

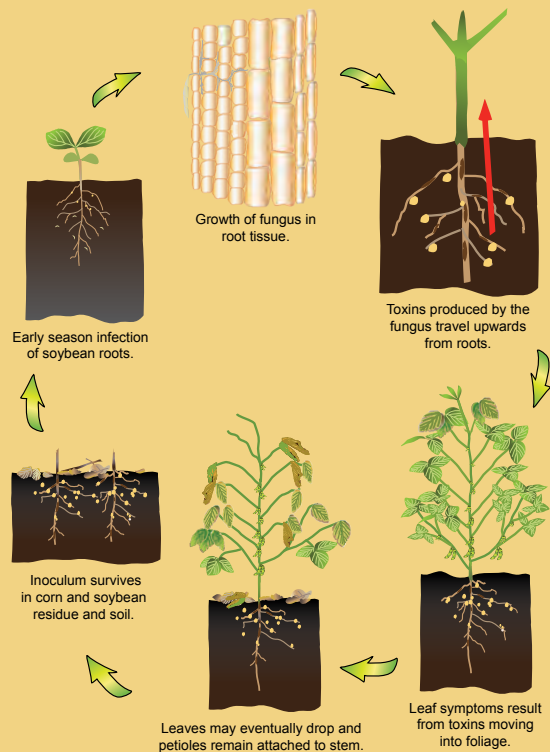


Scouting for Sudden Death Syndrome in Soybean

Soybean sudden death syndrome (SDS) has become one of the leading soybean diseases in North America to reduce yield. SDS has two phases—a root rot phase and a leaf scorch phase.

Disease cycle

The sudden death syndrome (SDS) fungus (*Fusarium virguliforme*) survives the winter as spores in crop residue and soil. Early in the season, the fungus infects and grows in soybean roots. Infection and colonization are favored by cool, wet soil conditions. The SDS fungus produces toxins in soybean roots that are transported to leaves. As a result, interveinal yellow and brown blotches appear on the leaves, typically after flowering. Foliar symptoms are more severe after frequent or heavy midseason rains.



Symptoms

Foliar symptoms

Leaf symptoms include yellow and/or brown lesions between the veins (interveinal chlorosis and necrosis) while leaf veins remain green. As the disease progresses, leaves die and prematurely drop from the plant. Pods and seeds also may abort.



(A) Interveinal chlorosis and necrosis from SDS and (B) Defoliated plants from SDS with petioles still attached.

Root and stem symptoms/signs

The woody tissue in the taproot (cortex) will be brown/gray while the upper portion of the center stem (pith) remains white. Blue masses of spores may be present on the root surface under wet conditions. Root symptoms and signs may be present even if foliar symptoms are not noticeable.



(C) Taproot discoloration symptoms of SDS and (D) Blue fungal growth on roots.

Others issues that look like SDS



Pith discoloration in the stem distinguishes brown stem rot from SDS.



Leaves of plants with stem canker remain attached after wilting, unlike symptoms of SDS.



Potassium deficiency symptoms.

Brown stem rot (fungus: *Cadophora gregata*)

Stems will have reddish-brown discoloration in the pith, which may only be found at nodes. The stem cortex will remain a normal white/tan coloration. Leaf symptoms include interveinal chlorosis and necrosis of the youngest leaves. Leaf symptoms may not always occur. Root rot is typically not evident.

Stem canker (fungus: *Diaporthe* spp.)

A dark, red-brown canker (lesion) forms at a node outside the stem and can extend over several nodes. Lesions often do not entirely surround the stem or extend to the ground. Inside the stem there is discoloration or browning near the lesion. Leaves may have interveinal chlorosis and necrosis, but, unlike SDS, remain attached to the plant. Root rot is typically not evident.

Late season potassium deficiency (top dieback)

Uppermost trifoliate leaves appear yellow. Yellowing begins at leaf margins. Roots and stems will appear healthy. Symptoms occur in fields or parts of fields with low potassium.

Management

An integrated SDS management strategy is necessary since a single management tactic alone is not likely to provide adequate results. Management strategies include planting soybean varieties with resistance to SDS, using effective fungicide seed treatments, avoiding or reducing soil compaction, improving soil drainage in fields with recurring SDS, and maintaining proper pH and fertility levels.



Planting soybean varieties with resistance to SDS can help manage the disease. This shows the differing varietal responses of more resistant plants (back) compared to those that are more susceptible (front).

Acknowledgments

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