



# Extension FactSheet

Plant Pathology, 2021 Coffey Road, Columbus, Ohio 43210

## Sudden Death Syndrome of Soybean

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Sudden Death Syndrome (SDS) has been limited to a very few locations in Ohio during 1995, 1997 and 1998. Symptoms of SDS begin as small, bright, pale green to yellow circular spots on the leaves. As the disease progresses, brown to tan areas surrounded by chlorotic tissue develop in between the veins. The pith of affected plants is white. This characteristic will separate SDS from brown stem rot in which the pith is tan to brown in color. More importantly, soybean plants with SDS also have substantial amounts of root decay and discoloration of roots and crown. Yield reductions due to SDS are dependent on when infections begin. Typically infections that occur after flowering will not have a significant impact on yield. Infections that occur early will result in pod abortion, reduced seed number and size.

### The Fungus

This is a fungal disease caused by blue-pigmented strains of *Fusarium solani* f. sp. *glycines*. This blue coloration may also be found on tap roots of plants that are severely infected with *F. solani* f. sp. *glycines* due to the large number of conidia (spores) produced on the surface. This fungus also produces a thick-walled survival structure, a chlamyospore, in the cortical tissue of soybean roots. The chlamyospore can overwinter and can possibly survive for several years in the soil. Chlamyospores have also been found on cysts of the soybean cyst nematode. This fungus is very closely related to another soybean pathogen that causes seedling disease and root rot of soybean, *Fusarium solani* form B. The SDS *F. solani* f. sp. *glycines* isolates produce phytotoxic compounds which are thought to induce the distinct foliar symptoms.

### Disease Development and Epidemiology

There have been numerous studies in other states in the past 10 years to determine which environmental factors favor SDS development as well as interactions with soybean cyst



Figure 1. Leaf symptoms of sudden death syndrome appear first as bright yellow chlorotic spots. Eventually the brown necrotic areas will develop between the veins and the leaflets will die.

nematode. Some of the factors that favor disease development include high soil moisture during the vegetative growth period and unseasonably cool temperatures prior to or during flowering and pod set. The association with soybean cyst nematode has not been as clear cut. Several studies and field observations indicate that soybean cyst nematode is not nec-

essary for infection, but that its presence can increase the severity of the foliar symptoms. However, in fields with severe SDS, where there is reduced root development as a result of this disease, nematode populations are low. The fungus has also been shown to overwinter in cysts, thus increasing its survival ability from season to season. This may be a key component in Ohio, as soybean cyst nematode populations continue to increase in soybean production areas.

## Disease Management

SDS requires an integrated management plan where several management strategies are utilized to reduce the incidence and severity of the disease.

1. Plant resistant varieties. Several varieties have been identified that have partial resistance to SDS. This type of resistance is inherited from multiple genes. ‘Jack’ and ‘Ripley’ have been identified as both having resistance to SDS. There also appears to be an association with soybean cyst nematode resistance, but it does not hold true 100% of the time. Vari-

eties that are resistant to soybean cyst nematode tend to be less susceptible to SDS. Contact your seed dealer for information on varieties with partial resistance to SDS.

2. Delayed planting, tilling to promote earlier warming of soils, and planting earlier maturing varieties may help soybeans escape infection from SDS. Manipulation of soil temperatures and moisture can help delay the onset of disease symptoms, thereby reducing the effects of SDS infections.

3. Reduce soybean cyst nematode populations. Management practices to reduce soybean cyst nematode populations are possibly thought to also delay onset and decrease severity of SDS disease development. See OSU Extension Fact sheet AC39 for recommendations for management of soybean cyst nematode.

4. Sufficiently long crop rotations (soybeans only once every three years) and maintaining good crop nutrition throughout the growing season have also been shown to reduce severity and incidence of SDS.

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