Vegetable Crops Hotline

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

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vegcropshotline.org

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IN THIS ISSUE

Downy Mildew of Watermelon - (*Dan Egel, egel@purdue.edu, 812-886-0198*) - This disease has been observed on watermelon in Knox County. The following article will discuss the symptoms, biology and management of downy mildew of cucurbits.

Symptoms. The symptoms of downy mildew vary depending on the host.

- On watermelon, the lesions start out as chlorotic (yellow) areas that become round and necrotic (brown/black) areas surrounded by a chlorotic halo. Lesions may be limited by veins (see Figure 1). Note that leaf lesions of gummy stem blight may have dark fungal structures (pycnidia) present that are lacking with downy mildew. Also, whereas gummy stem blight will affect stems and petioles, downy mildew will not.
- Pumpkin lesions also start out chlorotic and are often angular. Eventually, the chlorotic lesions become necrotic. Lesions may be more common along a vein.
- Lesions on muskmelon often have poorly defined margins and are not as angular as described above for pumpkin.
- Cucumber lesions start out chlorotic and very angular, eventually becoming necrotic.

For all hosts, the bottom of the lesions becomes covered with a dark 'fuzz' under moist conditions. (see Figure 2) The 'fuzzy' appearance is due to the production of spores. Severely affected leaves become crumpled and brown and may appear scorched. Downy mildew does not affect stems or fruit directly.

Downy mildew of cucurbits is favored by temperatures of 59 to 68°F. Relative humidity of 100% for 6 hours is sufficient to allow infection to take place on a leaf. Once infection takes place, spores are produced on the underside of the leaf. The spores are dislodged upon drying and easily become airborne.

Figure 1. Downy mildew of watermelon causes dark brown or black lesions often surrounded by a yellow halo. (*Photo by Dan Egel*)

Figure 2. The underside of leafs affected by downy mildew may exhibit a dark 'fuzz' under moist conditions, which is caused by the production of spores of the fungus-like organism. (*Photo by Dan Egel*)

The fungus-like organism that causes downy mildew does not overwinter in Indiana; instead it overwinters on the Gulf coast or in cucurbit greenhouse production somewhere near the Canadian border. Usually, this fungus-like organism blows into Indiana in late August or September. This year's entrance is unusually early.

The fungus-like organism that causes downy mildew of cucurbits does not affect unrelated hosts such as soybean.

There are several pathotypes of the fungus-like organism that cause downy mildew. Each pathotype specializes in a different set of cucurbit hosts. In most years, downy mildew shows up on cucumbers and cantaloupe first. Since, this situation is a bit complicated and isn't entirely understood, I would advise all cucurbit growers in Indiana to begin the management options described below even if it is only to closely scout one's field.

While crop rotation is always a good idea, this management technique will not work for downy mildew since the causal organism does not overwinter in the soil. There are a few varieties that have resistance, but only for cucumbers. Most growers find it necessary to apply fungicides to protect their cucurbit crops. However, since the fungus-like organism that causes downy mildew is not closely related to the fungi which cause most other cucurbit diseases, the fungicides that are most effective against downy mildew are not necessarily effective against most other cucurbit diseases. (A very different fungus causes powdery mildew of cucurbits.) Products that can be used to manage downy mildew are listed in the *Midwest Vegetable Production Guide*. The most effective products are likely to include Ranman®, Gavel® and Zampro®. Growers who have been applying Presidio® for Phytophthora blight may find that this product is also effective against downy mildew. I have found Previcur Flex® to be effective, however, more recent data indicate this product to be less effective than the above products. Products that contain phosphorus acid (such as Agri-phos®, Phostrol®, Prophyt®, Rappart®) may help in situations where the disease is not present, but may threaten in the future. Contact fungicides such as those with the active ingredients chlorothalonil or mancozeb may not be as effective as the products listed above, but do offer some protection. Organic growers should use a formulation of copper that is certified for organic use.

Additional information can be found through these links:
https://www.extension.purdue.edu/extmedia/BP/BP-140-W.pdf
https://www.youtube.com/watch?v=sz0vZ-t0gyg

Powdery Mildew of Tomato - (*Dan Egel, **egel@purdue.edu**, 812-886-0198*) - This disease has been reported near West Lafayette and in Wanatah Indiana. Powdery mildew of tomato can be recognized by the white fungal colonies on both leaf surfaces (see Figure 3). Occasionally, stems may also be infected. Severely affected tomato plants may have leaves that turn chlorotic and necrotic. Fruit will not be directly affected.

The causal organism has been identified as *Pseudoidium neolycopersici*, formerly *Oidium lycopersici*. This fungus may survive as resting structures on host material. The spores are easily wind dispersed to additional tomato plants. Development of this disease is favored by temperatures below 86°F. As with most powdery mildew diseases, high humidity allow the disease to develop; leaf wetness is not necessary. Since high humidity favors powdery mildew of tomato, greenhouse environments often favor the disease.

Reports of powdery mildew on tomato are not common in Indiana. There is no data on yield loss from this disease on tomato. Nevertheless, if this disease is present, management options should be considered. Several systemic fungicides are listed as possible options in the *Midwest Vegetable Production Guide*. It might be useful to choose a product that is also labeled on early blight and Septoria leaf blight. An example would be Fontelis®, which is labeled for field or greenhouse tomatoes.


Figure 3. Powdery mildew of tomato is easily recognized from the sporulation of the white fungus on the leaves. (*Photo by Natasha Cerruti*)

Magnesium and Manganese in Melon - (*Dan Egel, **egel@purdue.edu**, 812-886-0198 & Liz Maynard, **emaynard@purdue.edu**, 219-531-4200*) - I have observed many fields of cantaloupes with magnesium deficiency or manganese toxicity. Watermelon plants may exhibit similar symptoms, but not as frequently as cantaloupe. Both disorders are related to acid (low pH) soils and usually occur in clusters in a field. Magnesium deficiency usually appears on sandy ridges and can be recognized by interveinal yellowing and death of tissues on older leaves (see Figure 4). Manganese toxicity also first occurs on older leaves but appears in heavier or darker sands, often in low areas of the field. The diagnostic feature of manganese toxicity are the tiny pin-hole type lesions with yellow halos clustered between the veins (see Figure 5). Leaves are best viewed when held up to the sun.

These disorders can easily be confused with an infectious disease. In particular, magnesium deficiency has been confused with Alternaria leaf blight. Symptoms may seem to "spread" from areas of the lowest pH to areas of somewhat higher pH. Individual rows may seem to be worse than adjacent rows. Such rows may have

received less lime. The remedy for these disorders is to raise the pH of the soils involved with a lime that contains magnesium (dolomitic lime). This can be difficult to accomplish with crops growing under plastic mulch, because of the difficulty of getting the lime into the root zone. Magnesium deficiency alone can be alleviated by supplying a magnesium containing fertilizer.

Although growers may have soil tested and spread lime before the season, the heavy rains we have had over much of the state this year has led to many areas with low pH. In addition, wet conditions can increase the likelihood of manganese toxicity because manganese is converted to a more soluble form in saturated soils. Learn the symptoms of these disorders so you won't be wasting fungicides on a nonexistent disease. Additional discussion of manganese and magnesium may be found in Issue 585 of this newsletter.

Figure 4. Magnesium deficiency in cantaloupe often occurs in high, well-drained areas of the field. *(Photo by Dan Egel)*

Figure 5. Manganese toxicity in cantaloupe often occurs in lower, poorly drained areas of the field. *(Photo by Dan Egel)*

Upcoming Events

Pinney Purdue Vegetable Field Day and Sweet Corn Sampler. Thursday, August 13, 2015. 4:00 p.m. - 8:00 p.m. CDT. Pinney Purdue Ag Center, 11402 S. County Line Rd., Wanatah, IN. Plot tours include soil health management and disease suppressive soils, tomatoes and peppers in high tunnels, and sweet corn varieties. Private Applicator Recertification (PARP) Credit available. To register, visit **http://tinyurl.com/no6tosr** or contact Lori Jolly-Brown, **ljollybr@purdue.edu**, or 765-494-1296.

Beginning Farmer Tours. Free farm tours and networking events sponsored by Purdue Extension and Local Growers Guild. For more information and to register contact the Purdue Extension Education Store at **www.edustore.purdue.edu** or 888-EXT-INFO.

- September 8: Growing Places Indy, Indianapolis, IN. Lunch, networking session, tour. Urban produce farm with raised beds, u-pick, and greenhouses.
- September 14: Morning Harvest, Palmyra and Hardinsburg, IN. Breakfast, networking session, lunch and tour. Developing local markets for produce, including marketing to institutions such as hospitals and schools, hydroponic lettuce, herbs, strawberries, and more.
- October 11: Wayne-Egenolf Farm, Spencer, IN. Lunch, networking session, tour. Grassfed beef, pastured pork, and eggs.
- November 7: Perkins Good Earth Farm, DeMotte, IN. Breakfast, networking session, lunch, tour. Soil health, cover crops, vegetable and high tunnel production.

Indiana Pesticide Clean Sweep. To dispose of pesticides, first, complete the Pesticide Clean Sweep Planning Form to the best of your ability **www.oisc.purdue.edu/pesticide/clean_sweep.html**. Mail, fax or e-mail the completed form to Kevin Neal at OISC, 175 S. University, W. Lafayette, IN 47907-2063, 765-494-4331, or **nealk@purdue.edu** no later than Monday, July 30, 2015.

- August 18: Miami County Fairgrounds, Peru, IN
- August 19: Elkhart County Fairgrounds, Goshen, IN
- August 20: Randolph County Fairgrounds, Winchester, IN
- August 26: Decatur County Fairgrounds, Greensburg, IN
- August 27: Hendricks County Fairgrounds, Danville, IN

PURDUE UNIVERSITY

PURDUE UNIVERSITY COOPERATIVE EXTENSION SERVICE
Northwest District

July 21, 2015

Dear Sweet Corn Grower:

You know better than anyone that finding a sweet corn variety that grows well, looks good, and tastes great is like hitting the jackpot. We do our best to compare varieties for yield and ear characteristics in trials at the Pinney-Purdue Ag Center. But the question growers ask that is the toughest to answer is this: how does it eat?

Once again we're trying to answer that question at the **Pinney Purdue Sweet Corn Sampler on August 13, 4:00 to 8:00 PM Central Daylight Time**. We invite you, along with sweet corn lovers among the general public, to taste test some of the sweet corn varieties that are in the trial this year.

And because we know that you are probably growing some of the best-tasting sweet corn varieties on the market, we'd like to include some of your sweet corn in this friendly competition taste test, too.

If you would like to donate your corn to be included in the taste test, we would need at least two dozen ears, picked on August 13, and all of one variety. Ideally, you would deliver it to one of the following locations on August 13:

1. **Pinney Purdue Ag Center**, 11402 S. County Line Rd., Wanatah, IN 46390 between 7:30 AM and 12:00 PM CDT

2. **Purdue Extension, Lake County Office**, 880 E. 99th Ct., Suite A, Crown Point, IN 46307, 219-755-3240 between 8:30 and 10:00 AM CDT

3. **Purdue Extension, Porter County Office,** 155 W Indiana Ave, Suite 301, Valparaiso, IN 46383, 219-465-3555, between 8:30 and 10:00 AM CDT

4. **Purdue Extension, LaPorte County Office**, 2857 W State Rd 2, Suite A, LaPorte, IN 46350, 219-324-9407 between 8:00 and 10:00 AM CDT

If you are interested in supplying corn, please contact Lyndsay Ploehn at 219-465-3555 or at lploehn@purdue.edu by August 3. We will need to know the variety, the quantity (if not 2 dozen) and where you will deliver it. If you won't know the variety until August 13, that is fine, just be sure to tell us when you deliver it. If these delivery locations or times don't work for you, please contact Lyndsay to make alternate arrangements.

Your corn will be kept cool until it is cooked, except while it is being husked. For the taste test, we will give your corn a code number. We will invite people to taste all the corn entries and record how well they 'eat'. After the tasting we will give out the 'key' to the code numbers, so everyone can figure out which variety and whose corn they liked best. We'll summarize the results of the taste test and get that information to you as soon as possible. We will also report results to the public.
In addition to the taste testing, **the Pinney Purdue Vegetable Field Day & Sweet Corn Sampler will include a tour of the sweet corn variety plots, educational presentations–including one on insect management by Rick Foster–and a free dinner**. Hope you can make it, whether or not you decide to enter your corn in the taste test! You can pre-register by calling 219-465-3555 or online at **http://tinyurl.com/no6tosr**.

Sincerely,

Lyndsay Ploehn, ANR Educator
Liz Maynard, Specialist

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PURDUE UNIVERSITY

PURDUE EXTENSION

PINNEY PURDUE VEGETABLE FIELD DAY & SWEET CORN SAMPLER

Do you farm? Like to garden?

Like to cook? Love to eat?

Join us on the farm to learn about Purdue's vegetable research, talk with Purdue Specialists, and enjoy a FREE picnic dinner featuring local foods!

Topics include:

- Soil Health
- Cover Crops
- Organic Vegetable Production
- High Tunnels
- Insect Management
- Sweet Corn Varieties

Families welcome. Come rain or shine!

AUGUST 13, 2015

4:00-8:00 PM (CDT)

PINNEY PURDUE AG CENTER

11402 S. COUNTY LINE RD.

WANATAH, IN

REGISTRATION OPTIONS:

http://tinyurl.com/no6tosr

Contact Lori Jolly-Brown, 765-494-1296

ljollybr@purdue.edu

Or scan the QR Code.

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