

**CANADA**  
**Department of Northern Affairs and National Resources**  
**FORESTRY BRANCH**

**THINNING IN A WHITE PINE STAND**

**by**  
**B. C. Wile**

**Forest Research Division**  
**Technical Note No. 5**  
**1955**

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TO: INFORMATION SECTION,  
NORTHERN FOREST RESEARCH CENTRE,  
5320-122 STREET,  
EDMONTON, ALBERTA,  
T6H 3S5

**Published under the authority of  
The Minister of Northern Affairs and National Resources  
Ottawa, 1955**

# THINNING IN A WHITE PINE STAND

Project M-213

*by*

B. C. WILE

In 1937, near the Acadia Forest Experiment Station in central New Brunswick, two half-acre plots were established in a 40-year-old even-aged stand, consisting mainly of white pine (*Pinus strobus* L.), that regenerated after fire. One plot was thinned to determine the effect on the growth and development of the stand. The other plot was left undisturbed as control.

The plots are situated on a gentle southeast slope; the soil is a fresh, well-drained clay loam with litter and raw humus about one inch thick, a trace of an H-layer, and a very thin leached layer. On both plots, dominant white pine average 50 feet in height at 50 years total age.

The first thinning in 1937 removed approximately 34 per cent of the total volume, and in 1942 a second thinning removed about 22 per cent; both were considered to have paid for themselves. The trees cut were mainly hardwoods and suppressed and defective conifers.

Both thinned and control plots were remeasured at five-year intervals. Summarized data are given in Table 1 and Figure 1.

Thinning has increased the proportion of white pine from 77 per cent of the total stand volume before thinning in 1937, to 96 per cent in 1952; on the control plot, the percentage has remained almost constant (around 70 per cent).

Gross growth per cent for the same 15-year period for all species, using Pressler's formula, was 4.5 per cent on the thinned plot, and 3.5 per cent on the control. Because of lower mortality on the thinned plot, the net growth was even greater, amounting to 1,240 cubic feet per acre (780 cubic feet net increase in growing stock plus 460 cubic feet yield from thinning in 1942), as compared to 540 cubic feet for the control. The net periodic annual increment for white pine alone was 76 cubic feet per acre on the thinned plot; it was 20 cubic feet per acre on the control.

For all species, the loss in volume from mortality in 15 years amounted to 420 cubic feet per acre on the thinned plot, and 1,040 cubic feet on the control. This illustrates one of the advantages of thinning; many of the trees that would die and be wasted before harvesting under a "single cut" system are removed and utilized.

Lower mortality and higher growth rate combine to give a greater yield of wood from the treated plot. If both plots had been clear-cut in 1952 and completely utilized, the thinned plot would have yielded 3,380 cubic feet total volume (including 1,000 cubic feet utilized from thinnings), but the control would have yielded only 2,790 cubic feet. In addition, the volume of the thinned plot is contained in more valuable species and in better and larger trees, some of which have been pruned.

Figure 1

Stand tables  
of living, white pine

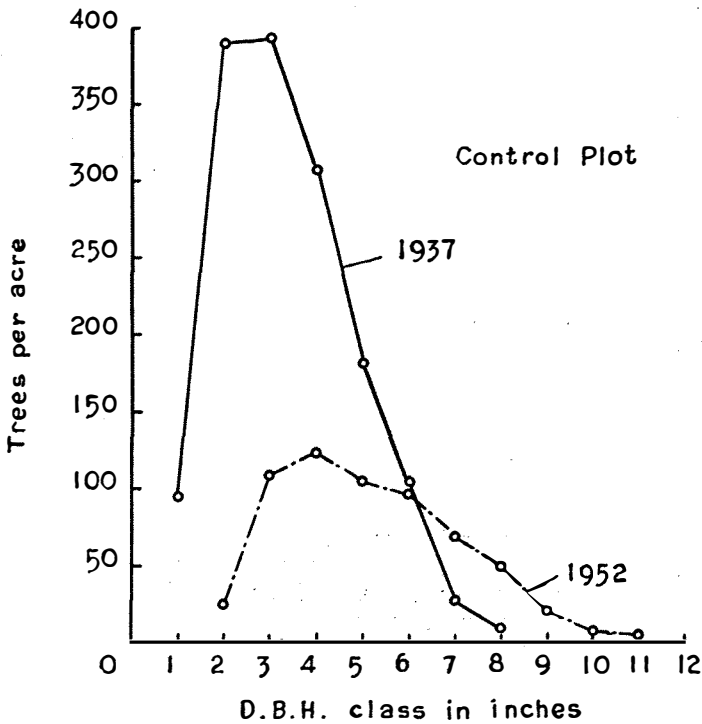
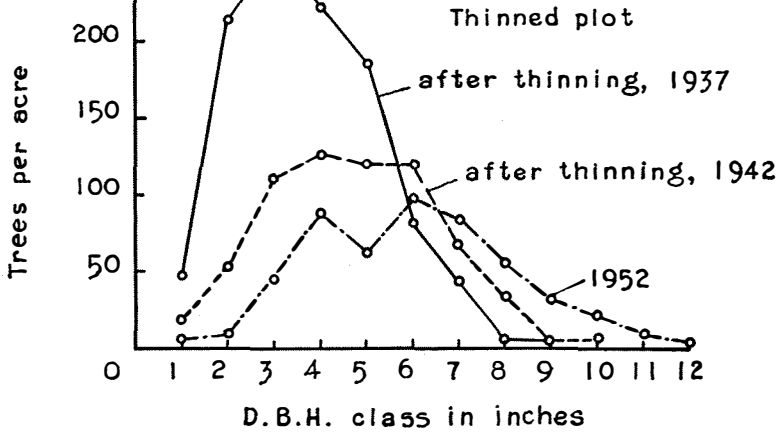


TABLE 1. Basal area in square feet and total volume in cubic feet, per acre, for live trees, one-inch D.B.H. class and up

## THINNED PLOT

| Species                          | 1937            |                 |              |      | 1942       |     |              |      | 1952       |              |
|----------------------------------|-----------------|-----------------|--------------|------|------------|-----|--------------|------|------------|--------------|
|                                  | Basal area      |                 | Total volume |      | Basal area |     | Total volume |      | Basal area | Total volume |
|                                  | BT <sup>1</sup> | AT <sup>2</sup> | BT           | AT   | BT         | AT  | BT           | AT   |            |              |
| White pine.....                  | 123             | 95              | 1863         | 1404 | 115        | 96  | 1838         | 1584 | 116        | 2297         |
| Other species <sup>3</sup> ..... | 28              | 11              | 545          | 196  | 14         | 4   | 263          | 62   | 5          | 84           |
| Total.....                       | 151             | 106             | 2408         | 1600 | 129        | 100 | 2101         | 1646 | 121        | 2381         |

## CONTROL PLOT

|                    |     |      |     |      |     |      |
|--------------------|-----|------|-----|------|-----|------|
| White pine.....    | 112 | 1644 | 114 | 1797 | 100 | 1949 |
| Other species..... | 30  | 603  | 34  | 603  | 39  | 840  |
| Total.....         | 142 | 2247 | 148 | 2400 | 139 | 2789 |

<sup>1</sup> BT—before thinning.<sup>2</sup> AT—after thinning.

<sup>3</sup> Red spruce, *Picea rubens* Sarg.; white spruce, *P. glauca* (Moench) Voss; black spruce, *P. mariana* (Mill.) B.S.P.; balsam fir, *Abies balsamea* (L.) Mill.; red maple, *Acer rubrum* L.; white birch, *Betula papyrifera* Marsh.; wire birch, *B. populifolia* Marsh.; largetooth aspen, *Populus grandidentata* Michx.; and trembling aspen, *P. tremuloides* Michx.