# Oregon Agricultural College
## Extension Service

O. D. CENTER
Director

Extension Bulletin 292 | Corvallis, Oregon | March, 1918

Department of Botany and Plant Pathology

Oregon Agricultural College and United States Department of Agriculture, Cooperating


# How to Prevent Grain Smuts


By H. P. BARSS, Botanist and Plant Pathologist


In 1917 the United States lost an estimated 125 million bushels of grain from smut. Oregon lost her share. Smut can only be controlled by the careful use of proper preventive methods. Careless treatment of grain usually results in poor smut control, or in excessive injury to seed vitality, or both. Follow directions closely. The methods given below have been thoroughly tested and are reliable.

### DIRECTIONS FOR SEED TREATMENT

**First.** Before treating, **clean seed thoroughly** by fannnig to remove all broken or shrivelled grain, smut balls, etc. Grain run through a scourer is injured and not safe for seed.

**Second.** After treating, increase the rate of seeding at least one-fourth because of swelling. It is wise also to treat a small sample some time before planting and make a **germination test** to assist in determining the proper rate of seeding.

**Third.** TO REDUCE INJURY TO SEED from treatment observe the following precautions: Do not soak or cover grain longer than recommended. Plant as soon as possible after treating, preferably not later than 24 hours. If necessary to plant in dry soil spread grain out as soon as fully treated and dry **completely** before seeding.

**Fourth.** After treating, do not bring clean seed into contact with sacks, floors, machinery or anything else that has not been disinfected with formaldehyde or bluestone or scalded with boiling water. Do not allow treated grain to freeze.

### ORDINARY FORMALDEHYDE METHOD

#### For All Grains

Use 1 pint formaldehyde (guaranteed 37-40%) in 40 gallons of water
Equals 1 ounce in 2½ gallons or 2 tablespoonfuls in a 10 quart bucket.

Wet all the grain thoroughly either by sprinkling; by pouring loose into the solution; or by soaking 5 to 10 minutes in gunny sacks. Loose grain should be piled up and covered with disinfected canvas or sacks for 2 hours. Sacked grain should be drained and let stand in sacks for 2 hours. Then plant at once or spread out to dry and plant within a few hours.

Unless wheat is absolutely free from smut balls, it should be poured into machine or open tank, stirred and the smut balls skimmed off.

**Note:** It will generally take a little less than one gallon of solution for each bushel of wheat; and somewhat more than one gallon for oats or barley.

## BLUESTONE OR BLUE VITRIOL METHOD

### For Wheat Only

Use: 1 lb. bluestone (copper sulphate) and
1 lb. common salt in
5 gallons water.

Suspend chemicals in sack at top of water and dissolve completely.

Pour in wheat, stir thoroughly and skim off smut balls. Drain off liquid or remove wheat from solution and drain.

If wheat is absolutely free from smut balls it may be treated in partly filled gunny sacks dipped and agitated until every kernel is thoroughly wet.

Dip at once in a lime bath made by slaking one pound of lime and making up the solution to 10 gallons with water. This helps to neutralize the injurious effect of bluestone on the seed.

Spread out on disinfected floor to dry. Then plant as soon as possible.

## HASKELL FORMALDEHYDE METHOD

### For Oats Only

A new and promising dry method of treating with concentrated formaldehyde, which has been used successfully on oats in New York and Michigan. Up to 1918 it had not been used in Oregon. This method must not be used on wheat or barley until tested further.

Use 1 part formaldehyde (guaranteed 37-40%) to 1 part of water.

Spread grain on clean floor. As grain is shoveled from one pile to another, each shovelful is sprayed with a small quart hand sprayer (atomizer), held close to the grain, using 1 quart of the solution to 50 bushels of oats.

When all are treated, pile in a heap, cover for 4 or 5 hours to retain fumes, then uncover, air out, and plant at once or in a few hours.

## SOIL INFECTION

In some sections of Oregon the surface soil may become contaminated with spores of stinking smut at threshing time, and fall-sown wheat, though properly treated, may become infected from the soil, especially on summer fallow. In such cases beneficial results may be expected from the elimination or replowing of summer fallow; from crop rotation; or from early or late seeding. Spring wheat is not subject to soil infection.

## LOOSE SMUTS OF WHEAT OR BARLEY

These smuts are not successfully controlled by chemical treatment. Send for special directions for hot-water method.