

VEGETABLE CROPS HOTLINE

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

Liz Maynard, Editor
600 Vale Park Road
Valparaiso, IN 46383
(219) 531-4200
emaynard@purdue.edu



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WHO'S THAT IN MY FIELD??? - (*Scott Monroe*) - Harvest season generally brings a large increase in the number of people in fields, packinghouses, and farm stands across the state. This increase may include people from state, federal, or local regulatory agencies. For years, regulators have collected samples of produce for routine testing. This year, growers can expect a larger presence from both the Food and Drug Administration (FDA) and the Indiana State Department of Health (ISDH) as they collect samples as part of their routine sampling program. In addition to these efforts, FDA is currently conducting cantaloupe packinghouse inspections. These nationwide inspections were announced last winter by FDA as an information gathering exercise in response to outbreaks of foodborne illness linked to cantaloupe in both 2011 and 2012. At the time of this writing there has been one such inspection conducted in Indiana.

Visits from regulatory personnel do not indicate that there is any particular problem. The sampling and inspections are part of a plan to better characterize fresh fruits and vegetables sold in Indiana. If someone from a regulatory agency visits your farm, allow them to introduce themselves and make sure you understand what they need from you. You may also ask to see proper identifying documents (badges, nametags, etc.) if there is any question about their identity. Be courteous and cooperative and, if samples are taken, make sure you understand the process for obtaining lab results for your records.

Cantaloupe growers who receive notice of an FDA packinghouse inspection are encouraged to contact Purdue Extension, either through your local county office or the Southwest Purdue Ag Program, as we have personnel and supplies on hand to attend/observe inspections and assist with parallel sampling.



PHYTOPHTHORA BLIGHT OF CUCURBITS - (*Dan Egel*) - The rainy weather that plagued much of Indiana earlier this year was perfect for the disease Phytophthora blight (pronounced fy-tóp-thor-a). Although the weather is drier now, the effects of earlier rains on the severity of Phytophthora blight are now showing up. Phytophthora blight affects all cucurbits. In Indiana, I often observe this disease in watermelon and pumpkins. In addition, Phytophthora blight can be severe on peppers. Read on to find a discussion of the biology, symptoms and management of Phytophthora blight, featuring pumpkins.

Often the first symptom that one notices of this disease is the wilting of individual vines. (see Figure 1). If one were to follow the vine to its source, it might be possible to see a constriction in the vine, a lesion, caused by the Phytophthora blight fungus (see Figure 2). Eventually entire plants may be affected. The outbreaks almost always start in low-lying areas in the field where water tends to stand (see Figure 3). Pumpkin fruit are especially prone to infection where moisture accumulates-at the top of the pumpkin, close to where the fruit is attached to the stem, or toward the base of the fruit. The lesions on watermelon fruit are often toward the underside of the fruit. Look for a white mold on the underside of affected fruit.



Figure 1: Often the first symptom of Phytophthora blight of pumpkins is the occasional wilted vine. (*Photo by Dan Egel*)



Figure 2: The wilted vine may be due to a lesion caused by Phytophthora blight on a stem. (Photo by Dan Egel)



Figure 3: Phytophthora blight usually starts in a low area. In this photo, the vines in the foreground and in the distance are on slightly higher ground than the dead vines in mid field. (Photo by Dan Egel)

Management options - Avoid poorly drained fields, especially those with a history of the disease. The use of raised beds can help control this disease in some crops. Limit overhead irrigation as much as possible. Fumigation has been effective in some cases. Reservoirs or rivers can be contaminated with Phytophthora from the run off of nearby fields. If such waters are used for overhead irrigation, Phytophthora blight may result. Use crop rotations of at least 4 years without crops in the pepper or cucurbit families. Only crops in the grass family such as wheat or corn are truly resistant.

Fungicides can be used to lessen the impact of Phytophthora infection, but it is an uphill battle. Contact fungicides may offer moderate protection if used as part of a season long program against Phytophthora

blight and other diseases. Contact fungicides include chlorothalonil (e.g., Bravo[®], Echo[®], Equus[®]). However, systemic fungicides will have more impact against this disease. Systemic fungicides include dimethomorph (e.g., Acrobat[®], Forum[®]), cyazofamid (Ranman[®]), fluopicolide (Presidio[®]) and Zampro[®] (ametoctradin & dimethomorph). These systemic fungicides are not labeled and will not control bacterial spot, black rot or powdery mildew. Therefore, I do not recommend applying these fungicides unless Phytophthora blight threatens. Tanos[®] is labeled for suppression of Phytophthora blight as well as anthracnose of watermelon. No fungicide will provide adequate control without also using the cultural controls discussed here. When deciding to use fungicides to combat Phytophthora blight with fungicides, remember that fungicides will only protect healthy plants. Fungicides are best used at the start of an epidemic.

Phytophthora blight is difficult to deal with, and must be managed with all available resources over a period of time. Do everything you can to avoid an early season outbreak that may jeopardize your other crops, and don't rely only on fungicides for control. In some cases, it may make sense to plow under a field or part of a field with Phytophthora blight to protect nearby fields.



THRIPS ON TOMATO - (Rick Foster) - We have seen damaging populations of thrips feeding on tomatoes in high tunnels (see Figure 4). Thrips are very tiny (0.1 mm long), slender insects. They can feed on blooms causing the blossoms to drop or the fruit to be deformed. They are also capable of transmitting the virus that causes tomato spotted wilt virus, although that is relatively rare in Indiana. Once the tomatoes in the high tunnels begin to die off, thrips can move to nearby tunnels or to field grown tomatoes. In the high tunnels, control can be achieved either with one of several of the pyrethroid insecticides or with Entrust[®]. In field tomatoes, Radiant[®] will provide excellent control.



Figure 4: Thrips feeding have caused the light brown areas on this tomato leaf. The small, dark spots are from thrips frass. The presence of thrips must be confirmed before treatment. (Photo by Dan Egel)



CORN EARWORM - (*Rick Foster*) - Corn earworm pheromone trap catches are down all around the state. Trap catches from our network of traps can be found at extension.entm.purdue.edu/cornearworm/index.php. Most of the field corn is silking now, so we can move up to the old threshold of 10 moths per night in the trap. This is a time when you can save some money and some time by not spraying your silking sweet corn when trap catches are low. However, this is the calm before the storm. Sometime in the next 2-3 weeks, I expect to see a dramatic increase in pheromone trap catches. Growers should continue to monitor their traps closely or follow the trap catches on our website.



SPIDER MITES ON MELONS - (*Rick Foster*) - As the weather heats up, spider mites have become more of a problem on melons and other crops (see Figure 5). As you scout your melons, look at the crown of the plants first, because that is where you tend to see damage initially. Also, mites will usually show up first near a gravel road because they prefer the high pH from the road dust. There are a lot of good miticides labeled for use on melons. You may recall that previously I did not recommend Brigade® for mite control because of field failures in the past. Last year in a small mite trial, I got very good results with Brigade® so it is now back in the recommendations. I would be interested to hear from growers who use Brigade® for mite control to see if my small plot trials are indicative of the control you receive in field situations.



Figure 5: Spider mites often cause a yellowing in mid leaf on watermelon. Be sure to confirm the presence of the spider mites with a hand lens on the underside of the leaf. (*Photo by Dan Egel*)



DOWNY MILDEW OF CUCURBITS UPDATE - (*Dan Egel*) - The good news is that downy mildew of cucurbits has not been observed in Indiana. However, the disease has been observed in southwestern Michigan on cucumbers (Allegan County). It is likely that more counties in this area of Michigan are affected. Therefore, cucurbit growers in northern Indiana should seriously consider applying specialized fungicides to valuable crops. At the very least, cucurbit growers should be scouting their fields for this disease.

A little background about downy mildew of cucurbits-this disease does not overwinter in Indiana. Instead it must be blown into the state on winds or brought in on plant material such as transplants. Downy mildew is favored by cooler temperatures (59 to 68 F) and as little as 6 hours of leaf wetness. An over night dew is plenty of moisture. The disease does not affect fruit directly, but can quickly devastate cucurbit foliage, causing loss of yield and fruit quality. Downy mildew of cucumber can be recognized by the bright yellow (chlorotic) angular lesions on the surface of leaves (see Figure 6) and the dark fungal growth on the bottom of leaves under moist conditions (see Figure 7).

Unfortunately, the most effective fungicides against this disease are not effective against many other cucurbit diseases. The list is similar to the list presented for Phytophthora blight in this same issue since the causal fungi are related. I would add to the list given for Phytophthora blight the product Gavel®. However, Gavel® is not labeled for pumpkins.



Figure 6: Downy mildew of cucumber can be recognized by the bright yellow angular lesions on the leaf. (*Photo by Dan Egel*)



Figure 7: On the underside of the leaf, downy mildew of cucumber causes a dark 'fuzzy' growth during moist conditions. (Photo by Liz Maynard)



PUMPKIN FUNGICIDE SCHEDULE - (Dan Egel) - I have had several questions about what and when to apply to pumpkins for disease. Below I share some ideas.

In most years, bacterial spot is our most important pumpkin disease. I recommend applying a fixed copper product for bacterial spot when pumpkin fruit are softball sized or, when lesions of bacterial spot are observed on pumpkins vines or, if a field has a history of bacterial spot. How often copper products are applied depends on the weather (warm, wet weather favors bacterial spot) and the presence of symptoms on the vines or fruit. In many cases, it makes sense to apply copper every 7-10 days though fruit set. Mancozeb products may help to control bacterial spot if tank mixed with copper products. Not all mancozeb products are labeled for pumpkins-last time I checked Dithane® and Manzate® are labeled for pumpkins.

Powdery mildew is always easier to control if a variety with partial resistance is chosen. However, most

vines will require some sort of powdery mildew fungicide on a 7-14 day schedule starting about when the vines are in the 'bush' stage (when the vines have grown up, but not out yet). Protect vines through September. Products that have been effective in Indiana include: Inspire Super®, Fontelis®, Monsoon®/Onset®/Toledo® (active ingredient tebuconazol), Pristine®, Procure®, Quintec®, Rally®, Torino®. Quintec® is the sole contact fungicide in the list. However, Quintec® has worked well.

In years when bacterial spot is not the most important disease of pumpkin fruit, Phytophthora blight often is. See accompanying article in this issue about this disease. This has been an important year for Phytophthora blight so far.

Other diseases that may occur on pumpkins include black rot and Plectosporium blight. In most cases, these diseases are controlled by applications of fungicides for the diseases mentioned above.



POWDERY MILDEW ON CANTALOUPE - (Dan Egel) - I have observed powdery mildew on a hybrid of cantaloupe that is listed as resistant to races 1 and 2 and which normally does not show symptoms of powdery mildew. It is possible that a race of the powdery mildew fungus has blown into Indiana that is different from our usual race. I advise cantaloupe growers to scout their fields for the talc like growth of the fungus on the leaves. Please contact me if you see unusual outbreaks of powdery mildew or if you have other questions.

Fortunately, many of the systemic products that are often applied for management of diseases such as Alternaria leaf blight, anthracnose and gummy stem blight also have activity against powdery mildew. Of the list of powdery mildew products given in the article on pumpkin fungicide schedule in this issue of the *Hotline*, Inspire Super®, Fontelis® and Monsoon®/Onset®/Toledo® have activity against more than just powdery mildew. For more details, see the *Midwest Vegetable Production Guide for Commercial Growers 2013*. And of course, always check the label!

AUTHOR INFORMATION

Dan Egel, Vegetable Pathologist, Southwest Purdue Ag Center, (812) 886-0198, egel@purdue.edu

Rick Foster, Fruit and Vegetable Entomologist, Purdue, (765) 494-9572, rfoster@purdue.edu

Scott Monroe, Extension Educator, Purdue Extension, Daviess County, (812) 254-8668, jmonroe@purdue.edu

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