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A red pine provenance test in northwestern Ontario: 48-year results

by Ali A. Rahi¹, Colin Bowling² and Dale Simpson³

ABSTRACT

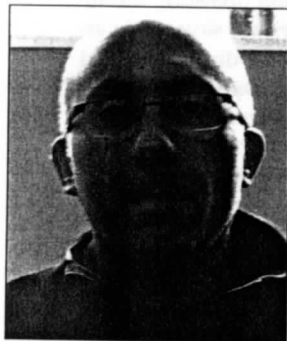
Survival, total height and diameter at breast height (DBH) were measured in the fall of 2005 in a 48-year-old red pine (*Pinus resinosa* Ait.) provenance trial growing in northwestern Ontario. There was significant variation in both height and diameter among the 23 provenances. Generally, westerly provenances performed well while those from the Maritime Provinces exhibited relatively poor growth. Considering that the plantation is at the northern biological range of red pine, survival was high, averaging 96% after 48 years. Provenances with the best growth rates exceeded a volume of 420 m³ ha⁻¹. Some provenances from Minnesota and Wisconsin as well as Fort Frances, Ontario exhibited superior growth and should be considered as seed sources for future planting programs in northwestern Ontario.

Key words: red pine, provenance test, survival, diameter, height, volume, Northwestern Ontario

RÉSUMÉ

Le taux de survie, la hauteur totale et le diamètre à hauteur de poitrine (dhp) ont été mesurées à l'automne 2005 dans une plantation de pin rouge (*Pinus resinosa* Ait.) âgée de 48 ans destinée à faire l'essai de différentes provenances de semis et située dans le nord-ouest de l'Ontario. On a relevé une variation significative tant au niveau de la hauteur que du diamètre parmi les 23 provenances. De façon générale, les provenances occidentales ont bien performé tandis que celles issues des provinces de l'Atlantique ont démontré une croissance relativement décevante. En prenant en considération que la plantation est située à la limite nordique de l'aire de distribution biologique du pin rouge, le taux de survie s'est révélé être élevé, atteignant une moyenne de 96 % après 48 ans. Les provenances ayant les meilleurs taux de croissance ont atteint un volume supérieur à 420 m³ ha⁻¹. Certaines provenances du Minnesota et du Wisconsin ainsi que de la région de Fort Frances en Ontario ont démontré une croissance plus importante et devraient être retenues comme sources de semences pour les prochains programmes de plantation à être réalisés dans le nord-ouest de l'Ontario.

Mots clés : pin rouge, essai de provenance, survie, diamètre, hauteur, volume, nord-ouest de l'Ontario



Ali A. Rahi



Colin Bowling



Dale Simpson

a limited seed supply, sensitivity to hard water and excessively large branches (especially at wider spacing) are drawbacks.

Despite growing on a wide range of sites, red pine is remarkably uniform in taxonomic and morphological characteristics, a rare feature amongst pines (Holst 1975, Boys *et al.* 2005). Studies on red pine populations from Quebec (Simon *et al.* 1986), Ontario, New Brunswick and Nova Scotia (Fowler and Morris 1977), and isolated populations in Newfoundland (Mosseler *et al.* 1991, 1992) have shown no genetic diversity.

Recent studies, however, detected a low level of polymorphism among both individuals and populations of red pine (DeVerno and Mosseler 1997) while Boys *et al.* (2005) found that three northeastern populations from Newfoundland and New Brunswick were genetically distinct from others. Also,

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Introduction

Red pine (*Pinus resinosa* Ait.) is commonly planted throughout the north-central United States and central and eastern Canada (Rudolph 1990, Boys *et al.* 2005) with growth rates exceeding 13 m³ ha⁻¹ yr⁻¹ in northwestern Ontario under ideal conditions (McClain *et al.* 1994). Its uniform growth rate and good form enhance thinning and pruning operations for value-added products (Fowler and Heimburger 1969) but

¹Department of Forest Sciences, University of British Columbia, 2424 Main Mall, Vancouver, British Columbia V6T 1Z4. Corresponding author. E-mail: aaraghir@lakeheadu.ca

²Ontario Ministry of Natural Resources, Northwest Science and Information Section, Box 5080, 808 Robertson Street, Kenora, Ontario P9N 3X9.

³Natural Resources Canada, Canadian Forest Service - Atlantic Forestry Centre, P.O. Box 4000, Fredericton, New Brunswick E3B 5P7.