Regional Considerations for Pistachio Production

Kat Jarvis-Shean
UCCE Sacramento, Solano & Yolo Counties

Thanks to David Doll & Louise Ferguson for input.

• Current Production Areas
• Annual Climatic Considerations
• Orchard Lifetime Consideration

Current Pistachio Geography

Bearing Acres, 2019

Sac Valley
Merced
Madera
Fresno
Tulare
Kings
Kern

Data & Image: Admin Committee For Pistachios
Photos: Jarvis Shean, Ferguson, UC IPM

Current Pistachio Geography

Climate: In-Season Rains

<table>
<thead>
<tr>
<th></th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
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</thead>
<tbody>
<tr>
<td>Durham</td>
<td>1.5</td>
<td>1.1</td>
<td>0.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
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<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Firebaugh</td>
<td>0.7</td>
<td>0.4</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
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<tr>
<td>Belridge</td>
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<td>0.3</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
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</table>
Climate: In-Season Heat

![Graph showing climate and heat units](image-url)

**Equation:**
\[ y = 0.1073x - 216.08 \]
\[ R^2 = 0.822 \]

**Figures:** Louise Ferguson, UC Davis

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Climate: Heat Units

- Nut Maturation
  - Delayed Development, Poor Split %
  - 2400 HU maximum kernel weight
  - Above 2000 HU, 100 HU=1% splits

![Heat units comparison graph](image-url)

*Heat Unit= Avg daily temp – 7°C*

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Climate: In-Season Heat

![Graph showing closed shell weight vs. total production weight](image-url)

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Data: Admin Committee for Pistachios
Climate: Navel Orangeworm & Heat

- Earlier Biofix, More Generations
- Ease of Sanitation

<table>
<thead>
<tr>
<th>Location</th>
<th>2015 NOW Degree Days</th>
<th>2020 NOW Degree Days</th>
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Climate: Winter Chill

- Impacts of Chill
  - Delayed bloom
  - Poor male overlap, increased blanks
  - Multiple shakes

Scattered ‘Kerman’ bloom observed in 2014

Climate: Chill Accumulation

- Cultivar important, esp. males
- Fog helps chill

UC Davis Fruit & Nut Center
Climate: Freeze

- Winter Juvenile Tree Dieback
- Elevation, Topography
- Dormancy
- Salts

Photo: C. Kallsen

- Current Production Areas
- Annual Climatic Considerations
- Orchard Lifetime Consideration

Water Quantity and Quality

- Varies across the state
  - 42” of water use for maximum production
  - Can get by on less, but affects yield
  - May need more if poor quality

- Source Issues
  - Groundwater
  - Surface Water
Water Quantity

Precipitation 2000-2019

Soil Quality

- Saturated or easily saturated soils
  - River bottoms
  - High water table (quality and quantity)
- Saline, Alkaline soils
  - Toxicity of sodium, chloride, and boron
  - Limits – M. Culumber’s talk

Conclusions

- No perfect site
- Management of many of these issues is possible
- For heat, chill, water & soil, early decisions are key
- Decisions must be made on current and future conditions
Questions?