

Leaflet K (Revised)

# **SMUT IN GRAIN**

New York Agricultural Experiment Station  
Geneva. N. Y.

1914

**Smut is a fungus disease.**

**What is smut?**

The tissue of the stem is permeated by the feeding threads of the causal fungus

while the grain is transformed into a black-brown powder composed of multitudes of minute, globose fungus spores. There are several different kinds of smut. The spores of oat smut cannot produce smut in wheat or barley.

**Oat smut.**

Smut is the most destructive disease of oats in New York. Frequently, it ruins 5 to 20% of the crop. There are two

kinds of oat smut, but they are very similar and controlled by the same methods; so, for practical purposes, it is unnecessary to make any distinction between them. Oat smut does not spread from plant to plant above ground. Neither does the fungus live over winter in the soil. Infection occurs only at time of germination and is brought about by smut spores on the seed oats—spores which lodged within the open oat-hulls at flowering time and became imprisoned there when the hulls closed up. Accordingly, disinfection of the seed is the logical remedy.

**Formalin treatment.**

Disinfection may be accomplished in several ways. Probably the best method is by the formalin treatment as

follows: Mix one pint of formalin (40% formaldehyde) with 45 gals. of water and sprinkle it over the grain thoroughly by means of an ordinary garden sprinkler or spray pump. A good way to do this is to spread the oats on the barn floor in a layer one or two inches thick and sprinkle them. Put on a second layer of oats and sprinkle again. Repeat this until as much grain has been treated as can be dried at one time. Then shovel it into a pile, cover with blankets or canvas and leave

it 2 to 4 hours, after which the grain should be spread out to dry. For each bushel of oats about one gallon of solution will be required. Use one peck more seed per acre to allow for swelling of the grain. This treatment is safe, cheap and effective. The most convenient time to do it is just previous to sowing. Treatment once in 3 years is usually sufficient to prevent material loss from smut. Treated oats left over from sowing may be safely fed to animals when mixed with an equal quantity of untreated grain.

**Wheat  
smut.**

There are three kinds of wheat smut (a loose smut and two stinking smuts). All occur in New York, but loose smut is the most destructive, often causing losses of 10% or more. Loose smut is conspicuous in the field at "heading" time. It attacks both the grain and the chaff, transforming them into a dusty brown powder most of which blows away by harvest time. The stinking smuts, on the contrary, are usually not detected until harvest time. Only the grain is attacked and affected heads appear nearly normal. The diseased kernels contain a brown, foul-smelling, greasy powder. The stinking smuts are readily controlled by dipping the seed wheat a few minutes in formaldehyde solution—one pint to 45 gals. water; but for loose smut no good remedy is known. With loose smut the best that can be done is to grow varieties least subject to smut and avoid using seed from smutty fields. Very little is definitely known as to the relative susceptibility of the different varieties. Dawson's Golden Chaff is much more liable to smut than Gold Coin. Fultz and Jones' No. 6 are said to be quite resistant. The reason that loose smut is not controlled by treating the seed with chemicals is because the fungus is inside the seed wheat kernels. Infection occurs

at flowering time. Infected kernels appear like healthy ones, but have the fungus inside and will produce smutty plants if sown.

**Barley smut.** Barley smut is of two kinds—covered smut and loose smut. Covered smut may be prevented by dipping the

seed in formaldehyde solution as recommended for stinking smut of wheat; but loose smut is preventable only by complicated methods of doubtful utility.

**Corn smut.** The corn smut fungus makes its attack above ground; hence seed treatment is useless. In fact, no practical

remedy is known. Fortunately, it is not often sufficiently abundant to cause material loss. It is worst on heavily manured land. Experiments have shown that animals may eat large quantities of corn smut without serious harm.

Farmers using any of the above smut treatments should follow carefully the detailed directions given in Farmers' Bulletin 507, which may be obtained from the Division of Publications, United States Department of Agriculture, Washington, D. C.