The Canadian Ecology Centre
FORESTRY Research Partnership
TREE TIPS
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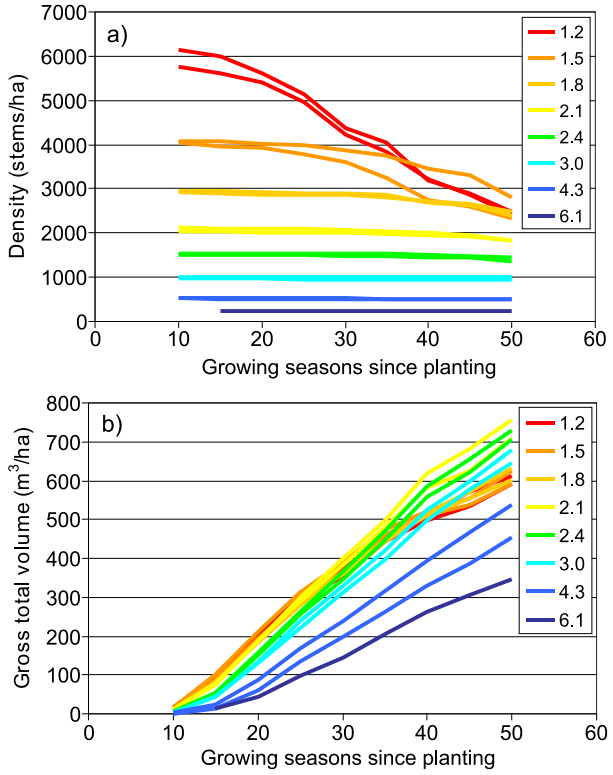
AECL RED PINE SPACING AND THINNING TRIAL

Forestry Research Partnership Project No. 130-211

Aim

This study sought to compare the growth and yield of red pine under a variety of spacing and thinning treatments on two plantations a few hundred metres apart on Atomic Energy of Canada Ltd. (AECL) property near Chalk River, Ontario. The expected project outputs are scientifically validated growth and yield data for eight spacings combined with up to three thinning intensities for red pine plantations up to age 50 on a site productive for red pine. Modeling efforts should provide projections for similar results up to rotation age. Wood quality results for each of 11 to 13 treatment combinations of spacing and thinning should reveal the potential to produce high-value utility poles by treatment. Further efforts to model the economics based on costs provided by FERIC and projections to rotation age will provide the basis for a revision of the management models for plantation red pine. Further testing against other red pine spacing and thinning trials will ensure the robustness of the management models.

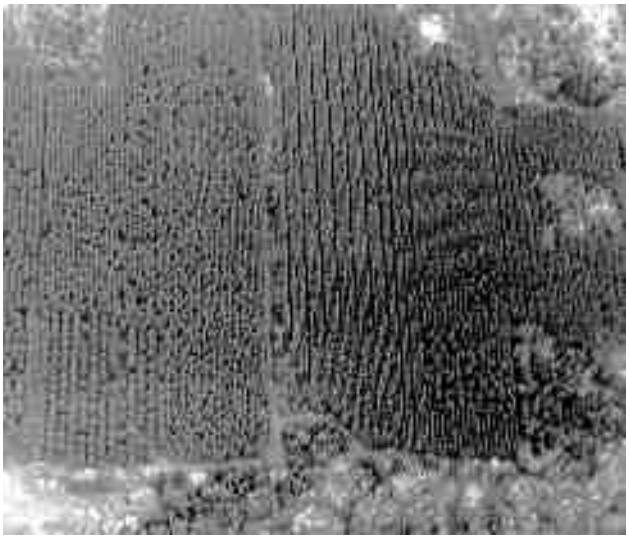


Evolution of stand density and gross volume production through time

Approach

The red pine spacing trial was established in 1953. Plots were established in 1962 and have been measured every 5 years since. Through a partnership with the Forest Research Partnership (FRP), Tembec, and the Petawawa Research Forest (PRF), the experiment was remeasured and thinned in 2002. Along with regular measurements of permanent sample plots, intensive measurements were conducted on 187 sample trees from a variety of treatment and control areas. These trees were selected for intensive sampling for growth and yield purposes, and for the testing of various wood

properties including quality and strength at the Forintek Lab in Quebec City. The total production (minus mortality) for the various thinning and spacing regimes will be compared. Mortality will be examined to determine which trees died and whether indicators of imminent mortality exist. All permanent sample plots (PSPs) were remeasured for DBH and total tree heights, and form class was measured on selected trees. Each plot was photographed from a standardised location to provide comparative photos both pre- and post-thinning. All thinning treatments were carefully marked and logged by trained PRF technicians to ensure scientific precision. Thinning followed the selection criteria used in 1992. Stems from the thinning plots were carefully sorted and piled by treatment block at roadside for additional milling studies. Up to ten representative stems per PSP were pre-identified for additional measurements during harvest. The intensively measured stems represent the range of diameter classes for each treatment. Additional measurements on intensive sample trees were for diameters and knots along the stems and have contributed to a study of taper.



Aerial view of the plantation

Tree Tip

Red pine is an ideal species for planting in plantations on sandy sites in the Great Lakes-St. Lawrence forest. A pioneer species, red pine does not require partial shade, is relatively pest-free, grows rapidly with good form, and provides high value products if managed correctly. Initially, basal area and volume increased as spacing decreased. By 50 years from planting there was considerable mortality at the closer spacings, while the widest spacings had not caught up in volume production. This resulted in the 2.1 m spacing having the highest standing basal area and volume. Thinning had a significant negative effect on basal area and volume, a positive effect on dbh_4, and no effect on top height. The optimal spacing for volume and basal area and volume production is 2.1 m if no thinning is contemplated. With thinning treatments, basal area and volume production increase with decreases in spacing as a result of capturing mortality; however, there is no evidence that thinning results in increased production (standing + dead gross total volume).

Team

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