

Prevent Smuts of Small Grains

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*Smuts Destroy About \$5,000,000 Worth of
Small Grains in Minnesota
Every Year*

*This Loss Can be Prevented by Treating
Seed at Cost of Less Than Four
Cents an Acre*

Treat Seed Grain—Insure a Smut-Free Crop

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SMUTS CAUSE HEAVY LOSSES

Smuts cost the farmers of Minnesota millions of dollars each year. This is a tragic waste because it can be so easily prevented. Nearly every farmer loses money on account of smut unless he treats his seed grain. Wheat, oats, barley, and rye are all subject to one or more smuts.

The covered smut of wheat, also called stinking smut or bunt, causes great damage because it reduces yields and also reduces the value of the grain. Badly smutted wheat must be put through a special washing process and therefore often is docked from 4 to 20 cents a bushel. Marquis and Minturki wheats and most of the durumms are somewhat resistant to stinking smut, but, even so, a good deal of smut may develop in most of them. Kota, Ceres, Ruby, Preston, Progress, Glyndon Fife, and most of the other varieties of hard red spring wheat are quite susceptible, and 25 per cent of the heads are often destroyed. Kota is almost always badly smutted unless the seed has been treated. Of the winter wheats, Minhardi is very susceptible.

Smuts of oats cause enormous losses. Fields in which from 10 to 35 per cent of the heads have been ruined by smut are not uncommon. Sometimes 50 per cent are destroyed. In 1925 more than 10,000,000 bushels were destroyed by smuts. The financial loss was about \$3,500,000. Had all the seed oats been treated with formaldehyde, the cost would have been \$150,000, but the profit, \$3,350,000—a return of 2300 per cent on the investment. Hull-less varieties of oats are especially susceptible.

Covered smut of barley and smut of rye both destroy large quantities of grain. In many barley fields from 5 to 15 per cent of the heads are killed; in rye, losses of from 5 to 25 per cent are common.

The following smuts can be prevented by the seed treatments described below: Stinking smut or bunt of wheat, smuts of oats, covered smut of barley, and flag smut of rye. The cost is less than 4 cents an acre.

HOW TO TREAT SEED

Copper Carbonate Dust for Wheat and Rye

Advantages of dust treatment

Extensive experiments have been made in Minnesota and other states during the last seven years, and the results with copper carbonate have been more satisfactory than those with formaldehyde. Both prevent smut, but formaldehyde is likely to injure the seed, especially if it is dried before sowing or if it is sown in dry soil.

The dust treatment has the following advantages :

It prevents smut effectively.

It does not injure the seed, even when used in excess, as formaldehyde often does.

Seed does not become wet; therefore it can be treated at any time without danger from freezing, heating, molding, or sprouting.

Seed can be treated in the winter, before the spring rush.

As there is a long period during which seed may be treated, farmers can use dusting machines co-operatively.

Drills do not have to be set to allow for swelling of grain. This insures more uniform seeding.

It protects seed which may be contaminated by smutty sacks or drills after treating.

The dust acts as a repellent to mice.

It saves time and labor.

How to use copper carbonate dust

There are two essentials to success: (1) Use a good grade of dust; (2) mix the dust thoroly with the seed.

A fine, fluffy dust containing a 20 per cent copper equivalent is just as effective in Minnesota as more expensive dusts which contain more copper. A good dust should be free from any gritty particles and should feel smooth when rubbed between the fingers. The light dust costs about 20 cents a pound. Always fan the seed in order to remove weed seeds, light-weight diseased kernels, and smut balls. Then use the dust at the rate of 2 ounces per bushel. If seed wheat is very badly smutted, use 3 ounces. If only small quantities of seed are treated, the dust can be mixed with it in a home-made device made on the principle of a rotating barrel churn in which baffle boards have been placed. A cement mixer is suitable for treating larger quantities. Every kernel should be completely covered with a fine layer of dust. This can be accomplished by rotating the mixer 15 or 20 times for each seed lot. There are several dusting machines on the market at a reasonable cost. These may well be purchased and used co-operatively. Never try to mix the dust with the seed by the shoveling method. It is ineffective and the operator may become sick from inhaling too much dust.

Precautions in using dust

1. Do not inhale the dust. It is not a deadly poison but may cause headache and vomiting. Use a gas mask or protect the nose and mouth with a moist cloth.

2. If much dust collects in the drill, it may "set" and cause the parts to work hard. To avoid trouble, always rock the feed shaft gently with a wrench before starting the machine. Before the drill is put away for the season, wash it thoroly and oil the parts.

3. Do not treat hulled oats or barley with copper carbonate, as it is not effective.

IS IT SAFE TO TREAT WHEAT WITH FORMALDEHYDE?

Many wheat growers are accustomed to treating seed wheat with formaldehyde. However, it is clear from the results of extensive experiments that copper carbonate is preferable. Formaldehyde sometimes injures wheat seed and may reduce yields. Wheat treated with formaldehyde should always be sown while still moist. Even then there may be some seed injury if the seed is sown in dry soil.

FORMALDEHYDE FOR OATS AND BARLEY

The dip and the sprinkle methods

Add one pint of formaldehyde to 40 gallons of water. Either dip the seed into this solution, or sprinkle the solution on the seed with a sprinkling can, while the seed is turned with a shovel. It is important to wet every kernel. In either case, 40 gallons of the solution will be enough for about 50 bushels of seed. The seed should be sown after treatment, preferably while still moist.

The spray method

The advantage of the spray method is that it does not wet the seed. Mix one pint of formaldehyde with about a gallon of water and spray this on the seed with a compressed air sprayer—not a sprinkler. Use exactly one pint of formaldehyde to 50 bushels of seed. The exact amount of water does not make any difference. After treatment, cover the seed with sacking or canvas for five hours. Then sow immediately, or spread out to dry.

PATENT FUNGICIDES

Many patent fungicides are on the market. Some of them are very effective, but most of them are deadly poisons and are rather expensive. In general, they do not prevent smut better than copper carbonate dust or formaldehyde.

SPECIAL TREATMENTS NEEDED FOR LOOSE OR NAKED SMUTS

The treatments outlined will prevent stinking smut of wheat, covered smut of barley, stem smut of rye, and smuts of oats. They will not prevent the loose or naked smuts of wheat and barley. Special hot-water treatments are needed to prevent these.

Corn smut can not be prevented by seed treatment.

For further details see Minnesota Special Bulletin 16, or write to the Plant Disease Department, University Farm, St. Paul.

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