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CORN

Lots of Physoderma Brown Spot of Corn in Western Kentucky

By Paul Vincelli

The UK Diagnostic lab and industry agronomists are reporting substantial amounts of Physoderma brown spot in corn this year.

Symptoms

Infection by the fungus produces chocolate-brown spots on leaf midribs and leaf sheaths. Infections of the leaf blade tend to be small and yellowish to yellowish-brown in color (Figures 1-2). Very often, symptoms appear as diffuse bands of disease (Fig. 1-2). This is because infections typically occur in the whorl, where free moisture accumulates. Since environmental conditions in the whorl fluctuate, so does the occurrence of infections as the corn tissue grows through the whorl. Under unusually disease-conducive conditions in highly susceptible hybrids, infections may progress into the stalk and cause browning at and above the node, though this is unusual.

Occurrence

This disease is almost always more of a curiosity than an agronomically significantly factor, but substantial amounts are present in some fields this year. As is usually the case, reports thus far suggest that only certain leaf positions are showing significant damage (Fig. 3).

Management

Generally, it is not necessary to direct management practices at this disease, since it so often is not agronomically significant. However, for producers who are concerned about the level of disease they see in their fields, rotation to a crop other than corn is an excellent option. The fungus that causes this disease survives in corn residue, so rotation helps to starve out the fungus. Likewise, tillage will reduce disease severity, but since this disease is commonly not a yield-limiting factor, I don't think it's advisable to till to reduce brown spot pressure.

Hybrids that were hit hard this season may be particularly susceptible, so it may be wise to avoid those hybrids, at least on land that isn't rotated or in bottomlands where humidity tends to be high. However, the susceptibility of most hybrids to Physoderma brown spot is probably not known, since this is such a hit-or-miss disease.

Some producers are wondering about fungicide sprays. The only published research on fungicidal control of this disease that that I have found thus

far is from Nigeria, and I am waiting for those results via interlibrary loan. There is so little published research on this disease primarily because it is normally such a minor issue.

Various reports I have received from agronomists over the years suggest that the one labeled fungicide (Headline) may sometimes provide partial suppression of this disease, but I don't see any value in applying fungicide now against this disease because Physoderma infection occurs primarily in the whorl. Thus, fungicide applications during and after tasseling will generally have little to no effect on brown spot.

Some producers wonder if a fungicide application on brown spot-affected corn might help protect the crop against the stalk rots that might follow "on the heels" of this disease. Again, I don't think so. Foliar fungicide applications can sometimes reduce damage from stalk rots. However, fungicides don't actually protect against infections by fungi that attack the lower stalk. They can reduce stalk rot by protecting leaves from gray leaf spot and certain other foliar diseases. Plants with better leaf health sometimes are physiologically better able to defend themselves against stalk rots. So foliar fungicides protect stalk health indirectly, not directly. But since Physoderma brown spot has done whatever damage it will do, a fungicide application now seems almost pointless.

The main thing producers can do this season is to monitor affected fields for stalk rots and stalk strength. One way to check stalk strength is to push the stalks 15-20 degrees from vertical at about chest height. If 10-15% of stalks collapse easily, schedule the field for early harvest before a strong wind results in lodging of the field.

Figure 1. Symptoms of Physoderma brown spot on corn leaf blade (Source: Bill Meacham, Pioneer Hi-Bred, 2011).

Figure 2. Symptoms of Physoderma brown spot on corn leaf sheath. Normally this fungus does not infect the stalk. Prove this to yourself by stripping away the sheath and inspecting the stalk for symptoms.

Figure 3. Severe symptoms of Physoderma brown spot in mid-canopy, before tasseling (Source: Phil Needham, not from 2011 growing season).

CUCURBIT

Cucurbit Diseases Widespread in Kentucky

By Kenny Seebold

Over the past two weeks, we've seen an explosion of disease issues across a wide range of vegetable crops, particularly on cucurbits. Warm temperatures and humid or rainy conditions have created environments that are favorable for a number of diseases on a cucumbers, melons, squash, pumpkins, and watermelons. Some of the more serious problems are listed below.

Foliar diseases such as angular leaf spot, Alternaria leaf blight, anthracnose, and gummy stem blight are fairly common around the state. I'm also seeing powdery mildew firing up in some areas, but air temperatures have been high enough to slow disease development. On the positive side, we have not found downy mildew, and are not being threatened by known sources on the east coast, Michigan, or Ohio. Refer to ID-91, the IPM Scouting Guide for Cucurbit Crops in Kentucky, for images of these diseases. One case of Phytophthora blight was confirmed earlier in July on watermelons in western Kentucky, and another outbreak was found at the end of July in central Kentucky. Phytophthora blight can be extremely difficult to control once an epidemic begins, especially if warm and rainy conditions persist. For more information on Phytophthora blight and its control, see PPFS-VG-04 (Phytophthora Blight of Cucurbits and Peppers).

Bacterial wilt has been a serious issue cucumbers and cantaloupes, and yellow vine decline is beginning to show up on squash and pumpkins. It's important to remember that these two problems can't be stopped with bactericides once they've started; bacterial wilt and yellow vine decline are transmitted by cucumber beetles (spotted or striped) and squash bugs, respectively. Controlling insect vectors is the only way to manage these problems.

Recommended cultural practices, fungicides, and sample spray programs for diseases of cucurbits can be found in ID-36 (Vegetable Production Guide for Commercial Growers) and specific tips for managing downy and powdery mildew were published recently in *Kentucky Pest News* No. 1276 (July 12, 2011). Additional information is listed below for organic producers and home gardeners.

Organic commercial producers: The most effective material available for cucurbit diseases is fixed copper. These are mediocre against diseases like Alternaria leaf blight, anthracnose, and gummy stem blight, but work well against angular leaf spot, downy mildew, and (to some extent) powdery mildew if applied preventively. OMRI-approved materials include Nordox 75WG, Nu-Cop 50WP, and Badge x2. Potassium bicarbonates (Kaligreen, Armicarb, and others) are OMRI-approved and are fairly effective preventive materials for powdery mildew.

Homeowners: General disease control recommendations are listed in ID-128, Home Vegetable Gardening in Kentucky. In terms of chemical controls, products containing

chlorothalonil (Daconil or Bonide Fungonil) are reasonably effective for foliar diseases of cucurbits. For powdery mildew, homeowners also can use fixed coppers (Bordeaux mixture, copper dust, or liquid copper fungicides). Spectracide Immunox Concentrate contains myclobutanil, the same active ingredient found in Rally 40WSP, and is a good tool for managing powdery mildew. No more than five applications can be made per season, and the fungicide should be alternated with a chlorothalonil or fixed copper to help prevent the development of resistance. A solution of 1-3 tsp of baking soda per gallon of water, applied as a foliar spray, can also be effective against powdery mildew if applied regularly. Adding a few drops of dish detergent will improve coverage.

Other Issues. The first-ever outbreak of bacterial fruit blotch in Kentucky was confirmed on July 15 on seedless watermelons ('Matrix'). The pollinators used in the field were 'Sidekick' and 'Ace'. No additional cases of this disease have been found since the initial report. Bacterial fruit blotch a devastating problem sometimes referred to as 'exploding watermelon disease' that has plagued producers in Florida, Georgia, North Carolina, and Indiana (among others) for many years, but had never been found in our state. The pathogen, *Acidovorax avenae* subsp. *citrulli*, is a bacterium that is spread mainly on seed. On watermelon fruit, the disease first appears as small, water-soaked spots that later expand to cover large areas. Cracks can appear in the affected areas, and liquid tends to ooze from the cracks (Figure 4). Necrotic areas, brown in color, develop in the rind (Figure 5), and the pathogen will ultimately invade the fleshy part of the fruit. After this stage watermelons will split or collapse, releasing large amounts of fluid and macerated tissue (Figure 6). Bacterial fruit blotch can be difficult, if not impossible, to control once found in the field. Regular applications of fixed coppers can slow disease development if begun before fruit set. The pathogen can be spread from field to field easily on equipment, clothing, or shoes, so it is extremely important to maintain sound sanitary practices if bacterial fruit blotch is confirmed. A summary of this disease and control measures can be found at http://www.apsnet.org/edcenter/intropp/lessons/prokaryotes/Pages/BacterialBlotch.aspx. Please contact your local Cooperative Extension agent or Extension plant pathologist if you find bacterial fruit blotch or suspect that it is present in your area.

Figure 4. Bacterial fruit blotch of watermelon, showing external symptoms.

Figure 5. Bacterial fruit blotch of watermelon, showing internal symptoms in rind.

Figure 6. Ooze from watermelon fruit with bacterial fruit blotch.

TOBACCO

Disease Update
By Kenny Seebold

Blue mold appears to have gone dormant in the areas where it had been reported earlier (Pennsylvania and Massachusetts). Temperatures in Kentucky have been above 90 °F for nearly three weeks, making conditions generally unfavorable for development and spread of the disease. The most recent outlook from the North American Plant Disease Forecast Center at NC State predicts an extremely low threat to Kentucky and surrounding states from blue mold. Many crops around the state have reached the topping stage, which will lead to lower susceptibility to blue mold. Crops that have yet to be topped should be checked regularly and growers need to be prepared to apply fungicides if the blue mold forecast changes.

Black shank has become increasingly prevalent over the past couple of weeks, particularly in areas that had received plenty of rainfall early and then entered a period of heat and moisture stress. At this stage in the season, control options for black shank are limited. Ridomil Gold SL (or generics such as Ultra Flourish or MetaStar) can be used as late as the layby stage (last cultivation) in situations where black shank appears after transplanting. If a fungicide was applied at or before transplanting, treat with Ridomil Gold SL at 1 pt/A (2 pt/A for Ultra Flourish or 2 qt/A for Meta Star). If no fungicide was applied at or before transplanting, Ridomil Gold SL is labeled at 1-2pt/A for a treatment made only at 1st cultivation, or 1 pt/A for treatments made at 1st cultivation and layby.

These "rescue" applications will be most effective if a variety with moderate-to-high levels of resistance has been planted, such as KT 204, KT 206, or KT 209. Applications should be directed at the soil and stems of plants for best control of black shank. The fungicide should be incorporated as quickly after application as possible, either mechanically or by irrigation (natural rainfall or overhead irrigation). Soils need adequate levels of moisture to activate mefenoxam and permit its uptake into the plant. Secondary spread of black shank is considerably less likely in a drought than in rainy weather; however, heavy rains or irrigation could result in heavy losses to black shank in fields with even low levels of disease, so mefenoxam should be applied in advance of anticipated moisture events. Unfortunately, black shank is showing up in many fields well after layby, and in some cases just before topping. Ridomil Gold SL, Ultra Flourish, and Meta Star are not labeled for use after the layby stage, and thus there are no chemical control options that are legal or practical when black shank sets in later in the growing season.

The black shank pathogen can be moved easily on equipment and feet! Growers need to sanitize properly when moving between infested and clean fields.

For recommendations on the control of tobacco diseases, please consult past issues of the *Kentucky Pest News*, or the *Kentucky-Tennessee Tobacco Production Guide* (ID-160), available at http://www.ca.uky.edu/agc/pubs/id/id160/id160.pdf.

Tobacco Insects and Signs
By Lee Townsend

Insect activity is picking up in tobacco; here are some things you might see, starting with foliage feeders.

The second and largest brood of hornworms is getting underway. Moths will be flying at night for the next few weeks and laying hundreds of single eggs on the undersides of tobacco leaves. Infested plants are randomly scattered over a field.

Hornworm larvae feed for about 3 weeks but most of the damage is done during the last few days of development. Approximate lengths (inches) of the 5 larval stages are: ¼, ½, 1, and 3-1/4. Watch for irregular holes with smooth sides in the upper third of the plant and treat if 5 or more larvae are found per 100 plants.

Both tobacco and tomato hornworms can be found on plants. Tobacco hornworms have a series of white slanted bars (/) with black edges along each side and a red horn. Tomato hornworms have a series of white v's (V) without black edges and a black horn.

Climbing cutworms are occasional pests. Damage is intense because moths lay a cluster of eggs on a single plant. Climbing cutworms feed over the entire plant rather than at ground level like most cutworms. They are about 2 inches long when full grown.

Tobacco aphids can be a problem if a systemic insecticide was not used at transplant of if foliar sprays were not applied when colonies began to appear. Serious yield loss due to sap removal occurs from 4 to 6 weeks after transplant until topping time. Small colonies that develop just before topping will not have a significant impact on yield but their honeydew can draw bees and wasps.

Several beneficial insects will begin to appear as tobacco aphid numbers begin to grow. Lacewing adults can be very abundant and fly frequently. They are often mistaken for pests but are important predators of aphids.

Figure 7. Tobacco hornworm moth ready to roll...

Figure 8. Smooth-edged holes caused by hornworm caterpillars.

Figure 9. Tomato hornworm.

Figure 10. Climbing cutworms have a single row of light spots down the center of the back.

Figure 11. Tobacco aphids.

Figure 12. Asian lady bettle.

Figure 13. Adult green lacewing.

Figure 14. Lacewing larva.

Lace Bug Feeding Injury Appearing
By Lee Townsend

Lace bugs use their sucking mouthparts to feed on plant sap. Damage ranges from a few scattered tiny white to yellow spots on the upper surfaces of leaves to bleached white leaves that drop prematurely in late summer. Common species in Kentucky feed on azalea (azalea lace bug); hawthorn, cotoneaster, pyracantha, Japanese quince (hawthorn lace bug); rhododendron and mountain laurel (rhododendron lace bug); and ash, hickory, mulberry, and sycamore (sycamore lace bug). Lace bugs can be confirmed as culprits by looking at the undersides of spotted leaves for the insects, white cast skins, tarry waste spots, or eggs (larger dark spots along leaf midribs). The adult is about 1/8 inch long with lace-like wings that cover the abdomen. Nymphs are dark and spiny.

Tolerate light to moderate damage as much as possible; often the plant is not harmed by these insects. Prune damaged foliage if practical, and follow sound practices to promote plant health. Insecticidal soap and horticultural oils can be used for control with minimal impact on natural enemies; most other insecticides will provide control, as well. Thorough spray coverage to lower leaf surfaces is necessary with all products.

Lace wing eggs are inserted into plant tissue so they are protected from sprays. Consequently, more than one application may be needed for control. These applications must be made at the first signs of leaf spots to be effective. A soil drench with an imidacloprid product can provide good preventive control where chronic infestations are a problem. The drench should be applied in the spring according to label directions.

Figure 15. Upper leaf surface - note green leaves next to leaves lightened by lace bug feeding (photo by P. Bachi).

Figure 16. Lace bug - check lower leaf surface for insects, black tarry waste spots, and regular rows of dark eggs (photo by P. Bachi).

DIAGNOSTIC LAB HIGHLIGHTS

By Julie Beale and Paul Bachi

Agronomic samples this week have included brown spot (*Physoderma*) on corn; Septoria leaf spot, Rhizoctonia root rot, root mealybug infestation and potassium deficiency on soybean; black shank, Pythium stem rot, soreshin, manganese toxicity and potassium deficiency on tobacco.

On fruits and vegetables, we have seen spur blight and white druplet on blackberry; black rot, bitter rot and powdery mildew on grape; common leaf spot on strawberry; Phytophthora root rot on raspberry; scab on apple; leaf spot (*Coccomyces*) on cherry; scab on peach; Pythium stem blight on bean; magnesium deficiency and Alternaria leaf blight on cantaloupe; common bacterial blight on crowder pea; bacterial spot and early blight on pepper; Cercospora leaf spot and Fusarium wilt on potato; Fusarium root/stem rot on pumpkin; early blight, Septoria leaf spot, sour rot, bacterial soft rot, root knot nematode and Fusaruim wilt on tomato; Pythium root rot, cottony leak, and Phytophthora blight on watermelon; and yellow vine decline on zucchini.

On ornamentals and turf, we have seen Pythium root rot and Fusarium wilt on chrysanthemum; bacterial wilt on mandevilla; Rhizoctonia and Pythium root/stem rots on petunia; cedar-quince rust on hawthorn; Cercospora leaf spot on hydrangea; canker on boxwood; anthracnose on beech, dogwood, maple and oak; powdery mildew on lilac; rosette on rose; chemical injury on rose, pine, spruce and taxus; Rhizosphaera needlecast on spruce; take-all patch and Pythium root dysfunction on bentgrass; brown patch on fescue; Curvularia leaf spot on ryegrass; and summer patch on bluegrass.

INSECT TRAP COUNTS

July 22 - 29

Location	Princeton, KY	Lexington, KY
Black cutworm	22	10
Armyworm	17	372
Corn earworm	94	12
European corn borer	0	0
Southwestern corn borer	7	0
Fall armyworm	0	0

Graphs of insect trap counts for the 2011 season are available on the IPM web site at - http://www.uky.edu/Ag/IPM/ipm.htm.
View trap counts for Fulton County, Kentucky at - http://ces.ca.uky.edu/fulton/InsectTraps

Note: Trade names are used to simplify the information presented in this newsletter. No endorsement by the Cooperative Extension Service is intended, nor is criticism implied of similar products that are not named.