EFFECT OF DEEP RIPPING ON THE PERFORMANCE OF PLANTED LODGEPOLE PINE AND DOUGLAS FIR ON A COMPACT BASAL TILL SOIL CARIBOO FOREST REGION

Working Plan 1985

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WORKING PLAN

Effect of Deep Ripping on the Performance of Planted Lodgepole Pine and Douglas-fir On a Compact Basal Till Soil Cariboo Forest Region

Survival and growth of plantations has been poor in the IDFb, SBSa and SBSb subzones of the Cariboo Region. This has been attributed to a combination of poor quality planting stock, inadequate site preparation, competition for moisture from grass matts of Calamagrostis and unfavourable climatic conditions. But no one knows the answer! We have had very little, if any, good planting stock for use in the drier areas of the Cariboo, and we have shown that site preparation in the form of patch scarification does very little to improve the performance of poor quality stock, even under relatively favourable climatic conditions. However, there have been reports of plantation successes in the Kamloops dry belt following site preparation using a ripper plough (Balco - Merritt area). The ripping supposedly improves soil moisture availability for seedlings planted in the bottom of the trench.

Objective

To test the proposition that ripping improves conditions for Douglas-fir and lodgepole pine seedling survival and growth on compact, fine textured, soils in the Cariboo.

Methods

1. Prepare a small (1 ha) area of basal till soil using two ripper teeth spaced two metres apart and attached to the back of a crawler tractor.
2. Assess planting sites produced by ripper teeth.
3. Plant the ripped area and adjacent unripped control with good quality Douglas-fir and Lodgepole pine.


5. Prepare working plan for long term test based on 2 and 4.

Experimental Design

The experimental situation is suitable for a split-plot design but in this case there will be no replication of the ripping factor. Thus the analysis will be limited and the applicability of the results will be restricted to use for planning further experiments and field demonstrations.

<table>
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<th>Ripped</th>
<th>Unripped</th>
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<tbody>
<tr>
<td>Fir</td>
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Factors
Ripping
Species
Plots (RS)

Levels
2 (fixed)
2 (fixed)
3
12

This is a randomized blocks design where Blocks is a fixed treatment effect (called here, Ripping).
<table>
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<th>Source</th>
<th>d.F.</th>
<th>EMS</th>
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<tr>
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<td>$\sigma^2_r + \sigma^2_p + \phi_R$</td>
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<td>Plots (RS)</td>
<td>8</td>
<td>$\sigma^2_r + \sigma^2_f$</td>
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The ripping effect is confounded with blocks. There is no way of estimating the variability of ripping and its possible effect on species.

**Reassessments**

1984  Assessment of planting sites by Research Pedologist.
1984  Survival, Planting Height, Total Height, Diameter, *lindera*.
1985  Survival, 1st Year Height, Total Height, Diameter. "
1987  Survival, 3rd Year Height, Total Height, Diameter. "

Further reassessments will depend on results obtained in 1987.

**Project Responsibility**

Research Forester, Cariboo Forest Region.
Effect of deep ripping on the performance of Lodgepole pine and Douglas fir planted on a compact basal fill soil; in the Cariboo Forest Region.

Location:
- Transition between IDP(b) SBS(b)
- Site referred to as Lignum 1 in Douglas Fir Progeny trail for Cariboo Transition breeding zone
- Maps attached

Ripping:
Area of 50m X 150m was ripped to 60 cm in the fall of 1983 using standard ripper teeth on a D6 cat. This treatment followed preparation of the site for the progeny site when slash was removed using a brush blade.

Layout:
A randomised block design was used, where the factor blocks is a fixed treatment effect synonymous with ripping. Thus there is no replication of the ripping factor. The seedlings were planted at 2m spacing, approximated, in a 7 X 7 square.
Treatments: Three treatments were replicated 3 times in the ripped and control areas. The treatments are:

1. Douglas Fir SL 2364 Webster Creek Narcosli PSYU, elevation 1+0 PSB 313 from Surrey Nursery.
2. Douglas Fir SL 4210 Clear Lake West Lake PSYU elevation 950m, 1+0 PSB 313 from World Silviculture Nursery.
3. Lodgepole pine SL 3786 Moffat Lake Quesnel Lake PSYU elevation 1+0 PSB 211 from Vernon Nursery.

All stock was selected to be of excellent quality. Nursery descriptions are attached. The DF 4210 was considered to be the best quality interior Fir produced in containers, and the DF 2364 was the best stock of local provenance. When the stock was received, the fir was in excellent condition, but the pine plugs were frozen and there as some evidence of Botrytis.

The blocks were planted in May 1984. On the ripped area the trees were planted at the bottom of the furrows, and where possible in soil of mixed horizons which had sloughed into the furrow over winter. The trees were planted on the unripped area without trimming. The soil was relatively dry in the furrows but seemed moister on the unripped area.

Tree Marking

Each tree in each plot was marked with a wire flag. The plots and tree are numbered for measurement purposes. Facing away from the baseline the trees are numbered 1-49 starting from the lefthand corner.

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Base line

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Cariboo Forest Region

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