

OREGON STATE BOARD OF FORESTRY

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A PRELIMINARY REPORT ON THE
DOUGLAS FIR SPOT SEEDING EXPERIMENT

by

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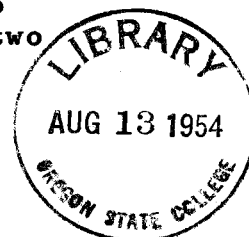
Introduction

There are many small areas in the Douglas fir region which have not restocked naturally and whose size makes aerial seeding impractical. The two methods currently employed to reforest artificially such areas, hand broadcast seeding and planting, both have serious disadvantages. Planting is slow and relatively costly, while broadcast seeding fails to make maximum use of the seed distributed as some seed falls on microsites unfavorable to germination and seedling establishment and growth.

A third possible method of artificially regenerating such areas is "spot seeding". Under this system several seeds are sown in a loose cluster. The seed spots are placed to utilize the best microsites and to fill in the blank spaces between already established reproduction. Theoretically, this last method should be the most logical system for restocking small areas but, unfortunately, little is known concerning the optimum number of seeds per spot. Too few seeds would result in a failure if none of them produced seedlings, while too many seeds per spot could create an over-stocked microsite with a resultant stagnant stand. The purpose of this experiment was to determine the optimum number of seeds to be sown in each spot.

Method

The experimental site is located in the Tillamook Burn, Section 31, Township 2 North, Range 5 West, W.M. Four sub-plots were laid out in the corners of a one-acre plot. This plot is nearly flat and supports a light to medium ground cover. These sub-plots were designed as Latin squares, two having twelve to twenty seeds per spot and the other two, two to ten.



The one-acre plot was broadcast with one-quarter pound of thallous sulphate treated wheat and one-quarter pound of sodium flouroacetate treated wheat (a mixture found relatively effective on rodent control projects in the Tillamook Burn) on February 2, 1953. In addition, three rows of spots of a mixture of these baits were placed around the one-acre plot at distances of $\frac{1}{2}$, $1\frac{1}{2}$, and $2\frac{1}{2}$ chains respectively from the edges of the one-acre plot. These bait spots were placed at intervals of one-third chain in each row and contained approximately one tablespoon of material. Care was taken, where possible, to place the bait under logs or other cover which would reduce loss due to leaching.

The seed spots were placed on February 6, 1953. There were twenty-five pairs of seed spots set in each Latin square. One spot in each pair was protected from damage by seed eating mammals by a six-inch hemispherical seed cap of quarter-inch hardware cloth which was placed over the spot and forced into the ground approximately one-half inch. The other spot in each pair was unprotected. All the spots were approximately six inches in diameter and the seed was scattered on only slightly disturbed soil.

The spots were examined and the number of sound seedlings tallied on June 15, July 9, and December 1, 1953. The seed caps were removed from the spots in the second and fourth rows of spots on June 15, and the remaining caps on July 9.

Results

The results of the examinations are summarized on the attached data sheet. Unfortunately, various factors disturbed several of the screen caps sometime prior to the first examination and made complete analysis of the sub-plots impossible. Because rodent control was not achieved on the area, the depredations of small seed-eating mammals made analysis of the results of the unscreened spots impossible.

In general, the following inferences may be drawn from the data:

- (1) The seed caps afforded very good protection for seeds and seedlings.
- (2) Number of seedlings under seed caps varied almost directly with the number of seeds placed. An average of approximately 60 per cent of the seeds produced seedlings of which two-thirds survived.

- (3) If no more than fifty per cent mortality occurs in the next three years, eight to ten seeds per spot would appear to be the best quantity of seed to sow per spot.

Conclusions

No definite conclusions as to the number of seeds to be placed per spot can be made on the basis of this experiment. The work thus far indicates that the number of seeds per spot can be determined through further experiments with improved rodent control techniques.

GERMINATION AND SURVIVAL OF "SPOT-SEEDED" DOUGLAS FIR SEED

Number of Seeds placed per spot	Number of Surviving Seedlings Per Spot			
	June 15, 1953		December 1, 1953	
	Covered	Uncovered	Covered	Uncovered
2	1.2	0.1	0.9	0.1
4	3.1	0.4	2.0	0.5
6	4.0	0.5	2.4	0.2
8	4.5	0.7	3.8	0.6
10	5.5	0.6	3.1	0.5
12	7.0	1.3	4.8	1.4
14	7.1	0.4	2.2	0.4
16	7.6	0.6	6.8	0.2
18	10.5	0.1	7.8	0.1
20	8.9	0.4	6.3	0.2
XXXX MEAN	5.9	0.5	4.0	0.4

SURVIVAL OF "SPOT-SEEDED" DOUGLAS FIR SEED

