Infrared Canopy Temperatures of Early Maturing Peach Trees under Deficit Irrigation

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Introduction

An early-season peach, “Crimson Lady” (Prunus persica (L.) Batsch), is generally harvested in late May to early June in central California. To reduce water use, regulated deficit irrigation may be applied to these trees for the remaining and also the most water demanding season (mid June to November).

As shown in the following figure, reference ET (ETo) was 725 mm for June – Sept 2007 and 757 mm June – Sept 2008. These post harvest water demands may not need full replacement from irrigation because peaches not on the tree during these periods.

Methods and Procedures

Deficit Irrigation Treatment - Post Harvest

Experimental Design: Randomized-block

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mar-May</th>
<th>Jun-Nov</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>1030</td>
<td>1243</td>
<td>2273</td>
</tr>
<tr>
<td>F2</td>
<td>405</td>
<td>673</td>
<td>1078</td>
</tr>
<tr>
<td>S1</td>
<td>267</td>
<td>1137</td>
<td>1404</td>
</tr>
<tr>
<td>S2</td>
<td>534</td>
<td></td>
<td>534</td>
</tr>
</tbody>
</table>

IRT Placement in Orchard

12 Agrojet IRR-P IRTs
- 1 plot, 3 clusters multi-drop network

IRT Lab Calibrations
- All IRT sensors lab tested w/ water bath @ 5 temperature settings
- New calibrations for each sensor to account for extension wires (25 to 50 m)
- All IRTs lab tested w/ water bath @ 5 temperature settings
- Variations in sensor readings were ± 0.1°C

Preliminary Results

IRT Temperatures

Measured Temperature Difference @ 2 PM PDT (2007)

Measured Temperature Difference @ 2 PM PDT (2008)

Soil Water Content

Yield and Quality

Summary

- Tcanopy > Tair under deficit irrigation (both furrow and drip)
- d(Tcanopy-Ta) correlated with soil water
- Potential impact on yield and fruit quality in S2 (drip + deficit ET replacement)
- Next step: d(Tcanopy-Ta) → Irrigation Scheduling

POSTER NUMBER 6