Effect of Scalp Size on Performance of Planted Conifer Seedlings

R. Fahlman
District Silviculturist
Prince George East
Bill Wexler
Jan 8/67

Dear Mr. Brown:

I think this would be an excellent subject for study.

The proposed project is clearly stated as to objectives and methodology.  Chances of success are high.  Design is simple and robust.  I completely agree with your opinion.

I agree with coming out the trial.  Please see attached note.

Bill
1) **Purpose of Project**

In instances where other forms of site preparation, such as prescribed fire or mechanical treatments could not be undertaken or were unsuccessful in providing a suitable planting medium, hand screening or scalping to remove existing vegetation and accumulations of organic matter may be used to prepare planting spots. As well as exposing a suitable planting medium, such treatment may also reduce vegetative competition for moisture and light and increase soil temperature in the rooting zone. Where scalping is required, the present practice is to specify a 900 cm² (30 x 30 cm) area be treated. Manual scalping of an area this size is both difficult and time consuming which is reflected in lower planter productivity and ultimately in higher costs.

The choice of a 900 cm² spot is arbitrary and it has been suggested by both planting contractors and Ministry staff that a smaller sized scalp may be just as effective in allowing successful spruce seedling establishment. As the recent development of a hand-operated, mechanized screefer may make the production of large-sized scalps feasible, a larger 2500 cm² scalp will also be included for comparison.

2) **Objectives**

To assess and compare the growth and survival of conifer seedlings planted on different-sized scalps.

3) **Proposed Methods**

**Treatments:**

Five levels of scalping will be tested

a) untreated control
b) 100 cm² scalp (10 cm x 10 cm)
c) 400 cm² scalp (20 cm x 20 cm)
d) 900 cm² scalp (30 cm x 30 cm)
e) 2500 cm² scalp (50 cm x 50 cm)

Specification for scalping depth will be made after examining specific sites. However, the major criterion for determining depth will be the requirement for exposure of an acceptable rooting medium.

4) **Experimental Design and Plot Layout**

A completely randomized design consisting of five, 20 tree replicated of each treatment will be used. The experiment will be repeated on a variety of sites. Both lodgepole pine and white spruce seedlings will be tested.
Each replicate will consist of a 20 tree line plot. The beginning and end of each plot will be marked with a labelled wooden stake. Every fifth tree in each line will also be marked with a wooden stake.

5) Assessments

Assessments will be done at the end of the first, second, third and fifth growing seasons after planting. After the first growing season the following variables will be measured: seeding caliper, total seedling height (nearest cm), current height increment (nearest cm), survival, seedling vigour and degree of vegetative competition. Coding for the last two variables are attached (from Herring and Pollack, 1985). Subsequent assessments will be similar except for the exclusion of current increment measurement. Analysis of variance will be carried out on growth and survival data.

6) Research Schedule:

Spring, 1987: Install first experiment - Establishment Report

Fall, 1987: First year assessment

Fall, 1988: Second year assessment - Progress Report

Fall, 1989: Third year assessment - Progress Report

Fall, 1991: Fifth year assessment - Final Report

7) Location

The first installation will be near Vama - Vama Creek, approximately 41 km East of Prince George. A variety of site preparation treatments have been used in the vicinity, making it an ideal location for demonstration purposes. See attached location maps.

8) Reference

Estimates of Degree of Overtopping for Crop Seedlings in Vegetation Management Trials

Degree of overtopping by competing vegetation is a subjective assessment of crop tree competitive stress. It is based on a judgement of the anticipated height-growth trajectory of the crop tree relative to the surrounding vegetation species. Three relative levels of overtopping exist as follows:

Code 2: **Overtopped** - the leader of the crop tree is at present overtopped by surrounding vegetation; crop tree available sunlight is greatly reduced.

Code 1: **Threatened** - the leader of the crop tree is at or near the same height of the surrounding vegetation, but is likely to be overtopped within two growing seasons.

Code 0: **Free to Grow** - the leader of the crop tree is well-above the surrounding vegetation and is not likely to become threatened.
APPENDIX 2(d)

Estimates of Crop Seedling and Target Plant Vigour in Vegetation Management Trials

The assessment of crop seedling vigour is a highly subjective estimate. Assessment criteria include foliage colour, needle number, needle length, shoot elongation, and stem calibre. A five-class code is proposed as follows:

0 - dead (must be confirmed by knife-cut).

1 - moribund, near death, little or no visible shoot growth.

2 - poor vigour, minimal shoot growth, small needle complement, etiolated shoot development, tendency for poor form due to inadequately rigid stem.

3 - moderate vigour, overall growth rate and condition lower than for open-grown seedlings.

4 - good vigour, growth rate and quality similar to open-grown seedlings.

Refinement or revision of this morphologically-based assessment code may be possible as experience accumulates in vegetation management studies.

Assessment of target plant vigour uses the same five-class code. Criteria for assessment may be based on the foliage complement of woody plant species, the growth rate and plant size achieved by annual and perennial species, and the overall dominance exhibited by the plant in the subplot. The target plant vigour description is designed to augment cover, condition, damage, and control ratings to more clearly interpret treatment responses.
Effect of Sculp Size on Performance of Planted Conifer Seedlings

Officer I/C: R. Fahlman

Location: Vama Creek

Region/District: Prince George/Prince George East

Objective: To assess and compare the growth and survival of conifer seedlings planted on different sized scalps.

Progress: Working Plan completed Spring 1987
Trial Establishment Spring 1987

Next Scheduled Assessment/Treatment: First Assessment - Fall 1987

Report Distribution: Silviculture Branch - SX Trial Coordinator
R.R.O. - Prince Rupert, Prince George, Cariboo, Kamloops, and Nelson
Rn & Site Prep Co-ordinators - Prince Rupert, Prince George, Cariboo, Kamloops, and Nelson
District Silviculturists - Prince George Region

- Incomplete