Grass-legume Seeding Trials to Control Brush Along Streambank Buffer Strips – FRDA Project 2.37

INTRODUCTION

Moist and rich sites in coastal lowland areas of the Vancouver Forest Region often pose a high brush hazard. The disturbance caused by clearcutting and burning on these sites often results in brush establishment which can reduce the growth and survival of planted conifers. The severity of the competition depends on the brush species present and the shade tolerance of the planted trees. In most cases, however, some treatment is required to release the planted seedlings. Manual treatment is effective if repeated, but such repeated treatments are costly. Herbicides may be more economical to use, but their application is sometimes prohibited (e.g., on sites adjacent to water courses which are fish-bearing or used as a domestic water supply).

As a result, successful establishment of coniferous plantations often requires an alternative silvicultural regime. One potentially useful approach is to establish a cover crop of vegetation which would exclude brush species yet not inhibit conifer growth.

This memo describes the objectives, methods and some early results of grass-legume seeding trials established at three locations within the Vancouver Forest Region.

OBJECTIVES

The trials have two main objectives:

1. to measure the efficacy of using grass-legume mixtures in controlling non-crop vegetation on fresh to moist, nutrient-rich sites that have been recently logged and burned.
2. to measure the height and survival of Douglas-fir, western redcedar and grand fir within the seeding treatments compared to that within adjacent control and manually brushed areas.

METHODS

Three sites likely to be invaded by thimbleberry, salmonberry and red alder were selected within the CWChm subzone near Vancouver, B.C. At Sechelt, a 15-year-old red alder stand was slashed and burned in summer 1987 and seeded in September. At Chilliwack, a 35-year-old mixed hardwood stand was prepared as in Sechelt. At the UBC Research Forest near Haney, a 120-year-old mixed conifer deciduous stand was scarified, piled and burned in winter 1987 and seeded in March 1988. Two seeding treatments were applied: the first, a grass-legume mixture consisting of 30% perennial rye, 20% Canada bluegrass, 20% creeping red fescue, 20% birdsfoot trefoil, and 10% alsike clover; and the second, 100% birdsfoot trefoil. The seeding rates for the two treatments were 30 kg/ha, and each treatment was accompanied by 150 kg/ha of 20:24:15 fertilizer. The third treatment was a manual brushing to remove competing vegetation around the planted conifers. This was done twice each year during the growing season. All sites were planted in March 1988 with 2+0 Douglas-fir, 2+0 grand fir and 1P+1 western redcedar.

RESULTS

At Sechelt, grass-legume cover significantly reduced the height growth of Douglas-fir. The height of western redcedar and grand fir, however, did not differ significantly among the four treatments (Figure 1).

![Height growth results at Sechelt, B.C.](image)

FIGURE 1. Two-year height growth results at Sechelt, B.C.

The cover of grass-legume species and legumes averaged 58 and 39%, respectively, after one growing season at Chilliwack. In the control plots, the four most abundant brush species after one growing season were Cirsium vulgare, Ribes howellii, Rubus parviflorus and Sambucus racemosa (Table 1). (Abundance is defined as % occurrence by subplot.) For example, C. vulgare occurred on 18% of the subplots in the grass-legume treatment, and within those subplots its average cover was 10%.
TABLE 1. Average abundance (AA) and cover (C) for four brush species within three treatments at Chilliwack after 1 year

<table>
<thead>
<tr>
<th>Species</th>
<th>Grass-legume AA(%)</th>
<th>Legume AA(%)</th>
<th>Control AA(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cirsium vulgare</td>
<td>16/10</td>
<td>16/14</td>
<td>30/31</td>
</tr>
<tr>
<td>Ribes howellii</td>
<td>16/5</td>
<td>59/8</td>
<td>58/8</td>
</tr>
<tr>
<td>Rubus parviflorus</td>
<td>39/3</td>
<td>79/14</td>
<td>89/14</td>
</tr>
<tr>
<td>Sambucus racemosa</td>
<td>15/5</td>
<td>41/6</td>
<td>45/7</td>
</tr>
</tbody>
</table>

CONCLUSIONS

Initial results indicate that grass-legume treatments result in reduced cover of major competing species. However, conclusions about conifer response to these treatments would be premature after only 2 years. Future remeasurement is planned.

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