Reseeding in New Brunswick.

Discussion Paper

By

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The best method of discussing this paper on direct seeding is, first to compare methods used by Mr. Veness and then, where possible, to compare results with work of a similar kind done by the Ontario Forestry Branch. But, before doing so there are one or two things in this paper to which I would like to draw your attention.

First, the Forest Service of New Brunswick appealed to the National Research Council to investigate the possibilities of direct seeding as a practical means of reclaiming burned-over, non-reproducing lands in that province. A committee was appointed who prepared a programme for field work, which was first undertaken in 1923 when seeding was done with Red and White Pine.

Yet in the table there is nothing to show whether Red or White Pine is being used. Neither is there anything in the report or table to show where Red Pine has been used in each particular case. This, unless there is a reason for not doing so, seems a very serious omission.

Then the table itself strikes me as being rather unbalanced with great variations between the number of seed spots examined. For instance, on area number 13, consisting of 10 acres, there are 28 seed spots examined, while on area number 2, at Coulter's Siding also of 10 acres, there are 271 seed spots examined. I presume it was from these examined spots that the per cent of success was figured. That is the second point.

Thirdly, on page 6, Mr. Veness states, "Broadcast method is expensive being wasteful of seed". Two comments suggest themselves at once;

(a) Is this a general statement covering all broadcasting? If it is, I disagree with him.

(b) Does this statement cover Spruce and Red and White Pine only? If it does, I agree with him.

The experiments conducted in New Brunswick were on a considerably larger scale than those carried out by the Ontario Forestry Branch. But we felt that it would be better to rather restrict our operations for the first two or three years, until we had determined as far as possible the seed which would give the best

results under the hard conditions imposed by the rocky burned-over barrens of the districts of Parry Sound and Nipissing, where the experiments were carried out. We felt that until we had ascertained this in a small way, it would be unwise to launch out on a large scale.

This brings me to my fourth point. A large area, about 1,000 acres, was sown in New Brunswick and in that area there is a certain number of sample plots, one square chain each - that means, that for experimental purposes the area is small compared to the total area sown.

Now having brought out these few points which attracted my attention, I would like to compare a few results obtained by the Ontario Forestry Branch with those obtained in New Brunswick.

A programme was prepared by the Ontario Forestry Branch with the object in its initial stages of determining.

(a) The best seed to be used to insure success at a reasonable cost.

(b) Also to compare the methods of seed spotting and broadcasting with the same aim in view.

(c) To compare the cost and success of seeding with the cost and success of planting on adjacent areas.

Then, when these results had been obtained over a period of three years, if any of the experiments showed a sufficient percentage of success to warrant the expenditure, the programme called for the seeding of larger areas.

Red and White Pine was used for our seed spotting experiments which were carried out in the district of Parry Sound on the shores of the Georgian Bay about nine miles south of Parry Sound itself.

The soil was sandy loam, but was in most cases restricted to depressions and crevices between rocks. The ground cover consisted of grass, blueberry and some wintergreens. Tree growth, in most cases, none. In every case but one we got nearly twice as good results in seedlings per acre from Red Pine as we did from White Pine.

In every case all the seed spots on every seed plot were examined and were used to determine the per cent of success based on one seedling per spot.

Table No. 1.

Comparison between Seedling Count for Red and White Pine.

Method - Seed Spotting.
2nd Year Count.

Seedlings per acre Red Pine.	Per cent of success.	Seedlings per acre White Pine.	Per cent of success.
2204	66	926	52
496	22	304	22
760	17	256	24
928	50	80	7
712	27	760	29
1020	36	Average 467	27

I notice that the deduction which Mr. Veness makes from his table agrees for the most part with results shown in our own experiments. As with his, nearly all our White Pine plots were more or less unsuccessful, probably, as he states, due to rodents, which seem to prefer White Pine seed to Red.

• We made a few experiments to find out whether rodents were really responsible for as much damage to seed as was reported. To determine this the following procedure was carried out;

A limited number of spots chosen at random on each plot were protected with a fine mesh wire meat-cover in such a manner that small animals and birds would be unable to get at the seed. In order to insure this result care was taken to press the edges of the wire into the ground. Where this was not practicable earth was heaped round the base so as to eliminate the probability of having any creature gain an entrance under the cover. Finally, in order to keep the cover solidly in its position a ten inch spike was driven through the centre into the ground.

The results showed on the average four times as many seedlings under the plots with cover as on the plots without cover. They do not, of course, show conclusively that rodents are the only cause of the smaller seedling count on the uncovered spots, as the partial shade afforded by the screen should be taken into account. But I think it would be safe to assume that rodents do a good deal of damage.

I notice that in the reference made by Mr. Veness in his summary to White Pine, his results coincide with ours, that is indifferent success for seed spotting and practical failure for broadcasting. Also his cost figures for seed spotting agree very closely with ours. As he says, broadcasting with White and Red Pine is expensive, results being so poor. But on the other hand, we consider broadcasting with Jack Pine to be quite worth while, both as regards expense and results obtained.

For experimental purposes we used two pounds of Jack Pine seed per acre, for we felt that if we sowed an ample quantity of seed we could better determine whether the experiment was worth while or not. Table II shows results obtained over a period of three years with broadcast sowing of this seed.

Table No. II.

Jack Pine Broadcasting,

Showing Seedling Count per acre for 1, 2 & 3 years.

Seed 2 lbs. per acre.

1st year. Based on 26 plots on $12\frac{1}{4}$ acres.	2nd year. Based on 15 plots on $3\frac{1}{4}$ acres.	3rd year. Based on 8 plots on 2 acres.
23.578	7.654	4.737

From the above table it can be seen that one pound per acre would have been sufficient. The following were our cost figures for reseedling, substituting one pound of seed per acre for the two which we actually used.

Expenditures for reseedling
per acre.

Labour	.30
Lost time	.06
Supervision (Forester)	.55
Cost of seed @ \$3.50	<u>\$3.50</u>
Total	<u>\$4.41</u>

This gives the cost of broadcasting with Jack Pine as \$4.41 per acre.

In closing I would like to compare this figure with cost figures of planting in the same district on the shores of the Georgian Bay nine miles south of Parry Sound and adjacent to our seed spotting and broadcasting experiments in that locality.

In this last case 80,000 two and three year old transplants of Jack, Scotch, Red and White Pine were planted, White Pine being given the preference of site. The planting was all done with a mattock as there was not enough soil anywhere to use a shovel. The site was very rocky with scarcely any tree growth, while the ground cover consisted of grass, blueberry, bracken and some moss. The trees average 800 to the acre. The cost being \$14.28 per acre and \$4.00 per thousand for the cost of growing the transplants. In the summer a count was made of this area which showed a survival of 90%. A second count was made the following summer and showed a survival of 86%.

Conclusions.

While these experiments have not been under way long enough to draw definite conclusions from them, they do, however, indicate certain lines of action.

First; that there is very little difference between a site which will allow of seed spotting and one which will not allow of planting two year old transplants. If this is the case then, as tree planting is more than three times as expensive as seed spotting, and as this expense will increase the further the area is from a lake or other means of transportation, seed spotting would be preferable, providing the survival in seed spots already established is satisfactory. This, of course, must be proved.

Second; Broadcasting can be done successfully on those areas where the number of pockets of soil are so few and shallow that planting cannot be carried out. The species of conifers to be used should be Red or Jack Pine, and since Red Pine is too expensive, Jack is the only remaining choice.

Third; It may be that a combination of the two methods will be found practicable, planting Red or White Pine where possible and broadcasting the whole area with Jack. There would be very few places where 30 to 50 trees per acre could not be planted; these would have a two year start, while the Jack Pine would come on forming a nurse crop. An experiment of this nature was started last spring, nine acres being sown and planted.