato	US-23
4 August	Polk (southeastern)	Tomato	US-23
12 August	St. Croix	Tomato	US-23
17 August	La Crosse	Potato; Tomato	US-23
17 August	Marathon (central)	Tomato	US-23
17 August	Walworth	Tomato	Not yet determined
28 August	Kenosha	Tomato	Not yet determined
28 August	Brown	Tomato	Not yet determined

Across the nation: There were new detections of late blight in NY this past week on potato (US-23) and tomato as posted to www.usablight.org. To date, nationally, there have been confirmations of late blight in FL (US-23), CA (US-11), CT (US-23), ID (US-23), IN (US-23), NC (US-23), TX (not reported on usablight.org/strain not yet identified), WA (US-8), MA, MD (US-23), ME (US-23), MI (US-23), NC, NE, NJ (US-23), NM (US-23), NY (US-23), ON and QC Canada, PA (US-23), TX, VT, WA, WI (US-23), and WV. See map below (blue counties are greater than 7 days old; red county indicates detection made in just the past 7 days). Screen shot grabbed at 11:05PM on 28 August, 2015.



<u>Fungicides are still critical for protection of potato and tomato crops in organic and conventional systems at this time.</u>

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. Fungicides for organic systems and home garden fungicides can also be found at my website.
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.

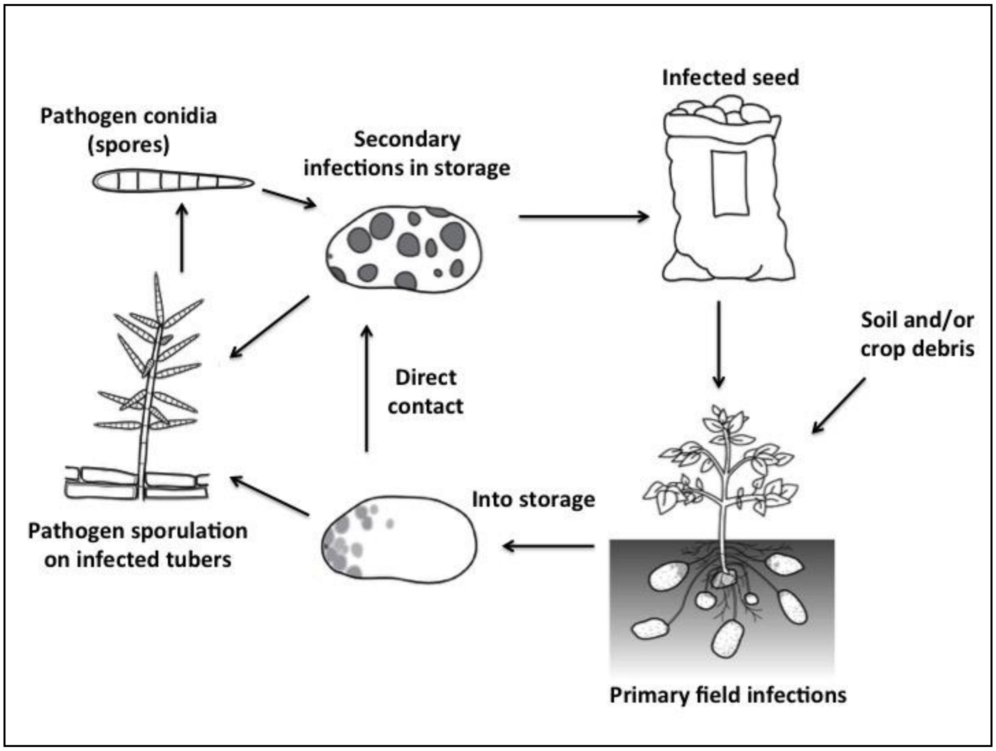
Management of blemish diseases of potatoes. Julia M. Crane, Amanda J. Gevens, and Amy O. Charkowski, Department of Plant Pathology, University of Wisconsin-Madison

INTRODUCTION: Silver scurf and black dot are potato blemish diseases that are growing in prevalence and economic importance. Both diseases cause tuber discoloration that makes infected tubers unmarketable. This discoloration is especially noticeable on potatoes commonly grown in muck soils, such as red and blue potatoes. Unfortunately, there are large gaps in our understanding of both diseases and how to best manage them, although research on these diseases has been intensifying in recent years. Silver scurf and black dot are caused by separate fungal pathogens that have distinct life cycles. Management strategies mostly consist of cultural and chemical controls, and are hindered by the lack of commercially available resistant cultivars. These ever-present diseases are challenging to control and require an integrated effort to reduce their impact on potato production. This document describes both diseases and available management strategies. **We will focus on field management, however, keep in mind that there are additional strategies for management of both of these diseases post-harvest.**

Silver scurf (left): fungus *Helminthosporium solani* **Black dot (right):** fungus *Colletotrichum coccodes* (photo courtesy P. Wharton, Univ. of ID

DISEASE BACKGROUND: Symptoms: Silver scurf and black dot symptoms appear as greyish, shiny lesions on the tuber skin. Silver scurf lesions begin as circles with well-defined borders, and are often initially at the stolon-end. Over time, they coalesce to cover much of the tuber surface. Black dot symptoms may be darker, are generally less defined, and cover a greater portion of the tuber surface. The black dot pathogen also causes foliar and stem symptoms similar to early dying and it may play a minor part in the potato early dying disease complex. The symptoms of both diseases are most evident on red and blue potatoes, and on tubers that are wet. Silver scurf and black dot symptoms are very similar, and in many cases microscopic or molecular diagnostic analysis is needed to differentiate between the two diseases. These diseases are typically cosmetic and affect just the tuber skin, although they may lead to tuber shrinkage and yield loss, particularly in storage. Infected fresh market tubers are frequently rejected, since tubers with these diseases lesions are unappealing to consumers. Diseased processing tubers may also be rejected, since chips produced from infected tubers often have burnt edges due to a hardening of the tuber skin.

Silver scurf disease cycle:



Initial silver scurf infection occurs in the field. The largest source of inoculum is believed to be from infected seed tubers, although inoculum may also come from soil or crop debris. The role of soil inoculum is greatest in fields with a history of silver scurf, or where there are shorter rotations between potatoes (less than three years). The fungus grows on the developing tubers, but the majority of symptom development occurs after vine kill. Dry conditions can cause severe symptoms even on young tubers. Significant secondary infection can occur in storage, through direct contact between tubers and the spread of pathogen spores through storage ventilation systems.

Black dot disease cycle: The main source of inoculum is from pathogen spores produced from fungal structures that survived the winter on debris, infected tubers, or in the soil. These structures can survive for several years in the soil in a dormant state. An additional but lesser source of inoculum is from infected seed tubers. Infections can occur on above-ground and below-ground plant parts, and spread to new plants throughout the season via wind and water splashing. Poor soil and warm temperatures contribute to infections. Conditions that stress plants appear to increase susceptibility. Surprisingly, day length may affect black dot severity, which could explain some of the conflicting reports on the importance of this disease. Black dot is more severe under short days than long days. Unlike silver scurf, black dot does not spread easily in potato warehouses. However, storage conditions may promote symptom development on tubers that had asymptomatic field infections at time of harvest.

MANAGEMENT: A combination of strategies will provide optimal control of both diseases. In general, silver scurf management focuses on reducing seed-borne inoculum, although management of inoculum from debris or soil is more important in fields with a history of disease, or when short (<3 years) crop rotations are used. Black dot management focuses on reducing inoculum from infested debris, tubers, and soil. An additional focus of managing both diseases involves reducing the length of tuber exposure to inoculum- through early harvest or selection of late-maturing cultivars. Finally, using good sanitation and overall plant health management practices will decrease the risk of both diseases. As mentioned previously, these methods focus on field management of silver scurf and black dot; additional steps should be taken for managing these diseases in storage.

Cultural control:

Management options include:

1. Field selection- Do not plant into plots with a history of severe disease.
2. Seed selection- Plant disease-free seed.
3. Sanitize field equipment.
4. Rotate-
    a. Silver scurf- Increase the length of rotations to at least three years. Even longer rotations will reduce the incidence of this disease. Rotate with non-host crops such as sweet potato, red clover, carrots, parsnips, beets, or turnips. One study demonstrated success with a barley (undersown with red clover), red clover, potato rotation. Avoid alfalfa, sorghum, rye, oats, corn, and wheat.
    b. Black dot- Rotations likely have less impact than for silver scurf, but could still be beneficial, particularly if rotations are long. Rotate with non-hosts such as barley, rye, or maize. Avoid non-hosts like solanaceous crops, yellow mustard, soybean, and spring canola.
5. Maintain high overall plant health.
6. Dig representative samples prior to harvest and have them evaluated to estimate incidence of disease. This information can be used to make decisions on where and how long to store the harvested tubers.
7. Harvest tubers early- soon after vine kill.
8. Do not spread or dump infested tubers on future potato fields, since they will serve as an inoculum source.

Other options for silver scurf include:

1. Use a lower planting density.
2. Plant smaller seed pieces.
3. Plant seed of a lower generation.

Other options for black dot include:

1. Control weeds, particularly velvetleaf and solanaceous weeds like nightshade.
2. Monitor soil fertility; very high or low levels of nitrogen may increase disease severity.
3. Perform pre-plant solarization/tarping, or mouldboard ploughing to a depth of 30cm.
4. Avoid planting into poorly drained soils.
5. Good plant health is particularly important.

Biocontrol: ***Use only products labeled for silver scurf or black dot and contact your local extension agent if you need recommendations about products appropriate for your region.*** Multiple biocontrol microbes have been tested for control of silver scurf with mixed results, thus these biocontrol microbes do not appear to provide consistent control of silver scurf. Minimal research has been conducted on black dot biocontrol.

Chemical control: Several at-planting products are labeled in Wisconsin for silver scurf and black dot control. See table below for registered fungicides. *Remember to use only products labeled for silver scurf or black dot and follow all label directions when using the product. Contact your local extension agent if you need recommendations about products appropriate for your region.* In-season application of phosphorous acid fungicides, such as Phostrol, have been shown to reduce silver scurf post-harvest in a systemic manner due to an increase in phosphites within the tuber tissues. Post-harvest application of Phostrol, or other phosphorous acid fungicides, can also result in silver scurf reduction through the previously described systemic manner, but also by direct antisporulant activity. Treatment with Stadium fungicide (Syngenta) can also reduce silver scurf when applied post-harvest. This fungicide contains three active ingredients, azoxystrobin, difenoconazole, and fludioxonil. Biopesticide Bio-Save (Jet Harvest) is a *Pseudomonas syringae* biopesticide that has demonstrate control of silver scurf and fusarium dry rot in several studies. Other post-harvest treatments which have been variable in control performance depending upon application parameters include ozone, chlorine dioxide, and peroxyacetic acid. It is important to keep track of your usage of specific fungicides that have risk of resistance, such as azoxystrobin, throughout the life cycle of your potato crop. We are currently working toward screening isolates in WI for QoI resistance to better understand the influence of this factor in overall silver scurf control.

Fungicide(s), FRAC	**Application, formulation**	**Active ingredient**	**Diseases controlled**
		Strobilurins-FRAC Group 11	
Dynasty, 11	Seed, liq slurry	azoxystrobin	Black Dot, Rhizoctonia, Silver scurf
Equation; Equation SC; Quadris; Satori; Willowood Azoxy 25C, 11	In-furrow and banded	azoxystrobin	Black Dot, Rhizoctonia, Silver scurf
Evito 480 SC, 11	In-furrow and banded	fluoxastrobin	Black Dot, Rhizoctonia, Silver scurf
		Phenylpyrroles-FRAC Group 12	
Cruiser Maxx potato, 12, 4A insecticide	Seed, liq	fludioxonil, thiamethoxam	Rhizoctonia, Fusarium, Silver scurf
CruiserMaxx Potato Extreme, 12, 3, 4A insecticide	Seed, liq	thiamethoxam, fludioxonil, difenoconazole	Rhizoctonia, Fusarium, Silver scurf,
Maxim 4FS; Spirato 480FS, 12	Seed, liq	fludioxonil	Rhizoctonia, Fusarium, Silver scurf

Maxim MZ, 12, M3	Seed, dust	fludioxonil, mancozeb	Rhizoctonia, Fusarium, Silver scurf
Maxim PSP, 12	Seed, dust	fludioxonil	Rhizoctonia, Fusarium, Silver scurf
Dithio-carbamates- FRAC Group M3			
Dithane-F45 Rainshield, Dithane-M45, Koverall, Roper DF Rainshield, M3	Seedpiece, Liquid for creating slurry	mancozeb	Fusarium, Late blight, Common scab, Rhizoctonia, Silver scurf
Phenyl-benzamides- FRAC Group 7			
Emesto Silver, 7, 3	Seed, liq	penflufen, prothioconazole	Rhizoctonia, Fusarium, Silver scurf, Black Scurf
Moncoat MZ, 7, M3	Seed, dust	flutolanil, mancozeb, contains alder bark	Late blight, Rhizoctonia, Fusarium, Silver scurf
Thiophanates- FRAC Group 1			
Evolve, 1, M3, 27	Seedpiece, dust	thiophanate methyl, mancozeb, cymoxanil	Silver scurf, Fusarium, Rhizoctonia
Tops MZ, 1, M3	Seed, dust	thiophanate methyl, mancozeb	Fusarium, Rhizoctonia, Silver scurf, Late Blight
Tops-MZ-Gaucho, 1, M3, 4A insecticide	Seed, dust	thiophanate methyl, mancozeb, imidaclopid	Fusarium, Rhizoctonia, Silver scurf, Late Blight

There has been limited effort in developing fungicides to control black dot so the efficacy of some of these products may be limited. Limited studies show that fumigation reduces black dot.

Resistant varieties: No commercial cultivars are completely resistant to black dot or silver scurf, although cultivars vary in the amount of spores produced or in the visibility of the symptoms on the tuber. In general, later maturing cultivars perform better against both diseases, because tubers are exposed to pathogen inoculum for a shorter period of time prior to harvest.

Tolerance to silver scurf been found in wild potato species, and the Verticillium resistant line C287 may also have useful tolerance to silver scurf. Research in this area is on-going.

There has been limited screening of wild potato and potato breeding lines to black dot. A recent screen of 40 wild potato accessions and 46 potato breeding lines found partial resistance in several accessions or lines, suggesting that additional screening would be worthwhile and that increased resistance to black dot can likely be introduced into cultivated potato.

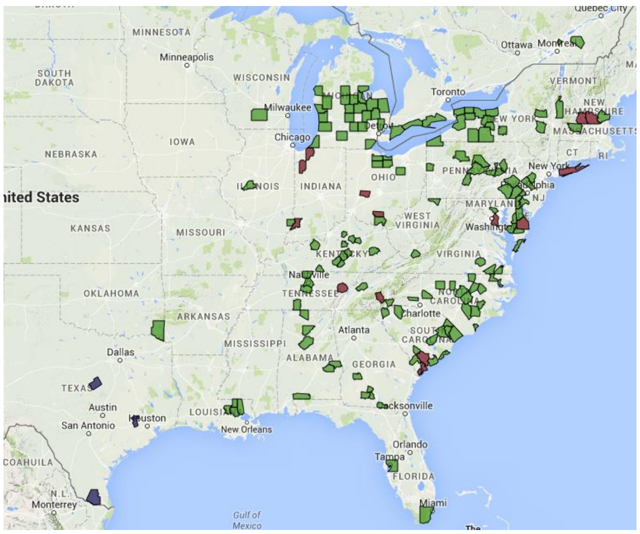
Detection, diagnosis, and identification: Both pathogens can cause latent infections that can develop into symptoms at a later point, making detection important even on tubers that do not appear to be infected. Silver scurf symptoms are very similar to black dot symptoms, but there are no other common tuber diseases easily mistaken for either of these diseases. Because of the similarity between silver scurf and black dot symptoms, microscopic or molecular diagnostic analysis is often needed to distinguish them.

One challenge facing silver scurf and black dot diagnostics is that both pathogens are often observed on the same tubers, making it difficult to determine which pathogen was the primary culprit. An additional challenge in the detection of silver scurf, is that the pathogen may take over a month to grow on tuber surfaces, and can be hidden by faster-growing molds. Molecular diagnostic primers have been developed for both pathogens, and may aid in rapid and comprehensive diagnoses. Research is currently being performed in this area at UW-Madison.

SILVER SCURF AND BLACK DOT SUMMARY

	Silver scurf	Black dot
Pathogen	A fungus, *Helminthosporium solani*	A fungus, *Colletotrichum coccodes*
Inoculum source (major contributor underlined)	<u>Seed</u>, soil/crop debris	Seed, <u>soil/crop debris</u>, weeds
Other plant hosts	Potato is main host, but can survive on debris of several other plants	Many hosts, especially Solanaceous crops and weeds
Infects above-ground plant tissues	No	Yes
Symptoms	Grey/silver lesions, defined margins, lesions not raised, lesions begin small but may grow together	Lesions darker and larger than silver scurf, raised and in irregular patches, black dots may be visible
Frequency of latent or asymptomatic infections	Likely high	Likely high
Potential for spread in storage	Yes	No
Management focus	Reducing inoculum from seed	Reducing inoculum from soil/debris
Season length influence	More disease with later harvest	More disease with later harvest
Crop rotation	Beneficial (>3 years)	Less beneficial
Other cultural strategies	Among others- seed and field selection, planting density	Among others - field selection and preparation, weed control, drainage
Resistant cultivars	No completely resistant commercial varieties available	No completely resistant commercial varieties available
Biological control	No consistently effective organisms identified	No consistently effective organisms identified
Chemical control	Effective seed/in-furrow products	Possibly less effective

<u>Cucurbit downy mildew updates:</u> <u>No new detections of cucurbit downy mildew in this past week.</u> We had detections of downy mildew on organic winter squash in Dane County last week, 8/21/15, and there was also a detection on July 20 in cucumber and cantaloupe from Dane County. At that time, 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 IL, IN, KY, MD, MI, NC, NY, PA, QC, TN, and VA. Prior reports of the disease have been confirmed in AL, DE, FL, GA, IL, KY, LA, MD, MI, NC, NJ, NY, OH, ON Canada, PA, QC Canada, SC, TN, TX, VA, and WI. For more information, visit: http://learningstore.uwex.edu/Assets/pdfs/A3978.pdf. Past newsletters provide fungicide recommendations for downy mildew on cucurbits in WI.



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 11:09PM on August 28, 2015. **We need to keep an eye out for this disease on all cucurbits as it has been identified on cucumber, cantaloupe, winter squash, pumpkin, and watermelon in upper Midwestern states.**

UW Organic Vegetable Field Day focused on flavor, fresh-market quality and variety performance in organic systems.

Free and open to the public. Please join us!

September 8th (Tuesday) from 4-7pm
West Madison Agricultural Research Station, 8502 Mineral Point Rd, Verona WI 53593

For more information: Julie Dawson, dawson@hort.wisc.edu

This field day is focused on vegetable variety trials for organic systems, including agronomic performance, insect and disease management, market quality and flavor. Vegetable crops include beets, cabbage, carrots, sweet corn, cucumber, kale, greens, melons, onions, peppers (sweet and hot), potato, winter squash, and tomatoes (high tunnel and field grown). After brief introductions from each researcher, participants will be able to the variety trials and hear results from different organic research projects. Attendees will get to participate in a flavor evaluation of different varieties in the trials represented.

Chef-farmer-plant breeder collaborative

Julie Dawson, Ruth Genger, Irwin Goldman, Phil Simon, Bill Tracy

Northern Organic Vegetable Improvement Collaborative – Erin Silva, Bill Tracy

Carrot Improvement for Organic Agriculture – Phil Simon, Erin Silva

Beet, onion and carrot breeding – Irwin Goldman

Sweet corn breeding – Bill Tracy

Participatory potato breeding – Ruth Genger

Hoop-house and field-grown tomato variety trials– Julie Dawson

Organic disease management for tomatoes and potatoes – Amanda Gevens

Organic insect management – Russell Groves