To: Curt Clark  
Silviculture Branch  
Victoria, B.C.

From: Vancouver Forest Region

Date: August 23, 1989

Enclosed please find a copy of a working plan for an SX trial. We are a bit ahead of the game and had to start planting before the plan was reviewed. It has been discussed with District staff and licensees working in the area. Note that the costing is shared between the Squamish District and Forest Sciences Section. Please let me know what the SX number will be.

/SJE

Encl.

SX89-120 V
SUMMER TO FALL PLANTING OF DOUGLAS-FIR
ON DRY SITES IN THE
COAST-INTERIOR TRANSITION

Proposal for an SX Trial
SX84/20 V

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Introduction

Problems with the Coast Interior Transition

Reforestation success on warm, dry sites at low elevations in the Coast-Interior Transition has proven difficult. Consistent results have not been obtained. Repeated failures are the rule rather than the exception. Species performance, planting technique, stocktype, time of planting, and severe environment of clearcuts have all been blamed.

Although reforestation success is more than just survival, survival has been unpredictable. Our immediate interest is to improve survival - subsequent growth appears to be acceptable except under severe brush conditions. Techniques to improve survival are needed.

Summer and fall planting

Microclimate data gathered over the last three years in the Ryan River and Pemberton Valley suggests that an ample planting window exists in the fall for planting these sites.

Summer and fall planting of Engelmann spruce and lodgepole pine has proven very successful in the interior of British Columbia. With early sowing and subsequent photoperiodic control of budset of Douglas-fir becoming a more common nursery practise, there is increased availability of a suitable summer and fall stock. This stock does not have to be held at the nursery late into the autumn and become pot-bound. Neither does the stock have to be cold stored. The stock is not expected to flush in the plantation but will still produce roots. A similar program for Douglas-fir needs to be tried.

Antitranspirants

Where soil moisture is limiting seedlings will desiccate through transpiration. Normally thickened cuticles, epicuticular waxes and stomata control this transpirational loss of water. Where leaves are still succulent transpirational losses of water can occur rapidly. This is a common occurrence in flushing seedlings - eg. spring planted stock.

In ornamental crops anti-transpirants (Gale and Hagan 1966) have been used to permit easier transport and storage of plants and protection from transplanting shock. Anti-transpirants have been experimented with in silviculture (Simpson 1984; Colombo and Odum 1987) but no operational plantation results have been reported. The forestry experience indicates that anti-transpirants may be promising. Small, informal trials conducted by G. Hues (Fletcher Challenge, Boston Bar) show a great deal of promise.

Combining an anti-transpirant treatment with a seedling with set buds, thickened cuticles, epicuticular waxes, and stomatal control may give a very drought-tolerant seedling that is still capable of producing roots.

Objective

To evaluate the effect of summer and fall planting in combination with antitranspirant treatment on survival and early performance of Douglas-fir in the Coast-Interior Transition.
The project compliments two other projects in the Pemberton area:

1. Ryan River Studies: FRDA 3.2; FL.A19215 Intensive reforestation research trial.
2. Birkenhead SX trial: SX89112G
3. Adds to FRDA 2.52 workshop.

Methods

Microclimate monitoring

A complete microclimate station similar to that used in the intensive reforestation study in the Ryan River will be used. The climate monitoring program is designed to monitor the general climatic conditions during the experiment so that the results can be applied to other sites in other years. Climate will be continuously monitored throughout the experiment and the data stored in a Campbell Scientific CR10 datalogger connected to an array of sensors.

Soil moisture and temperature will be monitored at 15cm and 30cm. All soil temperatures will be made using matched curve, Penwall waterproofed thermistors. Soil moisture tension will be measured with Delmhorst soil moisture resistance blocks. The thermistors and resistance blocks will be installed horizontally, immediately next to and below the seedling plug. Daily mean, maximum, and minimum temperatures and moisture will be recorded.

Air temperature, humidity, and rainfall will be also be monitored. All measurements will be replicated and extant sheltering treatments will be monitored. Measurements will be made hourly.

Planting

Depending upon stock suitability, five plantings will be made at two week intervals starting in late July. 180 trees will be planted at each planting date: 90 control; 90 antitranspirant treated. Space permitting, trees will be planted in 30-tree rows. Extra trees will be planted to allow excavation in fall 1989.

Outplanting plots at Surrey Nursery

All plantings will be complimented with an outplanting in an unirrigated bed at Surry Nursery. This outplanting will serve as a control on the experiment.

Seedling assessment

In the establishment year only seedling survival will be assessed. Flushing and other morphological attributes will also be noted. Extra seedlings will be excavated and root growth reported.
Tasks

I. Establishment

Set up climate station for trial and previously established SX trial. Layout trial area. Prepare working plan. Co-ordinate with Hybrid nursery.

II. Monitoring

A. Microclimate

Periodic visits to maintain climate station and interrogate data logger.

B. Planting and monumentation

Conduct five plantings of 180 trees each planting: 90 control, 90 treated with an anti-transpirant. Checks on the vigor of each planting will be made.

C. Nursery outplanting trial

Establish 25 trees/treatment in outplanting plots at Surrey Nursery.

D. Fall measurement

Measure all trees planted.

E. Workshop review session

Collate data from 1989 and prepare as summary graphics. Participate in a 1 day field review of Ryan River and Birkenhead experiments. Workshop to be held the week of October 20th.

III. File Report

As per other establishment reports. To be distributed to interested parties through the Vancouver Region.

Landmarks

Proposed payment is by landmark paid to Pacific Phytometric Consultants.

I. Establishment (Vancouver Forest Region) 1,590.50
II. Monitoring and October Workshop (Squamish Forest District) 6,000.00
III. File report (Vancouver Forest Region) 1,100.00

Total 8,690.50
References

