# 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>*

## *IN THIS ISSUE*



**Corn Earworms** - *(Rick Foster)* - We have now completed the first generation flight of corn earworms in most areas of the state. Counts in northern Indiana remain above threshold on some nights. The first generation was fairly substantial, with very high counts (for the first generation) in several locations. Most of the insects that I collected here in Lafayette had most of their wing scales intact, which indicates to me that they overwintered here rather than migrating from the South. The second generation will likely emerge in early August but we could get a migratory flight from the gulf region at any time. It is important to keep monitoring your trap or keep checking our website for the latest trap catch information, **http://extension.entm.purdue.edu/cornearworm/index.php**.

**European Corn Borers** - *(Rick Foster)* - The first generation of European corn borers have also completed their flight activity. For vegetable growers, we are most concerned about the second generation since their damage to fruiting vegetables such as tomatoes and peppers can be severe (see Figure 1). Populations of corn borers have been down in recent years, but growers should remain vigilant if they are growing susceptible crops.

**Figure 1:** The larvae of the European corn borer may tunnel into a pepper fruit. *(Photo by Rick Foster)*

**Squash Vine Borers** - *(Rick Foster)* - Squash vine borer moths have begun flying and laying eggs. Squash and pumpkins growers may want to make a couple of insecticide applications spaced 10-14 days apart to control this insect. If you start to see plants wilting, look for the characteristic entrance hole and frass that would indicate that squash vine borer is the cause. If you see frass, cut the plant open to look for the borer. There is little you can do to save your plants after the borers are inside, but egg laying will occur over about a month, so spraying an insecticide may prevent further damage. A number of excellent products are listed in the *Midwest Vegetable Production Guide* (ID-56) **http://www.btny.purdue.edu/Pubs/ID/ID-56/**.

**Twospotted Spider Mites** - *(Rick Foster)* - I haven't seen any outbreaks of spider mites in vegetable crops yet. Dan Egel has received some reports of problems in southern Indiana. However, we are having severe outbreaks of European red mites (a closely related species) on apples, so it would be prudent for growers to look for possible outbreaks of mites in their vegetables. Most growers know where mite outbreaks usually show up first. Next to a dusty gravel road is always a good place to start looking. Don't spray a miticide as a preventive measure because most fields will not have a problem. Wait until you see a mite problem before you treat. Again, see the ID-56 for details about labeled miticides for your crop.

**Bacterial Spot of Tomato** - *(Dan Egel)* - I have confirmed bacterial spot of tomato in several areas of Indiana over the last couple weeks. Leaf spots are usually 1/16 inch, black and angular. Spots are more often found on young than old plant tissue. Spots are usually surrounded by yellow plant tissue (see Figure 2). Spots on fruit are black, raised and up to 1/3 inch in diameter. The disease prefers warm wet weather. Overhead irrigation will also spread this disease. Scattered showers across much of Indiana have helped to establish bacterial spot of tomatoes.

Bacterial spot of tomato and pepper are closely related. Strains from pepper usually do not affect tomato and vice versa; the strains of the pathogen from bacterial spot of pumpkin do not affect peppers/tomatoes and vice versa.

Bacterial spot may be seed borne; the disease may have been brought in on your seed/transplants. However, the causal bacterium also survives on crop residue. Tomatoes should be rotated 2 to 3 years away from peppers or tomatoes. Treatment with copper hydroxide may reduce spread in the field. Some strains of the bacterial spot pathogen are resistant to copper products (see issue number 532 for details on how to manage strains of bacterial spot resistant to copper at **http://www.btny.purdue.edu/pubs/vegcrop/VCH2011/VCH532.pdf**). However, copper products will have little affect on tomato diseases such as early blight and Septoria leaf spot. There are no resistant tomato cultivars, however, some cultivars are more susceptible than others. See these links for more information on partial resistance of tomato cultivars or contact Dan Egel.

**http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1007&context=fvtrials&sei-redir=1#search=%22maynard+egel+zandstra+tomato%22**

**http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1006&context=fvtrials&sei-redir=1#search=%22maynard+egel+zandstra+tomato%22**

Make sure to consult the *Midwest Vegetable Production Guide for Commercial Growers* (ID-56) **http://www.btny.purdue.edu/Pubs/ID/ID-56/** and the BP-136-W **http://www.ces.purdue.edu/extmedia/BP/BP-136-W.pdf**. Always read and follow all information on the label.

**Figure 2:** Bacterial spot of tomato can affect leaves, stems and fruit. In this photo, the portion of the stem leading to the flower is severely affected. *(Photo by Dan Egel)*

**Pumpkin Powdery Mildew Management** - *(Dan Egel)* - Although pumpkin planting may have been slowed by weather-related challenges, for most growers it is probably time to start considering powdery mildew management.

Powdery mildew is one of the easier diseases to recognize. Growers should look for a white talc-like growth on the upper and lower surfaces of leaves (see Figure 3). Note that the cucurbit powdery mildew that affects pumpkin, muskmelon, squash and gourds is not the same disease that affects crops such as tomatoes.

Powdery mildew of pumpkins can be managed through a combination of partially resistant varieties, fungicides and crop rotation. Several pumpkin hybrids have partial resistance to powdery mildew. Recommended pumpkin varieties are listed in the *Midwest Vegetable Production Guide* **http://www.btny.purdue.edu/Pubs/ID/ID-56/**. Fungicides that can be used for powdery mildew of pumpkin are listed in the *Midwest Vegetable Production Guide* and in the extension bulletin BP-135-W **http://www.extension.purdue.edu/extmedia/BP/BP-135-W.pdf**.

The first application of a powdery mildew fungicide should occur when the pumpkin plant has grown into a full bush-like structure, but before it has started to vine. When the plant has grown into a 'bush', the higher humidity inside the plant canopy may contribute to powdery mildew development. Powdery mildew requires high humidity, but not leaf wetness to develop.

Although only scattered powdery mildew outbreaks have been reported, if history is any guide it won't be long now. Fungicide applications are more effective when applied before powdery mildew begins or early in the disease cycle instead of after the disease becomes well developed.

Fungicide applications for powdery mildew should be on a 7 to 14 day interval. Table 1, next page, includes several of the fungicides that have been found effective against powdery mildew of pumpkins in Indiana. Alternate fungicides so that products with the same FRAC code or mode of action number are not used back-to-back. Always read and follow the instructions on the label carefully.

**Figure 3:** Powdery mildew on pumpkin leaves appears as a white talc-like growth of the fungus. *(Photo by Dan Egel)*

**Table 1:** Some of the fungicides that have been found to be effective against powdery mildew of pumpkins and their characteristics.

| Product trade name | Active ingredient (FRAC/mode of action code) | Comments |
|---|---|---|
| Folicur/Monsoon/Toledo | Tebuconazol (3) | Also labeled for black rot |
| Inspire Super | cyprodinil (9)/ difenoconazole (3) | Also labeled for black rot and Plectosporium blight |
| Pristine | boscalid (7)/ pyraclostrobin (11) | Also labeled for black rot |
| Procure | triflumizole (3) | |
| Rally | myclobutanil (3) | |
| Qunitec | quinoxyfen (13) | Contact fungicide. Supplemental label required. |

**Downy mildew of cucurbits** - *(Dan Egel)* - This disease affects cucurbits such as cucumber, muskmelon, watermelon and pumpkin. The fungus that causes downy mildew does not overwinter in Indiana and thus must blow in each year. Downy mildew has not been observed in Indiana this year. Locations where downy mildew of cucurbits has been found include: Ontario Canada, north central Ohio, south central Michigan, Eastern Pennsylvania and Delaware. The prevailing winds will usually blow most of these outbreaks away from Indiana. For most of Indiana, no management actions are necessary now except for growers to scout their fields for symptoms of this disease (see Figure 4). Growers in northern Indiana with valuable crops may want to consider applying specialized fungicides for downy mildew that are listed in the *Midwest Vegetable Production Guide for Commercial Growers* (ID-56) **http://www.btny.purdue.edu/Pubs/ID/ID-56/cucurbit.pdf**. Note that many of the specialized products for downy mildew are not labeled for other diseases that may occur on cucurbits. Exceptions are Tanos®, which is labeled for downy mildew as well as Alternaria leaf blight and anthracnose and Gavel® which is also labeled for downy mildew, Alternaria leaf blight and Phytophthora blight. For more information see this link: **http://cdm.ipmpipe.org/**.

**Figure 4:** Downy mildew can be recognized by the dark 'fuzzy' growth on the underside of the leaves. Powdery mildew is also present in this photo of a pumpkin leaf. *(Photo by Dan Egel)*

**Weather video** - Growers who want more information about the weather can go to the link below. The USDA's Bob Ellison says this spring's extreme weather is going to continue for much of the country. It is likely that the northern plains and upper Midwest will continue to be wet while the drought in the south may continue. Growers who have trouble with the link below should call Dan Egel's number at the top of this newsletter. **http://www.youtube.com/watch?v=xZ5mZW36n8c**.