

COMMON SMUT

FUNGAL CAUSAL AGENT

Ustilago maydis

SYMPTOMS

Common smut is characterized by the presence of galls on aboveground parts of the plant. The galls are commonly found on the lower part of the stalk, ears, tassels, and leaves.

Young galls are firm to spongy, and are covered by a glistening, greenish-white to silvery-white tissue. Mature galls become black and are more spongy than young galls. The interior of the gall contains masses of powdery dark brown to black spores. Mature galls may reach several inches in diameter.

DISEASE CYCLE AND EPIDEMIOLOGY

The fungus produces two types of spores: chlamydospores (teliospores) and sporidia (basidiospores).

Chlamydospores are dark brown to black spores that are produced in the galls. The chlamydospores overwinter in galls and on infested debris in the soil. They can survive in the soil for several years. The spores are spread by water (irrigation or rain), farm machinery, and insects.

Under favorable conditions the chlamydospores germinate and produce sporidia. These spores are carried by air currents or are splashed to young, developing corn tissue. All tender succulent aerial parts of a corn plant are susceptible to infection.

The fungus penetrates corn tissue through natural openings (stomata), wounds, or directly through cell walls. Once inside the host, the fungus stimulates the host cells to proliferate and form galls. Ears of corn are infected through the silk.

There is no general agreement on what weather conditions are most favorable for development of corn smut. Moisture is needed for germination. However, once the fungus has penetrated the corn tissue, moisture no longer becomes a limiting factor in disease development. In general, common smut tends to be prevalent in New York in seasons characterized by dry conditions and temperatures between 79F and 93F. The interval between infection and gall formation varies from one to several weeks under favorable conditions.

Disease incidence is higher among plants grown in soils high in nitrogen or after heavy applications of manure.

Injuries due to hail, blowing soil or sand particles, cultivation, spraying, or detasseling in seed fields greatly increases the potential for smut infection.

MANAGEMENT

- Select varieties with tolerance. Some varieties are much more susceptible than others.
- Avoid mechanical injuries to plants during cultivation and spraying.
- Prevent injuries due to insect feeding.
- Maintain well-balanced soil fertility.
- Crop rotation must be practiced.
- For small plantings, remove galls before they mature and rupture - eat, sell, or burn them.

*Prepared by Ann C. Cobb and Helene R. Dillard, Cornell University, NYSAES, Plant Pathology
2/2002*