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3 YEAR DIRECT SEEDING STUDY

PINE



Virginia Division of Forestry

Department of Conservation and Economic Development



A THREE YEAR WHITE PINE DIRECT SEEDING STUDY

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ABSTRACT

A 3 year white pine direct seeding study was installed in 1963, 1964, and 1965. Rates of 1/2 and 1 pound of seed per acre were sown during the middle of January, February, March and April. Seed was stratified for the March and April sowings.

Sowing 1 pound of seed in January, February, and March gave acceptable stocking in all 3 years, but April sowing gave acceptable stocking in only 1 of 3 years. Sowing 1/2 pound of seed per acre generally gave unacceptable stocking.

DESCRIPTION OF STUDY

A three-year study was installed in Floyd County, which lies along the Blue Ridge Mountains in southwestern Virginia. In 1963, 1964, and 1965, seed was sown during the middle of January, February, March, and April at rates of 1/2 and 1 pound of seed per acre. Seed for the March and April sowings was stratified.² The 8 treatments (4 sowing dates x 2 rates) were replicated four times in randomized blocks, using half-acre plots. All seed was treated³ prior to sowing with a cyclone seeder.

The study was installed on a tract of land that had been abandoned for agriculture about 20 years. It had grown up in a stand of brush and trees that ranged from quite open to very dense. The plots were prepared for sowing by first bulldozing off the trees and brush, then disking with a heavy bush and bog disc, during the late summer of 1962. The plots sown in 1964 and 1965 were redisked late in the summer of 1963 and 1964 respectively.

The elevation of the study area is 2500 feet. Topography is rolling, with slopes up to 20 percent. The soils, derived from mica gneiss, mica schist, and granite, are in the Watauga, Manor, and Hayesville soil series.

In the fall, at the end of the first growing season, a permanent transect was installed on each of the 16 plots sown at the one pound rate. The locations of all seedlings on these transects were plotted on graph paper so they could be relocated the following fall. Heights to the nearest 1/2 inch were recorded. A total of 351, 429, and 176 seedlings were plotted in 1963, 1964, and 1965 respectively. The purpose of these permanent transects was to obtain information on mortality during the first winter and second growing season.

1. R. L. Marler is presently Director of the Applied Forestry Research Institute, College of Forestry, Syracuse University, Syracuse, New York.

2. Stratified in polyethylene bags for 25 days.

3. Materials applied and rates per 100 pounds of seed:

| | |
|-----------------|---------------|
| Arasan 75 | - 2.4 gallons |
| Endrin 50-W | - 2.5 pounds |
| Dow Latex 512 | - 12 ounces |
| Aluminum flakes | - 1.9 ounces |

EVALUATION OF PLOTS

The permanent transects were retallied at the end of the second growing season for mortality information. Final seedling counts on the half-acre plots were made during the fourth growing season. On each 1/2 acre plot, 60 mil acre plots were tallied for the 1963 sowing and 36 mil acre plots for the 1964 and 1965 sowings.

RESULTS AND DISCUSSION

Average stocking during the fourth growing season is given in Table 1. Stratified seed gave significantly better results when sown in March than April in all three years, and this was the only consistent difference between sowing dates.⁴

TABLE 1 — NUMBER OF SEEDLINGS PER ACRE AND MIL ACRE STOCKING PERCENT⁵

| Treatment | Study Year | | | | | |
|----------------------|------------|---------|--------|---------|--------|---------|
| | 1963 | | 1964 | | 1965 | |
| | Number | Percent | Number | Percent | Number | Percent |
| Jan. 15, NS, 1/2 lb. | 490 | 32 | 1990 | 62 | 290 | 29 |
| | 710 | 43 | 3470 | 65 | 670 | 37 |
| Feb. 15, NS, 1/2 lb. | 390 | 28 | 740 | 38 | 360 | 26 |
| | 920 | 41 | 1460 | 56 | 1180 | 53 |
| Mar. 15, S, 1/2 lb. | 400 | 27 | 1100 | 52 | 630 | 40 |
| | 1250 | 52 | 2030 | 65 | 930 | 50 |
| Apr. 15, S, 1/2 lb. | 280 | 19 | 280 | 24 | 280 | 22 |
| | 340 | 25 | 490 | 31 | 780 | 48 |

If 40 percent mil acre stocking is considered acceptable stocking, the 1 pound per acre rate gave acceptable results except for the January sowing in 1965 (which was very close to being acceptable) and the April sowings in 1963 and 1964 (which were far below the acceptable level). The 1/2 pound per acre rate gave acceptable stocking only for the January, February, and March sowings of 1964, and the March sowing of 1965.

Mortality on the permanent transects, between the end of the first and the end of the second growing season, was 41, 27, and 22 percent for the 1963, 1964, and 1965 sowings respectively. Mortality was not related to sowing date. Seedling heights after 2 seasons ranged from 1.0 to 6.5 inches, and average 2 year heights for the 3 study years ranged from 2.3 to 2.7 inches.

4. Analyses of variance and planned orthogonal comparisons were made using the logarithms of numbers of seedlings per acre. Differences between 1/2 and 1 pound per acre sowing rates were highly significant for all three years. Other significant comparisons were:
 - 1963: 1. Stratified seed better in March than April, at .005 level.
 - 1964: 1. Non-stratified seed (Jan. and Feb.) better than stratified seed (Mar. and Apr.) at .005 level.
 2. Non-stratified seed better in January than February, at .005 level.
 3. Stratified seed better in March than April, at .005 level.
 - 1965: 1. Stratified seed better in March than April, at .05 level.
5. Mil acre stocking percent is the percent of sample mil acre plots on which one or more seedlings were present.