



Pest e-alerts



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Soybean Disease Update

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Recent rainy and humid weather has favored the development of foliar diseases in soybeans. Both Septoria brown spot and Cercospora blight are widespread this year. These are typically called end-of season diseases that become most obvious as soybeans mature. While they occur late in the season, the thought is that these diseases accelerate maturation where they are severe thus reducing pod fill and seed quality.

Septoria brown spot, caused by the fungus *Septoria glycines*, is a common foliar disease of soybeans that shows up in old (continuously cropped) soybean fields and is showing up again this year. It first appears on lower leaves as early as pre-bloom vegetative stages (Figure 1). Symptoms appear as brown spots up to an 1/8 inch in diameter surrounded by yellow borders. Leaves eventually turn yellow and then brown. During maturation, most of the leaves may show brown spot symptoms (Figure 2).



Figure 1: Septoria brown spot on lower leaves of vegetative soybeans



Figure 2: Severe Septoria brown spot in soybeans at early maturity.

Cercospora blight, caused by the fungus *Cercospora kikuchii*, is most apparent on upper leaves first causing a purple-colored general leaf discoloration late in the season during pod fill stages of soybean development (Figure 3). Affected leaves and petioles become bronze in color (Figure 4) and leaves eventually fall from the petioles which initially remain upright and attached. The fungus also causes purple seed stain (Figure 5) which reduces seed quality. Researchers at LSU have determined that the purple seed stain and leaf blight phases of the disease may be caused by different strains or species of the fungus. This may explain why resistance to Cercospora blight on the foliage and purple seed stain is under different genetic control.



Figure 3. Purple leaf discoloration caused by *Cercospora* blight



Figure 4: Advanced development of *Cercospora* blight



Figure 5. Purple seed stain caused by *Cercospora kikuchii*.

Control of *Cercospora* blight and *Septoria* brown spot is best achieved with crop rotation since these pathogens survive on old crop residue. While resistance to *Cercospora* blight has been identified, it has not been well developed and is currently not listed as a soybean variety trait by seed companies. There is no reported resistance to *Septoria* leaf spot. Therefore, farmers cannot select resistant varieties as a control option. Fungicide application during early set stages generally reduced levels of disease leaves at beginning maturity, but yield responses have been variable. Fortunately these diseases occur late in the season and non-treated soybeans can still produce good yields.

Charcoal rot, caused by the fungus *Macrophomina phaseolina* is a common soilborne disease that has showed up again this year. It is favored by hot dry weather which has periodically occurred this growing season. Plants in areas of the field turn pale green to yellow and wilt and die. Leaves typically remain attached. Affected plants show reddish brown discoloration of the root system followed by the extensive development of charcoal grey discoloration caused by the formation of numerous microsclerotia of the fungus imbedded in the root system. We have recently seen microsclerotia colonizing the pith (Figure 6) of declining soybeans (Figure 7). The discolored pith is typical of another soybean disease called brown stem rot, however this disease is not thought to occur in Oklahoma and generally causes more extensive pith hollowing and discoloration than observed here. We are evaluating these samples further but it appears that charcoal rot is the cause because symptoms such as microsclerotia in the pith, reddish brown defoliation of the pith and vascular system are reported symptoms of charcoal rot.



Figure 6. Abundant microsclerotia (black specks) in the pith of lower stem.



Figure 7. Declining area of soybeans affected by charcoal rot.

Control of charcoal rot is difficult. Plants are thought to be infected early in their developments and symptoms are brought on by stresses such as high soil temperatures, dry soil, low soil fertility, and overly high seeding rates. There are differences in varietal responses to charcoal rot, but seed companies do not make claims about resistance. Crop rotation with small grains and cotton (1-2 years) and corn or grain sorghum (3 years) is beneficial. Cultural practices that reduce moisture stress are also recommended.

Disease and Insect Diagnostic Laboratory

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