Tree Fruits for Middle Tennessee

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Fruit Crops Production

**Negatives:**
- High risk
- High inputs
  - Labor
  - Management
  - Capital
- Relatively little mechanization
- Several years before a return on investment
- Perishable crops

**Positives:**
- Can be done on smaller acreages
- Can utilize hilly land
- Potentially high returns per acre
Site Selection

• Most important decision a grower can make

• Every aspect of crop development and marketing will be influenced by the site
Orchard Site Score Sheet

- Accessibility
- Elevation
- Direction of slope
- Degree of slope
- Soil Characteristics
- Water
- Wildlife
- Adjacent agricultural operations
Market Considerations

• Retail on farm:
  – Distance from customers
  – Quality of roads
  – Easy to find
  – Parking

Apples
25 miles

Single lane next
20 miles

?
Calendar

- Dormant Spray
- Planting
- Pruning
- Thinning
- Fertilizing
- Pest Control
- Canopy Management
- Harvest
- Clean up vineyard

Apples
Apples, Dwarf

• Time from planting to 1st harvest: 1 to 2 yrs.
• Time to full production: 4 to 6 yrs.
• Anticipated orchard life: 15+
• Anticipated yield at maturity:
  – Per tree: 1 ½ to 2 bushels
  – Per acre (600 to 800 trees/acre): 1,000+
    (actual yield/acre depends on rootstock & training system)
### Disease Resistant Apples*

* 1 = susceptible, 9 = immune, U = unknown

<table>
<thead>
<tr>
<th>Variety</th>
<th>Apple Scab</th>
<th>Cedar Apple Rust</th>
<th>Fireblight</th>
<th>Powdery Mildew</th>
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<tr>
<td>Pristine</td>
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<td>4</td>
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<td>William’s Pride</td>
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<td>Redfree</td>
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<td>Galarina</td>
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<td>Freedom</td>
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Apples, Standard Size Trees

- Time from planting to 1st harvest: 6 to 8 years
- Time to full production: 10 to 12 years
- Anticipated orchard life: 25+ years
- Anticipated yield at maturity:
  - Per tree: 8 to 10
  - Per acre (depends on tree spacing & training system): 600 - 900
Apples, Semi-Dwarf

- Time from planting to 1st harvest: 3 to 4 years
- Time to full production: 6 to 8 years
- Anticipated orchard life: 20+ years
- Anticipated yield at maturity:
  - Per tree: 3 to 6 bu. (depends on rootstock)
  - Per acre: (113 to 340 trees/acre): 500 to 800 bu.
  - (actual yield depends on rootstock & training system)
Apples (High Density)

- Time to:
  - 1st harvest – 2 to 3 yrs
  - Full production – 4 to 5 yrs.
- Time of harvest: August to November
- Yield potential: 1,000 bu./acre+
- Expected productive lifespan: 15 to 18 years
Dwarf Trees

**Advantages**
- Earlier bearing
- Higher, more consistent fruit quality
- Reduced production costs
- Higher yields/acre?
- Insect &/or disease resistance

**Disadvantages**
- Poor anchorage
- Needs irrigation
- High establishment cost per acre
- High management levels
- Insect &/or disease susceptibility
Exhibit 4: Apple cultivar Zestar!™ on rootstocks B9, M26, and M7
Rootstock Effect on Tree Size & Precocity
Apples

- Harvest period: late July into November
  - Summer apples have a much shorter storage life than fall apples
- Optimum storage conditions for apples:
  - Temperatures close to freezing (30 to 34° F, depending on variety)
  - High humidity (>90%)
  - Good air circulation
  - Storage life depends on variety, stage of ripeness at harvest (1 to 4 mo. in common storage)
Apple Diseases

Apple Scab

Fireblight

Bitter Rot

Powdery Mildew

Black Rot

Cedar Apple Rust

White Rot
Apples

• Major insect concerns: codling moth, stink bugs, oriental fruit moth, plum curculio, scale

• Apple pest control recommendations:
  – Integrated Orchard Management Guide for Commercial Apples in the Southeast
    • (access through UT Extension website)
Pears

European

• Flesh is soft, juicy, sweeter & more mellow than Asian pears
• Harvest mature, but not ripe, refrigerate & ripen @ room temperature

Asian

• Usually round
• Brown or yellow skin
• Flesh is crisp & juicy
• Reaches optimum quality when tree ripened

Chojuro
Peaches
Yellow Flesh

- “Classic” peach flavor
- Skin develops deep yellow with orange to red blush or striping
- Higher acidity (tartness) that mellows as peach ripens & softens

White Flesh

- Sweet flavor
- Skin is pale yellow with a pink blush when ripe
- Low-acid
- More delicate, easily bruised
- Smoother texture
Clingstone
• Fruit adheres to pit (stone)
• May be either white or yellow flesh
• May be either melting or non-melting flesh

Freestone
• Flesh separates cleanly from pit when fruit is ripe
• May be white or yellow flesh
• Generally melting flesh
Peento (Donut) Peaches

- Flat shape
- May have pit exposed to the outside of the fruit
  - Pit can be pushed out without cutting the peach, leaving a doughnut-like hole
Patio Peach

- Grown mostly as an ornamental
- Fruit tend to be poor quality when compared to traditional fruiting peach varieties
- Subject to same pests as regular peach trees
Peaches & Nectarines

• Time from planting to 1\textsuperscript{st} harvest: 3 years
• Time to full production: 5 to 6 years
• Anticipated orchard life: 17 years
• Anticipated yield at maturity:
  – Per tree: 3 bushels (early & midseason varieties)
  – 4 bushels (late season varieties)
  – Per acre (16 ft. between trees, 24 ft. between rows (113 trees per acre) = 339 to 452 bushels
Peaches & Nectarines

• Harvest period: June 1 – Sept. 1
  – Most varieties ripening prior to July 4 are clingstone or semi-clingstone

  – Tree-ripened peaches are very fragile and have a short shelf life.
    • Store above 60° for a couple of days to preserve flavor
    • Storage about 40° F may result in development of a bitter taste
# Peach Varieties

## Yellow Flesh
- 0 - Redhaven- semi-free (950 hours)
- +4 - Challenger (950 hours)
- +11 – Intrepid (1000 hours)
- +19 – Contender (1050 hrs)
- +32 – Carolina Gold (1050 hrs)

## White Flesh
- +14 – White County (trial) (950 hours)
- +6 – Nectar (1050 hours)
- + 32 – China Pearl (1100 hours)

*other good varieties exist but they all have shorter chilling requirements*
Peaches

• Select varieties with at least 950 chilling hours requirement
• Select varieties having bacterial spot resistance (West Coast varieties do not)
• All varieties have self-fertile blossoms (do not need cross pollination)
• Recommended rootstocks
  – Halford, Lovell, Guardian
Peaches & Nectarines

• Major disease concerns: brown rot, scab, bacterial spot
• Major insect concerns: plum curculio, oriental fruit moth, peach tree borer, lesser peach tree borer
• Pest control recommendations available at: Southeastern Peach, Nectarine and Plum Pest Management and Culture Guide (access via UT Extension website)
Peach Production - diseases

Brown rot

Bacterial spot

Scab
Peach Insects

• Plum Curculio
• Oriental fruit moth
• Peachtree borer
• Lesser peachtree borer
  • June beetle
Peach Production

• Annual pruning in late winter to early spring
• Thinning the crop: when fruit is about a nickel in diameter, remove excess fruit on the tree – space remaining peaches about 6 to 8 inches apart on a shoot, do not leave clusters of fruit
• Harvest as close to tree ripe as your market will allow to maximize fruit quality
Nectarines

Cultural practices and pest control are the same as for peach

- Fruit splitting may be a problem
Plums

**European**
- More cold tolerant
- Self-fertile, but fruits better with cross-pollination
- Tend to be sweeter than Japanese varieties
- Stanley prune

**Japanese**
- More heat tolerant
- Blooms earlier than European var.
- Needs cross-pollination
- Chilling requirements from 700 – 1,000 hours
- Ozark Premier
Tart Cherry

Montmorency

- Birds are a major problem
- Brown rot is a major disease problem
- More consistent than sweet cherries

Early Richmond
Sweet Cherries

- Some varieties need cross pollination
- Canker diseases
- Cold injury
- Raid-induced fruit cracking
High-Risk Tree Fruit Crops

• Apricots

• Pluots, plumcots, Apriums, Apriplums
Pawpaw
Papaya,
Poor Man’s Banana
Pawpaw

- Small, pyrimidal, deciduous tree (10 to 25 ft. tall) with long, drooping leaves
- Flowers turn from green to pink to deep purple at full bloom
  - May be 1 ½ to 2 in. diameter
- Most varieties need cross pollination for optimal fruiting
Pawpaw Fruit

• Resembles bananas in some ways-
  – Greenish-yellow skin becoming speckled or streaked with brown when fruit is ripe
  – Fruit may be 3 to 6 in. long & 1 – 3 in. wide
    • When developing, fruit points outward & upward similar to banana
  – Flesh is usually creamy white with a custard-like consistency
  – Flavor similar to banana but with additional hints of vanilla custard, pineapple and mango
  – Has 2 rows of brown seeds that separate easily from the flesh
  – Ripening from late summer to early fall
    • (~150 days from bloom to harvest)
Pawpaw: Site Selection

- Soil pH from 5.0 to 7.0
- Young plants prefer shade
- Good crops can be grown in partial shade
- Mature trees can tolerate full sun
- Surface mulching is desirable
- No major insect or disease problems
Persimmon

• Plant in full sun
• Soils well-drained, pH 6.0 - 6.5
• Cross pollination gives better fruit quality & reduces fruit drop
• Allow fruit to ripen fully at room temperature to avoid astringency
• Oriental persimmons are non-astringent
Oriental Persimmon

- Deciduous tree with edible fruit & attractive fall foliage
- Trees
  - size less than 20 – 30 ft.
  - Large, round crown
  - Lustrous dark green leaves that often turn bright crimson in fall
- May be damaged by winter temperatures less than 10°F
- Most are grafted onto seedling rootstocks
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American Persimmon

- More cold tolerant than Oriental Persimmon
- Native to eastern U. S. from Connecticut to Florida and west to Kansas
- Trees are vigorous when young and moderately vigorous once they begin fruiting
- Trees can reach 50 ft. in height
- Need well-drained sites in full sun
American Persimmon

• Fruiting:
  – Fruit may resemble a small tomato (about 1 in. diameter)
  – Fruit color ranges from pale yellow to orange to crimson & deep red
  – American persimmon fruit is softer & drier than Oriental
  – May contain 6 or more large, brown seeds

• (seedless varieties of both American and Oriental persimmons exist)
Fig

- Plant where there is full sun at least 8 hours a day
- Avoid poorly drained soils
- Avoid planting near clay sewer pipes or over septic tanks as roots may block drain lines
- Varieties: Brown Turkey, Celeste
Winter Protection for Figs

- Figs can bear 2 crops per year –
  - spring crop (breba crop) on wood from the previous year
  - fall crop (main crop) is borne on the current year’s growth
- Plant on the south side of a building for protection from winter winds
- In late fall, build a cage around the plant & fill it full of leaves to protect the plant. Remove in spring when temperatures have moderated
- Plant in 30 to 50 gal. containers that can be brought inside over the winter months
- Avoid over fertilizing