1993 TRIALS - SAANICH TEST NURSERY

SUBJECT: COPPER ROOT PRUNING COMPARISON TRIAL

Background

Copper coated containers are becoming widely used for growing pine in B.C. forest nurseries. There is some interest in growing other species such as interior spruce and interior Douglas fir in copper coated blocks, so these will be tested in this trial. Since some nurseries are using Beaver Copperblocks® while others are using standard blocks with an application of copper carbonate in latex paint, both types will be used, along with standard styroblocks for a control treatment. Recommendations made by Nigel Burdett in 1986 will be tested in the two sub-trials listed below.

Sub-trial A - Lime Rate Comparison

Nigel Burdett recommended that pH levels of 4.6 to 5.6 must be maintained to keep copper availability and toxicity problems to a minimum. Different levels of lime will be tested in a control as well as the two options for copper blocks - Beaver Copperblocks® versus copper painted blocks. The proposed treatments for this trial are:

1. Ventblock 160 - 2 kg/m³ dolomite lime
2. Ventblock 160 - 4 kg/m³ dolomite lime
3. Ventblock 160 - no lime added
4. Copperblock 160 - 2 kg/m³ dolomite lime
5. Copperblock 160 - 4 kg/m³ dolomite lime
6. Copperblock 160 - no lime added
7. Ventblock 160 - with copper paint applied - 2 kg/m³ dolomite lime
8. Ventblock 160 - with copper paint applied - 4 kg/m³ dolomite lime
9. Ventblock 160 - with copper paint applied - no lime added

Seedlots: Pli 32587 B2\DSA\1150 m.97% germ\343 s/g.
Sx 08421 B3\DWL\1450 m.81% germ\634 s/g.
Fdi 30885 B2\DSA\90% germ\114 s/g.

The trial will be greenhouse grown as a 1-0 (spring 1994 planting) crop at Saanich Test Nursery. Standard growing media consisting of 3:1 peat:vermiculite will be used. The fertilizer used will be Plant Prod 20-8-20, because it is low in calcium and magnesium. The growing media will be monitored weekly throughout the growing season for pH levels. Some static height measurements will be taken. Samples of media, foliage and roots will be taken for analysis at least three times during the growing season to check for copper, calcium, magnesium and other nutrient levels. At the end of the growing season, random samples will be taken for morphological analysis. Samples will be lifted for RGC testing in early 1994 and for nursery field bed outplanting.
Sub-trial B - Fertilizer Comparison

Nigel Burdett recommended using copper root pruning only at nurseries with water containing less than 10 to 15 ppm calcium and magnesium combined. Seedlings grown at STN in 1992 using a high Ca and Mg fertilizer show no adverse signs however. Since Saanich Test Nursery has very little Ca or Mg in the water, this sub-trial will compare stock grown with Plant Prod 20-8-20 (low Ca and Mg levels) versus Plant Prod 12-17-29 with CaNO3 and MgSO4 (combined Ca and Mg levels of 75-100 ppm at 100 ppm N). The proposed treatments for the trial include:

1. Ventblock 160 (2 kg/m3 lime) - using PP 20-8-20 - same as Tr. A1
2. Copperblock 160 (2 kg/m3 lime) - using PP 20-8-20 - same as Tr. A4
3. Ventblock 160 (2 kg/m3 lime) with copper paint applied using PP 20-8-20 - same as Tr. A7
4. Ventblock 160 (2kg/m3 lime) - using PP 12-17-29 with CaNO3 and MgSO4
5. Copperblock 160 (2 kg/m3 lime) - using PP 12-17-29 with CaNO3 and MgSO4
6. Ventblock 160 (2 kg/m3 lime) with copper paint applied - using PP-12-17-29 with CaNO3 and MgSO4

The species and work required will be the same as for sub-trial A.