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246. © Performance of jack pine (*Pinus banksiana*) rooted cuttings from proliferated dwarf shoots versus seedlings 8 years after planting. Lu, P., Bell, W., Charrette, P., and Thompson, M. Canadian Journal of Forest Research 42:1404-1409. 2012.

NOTE / NOTE

Performance of jack pine (*Pinus banksiana*) rooted cuttings from proliferated dwarf shoots versus seedlings 8 years after planting

Pengxin Lu, Wayne Bell, Paul Charrette, and Megan Thompson

Abstract: Growth and tree form characteristics of jack pine (*Pinus banksiana* Lamb.) rooted cuttings propagated from proliferated dwarf shoots (PDS) were compared with seedlings in two field trials 8 years after establishment. Results indicated that jack pine rooted cuttings from PDS can grow as well as seedlings and maintain acceptable tree form. Rooted cuttings of progeny from the 22 top-ranking open-pollinated families in a seedling seed orchard of jack pine were 4.2% taller and 10% larger in diameter at breast height than commercial seedlings tested on the same sites, which indicates that rooted cuttings have potential in realizing genetic gains in jack pine tree improvement programs. Rooted cuttings increased the proportion of trees with normal branching characteristics and reduced the percentage of trees with excessive heavy branches in the Sault St. Marie trial, which had larger tree sizes. However, longer term monitoring (20 to 25 years) is needed to determine stability of jack pine rooted cuttings planted on sandy soil where wind throw may become a problem as tree size increases.

Résumé : La croissance et les caractéristiques de la forme des arbres issus de boutures racinées de pin gris (*Pinus banksiana* Lamb.) produites par la prolifération de rameaux atrophiés (RA) ont été comparées à celles des semis dans deux essais au champ huit ans après leur établissement. Les résultats indiquent que les boutures racinées de pin gris provenant de RA peuvent croître aussi bien que les semis et conserver une forme acceptable. Les boutures racinées des descendances des 22 familles à pollinisation libre les mieux classées dans un verger à graines de semis de pin gris étaient 4,2 % plus grandes et 10 % plus groses en diamètre à hauteur de poitrine que des semis commerciaux testés au même endroit, ce qui indique que les boutures racinées offrent la possibilité de réaliser des gains génétiques dans les programmes d'amélioration du pin gris. Les boutures racinées ont augmenté la proportion d'arbres avec une branchaison normale et réduit le pourcentage d'arbres avec un nombre élevé de grosses branches dans l'essai de Sault Ste. Marie où les arbres étaient plus gros. Cependant, un suivi à long terme (20 à 25 ans) est nécessaire pour déterminer la stabilité des boutures racinées de pin gris plantées sur des sols sableux où le chablis peut devenir un problème à mesure que la dimension des arbres augmente

[Traduit par la Rédaction]

Introduction

For many years, vegetative propagation has been applied in tree improvement programs to capture nonadditive genetic variances and increase genetic gains (Thulin and Faulds 1968; Zobel and Talbert 1984). For several coniferous forest species, large-scale vegetative propagation is implemented through rooted cuttings (Ritchie 1991) and, more recently, somatic embryogenesis (Park et al. 1998; Cyr et al. 2001). Effective vegetative propagation enables the use of more efficient breeding strategies such as the multivarietal forests (MVF) strategy (Park 2002) in tree improvement programs.

Compared with several other conifer species, vegetative propagation is more difficult in jack pine (*Pinus banksiana* Lamb.). Under natural conditions, the species does not reproduce vegetatively (Rudolf 1958). Its rooting ability normally decreases rapidly with age, with rooting rate success as high as 76% reported using cuttings from young seedlings to less than a few percent for cuttings from 10-year-old trees (Zsuffa 1974). With improved rooting techniques and careful cutting selection, however, higher rooting success rates (up to 75%) are possible for trees up to 10 years of age (Browne et al. 1996, 1997*a*, 2000). The use of proliferated dwarf shoots (PDS), as described by Browne et al. (1997*b*), has the potential to further improve rooting success for jack pine.

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