Risk Management Considerations for Fruits: Fruit Production for Beverages

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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

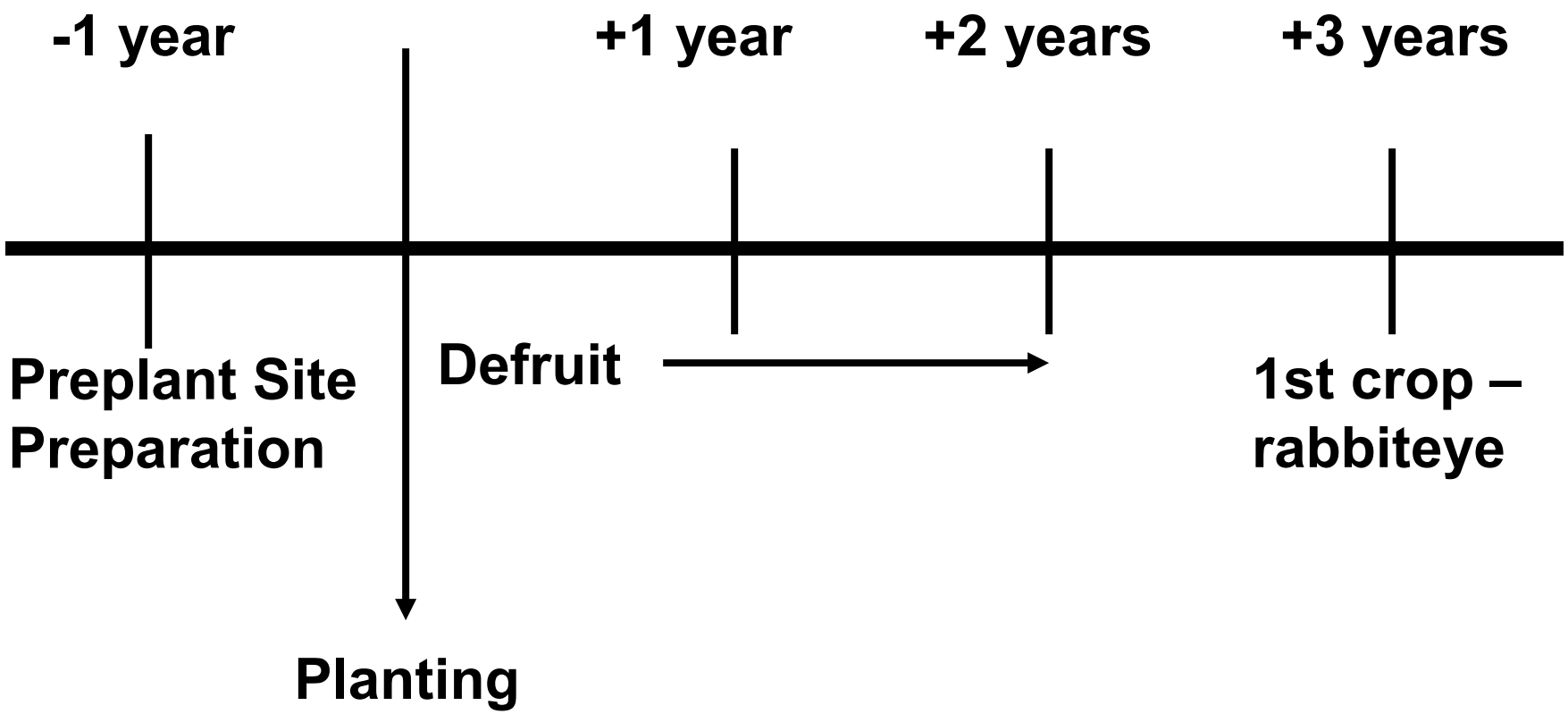
Positives

- Can be done on smaller acreages
- Can utilize hilly land
- Potentially high returns per acre
- High level of interest by consumers in locally produced crops

Getting Started in Fruit Production

- Lag time between planting & 1st crop
  - No return on investment
  - Determines productive potential of planting over its entire life
- Trees/vines/bushes live for many years
  - What you do this year affects what happens next year
- Fruit buds initiated in the growing season of the previous year
- Multiple pests
- Perishable commodity

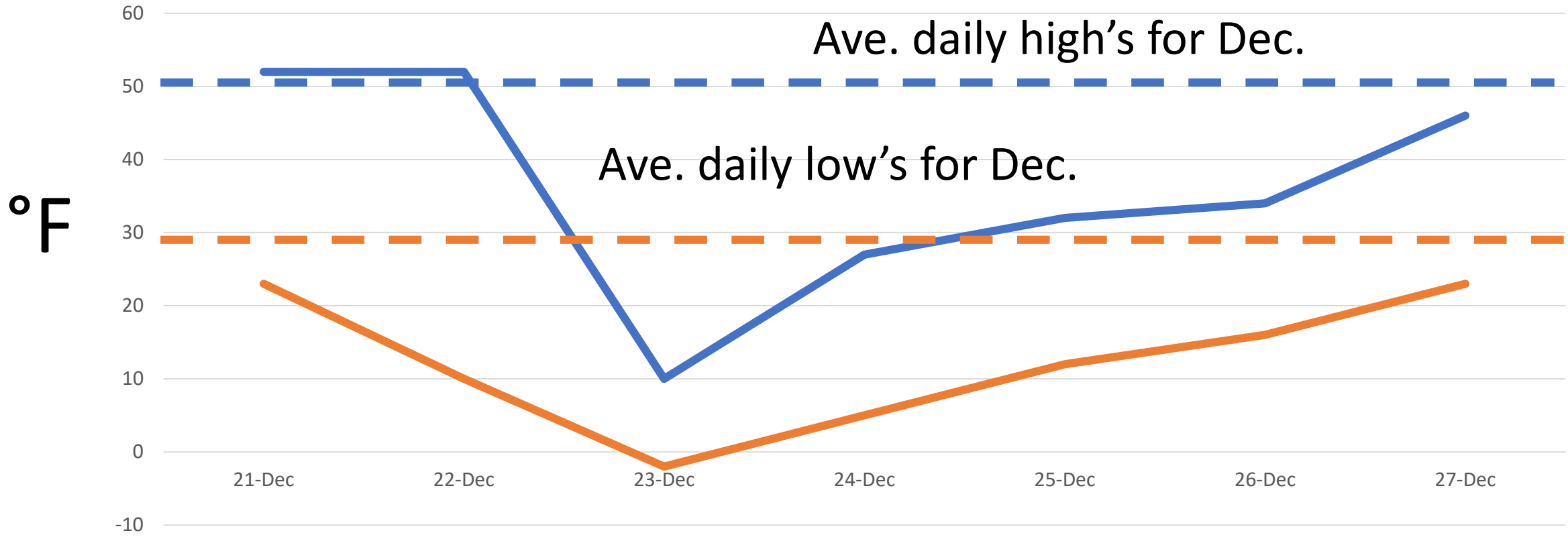
Blueberry Production Timeline



Site Selection Considerations

- Market – distance, accessibility, quality of roads, parking
- Full sun
- Elevation in regards to surrounding area
- Aspect of slope
- Degree of slope
- Soils:
  - Drainage – internal & surface
  - Potential rooting depth
  - pH
  - Fertility
- Water – availability & quality
- Wildlife issues
- Adjacent agricultural operations

MTREC: High/Low Temp. 12/21/22 – 12/27/22



Critical Temperature

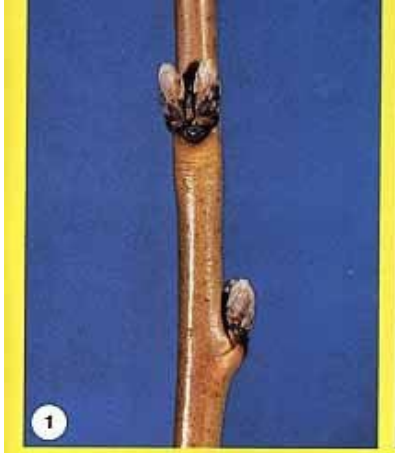
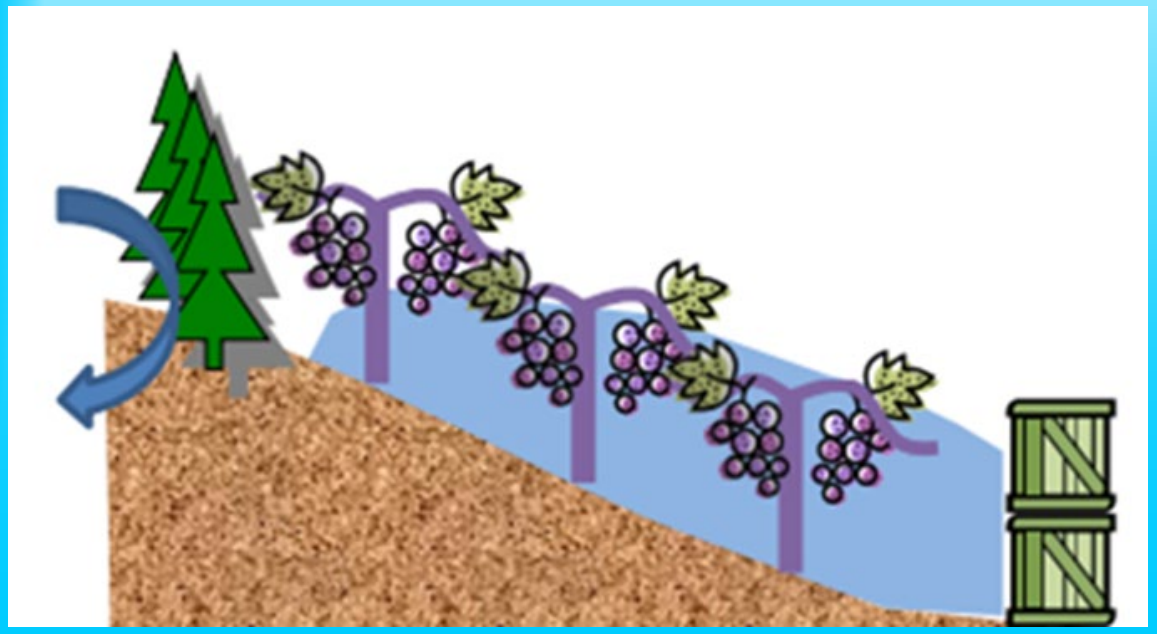


PLATE 5

PEACH

1. Dormant
2. Swollen bud
3. Half-inch green
4. Pink
5. Bloom
6. Petal fall
7a. Fruit set—shucks on
7b. Fruit set—shucks off

Passive Controls



Active Frost Control

What to Plant?

Yes	Maybe	No
Apple	Peach	Apricot
Pear: European Asian	Nectarine	Plumcot, Pluot, Aprium
Grape: American French American hybrid	Plum	Sweet Cherry
Blackberry:	Tart Cherry	Olive
Raspberry:	Grape: muscadine V. vinifera	Fig
Blueberry: Rabbiteye Highbush		
Strawberry: matted row plasticulture (annual)		

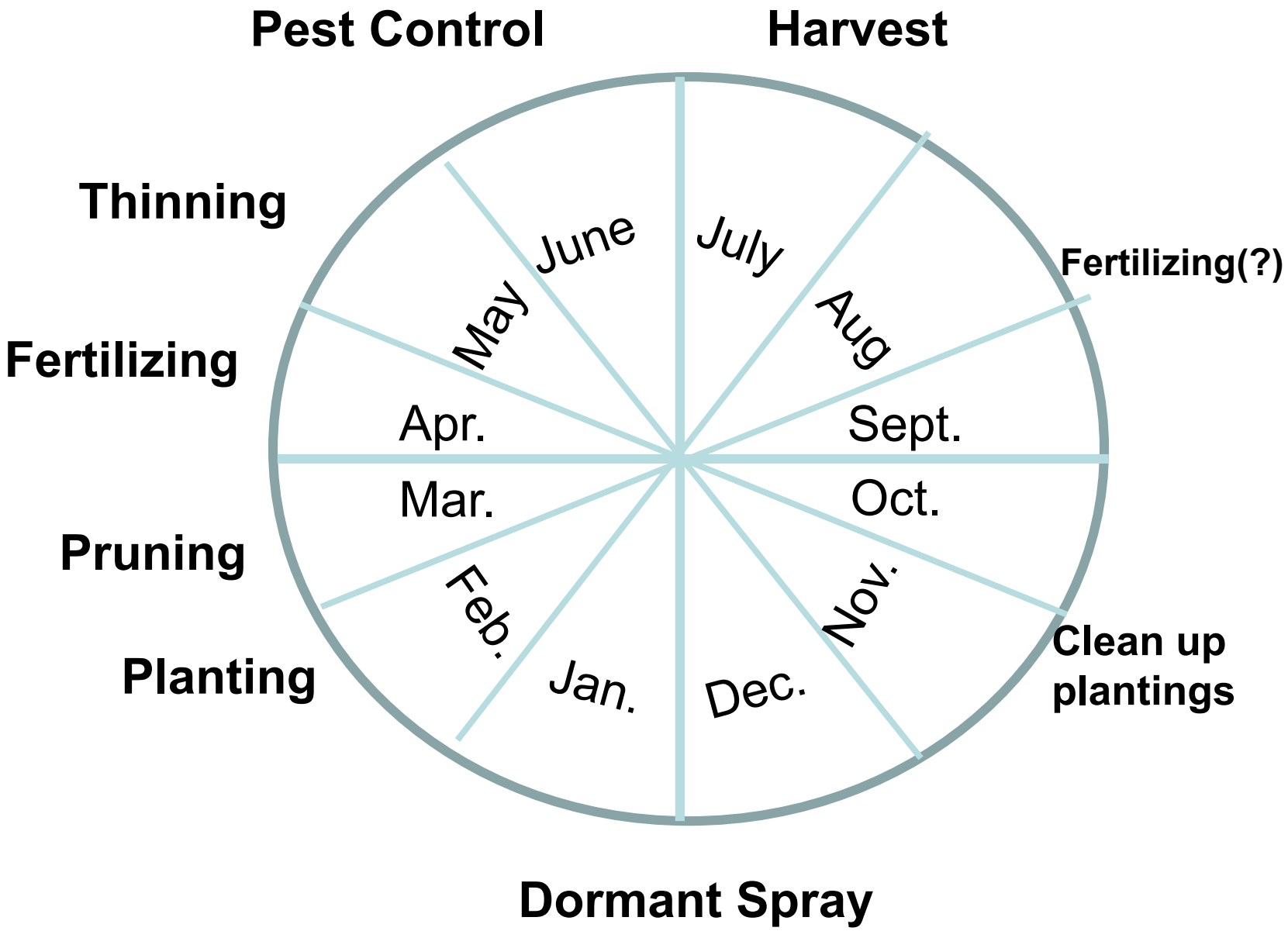
Tree Crop Timeline

	Planting to 1st crop	Planting to full crop	Life expectancy
Apples (semi-dwarf) 250 – 550 trees/acre 	3 to 4 years	6 to 8 years	20+ years
Apples (dwarf) 600 + trees/acre 	2 years	5 to 6 years	? (15 + years)
Stone fruits 	3 years	5 to 6 years	17 -20 years

Small Fruits: growth & fruiting

Crop	Planting to 1st crop - yrs	Planting to full crop - yrs	Yrs of Life Expectancy	Yield @ Maturity
Blueberry – Rabbiteye	2 to 3	6 to 8	25+	15 to 20 lbs.
Blueberry - Highbush	3 to 4	7 to 9	25+	15 to 20 lbs.
Grape – American Bunch	3 to 4	5 to 6	25+	15 to 20 lbs.
Grape – French/American Hybrid	3 to 4	5 to 6	25+	12 to 15 lbs.
Grape – Vitis vinifera	3 to 4	5 to 6	20+	6 to 8 lbs.
Grape - Muscadine	3 to 4	5 to 6	30+	30 to 40 lbs.
Blackberry	2	3	8 to 10	4 to 6 lb/plant
Raspberry	2	3	8 to 10	1 ½ to 2 lb/plant
Strawberry – matted row	2	2	4	½ to 1 lb/ft. of row
Strawberry - plasticulture	7 to 8 mo.	7 to 8 mo.	1	1 to 2 lb/ft. of row

Calendar


Pest Control
Harvest
Thinning
Fertilizing(?)
Fertilizing
Pruning
Planting
Clean up plantings
Dormant Spray
May
June
July
Aug
Apr.
Sept.
Mar.
Oct.
Feb.
Nov.
Jan.
Dec.

Harvest Periods

Crop	May	June	July	Aug	Sept	Oct	Nov
Strawberries							
Raspberries							
Blackberries							
Stone Fruits							
Grapes							
Muscadines							
Pears							
Apple							
Pecans							

Horticultural Maturity

- Defined as the stage at which growth or development of a fruit or vegetable is optimum for a particular use.
- To be mature, a crop must be either:
  - At optimum for consumption or processing at harvest

    or
  - Able to ripen to acceptable quality after harvest or storage

Types of Horticultural Maturity

1. Harvested physiologically immature:
   - Green cucumbers, green tomatoes, summer squash, gooseberries & cherries used for brining
2. Harvested firm mature but ripened later:
   - European pears, winter apples, fresh plums, apricots, peaches & nectarines
3. Harvested when ripe:
   - Berries, cherries, slicing tomatoes, nuts, prunes for canning or drying, fruits for roadside marketing

When to Harvest?

Will ripen after harvest	**Will not ripen after harvest**
Apple	Blueberry
Apricot	Cherry
Pear	Grape
Peach	Strawberry
Plum	Caneberry
	Nuts

When to Harvest?

- Premature harvest:
  - Fruit may be small, poorly colored, sour, tough, starchy, off-flavor & subject to storage disorders
- Delayed harvest:
  - Overripe fruit may have mealy flesh, flat flavor, discoloration of the skin, internal breakdown (watercore in apples) and poor storage life. Excessive losses to fruit drop may also occur.

Post-Harvest is a **Hotel** – Not a **Hospital**

- Garbage In – Garbage Out
  - Quality after storage & proper ripening can NEVER be better than harvest quality

- Poor quality fruit placed in storage will be *poorer* quality when removed

Ctr. For Agriculture, Food and the Environment
Univ. of Massachusetts Extension Fruit Program

Optimal Storage Conditions – Small Fruits

Crop	Temperature (°F)	Humidity (%)	Ethylene Production	Ethylene Sensitivity	Storage Life
Blueberries	31-32	>90	Very low	No	2 weeks 4 (rabbiteye)
Caneberries	31-32	90-95	Very low	No	2-3 days
Currants	31-32	90-95			1-4 weeks
Elderberries	31-32	90-95			1-2 weeks
Gooseberries	31-32	90-95			3-4 weeks
Grapes	31-32	85	Very low	Yes	2-8 weeks
Strawberries	32	90-95	very low	no	3-7 days

Juice Yield for Fruit Crops

Apples: 8 to 10 oz. per lb. of fruit
Cherries: 6 to 8 oz. per lb. of fruit
Cranberries: 4 to 8 oz. per lb. of fruit
Grapes: 8 oz. per lb. of fruit
Grapefruits: 320 oz. per case of fruit (#56)
Lemons: 190 oz. per case of fruit (#115)
Limes: 4 to 5 oz. per lb. of fruit
Melons: 6 to 8 oz. per lb. of fruit
Oranges: 352 oz. per case of fruit (with our JBT Whole Fruit Extraction)
Papayas: 3 oz. per lb. of fruit
Peaches: 1 to 3 oz. per lb. of fruit
Pineapples: 4 to 6 oz. per lb. of fruit
Strawberries: 4 to 5 oz. per lb. of fruit
Raspberries: 4 to 5 oz. per lb. of fruit
Watermelon: 6 to 10 oz. per lb. of fruit

juicernet.com/average-juice-yields-for-fruits-vegetables/

Field Heat

- Difference between the temperature of harvested fruit & the optimal storage temperature for it
- Lowering field heat is essential during the 1st few hours after harvest
  - 1 hour’s delay with field heat of 95°F will lower shelf life ~ 1 day even with optimal storage conditions

Precooling

Removal of field heat immediately after harvest

- much faster than just setting fruit in a cold room
- forced air (rapid movement of cool, moist air) is the most common method

- Postharvest losses of 25 – 30% without precooling vs. 5 to 10% with precooling

Postharvest Considerations: Storage

- Cold Storage:
  - Store @ ~30°F & 90 – 95% RH
  - Good air circulation & exchange
  - Leave spaces between rows for good air circulation
- Cold Storage:
- Maintain proper temperatures (Low to mid-30’s)
- High humidity levels (90 to 95% RH)
- Good air circulation
- Stack containers with gaps for air movement

Fruits & Ethylene

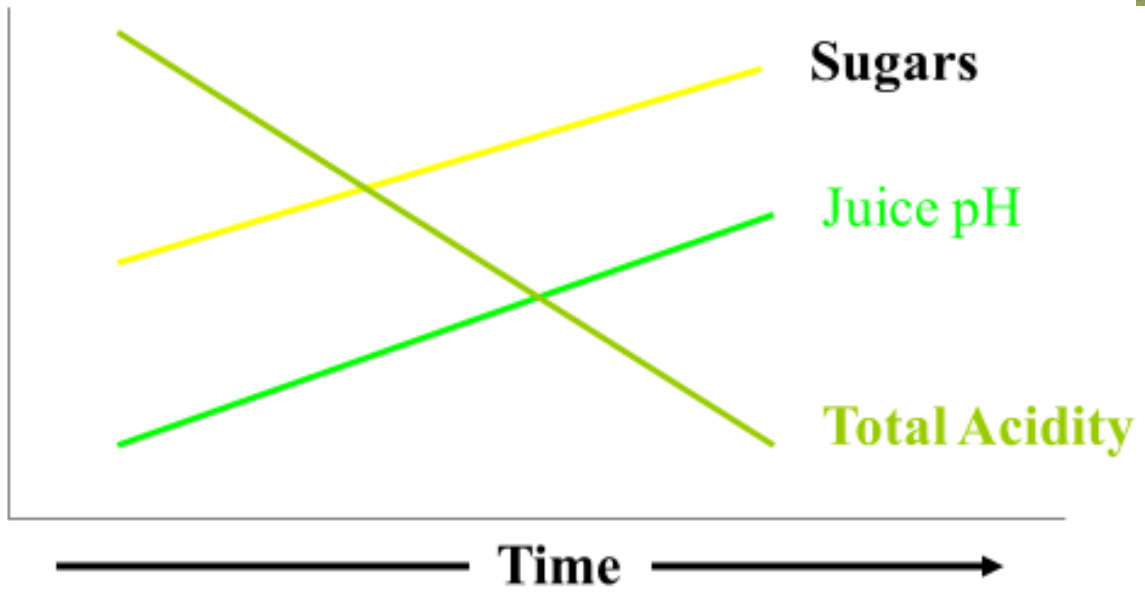
Fruits	Ethylene Emission	Ethylene Sensitivity
Apples	High	Yes
Apricots	High	Yes
Blueberries	Very Low	No
Caneberries	Very Low	No
Elderberries	No	Yes
Grapes	Very Low	Yes
Peaches	High	Yes
Strawberries	Very Low	No

SmartFresh™ Ginger Gold Trial – 2010
30 days at room temperature

Extending the shelf life of apples beyond that of common storage

When to Harvest WineGrapes?

- Wine
  - Work with the winery



Finding Fruit

- Contact local growers, Extension agents & specialists, commodity organizations in surrounding areas & states
- Collect & freeze unsold fruit from growers until the amount needed is accumulated
- Purchase “seconds” (blemished but sound fruit that cannot be sold fresh can be used for processing)
- Split loads with other processors
- Consider “custom crush” with wineries & cideries in the area

Working with Wineries

- Prospective growers:
  - Contact area wineries to
    - Find out what varieties they might need
    - Make them aware of your intentions to establish a vineyard
    - Get involved with TFWA (Tennessee Farm Winegrowers Alliance)
- Planting until 1st crop: maintain contact with wineries & TFWA

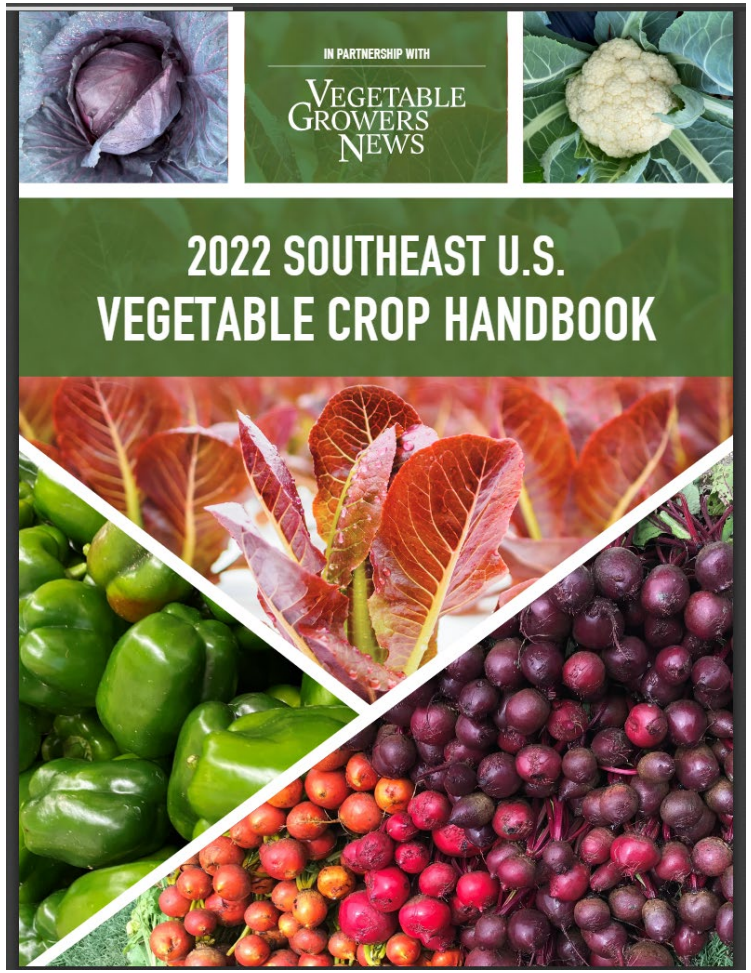
Working With Wineries:
Planning & Planting the Vineyard

- Contact Extension & other growers to see if the suggested varieties are suited to your area.
- Determine how many vines of a variety to plant
  - Wineries need to have full tanks of juice for a given variety
    - Rough calculations:
      - 120 to 180 gallons of juice per ton of grapes (depending on type of press & operator)
      - Yields from a mature vineyard – 5 to 7 tons/acre from muscadines & American bunch
        3 to 5 tons/acre from hybrids
        1 ½ to 2 ½ tons/acre from *Vitis vinifera*

Working With Wineries

- Work closely with the winemaker as harvest approaches
- Focus on quality & consistency in cropping
  - Your success as a grower depends on the wineries
  - The winery's success depends on the grower

References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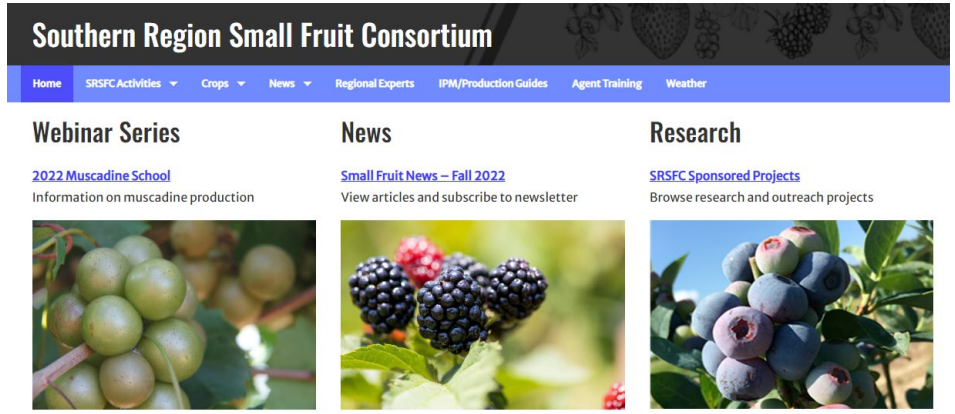
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Farm Toxicology for Primary Care: Recognition and Management of Pesticide Poisonings – Online Self-Paced Learning (Available Nov. 1, 2021-Aug. 31, 2024)
Mission
To involve collaborative efforts at various sites across the region between small fruit growers and grower organizations, industries and service organizations allied with and/or serving small fruit growers, agricultural extension programs and research stations working together to enhance the development of the small fruit industries in the region.
SRSFC Overview
SMALL FRUITS
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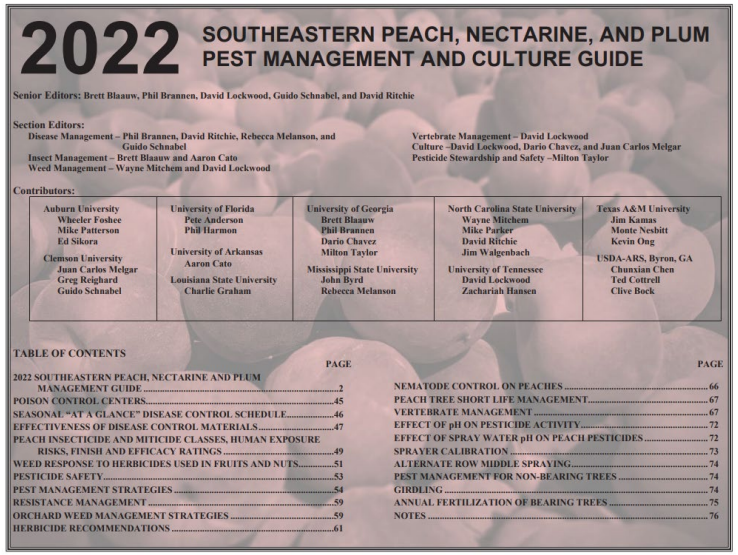
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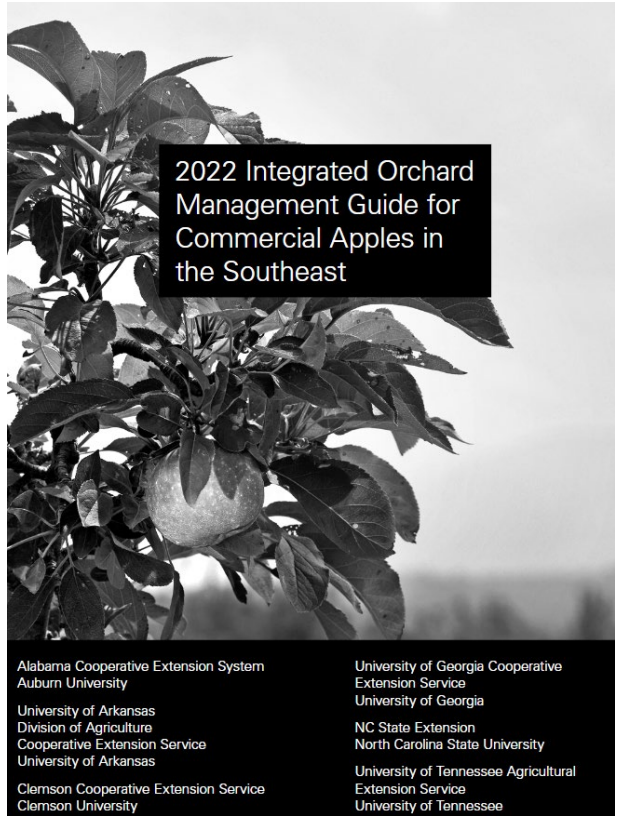
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