

Three-year Survival and Height Growth of 2+0 Bareroot Douglas-Fir Seedlings Treated with a Symbex Root Dip

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Douglas-fir 2+0 bareroot seedlings root-dipped in Symbex prior to planting showed no significant differences in height or survival benefits from controls in a 3-year test. The first-season height growth differences were significant and favored the root dip treatment, but this effect did not persist.

Douglas-fir (*Pseudotsuga menziesii*) plantation survival and growth on the east side of Vancouver Island, BC, is primarily influenced by the seedling's ability to rapidly develop an effective root system in a large soil volume prior to the onset of summer drought (4). Plants unable to do this either die due to excessive moisture stress or are unable to elongate stem units, resulting in slow plantation growth (2,3,6).

One means of stimulating root system development after planting may be to provide fertilizer (1) and root-stimulating microorganisms at the time of planting (5). Agrok Corporation has developed an agricultural product (Symbex) that has shown significant growth and yield benefits, both as a seed inoculant and as a seedling-root dip treatment in agricultural crops. The objective of the following trial was to determine if similar gains could be shown on 2-year-old bareroot Douglas-fir planting stock on a stressful site on Vancouver Island.

Methods

This experiment was designed as a randomized block with two treatments (dip in Symbex or dip in water), three replicates, and 25 seedling-rows per treatment per replicate. The seedlings were 2+0 barefoot Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) grown from one seedlot in a single nursery. The Symbex treatment consisted of dipping the seedlings five times (approximately 5 seconds each time) in a solution of Symbex diluted 40:1 with water. Control seedlings were similarly dipped in water prior to planting. Seedlings were assessed at the end of each growing season for survival and height growth.

The planting site was a well-drained, coarse-textured alluvial soil with a Douglas-fir site index at 50 years of approximately 18 meters. Seedlings were planted May 12, 1980, and were untended for the 3-year course of this study.

Results and Discussion

The results indicate that there were no significant differences ($P \geq 0.05$) in total height, height growth, or survival between treated and untreated seedlings over the 3-year duration of the test (table 1, fig. 1). A height growth advantage (approximately 20 percent) for the treated plots did become evident during the 1981 growing season. However, this result did not persist and the control trees began to close the gap during the 1982 season. The total height gain on the average over the three growing seasons was 4 centimeters or approximately 6 percent in favor of the Symbex-treated trees. The material and labor costs required to do this treatment on an operational basis would not make the Symbex cost-effective.

Table 1—Total height and survival results for treated and untreated plots, 1980–1982 growing seasons

Treatment	1980		1981		1982	
	Height (cm)	Survival (%)	Height (cm)	Survival (%)	Height (cm)	Survival (%)
Control	36.9	100.0	52.4	96.4	69.5	94.6
Symbex	37.2	98.1	56.1	92.2	73.6	92.0

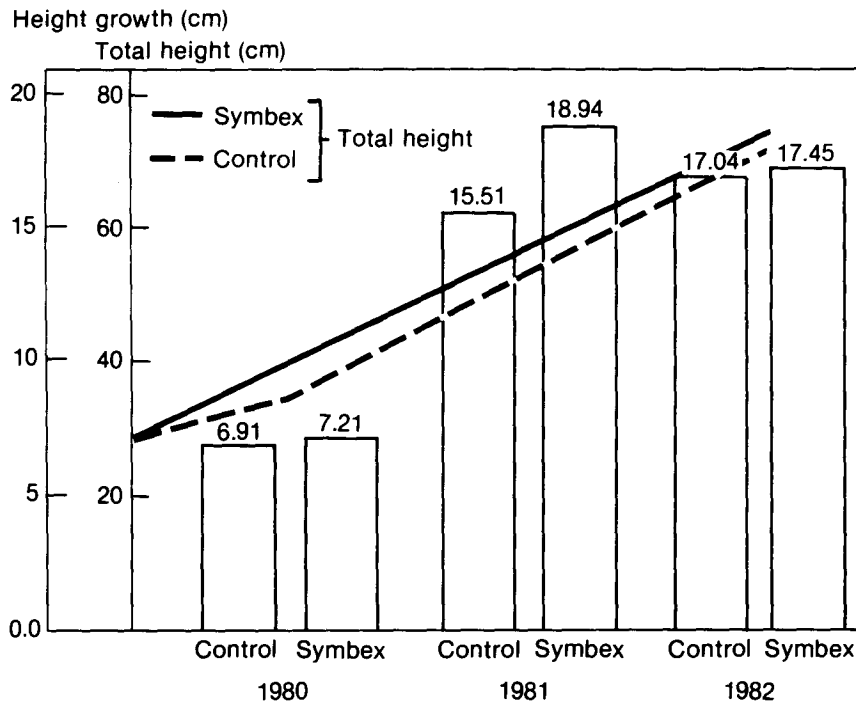


Figure 1—Height growth and total height of 2 + 0 bareroot Douglas-fir seedlings planted in a stressful site on Vancouver Island.

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