Root and shoot pruning of hybrid poplar for establishment in heavy clay soils

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Planting stock type and quality can have an important impact on early growth rates of plantations. The goal of this study was to evaluate early growth and root/shoot development of different planting materials in typical heavy clay soils of north western Quebec. Using 1 year-old bare root hybrid poplar dormant stock, four planting materials were compared: 1) regular bare root stock, 2) rootstock (stem pruned before planting), 3) whips (roots pruned before planting), and 4) cuttings (30 cm stem sections taken from the basal portion of bare root trees, i.e. roots and shoot pruned). Rooted stock types (bare root and rootstock) produced on average 1.2 times larger trees than unrooted stock types (cuttings and whips). However, shoot-pruned stock types (rootstocks and cuttings) reached similar heights and basal diameters as unpruned stock types (bareroots and whips), during the first growing season. Shoot pruning reduced leaf carbon isotopic ratios, suggesting that unpruned stock types were stressed for water during the first growing season. The stress was most likely caused by early leaf development while root growth occurred later in the summer. We conclude that shoot pruning bare root stock is a useful management option to reduce planting stress without compromising early growth rates of hybrid poplars.