VEGETABLE CROPS HOTLINE

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

Dan Egel, Editor
(812) 886-0198
egel@purdue.edu

No. 492
May 23, 2008

<http://www.btny.purdue.edu/pubs/vegcrop>

IN THIS ISSUE

TOMATO DISEASE PRIMER - *(Dan Egel)* - For most areas of Indiana, the weather has been too cool and wet to cause much foliar disease to get started. It won't be long, however, until warmer weather will allow the usual diseases to infect tomatoes. The following is brief description of some of the tomato diseases I see each summer.

Early blight (Figure 1) - The leaf spots caused by this disease are roughly circular and up to 1/2 inch in diameter. The spots contain dark concentric rings in a target-like pattern. The spots first occur on the older leaves and progress upwards. Fruit spots (less common) may occur at the stem end. Such spots are usually brown-black and up to 1 inch in diameter.

Early blight can be managed by rotating away from tomatoes or potatoes for 3 to 4 years. Fall tillage can help get rid of crop residue, which might harbor the disease. Most growers find that protective fungicides are critical to managing early blight. Check the ***Midwest Vegetable Production Guide for Commercial Growers (ID-56)*** <www.btny.purdue.edu/Pubs/ID/ID-56/>.

Bacterial spot - 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. Spots on fruit are black, raised and up to 1/3 inch in diameter. The disease prefers warm wet weather.

Bacterial spot may be seed borne; greenhouse grown transplants should be carefully monitored. Tomatoes should be rotated 2 to 3 years away from peppers or tomatoes. Treatment with copper hydroxide may reduce spread in the field. However, copper products will have little affect on tomato disease such as early blight and septoria leaf spot. Make sure to consult the ***Midwest Vegetable Production Guide for Commercial Growers (ID-56)***.

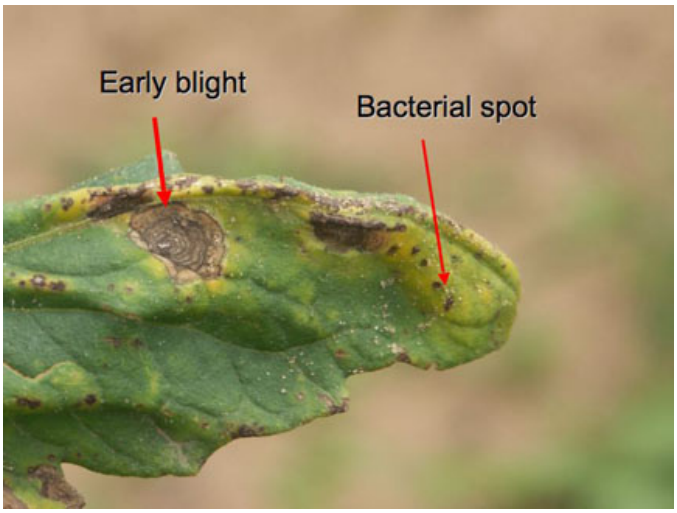

Figure 1: This leaf has lesions of early blight and bacterial spot (see labels). *(Photo by Dan Egel)*

Septoria leaf spot (Figure 2) - Spots on leaves are circular with chocolate brown margins and gray centers. As the spots enlarge (up to 1/8 inch in diameter), small dark spots may be observed within each lesion. These are the reproductive structures of the causal fungus. As in early blight, the spots start on the older leaves first.

Manage Septoria leaf spot in the same fashion as early blight.

Figure 2: Lesions of Septoria leaf spot tend to be round with a dark necrotic margin and a light gray center. *(Photo by Dan Egel)*

Bacterial Canker - Older leaves are often affected first. Leaves may turn downwards and eventually curl. The most characteristic symptom on leaves is the brown necrotic area along the margin of the leaves. Inside the brown area, the leaves are frequently yellow, giving the leaves a scorched appearance. However, other environmental factors can give the leaves a similar scorched appearance. Spots on fruit are usually less than 1/4 inch in diameter and have a characteristic "birdseye" appearance; that is, they are light colored with a dark center.

Bacterial canker is another disease that may be seed borne. Rotations of 2 to 3 years and fall tillage are important in managing this disease. The use of copper products to control the disease in the field has had mixed results. Remember to use good sanitation. For example, use only clean stakes. Reduce the spread of bacterial canker by working the field when the plants are dry.

Other diseases - The above list accounts for about 80% of the tomato disease I see each year. Other diseases include **bacterial speck** of tomato. This disease looks similar to bacterial spot but occurs in cooler weather. Thus bacterial speck is often found earlier in the year.

Circular sunken spots of about 1/2 inch in diameter on ripe to over ripe fruit may be caused by **anthracnose fruit rot**. A gray-green water-soaked spot that may cover half the fruit or more could be **buckeye rot**. A dark rot starting at the blossom end of the tomato fruit is most likely **blossom end rot**. The latter disorder is not a disease at all, but a calcium imbalance, frequently corrected by avoiding wide swings in soil water availability.

Many other diseases and disorders may occur. This list is just a start. Contact me if you have any questions.

Scouting Report - *(Dan Egel)* - This cool, wet spring has been associated with quite a few diseases related to the weather. The following article is a compilation of some of the problems I have observed this spring.

Angular leaf spot (Figure 1) - This bacterial disease, usually found in the greenhouse, causes irregular water-soaked lesions on muskmelon and watermelon. The lesions can occur on the seed leaves or the true leaves. On muskmelon, the lesions are dark brown with a yellow halo. Although a few seedlings may be severely affected, the disease never persists after the onset of warm weather. This disease has been very common due to the cool spring.

Damping-off - This disease may occur in the greenhouse or in the field. Affected seedlings may collapse; the stem at ground level may be discolored. It should be possible to avoid this disease in the greenhouse if proper sanitation is observed. Cool conditions in the greenhouse or in the field favor the fungi that cause this disease over the seedlings. Any vegetable seedling can be affected.

Figure 1: Angular leaf spot symptoms vary, but the dark lesion on this watermelon leaf is fairly typical. *(Photo by Dan Egel)*

Anthracnose (Figure 2) - I observed this disease on two different occasions on watermelon transplants. This disease is unusual to Indiana. Anthracnose causes jagged lesions on the true leaves. Avoid planting seedlings with anthracnose in the field.

Figure 2: Anthracnose lesions on watermelon tend to be jagged in appearance. *(Photo by Dan Egel)*

Gummy stem blight - This disease is most easily recognized by the water-soaked area of the seedling around the seed leaves. This area later appears 'woody'. This disease can be very serious in the greenhouse and in the field. Avoid planting seedlings with gummy stem blight in the field.

Fusarium wilt of watermelon - I have observed this disease in greenhouse grown transplants. Although this disease may be seed transmitted, the fungus may survive on transplant trays from year to year (we have been able to show this in our greenhouse). It is very difficult to disinfect trays sufficiently to completely rid used trays of the Fusarium fungus. This is a strong argument for using new transplant trays each year.

Striped Cucumber Beetles - *(Rick Foster)* - I have observed striped cucumber beetles in southwestern Indiana. The recent warming trend combined with predicted warmth over the weekend may increase the number of cucumber beetles observed across the state (Figure 1). Cucumber beetles often will attack a field en masse, with

Figure 1: Striped cucumber beetle. *(Photo by Dan Egel)*

infestation seeming to occur almost overnight. That is why it is important to regularly scout your fields. The only way to prevent transmission of bacterial wilt of cucurbits is to control the beetles (Figure 2). Because the beetles are not very effective vectors of the bacterium, many years of re-

Figure 2: Bacterial wilt of cucurbits. *(Photo by Rick Latin)*

search have shown that muskmelon and cucumber growers should start spraying when they find an average of one striped cucumber beetle per plant. In all of our studies on both of these crops, we have never had situation where an average of one beetle or less per plant resulted in any plants showing symptoms of bacterial wilt. Remember that watermelons are not susceptible to bacterial wilt, so the only concern is the direct feeding damage from the beetles. Some squash varieties are very attractive to the beetles and can have lots and lots of beetles on a single plant, but the direct feeding damage is the only concern. Generally speaking, it would require at least 5 beetles per plant before watermelon or squash should be treated.

Cool Temperatures - *(Liz Maynard)* - Cool temperatures have predominated for the past two weeks. For the week ending May 18, temperatures averaged 5 to 10 degrees below normal across the state, and lows ranged from 36 to 45. In addition to promoting pest problems such as the seed corn maggots mentioned in a previous issue of this newsletter, the cool weather can negatively affect crop growth. Most cool season crops can tolerate these conditions with nothing more than a slowdown in development, if not injured by insects or disease. Exceptions to this include vegetables that can be induced to bolt or form other reproductive structures by prolonged exposure to cool temperatures, such as cauliflower, Chinese cabbage, other crucifers, parsley, and other biennials.

It is a different story for the most tender vegetables. They suffer chilling injury below 45 to 50 degrees F. Chilling injury is cumulative: the lower the temperature and the longer the exposure, the greater the injury. Symptoms include wilting, water-soaked spots on leaves, and slowed growth for a time even after conditions improve. Muskmelon, watermelon, squash, cucumber, pumpkins, eggplant, pepper, and basil all are susceptible to this type of injury.

In northern Indiana, many of these tender crops are still in the transplant trays. If trays are outside for hardening, the plants may experience several consecutive nights of cool temperatures that will lead to chilling injury. Consider ways to protect these plants on cool nights.

Plants that experience chilling usually recover eventually, but their development is delayed compared to unchilled plants. Some may not recover, leading to a reduced stand in the field. Where feasible, preventing exposure to the chilling temperatures is the recommended solution to this problem.

Reference: USDA-NASS. 2008. Indiana Crop & Weather Report (19 May 2008). Indiana Office of USDA's National Ag. Statistics Service, available at <www.nass.usda.gov/Statistics_by_State/Indiana/Publications/Crop_Progress_&_Condition/2008/wc051908.pdf>.

Introduction to High Tunnels Streaming Video Available On-Line - *(Liz Maynard)* - Earlier this Spring, Extension at Purdue, Michigan State, Ohio State, and University of Illinois collaborated to present a program about growing vegetables in high tunnels and hoophouses. The program was recorded live and is now available for viewing as a streaming video. The video along with speaker handouts and links to other references are available at <www.tristateorganic.info> under the 'Hoophouses and High Tunnels' link.

Mid American Ag and Hort Services to Host Kentucky Human Resource Conference - *(News Release - Toledo, Ohio)* - Mid American Ag and Hort Services, Inc. (MAAHS), is hosting a comprehensive human resource conference for agriculture and horticulture businesses on June 18, 2008, at the Pritchard Community Center, Elizabethtown, Kentucky. The one-day conference will focus on helping producers of priority commodities manage legal and human resource risks. MAAHS is the labor organization dedicated to simplifying labor issues and transforming human resources for Kentucky, Indiana, and Ohio agricultural and horticultural businesses.

"Producers of floricultural, ornamental nursery, Christmas trees, turf grass sod, fruit, vegetables, tobacco, and livestock face human resource and legal risks due to their need for hired labor," noted Dr. Shari Plimpton, Executive Director for MAAHS. "The goal for this conference is to introduce some of these risks and educate producers on effective management tools to minimize and manage them."

The agenda includes two presentations by Dr. Bob Milligan, Senior Consultant with Dairy Strategies, LLC. Dr. Milligan provides insight to managers by presenting complex human resource and business concepts in formats that are understandable and useable. Dr. Milligan's agenda topics include, "Understanding How Individuals - Including Yourself - Respond to Change," and "Three Keys to Successful Supervision, Ways to Increase Workforce Productivity."

John Wargowsky, Sr. Director, Field Communications with the Ohio Farm Bureau Federation, is the former Executive Director of MAAHS with expertise and knowledge in labor and immigration compliance issues. Mr. Wargowsky will present on the topic, "What's New with Labor and Immigration Compliance?"

Registration is $50 for MAAHS members and $55 for non-members. A sharing and networking luncheon is included with each registration. Interested attendees can access registration forms through the website by visiting <www.midamservices.org> and clicking on Human Resource Conference. You may also contact Deanne Maus for more information or questions, (419) 724-2930, <maahsadmin@eisc.org>.

MAAHS is a unique non-profit, membership-based consortium of associations, organizations and employers organized to meet the educational, regulatory compliance assistance and labor recruiting needs of agricultural and horticultural employers in Indiana, Kentucky and Ohio. New members are welcome.

Vegetable Crops Hotline
c/o Dan Egel
Southwest Purdue Agricultural Program
4369 N Purdue Rd
Vincennes, IN 47591