Paul Vossen
University of California
Cooperative Extension
133 Aviation Blvd.
Santa Rosa, CA 95403
(707) 565-2621
pmvossen@ucdavis.edu
http://cesonoma.ucdavis.edu
OIL OLIVE VARIETIES

- Oil flavor “style”
- Oil yield % – quantity and extractability
- Fruit yield – precocity
- Harvest method
- Growth habit
- Maturity season
- Resistance to disease and cold
- Pollination
- Cost factors
Germplasm Repository

- DNA Identification
- Fruit Size
- Pit to Pulp Ratio
- Oil Content
- Quality Profile
- Cold Hardiness
- Salt Tolerance
- Removal Force
- Disease Resistance
Wild Olive Seedling
Acebuche Oleastrum
Oil Quality Factors

- **Variety** 40%
- Maturity 40%
- Processing 15%
- Growing Conditions 5%

*Variety Trial – Planted in 1996-97 – 5 locations in Northern California*
Italian Olives:

- Cipresino
- Coratina
- Dolce Agogia
- Frantoio
- Grappolo
- Itrana
SPANISH

- Bical
- Cornesuelo
- Cornicabra
- Lecin de Sevilla
- Blanqueta
- Empeltre
Farga
Gordal Sevillana
Hojiblanca
Lemeño
Morrut
Pico Limon
SPANISH
Picual de Jaén
Picual de Estepa
Pícudo
Royal de Cazorla
Verdala
Verdale
Manzanillo

M. Cordobes
M. de Cabra
M. de Sevilla
M. de Jaén
Chalkidiki  
Kalamon  
Koroneiki  
Amigdalolia  
Mirtoia  
Adramitini  
Megaritiki
N. AFRICA – MIDEAST

- Algeria
- Lebanon
- Morocco
- Syria
- Tunisia
FRENCH

- Aglandau
- Picholine
- Tanche
- Bouteillan
- Salonenque
- Grossane
FRUITINESS IN OLIVE OIL

Positive Characteristics
STYLE ATTRIBUTES

- Variety
- Degree of maturity
- Extraction Process

Fruitiness type
(ripe or green)

Intensity of Bitterness & Pungency

Depth and Complexity
Style Generalities

Mild
- Arbequina
- Ascolana
- Empeltre
- Kalamon
- Leccino
- Pendolino
- Maurino
- Picudo
- Sevillano
- Taggiasca

Medium
- Aglandau
- Barnea
- Bosana
- Bouteillan
- Farga
- Hojiblanca
- Manzanillo
- Mission

Strong
- Arbosana
- Chemlali
- Coratina
- Cornicabra
- Frantoio
- Koroneiki
- Moraiolo
- Picual
- Piccholine
Five Varieties From Central Italy

- Dolce di Agogia
- Maurino
- Pendolino
- Leccino
- Frantoio
## INTENSITY OF SENSORY CHARACTERISTICS
### SINGLE VARIETY TUSCAN OILS

<table>
<thead>
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<th>Variety</th>
<th>Fruity</th>
<th>Green</th>
<th>Bitter</th>
<th>Pungent</th>
<th>Sweet</th>
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</tbody>
</table>

A. Cimato, Baldini, Caselli, Marrunci, & Marzi. Florence 1995
VARIETY INFLUENCE ON FLAVOR

• **Arbequina** – very aromatic fruity, sweet
• **Picual** – bitter and pungent (overripe flavor)
• **Frantoio** – fruity, green, herbaceous, pungent
• **Leccino** – mildly fruity, spicy, sweet
• **Coratina** – fruity, green, bitter, pungent
• **Koroneiki** – crude fruity, bitter, pungent
VARIETY INFLUENCE ON FLAVOR

- **Manzanillo** — very aromatic fruity, peppery
- **Mission** - (early) very bitter
  - (mid season) slightly fruity, bitter, and pungent
  - (late) very bland and buttery
- **Sevillano** — fruity, green, herbaceous, pungent
- **Ascolano** — fruity, spicy, nutty, sweet
Cold Hardiness in Olives

**Hardy**
- Arbequina
- Aglandau
- Ascolano
- Bouteillan
- Coratina
- Hojiblanca
- Leccino
- Maurino
- Mission
- Pendolino
- Picudo
- Picual
- Sevillano

**Sensitive**
- Empeltre
- Frantoio
- Koroneiki
- Manzanillo
- Moraiolo
- Taggiasca

**Moderate**
- Kalamon
- Picholine
Ripening Season

**Early**
- Arbequina
- Ascolana
- Empeltre
- Farga
- Leccino
- Picual
- Sevillano

**Medium**
- Arbosana
- Barnea
- Bouteillan
- Manzanillo
- Mission
- Moraiolo
- Pendolino

**Late**
- Bosana
- Cornicabra
- Coratina
- Frantoio
- Hojiblanca
- Kalamon
- Koroneiki
- Picholine
- Picudo
- Taggiasca
Olive Pollination

- Some varieties are very self fertile
- Some are self sterile
- Most are somewhat self incompatible
- Set better with cross pollination – especially with bad weather (pollenizer within 200 feet)
- Barouni and Sevillano are incompatible
- Manzanillo and Mission are incompatible
ORCHARD SYSTEMS

- **Traditional** – 25 to 30 ft apart = 50 – 75 /acre
- **High Density** – 8 to 20 ft apart = 100 – 350/acre
- **SHD** – 4 x 12 to 5 x 13 ft apart = 670 – 900/acre

- Pruning by hand, hedging, topping, alternating
- Training – Tree Form
- Harvest Method
- Irrigation Management
High Density
100 – 350 trees per acre

- $8 \times 16 = 340$
- $10 \times 15 = 290$
- $9 \times 18 = 268$
- $10 \times 20 = 218$
- $11 \times 22 = 180$
- $15 \times 20 = 145$
- $20 \times 20 = 109$
Hedging and Mechanical Harvest of Large Trees
Central Leader
Closer Spacing – Shaker

Almost any variety

No advantages to Central Leader (mono-cone) “Pruning and Training Systems for Modern Olive Growing. Gucci & Cantini
www.publish.csiro.au
Open Center Shaker

Almost any variety
Upright Form is Best
Close Spacing
Open Center – Pole
Mini Shaker
Stihl
~ $1,000
Keeping Trees Small?
Heavy pruning to reduce size
Great vegetative vigor
No fruit on most varieties
This can be done with any variety
View of a super-high-density orchard from the harvester
Koroneiki
September to September
3 year old trees
Over-the-row harvest

$210 per acre

$42 per ton

@ 5 tons/acre
Before Harvest

After Harvest

Before Harvest

After Harvest
Pruning a central leader Arbequina tree in the super-high-density system
SUPER-HIGH-DENSITY SYSTEM YIELD

- Year 2 – 0.5 tons/acre
- Year 3 – 1.9 tons/acre
- Year 4 – 2.5 tons/acre
- Year 5 & up – 3.5 to 6 tons/acre
KEYS TO SHD SYSTEM

- Site *(very specific)*
- Varieties *(3 choices now)*
- Spacing *(very specific)*
- Push Young Trees *(important)*
- Fertility Level *(important)*
- Controlled Deficit Irrigation *(vigor)*
- Pest Control *(important)*
- Intensive Pruning *(very important)*
REGULAR “HIGH DENSITY” SYSTEM

• Site *(less specific)*
• Varieties *(any)*
• Spacing *(wide range)*
• Push Young Trees *(less important)*
• Fertility Level *(less demanding)*
• Irrigation *(less specific)*
• Pest Control *(easier)*
• Pruning *(much less critical)*