

EARLY RESULTS OF PROVENANCE HYBRIDIZATION IN BLACK SPRUCE

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Provenances of black spruce (Picea mariana (Mill.) B.S.P.) from Ontario, Quebec, New Brunswick, and Newfoundland were crossed: individual mother trees in 9 provenances received a pollen mixture from Chalk River, Ontario, and trees in the 10th provenance a mixture from Little Pic River, Ontario. The resulting hybrids were grown together with open-pollinated control lots from the locality of origin of the female parents in a greenhouse experiment for 16 months and subsequently in a plantation, which was subject to winter desiccation, to the age of 5 years. Measurements were made and analyzed to see whether the fast growth of southern and the hardiness of northern provenances could be combined and if heterosis exists in the resulting hybrid populations.

It was found that the growth of the hybrids exceeded that of the controls at 10 months by 48% but at 5 years by only 15%. Winter desiccation was higher in the hybrids than in the controls at age 2 years but not at age 5 years. A good combination of fast growth and hardiness was found in only one of the hybrid groups. Whether fast growth of the hybrids is due to heterosis is doubtful because of a possible difference in seed quality of the control-pollinated hybrids and the open-pollinated and perhaps slightly inbred controls. To be useful as an additional breeding method, provenance hybridization would have to produce progenies that are of greater vigor and hardiness than those obtained in seed orchards.

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