California Medium Density Table Olives

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Rocky Hill Ranch and Burreson Ranch
Bell Carter Olives and Musco Family Olive Company
Dave Smith, Erick Nielsen, Dave Loquaci, Phil Scott

California Olive Committee
Traditional Orchards: 96 – 139 t/a
Hedgerow Orchard #2:
12’ X 18’ = 202 trees/acre
What Are the Differences?

- Cultivar: ‘Manzanillo’
- Production Costs and Breakdown
- Spacing
- Yields
- Olive Size = Thinning and Irrigation
- Olive Fly Tolerance
- State of Maturity at Harvest = FRF
- Olive Quality at Delivery
- Disease Susceptibility
- Mechanical Harvesting Technology
What Are the Differences?

• Cultivar: ‘Manzanillo’
California Black Ripe
‘Manzanillo’ Table Olive
What Are the Differences?

• Cultivar: ‘Manzanillo’
• Production Costs and Breakdown
Cost to Produce Table Olives
$4,543/acre (2009)
What Are the Differences?

- Cultivar: ‘Manzanillo’
- Production Costs and Breakdown
- Spacing
- Yields
New Orchards: 12’ X 18 (200+ T/ac)
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<td>Tons/A</td>
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<td>Tons/A $/Ton $/Acre</td>
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<td>Conventional</td>
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<td>1.75</td>
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<td>6.39</td>
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<td>1.51</td>
<td>2.26</td>
<td>6.4</td>
<td>5.04</td>
<td>4.37 1189 5192</td>
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<td>Trellised, Woven</td>
<td>4.21</td>
<td>1.68</td>
<td>2.28</td>
<td>6.07</td>
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<td>3.45</td>
<td>1.76</td>
<td>7.51</td>
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<td>4.42 1179 5178</td>
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*NS (Not Significant at the 5% level using Fisher’s Test)
What Are the Differences?

- Cultivar: ‘Manzanillo’
- Production Costs and Breakdown
- Spacing
- Yields
- Olive Size = Thinning and Irrigation
Set fruit: will be an olive
Heavy Crop Set:
if representative of total tree and orchard will produce a heavy crop of small fruit.
Chemical Thinning of Olives

Removes fruit:
changes leaf to fruit ratio = larger fruit
Fruit Size Method – 1/8 to 3/16 inch
Preharvest Irrigation
What Are the Differences?

- Cultivar: ‘Manzanillo’
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- Spacing
- Yields
- Olive Size = Thinning and Irrigation
- Olive Fly Tolerance
No Tolerance!!
What Are the Differences?

- Cultivar: ‘Manzanillo’
- Production Costs and Breakdown
- Spacing
- Yields
- Olive Size = Thinning and Irrigation
- Olive Fly Tolerance
- State of Maturity at Harvest = FRF
Physiologically Immature Fruit: FRF >0.5 Kg
Overcome Biological Constraints

Find a selective abscission agent:
- Use model abscission agents as treatments
- Define seasonal response
- Examine physiological, molecular changes
- Select compounds based on metabolic changes
- Focus on ‘natural’ compounds
- Screen available compounds

Incorporate into a ‘mechanical harvesting system’:
- Define effective application parameters
- Establish tree architecture criteria
What Are the Differences?

• Cultivar: ‘Manzanillo’
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• Spacing
• Yields
• Olive Size = Thinning and Irrigation
• Olive Fly Tolerance
• State of Maturity at Harvest = FRF
• Olive Quality at Delivery
What Are the Differences?

- **Cultivar**: ‘Manzanillo’
- Production Costs and Breakdown
- Spacing
- Yields
- Olive Size = Thinning and Irrigation
- Olive Fly Tolerance
- State of Maturity at Harvest = FRF
- Olive Quality at Delivery
- Disease Susceptibility
Olive knot, caused by *Pseudomonas savastanoi* pv. *savastanoi*, is the most common bacterial disease of olive trees.

Characteristic symptoms are galls, usually developing on twigs and branches.
What Are the Differences?

• Cultivar: ‘Manzanillo’
• Production Costs and Breakdown
• Spacing
• Yields
• Olive Size = Thinning and Irrigation
• Olive Fly Tolerance
• State of Maturity at Harvest = FRF
• Olive Quality at Delivery
• Disease Susceptibility
• Mechanical Harvesting Technology
“Harvest Method determines the tree training method.”

Ricardo Gucci (2009)
Hedgerow Orchard #1:
12’ X 26’ = 139 Trees/acre
12 feet
Mechanical Pruning Reduces Yield!

3 Feet
Hedgerow Orchard #2:
12’ X 18’ = 202 trees/acre
Progress from 2006 - 2010

**Initial Objectives:**

- Decrease fruit damage
- Increase harvester efficiency:
  - Engineering
  - Tree pruning
  - Abscission agent

**Achieved:**

- Fruit damage eliminated
- Harvester efficiency < 64%
Current Objective: 2011

◆ Increase harvester efficiency > 64%:
  ◆ Engineering
  ◆ Canopy Contact
  ◆ Trunk Shakers
Oxbo in Spain: 2011
Current Objectives: 2011

◆ Increase harvester efficiency > 64%:
  ◆ Pruning before and during harvest:
    ◆ 139 trees/acre hedgerow
    ◆ 202 trees/acre hedgerow
Hedgerow Orchard #1:
12’ X 26’ = 139 Trees/acre
Hedgerow Orchard #2:
12’ X 18’ = 202 trees/acre
Pruning during harvest to increase % removal efficiency
Abscission Agent

Tree Training and Pruning

Harvester
The California table olive industry relies on hand harvesting of its primary ‘Manzanillo’ cultivar. In recent years the increasing cost and uncertainty of labor have adversely affected California’s competitiveness in the table olive market. Consequently, research attention has been devoted to the mechanical harvest of table olives, a practice common in the olive oil industry.

Mechanizing the harvest of table olives presents some unique challenges. The tree canopy and trunk must be adapted to the interface with the harvester, avoiding damage to the tree, and the fruit must be collected with minimum bruising. Our team brings dedication and diverse experience to these tasks, with the support of the growers and processors of the table olive industry.

Site was last updated on 5/11/10 at 12:22 PM