

VEGETABLE CROPS HOTLINE

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

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WATERMELON DISEASE UPDATE- (Dan Egel, egel@purdue.edu, 812-886-0198) - Most watermelon growers are in the process of placing transplants in the field. I have received several commercial samples of transplants still in trays prior to out-planting. The two diseases I have observed so far are gummy stem blight and bacterial fruit blotch. Below, I discuss these two diseases as well as management options.

Gummy stem blight on transplant seedlings may be recognized by the water-soaked area of the stem (botanical term: hypocotyl) as shown in Figure 1. The water-soaked area may eventually turn brown and woody. A closer look at the woody area may reveal the small, dark fungal structures of the gummy stem blight fungus (see Figure 2). The true leaves of watermelon transplants may also be affected.



Figure 1. This watermelon transplant has a water soaked area just under the seed leaves, a typical symptom of gummy stem blight. (Photo by Dan Egel)



Figure 2. A more advanced symptom of gummy stem blight is the light brown woody appearing area of the stem near the seed leaves. The dark structures of the fungus that causes gummy stem blight may be observed with a 10X hand lens. (Photo by Dan Egel)

The fungus that causes gummy stem blight (*Didymella bryoniae*) may survive in crop debris, thus overwintering in the field from year to year. This fungus may also survive in seed. It is also possible for the fungus to survive in greenhouse production facilities.

Crop rotations with non-cucurbit crops for 3 years will help to lessen disease severity. Preventive fungicide applications may be scheduled with **MELCAST**, a weather-based disease forecasting system. Contact fungicides such as chlorothalonil (e.g., Bravo[®], Echo[®], Equus[®], Initiate[®]) or mancozeb (e.g., Dithane[®], Manzate[®], Penncozeb[®]) should be alternated with systemic products such as Luna Experience[®], Switch[®], Inspire Super[®] or tebuconazole (e.g., Monsoon[®]). Not all of these fungicides are labeled for other fungal diseases such as anthracnose. Remember to alternate modes of action by using the FRAC codes of the fungicides. See the *Midwest Vegetable Production Guide* at <http://mwveguide.org/> for more information.

The symptoms of bacterial fruit blotch (BFB) can be difficult to recognize on foliage. Leaf lesions may be angular and appear to run along the vein (see Figure 3). The lesions may appear water-soaked, especially when viewed on the underside of the leaf. Leaf symptoms of BFB are easily confused with angular leaf spot, a disease that is not often economically important. A laboratory

analysis may be required to distinguish these two diseases. The relatively large, oily lesions on fruit are easier to recognize (see Figure 4).



Figure 3. Lesions of bacterial fruit blotch of watermelon on transplants may include angular lesions that may appear water soaked. (Photo by Dan Egel)



Figure 4. Mature watermelon fruit may have large, dark, irregular lesions due to bacterial fruit blotch. (Photo by Dan Egel)

In contrast with gummy stem blight described above, the bacteria that causes bacterial fruit blotch (*Acidovorax avenae citrulli*) does not readily survive in crop residue. The bacterium is known to survive in seed. It is possible that the bacterium may survive in greenhouse production facilities.

Once BFB is detected in the field, applications of a copper product tank mixed with a mancozeb product may help to lessen disease severity. Whether BFB is detected in a watermelon field or not, updated recommendations are to apply copper 2 weeks before first female bloom, at first female bloom and 2 weeks after first female bloom. Additionally, application of the product Actigard® at 2 of the 3 copper application times listed above is recommended. More information about these new recommendations may be found at <https://>

veggiediseasesblog.org or in the *Midwest Vegetable Production Guide*.

Be sure to inspect seedlings for signs or symptoms of disease. Avoid planting transplants that may be diseased.

Originally published on the veggiediseasesblog.org.



MELCAST - (Dan Egel, egel@purdue.edu, 812-886-0198) - Many cantaloupe and watermelon growers have planted transplants in the field or will soon. A question many growers often have is when and how should one apply fungicides. Applying fungicides according to a weather-based system is easy for cantaloupe and watermelon growers. **MELCAST** was developed at Purdue University by Rick Latin to allow growers to apply foliar fungicides to control *Alternaria* leaf blight, anthracnose and gummy stem blight. When **MELCAST** is followed, fungicides are applied when they are most needed depending on leaf moisture and temperature. Details are listed below or in the extension bulletin, *Foliar Disease Control Using MELCAST*, BP-67-W. Download the bulletin at 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. **MELCAST** also serves growers in Kentucky, Michigan and Missouri. Cantaloupe 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. Cantaloupe 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. A step-by-step list of how to use **MELCAST** can be found below.

1. Apply initial fungicide application at or before vines touch within a row.
2. Check the Environmental Favorability (EFI) value for the day of fungicide application.
3. Calculate the threshold for the next application by adding 20 (cantaloupe) or 35 (watermelon) to the EFI value in step 2. It is important for cantaloupe and watermelon growers to use the EFI values designed for their crop. To get a **MELCAST** calendar to keep track of EFI values, call Dan Egel. Alternatively, a **MELCAST** spreadsheet can be downloaded from <http://melcast.info>.
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 best to apply fungicides before the threshold has been reached then after. So, for example, 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. Use the thresholds of 20 and 35 EFI values as guides. Use a lower threshold if you feel that disease pressure is high. Finally, note that fungicide applications for downy mildew and 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://melcast.ceris.purdue.edu/> (or remember melcast.info); or sign up for the free MELCAST Update that comes once a week during the season. Please call Dan Egel with any questions.



TIPS FOR SUBMITTING GREENHOUSE SAMPLES TO THE PURDUE PLANT AND PEST DIAGNOSTIC LAB (PPDL) - (Gail Ruhl, ruhlg@purdue.edu, 765-494-4641) - Samples in plug trays, as well as unrooted and rooted cuttings, and plants in pots 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. This 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 a section of the tray helps maintain the integrity of the plants (see Figure 5). Secondary decay often occurs when soil is allowed to come in contact with the foliage, interfering with accurate diagnosis. When possible, submit at least 5-10 cells with plugs. This provides the diagnostician with ample material for microscopic observation, culturing, and virus testing if necessary.



Figure 5. Plug flat wrapped and ready for shipment to diagnostic lab.

Cuttings - separate foliage from media with a plastic bag. The primary concern is to keep the growing media separate from the foliage to prevent contamination and rotting. Put the cuttings into a plastic bag, and seal the bag with a twist tie (see Figure 6) at the soil line. Do **not** seal the foliage in a plastic bag. Next, wrap the sample in newspaper to prevent additional drying out of foliage before it is received. Newspaper is one of the best packing materials for plant samples.



Figure 6. Media and roots on left are properly secured for shipment.

Potted Material - pack around the plant. Take into consideration that the mail carrier will not necessarily keep these packages right side up. Place plastic wrap, clear packing tape or paper over the pot surface (see Figure 7), or put the pot in a bag and seal it with a twist tie around the base of the plant. Fill any extra space in the shipping box with newspaper, styrofoam peanuts, or another space filling packing material (see Figure 8) to prevent jostling of sample during shipment.



Figure 7. Tape keeps soil in the pot during shipment.



Figure 8. Use styrofoam, packing peanuts, or crumpled newspaper inside a crush proof box to protect the sample during shipment.

If you are delivering the sample to our building... We welcome delivery of samples in person! There are two parking spaces on the west end of our building. <http://www.ppdl.purdue.edu/ppdl/location.html> Samples may be dropped off from 8am-5pm in room LSPS 116 in the two-story brick building (Life Sciences Plant and Soils) located in-between Lily Hall of Life Sciences and the Life Science Greenhouses. A completed submission form must accompany all samples. Sample submission forms can be downloaded from our website (www.ppdl.purdue.edu) and filled out ahead of time or are available at the drop off point. We also encourage submission of accompanying digital images that show the symptoms and distribution in the greenhouse. <http://www.ppdl.purdue.edu/PPDL/digital.html>

Shipping - avoid the weekend. 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.



CORN EARWORMS - (Rick Foster, fosterre@purdue.edu, 765-494-9572) - 2015 marks the 40th year of my career as an entomologist and I still am surprised on a regular basis by how insects behave. I put out a corn earworm pheromone trap on May 14 and immediately caught 7 moths that night. Over the next three nights, I caught 36 moths. Typically, the few earworms that we would expect to overwinter here in west central Indiana would emerge about June 20. It has not been an unusually warm spring, to say the least, so it is unlikely that those moths emerged locally. The other possibility is migration from southern areas. Earworm moths often migrate in on storm fronts from the south. However, when moths are blown hundreds of miles on storm fronts, their wings usually get a little tattered. The moths I've been catching look pristine, as if they just emerged. So, the bottom line is that I have no idea what's going on.

So, how does this early population of earworms affect vegetable growers? Earworms are very polyphagous, feeding on many plant species, both crop and non-crop. So, the female moths are going to lay their eggs somewhere. My colleague Rick Weinzierl from the University of Illinois has reported earworm damage on strawberries. High tunnel or greenhouse tomato growers need to beware, since the other name for corn earworm is tomato fruitworm. Growers who have very early sweet corn may see earworm larvae feeding on the leaves. This damage is usually pretty minor, but growers need to keep an eye out for unusual damage.



STRIPED CUCUMBER BEETLES - (Rick Foster, fosterre@purdue.edu, 765-494-9572) - Striped cucumber beetles are emerging from their overwintering habitat in southern Indiana. This pest can damage cucurbit crops in several ways. One that I saw this week is that they can kill young transplants by their direct feeding. Of more critical concern usually is their ability to transmit the bacterium that causes bacterial wilt of cucurbits. Cantaloupes and cucumbers are especially susceptible to this disease. Pumpkins and some of the winter squashes are susceptible when the plants are young. Other squash and watermelons are not affected by the disease. Therefore, based on years of research and experience, we have set the treatment threshold at 1 beetle per plant for cantaloupes, cucumbers, and very young pumpkins and winter squash (less than 3 weeks old). For watermelons, summer squashes, and older pumpkins and winter squashes, the threshold is 5 beetles per plant.

Our research has shown that for cucurbits grown in the greenhouse and transplanted into the field, FarMore[®] treated seed provide no protection against striped cucumber beetles. For direct seeded cucurbits, FarMore[®] treated seed will provide about 3 weeks of protection. The use of planting time treatments of Admire Pro[®] or Platinum[®] will also provide about 3 weeks of control for transplants, but our research has shown that the lower rates provide control similar to the higher rate. Use of the lower rate will reduce the exposure of bees and other pollinators to neonicotinoid residues in the flowers. The pyrethroid insecticides provide excellent control of cucumber beetles as foliar sprays. However, it should be noted that our research has shown that weekly sprays of pyrethroids have a significant suppressive effect on cantaloupe yield when compared to spraying only when the threshold was reached. Additionally, spraying only when populations exceeded 1 beetle per plant resulted in 2-3 sprays versus 7-10 when sprays were applied weekly.



APHIDS ON MELONS - (Rick Foster, fosterre@purdue.edu, 765-494-9572) - It's early in the growing season, but I am already receiving calls about aphids on melons. We had lots of problems with aphids in 2013 and not very many last year. Particularly at this time of year, I'm recommending Assail[®] for aphid control on melons for several reasons. First, it does an excellent job killing aphids. Second, it will also provide very good control of striped cucumber beetles when they become active in your field. Third, I've never been a big fan of pyrethroid insecticides for control of aphids. They work to some extent but we have other products that are better. Finally, the active ingredient in Assail[®], acetamiprid, is much less toxic to honey bees than the other neonicotinoid insecticides that could be used for aphid control. If you used either Admire Pro[®] or Platinum[®] at planting time, you should receive 3-4 weeks of aphid control. Growers

should be watching their young melon plants closely. Look on the underside of the leaves. It is best to get the aphids under control before symptoms such as curling leaves are evident.



SEEDCORN MAGGOTS AND WIREWORMS - (Rick Foster, fosterre@purdue.edu, 765-494-9572) - I have received calls about seedcorn maggots in melons and have seen wireworm damage in my research plots in Vincennes. Seedcorn maggots are usually associated with cool weather since the adult flies will not lay their eggs near melons plants when the soil temperature exceeds 70°F. So the cool weather we have had this past week could promote seedcorn maggot problems. One of the species of wireworms I observed is *Conoderus lividus*, a species commonly associated with corn. If you are planting melons after corn, the field could be infested with wireworms, although frankly this is fairly rare. You can determine the potential for wireworm problems prior to planting by burying a cup of flour or untreated grain (corn or wheat) about 6 inches under the ground. Come back and dig up the bait in about a week and look for wireworms. About the only product melon growers have available for either seedcorn maggots or wireworms that is effective is Capture LFR®. This product is not great for control of either pest, but will provide reasonable levels of control.



EXCITING FUTURE FOR HORTICULTURE IN INDIANA - (Petrus Langenhoven, plangenh@purdue.edu, 765-496-7955) - In March 2015 the Department of Horticulture and Landscape Architecture appointed Dr. Petrus Langenhoven as Horticulture and Hydroponics Crop Specialist.

During the past 18 years Dr. Petrus Langenhoven has dedicated his career to the development of the horticulture sector in Sub-Saharan Africa. His career started off at the Agricultural Research Council in Stellenbosch, South Africa. He completed his M.S in Agronomy at Stellenbosch University while working at the Agricultural Research Council. He completed his PhD in Agronomy specializing in vegetable production in high tunnels at Stellenbosch University, South Africa in 2004.

He advanced his career at a non-governmental organization, Agribusiness in Sustainable Natural African Plant Products (ASNAPP). As operations director and senior agronomist he led ASNAPP's greenhouse crop production and specialty fresh market vegetable and herb crop research and technology transfer programs. He specialized in the analysis and development of horticulture supply chains. He has extensive experience

in applied on-farm research and development, outreach and extension, agribusiness development and the implementation of sustainable farming models. He assisted many start-up agribusinesses in the development of their business feasibility plans, production planning and management, and marketing of their products. His research has been used in several outreach and extension manuals. During the past 12 years he has been involved in several United States Agency for International Development (USAID) funded agricultural development projects. He served as Chairman of Intensive Agriculture South Africa (IASA) for 8 years, representing producers and companies from the controlled environment agriculture industry in South Africa.

Dr. Langenhoven is very passionate about horticulture, more specifically about controlled environment agriculture and the impact it can have on year-round local, sustainable food production. "One of the reasons that I find this opportunity so appealing is that I will be able to support the growing local food movement in Indiana by assisting growers with the expansion of their horticulture sector through collaborative extension and research that focuses on the development of sustainable and environmentally friendly production technology, and the evaluation and introduction of alternative horticultural crops." He will work closely with faculty from the Department of Agricultural Economics at Purdue to develop and evaluate the potential of new crops and markets.

His office is on the main Purdue campus (Horticulture Building) in West Lafayette and can be reached by telephone at 765-496-7955 or email at plangenh@purdue.edu.



SOUTHWEST PURDUE AGRICULTURAL CENTER FIELD DAY - A field day will be held on July 9 to share with the public the various research activities at the Southwest Purdue Agricultural Center in Vincennes, IN. The day will start at 7:30 A.M. with a health fair. Registration starts at 8:30 A.M. Presentation topics include: managing cucumber beetles while protecting bees, production of vegetables in high tunnels, canola production, hybrid cottonwood as a bioenergy crop, grape production, field crops disease update, soybean production, maximizing seed corn investment and benefits of starter fertilizer.

Lunch is free with registration. A PARP class will be offered after lunch. Please contact Barb Joyner at 812-886-0198 or joynerb@purdue.edu to RSVP or go on-line at <http://tinyurl.com/2015SWPAC>.



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