

VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the Purdue University Cooperative Extension Service

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<<http://www.btny.purdue.edu/pubs/vegcrop>>

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EARLY BLIGHT OF TOMATO UPDATE - (Dan Egel) - Early blight of tomato is perhaps the most common disease of tomato in the Midwest. It has not been a difficult disease for most commercial growers to manage. Crop rotation of 3 to 4 years reduces crop residue and disease severity. A few cultivars have partial resistance to early blight. Finally, several fungicide products help to manage this disease. In particular, fungicides in the mode of action (MOA or FRAC) group 11, the strobilurin group, have provided excellent control when alternated with a contact fungicide such as chlorothalonil or mancozeb. Fungicides in MOA group 11 labeled for tomato early blight include Cabrio®, and several Quadris® formulations.

However, there is evidence that at least a few strains of the early blight fungus in Indiana are resistant to group 11 fungicides. Since I do not know the extent of the problem, I would like to collect tomato plants with early blight so that I can isolate the fungus for later examination. If you notice problems with early blight, please let me know so that I can collect a sample (symptoms of this disease are described below). If you want to send me a sample (in state only), please contact me to arrange this.

Fungicides that are not group 11 that are labeled for early blight of tomato include the contact fungicides listed above as well as the systemic fungicides Endura®, Fontelis®, Gavel® and Inspire Super®. Check the *Midwest Vegetable Production Guide for Commercial Growers 2012* for more information on fungicide use on vegetables and what products can be used in high tunnels <http://www.btny.purdue.edu/Pubs/ID/ID-56/>. Always check the label before application.

The first symptom of early blight that one is likely to notice is that the lower leaves of tomato plants appear turn brown and die. This is because older leaves are

more susceptible to early blight than younger leaves. Close examination of the tomato leaves reveals lesions with target-like rings or concentric circles in the brown area (Figure 1). Lesions may occur on leaves, stems, or occasionally the top of fruit.



Figure 1: Early blight of tomato causes round, dark, necrotic lesions with concentric rings. (Photo by Dan Egel)

The fungus that causes early blight survives from year to year in crop residue. This is why crop rotations may reduce disease severity. Although it is not common, it is possible for the fungus that causes early blight to survive on seed, causing lesions on seedlings (Figure 2).

Growers who have had no trouble managing early blight of tomato may choose to continue existing practices. Growers who have had trouble with early blight may choose to use one of the non-group 11 fungicides listed above and contact me about a sample. All growers should carefully monitor early blight in their fields this season.



Figure 2: Early blight may affect transplants when introduced into the greenhouse either through seeds or improper sanitation. (Photo by Dan Egel)



CLEANING AND REUSING TRANSPLANT TRAYS - (Nathan M. Kleczewski) - One question commonly asked by growers is, "Should I reuse my transplant trays or should I purchase new trays every year?" It is recommended that new trays be used every year because some diseases such as gummy stem blight or Fusarium wilt may survive on transplant trays. As a result, reusing trays may allow these diseases to spread from year to year on greenhouse transplants.

Some growers insist on reusing trays for financial or environmental reasons. If you are one of these people, we strongly suggest that any reused trays are thoroughly washed and disinfested. This is necessary because many pests and pathogens can survive in organic matter contained in dirty trays. In addition, these organisms can hide out in tiny cracks or fissures in the trays. A simple water rinse is not sufficient to protect next year's transplants from pest or pathogen carryover.

To demonstrate this point we conducted a small study at the SWPAC, whereby trays of watermelon transplants (Tri-X 313) were infested with spores of the Fusarium wilt pathogen. The transplants were removed at the transplant stage and ten trays each were either 1) rinsed with water and scrubbed in soapy water; 2) rinsed, scrubbed in soapy water and then soaked in dilute bleach for 10 minutes (1:10 dilution of store brand chlorine bleach); or 3) rinsed, scrubbed in soapy water and soaked in quaternary ammonium (Greenshield®) according to the label. We also included trays that were free of Fusarium wilt pathogen and unwashed trays containing Fusarium wilt pathogen for comparison. After washing, new media and Tri-X 313 seeds were added to the trays. The seedlings were allowed to grow to the transplant stage, after which they were harvested and the lower portions of the stems plated onto Fusarium-specific medium to determine if the pathogen was present within the seedling.

Unwashed Fusarium infested trays contained the greatest number of infected seedlings, averaging about 14%. When this is compared to unwashed trays, scrubbing in soap reduced Fusarium infection to nearly 4%. However, soaking trays in dilute bleach or Greenshield® completely prevented infection with Fusarium wilt (Figure 3).

Yes, 4% seems like a small number of seedlings but the effects could be damaging in the field. Studies indicate that relatively low levels of Fusarium contamination of seeds (less than 10% of a seed lot) can result in nearly 30% wilt in the field. This is likely because the infested transplants transfer Fusarium to the field, which then spreads and infects surrounding plants. A similar effect may occur when transplants are infected with Fusarium. Once Fusarium is introduced into a field, it is very difficult to control.

If you insist on reusing trays, we suggest thoroughly scrubbing trays in soapy water and following this with a soak in dilute bleach or a quaternary ammonium product. Other products not included in this trial are also marketed for disinfesting pots or transplant trays. Organic standards permit use of a variety of materials for sanitation, including chlorine materials (with some restrictions) and hydrogen dioxide (e.g. Oxidate®). Be sure to follow instructions on the product label whatever product you choose. This will ensure that any adhering organic matter is removed and disinfested.

I'll leave you with one final question. Is the money you will save by reusing trays worth the risk of spreading pathogens or pests into your fields and the costs associated with managing these pests and pathogens? This is something only you can answer.

For more information on sanitization of greenhouse trays and associated materials please consult Purdue Extension factsheet HO-250-W (*Sanitation for Disease and Pest Management* by Nathan M. Kleczewski and Dan Egel). This publication is available online at the Purdue Extension Education Store (<http://www.the-education-store.com>) or can be obtained by calling the SWPAC office at (812) 886-0198 or stopping by the office located at 4369 N. Purdue Road, Vincennes, IN, 47591.

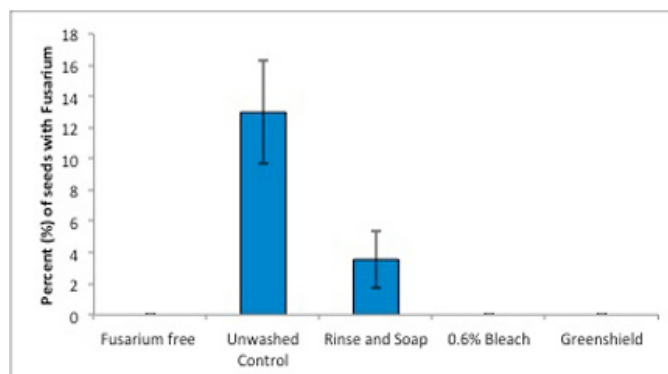


Figure 3: Percent of watermelon seedlings with Fusarium when grown in transplant trays with no Fusarium, or trays infested with Fusarium and then not washed, washed using soap and water, or washed using soap and water followed by sanitization with chlorine bleach or Greenshield®. See text for details.



TIPS FOR SUBMITTING GREENHOUSE AND FIELD SAMPLES - (Gail Ruhl) - Plant samples require extra care when they are packaged for submittal to a diagnostic lab. Before you mail the next sample, please take a few minutes to review these suggestions for packaging and submitting samples. Attention to packaging will help preserve the integrity of the sample during shipment and increase the likelihood of a more accurate diagnosis.

Plugs: keep them in the tray - If possible, do not remove the plugs from the plug tray. Submitting either an entire tray or cutting off and submitting a section of the tray helps maintain the integrity of the plants (Figure 4). Secondary decay often occurs when soil is allowed to come in contact with the foliage, interfering with accurate diagnosis. Submit plug trays that exhibit symptoms in question as well as several normal looking plants for comparison. Submission of a minimum of 10-20 cells with plugs provides the diagnostician with ample material for microscopic observation, culturing, and virus testing if necessary.



Figure 4: Seedling flat wrapped and ready for packaging. (Photo by Gail Ruhl)

Potted material and plants dug from the field: separate foliage from growing media/soil with a plastic bag - The primary concern is to keep the growing media/soil separate from the foliage to prevent contamination and rotting. Choose at least 6 to 8 plants exhibiting symptoms and place the roots and attached soil in a plastic bag, and seal the bag around the lower stem area (Figure 5). Aluminum foil may also be wrapped around soil and roots as a means of containment (Figure 6). Next, wrap the sample in newspaper to prevent additional drying of foliage; place into an UNSEALED plastic bag and place into a crush-proof box with packing material. Ship using priority or express delivery to help preserve sample integrity.



Figures 5 & 6: Eggplant with roots in a plastic bag or aluminum foil. (Photo by Gail Ruhl)

If you are delivering the sample to our building - We welcome delivery of samples in person. There are two designated parking spots for PPDL clients located at the west entrance of Life Sciences Plant and Soils (LSPS), the two-story brick building located in-between Lily Hall of Life Sciences and the Life Science Greenhouses. Samples may be dropped off from 8am-5pm Monday thru Friday in room LSPS 101. A completed submission form must accompany all samples. Sample submission forms can be downloaded from our website <http://www.ppdl.purdue.edu> and filled out ahead of time or are available at the drop off point.

Shipping: avoid the weekend - Mail early in the week! Do not mail or ship samples on Friday, as we are not here to receive them over the weekend. Samples can be sent via US mail, UPS, FedEx, etc. We encourage you to send samples with priority or express delivery so we receive them in the best condition possible to provide you with the most accurate diagnosis.



MELCAST 2012 - (Dan Egel) - Muskmelon and watermelon growers who apply fungicides to control anthracnose, Alternaria leaf blight and gummy stem blight should read on. **MELCAST** was developed at Purdue University by Rick Latin to allow growers to apply foliar fungicides when they are most needed. Details are listed below or in a revised extension bulletin, "Foliar Disease Control Using **MELCAST**", BP-67-W. Download the bulletin at <http://www.extension.purdue.edu/extmedia/BP/BP-67-W.pdf> or contact Dan Egel for a copy.

The **MELCAST** program uses weather information from one of the 12 sites located around Indiana: Daviess County, Decker, Elkhart County, Gibson County, Jackson County, Oaktown, Richmond, Rockville, Sullivan, SW Purdue Ag Center, Vincennes, and Wanatah. Muskmelon and watermelon growers should farm within about 50 miles of a **MELCAST** site. If rain events, dew formation and temperatures at one of the **MELCAST** sites are similar to your farm, **MELCAST** should be effective for you.

Muskmelon and watermelon growers using **MELCAST** apply foliar fungicides every 14 days unless the weather thresholds described below indicate that an application should be made sooner. Below find more details.

1. Apply initial fungicide application at or before vines touch within a row.
2. Check the EFI value for the day of fungicide application.

3. Calculate the threshold for the next application by adding 20 (muskmelon) or 35 (watermelon) to the EFI value in step 2. It is important for muskmelon growers to use the muskmelon EFI values and watermelon growers to use the watermelon EFI values.
4. Apply the next fungicide application 14 days after the first, or sooner if the EFI threshold has been reached.
5. Check the EFI values on the day you make your next fungicide application and re-calculate the threshold for the next application.

A few things to remember: It is better to apply fungicides before the threshold has been reached than after. So, if you are a watermelon grower, the EFI threshold has reached 33 and a rain is expected soon then go ahead and apply a fungicide. If disease becomes severe, then return to a 7-day fungicide schedule. Finally, note that fungicide applications for powdery mildew cannot be scheduled with **MELCAST**.

Keeping track of **MELCAST** values is similar to keeping track of oil changes in a car or truck. When one changes oil, the mileage is written down and the oil changed at the next threshold (3,000 miles or 35 EFI values). EFI values, like mileage of a truck, continue to increase.

Check EFI values by using the toll-free phone number (800) 939-1604 Monday through Friday; check the website 7 days a week <http://btny.agriculture.purdue.edu/melcast/> (or remember melcast.info); or sign up for the free **MELCAST Update** that comes once a week during the season. Please call Dan Egel at (812) 886-0198 with any questions.



NATIONAL CANTALOUPE GUIDANCE PROJECT: OPPORTUNITY AND RESOURCES - (*Liz Maynard*) - Melon growers may already be aware of the National Cantaloupe Guidance (NCG) project underway to develop food safety guidelines for cantaloupes. If not, I want to bring it to your attention because it offers an opportunity to be involved in development of the guidelines as well as resources for learning about food safety and cantaloupes.

The NCG is facilitated by the Fresh Produce Association of the Americas (FPAA), the Produce Marketing Association (PMA), the United Fresh Produce Association (UFGA), and Western Growers (WG). Using a series of weekly web meetings and an online workspace, the NCG plans to develop a draft guidance document this

summer. After a review by experts, the draft will be revised and discussed further to produce a final document. I expect this document will represent a consensus of industry and food safety experts regarding GAPs for cantaloupes and will drive expectations of wholesale buyers.

To see the draft document in progress, visit <http://www.cantaloupe-guidance.org>. Growers (and others) may participate in developing the draft by joining one or more of the Tuesday web meetings (12:00 to 1:30 Eastern Time), or by submitting written comments. The next meeting is May 1 and will include discussion of production site location and animal and human activity.

In addition to the draft guidelines, the web site includes other guidance documents for fresh produce in general and cantaloupes in particular. And for those wanting to learn more about the science behind GAPs, the compilation of key research abstracts relevant to food safety and cantaloupes is a welcome resource.



UPCOMING EVENTS

May 7, 2012, 12:30 - 1:30 ET. High Tunnel Crop Talk. Dial 1-866-492-6283 or go to <https://gomeet.itap.purdue.edu/htct/> and login as a guest. For more info, call 219-531-4200 ext. 4206 or email emaynard@purdue.edu.

May 15, 2012, 6:00 p.m. ET. Garden of Eatin' Field Day and Drip Irrigation Workshop. 268 E. 600 N., Fortville. For more info, call 317-462-1113 or email rballard@purdue.edu.