
Common Smut of Corn

Symptoms

Conspicuous galls are the symptoms that characterize this disease. Newly formed galls are greenish silvery-white, with a shiny periderm (Fig. 1 and 2.). Galls expand rapidly, and as they mature, the periderm dries, turns gray in color, and ruptures easily, releasing dark powdery spores (Teliospores, also known as chlamydospores). Galls form on any actively growing part of the plant (stalks, ears, tassels, or leaves). Many galls can form in a single organ; mature galls range from 1 to 15 cm in diameter depending on the organ affected. Corn may be infected at any growth stage, but is less susceptible after ear development. Damage includes grain replacement, stunting and even death of young plants.

Common smut can be easily distinguished from head smut in that numerous galls may form per ear, instead of a single one in head smut; and in that the gall's periderm is thicker, while in head smut the periderm is very thin, breaks easily, and is short-lived.

Causal Agent

Common smut is caused by the basidiomycete *Ustilago maydis* (syn. *Ustilago zaeae*). Teliospores of this fungus are generally spherical, spiny and dark brown to black. Besides corn, *U. maydis* also infects Teosinte. *U. maydis* is of culinary importance in Mexico and in Mexican restaurants around USA where immature smut galls are a delicacy known as *cuitlacoche*. For some farmers the

gall production on sweet corn constitutes a high value crop alternative.

Inoculum Source and conditions

Ustilago maydis infections can originate from teliospores overwintering in crop debris and soil, or can be introduced with unshelled seed corn or manure from animals fed infected corn stalks. In soil, the teliospores can survive for several years. Spores are spread by wind and splashing water. Infection of the plant can be facilitated by the presence of mechanical wounds (wounds caused by strong wind, hail, insects, cultivation, spraying or de-tasseling). Symptoms become visual 10 days after infection.

Common smut is favored by humid, temperate environments, by high nitrogen level and by conditions that cause extended silking.

Control

Best disease management is accomplished by the integration of the following practices:

- Planting resistant varieties. It is the most cost-effective and practical control measure.
- Deep plowing of diseased corn residue in the fall (to reduce inoculum).
- Maintaining balanced soil fertility. High nitrogen level increases severity.
- Avoiding mechanical and insect damage (spray for insect control).

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Fig. 1. Greenish gray, silvery periderm characterizes young galls appearance. Photo: CIMMYT.



Fig. 2. Mature galls of common smut on a corn ear.



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