Sorghum downy mildew is caused by the fungus *Peronosclerospora sorghi*. This disease most often occurs in the Upper Gulf Coast counties of Texas, but it has been found in other sorghum growing regions. Outbreaks of sorghum downy mildew (SDM) in Texas have been associated with metalaxyl-resistant strains of the fungus and the use of susceptible sorghum hybrids. Managing this disease and maximizing yield potential requires a three-pronged approach of crop rotation, hybrid selection, and seed treatments.

**Life Cycle and Symptomology**

*S. sorghi* survives in soil and plant debris. Systemically infected seedlings are pale yellow or have light-colored striping or mottling on the leaves. Infected plants can be stunted and may die prematurely. The fungus may produce a fuzzy, white growth on the underside of leaves (Figure 1). In general, systemically infected plants do not produce grain. As infected plants continue to grow, new leaves emerge that have white parallel stripes of varying width, alternating with green tissue. The white-striped areas eventually turn brown and disintegrate, which results in a shredded appearance that may look like hail injury. Oospores are produced in the diseased tissue; these are the fungal structures responsible for overwintering.

The fuzzy white growth produced by systemically infected plants is evidence of the production of sporangia. Sporangia are spores produced during cool, wet or humid weather. These spores are blown or splashed onto leaves of nearby plants and cause localized lesions. These lesions are brown and slightly rectangular-shaped (Figure 2). This phase of SDM infection does not produce oospores and is not responsible for loss of yield potential.

Plants infected systemically with SDM may be scattered in the field or found in clumps. Generally, yield loss does not occur until 20% or more of the plants in a field are infected. Below this point some yield compensation occurs in non-infected plants due to the thinning of the overall plant population. There can be greater yield loss from areas of the field where numerous infected plants are found together.

**Management**

Since 2000, outbreaks of SDM have often been linked to sorghum monoculture. Planting in monoculture allows for the gradual buildup of oospores in the soil. The presence of plentiful inoculum can lead to a severe disease outbreak under the right environmental conditions. If SDM occurs in a field, that field should be left out of sorghum for at least two years. Johnsongrass is susceptible to SDM and therefore needs to be controlled to maximize the effectiveness of a rotation program. SDM can also infect corn; however, little to no oospores are produced. The next time a sorghum hybrid is planted, consider using a hybrid resistant to the pathotype in the field.

If SDM occurs in a field, the strain or pathotype of the fungus should be identified. Pathotypes 3 and 6 occur in the Upper Coast Counties with pathotype 3 being more common. Identifying the pathotype of the fungus is important for making
hybrid decisions for the future. The Monsanto sorghum breeding program routinely screens breeding material for resistance to SDM. Breeding material and hybrids with resistance to pathotypes 3 and 6 are currently at various stages of development in the breeding pipeline.

The increased occurrence of SDM has been associated with metalaxyl-resistance in both pathotypes 3 and 6 of *P. sorghi*. Unfortunately, there are no effective seed treatment fungicides to take the place of metalaxyl. In fields where SDM has not been identified, seed treatments containing metalaxyl should be used as a preventative measure. Fields with metalaxyl-resistant strains of SDM should still be planted with treated seed as they may also contain a strain of the pathogen that is not resistant to metalaxyl, but may have the ability to overcome host resistance.

**Summary**

Now is a good time to scout fields for evidence of SDM. Later in the season, diseased and stunted plants may be hidden by healthy plants and easily overlooked. If SDM is identified, consider your management options going forward and arrange for pathotype testing to help with hybrid selection in the future.

While SDM is an important factor to consider when selecting sorghum hybrids, keep in mind that disease incidence can be sporadic and is dependent to a great degree on environmental conditions. Generally, SDM is noticeable one out of every five to six years in the Texas Gulf Coast. Most years the infection rate is below the threshold for yield loss. *Other agronomic characteristics such as yield, standability, sprouting resistance, and threshability should be considered when selecting hybrids and placing hybrids in each field.* Selecting hybrids for yield and implementing a crop rotation program may be the best plan for maximizing profitability over time. Contact your local DEKALB® Brand Seed Representative for more information on selecting sorghum hybrids.

**Sources**

3. Isakeit, T. Professor and Extension Specialist, Field Crops. Texas A&M University. Personal communication.