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ESTABLISHMENT REGIMES ON HIGH SITE - BRUSH SUSCEPTIBLE TFL 6 HOLBERG

Working Plan
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Establishment Regimes on
High Site, Brush Susceptible
TFL 6 - HOLBERG

R E S E A R C H P L A N

I - Purpose

The purpose of this trial is to evaluate the effectiveness of combinations of establishment treatments involving 3 herbicides, 3 planting stock types and fertilization on weed prone, high site alluvial land.

II - Background

The S4 alluvial ecosystem association described by Lewis (1983) is among the most productive forest ecosystems in Canada. The high productivity and easy access places these ecosystems in a high reforestation priority for forest management. However, establishment of new crops of Sitka spruce following harvest is difficult and costly because of the intensive weed competition, principally from Red alder Alnus rubra salmonberry Rubus spectabilis. These weed species are generally present in significant amounts in the open, old-growth stands prior to logging and quickly reoccupy the site following logging. Under such conditions, immediate replanting with large planting stock is frequently unsuccessful, in regaining full occupancy.

The sprouting habit of the weed species involved necessitates the use of herbicides for effective, economic weed control. Three potentially useful herbicides are proposed for this trial, Roundup (Glyphosate), Garlon (Trichopyr) and Velpar (Hexazinone).

All three have been reported to be effective in controlling Rubus species (Warren, 1982; Hay, 1977 and Newton & Knight, 1982) while showing relatively little effect on Sitka spruce.

The frequency of weed control application can be expected to be lower if initially large planting stock are used. Since suitably large stock may not always be available and because the cost advantages of large stock have not been clearly shown in relation to the intensity of weed control operations needed, a range of stock types is to be used to more clearly define these relationships.

Experience with planted Sitka spruce, both locally and in the U.K. (Everard, 1974) shows that Sitka spruce undergoes a growth check following planting, even on such rich sites. Loss of even one year's height growth on such sites can significantly reduce the chances of successful establishment. Fertilization has been shown to be successful in overcoming early planting check and diammonium phosphate has been shown to be effective in this regard (Barker, 1982).

Interactions between treatments can be expected to occur. Combinations of treatments giving optimum results may thus vary, although the inherent cost components will vary. The proposed trial will allow the assessment of a number

different options with respect to the inputs required to achieve successful regeneration of these sites.

III - Methods

The study area consists of 2 alluvial terraces adjacent to the Koprino River. (see map). Because of the dense cover of brush, the area must be scarified using a backhoe fitted with a raking claw to avoid soil damage.

1. Treatments:

Three treatment levels will be used:-

a. Stock type.

i) 1-0 Sitka spruce
ii) 1+1 Sitka spruce
iii) 1+2 Sitka spruce

b. Herbicide.

i)	Roundup	Applied once at 2.5 kg ai/ha in year after planting as 1m band around tree.
ii)	Garlon	
iii)	Velpar	
iv)	Control	
v)	Roundup	Applied yearly (or as necessary) at 2.5 kg ai/ha to free growth stage as 1m band around tree.
vi)	Garlon	
vii)	Velpar	

c. Fertilizer.

i) 125 gm diammonium phosphate per tree in slits 20 cm from base of tree.
ii) Control.

2. Treatment Units:

An experimental unit will be a square plot, 7 trees by 7 trees, planted at 1.8 x 1.8 m nominal spacing. This will reduce the plot size needed and speed crown closure. It will also permit future assessment of stand development parameters such as basal area per hectare produced. Individual trees will be staked and tagged.

3. Design:

A randomized complete block factorial design with 4 replications of 42 plots (36 treatment + 6 controls) each will be used.

4. Measurement:

During planting, a sample of 50 trees will be measured for root collar diameter (R.C.D.) and height to define stock classes. The time required to plant each plot will also be recorded.

After one growing season, a survival assessment will be made. Measurements of RCD, height and health class for each of the inner 25 trees on each plot will be made leaving a 2 row buffer between each plot.

Herbicide effectiveness will be scored in two ways. Damage to trees will be assessed as a score.

1. Terminal discoloration = 0, 1
2. Terminal dead = 0, 1
3. Percent foliage browned = xx%.

Thus, a tree with a discoloured but live tip with 20% of its foliage browned would be recorded as 1020.

A second score will involve assessment of the rate of weed regrowth on a plot basis. This will be a subjective rating based relative to the controls on a scale of 1 to 4 by 25% classes. For example, 1 will represent ¼ (or less) the amount of weed regrowth relative to the control.

Measurements will be taken during the fall of 1984, 1985, 1986, 1988 and 1993.

Analyses will follow the ANOVA outlined in Table 1.

5. Reports:

Establishment Report	1985
Interim Results	1986
Final Report	1994