

# Sudden Death Syndrome (SDS) Fact Sheet

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## Background:

Sudden death syndrome (SDS) is a significant disease of soybean throughout much of the U.S., including Minnesota, Nebraska, and Wisconsin. SDS also appears to be spreading across soybean production areas of Minnesota. Severe SDS can result in yield losses greater than 50%. SDS begins as a root disease and typically also affects leaves and causes defoliation. SDS often occurs in fields infested with the soybean cyst nematode (SCN).

## Symptoms:

Initial symptoms usually appear as scattered yellow, diffuse spots between veins on leaves in early to late August in the Midwestern U.S. The spots typically expand between veins to become brown lesions surrounded by chlorosis, and the leaves may become cupped or curled. Leaves detach from the petioles as the disease progresses. Also, brown to grey discoloration develops in the vascular tissue of the lower stem, and can typically be seen by removing the epidermis of the stem of fresh plants. The central pith remains white, which is a diagnostic feature that distinguishes SDS from brown stem rot (BSR, see third page). SDS also cause root rot, and roots may have blue fungal growth in moist conditions.

## Conditions and Timing that Favor Disease:

Initial infection of roots is thought to usually occur early in the season in the first three weeks after seed germination, but symptoms of SDS usually don't develop until late July or mid to late August. Infection and disease development are favored by early planting; cool and wet soil; heavy rainfall in late June through mid-July, SCN infection, and varieties susceptible to SDS and SCN.



Sudden death syndrome (SDS) in a Minnesota soybean field



SDS causes light brown to gray discoloration under the epidermis of the lower stem



Initial and well-developed symptoms of SDS on soybean leaves.



The pith remains white in plants infected with SDS



## Brown Stem Rot (BSR)

### Fundamentals.

Brown stem rot (BSR) is widespread across the northern tier of the U.S., soybean producing states. BSR can look similar and be confused with sudden death syndrome (SDS) based on the symptoms on leaves. The BSR pathogen infects the inner stem, and symptoms may or may not be visible without splitting stems of infected plants. BSR can cause significant yield reductions up to 30%, and plants without visible symptoms on leaves may also suffer yield losses up to 15%. BSR can cause premature senescence of infected plants.

### Symptoms:

Symptoms of BSR usually don't appear until mid-August or later. BSR causes browning of the pith in the center of the stem, especially near the lower nodes. The pith is brown in infected stems that are split. Depending on weather, soybean cultivar, and type of the pathogen, leaves may also develop brown and yellow discoloration between veins. The leaf symptoms can be confused with SDS symptoms, but these two diseases can be differentiated by the pith color in the lower stem.

### Conditions and Timing that Favor BSR:

The BSR fungus infects through the roots early in the growing season, but symptoms typically do not appear until August. BSR symptoms are favored by cool, wet weather during pod-fill followed by hot, dry weather in mid-late August. Soybean cyst nematode may enhance BSR.

### Causal Pathogen:

*Phialophora gregata*, (also named *Cadophora gregata*) is a soilborne fungus that overwinters in soybean stem residue in soil. Two different types of this pathogen (A & B) cause different symptoms. Type A typically causes pith browning and leaf symptoms, but type B usually causes only pith browning. Type B is common in the northern U.S.

### Disease Management Disease Management:

The two most important tactics for management of BSR are the use of resistant soybean varieties and rotation with non-host crops such as corn. Because SCN may interact with BSR, resistance to SCN may also help to reduce BSR.

### Brown stem rot symptoms on soybean



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### Brown pith in soybean stems infected with BSR



Soybean leaves with symptoms of BSR.  
Stems must be split to confirm BSR