



Corn Smut: *Ustilago maydis*

Introduction

The smut of corn (*Ustilago maydis*) was probably present when the British came to America. It is now present in nearly all countries where corn is grown and is of great economic importance in North America. Sweet corn is more susceptible than field corn and under very favorable conditions may become infected during the seedling stage.



Figure 1: Symptoms on the corn ears.

Symptoms and Signs

The plant may be infected at any time in the early stages of its development but gradually grows less susceptible after the formation of the ear. Any part of the plant above the ground can be invaded, although it is more common on the ears (Fig. 1), the tassels (Fig. 2) and the nodes than it is on the leaves, the internodes and aerial roots. The boil is composed of a white, smooth covering enclosing a great mass, sometimes four or five inches in diameter, of black, greasy, or powdery spores. After the spores mature, the covering becomes dry and brittle, breaks open, and permits the black powdery contents to fall out.

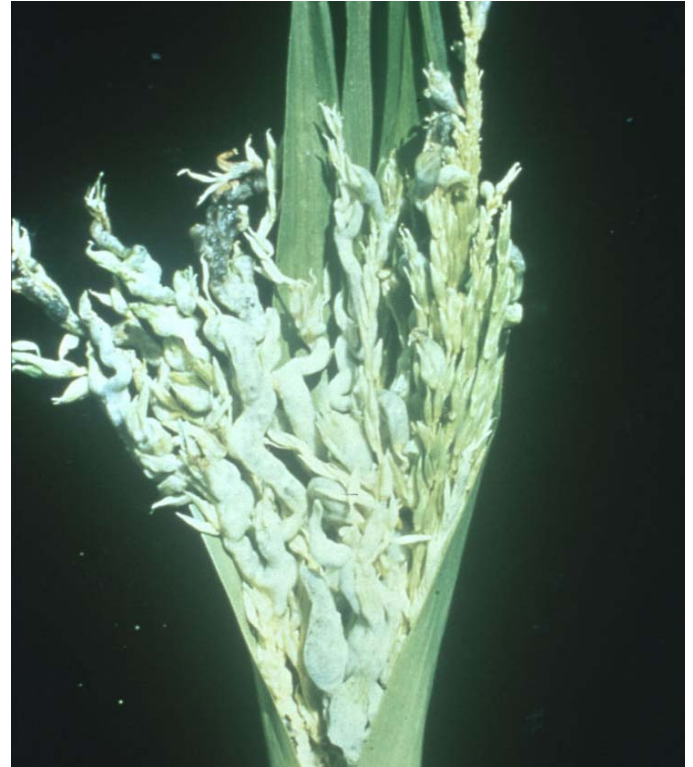


Figure 2: Symptoms on the corn tassel.

Disease Cycle

The smut spores are blown long distances by the wind and are particularly prevalent when there is much dust in the air. They will germinate in rain water, but germinate more readily in the drainage from barnyard manure. Consequently, spores are scattered over the farm with manure and have been known to pass through the digestive tracts of animals without losing germinating ability. The germ tube of the spore ordinarily does not enter the plant directly, but a few drops of dew caught in the leaf sheath will remain long enough for the fungus to start a luxuriant growth. It is only when it is growing in this manner that it can enter the plant.

Hot dry seasons are favorable for the growth of the fungus. When the soil is dry, dust can blow more readily, and it is by means of air-floating dust that fungus spores are carried from one farm to another. Furthermore, with drought, the temperature usually is high, which is especially favorable for the germination of the spores. The spores, however, must have water collected in the silk, leaf blades, and other parts of the corn to permit the required amount of growth for penetrating the tissue.

Management Strategies

Seed treatment is of no value. Recommended control measures are rather unsatisfactory. If every gardener or corn grower in a given community would go through his field two or three times during the season and cut out all of the smut balls before they have time to break open, and destroy them by burial or fire, smut could be reduced. One year of cutting is not enough to cause a noticeable difference in the amount of the disease, but if this cutting is continued for two or more years, the smut will gradually be reduced. This is true, however, only if adjoining neighbors also cooperate. The removal of the smut should always be accompanied by rather long crop rotations.

Although there is some degree of resistance to smut among some of the newer varieties, in favorable hot dry summers the disease may be found in all varieties. In general, the later maturing varieties with larger ears may show more resistance to smut. The following varieties have been shown to exhibit moderate to high

levels of resistance: Apache, Aztec, Bellringer, Bravo, Calumet, Capitan, Comanche, Gold Cup, Golden Gleam, Golden Security, Midway, Pacer, Silverado, Sweet Ice, Sweet Rhythm, Sweet Sue, Sweet Symphony, Wintergreen, and Wizard. Some varieties that are highly susceptible to smut include: Country Gentlemen Hybrid, Duet, Golden Bantam, Golden Beauty, Silver Queen, and Spring Gold.

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