Pruning and Training

M. Elena Garcia

Goals for training and pruning include:

- Producing a supporting framework for the tree
- Allowing annual flower formation
- Developing a tree which allows maximum fruit growth and quality development
- Ease of management
Pruning Equipment

*Keep Sharp!*

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Parts of a Fruit Tree

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Light Penetration

Light penetration into the canopy of a large tree

Effective light penetration into an unrestricted canopy is ~ 1 m

% of full radiation needed for various quality factors in apples

<table>
<thead>
<tr>
<th>Character</th>
<th>Satisfactory development</th>
<th>Unsatisfactory development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit size</td>
<td>&gt;50%</td>
<td>&lt;50%</td>
</tr>
<tr>
<td>Red color</td>
<td>&gt;70%</td>
<td>&lt;40%</td>
</tr>
<tr>
<td>Spur development</td>
<td>&gt;30%</td>
<td>&lt;25%</td>
</tr>
</tbody>
</table>
Pruning and Training

Balancing Act

Vegetative → Fruiting

Vertical View
Showing Desired Distribution of Scaffolds

…needs to be developed during years 1-3 of training

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Light Penetration

No shading should occur from the branches above.

Types of Pruning Cuts

• heading back
• thinning out
Pruning
Heading back cuts

- Removal of a part of a shoot or branch
  - It removes terminal buds
  - Apical dominance is weakened or lost
- Physiological effects
- Net result: increase in total shoot growth

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Pruning
Thinning cuts

- Removal of an entire shoot or branch at its junction with the trunk
- Ratio of terminal to lateral buds is not disturbed
  - Less physiological changes
- Net result: It does not increase shoot growth as much as heading cuts
MODIFIED CENTRAL LEADER System

...at planting

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MODIFIED CENTRAL LEADER (cont.)

...2nd and 3rd year dormant pruning

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Before and After

• promotes strong crotch angles
• promotes early bearing
• reduces scaffold vigor
Pruning Bearing Fruit Trees

- annual necessary
- dead, damaged branches
- water sprouts
- weak, drooping wood
- crossing-over
- thin out to increase light

Lowering the Height of a Neglected Tree

Removing Undesired Interior Branches from a Neglected Tree
Reducing the Breadth of a Neglected Tree

Excessive branching due to the removal of the central leader
**Common Training Systems**

<table>
<thead>
<tr>
<th>Training System</th>
<th>General Description</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Density</th>
<th>Rootstock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central leader</td>
<td>Free standingMost commonSingle, central trunkPronounced conic shapeSeparate and distinct tiers of scaffold branches</td>
<td>High yields at full canopyHigh fruit quality</td>
<td>Slow to come into productionHigh labor costs due to use of ladders and the pruning of large trees</td>
<td>Low to moderate</td>
<td>MM.111MM.106M.7 Mark</td>
</tr>
<tr>
<td>Slender spindle</td>
<td>Needs supportVery successful in Europe</td>
<td>Early croppingHigh tree densityMinimal pruningEfficient use of labor</td>
<td>High initial costSunburn</td>
<td>High800-1100</td>
<td>Dwarfing rootstocksM.9Mark</td>
</tr>
<tr>
<td>Vertical axis</td>
<td>Tall and narrow with a supported, dominant central leader</td>
<td>Early productionEfficient use of labor</td>
<td>Tall trees require laddersExcessive growth of the central leader</td>
<td>500-700 trees/Ac</td>
<td>M.9 EMLA 26 EMLA 7</td>
</tr>
</tbody>
</table>

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Thank You

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