

SDS

Sudden Death Syndrome



What is it?

Sudden Death Syndrome (SDS) of soybeans is caused by the fungus *Fusarium virguliforme*. The fungus enters the plant through the roots and causes root rot.

Pathogen toxins are produced in the plant, resulting in the sudden appearance of yellow and brown spots at (or after) flowering. Leaves fall off.

Under high disease pressure, up to 100 percent yield loss is possible.

Infection can take place just a few days after seed germination.

Identifying SDS

- Look for plants that have yellow and brown streaks between the leaf veins. Leaves may have dropped, leaving the petioles (leaf stems) attached.
- SDS foliar symptoms can be confused with brown stem rot and stem canker – look at the roots and stems to distinguish them.
- Split a stem: Soybean plants with SDS will have a white center (pith). If the pith is brown, the plant is probably showing symptoms of brown stem rot.
- Infections are worsened by soil compaction and poor soil drainage.
- Planting into cool, wet soils favors the disease because these conditions are optimal for root infection.
- SDS can also be severe when planting occurs in warmer soils, if moisture conditions allow infection at young seedling stages.
- SDS often appears in conjunction with the soybean cyst nematode (SCN). SCN causes the disease to appear sooner and be more severe.



Foliar symptoms of SDS



SDS-infected roots may have a blue hue because of the presence of blue-colored fungal masses.



SDS-infected stems will have a white pith.



Photo: Jason Bond



Photo: United Soybean Board

▲ **Warm dry soil** results in faster emergence and more seedling vigor.

This fact sheet was prepared under the supervision of Dr. Leonor Leandro, plant pathologist, Iowa State University

Impact

SDS was first reported in Iowa in 1993. It is present in all soybean-producing areas of the United States, and yield losses can range from negligible to severe, depending on disease onset and severity.

The impact on yield depends on the growth stage at the onset of symptoms. Yield losses are greater when symptoms develop in early reproductive stages (before pod fill).

- Nationwide, yield losses over the last 10 years have ranged from 20-30 million bushels.
- Yield losses are caused by reduced seed number (resulting from flower and pod abortion if symptoms develop during early reproductive stages) and reduced seed size (if symptoms appear during pod fill).

How to manage SDS

SDS is one of the most challenging soybean diseases to manage because disease development is highly dependent on the environment. However, a number of approaches can help lessen its impact.

1. Plant high-yielding varieties that are resistant to SDS and SCN.
2. Avoid planting in cool, wet soils.
3. Plant fields with a history of SDS last. But avoid planting too late, especially in northern Iowa, and thus incurring a yield penalty.
4. Avoid soil compaction – it provides a wet environment and puts stress on the plant.
5. Crop rotation is not helpful. The SDS pathogen can survive in corn debris, such as corn kernels and roots. SDS outbreaks can occur even after a few years of continuous corn.
6. Consider SCN control in your SDS management strategy. The two often appear together.
7. Deep tillage may reduce severity of SDS on headlands and other parts of the field where the soil is compacted. Tillage may also promote earlier warming of soils. If tillage is considered to reduce soil compaction, efforts should be taken to minimize soil erosion and maintain soil quality.



Photo: University of Illinois

▲ **Planting resistant varieties** is the best practice to manage SDS.