Evaluating Jack Pine Seedling Characteristics in Response to Drought and Outplanting

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Abstract

This thesis explores the influence of non-structural carbohydrates (NSC), seedling size, and root:shoot ratio (RSR) on jack pine (*Pinus banksiana* Lamb.) seedling performance under different drought intensities in a growth chamber and after outplanting on a reclamation site. NSC content, size, and RSR are seedling characteristics which could improve drought tolerance of jack pine and thus outplanting success. During seedling production, characteristics were altered by growing seedlings in a greenhouse, incorporating a period of outdoor growth, and staggering germination. Generally, smaller outside grown seedlings with initially high RSR, allocated more growth to aboveground organs whereas large greenhouse grown seedlings demonstrated greater growth allocated to roots. In the growth chamber, large seedlings exhibited less water stress under severe drought. On the reclamation site, seedlings were outplanted on different aspects and seedlings on the warmer and drier south-facing aspects had increased needle production and stomatal conductance.