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Can the number of aspen suckers be manipulated through conventional site preparation techniques?

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Present silvicultural practices to regenerate aspen are mostly based upon its root suckering ability following clearcutting. Currently it is recommended that sites be clearcut and left with minimal soil disturbance to promote aspen suckering. In northern Alberta, there have been numerous examples where this technique has resulted in sparse sucker initiation. Low solar radiation at northern latitudes, thick organic layers, and deep frost penetration are some of the potential reasons why the above recommendation may not be appropriate for aspen regeneration on some sites.

Over the last few decades, site preparation techniques have been developed to improve microsite conditions for the establishment of conifers. Casual observations of mechanical site preparation (MSP) for conifer plantations in boreal mixedwood sites showed that there are frequently more suckers along machine treatment rows than between the rows. While it seems logical that MSP could be used to promote suckering following logging, it has not been widely tested as a tool to promote aspen regeneration.

The effects of MSP on aspen suckering were tested on four cutblocks that were clearcut during the winter (on frozen ground). The four treatments (disc trenching, drag scarifying, blading and untreated control) were applied in the spring following harvesting, once most of the ground frost had thawed.



Aspen regeneration after disc trenching and in shallow blade

The results from the regeneration plots indicate that MSP can significantly increase aspen sucker numbers relative to untreated control areas. The disc trenching generated the greatest number of suckers per hectare

(86,100), closely followed by blading (75,800), drag scarifying (50,680) and the control (27,840). There were no differences in average dominant sucker height among the four treatments (average = 95 cm). The results also showed that microsites were important; deep blading and the trenches had the least amount of suckers while light scarification (drag and shallow blade) had the highest number of suckers.

While it is not necessary to treat all aspen cutblocks prior to suckering, those sites with thick organic layers or high brush competition would likely benefit from a scarification treatment. Site preparation for aspen regeneration will result in increased root wounding; however, we have ongoing research on the effect of wounding on suckering and stem quality.

A large wildfire burned 80% of the study sites at the beginning of the second growing season (May 2000). This fire was very severe as conditions were extremely dry, so a large proportion of the forest floor was consumed, which killed or severely injured a large proportion of shallow aspen roots. However, following the fire, aspen regeneration in the control plots averaged 59,325 sph which is significantly higher than what was measured in the first year after harvesting (27,840 sph); however, average dominant sucker height was lower following the fire (83 vs. 95 cm). Broadcast slash burning might possibly be a method for the promotion of suckering on sites that are suckering below potential after the first growing season.

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Further Information:

Fraser, E.C., Landhäusser, S.M. and Lieffers, V.J. 2002. The effects of mechanical site preparation and subsequent wildfire on trembling aspen regeneration. *New Forests* (in press).

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