MEMORANDUM

To: A. E. MacDonald
From: Silviculture Branch
Date: 87-03-30
File: 955-21

Re: Sx 87203Q Nutrient Trial (Control of Fast Growing Species)

Introduction

This trial will further explore new ideas in controlling seedling nutrition and growth as demonstrated in Sx 86206Q. The emphasis in this trial will be in using nutrition to control the height of fast growing species, while developing other parameters to target levels.

Experimental Design

Treatments will all have an adequate supply of trace elements, except for sulphur, to ensure that observed effects are due to nutrient manipulations and not to inadvertent trace element deficiencies. Treatments will contain either FTE 503 at 130 g/m³ or Micromax at 750 g/m³. All treatments will be based on a standard 3 peat:1 vermiculite growing medium containing 3 kg/m³ Green Valley 10 mesh and finer dolomite lime.

The seedlots to be used are:

Sw (SZ 3110) 93H11/B3/4177/.914 - 89%
Cw (SZ 1070) 92J11/B3/3546/.860 - 84%
Fdc (SZ 1090) 92M10/B3/7752/.460 - 94%
Ss (SZ 1100) 9303/B3/3981/.04 - 95%

All treatments are to be double down and thinned to one seedling per cavity.

Fertilizer Application Rates

<table>
<thead>
<tr>
<th>Fertilizer Application Rates</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FTE 503</td>
<td>130 g/m³</td>
</tr>
<tr>
<td>10 mesh and finer dolomite</td>
<td>3 kg/m³</td>
</tr>
<tr>
<td>Osmocote 18-6-12</td>
<td>6.5 kg/m³</td>
</tr>
<tr>
<td>Nutricote 16-10-10</td>
<td>7.3 kg/m³</td>
</tr>
<tr>
<td>Mag Amp 7-40-6</td>
<td>5.0 kg/m³</td>
</tr>
</tbody>
</table>

34-0-0, calculate PPM N rates using 33.5% N content.
H₂SO₄ Technical Grade = 93% H₂SO₄, 32.69% of which is sulphur, and has a specific gravity of 1.835.

\[
\begin{align*}
1.8 \text{ mL} \times .93 \times .3269 \times 1.835 &= 1 \text{ ppm S} \\
3.6 \text{ mL} &= 2 \text{ ppm S} \\
7.3 \text{ mL} &= 4 \text{ ppm S} \\
14.4 \text{ mL} &= 8 \text{ ppm S}
\end{align*}
\]

H₃PO₄ - 75% H₃PO₄, 31.6% of which is P. Specific Gravity is not known, therefore, use weight, not volume for calculations.

\[
\begin{align*}
21 \text{ g} \times .75 \times .316 &= 5 \text{ ppm P} \\
42 \text{ g} &= 1 \text{ ppm P} \\
63 \text{ g} &= 1.5 \text{ ppm P} \\
84 \text{ g} &= 2.0 \text{ ppm P}
\end{align*}
\]

Elements - % Content of Commercial Fertilizers

<table>
<thead>
<tr>
<th>Fertilizer</th>
<th>Mg</th>
<th>S</th>
<th>Fe</th>
<th>Cu</th>
<th>Mn</th>
<th>B</th>
<th>Zn</th>
<th>Mo</th>
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<tbody>
<tr>
<td>Gr. Valley 10-51-16</td>
<td>.05</td>
<td>-</td>
<td>.1</td>
<td>.051</td>
<td>.051</td>
<td>.026</td>
<td>.110</td>
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<tr>
<td>20-20-20</td>
<td>.05</td>
<td>-</td>
<td>.1</td>
<td>.051</td>
<td>.051</td>
<td>.026</td>
<td>.110</td>
<td>.001</td>
</tr>
<tr>
<td>Peters 7-40-17</td>
<td>.15</td>
<td>.2</td>
<td>.2</td>
<td>.03</td>
<td>.03</td>
<td>.015</td>
<td>.03</td>
<td>.003</td>
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<tr>
<td>20-7-19</td>
<td>.3</td>
<td>.4</td>
<td>.4</td>
<td>.06</td>
<td>.06</td>
<td>.025</td>
<td>.06</td>
<td>.005</td>
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<tr>
<td>4-25-35</td>
<td>.3</td>
<td>1.94</td>
<td>.4</td>
<td>.06</td>
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<td>.025</td>
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<td>.005</td>
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<tr>
<td>Osmocote 18-6-12</td>
<td>-</td>
<td>4.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Mag Amp 7-40-6</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Peters STEM</td>
<td>-</td>
<td>15.0</td>
<td>7.5</td>
<td>3.2</td>
<td>8.15</td>
<td>1.45</td>
<td>4.5</td>
<td>.0460</td>
</tr>
<tr>
<td>FTE 503</td>
<td>-</td>
<td>-</td>
<td>18.0</td>
<td>3.0</td>
<td>7.5</td>
<td>3.0</td>
<td>7.0</td>
<td>.070</td>
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Formulations and Usage

<table>
<thead>
<tr>
<th></th>
<th>Green Valley</th>
<th>Peters</th>
<th>Plant Prod</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter</td>
<td>10-51-16</td>
<td>7-40-17</td>
<td>11-41-8</td>
</tr>
<tr>
<td>Grower</td>
<td>20-20-20</td>
<td>20-7-19</td>
<td>20-8-20</td>
</tr>
<tr>
<td>Finisher</td>
<td>10-51-16</td>
<td>4-25-35</td>
<td>8-20-30</td>
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</tbody>
</table>

... 3
## Nutrient Levels – Commercial Fertilizers – ppm

<table>
<thead>
<tr>
<th>Formula</th>
<th>G/1000 L</th>
<th>N</th>
<th>P</th>
<th>K</th>
</tr>
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<tbody>
<tr>
<td><strong>Green Valley</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-20-20 (Grower)</td>
<td>250</td>
<td>50</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>20-20-20 (Grower)</td>
<td>375</td>
<td>75</td>
<td>33</td>
<td>62</td>
</tr>
<tr>
<td>20-20-20 (Grower)</td>
<td>500</td>
<td>100</td>
<td>44</td>
<td>83</td>
</tr>
<tr>
<td>20-20-20 (Grower)</td>
<td>625</td>
<td>125</td>
<td>55</td>
<td>104</td>
</tr>
<tr>
<td><strong>Peters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-7-19 (Grower)</td>
<td>250</td>
<td>50</td>
<td>8</td>
<td>39</td>
</tr>
<tr>
<td>20-7-19 (Grower)</td>
<td>375</td>
<td>75</td>
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<td>59</td>
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<td>20-7-19 (Grower)</td>
<td>500</td>
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<td>79</td>
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<td>20-7-19 (Grower)</td>
<td>625</td>
<td>125</td>
<td>19</td>
<td>99</td>
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<td><strong>Plant Prod</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>20-8-20 (Grower)</td>
<td>250</td>
<td>50</td>
<td>9</td>
<td>42</td>
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<tr>
<td>20-8-20 (Grower)</td>
<td>375</td>
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<td>20-8-20 (Grower)</td>
<td>500</td>
<td>100</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>20-8-20 (Grower)</td>
<td>625</td>
<td>125</td>
<td>22</td>
<td>104</td>
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<tr>
<td><strong>Green Valley</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10-51-16 (Starter)</td>
<td>750</td>
<td>75</td>
<td>167</td>
<td>100</td>
</tr>
<tr>
<td>10-51-16 (Finisher)</td>
<td>500</td>
<td>50</td>
<td>111</td>
<td>66</td>
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<tr>
<td><strong>Peters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-40-17 (Starter)</td>
<td>1430</td>
<td>100</td>
<td>250</td>
<td>202</td>
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<tr>
<td>4-25-35 (Finisher)</td>
<td>1250</td>
<td>50</td>
<td>136</td>
<td>363</td>
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<tr>
<td><strong>Plant Prod</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-41-8 (Starter)</td>
<td>909</td>
<td>100</td>
<td>163</td>
<td>60</td>
</tr>
<tr>
<td>8-20-30 (Finisher)</td>
<td>625</td>
<td>50</td>
<td>55</td>
<td>156</td>
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<tr>
<td><strong>Tune Up</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>28-14-14 (Grower)</td>
<td>180</td>
<td>50</td>
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<td>21</td>
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<tr>
<td>28-14-14 (Grower)</td>
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<td>75</td>
<td>16</td>
<td>31</td>
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<tr>
<td>28-14-14 (Grower)</td>
<td>357</td>
<td>100</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>28-14-14 (Grower)</td>
<td>446</td>
<td>125</td>
<td>27</td>
<td>52</td>
</tr>
</tbody>
</table>

### Timing of Fertilizer Applications

Fertilizer applications, whether they are "starter" or "finisher" formulations, should begin as soon as seed coats are shed, and should be applied each time that watering is necessary. Fertilizer should be changed from "grower" to "finisher" as each treatment achieves minimum height specifications for the species on average. Photoperiod lighting of 19 hours total on the white spruce should also be shut off at this time. Growth curves from past trials should be used to determine lead time for the application of moderate drought stress to achieve target heights.
Treatments

Treatment 1. Control. Green Valley Regime
- Starter: 10-51-16 at 75 ppm N
- Grower: 20-20-20 at 125 ppm N
- Finisher: 10-51-16 at 50 ppm N

Treatment 2. Green Valley. Grower Only
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

Treatment 4. Green Valley. Grower Only + Micromax
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

Treatment 5. Peters Forestry Regime
- Starter: 7-40-17 at 100 ppm N
- Grower: 20-7-19 at 100 ppm N
- Finisher: 4-25-35 at 50 ppm N

Treatment 6. Peters Grower Only
- Starter: 20-7-19 at 100 ppm N
- Grower: 20-7-19 at 100 ppm N
- Finisher: 20-7-19 at 50 ppm N

Treatment 7. Peters - MOF Formulation
- Starter: 5-30-20? at 100 ppm N
- Grower: 5-30-20? at 100 ppm N
- Finisher: 5-30-20? at 50 ppm N

Note: Apply 5-30-20? so that P levels are at 28 ppm, and use Ammonium nitrate (33.5% N) to bring N levels up to 100 (S+G) or 50 ppm (F). Use H₂SO₄ at 14.5 mL/1000 L to provide 8 ppm S.

Treatment 8. Plant Prod Forestry Regime
- Starter: 11-41-8 at 100 ppm N
- Grower: 20-8-20 at 100 ppm N
- Finisher: 8-20-30 at 50 ppm N
Treatment 9. Plant Prod Grower Only
- Starter: 20-8-20 at 100 ppm N
- Grower: 20-8-20 at 100 ppm N
- Finisher: 20-8-20 at 50 ppm N

Treatment 10. Tune Up Grower Only
- Starter: 28-14-14 at 100 ppm N
- Grower: 28-14-14 at 100 ppm N
- Finisher: 28-14-14 at 50 ppm N

Treatment 11. Osmocote 18-6-12 (9 month) at 6.5 kg/m^3 + Green Valley Grower
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

Treatment 12. Osmocote 18-6-12 (9 month) at 6.5 kg/m^3 + Green Valley Grower + 8 ppm S
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

Treatment 13. Mag Amp 7-40-6 (3 month) at 5 kg/m^3 + Green Valley Grower + 8 ppm S
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

Treatment 14. Nutricote 16-10-10 (6 month) at 7.3 kg/m^3 + Green Valley Grower
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

Treatment 15. Nutricote 16-10-10 at 7.3 kg/m^3 + Micromax + Green Valley Grower
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N

Treatment 16. Nutricote 16-10-10 at 7.3 kg/m^3 + Green Valley Grower + 8 ppm S
- Starter: 20-20-20 at 100 ppm N
- Grower: 20-20-20 at 100 ppm N
- Finisher: 20-20-20 at 50 ppm N
Treatment 17. Nutricote 16-10-10 + 8 ppm S + solubles having no phosphorus content

**Starter and Grower**
Potassium Nitrate (13-0-44) @ 230 g/1000 L
+ Ammonium nitrate (34-0-0) @ 210 g /1000 L
\[
\begin{array}{ccc}
N & P & K \\
100 & 0 & 84 \\
\end{array}
\]

**Finisher**
Potassium Nitrate (13-0-44) @ 115 g/1000 L
+ Ammonium nitrate (34-0-0) @ 105 g /1000 L
\[
\begin{array}{ccc}
N & P & K \\
50 & 0 & 42 \\
\end{array}
\]

- Starter: 23-0-23 at 100 ppm N
- Grower: 23-0-23 at 100 ppm N
- Finisher: 23-0-23 at 50 ppm N

**Treatment 18.** Sulphur series 0-52-34 and 34-0-0
- No sulphur

Use 0-52-34 at 200 g/1000L throughout to achieve:
\[
\begin{array}{ccc}
N & P & K \\
0 & 45 & 56 \\
\end{array}
\]

+ **Starter and Grower**
34-0-0 @ 300 g/1000 L = 100 ppm N

+ **Finisher**
34-0-0 @ 150 g/1000L = 50 ppm N

**Treatment 19.** As per #17, but with 1.8 ML Technical grade H2SO4/1000 L = 1 ppm S

**Treatment 20.** As per #17, but with 3.6 ML Technical grade H2SO4/1000 L = 2 ppm S

**Treatment 21.** As per #17, but with 7.2 ML Technical grade H2SO4/1000 L = 4 ppm S

**Treatment 22.** As per #17, but with 14.4 ML Technical grade H2SO4/1000 L = 8 ppm S
Treatment 23.  0-52-34 + 34-0-0, low P + 8 ppm S. Use 0-52-34 at 125 g/1000L throughout to achieve:

\[
\begin{array}{ccc}
N & P & K \\
0 & 28 & 35 \\
\end{array}
\]

+ Starter and Grower
34-0-0 @ 300 g/1000 L = 100 ppm N

+ Finisher
34-0-0 @ 150 g/1000 L = 50 ppm N

FTE and 8 ppm S +

- Starter: 24-15-10 at 100 ppm N
- Grower: 24-15-10 at 100 ppm N
- Finisher: 18-23-15 at 50 ppm N

Treatment 24.  0-52-34, low P and 2 ppm S. Use 0-52-34 at 125 g/1000L throughout to achieve:

\[
\begin{array}{ccc}
N & P & K \\
0 & 28 & 35 \\
\end{array}
\]

Use 34-0-0 from 0-125 ppm N to control N levels and match target height growth curves. Start at 25 ppm N and monitor tissue N levels because it is unlikely that N reductions will control height if tissue N levels are already high. Target tissue N levels prior to bud set are as follows:

- White spruce and coastal Douglas fir - 2.0 - 2.3% N
- Sitka spruce and western red cedar - 2.5 - 2.8% N

FTE and 2 ppm S +

- Starter: 0-52-34 + 0-125 ppm N
- Grower: 0-52-34 + 0-125 ppm N
- Finisher: 0-52-34 + 0-125 ppm N

Treatment 25.  Phosphorus series. Use potassium nitrate and ammonium nitrate to supply N and K levels and phosphoric acid to manipulate P levels. 8 ppm S.

Use 13-0-44 at 100 g/1000 L = \[
\begin{array}{ccc}
N & P & K \\
13 & 0 & 36 \\
\end{array}
\]

Starter and Grower
Use 34-0-0 at 260 g/1000 L and 13-0-44 at 100 g/1000 L = \[
\begin{array}{ccc}
N & P & K \\
100 & 0 & 36 \\
\end{array}
\]

Finisher
Use 34-0-0 at 110 g/1000 L and 13-0-44 at 100 g/1000 L = \[
\begin{array}{ccc}
N & P & K \\
50 & 0 & 36 \\
\end{array}
\]
Treatment 25 (cont'd)

- Starter: 28-0-12 at 100 ppm N
- Grower: 28-0-12 at 100 ppm N
- Finisher: 24-0-21 at 50 ppm N

Phosphorus - use H3PO4 - 75% and 32.7% P, at 21 g/1000 L = 5 ppm P.

Treatment 26. As per #24, but with 75% H3PO4 at 84 g/1000 L = 20 ppm P.

Treatment 27. As per #24, but with 75% H3PO4 used at varying rates to match target height growth curves. Start at 5 ppm P.

Treatment Rationale

Based on observations and results of the 1986 trial, the treatments are included for the following reasons:

1. To provide a reference to former trials in which 125 ppm was the standard grower rate. This has proven to be too high for fast growing species, especially with Peters and Plant Prod formulations.

2. Green Valley grower only at 100 ppm N. Grower formulation alone are generally as good as Starter-Grower-Finisher formulations. This will evaluate Green Valley grower at less than the 125 ppm N used last year.

3. As per #2, with 1987 supply of 20-20-20.

4. The compact top growth generally achieved with Green Valley may be due to a sulphur deficiency. Since Micromax is a sulphur based trace element source, we need to know if Micromax will boost height growth compared to Fritted Trace Elements.

5. To evaluate Peters Forestry Regime with the "grower" reduced to 100 ppm N from the 125 used in the past.

6. The same as #5 when the "grower" is used all season.

7. Peters will supply a formula judged to be adequate for our needs, i.e., 5-30-20(?). Trace elements will be supplied separately for now, but later their levels will also be prescribed.
8. Plant Prod Forestry Regime with "grower" levels reduced to 100 ppm N.

9. The same as #8 when the "grower" is used all season.


11. Under some conditions, i.e., outside, Osmocote enhances growth parameters. Part of this may be due to sulphur present in Osmocote which is otherwise deficient in some solubles by themselves. This is a base level treatment including a sulphate deficient soluble supplement.

12. The same as #11 except 8 ppm Sulphur is added with every fertilization to see if growth will be increased, or if there is sufficient S in the Osmocote alone as per #11.

13. In past trials Mag Amp has produced heavy roots, but tops are often stunted. This will see if S has been the limiting factor, and if roots will still be as good with more top growth.

14. Nutricote treatments were often suppressed although roots were good. They may have been P or S deficient, or both. This treatment will provide sufficient P in the 20-20-20, but S will probably still be limiting.

15. This will tell if the S contained in Micromax will be sufficient to increase growth over #14.

16. This treatment will have 8 ppm S added, to ensure that S is not limiting.

17. This treatment will provide additional N, K and S to see if Nutricote is P deficient.

18. It is suspected that S may be used to control height growth. The only S source in this treatment are contaminants and the small amount in the water supply (0.2 ppm).

19. Sulphur will be supplied at 1, 2, 4 and 8 ppm to determine the level that can be used to manipulate height growth.

20. To demonstrate that container conifer crops grow adequately at much lower P levels than previously thought necessary. The target P level of 25-28 ppm should have a safe buffer included and is the basis of proposed custom blends for container crops.
24. With all other nutrients adequately supplied, this treatment will attempt to confine fast growing species to target height levels by limiting and controlling the Nitrogen level as growth commences.

25. To determine where the limiting level is for P, this treatment will receive only 5 ppm P throughout, with all other nutrients including S, in adequate supply.

26. As per #25, this treatment will receive 20 ppm P throughout, with all other nutrients at adequate levels.

27. As per #25 and #26, except P will start at 5 ppm and will attempt to confine fast growing species to target height levels by limiting and controlling the Phosphorus levels as growth commences.

Observations Required

Samples for tissue analysis should be submitted at the change from "Grower" to "Finisher" fertilizer applications and at the conclusion of the trial in late fall. All treatments will be processed for morphological description in late 1987. Subjective observations such as colour differences, susceptibility to disease, and difficulty in achieving terminal bud set should be recorded.

G. Matthews
Agrologist
Silviculture Branch
1987 Nutrient Trial
Summary of Fertilizer Treatments

<table>
<thead>
<tr>
<th>Type</th>
<th>ppm N</th>
<th>S**</th>
<th>G</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. FTE + Green Valley Regime</td>
<td>SGF*</td>
<td>75</td>
<td>125</td>
<td>50</td>
</tr>
<tr>
<td>2. FTE + Green Valley 20-20-20 only</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>3. FTE + Green Valley 20-20-20 (1987) only</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>4. Micromax + Green Valley 20-20-20 only</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>5. FTE + Peters Forestry Regime</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>6. FTE + Peters 20-7-19 only</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>7. FTE + Peters - MOFL Formulation + 8 ppm S</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>8. FTE + Plant Prod Forestry Regime</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>9. FTE + Plant Prod 20-8-20 only</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>10. FTE + Tune Up 28-14-14 only</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>11. FTE + Osmocote 18-6-12 + Green Valley 20-20-20</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>12. FTE + Osmocote 18-6-12 + Green Valley G, + 8 ppm S</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>13. FTE + Mag Amp 7-40-6 + Green Valley G + 8 ppm S</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>14. FTE + Nutricote 16-10-10 + Green Valley 20-20-20</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>15. Micromax + Nutricote 16-10-10 + Green Valley 20-20-20</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>16. FTE + Nutricote 16-10-10 + Green Valley G, + 8 ppm S</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>17. FTE + Nutricote 16-10-10 + 23-0-23 + 8 ppm S</td>
<td>G</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>18. FTE + 20-21-14 (SG) and 15-30-19 (F) + 0 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>19. FTE + 20-21-14 (SG) and 15-30-19 (F) + 1 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>20. FTE + 20-21-14 (SG) and 15-30-19 (F) + 2 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>21. FTE + 20-21-14 (SG) and 15-30-19 (F) + 4 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>22. FTE + 20-21-14 (SG) and 15-30-19 (F) + 8 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>23. FTE + 24-15-10 (SG) and 18-23-15 (F) + 8 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>24. FTE + 0-52-34 + 34-0-0 + 2 ppm S</td>
<td>G</td>
<td>25</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>25. FTE + 13-0-44 + 34-0-0 + 5 ppm P + 8 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>26. FTE + 13-0-44 + 34-0-0 + 20 ppm P + 8 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>27. FTE + 13-0-44 + 34-0-0 + 7 ppm P + 8 ppm S</td>
<td>SGF</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>

* Fertilizer formula type used: starter, grower or finisher.
** ppm at starter, grower, finisher stages of growth.