DRAFT

WORKING PLAN

SX 90108 Q

COMPARISON of the EFFECTIVENESS of
ANI-PEL PLUS or PROTEX RIGID SEEDLING PROTECTORS
to PROTECT PLANTED SEEDLINGS
from ANIMAL DAMAGE

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TITLE: Comparison of the Effectiveness of Ani-Pel Plus or Protex Rigid Seedling Protectors to Protect Planted Seedlings from Animal Damage

INTRODUCTION: Damage from animal browsing on young plantations may limit or distort growth of seedlings. Survival and possibly root development may also be affected. Concern over meeting free-growing objectives indicates that new products that may reduce animal damage need to be tested.

This trial will examine the effectiveness of two methods of preventing animal damage, particularly browse, to newly planted seedlings.

"Ani-Pel Plus" and "Ani-Spray" are trade names for the products manufactured by Ani-Pel Silviculture Ltd. and distributed by T.S. Research Ltd. of Surrey, B.C.

Ani-Pel Plus is a tabular chemical formulation of animal repellant, designed to break down in a time-released fashion. Ani-Pel Spray is a short term chemical formulation that acts as an animal repellant until the tablet becomes effective.

Problems with the tabular formulation in 1989 led to reformulation in 1990.

"Protex" is the trade name for rigid seedling protectors. The protectors also support seedlings, potentially reducing damage from vegetation press.

Protex is manufactured by NorPlex, Inc., Northwest Plastic Extrusion, and distributed by Texguard Forestry Products Ltd. of Vananda, B.C.

OBJECTIVES: To compare:

a) outplanted seedlings which have been sprayed with animal repellant at the time of planting and have had time released animal repellant tablets added at the time of planting, with

b) outplanted seedlings which have Protex rigid seedling protectors attached immediately following planting, and with

c) outplanted control seedlings.
Comparisons will consist of measuring the seedlings' height growth and root collar calliper and analyzing the results. A visual estimate of survival, condition and browse damage or incident will be recorded and compared. Root development will be visually compared.

A secondary objective is to determine the general time (season) that animal browse occurs in this trial location.

STOCK:

Df 1+0 PSB 313 Seedlot ________
Pl 1+0 PSB 211 Seedlot ________

All stock has been operationally grown and stored, with no special handling or treatments applied prior to outplanting.

TREATMENTS:

All treatments will be applied at the time of planting or immediately following:

<table>
<thead>
<tr>
<th>TREATMENT NO.</th>
<th>TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control. No other amendments.</td>
</tr>
<tr>
<td>2</td>
<td>1 tablet of Ani-Pel Plus (18-6-12) placed in planting hole and seedling sprayed with Ani-Spray</td>
</tr>
<tr>
<td>3</td>
<td>Seedling supported with Protex protectors</td>
</tr>
</tbody>
</table>

LOCATION: The chosen location is within the Invermere Forest District. The site ...

TRIAL DESIGN: Two location replications will be established, each comprised of the 3 treatments. For each treatment 140 seedlings (4 replications of 35 seedlings per row) are required at each location, for each species.
Of the 35 seedlings in each row:

10 - measured for height and calliper (#11-20)
25 - measured for survival (#1-25)
10 - available for root examination and destructive sampling (#26-35)

A total of 1680 seedlings (840 of each species) will be planted in the two location replications.

Trees will be spaced 2.0 m apart in rows with rows spaced 3.0 m apart. A total of 24 rows will be established at each location.

The order the rows are arranged in each replication will be random, chosen by rolling a die. Each face of the die represents a treatment and species. Once the order of four rows of a particular treatment have been determined, any reoccurrence of that face on the die will be ignored.

**METHOD:**

Seedlings will be planted using a planting shovel.

For Treatment #2, Ani-Spray will be mixed (with water at 3:1, water to Ani-Pel) and sprayed on the seedlings the day prior to planting. (One litre of spray, mixed, should cover approximately 3000 seedlings.)

Ani-Pel Plus tablets will be placed in the planting hole near the centre portion of the plug.

For Treatment #3, Protex protectors will be assembled with a wire support and placed around each seedling immediately following planting.

Screeing of vegetation is not recommended, since this may expose the seedling for animals to find and browse.

Large wooden stakes will mark the beginning and end of each row. Small wooden stakes will mark every fifth tree in each row. No plastic flags will be used, since these may attract wildlife.

During the second remeasurement, the Protex protectors will be lifted to cover the leader of each seedling and reassembled with the wire support.

During the final remeasurement, the protectors will
be removed from the seedlings.

**ASSESSMENT:**

At each remeasurement, condition (and survival) will be assessed as either dead or alive with good, average or poor condition. The standards for the qualitative condition assessment are:

- **Good (1)** = dark green needles, no stressed growth and maximum height increment;
- **Average (2)** = green needles, little stressed growth and average height increment;
- **Poor (3)** = chlorotic needles or poor color, stressed growth and less that average height increment;
- **Dead (0)** = no green needles evident, brown cambium.

Browse damage/incident will be recorded as follows:

- **NO DAMAGE (0)** = no sign of animal browse
- **LIGHT DAMAGE (1)** = minor sign of animal browse
- **HEAVY DAMAGE (2)** = major sign of animal browse
- **OTHER DAMAGE (3)** = not attributed to animal browse

The species of animal responsible for the browse will be noted, if positively identified. Damage other than browse will be coded and comments added.

Photography will illustrate the site conditions, examples of each condition category and browse damage/incident for each species, and other pertinent findings.

**SCHEDULE:**

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
<th>S/90</th>
<th>F/90</th>
<th>F/91</th>
<th>F/94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height/Calliper</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Survival</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Condition/Browse</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Move protectors</td>
<td></td>
<td></td>
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<tr>
<td>Photography</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Initial Report</td>
<td>X</td>
<td></td>
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<tr>
<td>Interim Report</td>
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<tr>
<td>Final Report</td>
<td></td>
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<td></td>
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<tr>
<td>Remove protectors</td>
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</tbody>
</table>
In addition to the above schedule, monitoring inspections may be conducted, if a general walkthrough of the trial area indicates sufficient animal damage to warrant an inspection. A monitoring inspection consists of assessing 25 seedlings (#1-#25) in each row for damage, survival, and condition.

The timing and depth of snowfalls may influence the monitoring schedule. Inspections may be conducted in late November, December, February, March and April of each year until no further browse is noted, with the final inspection including the Fall '94 measurements.

Organization of the measurement assessments is the responsibility of Silviculture Branch. Organization of the monitoring inspections is the responsibility of the Invermere District.

REPORTS:

Initial Report (Fall 1990) - this report will include original and first growing season stock measurements and summary; maps (1:100 000) showing location of test sites, (1:15 000) showing location of trial plots within treatment blocks and sketches showing the row order for stock treatment types; a completed FS 739, ecological evaluation and report on planting, and representative photography. Trial locations will be documented on mylars and History Records, with map clearance requested.

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