



**THE EFFECT OF SCALPING AND CULTIVATING
(PRIOR TO PLANTING) ON THE SURVIVAL
AND GROWTH OF WHITE SPRUCE, MESIC CLAY LOAMS
RIDING MOUNTAIN FOREST EXPERIMENTAL AREA**

PROJECT MS-229

by

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**FOREST RESEARCH LABORATORY
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INTRODUCTION

In 1962 an experiment was begun at the Riding Mountain Forest Experimental Area to study the growth of white spruce transplants (and seedlings arising from seed) on mesic grey-wooded loamy soils where (1) all soil horizons down to the B had been removed with a bulldozer, (2) all horizons down to the B had been removed with a bulldozer then the B cultivated, (3) litter humus and A₂ horizons dug into and mixed with the B horizon and (4) organic mineral horizons were not disturbed prior to planting.

The experiment is being repeated annually for 3 years to compensate for differences in weather conditions. Transplants were set out on the first replication in the spring of 1963, and on the second in the spring of 1964. The third replication is to be planted in 1965.

This report briefly describes the three replications, work done on them in 1964 and work to be done in 1965.

For further details concerning the scope of this project, methods and design the reader is referred to the project plan, mimeo 62-MS-19, and to progress reports 64-MS-2 and 63-MS-4.

DESCRIPTION OF AREAS

First replication

The first replication was established in 1962. It is located within an area about 2.5 acres in size in Twp. 20, Sec. 35, Rge. 19, south of the "game line" about 25 chains west of Highway 10. Ten blocks (numbered 1 to 10) each 40 ft. x 40 ft. and divided in 4 plots 16 ft. x 16 ft. comprise the replications; treatments were applied randomly according to instructions in the project plan, see Figure 1.

In the fall of 1962, one sub-plot (2 ft. x 2 ft.) was established in one corner of each plot and sown with 30 white spruce seeds (viability 70 per cent at time of sowing).

White spruce transplants (2-2 stock from the Hadashville Nursery) were set out on the blocks in May 1963. Seedlings (nine per plot) were planted by the slit method at a 4 x 4 foot spacing.

Second replication

The second replication comprizes blocks 11 to 20. It was established in 1963 adjacent to the first, see Figure 1. Methods and procedures were the same as for the first replication.

Sub-plots (2 ft. x 2 ft.) were randomly established in one corner of each plot in October of 1963. Each sub-plot was sown with 31 white spruce seeds (viability was 68 per cent at time of sowing).

White spruce transplants (2-2 stock from the Hadashville Nursery) were set out on the blocks in the spring of 1964.

Third replication

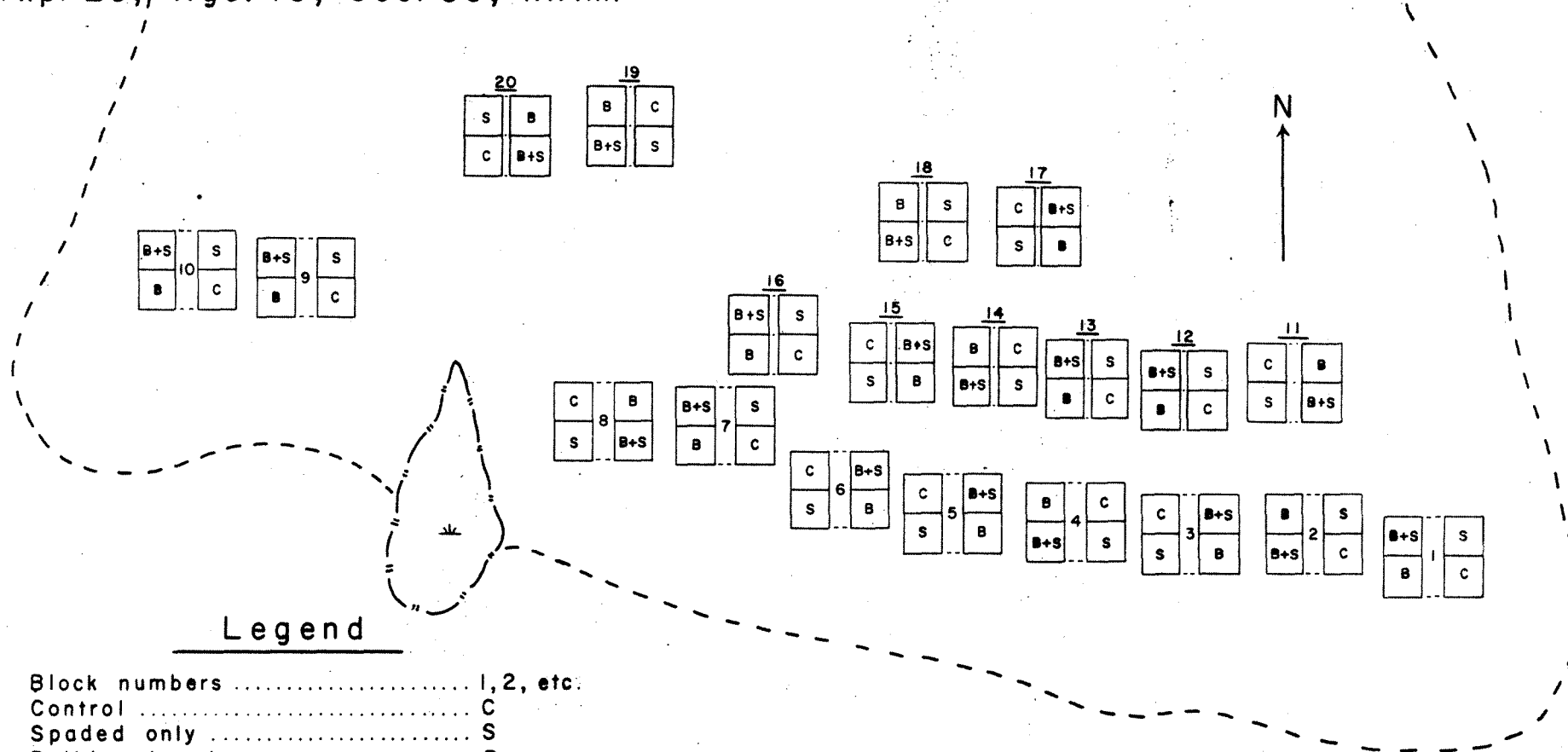
The third replication was established in 1964 and is located in

Twp. 21, Rge. 19, Sec. 2, W.P.M.

Game Line (From station A, East 24+45 chains to Highway, 10.)

Twp. 20, Rge. 19, Sec. 35, W.P.M.

Station A



Legend

- Block numbers 1, 2, etc.
- Control C
- Spaded only S
- Bulldozed only B
- Bulldozed and spaded B+S
- Grassy slough
- Boundary of experimental area
- 1963 planting Blocks 1 to 10
- 1964 planting Blocks 11 to 20

Scale: 2 chains

Figure 1. Layout of blocks established in 1962 and 1963.

Twp. 20, Sec. 24, Rge. 18, W.P.M. about 18 chains south of station Headquarters. It comprises blocks 21 to 30 which were laid out within an area about 2.3 acres in size. Treatments were randomly applied to the plots within each block, see Figure 2.

WORK DONE IN 1964

First replication

In May of 1964, transplants on blocks 1 to 10 were examined to determine 1963 growth; seedlings height and condition were recorded. In June the plots were sprayed with herbicide (mixture of 2,4-D and Dalapon at concentrations recommended by the manufacturer) to kill competing vegetation. The herbicide was applied with a garden pressure-type sprayer (2 to 3 gallon capacity) to vegetation surrounding each seedling within a radius of about 2 feet. During application transplants were covered to protect them from the spray; stove pipes 7-inches in diameter were used.

In the fall the seedlings were measured again. Total height growth for the 1964 growing season was recorded.

Seeded sub-plots (2 ft. x 2 ft.) were examined in the spring of 1964 for over-winter mortality and again in the fall. Survivors were tallied.

Second replication

A total of 360 white spruce transplants (2-2 stock from the Hadashville Nursery) of a uniform size and with well developed roots were set out on blocks 11 to 20 in May of 1964. The seedlings (nine per plot) were planted by the slit method at a 4 x 4 foot spacing.

Following planting a fence was erected around the blocks to exclude deer and elk.

Competing vegetation on the plots was sprayed with herbicide (2,4-D and Dalapon) in June. Methods of application was the same as for blocks 1 to 10.

In mid-September the height and condition of each transplant was recorded. Also the 2 ft. x 2 ft. sub-plots which had been sown in 1963 were examined. Surviving germinates were tallied.

Third replication

During the summer of 1964 standing trees on the site chosen for this replication were removed. Then blocks 21 to 30, each 40 x 40 feet were layed out in the center portion of the area. Each block was divided into 4 plots 16 x 16 feet; treatments were applied randomly according to instructions in the project plan, see Figure 2.

The station bulldozer was used to remove vegetation on the scalped plots and cultivation was done with spades. On the undisturbed plots and a 4-foot surround about each block, shrubs such as hazel were cut with a "brush master" and removed.

In October sub-plots (2 ft. x 2 ft.) were established at random in one corner of each plot. Each sub-plot was then sown by hand with 30 white spruce seeds (viability 84 per cent at time of sowing).

WORK FOR 1965

In the spring white spruce transplants will be set out on blocks 21 to 30. Seedlings (nine per plot) will be planted by the slit

method at a 4-foot spacing. The planting stock will be selected so that all seedlings will be of a uniform size with similar well developed roots. Following planting a fence will be erected around the blocks.

In the fall transplants on each replica will be measured. Seedling height and condition will be recorded. Also sub-plots sown to white spruce will be tallied.

During the summer vegetation on all plots will be killed with herbicide as conditions warrant.

Transplants and seedling development will be reported.