

## SMUTS

The smut diseases are characterized by the formation of conspicuous, black powdery masses of spores (the teleutospores) in the infected host. The losses due to these diseases can be attributed to reduction in yield, deterioration of quality and therefore low market value.

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|----|--------------------------|---------------------|
| 1. | <i>Ustilago tritici</i>  | loose smut of wheat |
| 2. | <i>U. scitaminea</i>     | smut of sugar cane  |
| 3. | <i>Tilletia foetida</i>  | bunt of wheat       |
| 4. | <i>T. caries</i>         | bunt of wheat       |
| 5. | <i>Neovossia indica</i>  | new bunt of wheat   |
| 6. | <i>Urocystis tritici</i> | flag smut of wheat  |

### LOOSE SMUT OF WHEAT

The disease is of worldwide occurrence. On the average the loss is about 2.0% but as high as 10-20%.

**Causal organism:** *Ustilago tritici*

**Order:** *Ustilaginales*

**Family:** *Ustilaginaceae*

**Symptoms:** Before the head emerges from the boot leaf it is dark brown with a thin silvery membrane over the spore mass, which soon ruptures to liberate the spores and thus permit them to be blown about over the field. The glumes and kernel are destroyed and only the naked rachis remains.

**Disease Cycle: Penetration:** Most commonly the penetration takes place through stigma by a germ tube produced by a germinating spore, in about 8-10 days the infection is established in the ovary.

**Dissemination:** The chlamydospores are wind disseminated.

**Perpetuation:** The fungus remains dormant within the seed as it matures, until the following season when it is activated by the germinating seed. The fungus following the growing point of the plant showing no external symptoms until the blossoming time when it rapidly increases in mass within the floral parts and by the time the head emerges from the boot leaf, it has completely replaced the grain by its own chlamydospores and destroyed the floral parts.



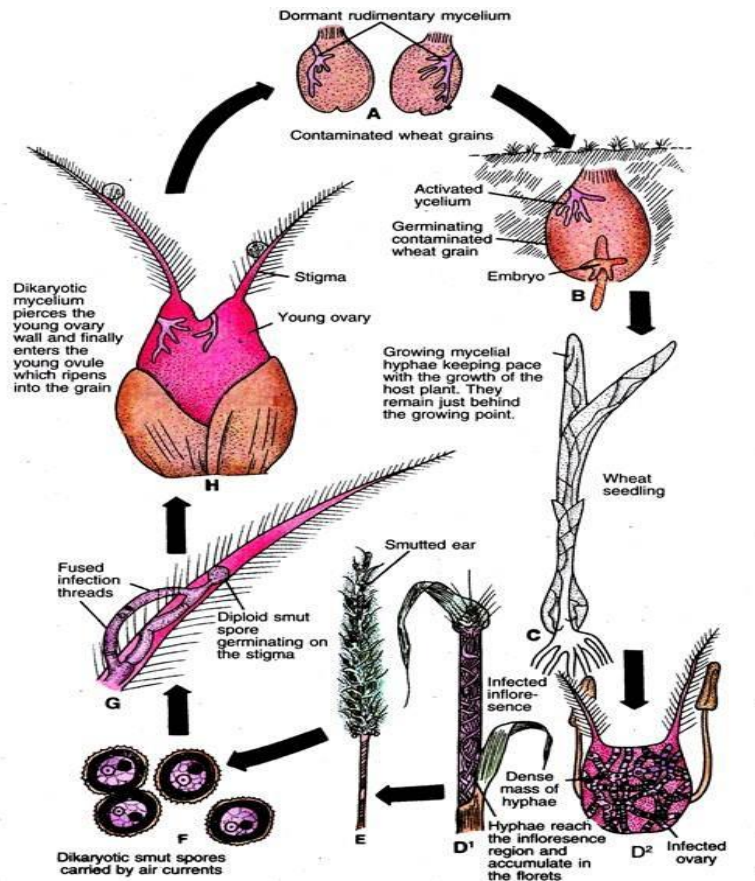


Fig. 22.14 Loose smut of wheat. A pictorial disease cycle of *Ustilago tritici*, a blossom-infecting smut.

**Epidemiology:** Moist, warm weather encourages infection, which results in higher incidence of the disease in the next season.

**Control:**

1. Hot water treatment: Presoaking at ordinary temp for 4-5 hours. 1<sup>st</sup> tub at 132°F, dip for 5 minutes, end point temp. 118-120°F. 2<sup>nd</sup> tub at 132°F, dip for 7 minutes, end point temp. 127-129°F. Dry in shade & sow immediately. Increase seed rate by about 5%.
2. Solar energy treatment: Recommended only for places where temp. in shade is not less than 100°F. Treat seed during May & June. Presoaking in water from 8 am to 12 noon. Then spread in open, direct sun. Dry for one or two days & store till sowing season. Increase seed rate by 5%.
3. Resistant varieties. Durum types are immune to the disease.
4. Seed treatment with chemicals: i) Vitavax) 56 gm/30 kg. iii) Ceresan M<sup>b</sup> ii) Benlate) or iv) Agrox. 1½- 2 gm/kg