Frost Injury to Oats

By Alfred Eastham, Chief Analyst, Dominion Seed Branch, Calgary

Early frosts this year have done much damage to the oat crop in many districts thruout the West. While of excellent feeding value, such oats are often unfit for seed. Great care, therefore, should be taken by farmers in the choice of seed, as the sowing of frosted oats may result in crop failure. Little reliance can be placed on general appearance and unless the farmer knows the origin of his seed and is certain that it has matured under favorable conditions, a germination test is indispensible. From the results of such a test the farmer can use his seed intelligently and so regulate the amount sown that he can obtain a proper stand of plants even tho he may be compelled to use seed somewhat lower in vitality than usual.

Little accurate information is to hand regarding the degree of frost necessary to damage oats for seed. So far as our own observations go, two degrees of frost in the milk stage are sufficient in most cases to ruin oats for seed. In the dough stage they are not nearly so susceptible and when well ripened and dry stand considerable frost without serious injury. A curious feature is that often oats that have been frosted in the milk stage seem to fill alright and give seed of a heavy bushel weight. Such oats frequently refuse to germinate more than 25 per cent. and in consequence are worthless for seed purposes.

Signs of Frost Injury

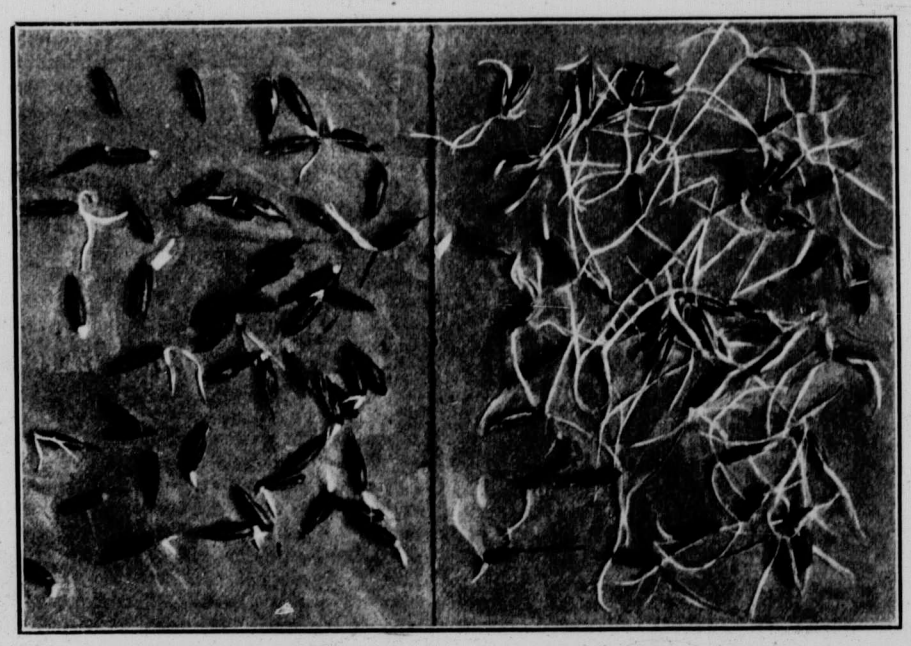
Superficially, there is often little to indicate that oats have suffered serious injury from frost. They may be heavy and of good appearance and yet be of low vitality. Frosted kernels, however, when stripped of the hull, are dark, particularly at the tips and are usually brittle. When cut they are much more waxy in texture. When the kernel is split lengthwise, a dark streak along the groove indicates frost injury. This is a character looked for more particularly in grading for milling purposes; for seed purposes it is unreliable. Oats may possess this character and yet give a germination as high as 90 per cent, much higher in fact than some which do not possess it. While it is true that some idea of the seed value may be obtained by careful examination, the only reliable method is by means of a germination test.

Where and How Tests are Made

The Dominion Seed Laboratory for the West is situated at Calgary, and all Western samples should be sent there.

In making germination tests a definite number of seeds are counted out indiscriminately from the sample. Oats are quite often received in the condition in which they have come from the thresher. Such samples contain a number of light kernels which could be cleaned out by a fanning mill, but in counting out seeds for a germination test, these light seeds are included in the proportion in which they occur in the sample. The result of the germination test thus gives the percentage of seeds that may be expected to grow in the sample as sent. It is necessary, therefore, that those who wish to know whether their grain can be profitably used for seed should send samples of the cleaned grain just as it is intended to be sown.

Frosted oats germinate more slowly than sound ones and in consequence a somewhat longer period of growth is allowed. The sprouted seeds are counted at the end of six, ten and fourteen days. The report gives the percentage of sprouted grains at the end of six days and also at the end of fourteen days. The former is known as the preliminary count and should be noted very particularly by farmers. The higher the count at the end of six days, the stronger the vitality of the seed and the better the prospects of a good crop being produced therefrom. Suppose, for instance, two samples of oats have been tested; one shows a preliminary count of 85 per cent. in six days and 95 per cent. in fourteen; the other grows 30 per cent in six days and 95 per cent. in fourteen days. Altho the total germination is the same, the first sample would make by far the better seed on account of the very much stronger vitality. Plants from such seed would come up stronger, more rapidly, and evenly and would undoubtedly come thru unfavorable conditions much more successfully. The resulting crop would ripen more evenly and in all probability a few days earlier due to the better start. The importance, therefore, of sowing seed of strong vitality cannot be overestimated, particularly in districts where climatic conditions are often unfavorable.



SEED OF WEAK VITALITY SEED OF STRONG VITALITY

Both taken at the end of six days.

Photo by courtesy of the Dominion Seed Laboratory, Calgary.

Points to be Observed in Sending Samples for Test

1—Samples should contain approximately one thousand kernels.

2—Where possible, samples should be cleaned before sending.

3—The postage should be prepaid. Packages insufficiently stamped are liable to be refused by the Post Office.

4—It is unnecessary to enclose stamps for a reply.

5—The usual time necessary for a test is fourteen days.

6—All samples should be plainly marked with the name and address of sender.

7—Twenty-five samples will be tested for any one person free of charge.

8—All samples should be addressed to Dominion Seed Laboratory, Calgary.

The Chief Factor in Road Maintenance

"Roads cannot be made with a split-log drag, but once they are graded, drained and crowned, no other single implement can maintain them in as perfect condition as can a split-log drag."

There are many districts thruout the West in which the municipalities have been progressive enough to make use of the earth road drag in the maintenance of the roads. A great deal of impetus has been given to the improvement of country highways by the increasing popularity of the automobile amongst farmers. It is becoming more and more widely recognized that time is very valuable during the short working period and as a consequence cheap rapid transit as furnished by reasonably priced motor power is coming steadily into favor. In order that motor vehicles of any kind may be expeditiously used, reasonably good highways are required and hence the increasing attention which is being given to road construction.

By far the largest factor in the construction of rural highways is the cost of maintenance or upkeep, and any method which will aid in keeping expenditure for this purpose at a minimum should be in great demand.

The split-log drag is a simple and inexpensive device for maintaining most types of earth roads which when wet become rutted under traffic and which become firm on drying out. Roads that are very rocky or composed entirely of sand cannot be materially improved by its use, but in the majority of Western townships great benefit will result from its use.

Uses of Road Drag

Properly used at the right time the road drag performs four distinct offices. First, by moving at an angle to the travelled way it tends to produce or preserve a crowned cross-section. Second, if used when the material of the surface is not compact and hard, it tends to reduce ruts and other irregularities in the road by moving material from the points that are relatively high to those which are relatively low. Third, when used after a rain on sandy roads it accelerates the drying out of the road by spreading out puddles of water and thus increasing the surfaces exposed to evaporation. Fourth, if the surface material is in a slightly plastic state, dragging smears over and partially seals the so-called pores which naturally occur in earthy material, and thus makes the road surface more or less impervious to water. Of course, if used improperly or at the wrong time, the drag may do actual injury to the road. Dragging a very dry road, for example, serves to increase the quantity of dust and may do additional damage by destroying the seal produced during previous dragging. If, on the other hand, the road is very wet and muddy, the irregularities in the surface are likely to be increased rather than diminished by dragging.

Constructing the Drag

The construction of the drag is clearly shown in the accompanying illustration. If a log seven or eight inches in diameter is obtainable in the locality it may be used to as good advantage as the sawn lumber. The material should be of hard, tough wood which will not decay very rapidly when exposed to the weather. Railroad ties have been frequently used for this purpose and possess the advantage that they are already cut to about the right length. In selecting a tie, however, care should be exercised to see that it is of sound wood and of the proper size. The runners in the design are made of 2 to 2½ inch boards, 10 inches wide and from 6 to 8 feet long, reinforced with other 2 inch boards of the same length, but only 6 inches in width. If more convenient, however, 4 inch runners without reinforcing boards may be readily substituted for those shown. The ends of the rungs of the two cross braces are fitted into 2 inch auger holes and these are so arranged that the runners, when framed together, will be displaced in a longitudinal direction with respect to each other. The object of this displacement, or offset as it is usually termed, is to make the ends of the front and back runners follow approximately the same line on the road while the drag is in operation. The amount of displacement, therefore, should depend upon the skew necessary to make the drag empty itself. Under ordinary conditions an offset of from 12 to 16 inches will prove satisfactory. The other braces are slotted and nailed into the runners.

In order to make it easy for a man to stand upon the drag and to shift his weight properly when dragging over a hard surface, the drag should be provided with two 1 inch boards placed parallel with the runners and nailed onto the top braces. These boards should be about 8 inches wide and their length should be slightly less than that of the runners of the drag. The chain by means of which the drag is drawn should be about 8 feet long and its links should be made of three-eighths inch steel. The hitching link, which is designed so that its position on the chain may be readily changed, should be made of one-half inch steel. If desired, an ordinary clevis may be substituted for this hitching link. It is a good plan, too, to use half inch links at each end of the chain because the wear is greater at these points. In fastening

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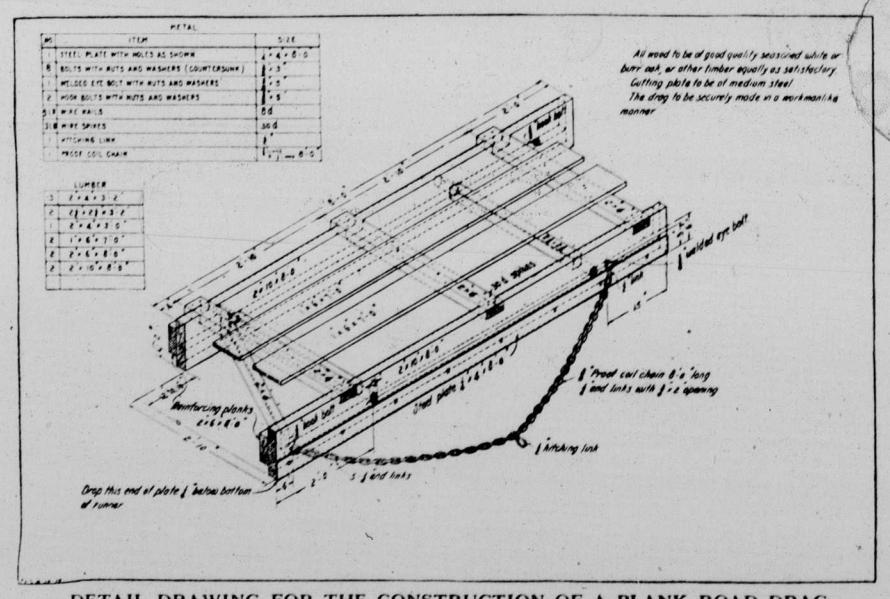

DETAIL DRAWING FOR THE CONSTRUCTION OF A PLANK ROAD DRAG