



# Vegetable Crop Update

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

No. 3 – April 15, 2016

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Early season potato diseases, potato seed treatments, and late blight considerations  
Hands-on field day – Tools in Action  
New Fruit Crop Updates Newsletter

## Calendar of Events

July 21, 2016 – UW-Hancock Agricultural Research Station Field Day

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The weather is finally warming up and the forecast indicates a continued warming trend in through the coming week! While many vegetable crops have a ways to go before direct seeding or transplanting to the field, potatoes have been going in the ground in southern and central Wisconsin.

**Potato early season disease considerations:** Wet and cool soils, as we've experienced over the past week, delay germination and emergence. Such conditions also promote activity of plant pathogens, such as *Rhizoctonia solani*, a potentially seed-, soil-, or debris-borne fungal pathogen which causes stem or stolon cankers resulting in reduced stands, stunted plants, and/or reduction in tuber number, size, or quality. Later in the season, **Rhizoctonia** can also cause black scurf on tubers. Cultural management approaches such as planting when soil temperatures are more consistently above 46°F, planting into well-drained soils, avoiding planting too deep, and avoiding hilling prior to adequate emergence can limit early season stem and stolon canker.

Several other seed-, soil-, and/or debris-borne diseases can also impact the potato crop, including **Fusarium seed piece decay** caused by the fungus *Fusarium sambucinum*, **Silver scurf** caused by the fungus *Helminthosporium solani*, and **Late blight** caused by the oomycete *Phytophthora infestans*. While optimum temperatures for promoting each of these diseases vary, all require high soil moisture levels.

**Fusarium**, as a dry rotting pathogen which requires wounds for entry, can affect quality of seed potatoes in storage and lead to further disease concerns when potatoes are moved and warmed for planting. As a seed piece decay pathogen, *Fusarium* can affect seed immediately after cutting and through to sprouting. If initial and subsequent sprouts continue to be affected by *Fusarium*, the seed piece loses vigor and stand is reduced.

The **Silver scurf** pathogen is favored by warmer conditions and is recognized as a weak soil-borne and a stronger seed-borne pathogen. Typically, symptoms are not evident on tubers at harvest, but develop over time in storage. The longer the tubers remain in the ground after vine kill, the greater the risk for development silver scurf. Blemishes on tubers are restricted to the

periderm. However, damage to the periderm causes increased water loss and shrink. The pathogen is not known to cause above ground plant symptoms.

Fungicide seed treatments have a place in an integrated pest management (IPM) plan which includes cultural practices such as i) planting certified potato, ii) proper handling and sanitation of storage/cutting/curing facilities prior to planting, iii) cultivar resistance, iv) biological control, and v) chemical control. In combination, IPM practices minimize economic losses to disease, minimize environmental effects, limit risk of pesticide residues in the food supply, limit development of fungicide-resistant pathogen strains, and limit development of pathogen strains which may overcome host disease resistance.

Seed cutting and planting events provide opportunities for application of fungicides to reduce negative effects of diseases such as *Rhizoctonia*, *Fusarium*, silver scurf, and late blight. While this article specifically addresses seed treatments in potato disease control, several potato fungicides are registered for in-furrow application and are also effective in managing seed- and soil-borne diseases. While seed-applied fungicides can enhance disease control and crop success, be mindful that some of the fungicides are contact only (ie: mancozeb and fludioxonil) and are active by limiting direct infection to the protected seed piece. Systemic fungicides (ie: flutolanil and cymoxanil) are xylem mobilized, moving the fungicide upward and outward (acropetally) for protection beyond the point of contact. Generally, seed-applied fungicides provide, at most, 10-14 days of disease protection. However, some active ingredients can protect seedlings considerably longer when applied at the highest labeled rate.

Typically, seed treatments are applied right after cutting with either a liquid or powder formulation. Taking care to avoid clumping or thick coating of the treatment is important as you can cut off oxygen to the seed piece and limit suberization (and promote soft rot). Good suberization of cut seed pieces is a critical component of potato disease management and should include a 3-4 day, 50-55°F, 90-95% relative humidity period with cut seed piled no deeper than approximately 6 ft to maximize airflow throughout the pile.

Seed treatments in potato have received increased interest and use in recent years due to improvements in active ingredients available, and the return on the investment of early season disease control. As there are no true rescue treatments for underground diseases post-planting, seed treatments provide a most effective use pattern with added benefits of relative ease of application, small volumes of fungicide necessary, no spray drift, and no waste or negative impact on non-target sites.

Several fungicides with effective control of multiple diseases are available with registration for application to seed pieces prior to planting. Always read and follow the pesticide label prior to use. While not comprehensive, the table at the end of this newsletter lists alphabetically by trade name, commonly used and currently registered fungicides for use on potato seed in Wisconsin.

**With the recent presence of the late blight pathogen in Wisconsin, and the uncertainty of disease-favorable weather conditions in 2016, it is critical that all growers of tomatoes and potatoes be on alert and prepared for late blight control. Key components of late blight control in potato are:**

- 1) Destroy all potato cull piles (May 20 deadline by DATCP)
- 2) Manage potato volunteers in all fields -*volunteers pose great risk for late blight introduction*
- 3) Acquire disease free seed from a reputable certified source -*infected seed poses great risk for introduction*
- 4) If there is a risk of disease associated with seed, use seed treatment or in-furrow application of effective late blight controlling fungicides (seed treatment is best)
- 5) Apply **only proven effective fungicides** for control of late blight when disease forecast tool indicates environmental risk and stay on a fungicide spray program (DSVs reach 18)
  - a. For conventional systems, a current list of registered late blight-specific materials can be found in the Commercial Vegetable Production in Wisconsin A3422 publication (further information below)
  - b. For organic systems, copper-containing fungicides have been long-standing effective materials for preventing late blight in susceptible crops. Some newer organic fungicides are also available with promising late blight control
- 6) Scout regularly and thoroughly for disease in all potato fields
- 7) Re-apply effective fungicides for disease control on a 7 day schedule (recommendation adjusts to a 5 day schedule when late blight is in the area and weather favors disease; recommendation adjusts to a 10 day schedule when late blight is not found in area and weather is hot and very dry)
- 8) If late blight is identified in a field, have a mitigation plan in place for specific site. Depending on days to vine kill, environmental conditions, and extent of infection – plan may vary from complete crop destruction to early vine kill with continued maintenance fungicide sprays. Mitigation plan should limit disease spread within field and from field-to-field.

The 2016 A3422 Commercial Vegetable Production in Wisconsin guide is available for purchase (\$10) through the University of Wisconsin Extension Learning Store website:

<http://learningstore.uwex.edu/Commercial-Vegetable-Production-in-Wisconsin2016-P540.aspx>

A pdf of the document can be downloaded for free at the following direct link:  
<http://learningstore.uwex.edu/Assets/pdfs/A3422.pdf>

I will begin posting Blitecast disease severity values (DSVs) for Wisconsin once we have our weather stations established in potato fields. Several of the host fields have just recently been planted, so we'll be reporting once crops emerge in the coming weeks.

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	fluoastrobin	Black Dot, Rhizoctonia, Silver Scurf
Elatus, 11, 7	In-furrow	azoxystrobin + benzovindiflupyr	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
Cyanoacetamide-oxine - FRAC Group 27			
Curzate 60DF	Seedpiece	cymoxanil	Late Blight
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			
Ernesto 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-Gaicho, 1, M3, 4A insecticide	Seed, dust	thiophanate methyl, mancozeb, imidaclopid	Fusarium, Rhizoctonia, Silver Scurf, Late Blight

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**Hands-on Field Day at Vermont Valley Community Farm sponsored by Fair Share CSA Coalition and University of Wisconsin Extension. Tools In Action.**

**Date:** Sunday, June 12, 2016

**Location:** 4628 Co. Rd. FF, Blue Mounds, WI 4:00-7:00PM

See, handle, and discuss an array of vegetable planting and cultivation equipment for all scales. Everything from the humble Earthway seeder to the illustrious Ferrari custom made carousel transplanter will be on hand to test and inspect. Highlights of the equipment list include a Japanese paper pot transplanter, KULT cultivators, and even the first Drangen lay down work cart imported to the U.S. David Perkins of Vermont Valley Community Farm will host this event and prepare a bed or two for us to work in. David, John Hendrickson, and Joe Schmitt will all provide equipment ranging from large tractor-draw pieces to unique hand-scale tools. See a full list of expected equipment below. Attendees should also bring a tool to share, anything from seeders to weeders to carts that can be easily transported. Please RSVP at:

<https://www.eventbrite.com/e/cool-tools-in-action-tickets-23918280220> and include a tool you can bring. We need a minimum of 15 RSVPs to make this event happen, so [sign up soon!](#)

#### **Equipment List:**

Home-made vacuum plug tray seeder

Jang seeder

Hatfield transplanter

Powel transplanter

BCS mounted Berta flail mower

KULT spiders on S-tine belly mounted cultivator

Tine weeder

Earthway precision seeder

Seed Spider mounted on Allis G

Japanese paper chain pot transplanter and accessories

Ferrari custommade Italian carousel transplanter

Drangen lay down work cart

Skidsteer mounted KULT Dual Cultivator

**Janet van Zoeren, Fruit Crops Extension Intern, Christelle Guédot, Assistant Professor & Extension Fruit Entomologist, & Amaya Atucha, Assistant Professor & Extension Fruit Horticulturist, UW-Madison, Phone: 608-622-2084, Email: [janet@vanzoeren.com](mailto:janet@vanzoeren.com).**

### Introducing the Wisconsin Fruit website and newsletter!

We are very excited to announce that we have just launched our updated Wisconsin Fruit website, which you can find at <http://fruit.wisc.edu>! This site is divided into sections focusing on berry crops, cranberries, grapes, and tree fruit, and offers a one-stop spot where commercial fruit growers and home gardeners can access links to the most recent management recommendations, pest alerts, and research findings from UW faculties. In this way, it is meant to provide a first step toward finding the answer to any questions you might have about Wisconsin fruit production. In order to make the website more convenient for you to use, we're working on making it easily accessible through your mobile devices. Over the next couple of months, we will be making the website friendlier to view on smartphones and tablets.

Along with the Wisconsin Fruit website, we are also starting up the Wisconsin Fruit News, a newsletter on fruit production, with the first issue to come out on April 18<sup>th</sup>. The Wisconsin Fruit News will be issued every other week during the summer, and will contain scouting reports, plant development reports, pest and disease management research updates, and other information pertaining to Wisconsin fruit production. Each issue will be divided into six sections: General Information, Berry Crops, Cranberries, Grapes, Tree Fruits, and an Upcoming Events Calendar.

If you would like a pdf of the newsletter to be delivered directly to your email inbox every other week, you can subscribe on our website! Simply go to <http://fruit.wisc.edu> and enter your email address on the right hand bar where it says "Sign up for our newsletter!" In addition, you are now able to link the Wisconsin Fruit updates and newsletters to the IPM Toolkit application, which was created through the University of Wisconsin's Integrated Pest and Crop Management program (<http://ipcm.wisc.edu/apps/ipmtoolkit/>).

Just download the app, then enter our RSS newsfeed URL (<http://fruit.wisc.edu/feed>), and you will be able to immediately see our most recent posts and to access the newsletters on your phone.

Happy reading!

