

## COLLEGE OF FOOD, AGRICULTURE AND ENVIRONMENTAL SCIENCES

# Brown Spot of Soybean

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Brown spot, also known as Septoria leaf spot, occurs in all soybean growing regions of the U.S. and is the most common foliar disease of soybean in Ohio. It primarily causes premature defoliation of the lower canopy, but can also infect seeds, pods, and stems. Based on several experimental field trials, yield losses are minimal on current soybean cultivars.

## Causal Organism

The causal agent of brown spot is the ascomycete fungus, *Septoria glycines*. It produces brown, globose fruiting bodies called pycnidia. The pycnidia are embedded in leaf tissue where they overwinter in the field in plant debris. The pycnidia produce hyaline, septate conidia, or infective spores, that will germinate in water on the leaf surface.

## Symptoms and Signs

Symptoms of brown spot first appear as small brown lesions on the cotyledons or unifoliate leaves and then move up the plant as the season progresses but remain in the lower canopy. Reddish-brown to dark brown spots, which are angular in shape, vary in size from small specks

to ¼ inch in diameter. Individual lesions can coalesce, surrounding tissue turns yellow or chlorotic and premature defoliation then occurs (Figure 1). Lesions can range in size from small specks to several square centimeters of leaf surface. Defoliation typically starts at the bottom of the plant and progresses upwards (Figure 2). Irregular brown lesions with undefined borders may also develop on infected stems, pods, and petioles (Figures 3 and 4).

## Disease Cycle

The fungus, *Septoria glycines*, overwinters on infected soybean debris. Warm, moist weather conditions will favor spore production on crop residue. The spores are disseminated by wind and rain to nearby leaves, which germinate and then infect through stomatal openings. Disease severity will increase during prolonged periods of leaf wetness (6-36 hours). Fruiting bodies (pycnidia) develop in mature lesions, providing inoculum for secondary infections of leaves, stems, and pods.

Moderate temperatures (60°-85°F) and high moisture favor infection and disease development. Hot, dry weather tends to halt the spread of *S. glycines*.



Figure 1. Characteristic small, brown, irregular lesions surrounded by leaf chlorosis.



Figure 2. Symptomatic leaves are usually located in the lower canopy.



Figure 4. Comparison of lesions of bacterial blight (left) and those caused by *S. glycines*.

## Disease Management

Yield losses due to brown spot are rarely severe as most cultivars today have high levels of resistance. Cultural practices targeted towards limiting residue build-up can further limit losses.

**Host Resistance:** It is important to use a cultivar with resistance towards *S. glycines* to avoid significant yield loss. In production systems with no-till or narrow rows, host resistance is increasingly important.

**Crop rotation:** Rotating with non-hosts allows time for soybean straw containing fungal fruiting bodies to degrade. This disease has been known to be more severe in continuously cropped soybean fields.

**Tillage:** Plowing under soybean straw can promote rapid decay of debris.

**Scouting:** Losses of 2 to 4 bushels per acre have been reported in Ohio in very carefully controlled field studies, but rarely is it economically feasible to manage this disease with fungicides. For seed companies, monitor levels of defoliation near R6 to be sure that varieties still have good levels of resistance. Discard varieties when defoliation of the lower canopy reaches the mid-level of the plant. Proper identification of this disease will allow for more effective management.

## Useful References

Cruz, CD, et al. 2010. Impact of Brown Spot Caused by *Septoria glycines* on Soybean in Ohio. *Plant Disease*, 94(7):820-826.

<https://apsjournals.apsnet.org/doi/abs/10.1094/PDIS-94-7-0820>

Crop Protection Network

<https://cropprotectionnetwork.org/encyclopedia/soybeans/foiar-diseases/septoria-brown-spot/>

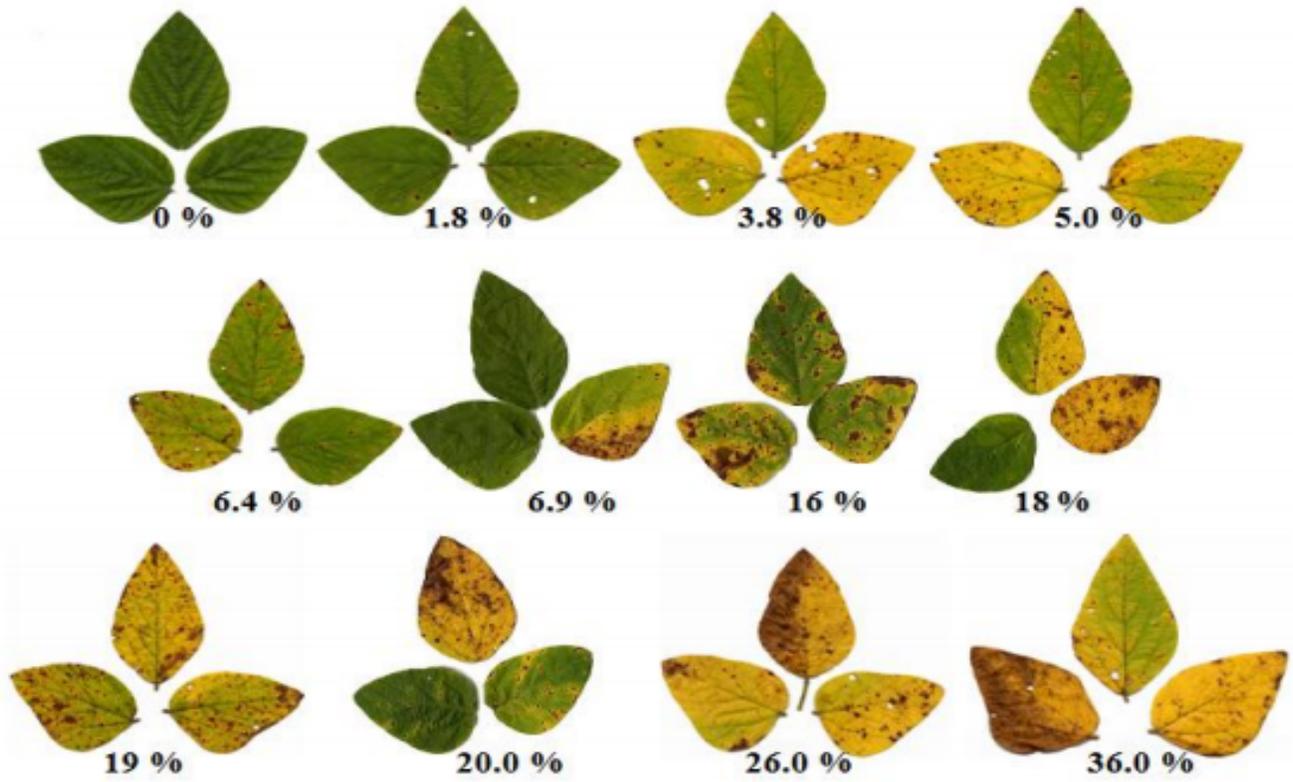


Figure 3. Quantification of disease severity using percentage of leaf area affected. Percentage based on lesion area, not chlorosis.