

Corn Diseases

Management and identification

Corn diseases caused by fungi, bacteria, viruses, nematodes and mycoplasms in Colorado are minimized by good management decisions made prior to the growing season.

Good weed control, fertility and irrigation practices throughout the growing season, coupled with prompt harvest of corn damaged by wind, hail or insects, can help minimize yield losses associated with the common corn diseases in Colorado.

Seedling blights

Damping-off and other seedling blights generally are caused by soil dwelling fungi such as *Pythium*, *Fusarium*, *Diplodia*, *Rhizoctonia* and others. These fungi may cause seed to rot before germination or the seed may germinate and the seedling becomes infected.

Damping-off is favored by cool, wet soil and is often first seen in low-lying or poorly drained areas in the field. Heavy plant residue on the soil surface favors damping-off by keeping soils cooler and wetter. Delayed emergence caused by compaction, crusting or planting too deep can also predispose seedlings to infection.

Damping-off is generally controlled by the seed treatments provided with seed corn. Avoid deep planting on wet soils cooler than 50°F to minimize occurrence of the disease.

Nematodes

Nematodes are microscopic roundworms that live in the soil. Several species of nematodes may feed on corn roots, but only a few are capable of causing significant damage. Nematodes may become a problem in fields that are not regularly rotated to another crop. Symptoms may occur throughout the growing season and generally appear as stunted plant growth, uneven stands, chlorosis, small or poorly fill ears. Often these symptoms will appear as patches in the field where nematode numbers are highest. Corn roots dug in those areas often appear stunted, malformed and may have discolored lesions. However, these symptoms may be confused with those caused by other problems. The only way to verify a nematode problem is by analyzing a soil and root sample.

Disease management practices

- Select hybrids with resistance to diseases common in your area.
- Plant high quality seed treated with a seed fungicide.
- Avoid planting too early into cold, wet soils.
- Avoid higher than recommended plant populations for the hybrid selected.
- Deep rip fields to reduce soil compaction.
- Rotate fields regularly to crops other than corn.
- Apply N,P,K and micronutrient fertilizers according to soil test recommendations.
- Control grassy weeds in and around corn fields to destroy host sites.



Damage to corn stands.

Chemical control guidelines can be found in the High Plains IPM Guide - CSU Cooperative Extension Bulletin 564A or on the website www.highplainsipm.org.

Corn Diseases



Goss's wilt

Top right photo R. L. Croissant
Bottom left photo H. F. Schwartz

Goss's wilt

Goss's wilt (*Clavibacter michiganense* subsp. *nebraskaense*) is an emerging disease in the High Plains region. It is now widely distributed in northeastern Colorado and can result in significant losses. The disease is aggravated by growing susceptible hybrids, continuous cropping and reduced tillage practices. The bacterium overwinters in previously infected corn residue and may be moved from plant to plant during the growing season by splashing water.

Corn leaves may be infected at any growth stage and symptoms appear as long gray green to black lesions. As lesions age, they gradually fade to tan. Plants may wilt as if under drought stress. Premature death may occur, limiting yield by up to 50%. Genetic resistance is available in hybrids. Growers may reduce incidence by rotation and tillage.

Virus Diseases

Numerous viruses cause corn diseases. Some may seed borne, whereas others may be transmitted by insects such as aphids. In general yield reductions caused by viruses have been minimal in Colorado because of the use of resistant hybrids and good weed management. Nevertheless, new viruses may occasionally emerge and result in damaging losses. For example, the high plains virus, transmitted by the wheat curl mite, caused damage to several susceptible corn hybrids in the early 2000's. This disease has largely been controlled by the use of resistant hybrids but it still remains a threat to sweet corn and to wheat.

Smuts

There are two problem smuts that occur in Colorado corn. Common smut (*Ustilago zeae*) damages all parts of the corn plant. This fungus is spread by the wind and spores infect the plant through wounds. Common smut overwinters in corn residue or soil and is often seen following hail or other injury. This disease is favored by excess N from fertilizer or manure. Some hybrids are less susceptible to common smut than others. Growers should avoid mechanical injury to corn during cultivation and maintain proper soil fertility levels to minimize impact.

The other smut that can be a problem in Colorado is head smut (*Sporisorium holci-sorghii*). It is commonly found to cause damage in tassels and ears. Different than common smut, head smut is systemic, infecting the plant through soil borne spores. Low soil moisture and soil temperatures between 70 to 82°F are optimum for infection, which cause stunting and ear abortion. Adequate soil N during early growth stages may limit susceptibility, but the disease is best managed by rotation and resistant hybrids.



Common smut

Head smut

Photo R. L. Croissant

Corn Diseases

Common rust

Common rust (*Puccinia sorghi*) initially results in yellow flecks on the leaves. Eventually reddish-blisters or pustules, filled with fungal spores, form on the upper and lower leaf surfaces. Most hybrids have some resistance to common rust, but the problem is seldom severe enough to warrant hybrid selection on this basis. Fungicides are available for use in years with economic levels of infection, but they must be applied early to be effective.



Common rust

Photo R. L. Croissant

Stalk rots

Several different organisms may be associated with stalk rot. The main fungal pathogens found in Colorado are *Gibberella zea* and several *Fusarium* species (in the *Gibberella fujikoroi* complex). Symptoms of stalk rot often appear after pollination. Affected plants die prematurely and the stalks are prone to breaking or lodging during high winds and rainstorms. Internal tissue in the lower portion of the stalk appears shredded.

Bacterial soft rot, caused by *Erwinia chrysanthemi*, is an emerging problem. Symptoms often appear in midseason when plants suddenly fall over. The damaged stalks are bleached and develop a soft, slimy, malodorous rot. Bacterial stalk rot often is associated with the use of surface water (river, lake, impounded water) is used for irrigation.



Fusarium stalk rot

Top Photo W. M. Brown

Bottom Photo R. L. Croissant

Stalk rots are controlled by a combination of resistance and cultural practices that include proper seed rates, insect control, balanced fertility, and drought avoidance. Early harvests may be necessary on fields that show a high (10-15%) stalk rot incidence.



Stalk rot damage

Photo H. F. Schwartz



Late plant pathologist Dr. Bill Brown worked on corn disease management in Colorado for 23 years. Bill also was instrumental in developing and promoting IPM practices.



Gibberella stalk rot

Photo W. M. Brown