

Effects of forest floor planting and stock type on growth and root emergence of *Pinus contorta* seedlings in a cold northern cutblock

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Abstract. A two-year field trial was conducted to determine the growth response, and root emergence pattern of interior lodgepole pine (*Pinus contorta* Dougl. var. *latifolia* Engelm.) seedlings in response to container type and forest floor removal. Seedlings were grown in Styroblocks™, Copperblocks™, or AirBlocks™, and were planted directly into the undisturbed forest floor or into manually prepared planting spots where the forest floor had been scraped away to expose the mineral soil. Seedlings planted into scalped planting spots exhibited marginally but significantly (7%) greater above-ground growth rates (seedling stem volume); whereas seedlings planted into the forest floor produced significantly more (11%) new roots. There were no differences in above- or below-ground biomass. Seedlings grown in Copperblock™ containers produced a higher proportion of roots near the top of the plug when tested at lifting, however this pattern was not observed in the field. Given that scalping is more costly than forest floor planting, and that the increased shoot growth was relatively small, we recommend that forest floor planting be considered as an alternative to manual spot scalping for sites, such as the site tested here: those with cold, but well-drained soils and where competition from other plants is not a serious problem.

Introduction

Growth of young planted conifer seedlings can be limited by low soil temperatures (Balisky et al. 1995; Balisky and Burton 1997; Landhausser et al. 2001). One common way to increase soil temperature in the root zone is to remove the organic soil horizons and expose the mineral soil during planting (DeLong et al. 1997). This practice, referred to as scalping or screefing, can be done mechanically or manually, and it also tends to increase available nutrients and water (Grossnickle and Heikurinen 1989; Radwan 1992), as well as decrease competition from herbaceous species (Cain 1996; Simard et al. 2003). As a result, it has become common practice in regions of British Columbia that are prone to cold soils. More recently, however, the practice of planting seedlings

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