

Is plant species diversity in conifer plantations affected by mechanical release treatments? Thiffault, N., and Roy, V. Direction de la recherche forestière, Ministère des Ressources naturelles et de la Faune du Québec, Québec, QC.

In Québec, the use of chemical herbicides is prohibited on forest crown lands since 2001. In this context, achieving free-to-grow conifer plantations requires an integrated vegetation management strategy to minimize the need for repeated mechanical release treatments on high-competition sites. The Québec strategy is based on the use of large seedling stock outplanted the spring immediately following a final harvest, in order to take advantage of favorable growth conditions, which prevail before competing vegetation establishment. To optimize mechanical release effects within this strategy, a network of 14 experimental sites, that cover a range of ecological conditions, was established. Our main objective was to determine the optimal delay (number of years since planting) before performing a mechanical release which could maximize conifer seedling growth and minimize the need for a second treatment. We also aim at quantifying the impacts of mechanical release on the vegetation community, in terms of richness and diversity. Each experimental site consists of a completely randomized block design with 5 to 8 replicates. Preliminary results for a sub-set of the entire experimental network confirm the importance of release treatments for seedling growth over a range of ecological conditions. However, carrying mechanical release 3 (R3), 4 (R4) or 5 (R5) years after planting large seedlings did not affect seedling size reached at age 8 years, over the range of conditions tested. Similarly, we did not observe major differences in the vegetation diversity ; shannon's index of diversity and species evenness were equivalent among the treatments, including the control. However, results from canonical discriminant analyses suggest significant differences between R3 and R5 vegetation communities on some sites. Further investigations, integrating change over time up to 12 years following planting, as well as a larger array of ecological conditions, will be performed.