THE EFFECTS OF VELPAR HERBICIDE SPOT APPLICATION
TREATMENTS TO CONTROL WOODY BRUSH IN
CONIFER PLANTATIONS

Conifer plantations in the SBSj and SBSc subzones within the Quesnel T.S.A. often suffer competition from aspen, birch, alder, willow, cottonwood and deciduous shrubs. The significance of this brush competition to conifer plantation growth has yet to be quantified but is believed to be a serious problem. To determine if the growth of planted conifers can be accelerated, brush control will be attempted using manual cutting treatments and three concentrations of Velpar liquid herbicide. The Velpar herbicide will be applied using basal spot application techniques.

In late May 1985, Velpar was applied to a half hectare of spruce plantation which was overtopped by deciduous woody plants. The application rate of 10 liters of product per hectare caused what appeared to be serious damage to the planted spruce. To determine if adequate brush control can be achieved without detrimentally affecting planted conifers, the following application rates of Velpar L will be applied using a 2 meter x 2 meter grid:

(a) 7.5 liters Velpar/ha x .240 Kg ai/liter = 1.8 Kg ai/ha (3 ml/spot)
(b) 10.0 liters Velpar/ha x .240 Kg ai/liter = 2.4 Kg ai/ha (4 ml/spot)
(c) 12.5 liters Velpar/ha x .240 Kg ai/liter = 3.0 Kg ai/ha (5 ml/spot)

The 2 meter x 2 meter grid was chosen as it allows more flexibility in locating spots so that they can be at least 1 meter away from planted conifers. It is also suggested by Dupont that for larger brush with better developed root systems, a wider spacing between spots should be employed (see attached sheet).

The Velpar treatments will be carried out as separate projects in both pine and spruce plantations. Each of the Velpar treatments will be replicated on 3 half hectare plots in each of the plantation types. In addition, 3 replications of a control and 3 replications of a manual cutting treatment will be installed in each plantation. All treatment plots will be one half hectare in size. The treatment plots will be rectangular in shape (i.e. 100m x 50m) with corner posts with metal tags and flagged boundaries following compass bearings. Suitable
buffer zones will be left untreated between plots (i.e. 10 meter width).

In each plantation, a total of 15 treatment plots will be established in a completely randomized design. A minimum of twenty subplots will be established in each half hectare treatment plot on a systematic grid. The subplots will be used to measure the height and diameter of the crop tree species (pine or spruce), crop tree damage and the height and damage to aspen, birch and willow. The subplots will be established along a 10 meter x 10 meter grid. At each subplot center, one crop tree and one specimen of each of the brush species will be tagged. The closest healthy specimen of each species will be selected for measurement and tagging. In the event that all 4 species being sampled are not present within a suitable distance from a given plot center, additional plot centers will be established until a sample of twenty specimens of each species is obtained. All plot centers will be mapped for ease of relocation.

The exact variables to be measured at each subplot are listed below. The subplots will be established prior to treatment and then re-assessed at one year, two years and five years after treatment. The re-assessment will be carried out near the end of the growing season to coincide with maximum plant growth.

Assessment #

1. Type of Asseement

Subplot Identity

2. Replicate

3. Treatment # (i) Control (ii) Manual (iii) 7.5 l/ha Velpar (iv) 10 l/ha Velpar (v) 12.5 l/ha Velpar

4. Subplot # 1-300 (3 replicates x 5 treatments x 20 subplots)

Seedling Specimen Description

Species 5. Name code (PIN CONT, PIC GLAU)

Morphology 6. Seedling Height

7. Seedling diameter at breast height

8. Current year height increment

9. Tolerance Rating 0 = no damage - 100 = top kill

Target Plant Specimen Description (repeated 3 times/plot)
Species
10. Name Code (POTPREM, BETPAPY, SALSPPS.)
11. Specimen Location - Azimuth bearing.
12. Specimen Location - Distance
Morphology
13. Specimen Height
14. Control Rating - 0 = Healthy - 100 complete kill

The Ministry of Forests will provide assistance in the initial location of the plots. Data will be provided to the Ministry of Forests who would conduct analysis of variance. Reports will be prepared by West Fraser Mills after each assessment is completed. The Ministry of Forests will provide numbered metal tags for labelling crop trees and specimens of each brush species. The following tags would be necessary for the design which has been outlined above.

Pl to P300 for Pine crop trees 300
Sl to S300 for Spruce crop trees 300
A1 to A300 two sets for aspen specimens 600
B1 to B300 two sets for birch specimens 600
W1 to W300 two sets for willow specimens 600
2,400 tags

Al Waters

AW/md
Attachment
VELPAR PROJECT - COST ESTIMATE

- plot boundary location and staking 10 mandays (5 supervisor, 5 technician)
- (30 plots) 15 in spruce, 15 in pine
- subplot establishment and tagging of sample trees
  (600 subplots) 300 in Spruce, 300 in Pine 8 mandays (4 supervisor, 4 technician)
- manual cutting treatments
  3 hectares 1.5 ha. in Spruce 1.5 ha. in Pine (3 mandays - technician)
- Velpar application
  9 ha. 9 - half ha. plots in Spruce, 9 - half ha. plots in Pine
  (2 mandays supervisor, 2 mandays technician)
- report preparation - 5 mandays supervisor

MANPOWER

Supervisor: 16 days x 8hrs/day x $20.73/hr = $2,653.44
Technician: 14 days x 8hrs/day x $19.05/hr = $2,133.60
VELPAR - 90 liters x $17.50/liter = $1,575.00
  6 plots x .5 ha x 7.5 liters Velpar/ha = 22.5
  6 plots x .5 ha x 10.0 liters Velpar/ha = 30.0
  6 plots x .5 ha x 12.5 liters Velpar/ha = 37.5

90.0 liters

6 plots = 3 replicates in Spruce + 3 replicates in Pine

VEHICLE 74.4 Km/trip x $.39/Km x 12 trips = $ 348.19
14% Overhead on the above costs ($6,710.23) = $939.43
TOTAL PROJECT COST: $7,649.66
GUIDE FOR CONCENTRATED SPOT APPLICATIONS
WITH VELPAR® L HERBICIDE

Rates of application per hectare are determined by the amount of VELPAR L applied per spot and the number of these spots applied in a given area.

<table>
<thead>
<tr>
<th>Grid Spacing</th>
<th># of Spots/ha</th>
<th>2 mℓ</th>
<th>3 mℓ</th>
<th>4 mℓ</th>
<th>6 mℓ</th>
<th>8 mℓ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 m x 1 m</td>
<td>10,000</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 m x 2 m</td>
<td>5,000</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 m x 1.5 m</td>
<td>4,400</td>
<td>8.8</td>
<td>13.2</td>
<td>17.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m x 2 m</td>
<td>2,500</td>
<td></td>
<td>7.5</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

Use the narrower grid spacings for small stemmed brush that does not have wide spreading roots. For larger brush, apply the spots of VELPAR L at wider spacings since the root systems extend further to intercept the concentrated columns of chemical.

*Soil type influences the amount of VELPAR L to use per hectare of brush. Soils low in clay or organic matter are less adsorptive; thus, lower rates perform well. Conversely, heavier soils which are high in organic matter or clay are more adsorptive; thus, higher rates are required to control brush.*

Field experience indicates that grid spacings tend to get stretched during commercial applications in the field. Because of this tendency, and the influence that spacing has on the rate of application, we recommend that periodic checks be made to ensure that the desired amount of product is being applied to a given area. The use of dye with the VELPAR L can be helpful to monitor your grid spacing and to determine those areas that have received treatment.

For more information, contact:

Kerry Teskey
64 Falton Court N.E.
Calgary, Alberta
T3J 1J3
(403) 285-3037.

or

Jamie Corcoran
344 Scottsdale Drive
Guelph, Ontario
N1G 2Z8
(519) 822-0732

* Registered trade mark of E.I. du Pont de Nemours & Company