SX 86127 Q

Working Plan

Manual Root Pruning of PSB 313
Interior Spruce Stock Planted
On Prepared and Unprepared Spots

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R. Winter
Introduction


Carlson and Preisig (1981) reported that adjacent application of osmocote to trees stimulated root growth in all zones surrounding the seedling, not just the zone in which fertilizer was applied.

Site preparation trials undertaken by McMinn and Herring have indicated increased growth of spruce has occurred on site prepared sites.

It is therefore proposed that a silviculture trial be established in the Prince George Region to test the effect of different root culturing treatments and different site preparation methods on the root morphology and growth of Interior Spruce plug stock.

Objectives

1. To compare the effect on root development of three levels of manual root pruning with a control treatment.

2. To compare the root development of PSB 313 Interior Spruce treatments on prepared and unprepared spots.

3. To compare the root development of fertilized PSB 313 Interior Spruce trees with manually pruned plugs and a control treatment.

4. To compare height, caliper and survival of PSB 313 Interior spruce plugs manually pruned to three different plug lengths with that of fertilized plugs and a control treatment.
Trial Design

1. Treatments: PSB 313 Interior Spruce will be used in this trial.

CO - Control treatment with no manual pruning of roots.
MP1 - This treatment will consist of PSB 313 plugs which will be manually pruned 1 cm from the bottom of the root tip.
MP3 - This treatment will consist of PSB 313 plugs which will be manually pruned 3 cm from the bottom of the root tip.
MP5 - This treatment will consist of PSB 313 plugs which will be manually pruned 5 cm from the bottom of the root tip.
F1 - This treatment will consist of PSB 313 plugs fertilized at planting using Osmocote 18-6-12 (N, P, K) with a nine month release period (25°C).

These treatments will be planted on both site prepared and unprepared planting spots for a total of 10 treatments.

2. Layout

a. Two locations will be established in the Prince George Region: one site will be located in Vanderhoof District near Big Bend Creek; and one site will be located in the Ft. St. John District near Iron Creek.

b. Each treatment will consist of 4 replications of 35 trees spaced 2.0 meters apart. A total of 40 rows spaced 3.0 meters apart will be established. Each tree in every row will be properly identified with wire flags.
Seedling Requirements

<table>
<thead>
<tr>
<th>Region</th>
<th>Forest District</th>
<th>Location</th>
<th>Nursery</th>
<th>Seedlot</th>
<th>Stock Type</th>
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<tbody>
<tr>
<td>Prince George</td>
<td>Fort St. John</td>
<td>Iron Creek</td>
<td>I.F.S.</td>
<td>2665</td>
<td>1+0 PSB 313</td>
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<td>Vanderhoof</td>
<td></td>
<td>Big Bend Creek</td>
<td>I.F.S.</td>
<td>2674</td>
<td>1+0 PSB 313</td>
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</table>

Location 1 2 3 Prepared 4 5 Unprepared 6 7 8 9 10

| Location      | Co  | MP1 | MP3 | MP5 | Fl  | Co  | MP1 | MP3 | MP5 | Fl  |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Iron Creek    | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| Big Bend Creek| 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 |

Establishment: Total Trees Required = 2800

Root Growth Capacity Tests: 128

Shoot and root Dry Weights: 200

Total Seedling Requirement = 3128

Schedule of Assessments

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Estab/S87</th>
<th>Fall 87</th>
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<td>Interim Report</td>
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<td>Final Report</td>
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Silviculture Branch Sx Trial Specialist, Ralph Winter, will be responsible for monitoring the establishment of this trial. He will also be responsible for the manual pruning of the stock prior to planting.
R. Winter will be responsible for establishing two locations of the trial, properly marking treatment rows, and ensure that stock is properly planted. He will also be responsible for establishment, interim and final measurements of the treatments.

Ten trees from each treatment row will be selected for measurement for the duration of the trial (from establishment to final assessment). This will be done by measuring seedlings 11 to 20 in each of four replicated treatment rows. At each location 40 trees will be measured from each treatment. At each location a total of 400 trees will be accurately measured for height, caliper and condition.

A computer coding sheet will be used to record all field measurements in the field.

Tree #1-25 in each row will be assessed for survival and calculation of survival percent.

Excavation

In each treatment row, trees #26-35 will be used for extraction of samples for root examination. In each Fall of 1987, 1988 and 1991, 10 trees (taken randomly from the 4 replications of each row) will be excavated for each treatment. This will result in (10 trees/treatment x 10 treatments) 100 trees being excavated at each location. Excavation will be done with a shovel, ensuring that a 15 cm radius of lateral roots are undamaged. Photographs will be taken of an average tree for each treatment. The photograph will show root and shoot structures.
Dry weight shoot and root measurements will be carried out for the excavated trees. At the time of dry weight measurements, the following will also be taken for each tree:

1. Height (cc) of sample
2. Caliper (mm) of sample
3. Length (cm) of tap root
4. Diameter (mm) and location (A) of the five largest laterals of the stock

(A) The location will be coded as:

(1) if in the top third of root structure
(2) if in the middle third of root structure
(3) if in the bottom of the root structure.

**Establishment Report**

Fall 1987 - this report will include original stock measurements and summary, maps (1:15,840 or 1:20,000) showing location of test sites, maps (1:5000 or 1:10,000) showing location of staked lines within treatment blocks, a completed FS739 and a Planting Report. Trial locations will be documented on mylars and History Records. A copy of a coding sheet is enclosed to show how heights and root collar diameters will be recorded from establishment through to final assessment.

**Interim Report**

Winter 1988/89 and Winter 1991/92 - an Interim Report will be prepared based on the data from the first, second and third assessments.

**Final Report**

Winter 1996/97 - a Final Report will be completed based on four assessments.
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<th>TREATMENT</th>
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<th>RCD.1</th>
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