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RETENTION OF BIOMASS ON THE CUTOVER
Effect of delimbing location

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Introduction

Concerns about the effects of harvesting operations on biomass retention on cutovers led Liro Limited to answer the question;

> *Does delimbing at the landing significantly reduce biomass retention on the cutover compared to delimbing at stump?*

The volume and make-up of biomass (stem waste, branches and needles) retained on the cutover was quantified at ten clearfell operations.

Two main types of clearfell operation were studied, delimbing at landing and delimbing at stump.

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Table 1 - Summarised study results (mean ± 95% confidence limits)

	Delimb at landing (n=7)	*Delimb at stump (n=3)*
% of total needles on cutover	*92 ± 1.6*	*98 ± 3.4*
% of total branch on cutover	*84 ± 2.9*	*97 ± 2.2*

Results and Discussion

The results are summarised in Table 1. The main findings were as follows:

- the majority of the needles within the stand prior to logging (>90%) were retained on the cutover in both types of operation
- however, significantly more needles were retained on the cutover when delimbing at the stump
- delimbing at the stump resulted in a significantly larger volume of branches being retained on the cutover. However, more than 80% of the branches were retained on the cutover in the delimb at landing operations.

Despite the large difference between the two types of logging operation in terms of where the delimbing occurred, there was a relatively small variation in the percentage of total branch material left on the cutover.

This can be explained by breakage. The stems of trees break when they hit the ground at felling. Typically, breakage occurs at the smaller diameter upper end of the stem where the concentration of green (needle bearing) branches is greatest. Branches that are still attached to the stem after felling may be broken off during extraction.

Any concerns over the removal of nutrients from forest sites by "whole tree" harvesting with delimbing at the landing would therefore seem to be unjustified. Genuine whole tree harvesting of mature radiata on steep slopes is unlikely to occur.

The apparent size of the branch piles at landings gives the impression that the majority of branch material has been removed from the cutover. However, the density (solid content) of the piles is only (approximately) 20%. Therefore, only one-fifth of what appears to be present is actually there. It should also be remembered that the pile represents part of the branch material from a large area (8 to 10 ha average hauler setting) concentrated in a very small area (0.1 to 0.2 ha) around the landing edge.

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