Vegetable Crops Hotline

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

Dan Egel, Editor
4369 N. Purdue Road
Vincennes, IN 47591
(812) 886-0198
egel@purdue.edu

No. 534
April 8, 2011

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

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Melcast 2011 - *(Dan Egel)* - Foliar diseases such as anthracnose, Alternaria leaf blight and gummy stem blight cause significant losses to muskmelon and watermelon growers each year (see photos in Figures 1-3). Yield reductions may be due to loss of the foliage that supports fruit production or direct infection of the fruit. In addition, the cost of the fungicides applied for prevention as well as the time and money spent on the actual applications is a major cost associated with these crops. Fortunately, MELCAST (MELon Disease foreCASTer) is available to tell Indiana muskmelon and watermelon growers the best time to apply fungicides (Pumpkin growers can use the watermelon EFI values to schedule fungicide applications.) In most years, MELCAST will save growers 2 to 3 fungicide applications. MELCAST was developed by Rick Latin in the Botany and Plant Pathology Department at Purdue University. At the right and on the next page, you will find information about how to use MELCAST.

The MELCAST program uses weather information from one of the 12 sites located around Indiana. 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 on page 2 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. At the right, find more details. Also, please see the extension Bulletin BP-67 **http://www.ces.purdue.edu/extmedia/BP/BP-67.pdf** (or call me for a copy).

Figure 1: This watermelon has two lesions about the size of a dime caused by anthracnose. The vines surrounding the watermelon are dead due to infection by the anthracnose fungus. *(Photo by Dan Egel)*

Figure 2: This leaf has severe symptoms of gummy stem blight. Although direct fruit infection is rare, gummy stem blight can lower yields through loss of foliage. *(Photo by Dan Egel)*

1. Apply initial fungicide application at or before vine 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 best to apply fungicides before the threshold has been reached then 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 (4,000 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 though 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 with any questions.

MELCAST SITES IN INDIANA

INDAV - Daviess Co., 2 miles N. of Washington on St. Rd. 57

INDEC - Knox Co., 2 miles NE of Decker

INELK - Elkhart Co., Downtown Wakarusa

INGIB - Gibson Co., 1 mile S. of Owensville

INJAC - Jackson Co., 1 mile N. of Vallonia

INOAK - Knox Co., 2 miles SW of Oaktown

INRCH - Wayne Co., Downtown Richmond

INPAR - Parke Co., Downtown Rockville

INSUL - Sullivan Co., Merom Station

INVIN - Knox Co., 1 mile E. of Lincoln High School

INSWP - SW Purdue Ag Center, Knox Co., 5 miles N. of Vincennes

INWAN - LaPorte Co., Downtown Wanatah

Figure 3: Alternaria leaf blight causes medium brown lesions with concentric circles, which are often surrounded by yellow halos. Yield loss may be caused when the symptoms become severe on foliage. *(Photo by Dan Egel)*

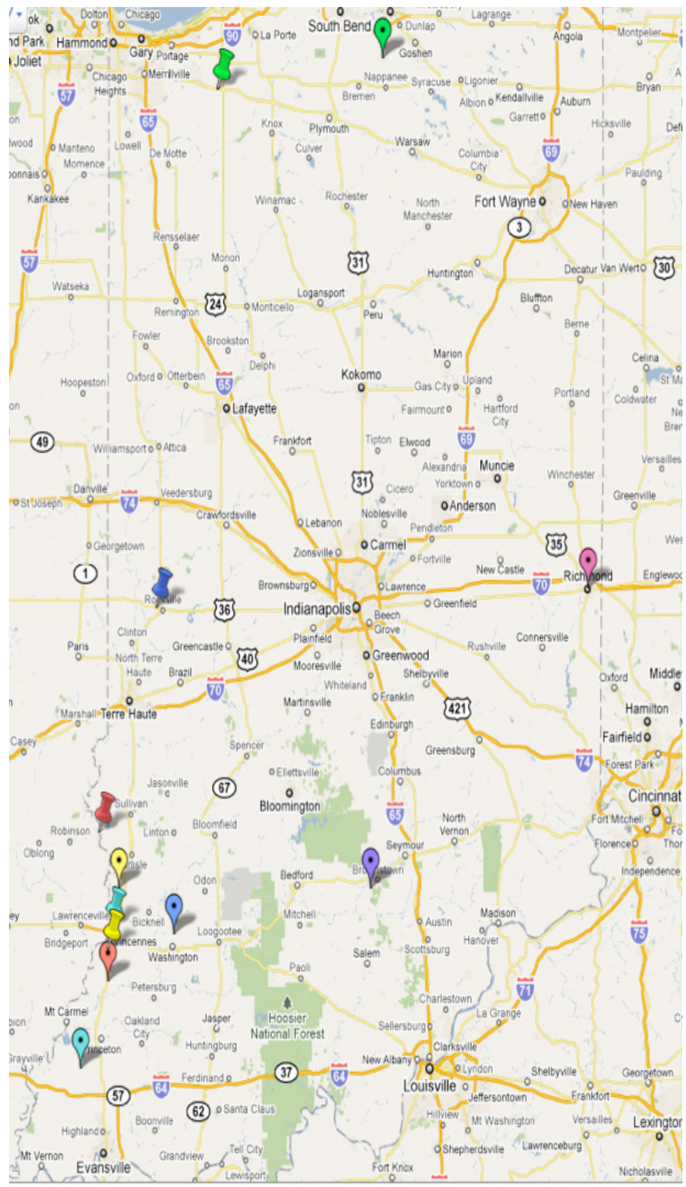

Figure 4: Indiana MELCAST sites for 2011

Planning for Successful Vegetable Transplant Production - *(Liz Maynard)* - Many Indiana vegetable crops begin life as transplants. If lack of nutrients, lack of light, disease, or other problems slow growth during this stage it may reduce establishment success and/or growth and yield in the field or high tunnel. I expect that experienced, successful transplant growers have a plan either in their head or on paper that includes the topics below. If your plan has additional items, let me know!

1. Time: Don't seed transplants too early. Overgrown transplants are difficult to manage. If they get too root bound or shaded by other plants in the same flat that growth stops it will take them longer to resume growth in the field. They may become weakened and more susceptible to disease in the transplant tray and field. The ideal time depends on the crop and cell size, as well as the growing temperature. Recommendations provided in Tables 1 & 2 on the next page were developed for Florida but are also relevant for Indiana production. For ease of transplanting, the finished transplant should have a well-developed root system that holds the root ball together, a sturdy stem, and be of a size that minimizes injury during the transplant process.

2. Cell size: Vegetables are commonly grown in trays with cell diameters of ½ inch to 2 inches, and sometimes in pots up to 4 inches. Larger cells or pots usually lead to greater early yield in fruiting crops like tomatoes, peppers, and muskmelons. Larger cells are also easier to manage because the greater soil volume holds more water and nutrients. The ideal cell size for a particular operation will depend on space available for transplant production, crop harvest schedule, and management available for transplant production.

3. Growing media: Growing media should be free of plant diseases, have pH in desired range, and have enough pore space to allow good drainage and aeration. A laboratory test of the media for pH, electrical conductivity, and major nutrients is useful to avoid any unexpected problems, whether media is purchased or made on the farm. Take care when flats are filled to avoid packing media into cells because that will reduce the pore space.

4. Temperature: Maintaining temperature in the growing medium at the optimum level for germination means seeds will germinate and emerge quickly, reducing the chance that pathogens will kill the germinating plant. During production, air and growing medium temperature can be used to control speed of crop development, with faster development at higher temperatures up to the optimum for the crop. Care should be taken to avoid chilling temperatures for warm-season crops. Be aware that cold irrigation water reduces the temperature of the growing media and may chill sensitive crops.

5. Light: Once seeds have emerged, the brightness and duration of light directly influences how quickly the plants develop. Light provides energy to the plant to create the building blocks needed for the plant structure and biochemical machinery. With low light levels, seedlings will develop new leaves slowly, root development will be poor, stems will be thin, and plants will get tall and spindly, or 'stretch.' In a greenhouse, natural light can be maximized by eliminating shade-producing objects in and outside the greenhouse, painting surfaces white to reflect light, minimizing condensation on the glazing, and orienting the roof or sidewall of the house perpendicular to the sun's rays. In a growth room, artificial light sources that provide photosynthetically active light (wavelengths between 400 and 700 nanometers) may be used. A solid bank of cool white fluorescent lights provides an inexpensive light source for transplant production. Lights should be placed as close to the seedlings as possible without injuring them to maximize the light they receive. Artificial light may also be used in a greenhouse but may not be a worthwhile investment for vegetable transplant production.

6. Water: An annual laboratory test of irrigation water is recommended to document alkalinity, electrical conductivity, pH, and mineral content. Well water characteristics can change from year to year, and this information is useful when troubleshooting a production problem or planning a fertilization program. Delivery of water to seedlings is of course a critical aspect of production. Watering too frequently reduces air available to plants roots and promotes a weak root system. Infrequent watering that leads to crop wilting will over-stress plants leading to long-term growth reduction. Also, when growing media dries out excessively, fertilizer salts can become concentrated enough so that roots are injured and become more susceptible to diseases like pythium root rot. Transplant growth can be managed by judicious watering: keeping plants on the dry side will keep growth in check. Uneven distribution of water translates quickly into uneven growth of transplants. The person in charge of watering should understand the importance of the job, know how to determine when irrigation is needed, and use proper technique when hand watering to evenly supply water. If an automated system is used, check it for even distribution and plan for touch up watering in areas that dry out more quickly.

7. Mineral nutrition: The need for fertilization during transplant production depends largely on the nutrient content in the growing media and how long it takes to produce the transplant. In addition, judicious restriction of nutrients, particular nitrogen and phosphorus, can be used to manage transplant growth. The media soil test recommended above (item 3) will provide information about what nutrients are in the media. Most commercial peat-based or other soilless growing media designed for transplants contains a small amount of 'starter fertilizer' to supply nitrogen (N), phosphorus (P), and potassium (K). Seedlings

grown for more than two or three weeks in this media will usually benefit from additional nutrients. Growing media that contains a significant amount of compost may have enough nutrients that no more fertilization is needed during production. A transplant production system should include a plan to supply mineral nutrients that takes into account nutrients supplied by the growing media and water.

Table 1: Germination temperature required to produce vegetable transplants in containerized trays.

Crop	Optimum Germination Temperature (°F)
Broccoli, Brussels sprouts, Cabbage, Cauliflower, Collards	80-85
Cantaloupe,	90
Cucumber,	90
Eggplant, Pepper, Tomato	85
Lettuce	75
Onion	75
Squash, Watermelon	90

Table 2: Germination time required to produce vegetable transplants in containerized trays.

Crop	Time Required (weeks)
Broccoli, Brussels sprouts, Cabbage, Cauliflower, Collards	5-7
Cantaloupe,	4-5
Cucumber,	2-3
Eggplant, Pepper, Tomato	5-7
Lettuce	4
Onion	10-12
Squash, Watermelon	3-4

Tips for Submitting Greenhouse Samples - *(Gail Ruhl)* - Plant samples, especially those in plug trays, and 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. 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. 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.

Rooted 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 rooted end and media into a plastic bag, and seal the bag with a twist tie 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 1: Wrap samples so that the soil and roots are kept separate from the foliage. *(Photo by PPDL staff)*

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, 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 to prevent jostling of sample during shipment.

Figure 2: Ship samples securely in a box to minimize shifting during shipment. *(Photo by PPDL staff)*

If you are delivering the sample to our building: We welcome delivery of samples in person, however, ongoing construction may somewhat hinder parking near the building this summer. Samples may be dropped off from 8am-5pm in room LSPS 101 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, **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.

Email list for Indiana Fruit and Vegetable Industry - (*Liz Maynard*) - A few years ago the fruit and vegetable Extension team at Purdue established the 'fruitveg' email list for communication among Indiana fruit and vegetable growers and farm marketers. Growers and marketers may use the forum for free and open exchange of information and ideas. The list can be used to coordinate group purchases of equipment and supplies, and as a forum to buy and sell produce and used equipment and supplies.

Extension Staff also use the list to get word out about programs and other topics in between normal editions of newsletters.

This is not a very 'busy' list, so it doesn't clog up your inbox. It's easy to subscribe to the 'fruitveg' email list. Just point your browser to **https://lists.purdue.edu/mailman/listinfo/fruitveg** and type in your email address and a password. If you have trouble subscribing, contact me at **emaynard@purdue.edu**.

Vegetable Specialists for Indiana

Specialist	**Area of expertise**	**Contact**
Dan Egel	Vegetable Diseases	(812) 886-0198 **egel@purdue.edu**
Rick Foster	Vegetable Insects	(765) 494-9572 **fosterre@purdue.edu**
Liz Maynard	Vegetables, Weed Management	(219) 531-4200 ext. 4206 **emaynard@purdue.edu**
Plant & Pest Diagnostic Laboratory – Tom Cresswell, Gail Ruhl	Pest Identification	(765) 494-7071 **creswell@purdue.edu** **ruhl@purdue.edu**
Shubin Saha	Vegetables, Pest Management	(812) 886-0198 **ssaha@purdue.edu**
Steve Weller	Weed Management	(765) 494-0391 **weller@purdue.edu**
Fred Whitford	Pesticide Education & Regulations	(765) 494-1284 **fwhitford@purdue.edu**
Jennifer Dennis	Marketing	(765) 494-1352 **jhdennis@purdue.edu**