WORKING PLAN

SX88204Q

FIELD FERTILIZATION TRIAL

Ralph Winter

Silviculture Branch
89-05-06
INTRODUCTION

Studies by Burdett (1984), Thompson and Brockley have indicated benefits due to fertilization at time of planting. This trial will examine the benefits of adding slow release fertilizer at time of sowing and the resultant survival and growth of outplanted seedlings.

High rates of slow release Osmocote and Nutricote were incorporated into the original soil mix and sown with White Spruce at the Ministry of Forest's Saanich Test Nursery.

The seedlings will be outplanted in the Prince George Region in May 1989.

OBJECTIVES

To compare the height, caliper, survival and root development of outplanted seedlings which had been grown one year in soil mixtures incorporating varying rates of slow release fertilizers.

SEEDLOTS

The seedlots which will be used in this trial are:

Sw seedlot 8779 seedzone (HH) map sheet 9309

TREATMENTS

All treatments are comprised of 313A styroblocks. All treatments are based on 3:1 peat-vermiculite containing 2 kg/m3 Green Valley dolomite and 750 g/m3 Micromax. Nutrients provided are by using Peters 10-30-20 at 75-100 ppm N during active growth and 50 ppm N as a finisher, plus STEM at 1/2% of fertilizer weight throughout.

The following treatments will be outplanted:

1. Control. No other amendments
2. Incorporate 30 kg/m3 of 12 month Osmocote
3. Incorporate 30 kg/m3 of 360 day Nutricote
4. Incorporate 6.5 kg/m3 of 9 month Osmocote 18-6-12
5. Incorporate 7.3 kg/m3 of 180 day Nutricote 16-10-10
LOCATIONS

Prince George Region:

Two trial locations of White Spruce will be established on recently
denuded cutblocks 10 kilometers northwest of Chetwynd B.C. An
opening on mapsheet 93 P-12g near Moberly Lake has been chosen,
TSHL A01230, C.P. 13, C.B. 2 (no opening number available, logged

LAYOUT

A) At each location one species containing 5 different treatments
will be outplanted.

B) Each treatment will consist of 4 replications of 35 trees
spaced 2.0 metres apart within the row. A total of 20 rows
spaced 3.0 metres apart will be planted. Each tree in every
row will be identified with wire flags.

SEEDLING REQUIREMENTS

<table>
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<tr>
<th>LOCATION</th>
<th>SPECIES</th>
<th>SEEDLOT</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Chetwynd #1</td>
<td>SW</td>
<td>8779</td>
<td>140</td>
<td>140</td>
<td>140</td>
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<tr>
<td>Chetwynd #2</td>
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Establishment: Total trees required SW = 1400
Shoot/Root Dry Weights SW = 100
TOTAL FDC REQUIREMENTS = 1500

SCHEDULE OF ASSESSMENTS

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Establish S/89</th>
<th>Fall 89</th>
<th>Fall 90</th>
<th>Fall 93</th>
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<tr>
<td>Shoot/root wts</td>
<td>x</td>
<td>x</td>
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<td></td>
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<tr>
<td>Height/Caliper</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>Survival</td>
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<td>Interim Report</td>
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<tr>
<td>Final Report</td>
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METHODS

Seedlings will be outplanted by Silviculture Branch personnel, using standard dibble and handling techniques.

Seedlings 11-20 in each row at each location will be measured throughout the duration of the trial for height and root collar caliper. Trees 1-25 in each row, will be assessed for survival. Trees 26-35 will be used for excavations for photography and root examination.

ESTABLISHMENT REPORT

Fall 1989 - this report will include original stock measurements and summary, maps (1:15840 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 FS 739, ecological assessment and a planting report. Trial locations will be documented on mylars and History Records.

REPORT DISTRIBUTION

Research Officers - All Regions
Silviculture Officers - All Regions
Resource Officers - Chilliwack and Dawson Creek Districts
Silviculture Branch Agrologist
Manager, Nursery and Seed Extension Services
SX Trials Manual
MoF Library
Regeneration Programs Section
Silviculture Branch, 31 Bastion Square, Victoria, B.C. V8W 3E7

Silviculture Trial SX882040
Slow Release Fertilizer Trial

Purpose:
To compare the growth and performance of seedlings grown in styroblocks with varying concentrations of slow release fertilizer, with regular stock.

Method:
White Spruce Seedlings produced at the Puckle Road Test Nursery in 1988. Sw PSB 313A seedlings cold stored March to May 1988 at Puckle Road Test Nursery. Storage was not ideal, resulting in Botrytis being evidenced on all treatments. Seedlings planted at two sites in Chetwynd in May 1989 on freshly logged sites. Measurements were made at establishment, in the fall of 1989 and 1990. The attached graphs summarize the data from 1989 only. A report on the 1990 data is presently being prepared.

Results:
After 1 growing seasons: Significant differences in survival. Botrytis, heavily present on the 30 kg/m^3 of 12 month Osmocote treatment resulted in extremely poor survival. All treatments with slow release fertilizer were taller than the control at time of planting. After 1 growing season, trees with slow release fertilizer had greater height than the regular production stock (control). All treatments with slow release fertilizer had slightly larger root collars at planting. After 1 growing season the fertilized seedlings all had larger root collar diameters than the control.

Fertilized seedlings had up to 62 % more tree volume than the control. See graph 4.

Recommendation:
Sow more trees with slow release fertilizer at Puckle road this spring. We suggest more testing be done using 12 month slow release Osmocote. It is a more stable product than Nutricote. We suggest that 400 trees be grown for each of the following Osmocote rates - 6.5 kg/m^3, 13 kg/m^3, 20 kg/m^3, 30 kg/m^3 and 40 kg/m^3.

White Spruce seedlings should be sown for now with these rates of slow release Osmocote added. Seedlot should be selected for the Prince George Region ICH.
Graph 1. Survival
Summary of treatments for entire trial after one growing season

Graph 2. Mean Height
Summary of treatments for entire trial at outplanting and first growing season

Graph 3. Mean Root Collar Diameter
Summary of treatments for entire trial at outplanting and first growing season

Types of Treatment

1. Control
2. 30 kg/m³ of 12 month Osmocote
3. 30 kg/m³ of 360 day Nutricote
4. 6.5 kg/m³ of 9 month Osmocote 18-6-12
5. 7.3 kg/m³ of 180 day Nutricote 16-10-10
Graph 4. Mean Volume
Summary of treatments for entire trial at outplanting and first growing season

Types of Treatment

1 Control
2 30kg/m3 of 12 month Osmocote
3 30kg/m3 of 360 day Nutricote
4 6.5kg/m3 of 9 month Osmocote 18-6-12
5 7.3kg/m3 of 180 day Nutricote 16-10-10

Graph 5. Stem to RCD ratio
Summary of treatments for entire trial at outplanting and first growing season

Types of Treatment

1 Planting
2 Increment VolYr1