Fruit Tree Training and Pruning

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Objectives of Training and Pruning

- Develop and maintain desired shaped trees that are capable of early production of large crops of high quality
- Balance vegetative growth and reproductive growth

What are training and pruning?

- Training is the process of directing tree growth to a desired shape or form. Performed on young trees.
- Pruning is removal terminal portion of a branch or the whole branch to adjust or maintain tree structure. Annual event.
- Pruning is part of training process.

Pruning tools


Types of pruning cuts

- **Heading cut**: Removal of the terminal portion of a shoot. Increasing side branches.
- **Thinning cut**: Removal of a shoot at the point of its origin. It will not invigorate the tree as heading cut.
- **Bench cut**: Removal of vigorous upright shoot back to a side branch that are flat and outward going. Used to open up the center of the tree and spread the branch outward.
**Tips on pruning and training**

- Do not wait till the fruit trees grown up to prune them!
- Start working on your fruit trees just after planting
- During the first two or three years after planting, training and pruning are critical for the tree framework formation.

**Where the cut should be?**

Close to the branch collar.

**Branching angle**

**Spreading branch angles**

- Clothpin
- Toothpick
- Branch spreader
- Hanging weight
- (Tying down)

**Cloth pins**

Apple training with cloth pins at Alcalde, NM in 2013.
Different types of training systems

Apples
- Central leader- no support (traditional)
- Trellis-wires and support
- Slender spindle, tall spindle, super spindle, vertical axe - support and wire

Recent development of apple training
- High density planting with dwarfing rootstocks
- Minimum pruning
- Pruning out competition
- (Tie feathers down for tall spindle)
- Use early cropping to slow the tree down

Super Spindle and Vertical Axe

Tall spindle system
- Planting density 3×11 ft, or 4×12ft, 1000-1500/acre.
- Rootstock/scionwood: M9, B9, G11, G41 etc.
- Planting well feathered trees
- Tie down branches after planting
- Minimum pruning for the first several years, support central leader
- Removal branches with diameter 1” or bigger with bevel cut
Tall spindle – older trees

Trees need to be tall enough for good yield

Keep central leader dominance, tie down feathers.

Remove big branches with Beveled cut

Pruning new plantings

- Central leader system: heading cut. The first 3-4 years are critical for tree framework formation.
- http://aces.nmsu.edu/pubs/_h/h-306.html
- Tall spindle, super spindle, vertical axe etc.: high density, no heading cut, minimum pruning for the first 3-4 years. Early cropping.
Pruning mature trees

- First, remove diseased, broken, dead branches completely
- Remove overshadow, cross or competing branches
- Reduce tree height
- Remove suckers or water sprouts
- Manage numbers of removed big branches

Principles for pruning neglected trees

- Remove dead, diseased, damaged wood
- Lower the height of the tree
- Reducing overcrowding (remove undesirable interior branches)
- Remove low hanging off branches
- Prune moderately every year.
Pruning neglected apple trees

• Too many heading cut
• Stimulate water sprout growth
• Shade problem

Peach training and pruning

• Peach needs more sunlight than apples.
• No central leader for peach training, all open centered.
• Open Vase (center), Perpendicular V etc.

Open Vase

• 3-4 scaffolds
• Cover each quadrant to optimize light interception
• Tree height: 8 ft. optimize the activities without using a ladder.

Pruning Techniques

• Dormant Pruning
  – Remove vigorous shoots (water sprouts)
  – Shape tree
  – Choose fruiting wood
  – Thin branches
• Summer Pruning
  – Reduce height of tree to 8 feet
  – Remove dead shoots
  – Remove hanging shoots close to ground
  – Increase light penetration to middle of tree
  • Be careful of sunburn!
  • Light is very important to form flower buds for next year
Open Vase

Perpendicular-V
- System developed in California
- Trees are trained to two main scaffolds
  - 50-60 degrees apart between scaffolds
  - If angle is too vertical (<20° from vertical), scaffolds will be weak
  - If angle is too horizontal (>45° from vertical), scaffolds are sunburn-prone
- Tree height set at 8 feet
  - Optimize activities from ground

Pruning Techniques
- Dormant Pruning
  - Remove vigorous shoots (water sprouts)
  - Shape tree
  - Choose fruiting wood as close to scaffolds as possible
  - Thin branches
- Summer Pruning
  - Reduce height of tree to 8 feet
  - Remove dead shoots
  - Increase light penetration to fruiting wood
  - Thin shoots
  - Be careful of sunburn – leave a few upright shoots in middle

Sweet Cherry
- Central leader
- Spanish bush
- Vogel central leader
- Steep leaders
- Sol axe system
- UFO system
Upright Fruiting Offshoots (UFO)
- Precocious system
- Space between trees filled at planting
- Use unpruned and unbranched trees
- Plant at an angle of 45-60° from vertical
- Focus growth on well-spaced upright buds

Raspberry and blackberry

Floricane cultivars:
- Prune the fruited floricane (second year) out in winter and keep the primocane (first year) for fruiting

Primocane cultivars:
- Prune them all the way down to the ground in winter.

Raspberry pruning
-primocane cultivar

Blackberry primocane and floricane

Blackberry pruning
-floricane cultivar

References
1. Training young apple trees to the modified central leader system (NMSU)
   - [http://aces.nmsu.edu/pubs/_h/h-306.html](http://aces.nmsu.edu/pubs/_h/h-306.html)
2. The Tall Spindle Planting System (Cornell)
3. The Vertical Axis System
4. Cherry UFO System (Prosser, WA)
   - [http://fruit-prosser.wsu.edu/UFO.html](http://fruit-prosser.wsu.edu/UFO.html)
5. Peach Perpendicular V System