

EVEN-AGED INTENSIVE MANAGEMENT
TWO CASE HISTORIES

by Harold M. Klaiber, Forestry Manager, Northeast Operations, Scott Paper Company, Winslow, Maine.

INTRODUCTION

In 1967 Scott Paper Company merged with the S. D. Warren Company and S. D. Warren became a division of Scott. In 1969 the S. D. Warren timberlands in the Bingham, Maine area were transferred from the Warren Division to the Northeast Operations of Scott. Included in this transfer were approximately 700 acres of tree plantations which had been established in the 1920's and early 1930's. A wide variety of both native and exotic species were planted. These included Douglas-fir, Norway spruce, European larch, Austrian pine, red and white spruce, and red and white pine.

As case histories to illustrate the practice of even-aged intensive silviculture, I have selected one plantation consisting of native red pine and white spruce in alternating rows, and one plantation of exotic Norway spruce as a pure stand.

TUSCON PLANTATION

The red pine (*Pinus resinosa* Ait.) and white spruce (*Picea glauca* Voss) plantation is located in Bingham, Maine and is commonly called the Tuscon plantation. The plantation contains 31 acres, of which 14 acres are alternating rows of red pine and white spruce. The planting site was an old field that had not been mowed and weedy vegetation occupied the site. Planting was done in the fall of 1930 at a cost of \$10.40 per acre.

Initial spacing was 6 feet x 6 feet.

The white spruce planting stock was 3-1, and the red pine stock was 2-1.

In 1948 and 1949 the red pine was pruned. The stand was also thinned on an individual stem selection basis. The records do not indicate how much volume was removed, but report a profit of \$31 per acre over and above the actual thinning cost, so some merchantable volume must have been removed in the thinning.

In 1971 increment borings on the red pine which had almost completely over-topped the white spruce showed that the red pine grew at a maximum of 5 rings per inch, but by 1971 had slowed to 10 rings per inch.

Also in 1971, measurements on 3 sample plots showed the following:

<u>Species</u>	<u>Volume in Cords/Acre</u>	<u>Basal Area per Acre</u>
Red pine	54.2 Cds.	186 sq. ft.
White spruce	7.3 Cds.	31 sq. ft.
Combined	61.5 Cds.	217 sq. ft.

In the 41 years since planting, merchantable volume growth averaged 1.5 cords per acre per year. This figure does not include the volume removed in the 1948-49 thinning because no record of the actual volume removed is available.

BRAZIER PLANTATION

The Norway spruce (*Picea abies* (L.) Karst.) plantation that I selected for the second case history is located in Brighton, Maine and is commonly known locally as the Brazier plantation. The total plantation is 27 acres, of which 10 acres are pure Norway spruce. The planting site was an old field with heavy grass cover. Planting was done in the spring of 1921.

Initial spacing was 6 feet x 6 feet.

The planting stock was 2-1.

In 1928 at plantation age 7 years, the Norway spruce were released from alder and grey birch competition which are typical volunteer species on old fields in this location.

In 1941 at plantation age 20 and again in 1948 at plantation age 28, individual crop trees were pruned.

In 1955 at age 34, the plantation contained a volume of 30 cords per acre. A thinning removed every 6th row of trees completely and removed individual stems on a marked tree basis in the 5 residual rows. Approximately 20% of the total merchantable volume was removed leaving a residual volume of 24 cords per acre for the entire 10 acres.

The year following this thinning, in 1956, a permanent 1/4 acre sample plot was established. The results of 20 years of measurements on this plot are shown in Table 1, covering the period from July 2, 1956 to June 30, 1976.

Table 1. BRAZIER PLANTATION - NORWAY SPRUCE

<u>Date</u>	<u>Cords/ Acre</u>	<u>Basal Area (Sq.Ft.)</u>	<u>Avg. DBH (in.)</u>	<u>Avg. Height (ft.)</u>
7/2/56	31.3	133	8.95	46
11/59	36.8	162	9.85	50
12/3/65	43.3	184	11.30	58
6/16/70	52.7	211	12.00	69
11/17/71	55.5	225	12.20	71
9/26/73 ^a .	44.9	175	10.30	71
6/30/76	48.5	187	10.40	71

a. After thinning.

In 1971 the plantation averaged 55.5 cords per acre with an average DBH of 12.2 inches. In early 1972 additional thinning was done with individual trees removed on a marked tree basis. Removal in this thinning averaged 10 cords per acre.

Based on the 1976 remeasurement of the permanent plot, the present stand volume is 48 cords per acre. The two thinnings have removed 15 cords per acre making a total net merchantable growth of 63 cords per acre for the 54 years since planting. This averages 1.2 cords per acre per

year for the 54 years.

During the 16 year period between thinnings (1956 to 1971) the net merchantable growth was 24.3 cords per acre or an average of 1.5 cords per acre per year for each of the 16 years.

EVEN-AGED GROWTH POTENTIAL

In both case histories cited, the intensive management consisted only of:

1. Species selection
2. Control of initial spacing
3. Early release from volunteer hardwoods
4. Thinning at infrequent intervals

One can only speculate what the growth potential of even-aged stands would be if initial planting stock were selected for superior growth capabilities, if the stand were fertilized perhaps 2 or 3 times during the rotation, and thinning was done at more frequent intervals. I believe these two case histories demonstrate that with some modest increases in the intensity of our management it is extremely likely that a minimum growth of 1.5 cords per acre per year over the entire rotation could be attained on considerable acreage in Maine.