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Plant Pathology Fact Sheet

Brown Spot of Soybean

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Importance

Brown spot, caused by the fungus *Septoria glycines*, is present in all soybean fields in Kentucky. In most years the disease causes little to no yield impact; however, up to 15% yield losses can occur in select environments. For example, brown sport tends to be worse where soybeans follow no-till soybeans, where early-maturing varieties are planted, and/or when fields are planted in late April. River bottom fields or fields subject to fog or morning shade are frequently impacted.

Symptoms

Symptoms begin as pin-point to small (up to 1/4 inch), irregular, red-brown spots which appear on unifoliate leaves 2 to 3 weeks after planting (Figure 1). Spots appear on both leaf surfaces, but they tend to be more pronounced on the lower surface. Individual spots may coalesce to form larger blackish-brown irregular blotches. Numerous spots cause leaves to yellow and drop from plants; yellowing and defoliation are the result of a host-specific toxin produced by the fungus in diseased tissue. Spotting occurs most prominently on unifoliolate leaves of young plants (Figure 2) or throughout the canopy during pod fill to maturation (Figure 3). Brown spot is often confused with a bacterial disease, bacterial leaf blight (Figure 4).

Figure 1. Small, irregular spots of Brown Spot initially appear on unifoliate soybean leaves.

Cause and Disease Development

Septoria glycines overwinters in infested crop residue and the debris of certain common weeds, such as velvetleaf. The brown spot fungus also survives both in and on seed, but to a limited extent. Infections take place when fungal spores produced in debris are splashed onto wet foliage. Infection and disease development can occur over a range of temperatures (60° to 85°F), but is greatest at 77°F; increasing leaf wetness (up to 36 hours) is associated with increased disease infection and severity. Disease development is severely hindered during hot, dry weather, but will resume when conditions again favor the disease and/or the crop approaches

Figure 2. Brown Spot symptoms occurring on the unifoliate leaves of young soybean plants.

Figure 3. Significant spotting occuring late in the season on soybean trifoliate leaves.

Figure 4. Bacterial Leaf Blight is often confused with Brown Spot.

maturity. Infections early in the season are frequently the source of late-season infections. As a consequence, the disease almost always exists first in the lower canopy and then moves into the upper canopy as the season progresses.

Disease Management

Early season infections

- No control is needed or recommended when brown spot develops early in the growing season; infected plants will recover with no permanent damage.

Late season infections

- When the environment is favorable for brown spot development during early to mid-pod fill, the disease can cause significant yield losses. In those instances, fungicides (strobilurin- or triazole-class fungicides) may be applied in the early stages of disease development (i.e. beginning pod to beginning seed or R3 to R5) to prevent premature defoliation and protect crop yield. However, be forewarned that economic returns when using fungicides are highly variable, with profitability only being assured when disease pressure is high.

Additional management practices

- While all soybean cultivars are susceptible to brown spot, some cultivars appear to be more susceptible than others. For example, early-season cultivars (e.g., maturity group III cultivars) tend to mature when conditions favor disease, so they are commonly the most impacted by brown spot.
- Avoid ultra early planting dates (mid- to late-April) and avoid back-to-back consecutive years of soybean in the same field.
- Manage weeds that may harbor the brown spot fungus.

Additional Resources

- Kentucky Plant Disease Management Guide for Soybeans, PPA-10b (1995) http://www.ca.uky.edu/agc/pubs/ppa/ppa10b/ppa10b.pdf

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Photos courtesy of Daren Mueller, Iowa State University, Bugwood.org (Fig. 1) and Don Hershman, University of Kentucky (Figs. 2 , 3 & 4)