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EC73-1860 Sorghum Diseases

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SORGHUM DISEASES

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1. FUSARIUM STALK ROT: The fungus, *Fusarium moniliforme,* also causes stalk and ear rot diseases in corn. In grain sorghums external symptoms are characterized by a softening of the basal stalk tissues followed by lodging. The pith may first appear watersoaked and/or slightly discolored. Individual vascular bundles or fibers appear pink, red, or reddish purple. Later, infected stalk tissues take on a deep red color, cavities form between the vascular strands, and the stalk becomes weak, breaking over at or near the ground. The disease is favored by abundant moisture and moderate temperatures following head initiation. Some hybrids are less susceptible than others to this fungus. High plant populations and continuous cropping tend to increase the severity of the disease.

2. CHARCOAL ROT: This is potentially the most serious disease of sorghum. Prevalence and severity are frequently associated with continuous cropping and extreme heat and drought. In some years it may occur only in dry spots. Symptoms usually become evident when plants approach maturity, although infection by the fungus *(Macrophomina phaseoli)* occurs between early milk and late dough stages of growth. External symptoms are similar to those of Fusarium stalk rot. A positive diagnostic symptom is the shredding of the internal tissues in the lower stalk with small black bodies adhering to the remaining vessel fibers. These bodies are called sclerotia and, when numerous, appear like charcoal dust throughout the shredded stalk.

Crop rotation reduces disease severity. Maintain soil moisture at or above 80% capacity during the period of grain maturation.

3. HEAD SMUT: Of the three smut diseases of sorghum, head smut caused by *Sphacelotheca reiliana* is the most damaging. The disease is now widely distributed in the Central Plains states. Several races of the fungus are known. Head smut destroys the entire head, transforming it into a large mass of dark brown powdery spores. These galls (or sori) first become evident at heading time. The sorus is covered with a thin white membrane which soon breaks, releasing the spores to be scattered by wind and rain to the soil where they overwinter. The following spring the spores germinate and infect host seedlings. Commonly observed symptoms also include the formation of sterile flowers and/or numerous leafy shoots.

Head smut control is possible by using clean seed of resistant varieties. Seed treatment gives some protection against the disease but will not prevent infection from spores already in the field.

4. SOOTY STRIPE: Sooty stripe, caused by the fungus *Ramulispora sorghi,* occurs on sorghum, sudan grass and Johnson grass, but not on corn. The fungus attacks the leaves and leaf sheaths. Spots begin as small reddish-brown areas, later developing into conspicuous elongate-elliptical lesions with straw colored centers bordered by a purple margin. When mature the lesions may extend 3-5 inches in length and 3/4 inch across. The dead centers turn from straw-colored to greyish when sporulation occurs and "sooty" when numerous small black sclerotia are produced. These sclerotia provide the source of inoculum the following spring. Sooty stripe is favored by warm, humid conditions. Control measures include the destruction of infected crop residue and/or crop rotation.

5. HELMINTHOSPORIUM LEAF BLIGHT: The fungus *H. turcicum* attacks corn, sorghum, sudan grass, and Johnson grass. Small reddish-purple or yellow-tan spots develop on leaves of infected sorghum seedlings. The spots gradually enlarge into long elliptical lesions several inches in length and appear very similar to sooty stripe. Following warm, humid weather, sporulation occurs in the center of the spots, giving the lesions a grey color. The absence of the "sooty" appearance differentiates this leaf blight from sooty stripe.

Crop rotation and destruction of infected plant residue helps to minimize disease intensity. Fungicidal application has been investigated and found to be effective but usually is not economical.

6. RUST: In northern areas rust on sorghum is usually not seen until plants approach maturity. The disease is generally confined to mature leaves. Severe rust, however, causes the leaves to dry and break. For this reason forage sorghums are more severely affected than are grain sorghums.

Rust, caused by *Puccinia purpurea,* appears as raised blisters with a light brown covering that eventually ruptures exposing dark chestnut-brown spores for wind dissemination. The pustules (blisters) occur on both the upper and lower surfaces of the leaf. The disease is favored by warm, humid weather. Rust control is usually not warranted under typical field conditions.

7. BACTERIAL STREAK: Several bacterial diseases occur on sorghum, sudan grass and Johnson grass, but the most prevalent is bacterial leaf streak caused by *Xanthomonas holcicola.* The first symptoms are narrow water-soaked leaf streaks 1/8 inch wide and from 1 to 6 inches long. The streaks turn red and lose their water-soaked characteristic. Parts of the streak may broaden into elongated oval spots with tan centers and narrow reddish margins.

Bacterial streak is favored by warm wet weather and spread is by rain and wind. Bacteria probably overwinter on infected sorghum residue and may be seed transmitted. The disease is usually not serious enough to justify special control measures.

8. MAIZE DWARF MOSAIC: Maize dwarf mosaic virus (MDMV) has spread rapidly throughout most sorghum producing areas. Severity of the disease is largely dependent on several restrictive factors, such as presence of the virus, availability of perennial host plants (Johnson grass), and the population level and species of aphid vectors. Symptoms of maize dwarf mosaic appear on leaves as a chlorotic mottle of light and dark green areas. Intensity is somewhat dependent on the genetic make-up of the particular hybrid, stage of infection, and environmental conditions. Following cool weather, a "red leaf" symptom may develop in some hybrids.

Best prevention of the disease is through eradication of perennial host grasses such as Johnson grass in or near fields of sorghum. Prevention of MDMV by aphid control is difficult since the virus can be transmitted before conventional insecticides take effect.

9. INSECT FEEDING INJURY: Two species of aphids, the greenbug *(Schizaphis graminum)* and the corn leaf aphid *(Rhopalosiphum maidis),* commonly feed on sorghum. The greenbug is light green and has a darker green stripe down the middle of its back. The body of the corn leaf aphid is dark green and lacks the darker stripe. The toxic saliva that the greenbug injects into the plant while feeding kills the surrounding cells, causing leaves to turn yellow or purple. Plants can be attacked at any time from late May through early August. On larger plants, greenbugs usually attack the lower leaves, moving upward as the leaves die. The corn leaf aphid usually is found in the whorl, where it may cause the flag leaf to turn brown.

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U. S. Department of Agriculture and the College of Home Economics
E. F. Frolik, Dean J. L. Adams, Director

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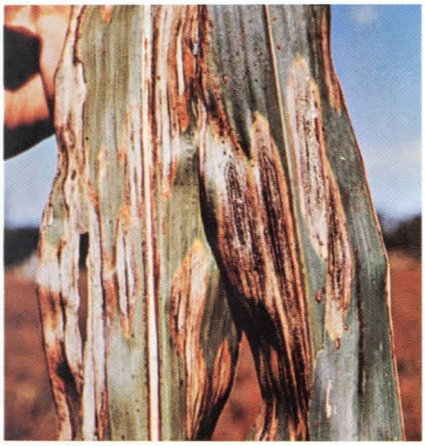
SORGHUM DISEASES

An Aid to Identification and Control

1. Fusarium Stalk Rot

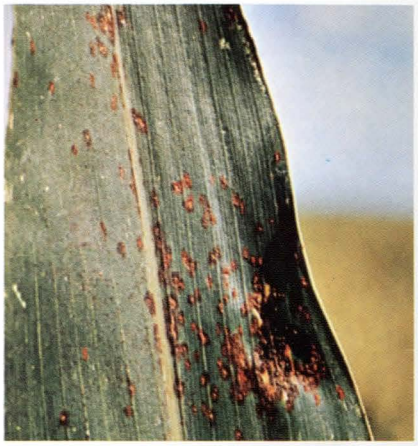
2. Charcoal Rot

3. Head Smut

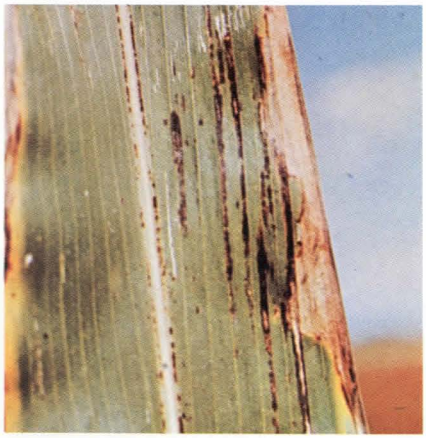


4. Sooty Stripe

5. Helminthosporium Leaf Blight



6. Rust



7. Bacterial Streak

8. Maize Dwarf Mosaic

9. Insect Feeding Injury