

VEGETABLE CROPS HOTLINE

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

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IN THIS ISSUE

- ANTHRACNOSE OF CUCUMBERS
- DOWNY MILDEW OF BASIL
- PHYTOPHTHORA BLIGHT OF CUCURBITS
- THE FUTURE OF THE MANEB LABEL
- ANNOUNCEMENTS

ANTHRACNOSE OF CUCUMBERS - (Dan Egel) - The appearance of anthracnose of watermelon occurs every year in Indiana. A few weeks ago, an article appeared in the *Vegetable Crops Hotline*, issue number 511, that compared and contrasted anthracnose and gummy stem blight of watermelon. In over 14 years studying Indiana vegetable production, I have never observed anthracnose of cucumbers-until this year. I observed this disease in my cucumber experiment designed to study downy mildew. Read on for more details on anthracnose of cucumbers.

Anthracnose of cucumbers and watermelon are caused by different races of the same fungus. The cucumber race (race 1) affects only cucumbers and the watermelon race (race 2) affects only watermelon. (Anthracnose of muskmelon is rarely observed in Indiana and seems to be affected more by the cucumber race than the watermelon race. One might find watermelon hybrids in seed catalogs that claim resistance to race 1-the cucumber race! While technically true, virtually all modern watermelon hybrids are resistant to race 1 and susceptible to race 2.)

The rather large, round, light brown lesions of anthracnose of cucumber are shown in Figure 1. In contrast, lesions of downy mildew (which I expected to find in this experiment) are initially yellow and limited by veins (figure 2). On the underside of downy mildew lesions, one may be able to observe a fuzzy appearance which is the spores of the downy mildew fungus.

It is possible to find cucumber varieties resistant to race 1 (it never occurred to me to even worry about this disease). In addition, several fungicides should provide good control of this disease. Possible products include group 11 fungicides (e.g., Amistar®, Cabrio® and Quadris®) and products with more than one active ingredient (e.g., Pristine®). Also, the contact fungicides such as chlorothalonil (e.g., Bravo®, Echo® and



Figure 1: Anthracnose of cucumber causes light brown lesions that have round borders. (Photo by Dan Egel)



Figure 2: Down mildew of cucumber causes yellow lesions that are limited by veins. (Photo by Dan Egel)

Equus®) and mancozeb (e.g., Dithane®, Manzate® and Penncozeb®) should help manage this disease. Rotations of 3 or more years and fall tillage will help to keep the crop residue to a minimum and help in disease management. Finally, this disease can be transmitted on seed, so transplants should be closely inspected before transplanting. Greenhouse sanitation is a must.

Anthracnose of cucumber may be rare in Indiana. However, it is always best to be prepared.

DOWNY MILDEW OF BASIL - (*Dan Egel and Liz Maynard*) - This disease has been observed in northern Indiana. The fungus that causes downy mildew of basil does not overwinter in Indiana, but must blow in from the south. The fungus that causes downy mildew of basil is not the same fungus that causes downy mildew of cucurbits.

The symptoms of downy mildew of basil may not be immediately obvious. Leaves may turn a yellow color that is restricted by veins (Figure 1). Brown areas may develop in severe infections. Close examination of the underside of the leaf under moist conditions may reveal a gray 'fuzz' which is the spores of the causal fungus. Such leaves may not be marketable.



Figure 1: Downy mildew of basil can be recognized by the light yellow region between veins. (*Photo by Dan Egel*)

Since the fungus that causes downy mildew of basil does not overwinter in Indiana, fall tillage and crop rotation, although a good idea, won't help manage this disease. Pruning plants so that leaves dry out sooner may help reduce the amount of infection (many growers may want to prune plants to avoid flowering anyway). The only fungicide that I can find that is labeled for downy mildew of basil is Oxidate®. If applied properly, this fungicide should kill the fungus on contact. However, there will be no residue left on the leaf. Therefore, frequent applications may be advisable. The fungicides Amistar®, Quadris® and Switch® are labeled for basil, but not for downy mildew. Applying these fungicides will help reduce the amount of other foliar diseases on basil and may provide some protection for downy mildew.

PHYTOPHTHORA BLIGHT OF CUCURBITS - (*Dan Egel and Liz Maynard*) - Issue number 511 of the *Vegetable Crops Hotline* discussed this disease in some details. This article will update observations that have been made across Indiana. As discussed in the earlier article, heavy rains are often responsible for creating ideal conditions for the onset and spread of Phytophthora blight of cucurbits. Unfortunately, heavy rains have continued across much of the state.

Recently, Phytophthora has been confirmed in cucumbers in northern Indiana. Growers might notice the white moldy appearance of cucumbers (Figure 1).

Pumpkins likewise have a white mold that appears initially on the underside of the fruit (Figure 2). Fruit affected by this disease will soon completely rot. Produce should be culled carefully to avoid shipping fruit that will eventually rot.

The fungicides available for treatment were discussed in issue number 511. Remember when considering fungicide treatments that no treatment will help fruit and vines that are already infected with the fungus. All fungicide treatments should be aimed at keeping vines healthy. Fungicides will help to slow the spread of the disease from plant to plant, but will do little to reduce infection that takes place from the bottom of the fruit where infection normally starts.

One might want to consider plowing down a portion of severely affected fields to reduce the amount of the fungus that is available for spread (Figure 3). Be sure to plow down a few apparently healthy plants next to the diseased area. Phytophthora blight has almost certainly already spread to the adjacent plants.



Figure 1: These cucumbers have been culled due to infection by Phytophthora blight. (*Photo by Liz Maynard*)



Figure 2: Infection by the Phytophthora blight fungus often takes place from the bottom of the fruit. (*Photo by Dan Egel*)



Figure 3: One method to slow the spread of *Phytophthora* blight is to plow down (rogue) diseased vines. (Photo by Dan Egel)

THE FUTURE OF THE MANEB LABEL - (Editors note: This article is modified from information provided by Gary E. Vallad of the University of Florida and Kent Smith ARS-USDA) - Last spring, United Phosphorus™, the sole registrant of technical maneb voluntarily cancelled the registration for maneb. For several vegetable crops, maneb is the only broad-spectrum fungicide available. A registration for mancozeb, an ideal broad-spectrum replacement for maneb, was submitted to the EPA for review this summer. However, the review date for this petition has now been postponed until March 2010. This has reignited fears that existing stocks of maneb will be

gone before the end of 2009. Pepper producers would be most adversely impacted by such a shortage, as they rely on maneb for mixing with copper-based fungicides to control bacterial spot. Mancozeb and maneb are both dithiocarbamate fungicides commonly used as protectants against a broad spectrum of fungal pathogens on numerous vegetable and fruit crops. While there should be adequate stocks of maneb available for this fall and the following spring, there is no guarantee that supplies won't be redistributed if a demand arises elsewhere (ie. Mexico/California). As a precaution, pepper growers should contact their local distributor to ensure adequate availability through next spring. Hopefully, at such time, the EPA will have reviewed the mancozeb registration, which will include expanded usage on several vegetable crops, including pepper. A new label will probably not be available for use until the summer of 2010 at the earliest and many other crops will still remain orphaned with no broad-spectrum fungicide available (see table below).

Growers should also be aware that the EPA did approve the addition of several new vegetable uses to the Bravo® (chlorothalonil) label. These additions are summarized in the table below. Growers using old stocks should contact their distributor for the new label. The expansion of the Bravo® label will satisfy some of the needs for broad-spectrum fungicide control in crops orphaned by the loss of maneb. Unfortunately, Bravo® (chlorothalonil) is not effective against bacterial diseases and will not replace maneb as an effective tank-mix partner with copper for the control bacterial spot on pepper or other vegetables.

Florida vegetable crops affected by the loss of maneb, and Bravo® (chlorothalonil) label expansion.

Crop	Registration status as of August 2009		
	Maneb (existing stocks)	Mancozeb	Chlorothalonil
Mancozeb Petitioned Crops			
Broccoli	Yes	No*	Yes
Cabbage	Yes	No*	Yes
Lettuce	Yes	No*	No
Peppers	Yes	No*	Yes
Pumpkins	Yes	No*	Yes
Squash, winter	Yes	No*	Yes
Orphaned Crops - lack supporting petition for mancozeb			
Beans, dry	Yes	No	Yes
Brussels sprouts	Yes	No	Yes
Cauliflower	Yes	No	Yes
Chinese cabbage	Yes	No	Yes
Collards	Yes	No	No
Endive	Yes	No	No
Eggplant	Yes	No	Yes
Kale	Yes	No	No
Kohlrabi	Yes	No	Yes
Mustard greens	Yes	No	No
Onion, green	Yes	No	Yes
Turnip tops	Yes	No	No

*New mancozeb uses being sought by Dow®, DuPont®, or IR-4; expected March 2010



PUMPKIN TWILIGHT MEETING - (*Announcement*) – Thursday, September 17, 2009, 6:00 – 7:30pm (Central Daylight Time), Pinney-Purdue Ag Center, 11402 S. County Line Road, Wanatah, IN. Join us for a wagon and walking tour of pumpkin plots to compare variety performance with and without treatment for powdery mildew. Purdue Extension Specialists Dan Egel and Liz Maynard will discuss disease management, variety highlights, and production methods.

Directions: 5.5 miles east of Valparaiso or 1 mile West of Wanatah on US Highway 30, then North .5 mile on Porter/LaPorte County Line Road.

❖ If you have a disability that requires assistance for you participation in this event, please call (219) 785-5674 at least 3 days prior to the event.

❖ Sponsored by *Northwest Indiana Commercial Horticulture Program – Purdue University Department of Horticulture and Landscape Architecture, Purdue Agricultural Research Programs – Purdue Ag Centers, and Purdue University Cooperative Extension Service.*

CUCURBIT DOWNY MILDEW ipmPIPE SURVEY - (*Wendy Britton, North Carolina State University*) - This is a reminder to everyone about the site survey for the Cucurbit Downy Mildew ipmPIPE. The survey can be found at the following website, <www.ces.ncsu.edu/depts/pp/cucurbit/>, by clicking on the "Please help us improve our Website" link on the top of the main page as well as on the top of the interactive map page.

We currently have 20 results from the survey and it would be extremely beneficial to have more. There will also be an "end of season" survey posted soon.

Fulton County Vegetable Crops Meeting, November 25, 2009, 1:00PM at the Fulton County Fairgrounds, Rochester, IN. Contact Mark Kepler mkepler@purdue.edu or (574) 223-3397.

2009 SARE FARMER/RANCHER GRANTS - (*Announcement*) - The 2009 call for farmer / rancher grant proposals is now available at <http://sare.org/ncrsare/documents/FRG_CFP_2009.doc>. The deadline is 4:30pm CDT, Thursday, December 3, 2009.

Illiana Vegetable Growers School, Tuesday, January 5, 2010, Teibel's Restaurant, Schererville, Indiana. Program available in December. For more information (219) 785-5673 or emaynard@purdue.edu.

Indiana Horticultural Congress, January 19-21, 2010, Windham Hotel, Indianapolis, Indiana. For more information <www.inhortcongress.org>.

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