

# Common Smut and Rust of Corn

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Corn smut, caused by the fungus *Ustilago maydis*, causes unsightly galls on ears and other aboveground portions of corn plants. Yield losses in Michigan are variable, ranging from a trace up to 15 percent in individual fields, but rarely exceeding 2 percent. Losses in sweet corn, however, may be considerable. The amount of yield reduction is related to the number, size, and location of galls on the plant. Galls on and above the ears cause greater yield reductions than galls below the ears.

The relationship between weather conditions and the prevalence and severity of common smut is not clear. Weather conditions that retard the growth of corn plants appear to favor smut. Drought, excessively wet soils, and cool temperatures favor smut



Figure 1. Smut on ear.



Figure 2. Smut on tassels.

development, but smut can also occur under other conditions.

Actively growing tissues are readily infected by *U. maydis*. High nitrogen fertility, especially in soils receiving barnyard manure, favors smut development. Infection occurs through wounds caused by hail, blowing sand or soil particles, or cultivation practices. Galls are commonly seen in seed fields because of wounds caused by the detasseling procedure.

## Symptoms

Common smut of corn is easily recognized by the presence of galls which may occur on all aboveground portions of the plant (Figures 1, 2 & 3). Galls are first covered with a shiny white membrane. As the galls mature, the interior turns into a mass of



**Figure 3. Smut on leaf.**

black powdery spores which are released when the membrane ruptures. If the galls mature early in the season, the spores may cause new infections on other plants. They may also persist in the soil on plant debris and cause infections in later years.

### Control

The most effective means of control is the use of resistant or tolerant hybrids. In 1980, a number of sweet corn hybrids were evaluated for tolerance to smut in Michigan (see Table 1). When smut is a chronic problem in commercial sweet corn operations, avoid highly susceptible hybrids such as Asgrow Cherokee, Asgrow Guardian, Asgrow Commander, and Harris Silver Queen (Table 1.) Also avoid hybrids which have a high percentage of smutted stalks, even though the percentage of smutted ears may be low (Asgrow Calico and Harris Golden Gleam). Depending upon other qualities such as taste and maturity, use hybrids with low smut ratings—

**TABLE 1. The percentage of smutted stalks and ears of 33 sweet corn hybrids tested in field studies in 1980.**

Hybrid	Days to Maturity	% Smutted Stalks	% Smutted Ears
Asgrow-Guardian	79	36	6
Asgrow-Calico King	88	37	1
Harris-Golden Gleam	90	28	1
Asgrow-Commander	86	22	7
Asgrow-Spring Calico	70	21	7
Harris-Silver Queen	94	14	9
Asgrow-Calico	77	21	1
Asgrow-Cherokee	79	15	6
Asgrow-Silver Chief	86	17	3
Ferry Morse-Bonanza	86	13	3
Sun-Reliance	73	9	6
Asgrow-XP2527	80	10	4
Asgrow-XP2500	80	8	5
Asgrow-Mevak	76	9	4
Asgrow-Merit	80	8	3
Asgrow-Aztec	68	10	0
Sun-NK 199	88	6	2
Asgrow-Commanche	72	4	4
Harris-Bellringer	82	8	0
Sun-Sugar Time		7	0
Harris-Gold Cup	82	6	1
Willey-Gold Crest		2	5
Ferry Morse-Mellow Yellow		3	2
Harris-Bell Gold		3	2
Sun-Golden Nectar		3	1
Sun-Sugar Loaf	82	3	0
Harris-Northern Bell	74	3	0
Harris-Seneca star	69	2	1
Ferry Morse-Style pak	80	1	1
Sun-Honeycomb		2	0
Sun-Lukon	80	2	0
Harris-Seneca Scout	90	1	1
Asgrow-Apache	80	0	1

*The sweet corn hybrids shown here are not a complete listing of hybrids grown in Michigan. The smut ratings do not take into account other agronomic characteristics which may preclude the selection of a specific hybrid.*

Asgrow Apache, Harris Seneca Star, and Ferry Morse Style pak. Crop rotation and roguing-out and destruction of the galls are not effective or practical means of control in large fields. In small garden plots, these practices may reduce the number of spores available for new infections or for overwintering. Control of corn smut by chemical sprays is not recommended.



Figure 4. Rust on leaf.

## COMMON CORN RUST

Common rust of corn, caused by the fungus *Puccinia sorghi*, rarely causes serious damage to field corn, but may occasionally reduce yields in sweet corn. Rust is often seen in seed corn fields and most

inbred lines are susceptible. Disease development is favored by cool, humid weather. The rust usually appears soon after silking.

### Symptoms

Common rust is recognized by oval-to-elongate pustules containing reddish-orange spores scattered over both leaf surfaces (Figures 4, & 5).

Although the pustules may occur on any part of the plant, they are most common on the leaves. Later in the season, the pustules become black due to production of winter spores (teliospores). While the reddish urediospores will cause new infections on corn, the black teliospores infect only species of *Oxalis*, such as creeping oxalis and yellow wood sorrow. Overwintering is probably of limited importance in Michigan, since primary infections are believed to be caused by spores blown in from southern states.

### Control

Although rust is common on corn, there has been no urgent need for control. Some chemicals are registered for rust control in sweet corn but their use is not recommended except when a great amount of disease is present. See Extension Bulletin E-312, "Control of Insects, Diseases & Nematodes on Commercial Vegetables" (\$1.30) for specific chemical recommendations.



Figure 5. Close-up of leaf rust.

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