



ANTHRACNOSE OF FORAGE GRASSES AND CEREALS

Anthracnose, caused by a widely distributed, soil-inhabiting fungus *Colletotrichum graminicola* (*C. graminicolum*), attacks practically all grasses and cereals grown in Illinois. Anthracnose is usually of little importance except in coarse, sandy soils where fertility is low or unbalanced and where a more or less continuous grass-cereal culture is followed. Early attacks of the disease cause a general reduction in vigor, premature ripening or dying, and shriveling of the seed. Defoliation of sorghum and Sudangrass reduces the value of plants for forage and may lower the sugar content of the stalks in very susceptible varieties. Losses vary greatly from year to year because the *Colletotrichum* fungus is greatly affected by variations in weather. Periods of humid, hot weather (about 82°F or 28°C) are optimum for disease development.

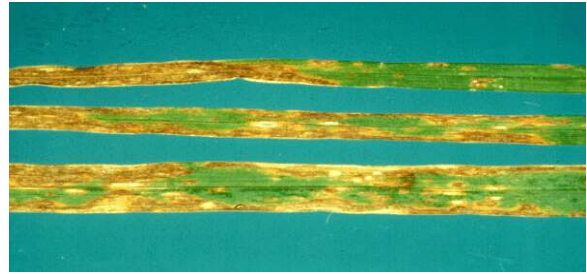


Figure 1. Anthracnose on Orchardgrass (courtesy University of Wisconsin).

In severe attacks, plants may die prematurely. Heads may become bleached and sterile. Winter varieties of oats suffer more severe attacks than spring varieties. G.H. Boewe, former plant pathologist with the Illinois Natural History Survey, has reported almost 100 percent of the oat plants in fall-sown field to be infected in certain years. Many of these plants are weakened and killed prematurely.

SYMPTOMS

Anthracnose is most noticeable on many grasses and cereals as plants approach maturity. Sudangrass, sorghums, broomcorn, and Johnsongrass—all species of *Sorghum*—however, suffer most during hot, damp weather in midsummer at the height of their vegetative growth.

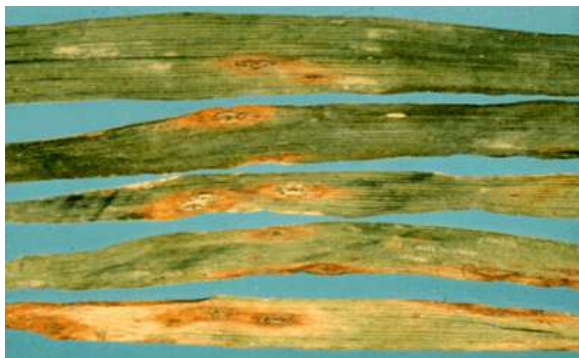


Figure 2. Anthracnose on oat leaves. Note the black fruiting bodies of the *Colletotrichum* fungus in the affected areas. Infection frequently occurs at the base of a leaf.

If conditions are favorable (warm and moist), the disease causes stunting and wilting and sometimes kills grass and cereal seedlings. It occurs commonly over a temperature range of about 60° to 90°F (15.5° to 32°C). Affected plants often appear to recover as the season progresses. In older plants, the leaves, leaf sheaths, and stems (culms) are affected. Severely infected plants are stunted and have few tillers.

Anthracnose often develops on cereals and grasses as a bleaching of the stem bases, followed by a brown rotting

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of the crowns and roots. If the disease is severe, the *collectotrichum* fungus may also spread into the crowns and roots of perennial grasses, causing lodging. Affected stands may die in the second or third year, especially in sandy, dry, unfertile soils.

On sorghums a red or purplish rotting of the basal stalk often occurs (called red rot). When stalks are split lengthwise, the pith is discolored in areas and interspersed with white, giving a marbled appearance to the decayed area. Depending on the cultivar, the discolored areas range from tan to purplish red. A similar symptom occurs when the peduncle or upper stem below the head becomes infected. Rotted stalks frequently break near the middle of the stalk or just below the seed head. Diseased plants may not lodge but produce small, poorly filled heads. (For a more complete account of the root rot-crown rot disease complex of cereals and grasses, read Report on Plant Diseases No. 113, "Root and Crown Rots of Small Grains"). Small, well defined; round to elliptical, elongate, or irregular; often zonate leaf spots or lesions are commonly produced on the lower leaves of susceptible plants. The lesions usually have light tan or straw-colored centers (reddish brown on oat leaves) with dark red to brown borders (Figures 1 and 2). As the disease progresses, it gradually affects all leaves on highly susceptible species like Sudangrass and sorghums. Individual lesions may merge, causing entire leaves to wither, die, and drop prematurely. On broom corn, production of heads may be poor.

The fruiting bodies of the *Colletotrichum* fungus are elongated, slightly raised, dark brown to black specks called acervuli. They may form in the bleached centers of older lesions on both living and dead leaves (Figure 1 and 2), at or near the joints (nodes) of stems, and on diseased heads when moisture is abundant. Clusters of small black "spines" or setae (visible with a hand lens or strong reading glass) protrude from the acervuli and help to distinguish *Collectotrichum* from other leaf-blighting fungi. (See Report on Plant Disease No. 116, "Scald of Cereals and Forage Grasses"; No. 309, "Helminthosporium Leaf Spots and Blotches of Forage Grasses"; No. 310, "Brown Stripe or Leaf Streak of Forage Grasses"; No. 311 "Selenophoma Leaf Spot or Speckle of Forage Grasses"; and No. 312, "Stagonospora Leaf Spot or Blotch of Forage Grasses").

DISEASE CYCLE

The tiny black acervuli, found on above-ground parts of diseased plants, produce large numbers of spores (conidia) in pinkish masses during warm to hot, damp weather (optimum temperature about 77°F or 25°C). Wind and splashing or blowing rain disseminate these spores to nearby plants, where they germinate, penetrate directly through the epidermis or stomata, and start new infections. The *Colletotrichum* fungus survives the winter on both living and dead tissues—seed, leaves, and stubble—of grains, forage, and weed grasses, Quackgrass, Johnsongrass, cheat, wild barley, foxtails, hairy crabgrass, barnyard grass, bermudagrass, orchardgrass, redtop, red fescue, switchgrass, and other grass weeds are susceptible and are common sources of conidia to initiate new infections. Primary infection is from conidia and fungus threads (mycelium) on crop refuse. Infected seed that is not properly treated with a thiram- or captan-containing fungicide is a possible source of seedling root and crown infection. As plants mature, secondary spread of anthracnose is general from conidia as well as from mycelium on crop residues.

Isolates or pathogenic races of *Colletotrichum graminicola* that attack corn do not infect *Sorghum* species and small grains, nor do isolates from *Sorghum* spp. and cereals infect corn.

CONTROL

1. Maintain adequate to high, balanced soil fertility—especially of potassium and phosphorus—based on a soil test. Remember that anthracnose is most severe in old sod or continuous grain fields where fertility is low or unbalanced.
2. Where possible, sow only thoroughly cleaned, certified, plump, disease-free seed of improved, well-adapted small grain and grass varieties recommended by University of Illinois agronomists and your county Extension adviser. The seed should be properly cleaned to remove the light, infected kernels.
3. Treat the seed of small grains, sorghums, Sudangrass, and other forage grasses with a protectant fungicide. (Read [Report on Plant Disease](#) No. 1001, “Seed Treatments for Field Crops,” for details). Seed treatment helps to prevent the introduction of the *Colletotrichum* fungus carried on the seed, to new fields.
4. Where feasible, rotate forage grasses and cereals with soybeans, forage legumes, or corn for one year or more. Rotation helps to prevent disease buildups.
5. Avoid the following:
 - a. A sequence of closely related grasses and cereals.
 - b. Pure dense stands of a single grass variety. Where practical, seed a mixture of forages.
 - c. Leaving a heavy mat of hay on the grass during warm, damp weather.
6. Plant at the recommended rate in a fertile, well prepared seedbed.
7. Keep down weed grasses by cultural or chemical means.
8. Where feasible, plow under crop and weed debris cleanly.