Western Larch Ten-Year Response to Weed/Feed Treatments

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Weyerhaeuser Company

And

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Intermountain Forestry Cooperative

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# Tornilla and Gold Creek Weed/Feed Demos Treatments

<table>
<thead>
<tr>
<th>TRT</th>
<th>Formulation</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control (No fertilizer, No herbicide)</td>
<td>Control</td>
</tr>
<tr>
<td>2</td>
<td>200 N (lbs./ac)</td>
<td>Nitrogen Only</td>
</tr>
<tr>
<td>3</td>
<td>Herbicide 15 GPA equivalent: Chopper (2 lb. Imazapyr 24oz/ac.) Razor (Glyphosate 2.0 qt/ac)</td>
<td>Herbicide Only</td>
</tr>
<tr>
<td>4</td>
<td>200 N plus Herbicide</td>
<td>N plus Herbicide</td>
</tr>
<tr>
<td>5</td>
<td>200 N, 170 K, 90 S, 3 B</td>
<td>Best</td>
</tr>
<tr>
<td>6</td>
<td>200 N,170 K,90 S, 3 B plus Herbicide</td>
<td>Best plus Herbicide</td>
</tr>
<tr>
<td>7</td>
<td>200 N, 170 K,90 S,10 Cu, 3 B,10 Mg,10 Zn, 3 Fe</td>
<td>Complete</td>
</tr>
<tr>
<td>8</td>
<td>200 N,170 K, 90 S,10 Cu, 3 B, 10 Mg,10 Zn, 3 Fe plus Herbicide</td>
<td>Complete plus Herbicide</td>
</tr>
</tbody>
</table>
Tornilla and Gold Creek Weed/Feed Demos  
Non-Replicated Study Design

<table>
<thead>
<tr>
<th>Plot 1</th>
<th>Plot 2</th>
<th>Plot 3</th>
<th>Plot 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Estimate Nutrient Blend Plus Herbicide</td>
<td>Nitrogen Only</td>
<td>Herbicide Only</td>
<td>Nitrogen Plus Herbicide</td>
</tr>
<tr>
<td>10 Ft Buffer</td>
<td>10 Ft Buffer</td>
<td>10 Ft Buffer</td>
<td>10 Ft Buffer</td>
</tr>
<tr>
<td>10 Ft Buffer</td>
<td>10 Ft Buffer</td>
<td>10 Ft Buffer</td>
<td>10 Ft Buffer</td>
</tr>
</tbody>
</table>

Plot 5: Best Estimate Nutrient Blend
Plot 6: Control – No Treatment
Plot 7: Full Multi-nutrient Blend
Plot 8: Full Multi-nutrient Blend Plus Herbicide
## Tornilla and Gold Creek Weed/Feed Demos

### Site and Stand Characteristics

<table>
<thead>
<tr>
<th>Site</th>
<th>Soil Parent Material</th>
<th>Vegetation Series</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORNILLA</td>
<td>Ash/Till – Carbonate-Sedimentary (Waldbillig ashy sil)</td>
<td>W. Red Cedar (warm moist)</td>
<td>3646’</td>
</tr>
<tr>
<td>GOLD CREEK</td>
<td>Ash/Till – Metasedimentary (Waldbillig-Holloway gr sil)</td>
<td>Subalpine Fir (cool moist)</td>
<td>4772’</td>
</tr>
</tbody>
</table>

### Initial YR0 - Average per acre condition for all plots

<table>
<thead>
<tr>
<th>Site</th>
<th>QMD (inches)</th>
<th>Site Height (feet)</th>
<th>Trees Per acre</th>
<th>BA (ft²/a)</th>
<th>Relative Density</th>
<th>Volume (ft³/a)</th>
<th>SDI</th>
<th>Max SDI</th>
<th>% Max SDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORNILLA</td>
<td>4.4</td>
<td>32</td>
<td>283</td>
<td>30</td>
<td>14</td>
<td>293</td>
<td>76</td>
<td>395</td>
<td>19</td>
</tr>
<tr>
<td>GOLD CREEK</td>
<td>5.8</td>
<td>35</td>
<td>248</td>
<td>46</td>
<td>19</td>
<td>560</td>
<td>104</td>
<td>476</td>
<td>22</td>
</tr>
</tbody>
</table>

### YR10 - Average per acre condition for all plots

<table>
<thead>
<tr>
<th>Site</th>
<th>QMD (inches)</th>
<th>Site Height (feet)</th>
<th>Trees Per acre</th>
<th>BA (ft²/a)</th>
<th>Relative Density</th>
<th>Volume (ft³/a)</th>
<th>SDI</th>
<th>Max SDI</th>
<th>% Max SDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORNILLA</td>
<td>6.9</td>
<td>51</td>
<td>283</td>
<td>74</td>
<td>28</td>
<td>1159</td>
<td>155</td>
<td>395</td>
<td>39</td>
</tr>
<tr>
<td>GOLD CREEK</td>
<td>7.7</td>
<td>50</td>
<td>248</td>
<td>81</td>
<td>29</td>
<td>1401</td>
<td>163</td>
<td>476</td>
<td>34</td>
</tr>
</tbody>
</table>
Tornilla and Gold Creek Weed/Feed Demos
Ten-Year Individual Tree Diameter and Height Growth

![Graph showing 10-year diameter growth and height growth for Tornilla and Gold Creek](image-url)
Tornilla and Gold Creek Weed/Feed Demos
Ten-Year Individual Tree Diameter Growth Response
Tornilla and Gold Creek Weed/Feed Demos
Two-Year Individual Tree Diameter and Height Growth

![Bar Chart]

- **N Only**:
  - Tornilla: 23
  - Gold Creek: 34

- **Herbicide Only**: 6

- **Herbicide + N**:
  - Tornilla: 30
  - Gold Creek: 61

- **Best**: 15

- **Herbicide + Best**:
  - Tornilla: 84
  - Gold Creek: 96

- **Complete**:
  - Tornilla: 37
  - Gold Creek: 61

- **Herbicide + Complete**: 22

- **Herbicide + Complete**:
  - Tornilla: 34
  - Gold Creek: 82

- **Questions**:
  - When?
  - Where?
  - How Much?
Why did Tornilla Stop Responding??

- Non-Replicated Study?
- Treatments - Herbicide or Fertilizer?
- Site Factors?
  - Soils and Rock content
  - Soil Parent Material
  - Logging Disturbance
- Western Larch Response?
- Was it Dr. Death!!!!?
Western Larch Weed/Feed Response

**W. Montana - Western Larch Screening Trials**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P1BA</th>
<th>P2BA</th>
<th>BAM (Tornilla)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Only</td>
<td>1.23</td>
<td>1.12</td>
<td>1.19 (1.30)</td>
</tr>
<tr>
<td>Weed-Only</td>
<td>0.97</td>
<td>1.17</td>
<td>1.06 (1.13)</td>
</tr>
<tr>
<td>N+Weed</td>
<td>1.21</td>
<td>1.58</td>
<td>1.37 (1.46)</td>
</tr>
<tr>
<td>Multi+Weed</td>
<td>1.07</td>
<td>1.35</td>
<td>1.19 (1.74)</td>
</tr>
</tbody>
</table>

**W. Montana Fert - Quality/Density**

<table>
<thead>
<tr>
<th>% Increase Over Control</th>
<th>DF</th>
<th>LP</th>
<th>WL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thin soils and heavily disturbed site ("Skid Row"). Is it possible that fertilized trees grew faster than the site was capable of supporting?

Drought conditions were in effect throughout most of the four years under study. This combined with thin soils and site disturbance probably exacerbated growth/response issues.
Tornilla and Gold Creek Weed/Feed Demos
Combined Ten-Year Stand (Plot) Volume Growth and Response

![Graph showing volume growth and response to different treatments.]

- Control
- N Only
- Herbicide Only
- Herbicide + N
- Best
- Herbicide + Best
- Complete
- Herbicide + Complete

Volume Growth (ft³ ac⁻¹)

% Volume Response

- N Only
- Herbicide Only
- Herbicide + N
- Best
- Herbicide + Best
- Complete
- Herbicide + Complete

Legend:
- Control
- N Only
- Herbicide Only
- Herbicide + N
- Best
- Herbicide + Best
- Complete
- Herbicide + Complete