

CENTRE FOR ENHANCED FOREST MANAGEMENT



ADVANCES IN FORESTRY RESEARCH

DEPARTMENT OF RENEWABLE RESOURCES

EFM RESEARCH NOTE 02/2009



Hazel root competition reduces the density of shallow aspen roots and reduces suckering after logging

MUNDELL, T.L. LANDHÄUSSER, S.M. AND LIEFFERS V.J.

Presence of beaked hazel has been linked to poor regeneration of aspen after logging. In this study we determined if and how the competition with understory hazel in mature aspen stands affects the distribution and number of roots and subsequent aspen regeneration after logging. .

Methods: In Western Manitoba (near Roblin) 10 study sites were located in aspen stands with a hazel understory prior to logging. In each site an area with hazel (47,000 hazel stem/ha) was paired with an adjacent area relatively free of hazel (3,600 hazel stem/ha). Sites were logged and left to grow for one growing season. At the end of the growing season



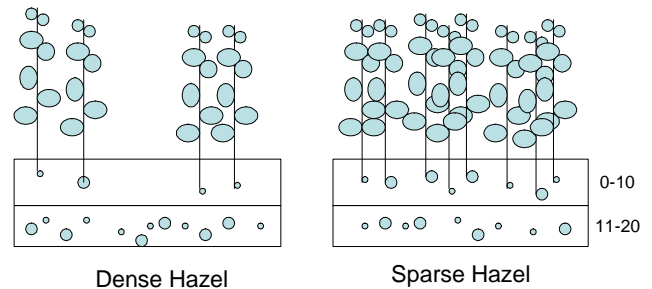
Root excavations to determine density and depth of aspen roots.

sucker density and height growth was assessed and the distribution and density of aspen and hazel roots was assessed at the 0-10 and 10-20cm depths in large root pits excavated using a backhoe.

Results: There were no differences in above ground stem densities, crown closure and root carbohydrates for the aspen growing in areas with hazel thickets or control sites prior to logging.

After logging, sucker density was reduced by 30% in areas that had hazel patches compared to the control areas.

Although the total number of aspen roots was similar between hazel patches and control areas the distribution of these roots was different; fewer aspen roots (30%) were found in the shallow soil layer in the hazel areas compared to the control.



Distribution of aspen roots at two depths with and without beaked hazel. Suckering was dependent upon the aspen root density in the surface layer

Implications:

Aspen roots enter the hazel thickets but they tend to be located lower in the soil profile.

These deep roots did not support the sucker regeneration.

Managers may promote aspen suckering in these stands either by removal of hazel thickets some years before logging or by site preparation after logging to promote suckering from roots occupying the deeper soil layers.

Funding was provided by Ainsworth Lumber Inc., Alberta Pacific Forest Industries Inc., Alberta Plywood Ltd. (West Fraser Mills), Daishowa-Marubeni International Ltd., Footner Forest Products, Louisiana Pacific Corp., Millar Western Industries Ltd., Weyerhaeuser Company Ltd. and Natural Sciences and Engineering Research Council of Canada (NSERC).

We particularly thank Louisiana Pacific for their assistance in the setup of this study.

Further Information:

Mundell, T.L. Landhäusser, S. M., and Lieffers, V.J. 2007. Effects of *Corylus cornuta* stem density on root suckering and rooting depth of *Populus tremuloides*. Can. J. Bot. 85: 1041-1045.

<http://www.cefm.rr.ualberta.ca/>

Centre for Enhanced Forest Management, Dept. of Renewable Resources, U. of A., Edmonton, AB T6G 2H1

Simon.Landhausser@ualberta.ca; Victor.Lieffers@ualberta.ca