



SOYBEAN FACTS

Soybean Sudden Death Syndrome (SDS)

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SDS appears to be increasing in Michigan

In recent years, soybean fields reported with SDS symptoms have been increasing in Michigan. SDS is caused by a fungus, *Fusarium virguliforme* (formerly *F. solani* f.s. *glycines*). Research shows that there is a definite relationship between SDS and the soybean cyst nematode (SCN). Although SCN is not required for the development of SDS it increases its severity. SCN has been found in all major soybean producing counties in Michigan. A Michigan soybean checkoff supported soil testing program for SCN began in 1997. The percentage of soil samples testing positive for SCN has increased over the last few years to about 65% (of an average 1,100 samples/year). In fields where SDS is a problem, a combination of techniques are needed to manage both the cyst nematode and the fungus causing the disease.



Important practices for managing SDS

Choose resistant varieties to limit yield loss—It's important to look at both SCN resistance and SDS resistance levels when selecting varieties. Even when SCN resistant soybeans are used, SDS may be more severe in fields with a history of high levels of SCN. Because SCN is usually present in fields with SDS, it's advisable to choose an SCN-resistant soybean that has at least moderate resistance to SDS. Growers requiring group II and shorter maturity soybeans have fewer choices for SDS resistant varieties than longer maturity groups, but there are some varieties available. Information about SCN-resistant soybeans in the Michigan soybean variety trial ratings can be found at http://www.css.msu.edu/varietytrials/soybean/Soybean_home_page.htm. Ratings of SDS resistance for commercially available soybeans has been conducted across a number of locations in Illinois for several years. That information along with SCN ratings, maturity group, and yield can be found at the *Varietal Information Program for Soybeans* (VIPS) website www.vipsoybeans.org or at the *Southern Illinois University SDS North Central Soybean Research Project* website <http://soybean.siuc.edu/>.

Avoid early planting—Yield reductions due to SDS are dependent on when infections begin. Early infections result in pod abortion, reduced seed number, and size. Avoid early planting, especially in soils that are cold and wet. SDS is often less severe in delayed plantings and in early maturing cultivars, as the onset of the disease doesn't occur until later reproductive stages.

Evaluate your tillage practices—Severity of SDS tends to be greater under no-till or reduced tillage systems than conventional tillage. Reasons for this may include higher soil moisture, cooler soil temperatures, and higher loads of the pathogen remaining as inoculum for subsequent soybean crops.

Improve drainage—SDS is often found in wet areas or poorly drained soils.

Minimize soil compaction—Wetter, less porous soils resulting from compaction favor the development of SDS.

Avoid moving infested soil from field to field on equipment or vehicles. The fungus responsible for SDS can survive for extended periods in soil.

Crop rotation is not a primary management tool for SDS, because the fungus produces resting spores in the soil, and can survive for extended periods in the soil, but rotating out of soybeans for at least two years does help to reduce SCN populations.

Distinguishing Soybean Sudden Death from Brown Stem Rot

Brown stem rot (BSR), caused by the fungus *Phialophora gregata*, has very similar leaf symptoms. BSR causes browning of the pith, SDS does not. BSR does not cause root decay, but SDS does. BSR typically shows up later in the season (around R5-R6) than SDS—see photos on back.

A pictorial guide to SDS field symptoms

Early symptoms of SDS show up on the foliage as small, round, light green to yellow spots between the leaf veins. As the disease progresses, these spots are replaced by brown to tan areas surrounded by chlorotic tissue. Check wet or poorly drained areas of fields for plants with symptoms of SDS.



A range of SDS foliar symptoms, left to right, early symptoms to more advanced. Holes in foliage (left) are caused by insect feeding. Symptoms may begin to appear around R3-R4, compared with R5 or R6 for brown stem rot (BSR).



The **stem pith** of soybean plants with SDS **remains white**. Although foliar symptoms of BSR look similar, the pith of plants with BSR turns brown.



A brown, grayish brown, or reddish brown discoloration shows up in the vascular (water conducting) tissues of the lower stem and root.



Root symptoms are smaller and show some degree of decay. Discoloration appears on the lower part of the taproot first. Dark blue to blue-green areas may be visible on the root surface where the pathogen has produced spores, but aren't always present.



Frequently, plants lose their leaves, but **leaf petioles remain attached**.

References:

<http://www.plantpath.wisc.edu/soyhealth> University of Wisconsin-Madison, Department of Agronomy, Entomology and Plant Pathology-*Watch for Sudden Death Syndrome in 2007*

http://www.planthealth.info/sds_basics.htm

Soybean Sudden Death Syndrome;
The Plant Health Initiative website

Photos: Dan Rajzer, Cass County Extension, and Diane Brown-Rytlewski