Getting Peaches Ripe – Preharvest Practices

Mercy Olmstead, Stone Fruit Extension Specialist
Peach Fruit Development

- There are 3 (4) phases of fruit development
  - Cell Division
  - Lag Phase (Pit Hardening)
  - Cell Enlargement
  - Ripening
Avoiding Stress During Fruit Development

• Irrigation
  – Avoid too much or too little
  – Monitor with soil moisture sensors
    • Tensiometer
    • Use Reference ET as a guide (FAWN)
### Station 12/3 (in/day) 12/4 12/5 12/6 12/7 12/8 12/9 7-day total Daily Avg. (gals/A/day)

<table>
<thead>
<tr>
<th>Station</th>
<th>12/3 (in/day)</th>
<th>12/4</th>
<th>12/5</th>
<th>12/6</th>
<th>12/7</th>
<th>12/8</th>
<th>12/9</th>
<th>7-day total</th>
<th>Daily Avg. (gals/A/day)</th>
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</thead>
<tbody>
<tr>
<td>St. Lucie West</td>
<td>0.06</td>
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<td>0.05</td>
<td>0.06</td>
<td>0.05</td>
<td>0.41</td>
<td>0.06 (1581)</td>
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**Remember:**
1 acre-inch = 27,154 gallons
Peach Fruit Development

• Low-chill peaches have a short *fruit developmental period* –
  – 78-95 days

• Early leaf area is important for sugar development (carbohydrates)
Importance of Leaves & Sugar Development

Photosynthesis drives fuel/sugar production

\[ \text{C}_2\text{H}_12\text{O}_6 \to \text{CO}_2 + \text{O}_2 \]

\[ \text{C}_2\text{H}_12\text{O}_6 \]
Fruit Quality

- Poor leaf area early due to low chill accumulation =

Bad Fruit Quality!
What Does “Tree Ripe” Mean?

![Diagram showing chromatograms of Gieason Early Elberta peach volatiles, tree ripe (top) and artificially ripened (bottom).]

Do et al., 1969
What Determines Size?

• Cherries – genetic predetermination
  – Cultivar dependent for final size
  – E.g., your height is predetermined by your parents’ height.

• What about environment/cultural practices?
Fruit Thinning

Over 450 Fruit on Mature Tree!
Fruit Thinning

• Should be thinned before pit hardening
  – Otherwise, won’t make difference in fruit size
  – Save and redistribute resources!

• Thin to at least 6” between each fruit
  – UF Sun = wider spacing btw. fruit
Fertilization

- Too much N after harvest = strong vegetative growth, fewer floral buds develop, other effects?
Potassium

- Important in cell division (phase 1 of fruit development)
- Deficiency not often observed
- Corrected with potassium sulfate

http://ucanr.edu/sites/fruitreport/Nutrition_-_Fertilization/Individual_Nutrients/Potassium/
Other Factors Affecting Fruit Size

• Insects
  – Chewing/sucking on leaves
    • Increases stress
    • Reduces photosynthates to fruit

• Diseases
  – Leaf/branch/fruit damage
    • Photosynthesis stress
When is the Fruit Ripe?

- Buyer minimums
  - Sugar
- Other important factors?
  - Melting vs. Non-melting texture
  - Acid
  - Color
  - Postharvest
Farmers Market Study
2013-2014

M. Olmstead and R. Kluson, Sarasota County Extension
Survey Methods

• Farmer’s Market Survey
  – Focus on fruit appearance, shape, color, texture, liking
  – 100 volunteers
  – Conducted brix/firmness readings of fruit being sampled
What did they prefer?

• Texture correlated with:
  – Firmness
  – Flavor
  – Overall Liking

• Overall Liking *highly* correlated with flavor, but flavor was *not* correlated with sugar (Brix)

Importance of Acid?
What flavor compounds?
Aromas?
Asking America:

WHAT IS AN IDEAL PEACH?
Breed/produce peaches that consumers want!

What are the consumer perceptions of peaches?

How much are they willing to pay for important traits?
An Ideal Peach for the U.S. Market?

Top Elements
• Melts in the mouth when you bite into the peach
• High in vitamin C
• So sweet...no sugar needed
• Full of juice
• Organic peaches

Negative Elements
• Small... bite-sized peaches
• Flat, shaped like a donut
• Meaty... not juicy
• Tough chewy skin
• Mealy... pasty and dry
Summary

• Minimize environmental stress
  – Drought

• Minimize cultural stress
  – Fertilizer
  – Cropload
  – Insects/Disease
  – Retain leaves through autumn to maximize carbohydrate storage
Questions?