Pruning Systems for Tropical Fruits in Florida

Carlos F. Balerdi, Jonathan Crane and Rubén Regalado

UF UNIVERSITY of FLORIDA IFAS Extension

MIAMI-DADE COUNTY

Pruning History

- Practiced on deciduous tres for hundreds of years
- Mechanical pruning: Hedging & topping machines used by Florida Citrus growers in the late fifties

- Adopted in the sixties by South Florida lime, avocado & mango growers

Pruning History

- Initially in S.F., groves planted at wide spacings (30 x 30 f, 35 x 35 f) with little to no pruning practiced

- Old publications & some recent say tropical fruits need no pruning or only need to remove dead, diseased, or damaged branches

Pruning History

- With wide spacings little competition for light among the trees existed

- Late sixties & beyond: high density plantings brought light competition at 5 or 6 years after planting

Pruning History

- No control of tree size caused crowding, loss in fruit production & low canopy, a decrease in quality and expensive picking costs

Pruning History

- Growers realized tree management was necessary for good production
- Avocado, mango & Tahiti lime growers started using toppers and hedgers developed by the citrus industry
- Machines did a good job at a reasonable cost

Pruning History

- Other growers (guava, carambola, longan, lychee, and mamey sapote) soon adopted mechanical pruning

Pruning Systems

- Two common pruning systems used by tropical fruit growers

a) Structural or formative

b) Maintenance or production

Structural Pruning in Nurseries

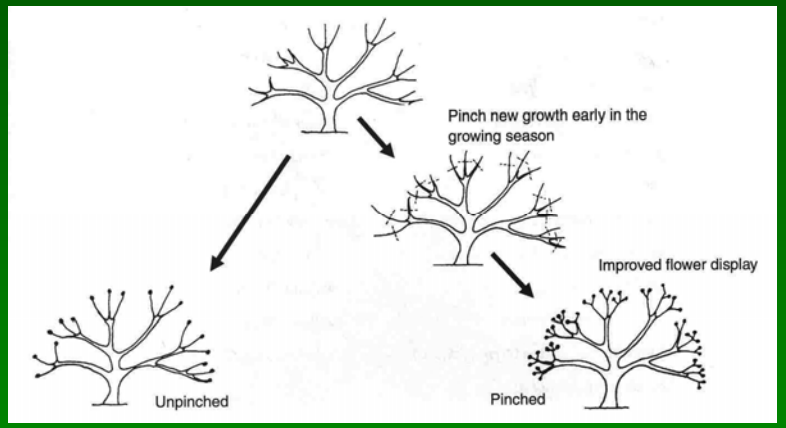
- Used in nurseries and during the first 2 years after planting
- Not as common as maintenance pruning
- Less used in nurseries than after planting
- There is danger that selected shoots could die
- Workers doing marcotts need to be trained to choose shoots with proper structures

Structural Pruning in Nurseries

- Little chance for growers receiving trees to select shoots for basic structure; shoots are of good size and trees may suffer from the removal of unwanted shoots
- With air layering, selection of shoots is possible because they are well developed and permanent

Field Structural Pruning

- Remove shoot tips to induce branching, c.a. 6 to 8 months after planting
- Spring & summer
- Most growers do tipping/pinching in parts of trees in spring & complete process in summer
- Process repeated during the 2nd year



Field Structural Pruning

- Tip removal → apical dominance is broken and 2- 4 new shoots grow → well structured, compact tree without dominant shoots

Tipping

Field Structural Pruning

Tipping

Field Structural Pruning

Tipping

- Production potential increases with a higher number of shoots

- Remove inflorescences/fruit set during first 2 years. Helps canopy development

Field Structural Pruning

- Remove branches below 2-2.5 ft. from ground & leave branches above
- Avoid top heavy trees (no low branches)

- Aesthetics not important in commercial fruit production

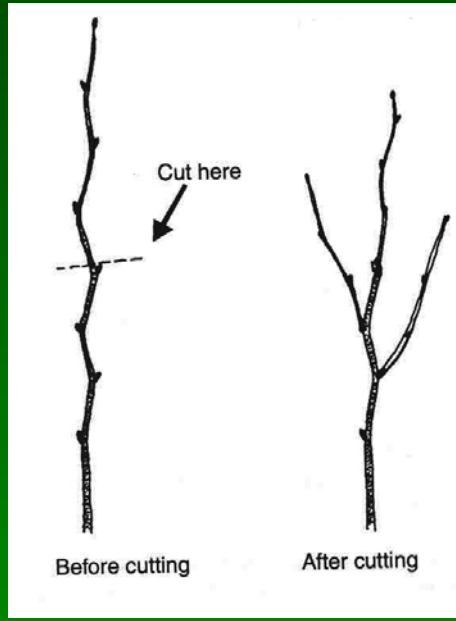
Field Structural Pruning

- Long shoots of young trees pruned at same height that surrounding canopy
- These cuts will reduce shoot vigor & induce multiple shoot formation
- Remove rootstock shoots below the graft union as they compete for water & nutrients, won’t produce fruit for years, may choke the scion and occupy most of the canopy

Field Structural Pruning

Field Structural Pruning

- Cut the tops of young leggy (not branched) & top heavy trees (high canopy) at about 2-3 ft. at planting time to induce lateral branching
- Select 3 to 4 strong, well spaced, wide angled main scaffold branches



Maintenance Pruning

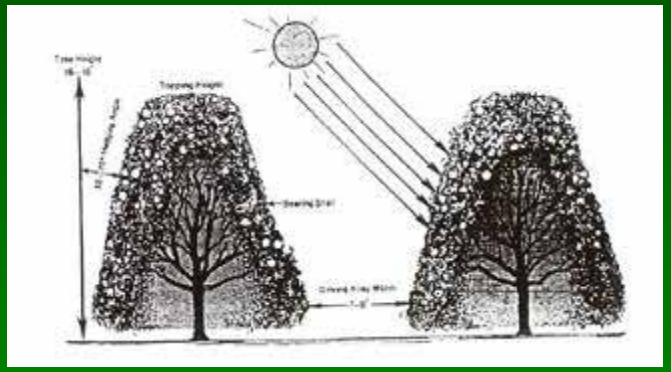
- Begins at 3 – 4 years after planting
- Yearly operation soon after harvest
- Early avocados and mangos pruned at end of July or August
- Late avocados in the winter

Maintenance Pruning

- Mostly vegetative growth and no bloom (no fruit) if pruned in winter after recent harvest
- Several options to avoid lack of production
- a) hedge & top but expect small/no crop
- b) top all trees, but only hedge alternate rows
- c) top all trees, but only hedge one side of each row

Maintenance Pruning

- Preferred hedging angle 5 - 10º from vertical: allows light to reach the bottom of trees
- Pyramidal shape



- Bottom of trees wider than the top
- Light reaches tree bottom

- 14 – 16 f. height

Maintenance Pruning

- New tendency 12 -14 ft. → facilitates light reaching tree bottoms, harvesting & spraying

Maintenance Pruning

- Maintain row middles 6 – 8 feet wide to facilitate traffic (spreaders, sprayers, mowers & trucks)
- Groves w/large trees planted at 20 ft or less (avocado, mango, lychee, mamey sapote) row middles need excessive hedging. Get less production
- At 20 f. between rows use central leader or modified central leader

Maintenance Pruning

- **Rejuvenation/skeletonization:** The removal of all foliage/wood < 1.5”. Remove most tops/leave main scaffolding
- Used in old or not well cared groves or in hurricane damaged groves.

Maintenance Pruning

- Do the grove at once or do in 2 -3 years
- Reestablish good production

Maintenance Pruning

- Stumping/topworking reduces tree to stumps 3 – 4 feet high w/short branches
- Changing to new cultivar or rejuvenation
- Hurricane damaged trees
- Protect stump w/paint (latex or hydrated lime) or w/brush from trees placed on top of stumps
- Sunburning causes severe damage

Maintenance Pruning

- Large Branch Thinning: new practice in old groves w/dense canopy

- Remove one, sometimes two, main branches to allow light penetration
- New branches appear (5 – 10 feet from ground)
- Increases production & facilitates spraying

Maintenance Pruning

- Sanitation Pruning : eliminates insect and/or diseased damaged branches & broken/dead
- Fruit & Flower Thinning: ft. thinning is done to improve fruit size in crops tending to overbear (guava, longan, carambola), rarely in avocados and mangos

Maintenance Pruning

- Total fruit removal used to induce offseason fruiting in carambolas & prevent death of longan
- Total flower removal at normal bloom time to induce offseason fruiting of longan

Maintenance Pruning

- Tree Thinning: done all at once or programmed for 2 or 3 years
- Number of trees/acre cut in half but light in grove is greatly increased
- High wind velocity hurricanes cause large amount of structural damage & loss of many trees (> Cat 1)
- Production affected
- Tree removal should not be used in hurricane prone areas
- Instead, use rejuvenation, stumping, branch thinning preserving the original plant density per acre