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G89-931 Alfalfa Anthracnose

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Alfalfa Anthracnose

Symptoms, disease cycle and control of alfalfa anthracnose are discussed here.

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Forage crops are grown on and harvested from more acres in Nebraska than any other crop. Of the almost 49 million acres of agricultural land in Nebraska, approximately 24 million acres are in hay. Alfalfa production has stabilized at about two million acres.

High feed and forage production costs and periodic droughts have generated increased concern by farmers and ranchers over forage losses from diseases, insects and environmental stresses. Estimates suggest about one-fourth of the U.S. alfalfa hay crop and one-tenth of the seed crop are lost annually to disease.

Historically, anthracnose has been more of a problem in hay production in the eastern and southeastern United States, but in the last decade the incidence and severity of anthracnose has increased dramatically in the north central states.

Anthracnose and Phytophthora root rot are the most serious alfalfa diseases in Nebraska. Although anthracnose often is singled out as a separate problem, it is only one of several components affecting plant health. It interacts with other diseases and with environmental factors to produce a cumulative stress that together cause yield and stand loss. This situation occurred in the mid-1980s in central Nebraska, where some counties estimated alfalfa losses at over 50 percent due to the combined effects of anthracnose, Fusarium crown rot, and weather. Two- and three-year-old production stands were totally lost to this disease-environment combination, causing significant economic hardships on area producers.

Anthracnose of alfalfa is caused by *Colletotrichum trifolii*. This fungus can attack leaves, but most characteristically attacks stems and crowns.

Symptoms

Anthracnose may appear anytime during the growing season and on any age of stand. It typically appears after the second cutting and on stands two or more years of age, but it has occurred on seedlings in early summer before the initial cutting.

Figure 1. Curving at the tip and green stems with dead leaves indicate anthracnose. (35K JPG)

From a distance, infected fields show dead, straw-colored stems scattered throughout the stand. Infected stems are curved at the tip similar to a shepherd's crook (*Figure 1*). Leaves wilt, turn tan, and the entire stem dies.

At first only a few, individual stems on scattered plants are affected; but on susceptible varieties, the disease progresses rapidly until at the one-tenth bloom stage 30 to 50 percent of the plants within the crop canopy can show evidence of anthracnose.



Typical stem lesions are diamond-shaped and ash-gray in color (*Figure 2*). They have a dark-brown to purple border and usually form on the lower stem. The gray centers of the lesions are dotted with small, black fruiting bodies of the fungus. More than one lesion may be found randomly distributed along the stem.

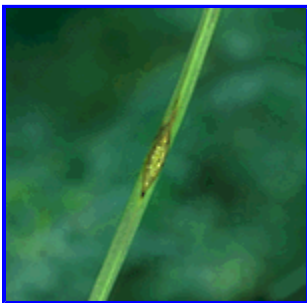


Figure 2. Typical diamond -shaped anthracnose lesion. (11K JPG)

Lesions may coalesce and girdle the stem, resulting in wilt and subsequent death. Those occurring just above the crown may not have the typical diamond shape.

The anthracnose fungus may advance downward from the infected stem into the crown tissues. Infected crowns appear bluish-black near the origin of the stems and a reddish-brown near the inner crown tissues (*Figure 3*). Crown symptoms may be present without the presence of stem lesions.

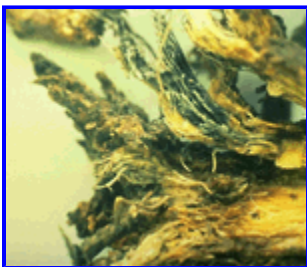


Figure 3. Shiny, bluish-black dry rotting of infected crown. (25K JPG)

Major reductions in stand occur when anthracnose crown rot is widespread within a stand. Infected plants usually die within one or two seasons after invasion of crown tissues. Plants may be killed outright by the disease, or by cold winter temperatures because of reduced cold tolerance. Many die during the winter and fail to initiate growth the following spring. When this occurs, plants should be dug, cleaned, and the crowns examined for evidence of anthracnose.

Disease Cycle

The anthracnose fungus persists on or in plant debris in the field or clinging to harvesting equipment. Stacked hay also serves as a potential source of fungus inoculum.

With warm, wet weather, spores are produced on stems and spread from stem to stem and plant to plant by wind, splashing rain, or irrigation water. Spores are carried down into crowns during rain, irrigation,

or heavy dew formation; or the fungus may grow down from stem infections into crown tissues.

Spread from one field to another is by wind-blown spores or by the movement of infected stems on machinery. Anthracnose is not spread through seed.

Anthracnose is most active in Nebraska from July through September. Maximum severity of the disease occurs on late harvests during warm days with cool nights accompanied by heavy dew.

Anthracnose differs from other alfalfa crown rots in that it renders fields unproductive in a matter of one or two seasons. Crown rot caused by *Fusarium* spp. and other fungi results in a more gradual stand decline. For more information on these crown rots, consult NebGuide G89-912, *Alfalfa Crown and Root Rots and Stand Longevity*.

Control

Planting alfalfa varieties resistant to anthracnose is the best approach to prevent forage and stand losses. Many of the improved varieties now have acceptable levels of resistance to anthracnose.

Nebraska producers are strongly urged to plant varieties resistant or highly resistant to anthracnose, Phytophthora root rot, and bacterial diseases. These are the three major diseases that contribute to early stand decline and loss in forage production.

Information on variety, disease, and insect resistance and performance in Nebraska is available in NebGuide G77-357, *Selecting Alfalfa Varieties for Nebraska*.

Cleaning debris from haying machinery before first cutting in spring and during the growing season provides some protection against introducing the anthracnose fungus into clean fields. Mowing young stands before old stands also helps reduce anthracnose spread.

Fields with a previous history of alfalfa crown rot should be rotated to another crop for two years before being replanted to alfalfa to reduce the survival of sources of infection to the new crop.

Good management and avoidance of stress on the crop, where possible, will help reduce disease losses.

File G931 under: PLANT DISEASES

C-29, Field Crops

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