Vegetable Crop Update

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

No. 1 – March 2, 2014

In This Issue

Calendar of Events

March 5 – Processed Vegetable Crops Conference – Elizabeth Inn Plover WI
July 22– UW-Hancock Agricultural Research Station Field Day

Cover Crop Webinar Series Announcement– Matt Ruark, Assistant Professor & Extension Soil Scientist, UW-Madison, Dept. of Soil Science, 608-263-2889 (office), Email: mdruark@wisc.edu, Website: ruarklab.soils.wisc.edu

Cover crops are an important tool for Wisconsin farmers to prevent erosion, conserve plant nutrients, and to improve the soil condition. However, there are many aspects of cover crop management that need to be considered to ensure successful establishment and termination, as well as to obtain the short-term and long-term benefits. To address these aspects of cover crop management, a four-part cover crop webinar series is available for free through the American Society of Agronomy. This webinar series is sponsored in part by the University of Wisconsin Department of Soil Science. These webinars are 12:00 to 1:00 pm (CST) and topics are as follows:

March 6: Cover crops, soil health principles, and maximizing yields

March 13: Combining livestock, manure, and cover crops

March 20: Cover crop seed selection and planting

March 27: Cover crop management and termination

Each webinar is co-hosted by one farmer and one scientist (USDA or Extension). This format allows for presentations on successful cover crop management by experienced farmers along with presentations on recent cover crop research. Detailed information on each seminar, including instructions for registration can be found at: https://www.agronomy.org/education/online-courses. You will need to register at least one hour before the start of the seminar. Participants can earn one hour of CEU credit for Certified Crop Advisors, Certified Professional Agronomists, or Certified Professional Soil Scientists.

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 Pathology Webpage: http://www.plantpath.wisc.edu/wivegdis/

Potato early season disease considerations:

Wet and cool soils 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.

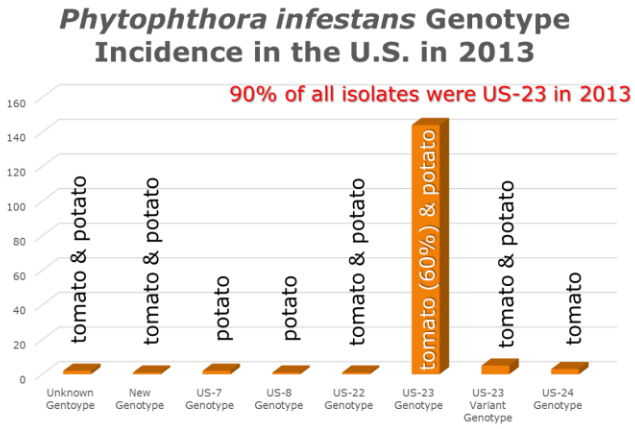
Typically, seed treatments are applied right after cutting with either a liquid or powder formulation. Taking care to avoid clumping or thick coating of the treatment is important as you can cut off oxygen to the seed piece and limit suberization (and promote soft rot). Good suberization of cut seed 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 provided lists alphabetically by trade name, commonly used and currently registered fungicides for use on potato seed in Wisconsin.

Late blight in 2014?:

Late blight continues to be a risk in potato and tomato production in WI and nationally. To briefly summarize the disease in 2013: late blight was confirmed in over a dozen states with the US-23 genotype (strain) predominating most epidemics (see graph on right). The late blight characterized in WI last year was primarily the US-23 type which is sensitive to mefenoxam and metalaxyl products and can be well-controlled with fungicides containing such active ingredients (ie: Ridomil).



Data from www.usablight.org

With the recent presence of the late blight pathogen in Wisconsin, and the uncertainty of disease-favorable weather conditions in 2014, 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 (ie: Zonix, EF400).

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 2014 A3422 Commercial Vegetable Production in Wisconsin guide is available for purchase through the University of Wisconsin Extension Learning Store website:
http://learningstore.uwex.edu/Search.aspx?k=A3422

A pdf of the document can be downloaded or is available 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 potato fields established.

Fungicide, form, FRAC	Active ingredient	Diseases controlled
Fungi-Phite, liq	salts of phosphorous acid	Late blight, Pink Rot, Pythium
Oxidate, liq	hydrogen dioxide	Fusarium
Curzate DF, liq slurry/mist, 27	cymoxanil (must be applied with another fungicide)	Late blight
Dynasty, liq slurry, 11	azoxystrobin	Rhizoctonia, Silver Scurf, Black Dot
Cruiser Maxx potato, liq, 12	fludioxonil, thiamethoxam	Rhizoctonia, Fusarium, Silver Scurf
CruiserMaxx Potato Extreme, liq, 12, 3	thiamethoxam, fludioxonil, difenoconazole	Rhizoctonia, Fusarium, Silver Scurf, Black Scurf
Maxim 4FS, liq, 12	fludioxonil	Rhizoctonia, Fusarium, Silver Scurf
Emesto Silver, liq, 7, 3	penflufen, prothioconazole	Rhizoctonia, Fusarium, Silver Scurf, Black Scurf
Penncozeb 80WP/75DF, liq, M3	mancozeb	Late blight, Rhizoctonia
Manzate Flowable/ Manzate Pro-Stick/Potato Seed Treater, liq, M3	mancozeb	Late blight, Rhizoctonia
Dithane F45/M45/DF, liq, M3	mancozeb	Late blight, Rhizoctonia
Mancozeb 6% Firbark, liq, M3	mancozeb	Late blight, Rhizoctonia
Polyram 80DF, liq, M3	metiram	Late blight, Rhizoctonia
Penncozeb 80WP/75DF, liq, M3	mancozeb	Late blight, Rhizoctonia
Maxim MZ dust, 12, M3	fludioxonil, mancozeb	Rhizoctonia, Fusarium, Silver Scurf
Maxim PSP, dust, 12	fludioxonil	Rhizoctonia, Fusarium, Silver Scurf
Evolve Potato Seed Piece Trt, dust, 1, M3, 27	thiophanate methyl, mancozeb, cymoxanil	Late blight, Fusarium, Rhizoctonia
Moncoat MZ, dust, 7, M3	flutolanil, mancozeb, contains alder bark	Late blight, Rhizoctonia, Fusarium, Silver Scurf