

Preliminary remarks on hot water treatment.—The hot water treatment consists simply in the immersion of the infected seed grain for about ten minutes in water kept during this time at a constant temperature not below 122° F. and not above 126° F.

Will cause loss of germination.—It is also claimed and proved by experience that from 6–10 per cent of good sound grain will be injured in the treatment, while seed with a low power of germination at the beginning will lose far more of its germinating power.

Even though considering an average loss of 8 per cent from hot water treatment as unavoidable, this could easily be made up by an increase of 8 per cent in the rate of sowing. In one bushel and a half—the usual rate of sowing per acre—a little over 7 pounds would have to be added, which would mean the very slight increase in cost of 7–8 cents, whereas a loss of 5 per cent from smut in the field would really amount to a loss of \$1.25 per acre or so.

Co-operative work in hot water treatment.—In Denmark smut-treating plants have been installed during the past ten years to a considerable extent in the creamery and brewing establishments, where the grain of the farmers in the locality is subjected to the hot water treatment at a small cost, and in which plants there may be treated in ten hours as much as 250 bushels (certainly sufficient for farms of considerable size). Notwithstanding such co-operative arrangements, which would make hot water treatment, especially of large quantities of wheat, more feasible, we cannot conceive of its being made the general practice in Canada, especially in the West, where the problem of manual labour and even the water problem itself will offer most serious objections, at any rate for some years to come.

But we strongly urge the farmers not to be negligent on this account, but follow strictly the suggestions made along the following lines, by which it is hoped that the problem of loose smut of wheat may be eventually solved. Begin slowly and persist in your efforts, and loose smut will cause very little damage. Dr. C. E. Saunders, in conversation on the subject, stated that some years ago loose smut was a factor of considerable moment in his Ottawa experimental plots, but at the present time it only occurred in a negligible percentage, and he hoped that it would disappear entirely. This result is largely due to the untiring efforts of Dr. Saunders to control this smut by every possible precaution.

Raising of one's own seed supply from pure seed.—The solution of this problem lies in the practice of growing one's own seed grain, starting with clean seed grain or such as has been treated with hot water. The difficulty of the hot water treatment will be largely avoided and success in prevention of loose smut proportionally increased if the farmer will start rightly.

Method for securing smut-free seed grain.—The first year he may begin by securing, say, three-quarters of a bushel of the very best wheat of that variety which has given the greatest satisfaction in his neighbourhood. This small quantity is easily subjected to hot water treatment in the way to be described presently, and it will suffice to sow one-half acre. It is important that this half-acre plot should be far enough removed from any other wheat field to prevent smut spores from being blown over from an infected field. From the observations recorded in a former chapter, it would seem that 500 yards away from other wheat would prove a safe location for the 'seed grain' plot. It may be difficult or impossible in some typical wheat-growing centres to remove the seed plot thus far from other growing wheat. We would recommend as an alternative to surround this plot with a shelter belt of trees or shrubs. In the West, the Siberian pea tree would provide a very suitable shelter. These belts will very effectively eliminate the danger from outside infection.

If the treatment has been successful, and that will depend upon the amount of care with which it has been practised, the smut should be entirely absent from this