SeedSCOOP

# Sudden Death Syndrome in Soybeans

**Sudden death syndrome (SDS) is caused by a soil borne fungus, and soybeans are at greater risk for SDS when planted into cool, wet soils, when soybean cyst nematode is present, and when summer rains cause saturated soils.**

## What to Consider

Sudden death syndrome is caused by the soil borne fungus, *Fusarium virguliforme*. Symptoms appear after flowering and during pod fill and include -

- initially, small yellow spots on upper leaves
- chlorosis expands interveinally along with necrosis (Figure 1)
- pith tissue remains white and internal root tissue is discolored
- green vein pattern remains on leaves until defoliation (Figure 2)
- increased flower and pod abortion
- reduced seed size and quality.

Figure 1. SDS initial leaf symptoms.

Figure 2. Severe SDS leaf symptoms with a split stem exhibiting white pith.

Symptoms can resemble those of other diseases, such as southern stem canker.[1] However, leaves and pods affected with SDS drop from plants as opposed to remaining on plants as with southern stem canker.[1] Unlike soybean plants infected by brown stem rot, an SDS-infected plant should have a white, decay-free pith (Figure 3). Although the pith remains white, discoloration of the stem occurs as the vascular tissue deteriorates along with the lateral roots and root nodules. Sudden death syndrome can affect entire fields but usually begins as scattered areas within fields. Unfortunately, if SDS symptoms appear, there is no treatment for the current crop.

## Yield Impact

Yield losses from SDS can range from slight to nearly 100% and are dependent on disease onset and severity.[1] The fungus overwinters in crop residue or soils and can infect soybean plants soon after

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planting.[2] Sudden death syndrome is usually most severe in saturated soils.[3] Soils with major compacted areas such as field entrances may also exhibit more severe SDS symptoms. Moderate to high populations of soybean cyst nematode (SCN) can be associated with SDS and may increase the severity of the disease.[2,3]

## Management Options

Management should begin before planting to help reduce infection in fields with a history of SDS. Foliar fungicides are not an option for SDS control due to the nature of the disease.[4] An integrated management plan for SDS may include the following:

- Plant soybeans with good disease packages. Soybeans with good to excellent rating for tolerance to SDS and also those that are described as resistant or moderately resistant to SCN should be chosen.[4] Consult your seed guide for SDS and SCN tolerance ratings.
- Delay planting or plant earlier maturing products to possibly help soybean plants escape SDS infection. Cool, wet soils promote infection.
- Cultural practices to improve water drainage, reduce SCN population or alleviate soil compaction layers may lessen SDS severity.

ILeVO® seed treatment is a management tool that can reduce the severity of SDS.[4] This product should be considered if planting in fields with a history of SDS.

For SCN management consider NemaStrike™ Technology, a seed treatment technology, that provides broad-spectrum nematode control, including SCN, for soybean, corn, and cotton crops. Other nematodes controlled include root knot, lesion, lance, reniform, sting, and needle.

With a novel mode of action and low water solubility, this synthetic nematicide (tioxazafen), NemaStrike™ Technology, defends crops from the start and stays in the root zone as plants grow for up to 75 days. In

Figure 3. (Above) soybean stem split lengthwise showing the brown pith in the stem from BSR. (Below) stems with white pith from a plant infected with SDS.

numerous field trials over 4 years, the technology has helped to protect the average yields of soybean by 2.2 bu/acre (138 trials), corn by 6 bu/acre (140 trials), and cotton by 80 lbs lint/acre (63 trials).[5] Performance results will vary based on nematode pressure.

Please contact your local brand seed providers for additional information on Acceleron® Seed Applied Solutions with NemaStrike™ Technology offerings with seed purchases.

**Sources:** [1] Faske, T., Kirkpatrick, T., Zhou, J., and Tzanetakis, I. 2014. Soybean diseases. Arkansas Soybean Production Handbook. University of Arkansas.
[2] Westphal, A., Abney, T.S., Xing, L., and Shaner, G.E. 2008. Sudden death syndrome of soybean. The Plant Health Instructor. https://www.apsnet.org/edcenter/intropp/lessons/fungi/ascomycetes/Pages/SuddenDeath.aspx.
[3] Malvick, D. 2010. Sudden death syndrome of soybean: favorable conditions and request for samples. University of Minnesota Extension.
[4] Bradley, C. 2014. Destructive diseases of soybean—sudden death syndrome and white mold—observed in the state. The Bulletin. The University of Illinois.
[5] 4-Year Average Yield Protection Advantage over control, across all locations and thresholds, N=341Trials (2014, 2015, 2016, 2017) (AR, GA, IA, IL, IN, KS, KY, LA, MD, MI, MN, MO, MS, NC, ND, NE, OH, SC, SD, TN, TX, VA, WI). Results will vary based on nematode pressure in each field. http://www.acceleronsas.com/Pages/NemaStrikeTechnology.aspx
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