

Influence of lath plot-separators on frost heaving and growth of seedlings

by

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In mid-May 1971, seed from 103 geographic sources of black spruce (*Picea mariana* (Mill.) BSP.) was sown in seedbed plots located in six randomized blocks at the nursery of the Acadia Forest Experiment Station, near Fredericton, New Brunswick. Each plot consisted of three seed rows sown across the width of the seedbed. All rows were 4 inches apart. The seedbeds were crowned to improve surface drainage and the edges of the beds were protected by wooden 2- x 2-inch mudsills. After sowing, wooden laths (about 1.5 inches wide, 1/4 inch thick, and 48 inches long) were placed between adjacent plots to make identification easier. The ends of the laths were nailed to the mudsills (fig. 1).

In the spring of 1972, the winter protection of balsam fir branches (*Abies balsamea* (L.) Mill.) was removed from the seedbeds when snow mold (*Phacidium infestans* Karst.) was reported to be attacking some 1-year-old seedlings under the protection of branches in another part of the nursery. After the branches were removed, a few frosty nights and warm days caused alternate freezing and thawing of the exposed seedbed surface. This in turn caused slight frost heaving of trees in the center rows of the plots. The root collars of some seedlings were exposed above the surface but very few were lifted to the extent that they fell over. Virtually no heaving occurred in the outer rows adjacent to the wooden laths; apparently

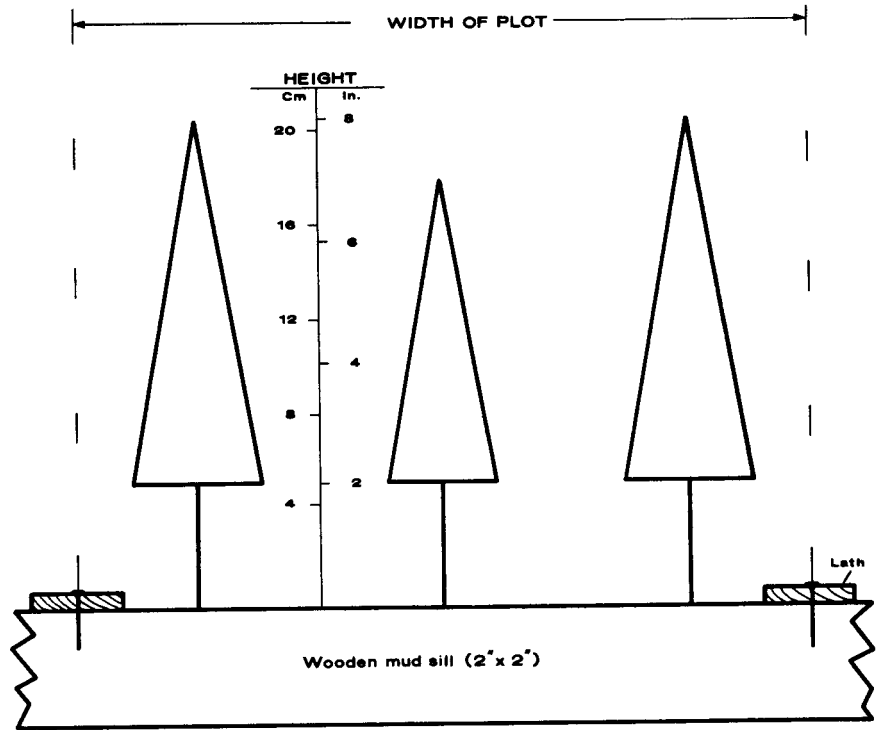


Figure 1.—Stylized trees indicate difference in average height between 2-year-old trees in center row of plot and those in the outer rows adjacent to the laths.

the laths reduced heat loss from the soil at night and heat absorption from the sun by day. This would reduce the tendency of the soil near the laths to freeze and thaw.

Differences in height growth between the trees in the outer rows and those in the center rows of most plots throughout the six randomized blocks became apparent midway through the second growing season (1972). In October 1972, tree-heights (to the nearest millimeter) were measured on 10 randomly chosen trees in the center row and five randomly chosen trees in each outer row in each of

88 plots in one randomly chosen block. The average height of the trees in the outer rows were 20.4 cm. (8.03 inches) compared to 17.9 cm. (7.05 inches) for trees in the center rows. The difference, 2.5 cm. (almost 1.0 inch), was highly significant ($t = 7.7$, significant at 0.001 level). It appears that even slight frost heaving can inflict enough damage to cause serious loss of growth. In nurseries where row sowing is practiced, the use of wooden laths or some other covering to protect the seed-bed surface between the rows may have a practical use.