



## LOOK FOR SUDDEN DEATH SYNDROME (SDS) IN MINNESOTA SOYBEAN FIELDS

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Sudden death syndrome (SDS) has been a significant disease of soybean in several Midwestern states for over 20 years, but it was not known in Minnesota until 2002. In the first week of August 2007, SDS was confirmed in two soybean fields (both irrigated) in Dakota and Swift counties. In 2006 this disease was also initially reported the first week of August and was subsequently found in 19 counties in Minnesota. SDS has now been confirmed in 20 counties in southern Minnesota ([www.extension.umn.edu/cropenews/2006/06MNCN66.htm](http://www.extension.umn.edu/cropenews/2006/06MNCN66.htm)).

**SDS samples requested.** We are working to advance our understanding of where SDS occurs in Minnesota. Please send plants suspected to be infected with SDS to the address shown below. Please send whole plants, including roots, stems, and leaves, and if possible describe the symptoms, the distribution of the disease in the fields, and the county where the sample was collected. We will confirm whether SDS is present in the plants and will add to our knowledge of the distribution of SDS in Minnesota.

*Address for sending samples:*

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**Look for symptoms of SDS** on leaves, lower stems, and roots of soybean. The most obvious symptoms are on leaves where diffuse, yellow spots/blotches and brown dead areas develop between veins. The leaves become cupped, wilt, and fall off as the disease progresses, leaving petioles behind. The leaf symptoms can look very similar to symptoms caused by brown stem rot (BSR), however, the pith in the lower stem remains white in plants infected with SDS while the pith becomes brown in plants infected with BSR. SDS also causes root rot and results in death of nitrogen-fixing nodules, and in moist soil conditions a blue fungal growth sometimes develops on the surface of infected roots. Infection in the lower stem can be seen as a



Figures 1 and 2. Early (yellow spots) and advanced symptoms (brown tissue between veins) of SDS on soybeans in Dakota county, MN. August 2007. Photo: Dean Malvick

brown-gray discoloration that develops just under the epidermis and into the vascular tissues. See photos of typical symptoms above.

**Where SDS tends to develop.** SDS is strongly influenced by weather conditions, and tends to develop most readily where adequate to excess rainfall has occurred from May through July. Thus, based on the very dry conditions this summer across much of Minnesota, SDS may not develop in many areas this year. SDS typically develops in a patchy distribution in fields, often in areas smaller than 1 to 2

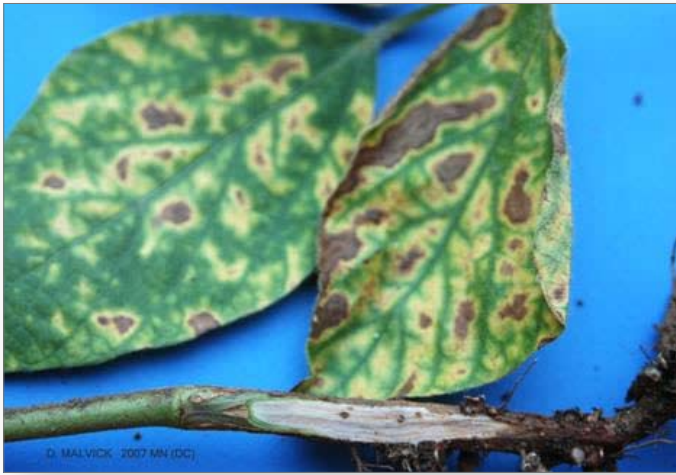


Figure 3. Brown to gray discoloration under the epidermis in the lower stem, and chlorotic and necrotic symptoms of SDS on soybean leaves from a field in Dakota county Minnesota 2007. Photo: Dean Malvick

**Background.** SDS is caused by the soilborne, fungal pathogen *Fusarium virguliforme* (which was previously named *Fusarium solani* f.sp. *glycines*). This fungal pathogen infects the roots and the lower stem. The leaf symptoms are caused by a toxin which is produced in the roots and is translocated up into the leaves. Reports indicate that yield loss due to SDS can result from root rot alone in the absence of severe foliar symptoms. Yield losses due to SDS can be significant and can exceed 60% in heavily infected parts of fields. The most effective strategy to manage SDS is to plant the most resistant cultivars available. Rotation, tillage, and seed treatments have not significantly or consistently reduced SDS. Another report on SDS in Minnesota will be written later this year.

acres in size. This disease also often occurs where moderate or high populations of the soybean cyst nematode are present. SDS is also favored by compacted soil and poor drainage, cool and wet soil after planting, soybean cultivars with low resistance to SDS, and occasional heavy rainfalls in late June and July.