Re: SX 90 ---0 Potassium Silicate Trial

Introduction

A number of reports involving a variety of crops have indicated that, in some plants, silicon is essential to the plants general health and its resistance to fungal disease infection. Some crops appear to profit from supplemental silicon application (e.g. cucumbers), showing increased growth and yield; while others (e.g. tomatoes) don't realize the same benefits. Eric van Steenis feels that some potential exists to reduce the susceptibility of conifer seedlings to Botrytis infection or other disease organisms (i.e. root rots) using silicon application. For conifer seedlings there don't appear to be any published reports dealing with optimum tissue silicon levels or attempts to modify tissue levels. Also, there doesn't appear to be any information on conifer silicon uptake (active uptake, passive uptake, or rejection) or the effects of silicon levels on other nutrients. This trial will attempt to elevate plant tissue silicon levels through the frequent application of various levels of potassium silicate and to assess any improvements in morphology or disease resistance.

Experimental Design

Each treatment will consist of 5 replicates loaded with the standard 3 peat:1 vermiculite media, incorporating 2 kg/m³ 12 mesh and finer dolomite lime, and 0.75 kg/m³ Micromax. All treatments will be double-sown in PSB 313A’s. Silicon application will be in the form of Kasil #6, a potassium silicate solution. Adjustments will be made using potassium fertilizers and phosphoric acid to maintain constant levels of all other nutrients. STEM will be applied throughout the season at 0.5% of the fertilizer weight.
Seedlots

The seedlots to be used are:

Sw 4177 (MRB) 93H11/B3/4177/.91 - 95% 436 s/g
Fc 16501 (CSM) 92D08/B3/16501/.40 - 94% 99 s/g
Cw 20202 (1050) 92H04/B2/20202/0.23 - 91% 816 s/g
Hw 18752 (1010) 92F12/B3/18752/0.42 - 94% 422 s/g

Treatments

1. Control: standard Green Valley Regime
   Grower - 20-20-20 at 100 ppm N
   Finisher - 20-20-20 at 50 ppm N

2. 25 ppm Silicon Supplement & Green Valley Regime
   Grower - 20-20-20 at 100 ppm N
   Finisher - 20-20-20 at 50 ppm N
   Supplement - Kasil #6 at 25 ppm Si

3. 50 ppm Silicon Supplement & Green Valley Regime
   Grower - 20-20-20 at 100 ppm N
   Finisher - 20-20-20 at 50 ppm N
   Supplement - Kasil #6 at 50 ppm Si

4. 100 ppm Silicon Supplement & Green Valley Regime
   Grower - 20-20-20 at 100 ppm N
   Finisher - 20-20-20 at 50 ppm N
   Supplement - Kasil #6 at 100 ppm Si

Evaluation

Static samples will be collected during the season and used to generate growth curves. Random samples collected at the time of bud-set and at the end of the year will be processed for morphological comparison. Tissue analysis samples will be collected throughout the growing season and analyzed for silicon levels. Soil samples will be collected and pH and conductivity will be measured. Frequent observations will be recorded with regard to incidence of disease and general appearance (colour differences, growth). Observations will be made and recorded, during extraction and packaging, regarding numbers culled on the basis of root development or disease.

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