VEGETABLE CROPS HOTLINE

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

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<http://www.entm.purdue.edu/entomology/ext/targets/newslett.htm>

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FUSARIUM WILT OF WATERMELON - *(Dan Egel)* - This disease of watermelon may cause plants to wilt and/or become stunted. Often one leaf or vine may be wilted leaving the rest of the plant apparently healthy (Fig. 1). While the roots may be white and healthy, the interior of the stem may have a brown discoloration (Fig. 2).

Fig. 1: Fusarium wilt has caused a leaf and vine of this watermelon seedling to wilt. *(Photo by Dan Egel)*

The incidence of this disease appears to be much higher this year than in past years. The relatively cool weather favors the fungus over the watermelon seedling. Regardless of how many watermelon plants appear to be dying at the moment, remember that this disease will not spread from plant to plant in the field. Typically, no more than 10 percent of plants will be killed due to Fusarium wilt of watermelon. In addition, once the weather turns warmer, the watermelon plant will begin to outgrow the fungus.

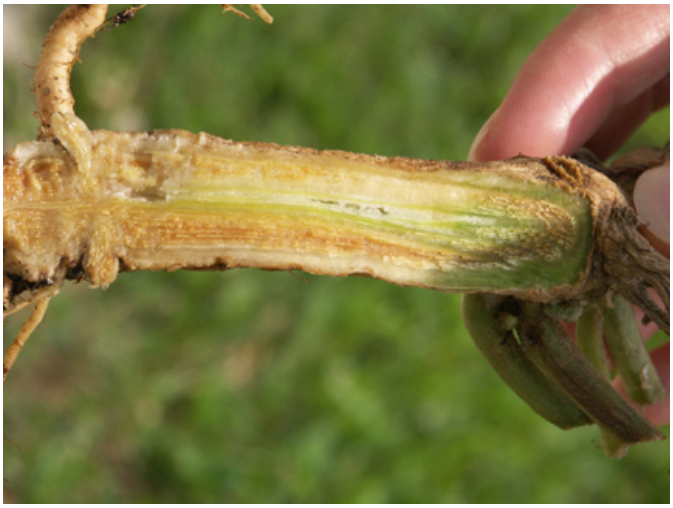

Fig. 2: A brown discoloration of the inside of the stem is typical of Fusarium wilt of watermelon. *(Photo by Dan Egel)*

It is possible to spread the fungus that causes Fusarium wilt of watermelon through soil that remains attached to cultivation equipment between fields. In order to minimize the spread of the fungus between fields, clean off soil between fields with high-pressure water. It may not be practical to disinfest the equipment between fields; however, one might spray a solution of a quaternary ammonia solution (Greenshield or Physan 20) or 10 percent bleach on the tools.

Growers will want to make every effort to keep infected seedlings out of commercial fields. Closely inspect transplants before planting them. Previously used trays may harbor the fungus that causes Fusarium wilt. Although transplant trays can be disinfested, it can be very difficult to clean and disinfest trays sufficiently to eliminate the possibility of Fusarium wilt.

While no variety is completely resistant to Fusarium wilt of watermelon, there are differences in susceptibility. <www.btny.purdue.edu/Pubs/ID/ID-56/cucurbit.pdf>. There are no fungicide treatments for Fusarium wilt.

Tomato Blossom End Rot - (*Chris Gunter*) - Blossom end rot is a physiological disorder caused by a deficient supply of calcium to the developing fruit. It is a common problem on tomatoes, but can also occur on peppers, eggplants, and melons.

Blossom end rot appears first as a small darkened or water soaked area around the blossom end of the fruit. This spot darkens, enlarges and dries out as fruit matures (Fig. 1). This area is an open wound on the fruit surface that may be invaded by secondary decay causing organisms. This disorder is caused by a combination of both cultural and climatic factors including nitrogen, calcium and soil moisture. Prevention is the best way to avoid losses from blossom end rot.

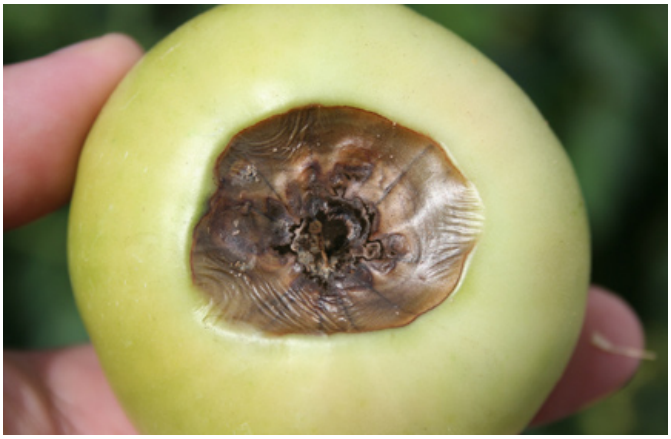

Fig. 1: Advanced blossom end rot on processing tomato fruit. *(Photo by Chris Gunter)*

Avoid excessive nitrogen, which promotes vegetative growth that will compete with the developing fruit for an adequate supply of calcium. Remember that the calcium necessary for plant growth moves to the roots in the soil water. It is transported from the roots to the leaves and fruit through the xylem. Any interruption of water supply to the roots, for example during hot dry weather, can cause a temporary calcium deficiency in the developing fruit. Low pH can also cause calcium to be less available, maintain pH between 6.0 and 6.8. Be aware that foliar applications of a calcium containing products, which are frequently advocated, may be of little value because calcium has poor absorption and remobilization to the fruit where it is needed. If a spray is applied, follow label directions carefully to maximize effectiveness.

Powdery Mildew of Cucurbits - *(Dan Egel)* - When I arrived in Indiana 12 year ago, powdery mildew of cucurbits affected primarily muskmelon, pumpkins, squash and zucchinis. Today muskmelon varieties such as Aphrodite, Athena and Eclipse are resistant to powdery mildew. Pumpkin varieties such as Cannonball, Magic Lantern and Gladiator have partial resistance. Squash and zucchini are still susceptible to powdery mildew.

A colleague from the southeastern US reports that powdery mildew has been observed on muskmelon varieties previously thought resistant. Watermelon from the SE has also been observed with powdery mildew. It is impossible to know what may or may not happen here in Indiana; however, it might help to review powdery mildew of cucurbits.

Powdery mildew causes white, talcum-like colonies on the upper and lower surfaces of leaves. Although powdery mildew does not directly affect the fruit, severe outbreaks of this disease can result in loss of yield and/or poor quality fruit. Unlike most other foliar diseases of cucurbits, the fungus that causes powdery mildew does not require leaf wetness for infection. Under conditions of high relative humidity and temperatures of 68 to 81˚F, this disease can spread rapidly.

The fungus that causes powdery mildew does not survive well in crop debris compared to diseases such as gummy stem light or Alternaria leaf blight. Plus, the powdery mildew fungus may be spread on the wind for long distances. These factors result in only moderate importance for fall tillage and crop rotation for the management of this disease.

Fungicides labeled for powdery mildew management of cucurbits are listed in the Midwest Vegetable Production Guide for 2007 <www.btny.purdue.edu/Pubs/ID/ID-56/>. Additional information on fungicides can be found on BP-134W <www.ces.purdue.edu/extmedia/BP/BP-134-W.pdf>.

Systemic fungicides are generally superior to contact fungicides for control of powdery mildew. As with most foliar diseases, the best control occurs when fungicides are applied prior to the arrival of the fungus, or at least in the early stages of disease.

When powdery mildew threatens, an application of a systemic fungicide should be made 10 to 14 days before the first harvest. Systemic fungicides labeled for use on muskmelon and watermelon include those in FRAC (MOA code) group 11 (Amistar, Quadris, Cabrio, Flint and Pristine), FRAC group 1, (Topsin M) and FRAC group 3 (Nova, Procure). Quintec has recently been labeled on muskmelon and on watermelon and is in FRAC group 13. Qunitec is not systemic, but has a vapor phase and good activity against powdery mildew in most tests.

It is always a good idea to alternate systemic fungicides between different FRAC groups whether such an alternation is required on the label or not. In the southeast, my colleague is recommending an application of Quintec followed by either Nova or Procure at a 7 to 10 day interval.

Note that Quintec is not labeled for pumpkin. Also, note that Qunitec has some plant back restrictions on the label. Always read and follow the label carefully.

Melon Insects - *(Rick Foster)* - We have begun to see just a few striped cucumber beetles on melons in the Vincennes area (Fig. 1). Beetle populations appear to be extremely low, possibly the result of the early April freeze

following a week of warm weather. It is very important that growers scout their cucurbit fields at least twice per week now for the next couple of weeks. The action threshold for cucumbers and muskmelons is 1 beetle per plant, because of the susceptibility of those crops to bacterial wilt (Fig. 2). For watermelons, squash, and pumpkins, the threshold is 5 beetles per plant, because we are only concerned about direct feeding damage. Cucurbits that were treated at planting with a systemic insecticide such as Furadan or Admire are less likely to have damaging infestations, but should still be scouted.

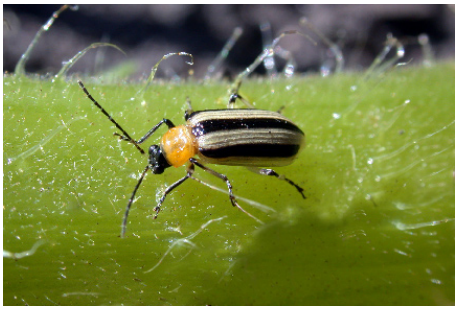

Fig. 1: Striped cucumber beetle. *(Photo by John Obermeyer)*

Fig. 2: Early symptoms of bacterial wilt on muskmelon. *(Photo by Rick Latin)*

Aphids can be found fairly easily in many melon fields. Most aphid colonies that I've seen have a number of mummy aphids, indicating that parasites are active. Since cucumber beetle populations are low, growers should refrain from treating for them unless necessary because most of the insecticides used for the beetles will kill natural enemies and cause aphid populations to flare. Watch aphid infestations and, if they are increasing, treatment is recommended. However, not all fields are infested, so a little scouting could save you a lot of money.

Two-spotted spider mites are also showing up in melon fields. The forecast for continued hot, dry weather raises the prospects for mite outbreaks. Again, spraying for cucumber beetles will often kill predators that help control mites, increasing your mite problems. I have not had good luck with pyrethroid insecticides for mite control, so the best choices if you need to treat are Agri-Mek, Acramite, and Oberon.

Potato Leafhopper - *(Rick Foster)* – Potato leafhoppers do not overwinter in Indiana so they have to fly or be blown up from more southern areas each spring (Fig. 1). They have arrived, somewhat earlier than normal. Leafhoppers can be important pests of a number of crops, but particularly potato and snap beans. It is important to catch leafhoppers early, because once the damage is visible, yield loss has already occurred. An easy way to scout for leafhopper adults is to just walk down the row and brush the plants with your hand. If you see little light green insects flying out of the plants, then you have leafhoppers. A more formal way of scouting is to use a sweep net and make 25 sweeps along a row. The action threshold is 0.5 leafhoppers per sweep in seedling beans or 1 leafhopper per sweep in potato or larger beans. To check for the nymphs, which don't fly, simply turn over the leaves and look for the nymphs on the lower leaf surface. The threshold for nymphs is 2.5 nymphs per 25 leaves in potato or 1 per leaf in snap beans. Potatoes or beans treated with a planting time soil insecticide or a seed treatment will be less likely to have damaging infestations, but fields should still be scouted. See the Midwest Vegetable Production Guide <www.btny.purdue.edu/Pubs/ID/ID-56/> for insecticide choices.

Fig. 1: Adult and nymph potato leafhopper. *(Photo by Michign State University)*

Fig. 2: Hopperburn on snap beans. *(Photo by John Obermeyer)*

Fig. 3: Hopperburn on potato. *(Photo by University of Wisconsin)*

The injury caused by leafhoppers is called hopperburn (Fig. 2). Potato varieties differ in their susceptibility to hopperburn (Fig. 3). This table shows the relative susceptibility of some potato varieties to hopperburn.

Most susceptible

Delrus
Norland
Monona
Norchip
Atlantic
Early Gem
Denali
Superior
Norgold Russet
La Chipper
Kennebec
Goldrush
Snowden
Oneida
Red Pontiac
Sebago
Katahdin
Russet Burbank
Ranger Russet
Russet Norkotah
Ontario
Red La Soda
Nooksack

Least susceptible

Corn Earworm - *(Rick Foster)* - We began catching corn earworm adults in pheromone traps in Vincennes last week, and we caught 10 in our trap in Lafayette over the weekend. I believe these moths overwintered here in Indiana, since we have not had the proper weather conditions for migration yet. Growers should have their traps in place by now. Early planted sweet corn that begins silking when moths are flying is particularly attractive to female moths looking for a place to lay eggs. This first generation is usually fairly small and sweet corn that silks when moths are flying can usually be protected with one or two sprays begin at silking. The superior products for control are Capture, Warrior, and Mustang Max.

European Corn Borer - *(Rick Foster)* - It appears that in most areas of the state, European corn borer populations are fairly low. I am just beginning to see a little larval feeding on leaves in my early planted sweet corn in Lafayette (Fig. 1). This appears to be a good opportunity for growers to save a spray (and some money) by skipping the pre-tassel spray that they would normally apply for corn borer control. You should not apply an insecticide for your early sweet corn at pre-tassel unless you have at least 30% of the plants showing whorl feeding.

Fig. 1: European corn borer whorl feeding. *(Photo by John Obermeyer)*

Japanese Beetles - *(Rick Foster)* - Japanese beetles were first found in the Lafayette area on June 3 this year, about 2 ½ weeks earlier than normal and a week earlier than they have ever been found before. Growers should start watching their vegetable and fruit crops that are attacked by Japanese beetles right away.

Cover Crops for Early Summer - *(Thomas Björkman)* - Summer may seem an odd time to use cover crops, because that is the time when the *real* crops are growing. But summer may be the right opportunity to improve fields with a cover crop. If the soil is wearing out, summer is when a soil-building crop can do a lot more work. Also, if the rotation leaves an opening in the summer, a short cycle cover crop will be much better than leaving the field open, to suffer erosion from rain and allow weeds to go to seed. Buckwheat sown in late May or early June can be used before vegetables such as pumpkins, broccoli, or late cucumbers. There is another opportunity for summer cover crops after lettuce, peas, early beans, spinach or small grains.

For planting in June, there are really only two choices. One is sudangrass, or sorghum-sudangrass, and the other is buckwheat. Both grow rapidly in the summer warmth.

The two cover crops have different properties, so the management goal and field condition will determine which one is the best choice.

Sudangrass is often chosen for improving soil organic matter. It produces a strong root system and lots of biomass. The deep root system is helpful for reducing subsurface hardness. It is also a good choice for reducing root-knot nematode pressure.

Buckwheat is best known for weed suppression and mellowing the soil. If weed suppression is the main purpose, buckwheat is preferred. It covers the ground earlier than sudangrass, especially in early June, and out-competes weeds that may establish in sudangrass. Sudangrass requires a higher seeding rate for effective weed suppression.

The amount of time until the fall crop is to be planted is a significant decision factor. Buckwheat is in the ground for 35 to 40 days when used as a cover crop. It can be sown as early as May 20th. Sudangrass needs 60 to 70 days to be effective, and is best planted once June has become thoroughly warm. Both of these cover crops should be mowed after about 40 days. That is the end of the season for buckwheat, but the beginning of major root growth for sudangrass. Sudangrass needs a final flail mowing and immediate incorporation to suppress nematodes.

The condition of the field will determine which crop is suitable. If the soil is hard, or the field is prone to standing water, sudangrass is a good choice, while buckwheat will do poorly. However, if the field is low in nitrogen and phosphorous, buckwheat will do well without additional fertilizer, while sudangrass needs about 40 lb of N to give satisfactory performance.

If the crop to follow needs a fine seedbed, that will be easier to produce after buckwheat. It mellows the soil for easy working, and decomposes quickly after incorporation. Sudangrass crowns take some time to break down, so the following crop needs to be one that can be sown in a somewhat lumpy field.

The main production risks with buckwheat are a failed stand and letting it go to seed. The failed stand usually follows a heavy rain around emergence. It will be obvious two weeks after planting. If the seedlings are not doing well then, till them in and plant again. To avoid volunteer buckwheat seed, kill the crop before there are filled green seeds on the plant. That takes about 40 days from a July planting or 50 days from a June planting.

The main production risk with sudangrass is that the crop gets too big to mow, or to incorporate after frost has killed it. This crop grows very fast, so keep an eye on it. Mow the first time at about 3 feet and the second time while the flail mower can still chop it well. If sudangrass gets too big to control, it will be killed by frost and make a nice winter mulch. However the biofumigant effect will be lost.

Buckwheat is available from some local farm seed retailers. The variety does not matter, and many suppliers don't identify any variety. Typical seed prices range from $15 to $25 per 50 lb bag, which is enough to seed an acre.

Sorghum and sorghum-sudangrass are widely available. Varieties suitable for cover crops must be selected carefully. Grain types are inappropriate and some new forage varieties described as sweet or with brown midrib are low in dhurrin, which is the biofumigant in sudangrass. Piper sudangrass is readily available, and has a similar composition to Trudan 8, the classic sudangrass for biofumigation. Sorghum-sudangrass hybrids are more vigorous, and will produce more biomass than sudangrass, but the seed is also more expensive. Other varieties that are available include Sordan 79, Green Grazer and Special Effort. With a modest seeding rate of 30 lb/ac, sudangrass can cost as little as $10 to $20 per acre. Weed suppression requires 50 lb/ac.

Thomas Björkman is with the Department of Horticultural Sciences, New York State Agricultural Experiment Station, Cornell University in Geneva, NY.

New Publication on Stinging Insects - *(Catherine Hill and John MacDonald)* - A new publication from the Department of Entomology at Purdue discusses stinging insects and the medical risks associated with their venoms. Stinging insects belong to the insect order Hymenoptera, the group that consists of ants, wasps, and bees. Their presence around humans can cause fear and disrupt outdoor activities, but only a very small number of species are a medical risk. The most problematic are the social species that exist in colonies, including ants, social wasps, and social bees <www.entm.purdue.edu/entomology/ext/targets/e-series/EseriesPDF/E-248.pdf>.

Two New Leaders at Purdue - *(Peter Hirst)* - A New department head named for horticulture: Dean Randy Woodson has named Dr. Bob Joly as the new head of the Department of Horticulture and Landscape Architecture at Purdue. Bob has been interim department head since the departure of Ed Ashworth about 6 months ago. Dr. Joly has been on the faculty of the horticulture department for 22 years, and has distinguished himself as a great teacher, winning a number of prestigious awards for his teaching. He has also conducted research on how plants handle stress, especially with regards to water stress. Although Bob has had little direct experience with extension in the past, he is learning fast, believes in the mission of extension, and is supportive of our extension programs. Many of you may have met Bob at the Indiana Horticultural Congress back in January. He's looking forward to meeting more of you at upcoming meetings.

New president for Purdue: On May 7, Dr. France A. Córdova was named as the incoming president of Purdue University, taking over from Dr. Martin Jischke who has held the position since 2000. She will be just the 11th president in the history of the university. Since 2002, Dr. Cordova has been the chancellor of the University of California, Riverside. A world-renowned astrophysicist, she was previously the chief scientist at NASA, the youngest person to hold that position. Dr. Cordova and her husband have 2 college-aged children. She assumes her new position on August 1.

New Nematology Website - *(Announcement)* - The Nematology Laboratory is announcing a new website <www.entm.purdue.edu/nematology/>. The mission of the Nematology Laboratory is to identify and provide suitable management strategies for plant parasitic nematodes in Indiana. The laboratory is equipped with tools and expertise to process soil and plant materials to extract plant parasitic nematodes in a timely fashion. Relevant research and outreach activities are conducted to enable us to present the best management strategies for nematode pests in Indiana.

Twilight Meeting - *(Announcement)* - A twilight meeting has been scheduled for commercial vegetable growers to meet with Purdue extension specialists. The meeting will be held on Wednesday June 20 and hosted by George Dillon, 12122W 875S, Poseyville, IN 47633. Growers are encouraged to attend and bring questions or samples for discussion. Light refreshments will be provided.

Greenhouse Open House - *(Announcement)* - A recently completed greenhouse at the Southwest Purdue Agricultural center will be available for public inspection on Friday, June 22 from 2 to 6 pm. The greenhouse was purchased with funds raised by the Illiana Watermelon Association. The purpose of the greenhouse is to do research on mature watermelon vine decline and other diseases that occur in Indiana. The greenhouse is the only one at the Southwest Purdue Agricultural Center that is of a solid polycarbonate construction and the only one to have evaporative cooling. The Southwest Purdue Agricultural Center is located 1 mile north of Vincennes on US 41 at 4369 N. Purdue Rd. Address questions to Dan Egel at (812) 886-0198.

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