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PLANT PATHOLOGY
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Corn Smut

Corn smut is usually more spectacular than damaging, but sometimes a high percentage of plants can be diseased and losses can occur. Long-term estimates indicate about 1-2 percent loss to smut in field corn. Sweet corn is more susceptible than field corn to smut and, in addition to yield loss, there are problems in handling the smutted ears in canning plants. Corn smut in a garden can be a nuisance, but smutted ears can be discarded.

Corn smut galls are actually a combination of the smut fungus and plant tissue that is caused to grow abnormally by the fungus, *Ustilago maydis.* The combination of corn and fungus tissue results in the large, silvery galls (figures 1, 2, and 3) that eventually are filled with spores of the fungus. The corn smut fungus develops only in meristematic tissue, that is, in tissue that is actively growing.

The fungus overwinters as spores in the galls; spores are disseminated by air in spring. The overwintered spores germinate and produce another stage of spores that infect the new crop of corn.

Factors Affecting Corn Smut

Corn smut has many peculiarities that have not been well explained. Smut spores falling on corn plants often fail to cause disease. The occurrence of smut cannot be forecast with accuracy, and it is not known how to prevent smut infection.

Several factors affect the incidence of corn smut, but how they influence smut infection is not well understood:

- Plants in a low density field (such as 4,000 or 8,000 plants per acre) are likely to have a higher percentage of smutted plants than plants in higher populations of 12,000 to 20,000 plants per acre.
- A high rate of nitrogen applied to soil is likely to increase the incidence of smut.
- Certain dates of planting often result in crops with a high incidence of smut, but these dates are different each year and we cannot predict them.
- Seasons that are dry early, such as during May and June, often produce crops with a high incidence of smut.
- Some chemicals cause variations in tissue growth in corn, and this tissue is often associated with a high incidence of smut.
- Some corn hybrids are relatively susceptible and others are relatively resistant, but in some seasons the resistant ones may also have a high percentage of smut.
- High-yielding fields are likely to have a higher percentage of plants with smut galls than low-yielding fields.

One conclusion that some of the above items tend to indicate is that vigorously growing plants are more likely to be smutted than poorly growing plants. This may sound unusual, but corn smut is an unusual disease.

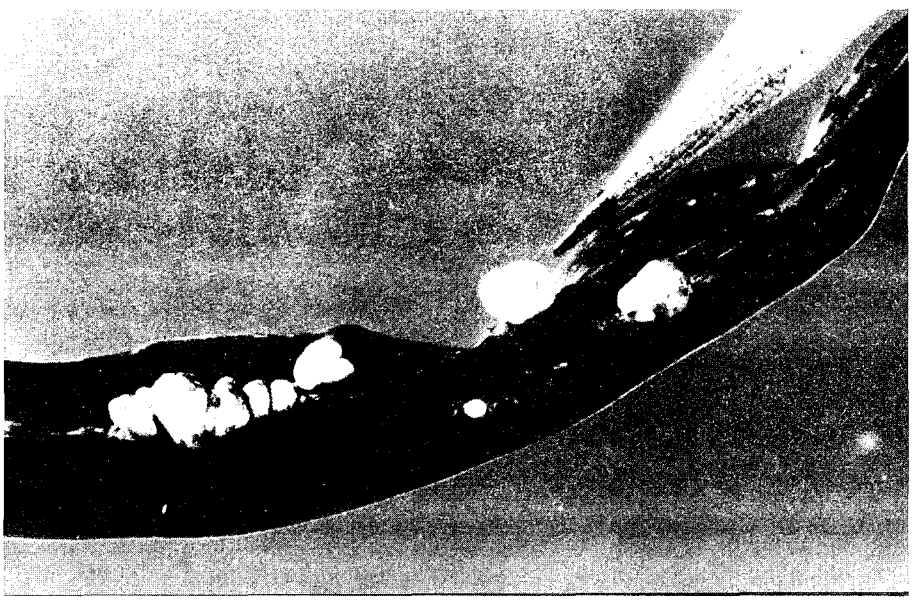

Figure 1. Smut galls on corn leaf.

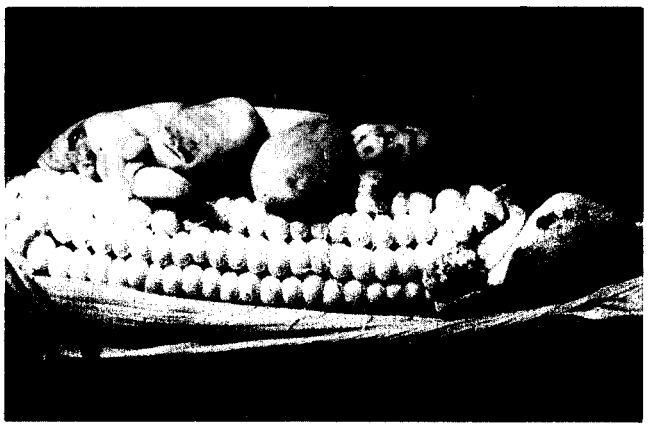

Figure 2. Smut galls on immature corn ear.

Injured corn plants are likely to produce smut galls at the locations of injuries, provided the plants have not completed their growth at the time of injury. This often can be seen following hail damage or after detasseling of plants in seed corn fields.

Even though several fungicides will kill germinating smut spores, none have been found to control smut on corn.

Smut Control Suggestions

Modern procedures for growing field corn and commercial canning corn are well in line with smut control suggestions.

The following suggestions may be of some value to home gardeners.

- Grow smut-resistant corn. Corn lines differ in susceptibility to smut, but the information is often difficult to obtain. A smut-susceptible corn line may be grown because of many desirable characteristics.
- Make plantings on several different days. This will help to avoid severe smut infection for the season's crop, and also provide sweet corn for eating and marketing over a long period of time.
- Establish plant populations of 12,000 to 20,000 plants per acre. Plants in lower populations tend to have more smut. The following table gives guidelines for obtaining a range of plant populations:

Row Widths and Kernel Spacings to Obtain Certain Plant Populations

Seeds per acre	Inches between kernels: 30-inch rows	Inches between kernels: 36-inch rows	Plant populations after 10% loss
14,000	15	12.4	12,600
15,000	14	11.6	13,500
16,000	13.2	10.9	14,400
17,000	12.4	10.2	15,300
18,000	11.7	9.7	16,200
19,000	11.1	9.2	17,100
20,000	10.5	8.7	18,000
22,000	9.5	7.9	19,800
24,000	8.7	7.2	21,600

For garden purposes the above rates of planting may be doubled and then thinned to the above spacing after emergence. This procedure will provide a near perfect population rate.

- Remember that the value of crop rotation and sanitation practices for individual plantings within an extensive corn-growing area is questionable.

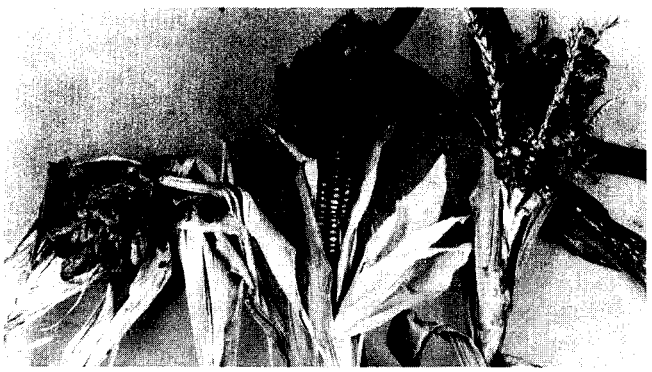

Figure 3. Smut galls on mature corn ears and tassel.

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