

AERIAL BLIGHT

OF SOYBEAN



Rhizoctonia solani AG1-IA

Description

Aerial blight is a soybean disease caused by the soilborne fungus *Rhizoctonia solani* AG1-IA, and it is particularly important in the Midsouth. The disease causes economic losses in Alabama, Arkansas, Louisiana, Mississippi and North Carolina and can be particularly severe in fields where rice-soybean crop rotations are common. *Rhizoctonia solani* AG1-IA has a wide host range and causes sheath blight on rice, banded sheath blight on sorghum and corn, and web blight on beans.

Symptoms and signs

Foliar symptoms of aerial blight first appear in the lower soybean canopy, frequently after canopy closure, during late vegetative or early reproductive stages. Initial symptoms include water-soaked lesions that turn greenish-brown to reddish-brown and later brown or black (Figures 1A and 1B). Lesions on leaves vary from small spots to blighted whole leaf. Blight symptoms can appear on leaves, stems and pods. Severely infected soybean plants can lose their leaves and spread infection to neighboring plants. Infected leaves are also frequently matted together (Figure 2A), adhering to adjacent pods and stems, resulting in plant-to-plant spread of the disease in the field.

There are two characteristic signs of the disease that can aid in field diagnosis. First, white fungal mycelia (long threads of fungal cells) may be seen growing on the surface of any plant part (Figure 2B) and commonly on matted leaves (Figure 2A). Second, sclerotia (compact mass of hardened fungal mycelium) may be seen on infected tissues (Figures 2C and 2D). Young sclerotia are white (Figure 2C) but mature throughout the soybean growing season



Figure 1. Typical symptoms of aerial blight on soybean in the field. Small necrotic lesions are observed in leaves of lower canopy early in the season (A, B). Under optimal weather conditions, severe blighting is observed, often with blighted leaves stuck to each other (A, C).

turning light to dark brown and hardening during the process (Figure 2D). The sclerotia are survival structures that can remain viable in the soil and crop debris for many years and serve as primary inoculum for disease in subsequent seasons.

The spread of aerial blight occurs in two stages. In the first stage, sclerotia germinate, and the fungus infects the lower canopy

of the plant. In the second stage, canopy closure creates a favorable microclimate with warm temperatures and high humidity allowing the fungus to colonize the plant and rapidly spread from one plant to the next. At this stage, leaves are severely blighted, and disease is easily noticed in the field (Figure 1C). Rainfall and free moisture significantly increase disease severity.

Disease scouting and management

Scouting for disease in the lower canopy is crucial for disease management and should involve walking through the field and opening the canopy. Hot spots for disease may include shaded areas where leaves remain wet longer or areas where crop debris harboring the pathogen has accumulated (low-lying areas of the field). Avoid excessive weeds as they can serve as alternative hosts. Crop rotation is usually minimally effective because of the wide host range of the pathogen. Tillage helps to reduce the number of sclerotia on the soil surface.

There are no soybean cultivars completely resistant to aerial blight, but less susceptible cultivars may be available. Official variety trials conducted in Louisiana (published annually in the Soybean Variety Yields and Production Practices) frequently identify varieties susceptible to aerial blight. These varieties should be avoided in areas with known occurrence of aerial blight (or sheath blight/banded sheath blight in rotational crops), if possible.

Quinone outside inhibitor (FRAC Group 11) fungicides may still be effective in fields where fungicide resistance has not been reported. In fields with QoI resistance, pre-mixes containing succinate dehydrogenase inhibitors (SDHIs, FRAC Group 7) remain effective on aerial blight. Some SDHI materials may perform better than others. Fungicides should be applied at disease onset at proper rates and carrier volumes. Ground applications are preferred using 15 gallons per acre total water volume. Once severe blight symptoms are observed, fungicide applications may provide limited control. Thus, the integration of frequent scouting, cultivar tolerance, tillage and fungicide applications are necessary for effective disease management.

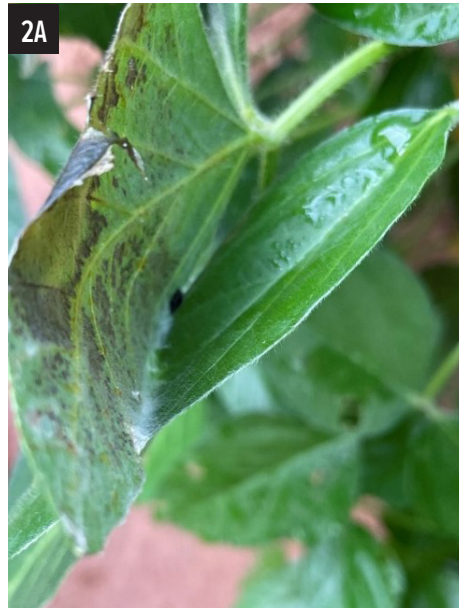


Figure 2. Typical signs of the aerial blight pathogen, *Rhizoctonia solani* AG1-IA, include mycelia on the stems and leaves (A, B) and sclerotia (C, D) on infected plant parts.

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