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SITE PREPARATION OF BRUSHY SITES BY ULV GROUND
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SX 81508Q

SITE PREPARATION OF BRUSHY SITES BY U.L.V.
GROUND APPLICATION OF GLYPHOSATE

Final Report
1985

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Introduction

A herbicide trial to control False Azalea (Menziesia ferruginea) and White Rhododendron (Rhododendron albilorum), SX 81508 Q was initiated in August 1981 with the following objectives:

1. To estimate cost and production potential of the combination knapsack ULV ground spray equipment for preparation of brushy sites, and

2. To demonstrate efficacy of Ultra Low Volume application of glyphosate at 3% and 5% a.i.

Location

The trial area is located approximately 8 kilometres northeast of the Blue River community on the north side of Mud Lake, site details of the area are as follows:

TSHL A01029 CP 66 B1k E
Original Stand - BS 821 L
Aug. Slope - 15 to 20%
Aspect - Southerly
Elevation - 1675 m
History - Logged 1978

Pre-Treatment Conditions

As a result of no post-logging site preparation, both False Azalea and White Rhododendron have thrived. At the time of treatment they covered approximately 50% of the area, at an average height of 1 metre. The remainder of the ground cover consisted mainly of herbaceous vegetation which did not appear to present a major threat to establishment of conifer seedlings. At the time of treatment, considerable debris (group branches and frequent logs) still existed on the site, therefore making access difficult.

The extensive amount of skid roads throughout both blocks made treatment easier due to the fact that they could be used to dissect the area into smaller treatment blocks.

Equipment Used

The combination ULV/knapsack sprayer, developed by Silviculture Branch, was used for the treatment of both Blocks (see Figure 1). This equipment allowed the worker to carry out spraying with a minimum amount of refilling, thus causing a reduction in downtime when compared with conventional backpack sprayers.
Figure 1: The ULV/knapsack sprayer

**Treatments**

Two blocks, totalling 7.55 ha, were treated with Roundup on August 7-11, 1981, using the ULV/knapsack sprayer. Details of the treatments are given in Table 1.

**Table 1: Treatment Data**

<table>
<thead>
<tr>
<th>Block</th>
<th>Area (ha)</th>
<th>% Solution (a.i.)</th>
<th>Grams a.i./ha Roundup</th>
<th>Spray Mix Rate/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.25</td>
<td>3</td>
<td>480</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>3.3</td>
<td>5</td>
<td>850</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>7.0</td>
<td>control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Results**

1. Production

A record of on-site times was kept and a summary, by activity, is given in Table 2.
Figure 2: Pre-Treatment Brush Conditions

Figure 3: Block 2 - Brush Condition 2 years post-treatment
Figure 4: Border of Block 2 and Control, 2 years post-treatment

Figure 5: Border of Block 2 and Control, 2 years post-treatment
Figure 6: Pre-treatment photo, area to be treated with 3% a.i. solution of Roundup

Figure 7: Area treated with 3% a.i. solution of Roundup, 2 years post-treatment
The Beale's V-type clearing blade was modified in the F.S. Prince George shop in February of 1981. Modifications consisted of the following:

1) the horizontal cutting blade was cut back to the commencement of the front face of the plow.
2) an adjustable-depth stinger was added to the front of the plow.
3) two channels were cut through the bottom edge of the plow.
4) push bars were added to the top of the plow.

Field trials of the modified plow commenced on July 2nd at a site near the junction of the Yellowhead Highway and the Bowron Access Road.

The site was level and dry. The soil texture was a sandy loam. A dense growth of twinberry, thimbleberry, raspberry and tall grasses had come in since logging in 1977. There was a considerable amount of large debris on the area consisting of old unmerchantable stems and more recent windthrow poplar.

It was soon found that the channels in the bottom edge were not effective in allowing the passage of debris and, in fact caused material to jam rather than slide off the ends of the plow. Steel plates which were designed to adjust the size of the opening were moved to their lowest position to effectively eliminate the channels. The plates soon buckled and had to be replaced by proper welded inserts.
The stinger was tried at different levels and was found to work best at a level of approximately 7 cms below the bottom of the plow. In essence the stinger is necessary to pick up logs lying on the surface of the ground but should not project more than is necessary as it tends to hold material and cause a deep central rut.

A double layer of Ti steel section 87 cms long cut from the original horizontal cutting edge on the plow was welded to each outer extremity of the plow in order to lower the cutting level in the region where the clearing depth is most critical. The double plates lowered the cutting depth approx. 5 cms. This alteration had the desired effect in that the operator was better able to attain the desired screeching level at the outer edges.

In a later refinement the depth of the outer cutting edges were extended to a depth of 15 cms below the front edge of the plow. This latter configuration appeared to be the most effective.

Material tends to accumulate in certain regions of the plow rather than slide off the ends of the plow. In particular the extreme curvature of the lower section of the face appears to form a pocket which holds soil.

Discussion:

The action of a V plow is to push material in a direction at right angles to the blade until it has reached a point beyond the ends of the blade. If the material is cohesive it can be formed
into large rolls, if non-cohesive the individual particles will roll or slide ahead. There appears to be a fundamental difference in that a "sod" (roll-forming) plow has a deep curvature whereas a gravel plow has a shallow curvature. The deep curvature would appear to result in a larger surface of contact between the soil and the plow and thus increase the total sliding friction.

As presently designed, ours is a sod type plow. Unfortunately our "sod" is very broken up and the roll action seldom happens. This leaves us with the detrimental effect of increased friction without the benefits of a "roll". My inclination would be to reduce the curvature of the blade.

Commensurate with the foregoing, the cutting edges should be angled forward slightly to present a more uniform face.

It would also seem desirable to sharpen the angle of the V in order to assist in side casting.

The stinger should be incorporated into the plow in the same manner as the Timberland plow.

Apart from the stinger and the extended cutting edges at the outer extremities, the leading edge of the plow should be as smooth as possible to assist the sliding of the debris against the plow.

While improvements as suggested in the foregoing should make this plow suitable for a considerable amount of site preparation, there would be an advantage in having a variable-height skid plate which would float the unit at different levels depending on the level of scarification that is required.

Continuing project