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FINAL REPORT

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HIGH LEAD TRIAL
WITH LENO SCARIFIER

Silviculture Branch

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SILVICULTURE TRIALS and TESTS

REPORT SX 81513 Q INTERIM ☐
FINAL ☑
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TITLE High Lead Trial with Leno Scarifier

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Report & Distribution Approved by: R.G. Brown (Typed)

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Introduction

Most site preparation machines are designed to be moved by prime movers riding on the ground surface. The limitations to this method are steepness of the ground and wetness. While logging can be carried out on wet soils when they are frozen it is often not possible or desirable to move machinery over them for treatment when they are unfrozen.

Purpose

The purpose of the trial was to test the feasibility and the results obtained by drawing an intermittent acting scarifier over a steep logged surface using a cable yarding system. It is particularly important that the scarifier be intermittent acting so as not to create erosion channels on the slope. It was also important that the scarifier penetrate the ground sufficiently to remove surface duff and the roots of competing vegetation.

The Machine

The basic unit used was a Leno Scarifier. This machine is normally pulled by a wheeled skidder or crawler type tractor and prepares intermittent plantable patches by scraping the surface with hardened steel "paddles" for periods governed by a restricted fluid flow.

This basic machine was modified by the addition of a roll bar (see photo #1) in case of flipping.
Further modifications consisted of a clamp to prevent movement into a lock position (see photo #2) and chain to limit swing (see photo #3). This latter was not found necessary and was later disconnected.
A towing device was fabricated to provide the correct height for the towing arm and to provide lift over ground debris. The basis of this device was a standard towing "boat" used with shark-fin drag equipment. (see photo #4)

Photo #4

Towing was done using a Thunderbird skyline machine with a 47 foot spar. (see photo #5)
Site

The site was a sidehill on the west side of Cariboo Lake approximately 90 km North-East of Williams Lake. Slopes ranged from 30 to 100%. Soil is a moderate depth silt with numerous rock outcrops.

Tree cover had been Spruce and P1. There had been a large number of dead stems in the stand which resulted in a very high level of slash in some areas. (see photos #6 & #7)
Method

The "boat" of the towing device was attached to the butt rigging of the skyline. The haul-back was then used to pull the unit straight down the hill toward a tail block. (see photo #8)

![Photo #8](image)

At the bottom of the run it was necessary to run the return (main) line around a stump off to one side in order to turn the unit. Once this was accomplished the unit was yarded straight back to the spar by the main line.

Results

Our first fear that the Leno might tend to over-ride the tow proved to be unfounded as it was able to dig in sufficiently to hold itself back. Once clear of a very heavy accumulation of debris at the edge of the landing, the towing device rode over the accumulation of cull logs and debris on the site. The elevated point of attachment to the Leno tended to cause the front of the towing device to lift, thus easing it over the logs. (see photo #9)
Being pointed at the front, the tow device was normally deflected by stumps. The slope over which the unit travelled varied from 50 - 80%. Even on the 80% slope the Leno was effective in removing surface debris and providing a suitable planting spot. (see photo #10)
Conclusions

This trial was done utilizing a normal high-lead machine on site as being the most convenient, and perhaps the most relevant, method of testing. From previous trials and operational application we were aware that the Leno was effective on light slash areas with slopes up to 58% and on a heavy brush slope of 30%.

For practical application it will be necessary to utilize a much less costly spar and a moveable tail block arrangement.

From the results of this trial we are convinced that a practical method can be developed to prepare intermittent planting spots on logged sites which can not be traversed by surface machines.