Top-Pruning in Nurseries

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Top pruning/clipping when & how

- What is top pruning? - a method of controlling seedling height in the nursery bed to produce short, well balanced seedlings that are better prepared to cope with stressful growing conditions
- 1st report – 1679
- Top pruning done by _______ all bareroot nurseries
- July – to Sept
- Goal:

The effects of top pruning are accomplished by manipulation of plant hormones

Auxins - Indoleacetic acid (IAA) promotes apical dominance, inhibits lateral buds (concentration related).
9 Reasons not to top-prune

1. The balance between root and shoot is not important for survival
2. It wounds the seedling
3. It causes _______________________________
4. It changes seedling biochemistry
5. Late pruning removes the terminal bud
6. It might increase disease
7. It increases ______________________________
8. It makes culling of small seedlings difficult
8 Reasons to top-prune

1. IT CAN ___________________________(primary economic reason)
2. It can increase freeze tolerance (it changes seedling biochemistry)
3. It increases the root weight ratio
4. It increases _______________________________
5. It reduces the _____________________________
6. It increases crop value by increasing seed efficiency
7. It allows managers to fertilize and irrigate to produce large root systems
8. It can reduce shipping and handling costs
SUMMARY – 4 points

1.

2.

3.

4.

Root-Pruning in the Nursery

Tom Starkey

Undercutting seedlings with a horse-drawn L-bar (@ 1905)
Credit Line: U.S. Forest Service.
When does root pruning occur?

1. Bareroot
   1. ___________ one time before lifting
   2. ___________ – before lifting
   3. ___________ – as needed (1 or 2 times)

2. Container
   1. 100% growing containers are air-pruned
   2. Some container coated with Copper
   3. At Planting by tree planters

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Root culturing in bareroot nurseries

<table>
<thead>
<tr>
<th>Term</th>
<th>Function</th>
<th>Cultural Objectives</th>
<th>Implement</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undercutting</td>
<td>Cuts roots in a horizontal plane in the root zone Generally 6&quot;-7&quot;</td>
<td>1. Encourage root fibrosity; 2. Reduce shoot growth (make sure height target is achieved); 3. Control tap root growth; 4. Facilitate lifting.</td>
<td>Sharp, thin fixed blade or oscillating blade covering full bed width. Frequent sharpening of the blade is important. Tractor must be kept at a constant speed. Keep blade absolutely horizontal</td>
<td>One or two times per season, or prior to lifting</td>
</tr>
</tbody>
</table>
### Root culturing in bareroot nurseries

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<td>Wrenching</td>
<td></td>
<td>1. Induce moisture stress and loosen soil within root zone. 2. Tears or breaks fine feeder roots.</td>
<td>Sharp fixed blade at an angle covering full bed width</td>
<td>Once to several times per season, or prior to lifting</td>
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<tr>
<td></td>
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<td>1. Reduce shoot growth. 2. Reduce soil compaction. Wrenching is sometimes done to increase soil drainage.</td>
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<td>3. Increase aeration. 4. Facilitate lifting. 5. Can kill seedlings if seedbeds are permitted to become dry. Lifts and ripples the bed and seedling.</td>
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<tr>
<td>Lateral root pruning</td>
<td></td>
<td>1. Encourage root fibrosity; 2. Facilitate lifting</td>
<td>Coulter blades spaced between seedling rows</td>
<td>Once to several times per season, or prior to lifting</td>
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**Images:**

- **UNDERCUTTER**
- **LATERAL PRUNER**
Undercut Roots

Root Pruning in nursery vs Root pruning by planters

<table>
<thead>
<tr>
<th>Nursery</th>
<th>Planting Site by planters</th>
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<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>2.</td>
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<td>3.</td>
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<td>4.</td>
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</table>
8 Reasons to undercut/wrench

1. Increases fibrosity
2. Control height
3. Increases RWR
4. Aids lifting
5. Sever tap root
6. Increases aeration
7. Increases infiltration
8. Stresses the seedlings

Lateral-root pruning
Fibrous-root rating (Longleaf)

Seedbed density

Hatchell and Muse 1990

Lateral-root pruning
Survival (Longleaf)

Seedbed density

Hatchell and Muse 1990
Final Thoughts....

Top Pruning
- Cheap operation to do
- Slows growth of only those seedlings growing too fast
- Increases survival
- Increases freeze tolerance

Root Pruning
- Less research to show benefits of its use
- Primarily done to accommodate full bed lifters
- ** Stops growth on all seedlings – large or small **