Virginia Cooperative Extension

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Corn Smut

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Common smut of corn is caused by the fungus Ustilago maydis. The fungus causes gall formation on all aboveground parts of corn plants. In some parts of the world, such as Mexico, immature galls are eaten and considered a delicacy. In the United States, infected ears are usually culled.

Symptoms

Galls are most obvious on the ears (Fig. 1), but they may also form on leaves, tassels, and stalks. The galls are at first enclosed in a silvery white membrane. As they mature, the membrane breaks and a black, powdery mass of spores is exposed. Smut on the leaves and tassels usually appears as very small galls or pustules (generally less than an inch in diameter) that eventually become hard and dry. On all other parts of the corn plant the galls are frequently several inches in diameter. Ears are most often infected at the tips, but they may be invaded at any other point. The entire ear is sometimes replaced by the smut gall, which is usually partially or wholly enclosed by the outer corn husk. If plants become severely diseased before they are a foot high, they are usually either killed or stunted in growth.

Fig. 1. Smut galls on an ear of sweet corn. (Photo by M.A. Hansen)

Disease Cycle

The smut fungus survives from year to year in old, smutty corn stalks. Spores may be blown by wind for considerable distances to new plants. The fungus often enters plants through wounds made by hail, cultivating equipment, or detasseling. Infection may also occur through the silks. The fungus grows down the silks to the kernels and causes galls on the ears. Silk infection must occur in a 7-10 day period following silk emergence in order for galls to form.

The factors that determine severity of common smut are not fully understood. Hot, dry weather during pollination, followed by rainy weather, seems to favor disease spread and development. Corn grown on heavily manured soils often develops severe smut. Plants on such soil produce succulent growth, which may be more susceptible to fungal infection. Such soils may also provide a good medium for the overwintering and germination of the smut spores.

Control

Cultural Control

- Corn smut is not a seed-borne disease; therefore, seed treatment is of no value.
- Collecting and destroying galls before the dark fungal spores form will help reduce severity in small plantings.
- Crop rotation, in which corn is not grown more often than one year in three, will help reduce fungal inoculum in the soil.

Resistance

- The most effective control is to plant resistant hybrids. No hybrid is completely immune to smut, but most of the recommended hybrids of field corn are reasonably resistant. Many of the commonly used

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sweet corn varieties are susceptible to this disease, however. The White Sugary Enhancer varieties are more resistant to smut than either the White or Bicolor Supersweet varieties. Some of the available White Sugar Enhancer varieties are listed in Table 1.

- Highly susceptible varieties are sometimes grown for sale of smut galls to Mexican restaurants. Some highly susceptible varieties are listed in Table 2.

Table 1.

Sweet corn varieties with some resistance to common smut

White Sugary Enhancers	
Argent	Brilliance
Fantasia	Pristine
Seneca Sensation	Seneca Snow Prince
Seneca Sugar Prince	Silver King
Silver Prince	Summer Flavor 72W

Table 2.

Sweet corn varieties that are highly susceptible to common smut

Country Gentlemen Hybrid	Duet
Golden Beauty	Silver Queen
Spring Gold	