

VEGETABLE CROPS HOTLINE

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



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MELCAST 2018

(Dan Egel, egel@purdue.edu, (812) 886-0198)

MELCAST is a weather-based disease-forecasting program that helps growers schedule foliar fungicides. MELCAST stands for MELon disease forCASTer. This program, designed by Dr. Rick Latin, Professor of Plant Pathology at Purdue University, keeps track of weather conditions so that cantaloupe and watermelon growers can apply foliar fungicides to their crops when they are most needed. The foliar diseases that MELCAST was designed for are *Alternaria* leaf blight, anthracnose and gummy stem blight. In a typical year, MELCAST will save growers 2 to 3 foliar applications of fungicides without sacrificing yield. MELCAST works by having growers apply fungicides at specific Environmental Favorability Index (EFI) values instead of using a calendar-based schedule. The extension bulletin "Foliar Disease Control using MELCAST" [BP-67](#) describes this program in more detail.



The Purdue MELCAST system allows growers to apply foliar fungicides according to weather conditions instead of using a calendar-based system.

To use MELCAST, follow these steps:

1. Apply your first foliar fungicide application when vines first

touch within a row or earlier.

2. Find a MELCAST site near your farm from Table 1. Select a MELCAST site near enough that the weather is similar to your field.
3. Using either the Internet melcast.info or the toll-free phone number (800) 939-1604, write down the EFI value on the date when the first fungicide was applied on your MELCAST Record Sheet (contact me for a hard copy). Note that the EFI values are cumulative. That is, the values keep increasing.
4. It is not necessary to read the MELCAST EFI values every day. Keep in mind, however that cantaloupe growers will apply a foliar fungicide again at 20 EFI values and watermelon growers will use a 35 EFI threshold. So, when the EFI values are close to the threshold, watch the MELCAST EFI values closely.
5. When the EFI threshold has been reached or is close for your site, apply a foliar fungicide and write down the new EFI value for the date when the spray was made. If at all possible, do not let the EFI values go over the threshold. It is better to apply a fungicide before the threshold is reached than to wait until the threshold has gone over.
6. If 14 days have expired and the threshold has not been reached, apply a foliar fungicide. This is because after 14 days, new growth will have occurred and some of the product applied 14 days ago will have weathered. Again, when the next fungicide application has been made note the EFI value.

Using MELCAST is much like keeping track of the mileage for oil changes in your truck. Note the accumulated EFI values when you make your first spray much as you would write down the mileage on your truck when you change the oil. Make your next spray when the EFI threshold nears the threshold by keeping track of the accumulating EFI values much as you would change the oil in your truck every 4,000 miles.

If you choose to view MELCAST information on the Internet, go to melcast.info. You will see a table with several MELCAST sites around Indiana as well as in other states. The table also has more detailed information about each MELCAST location. Click on the location nearest your farm.

The next view will be of a few paragraphs I write every week about weather conditions and a table with weather data for the site you have chosen. This data includes EFI's for cantaloupe and

watermelon for the past 7 days, total precipitation, high temperature and growing degree days. Below the table is a link for the past week's data and the state summary.

If the Indiana state summary is chosen, all the Indiana MELCAST sites can be viewed along with the EFI values for the past 7 days and, a new feature this year, a 14-day EFI total for each site. All EFI values are updated on the Internet 7 days a week.

A phone call to the number given above will allow one to hear a pre-recording of the days EFI values across Indiana. These recording will be made Monday through Friday.

It is possible to sign up for a free hard copy of the weekly *MELCAST Update* newsletter (during the season) by contacting Dan Egel.

Another new item in 2018—several new MELCAST sites have been added. These new sites all represent Purdue Ag Centers which are taking part in a study. A list of all the MELCAST sites can be found in Table 1.

Table 1: Location of MELCAST sites for 2018. Growers should select a site near where they are growing cantaloupe or watermelon. Go to melcast.info for more information.

Location	Description
Daviess County	Old HWY 50 and HWY 57, Washington, IN
Decker	Decker, IN
Gibson County	Owensville, IN
Goshen	Elkhart Co. Fairgrounds, Goshen, IN
Jackson County	Vallonia, IN
NE Agricultural Center	16 mi W of Fort Wayne, IN
Oaktown	Oaktown, IN
Pinney-Purdue Agricultural Center	2 mi NW of Wanatah, IN
Richmond	Richmond, IN
Rockville	Rockville, IN
SE Purdue Ag Center	1 mi W of Butlerville, IN
Sullivan	Carlisle, IN
SW Purdue Ag Center	6 miles N of Vincennes
Throckmorton Purdue Ag Center	9 mi S of West Lafayette, IN
Vincennes	Lincoln High School, Vincennes, IN

Bacterial Wilt of Cucumbers Grown in a High Tunnel

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Bacterial wilt is one of the most destructive diseases in high tunnel cucumber production. The reason bacterial wilt is so important is because, like other wilt diseases, it ties up with the entire vascular system of a plant, causing systemic effects (Figure 1). The relatively less important roles that other cucumber diseases play also make bacterial wilt the major limitation for high tunnel cucumber production in Indiana. For example, common cucumber diseases such as angular leaf spot, anthracnose and *Alternaria* leaf blight seldom occur in a high tunnel scenario;

improved resistance to powdery mildew was observed in some of the newly developed cucumber varieties; downy mildew in general does not occur in Indiana until end of the high tunnel cucumber production season.



Figure 1. A cucumber plant grown in a high tunnel died because of bacterial wilt.

The causal organism for bacterial wilt of cucumbers is *Erwinia tracheiphila*. After the bacteria enter the plant vascular system, it multiplies quickly. As a result, it interferes with water uptake in the plant and induces plant wilt. Striped and spotted cucumber beetles are well known for vectoring the disease. They carry the pathogen in their body, and transmit it to plants when the frass and contaminated mouthparts come into contact with plant wounds during feeding.

Another way that transmission may occur is through wounds caused during plant pruning. Since extensive plant pruning is required to grow cucumbers vertically in high tunnels, this transmission approach could be particularly important in high tunnel cucumber production. Moisture and a high level of bacteria present on the edges of a pruner right after cutting a sucker or a petiole of an infected plant make pruners an excellent method to spread this disease to a healthy plant. To prevent this situation, it is important to sanitize pruning tools each time you are conducting pruning work, and avoid using the same pruners for plants showing wilt symptoms. Alcohol, chlorine and household cleaners (Lysol etc.) can be used to sanitize the pruning tools. The relative pros and cons of these disinfectants are discussed in this article

<http://gardeningsolutions.ifas.ufl.edu/care/tools-and-equipment/disinfecting-tools.html>

The bacteria can infect plants at any time during the growing season. Interestingly, studies found young plants have a higher risk of developing the disease than older plants. Possible reasons might be that mature plants are less attractive to beetles because of a lower level of cucurbitacin, the plant compound that stimulates beetle feeding. Another reason might be that older plants are more tolerant of the disease infection. Adult striped

cucumber beetles overwinter in or near cucurbit fields, and become active in the spring when air temperatures are above 53 °F. In Indiana, this often occurs during late April to June. The percentage of beetles carrying and transmitting the pathogen is low at the beginning of the season. However, early-season infections can lead to more devastating disease outbreak due to mass immigration of the beetles to the cucurbit field. Three reasons may contribute to the mass immigration. First, there are fewer cucurbit fields in the early season, limiting their food choice; second, beetles are particularly attracted by volatile biochemicals emitted by seedlings; third, cucumber beetles exhibit an aggregation behavior that attracts other beetles.

High tunnels are an effective tool for season extension.

Cucumbers, like other warm season vegetables, are planted in high tunnels earlier than they are planted in the open field. At the time when the first generation of cucumber beetles emerge, there are normally fewer cucumbers planted in the open field. As a result, high tunnel cucumbers may become the target for the first generation of cucumber beetles. We noticed that cucumber plants that are well established and are in an advanced production stage when cucumber beetles show up are less likely to attract beetles, and have a lower risk of infection by bacterial wilt. This agrees with previous reports that young plants have a higher risk of developing the disease than older plants. In our endeavor to exploring the possibilities of growing grafted cucumber plants very early in the season, we noticed that this technique may also help to reduce the risk of bacterial wilt in some situations.

Installing insect netting, so far, is probably the most effective way to control cucumber beetles in a high tunnel situation besides using synthetic insecticides. Current studies are investigating other organic approaches to control cucumber beetles, such as the ones discussed in this article

<https://vegshotline.org/article/organic-control-methods-for-striped-cucumber-beetles/> Hopefully, this research will eventually provide high tunnel cucumber growers options to effectively manage this disease.

Videos on Mechanical Weed Control

Three videos on in-row weeding tools (Finger weeder, Torsion weeder, Tine harrow) were developed at the Michigan State University Department of Horticulture. Each video is 20 minutes: introduces the tool, how it works, different models, show adjusting the tool in the field, and a short interview with a farmer who uses the tool. These videos can be accessed at the MSU Mechanical Weed Control

Channel <https://www.youtube.com/channel/UCH-k889oYbUaEznvgiDtrOQ>

A Blog about Biological Control

Would you like to learn more about biological control and how to use it successfully? New York State Integrated Pest Management biocontrol specialist Amara Dunn has a new blog – “Biocontrol

Bytes” (<https://blogs.cornell.edu/biocontrolbytes/>). Short articles are posted approximately once a month to share information, answer stakeholder questions, and connect readers to other relevant resources. Subscribe using the green button on the right side of the page in order to receive email updates when new articles are posted.

Upcoming Events

Southwest Purdue Ag Center High Tunnel Tour

Date: June 13, 2018 7:00-9:00 pm Eastern Time

Location: Southwest Purdue Agricultural Center, 4369 North Purdue Road, Vincennes, IN, 47591

The SWPAC high tunnel tour will be held on the evening of June 13, 2018.

Seedless cucumber production in high tunnels will be the highlight of this year’s event.

- You will see 16 cucumber varieties grown in a high tunnel, and be able to taste them.
- We will share with you yield results of grafted cucumber plants that have started to produce since middle April in an unheated high tunnel.
- You will also see cucumbers grown in the high tunnels with different pruning and trellising systems.
- Entomologist Laura Ingwell will join us at the event to discuss cucumber beetle management approaches.

Other things you will see at this event include: summer squashes growing in a high tunnel; different pruning and trellising systems for growing tomato and pepper; annual strawberry production with low tunnel systems.

Registration will begin at 6:30 pm. The tour is free; to register please call (812) 886-0198. For more information please contact Wenjing Guan (guan40@purdue.edu). This event is sponsored by North-Central Sustainable Agriculture Research and Education.



High Tunnel Tour Southwest Purdue Ag Center

4369 N. Purdue Road, Vincennes, IN 47591

Wednesday, June 13, 2018

7:00 PM – 9:00 PM (EST)

Registration and self-guided tour start at 6:30 PM (EST)

Highlights of 2018 High Tunnel Tour: Seedless Cucumber Production

- Evaluate 16 seedless cucumber varieties.
- Learn cucumber grafting technique and its potential to extend early season cucumber production.
- Observe different trellises and pruning systems for growing cucumbers in high tunnels.
- Discuss management options for striped cucumber beetles.



If you already or plan to grow cucumbers in high tunnels, this will be a field day that you will not want to miss!!!

- In addition to cucumbers, this event will include topics on high tunnel **tomato**, **pepper** and **summer squash** production. You will learn about variety selection, pruning and trellising systems, as well as how to maximize benefits of using grafting technique on tomatoes.
- Last but not least, you will see a demonstration of growing **strawberries** with plasticulture and an innovative low tunnel system.



The tour is free, to register please call: Southwest Purdue Ag Program (812) 886-0198. We may be able to arrange transportation upon request. For more information, please contact Wenjing Guan at guan40@purdue.edu.

This high tunnel tour is sponsored by Purdue University and North-Central Sustainable Agriculture Research and Education (NC-SARE). Project number LNC17-390.



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2018 Indiana Hort Society Summer Field Day

Date: June 26

Location: Garwood

Orchard, LaPorte, IN

Please contact Lori Jolly-Brown at ljollybr@purdue.edu for more information about the field day.

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