

# Illinois Soybean Pathology and Entomology Research



## Sudden Death Syndrome

National Soybean Research Laboratory, Factsheet #1

### Introduction

Sudden Death Syndrome (SDS) in soybean was first documented in the late 1960's in the rich Mississippi River bottomland of Arkansas and Tennessee. At present, SDS has been detected in Illinois, Alabama, Iowa, Kansas, Kentucky, Louisiana, Missouri, Ohio, Texas and Wisconsin. The disease is of major concern to both farmers and agri-business because of its potential to reduce yields by 20-70%. Currently, varietal selection provides the only way to control the disease.



Soybean leaves showing early SDS symptoms of scattered, interveinal chlorotic spots.

### Symptoms

The most apparent symptoms of SDS are scorched leaves, starting as yellow to light green blotches between veins. As the disease progresses, only mid-vein and major lateral veins remain green. Eventually, the yellow spots will turn brown, with the leaflets often falling off, leaving the petioles upright. SDS also can cause flower and pod abortion. Seed from infected plants may be reduced in both size and quality. SDS can affect entire fields of soybeans, but usually affects only scattered areas within a field.



Soybean field showing a high incidence of SDS.

### Causal Agent

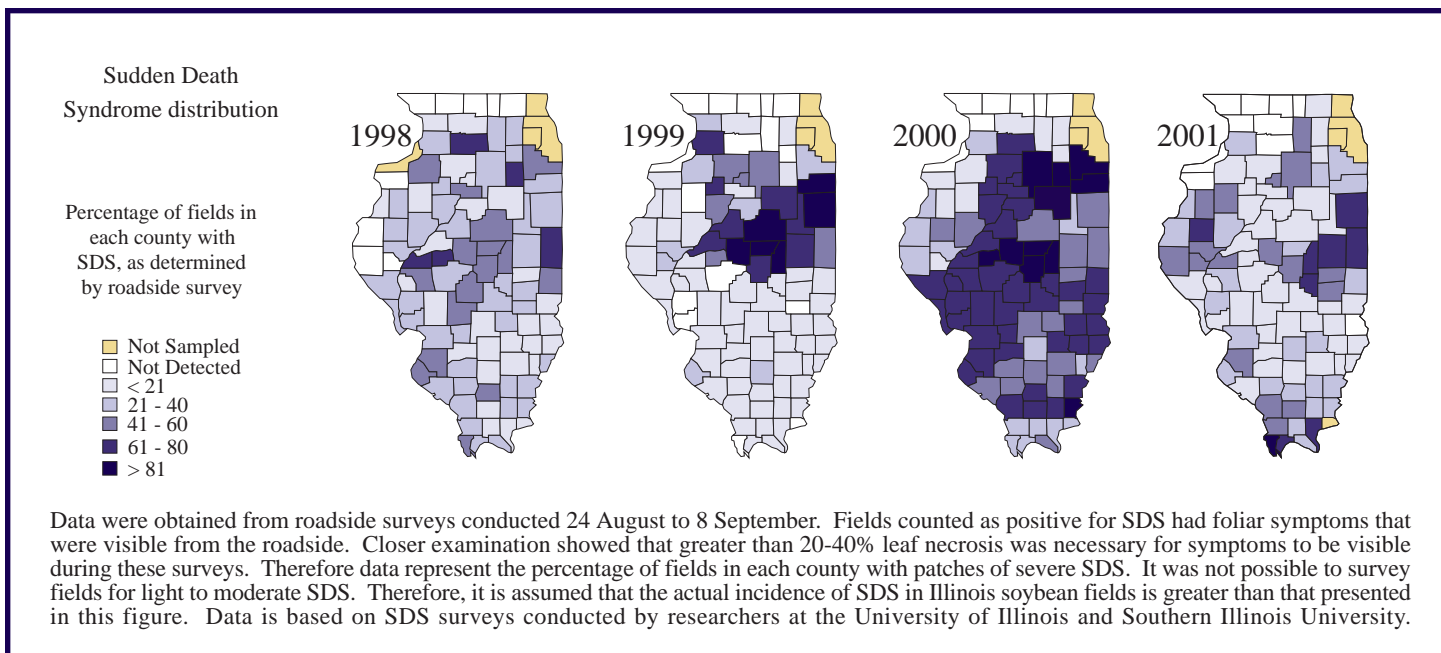
The organism that causes SDS is a soilborne fungus called *Fusarium solani* f. sp. *glycines*. It is a pathogen of the soybean plant roots and lower stem. Root infection can occur very early in the growing season, within 2 to 3 weeks after planting. The fungus produces a toxin or toxins that move from infected roots to shoots. The fungus itself is not found above the crown. Secondary veins of infected plants are plugged by the toxin cutting off the water supply to the soybean leaves.



Soybean roots exhibiting considerable stress as a result of SDS.

## Spread

There are many possible ways that SDS may be spread in Illinois. Since SDS is caused by a soilborne pathogen, anything that moves soil can transfer SDS to new areas, including equipment, human and animal feet, birds, and soil erosion by wind and water. Also, cysts of the soybean cyst nematode have been found to carry the SDS fungus. The major concern now is that the disease threatens the nation's most productive soybean growing acreage in Illinois, Iowa, and Indiana. These three states alone produce more than half of the US's 1.8 billion bushels of soybean. The severity of SDS in Illinois counties over the past four years appears to be directly related to the amount of rainfall during the early growing season.



## Factors Influencing SDS Occurrence and Severity

**Physical Environment:** Ample soil moisture and cool temperatures shortly after planting and during the reproductive period of soybean growth have been found to enhance the expression of SDS. In contrast, hot and dry conditions seem to deter the disease. Soil properties have an important impact on SDS severity. In cases where soil phosphorous, magnesium, pH, and organic matter are high, the level of SDS is increased.

**Planting Date:** In general, SDS incidence is decreased by delayed planting dates because this practice usually results in germination into warmer, drier soils.

**Cultural Practices:** Thus far, the effects of crop rotation, tillage practices, and row spacing on SDS have proven to be inconclusive.

**Soybean Cyst Nematode:** Although the interaction of SDS leaf symptoms with soil counts of soybean cyst nematodes (SCN) is very complex, some reports have shown that high SCN counts were strongly correlated with severe SDS.

**Varietal Selection:** Concerned growers are advised to plant SDS resistant or tolerant soybean varieties.

## Further Information

Recommendations for management of Sudden Death Syndrome can be found at:

**University of Illinois Extension**, Report on SDS of Soybeans (RPD No. 512), [www.ag.uiuc.edu/%7Evista/abstracts/512.html](http://www.ag.uiuc.edu/%7Evista/abstracts/512.html)

See the following web sites for additional information concerning Sudden Death Syndrome and other soybean diseases:

**Illinois Soybean Association**, [www.ilsoy.org](http://www.ilsoy.org)

**Illinois Council on Food and Agricultural Research**, [www.ilcfar.org](http://www.ilcfar.org)

**Laboratory for Soybean Diseases**, University of Illinois at Urbana-Champaign, [www.soydiseases.uiuc.edu](http://www.soydiseases.uiuc.edu)

**North Central Soybean Research Project**, Southern Illinois University at Carbondale, [www.siu.edu/~soybean](http://www.siu.edu/~soybean)

A PDF file of this publication is available at the National Soybean Research Laboratory web site, [www.nrsl.uiuc.edu](http://www.nrsl.uiuc.edu)

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