Aspen Control Trial - Prince George

WORKING PLAN

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Aspen Control Trial - Prince George

Objectives

1. To identify design problems and limitations of the MOF "Punch and Fill" injection system under conditions that closely resemble operational situations.

2. To obtain efficacy information for Roundup and 2,4-D Amine, applied by "Punch and Fill" injection for pre-harvest injection of interior deciduous trees.

Introduction

Chemical injection for deciduous tree control traditionally involves the use of an axe to frill the stems, and an oil can or squirt bottle to place the herbicide in the cut. Precise application rates are difficult to maintain and there is a high spillage hazard using this method. The "Punch and Fill" technique can provide a precise amount of chemical, limit operator exposure to the chemical and spills in the field, and requires less effort to punch a cavity than to bark-frill a tree using the axe.

Large residual deciduous trees left standing in logged cut blocks can supply excessive amounts of unwanted seed to the cut block. Falling these stems during logging may cause resprouting. Post-harvest herbicide injection will control the stems, but the dead standing trees may pose a hazard to regeneration or stand treatment crews. If pre-harvest stem injection is done sufficiently ahead of logging to allow complete chemical translocation, total clearcutting of all trees may eliminate unwanted seeding-in or resprouting.

Methods - Layout of Trial Area

Preharvest - Teardrop Forest Road

Within the permit area, three trial plots will be established (borders flagged). Each plot will contain 60 treatable aspen stems numbered 1-60 and marked with paint and cardboard numbers. Treatments will be randomly assigned to the plots.
Treatment:

Three basic treatments will be established at both locations as follows:

<table>
<thead>
<tr>
<th>Treatment Code</th>
<th>Treatment</th>
<th>No. of Stems</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>2,4-D Amine at 100% product</td>
<td>3 reps x 20 stems = 60</td>
</tr>
<tr>
<td>R</td>
<td>Roundup of 100% product</td>
<td>3 reps x 20 stems = 60</td>
</tr>
<tr>
<td>C</td>
<td>Control (No treatment)</td>
<td>3 reps x 20 stems = 60</td>
</tr>
</tbody>
</table>

Application Rate/STEM

The number of injections (chemical applied) per stem varies with stem diameter and herbicide used. Recommended rate of application for 2,4-D Amine is 1 ml product/3 cm DBH where as the manufacturers of Roundup recommend 1 ml product/5 cm DBH. These rates appear to offer adequate control of stems up to 20 cm DBH. Studies carried out by Silviculture Branch HQ during 1983 (Sx 83 401 Q - Alder Control trial, Duncan and SX 83404 G - Aspen Control Trial, MacKenzie) indicate that the prescribed rate does not adequately control stems with a dbh greater than 20 cm. Data received from these field trials indicate that these larger stems (20 cm DBH) require a proportionally greater amount of chemical than smaller stems.

To receive some indication of results we suggest for this trial larger stems the rate of application be double that prescribed by the manufacturer. In the case of 2,4-D Amine treatments, stems would receive the prescribed rate (1 ml/3 cm DBH) up to 20 cm DBH and above that diameter a rate of 1 ml/1.5 cm will be tested. In the case stems treated with Roundup, stems less than 20 cm DBH would receive 1 ml/5 cm DBH and above that diameter a rate of 1 ml/2.5 cm will be tested.

<table>
<thead>
<tr>
<th>Rates of Application 2,4-D Amine</th>
<th>Roundup</th>
<th>Rates of Application 2,4-D Amine</th>
<th>Roundup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dia. Chemical (ml)</td>
<td>Dia.</td>
<td>Chemical (ml)</td>
<td></td>
</tr>
<tr>
<td>0.1-3</td>
<td>0.1-5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3.1-6</td>
<td>5.1-10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6.1-9</td>
<td>10.1-15</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9.1-12</td>
<td>15.1-20</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>12.1-15</td>
<td>20.1-22.5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>15.1-18</td>
<td>22.6-25</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>18.1-20</td>
<td>25.1-27.5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>20.1-21.5</td>
<td>27.6-30</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>21.6-23</td>
<td>30.1-32.5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>23.1-25.5</td>
<td>32.6-35</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>25.6-27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.1-29.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.6-31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.1-32.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.6-34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Equipment

All herbicide applications will be made using the "Punch and Fill" hatchet and modified Hgvar Spotgun.

Assessment

At the time of treatment, the following data will be collected for each numbered stem

- tree number
- stem DBH (# of injections)

Also, equipment suitability (downtime, ease of operation, equipment problems) and number of manhours/60 stems for each treatment will be recorded.

Target trees will be assessed for mortality in the spring, 1985

Assessment

Data will be analyzed by chi square testing of contingency tables.

1. Effect of treatment level on mortality

<table>
<thead>
<tr>
<th>treatment level</th>
<th>control</th>
<th>Roundup</th>
<th>2,4-D</th>
</tr>
</thead>
<tbody>
<tr>
<td># alive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># dead</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Effect of DBH on mortality within treatment level

<table>
<thead>
<tr>
<th>DBH cm</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9 ....</th>
</tr>
</thead>
<tbody>
<tr>
<td># alive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># dead</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Site Information

Original Stand Label
Logging History
TSL
Opening
Latitude
Longitude
Lot
Land District

Pre-Harvest

NEO/Prince George - km 2123 on
Teardrop Forest Road
P1 (SA) 531-G
Proposed 1985
-
-
54011'
123904'
2650 2654
Cariboo
Vegetation Teardrop Forest Road

Woody Species

Alnus
Amelanchier alnifolia (Nutt.) Nutt
Chimaphila umbellata (L.) Barton
Lindera borealis L.
Rosa acicularis Lindl.
Rubus parviflorus Nutt.
Shepherdia canadensis Greene
Sorbus scopulina Greene

Herbaceous Species

Arabia nudicaulis L.
Arnica cordifolia Hook.
Aquilegia formosa Fisch. in D.C.
Clintonia uniflora (Schult.) Kunth
Corallorhiza maculata Raf.
Cornus canadensis L.
Dipsorium hookeri (Torr.) Nicholson
Epilobium angustifolium L.
fragaria virginiana Duchesne
Plantatera orbiculata (Pursh) Lindl.
Smilacina racemosa (L.) Desf.
Streptopus amplexifolius (L.) D.C. in Lam&D.C.

Tiarella trifoliata L.
Viola spp.

slide alder
Saskatoon berry
prince's pine
twin flower
prickly rose
thimbleberry
soapberry
mountain ash
sasparilla
heart leaved arnica
columbine
Queen's Cup
spotted coralroot
bunchberry
Hooker's fairyballs
firseed
blueleaved strawberry
round leaved rein orchid
false Soloman's Seal
clasping-leaved twisted stalk
foam flower
purple violet