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WATER RELATION PARAMETERS OF 20-YEAR OLD BLACK SPRUCE (PICEA MARIANA) FROM UPLAND AND LOWLAND PROVENANCES

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Water relation parameters were followed on 20-year old black spruce (*Picea mariana* (Mill.) BSP) trees over the course of a summer. The trees were part of a pan-domain provenance test established at Forestry Canada's Valcartier station, about 20 km north of Québec City. Four provenances were selected for sampling, two from upland sites, and two from lowland sites. The upland and lowland sites were paired geographically. Each provenance in the plantation was represented by 8 individual trees. The site was visited nearly every week between May 20 and October 16. Water relation parameters were obtained from P-V curves.

All provenances showed similar patterns of change of parameters with (phenology) time. The intensity of sampling with time revealed patterns of variation seldom found in similar studies on either deciduous or coniferous species.

The effect of ecotype (upland vs lowland) was highly significant ($P<0.0001$) for most of the parameters, especially for θ_{tlp} and ε_{max}, and the difference between osmotic potential at saturation and at TLP, in spite of the fact that the trees had been growing side by side on a mesic site. Trees from lowland sites exhibited traits that are associated with acclimation to water stress such as lower ε_{max} and lower osmotic potentials. Lowland sites possibly offer environments that are often water logged and where root development is severely hampered by high water tables.