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SOUTHERN PACIFIC LINES

SEED TREATMENT FOR SMUT OR OTHER DISEASES IN CEREALS

Necessity of Treatment—The smuts and other diseases of cereals which are carried by microscopic spores on the seed are so common through Oregon, as well as elsewhere in the United States, that crops free from disease can not be expected unless the seed is treated to kill the disease spores before planting. Where the treatment is properly given the crop will be practically free from smut.

Soil Infection—Is practically unknown in Western Oregon and is of little importance in most of the Columbia Basin. Where it does occur, it may result in a smutty wheat crop in spite of proper seed treatment. In regions where soil infections are frequent, it is reported that much of the danger from this source may be avoided by very early or late planting.

Formaldehyde Treating Solution—The formaldehyde method is effective, inexpensive and is the one most commonly used. The ordinary dilution is:

Formaldehyde (formalin) full strength (about 37 per cent) 1 pint; water 40 gallons.

One pint in 45 gallons is sometimes used and apparently with equal effectiveness. Two good methods of treating with formaldehyde are given below:

Tank or Barrel Treatment—Run grain through fanning mill to remove smut balls, shrunken kernels, etc.

Partly fill tank or barrel with solution and put in the grain.

For wheat—If the seed is not known to be perfectly free from smut balls, pour the wheat in loose, stir with hoe or other implement to bring the smut balls to the surface, and skim off. If seed is known to be perfectly free from smut balls, it may be treated from partially filled sacks. Soak for 30 minutes. Remove, drain and plant the same day or wash with pure water and spread out to dry.

For Oats—Put oats in gunny sacks and soak for 20 minutes in the solution. Take out, drain and plant at once. If grain is to be kept for a later day wash with pure water and dry thoroughly.

For Barley—Barley is more sensitive to the action of formaldehyde than wheat or oats. Use same method as for oats but use the weaker solution, 1 pint formaldehyde to 45 or 50 gallons of water and soak for 10 minutes only. It should then be washed with pure water, drained, and if not seeded shortly, should be thoroughly dried.

Sprinkling Method—

1. Run grain through fanning mill.

2. Spread grain out on a clean floor or tarpaulin a few inches thick.

3. Sprinkle with the 1 pint to 40 gallons solution of formaldehyde, using a sprinkling can or sprayer.

4. Shovel or hoe the grain over till every kernel is wet.

5. Then shovel up into a pile and cover with sacks or tarpaulin previously moistened with the solution.

6. Leave for 2 hours or more.

7. Uncover and spread out till dry enough to run through drill and plant at once or if the grain is not to be seeded immediately dry thoroughly before storing away.

Note—The sprinkling method should not be used for wheat that has not been cleaned of smut balls as this method does not kill the spores contained in unbroken balls and when run through the drill the smut balls are broken and the living smut spores are then sown on the seed. Such grain should therefore be treated loose in an open tank where they can float to the top of the solution and then be removed by skimming.

Drill should be set to allow for swelling of seed when damp grain is planted.

Bluestone (Copper Sulfate) Solution—A good many growers use the bluestone method in place of formaldehyde with good results. It is more expensive and probably no more effective than the formaldehyde. It must not be used with barley as it injures germination severely. It is not advised for oats. Bluestone as well as formaldehyde may under certain conditions cause some injury to the germination of wheat. The following directions will give maximum effectiveness and minimum injury if followed carefully in using the bluestone solution:

Formula—Bluestone (copper sulfate) 1 pound, common salt 1 pound, water 5 gallons.

Milk of Lime—Slake some quick lime and dilute with water in a barrel or other suitable container to be used as a neutralizer for the bluestone after treatment.

Directions—

1. Remove all smut balls by fanning.

2. Place wheat in loose sack and put into the solution, being sure to get all kernels thoroughly wet.

3. Leave for 5 or 6 minutes.

4. Remove, drain quickly and dip at once into barrel containing milk of lime to neutralize the copper. This reduces somewhat the possible injury to germination.

5. Spread out and dry at once.

Injury to Germination—The soft wheats grown in Oregon ripen with an exceedingly low water content and the kernels are very brittle. When threshed with an ordinary separator running at the usual speed a large percentage of the kernels are often broken, cracked or scratched. Running the machine at a lowered speed has been shown by the Washington Experiment Station to reduce the amount of this kind of injury to some extent, while flailed grain will have very much less of the injury.

In using the formaldehyde and bluestone methods of treatment considerable loss in germination of seed or failure to make a good stand of grain are often reported. Experiment has shown that perfectly uninjured wheat suffers little or no injury to germination from either method of treatment. Grain that is cracked or kernels that are scratched, especially over the germ end so as to break through the seed coats, are liable to have their powers of germination destroyed or their vitality injured because the chemical used in treating is able to get into the interior through these injuries. The loss in germination in this way is, when proper precautions are observed in treating, not so severe in most cases as would have been the loss from smut. No grower would be justified in discontinuing treatment on this account.

In order that injury to seed vitality may be reduced to the minimum, particular attention should be given to the following points:

Do not soak seed longer than recommended.

Spread out to dry at once.

In the bluestone treatment use the lime bath at once before drying.

In the formaldehyde treatment if grain is not to be planted at once, wash in pure water before drying and then dry thoroughly before sacking up.

Never allow treated grain to stand around in sacks any length of time with the grain wet or moist.

Where injury to germination is suspected germination tests with treated grain are recommended and the drill should be set to sow more heavily according to the results of the tests.

The "loose" smuts of wheat and barley are not controlled by either of the above methods of treatment. These smuts, however, are not ordinarily serious in Oregon.

The Graphic and Weekly Oregonian, one year, \$2.00.

W. C. T. U. CLEANINGS

The W. C. T. U. is engaged in the Red Cross work everywhere. Recently 182 comfort bags were sent to the U. S. naval training station at Seattle. In acknowledging them, Harold C. Jones says: "The comfort bags sent the men of Oregon are appreciated greatly by the men; they are convenient and practical. The fact that the men are being remembered means a lot to them." Over 700 many-tailed bandages were included in the shipment, concerning which Mrs. Frances P. Parks, national corresponding secretary, writes: "I have the original letter on behalf of the Queen of England expressing her majesty's grateful thanks, and says she, the queen, 'is much touched by the kindly thought which has prompted this gift.'" Over 2000 many-tails and many

pounds of clean linen and cotton pieces for use in hospitals on the battle front have been turned over to the Portland war relief.

Major W. S. Gilbert calls often at state headquarters in Portland to express his thanks for the house-wives, tea towels and gun-cleaning cloths which are being sent by women over the state to state headquarters and by us forwarded for distribution to the Third Oregon. Major Gilbert is so anxious we shall keep up the supply that he has arranged for us to send articles to the Third Oregon after it leaves the state.

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