Introduction to Olive Growing

Santa Rosa August 12, 2009

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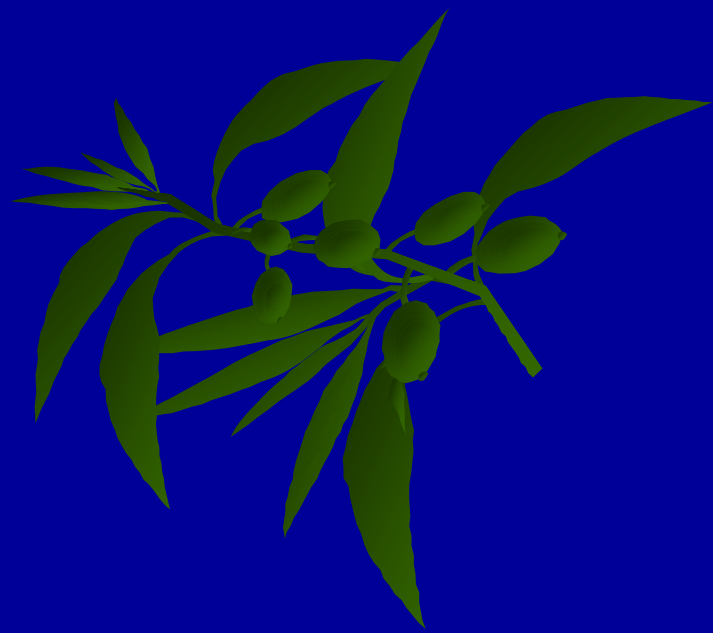


Presentation Outline

- Production Innovations
- Growing Systems {MD and HD SYSTEMS}
- Marketing Demand & Profitability
- Soil, Climate, Water, Varieties
- Making a profit – Understanding quality

September 9th

- How to grow details & pest control

Two 1º reasons for interest in olive oil

Mechanization & Health

Why Olive Oil ?

- Lower grade soils
- Easy to grow
- Few pests
- Low water use
- Lower quality water

- Mechanized
- Healthy - tastes good
- Big market
- Vertical integration
- Sales all year

Why Olive Oil – NOT ?

- Large investment
- Slow to full bearing
- Small profit margin
- Lots of competition
- Expensive harvest
- Ignorant consumers
- Small scale profit is in direct sales only

Olive Oil Production Innovations

GROWING OLIVES

- Mechanical harvest
- Low vigor varieties
- Drip irrigation
- Mechanical pruning

PROCESSING FRUIT

- Cont. flow system
- Electricity (pumps, motors, temp. control)
- Stainless steel

1:1 ratio
$400/ton

Harvesting olives with air powered combs

1:2.6 ratio
$160/ton

Shaker harvest

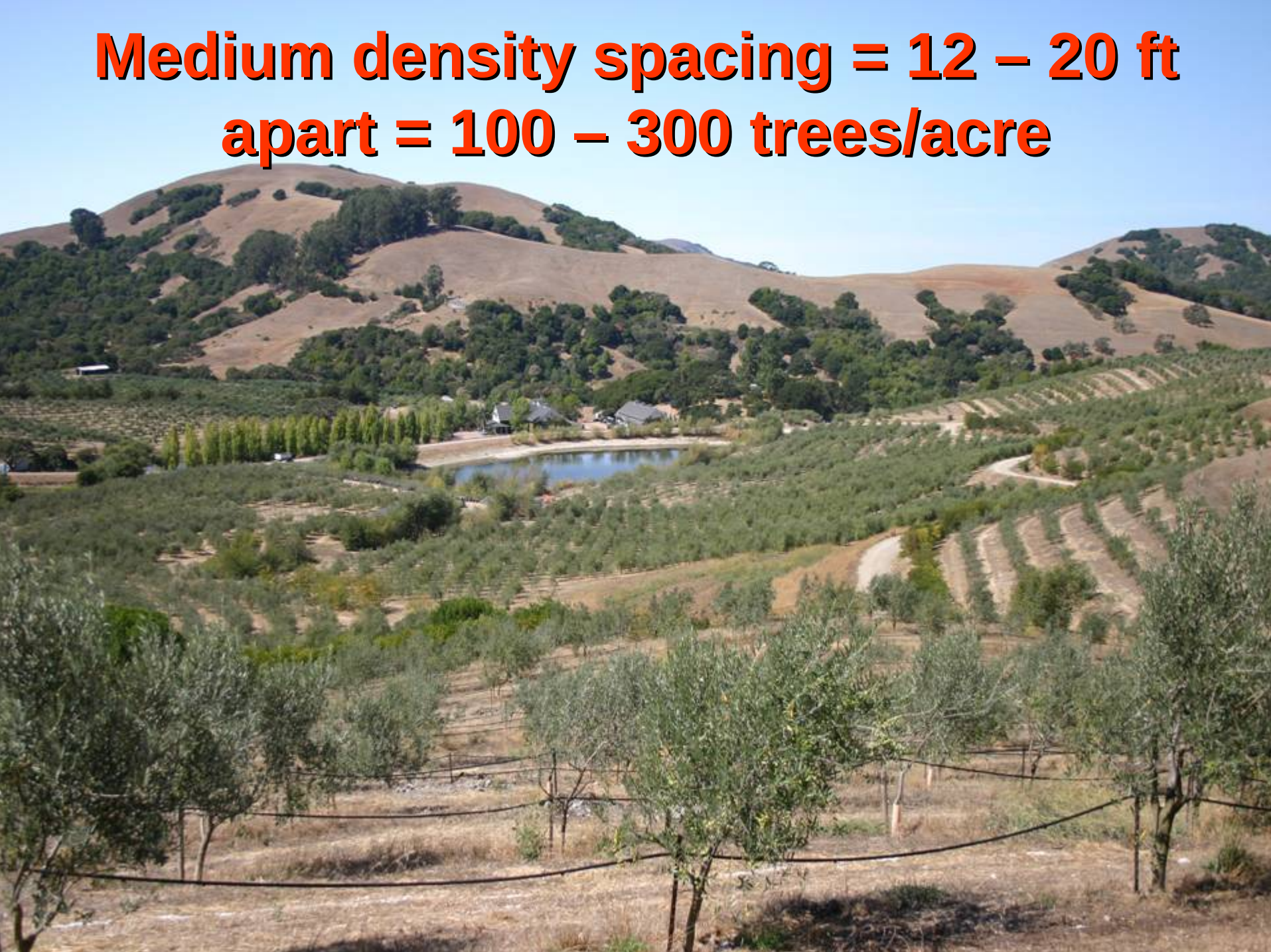
Trunk shaker and inverted umbrella WRAP AROUND

California Prune Harvester

California Pistachio Harvester

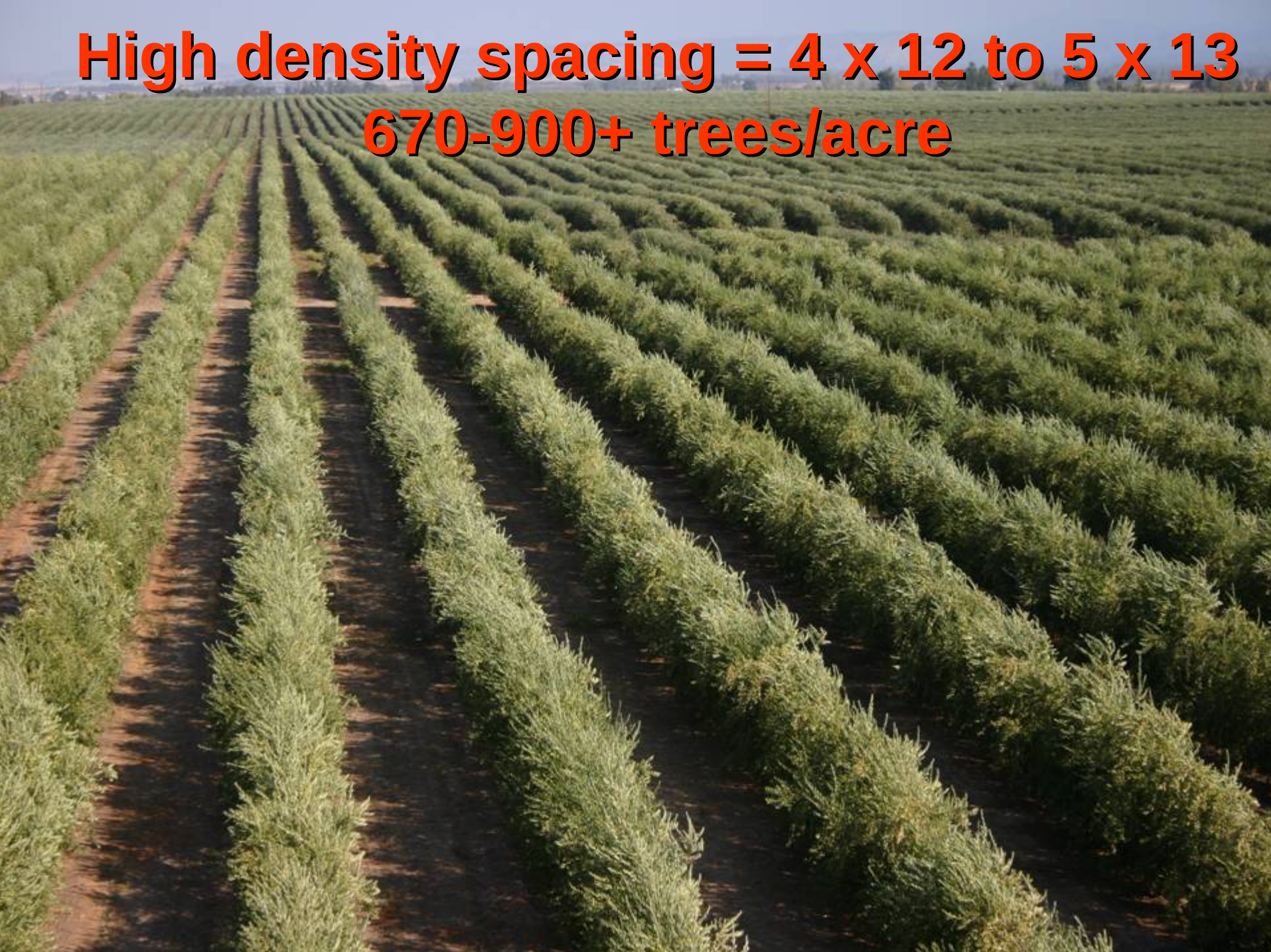
IMBRIANO
macchine agricole

Medium density spacing = 12 – 20 ft apart = 100 – 300 trees/acre

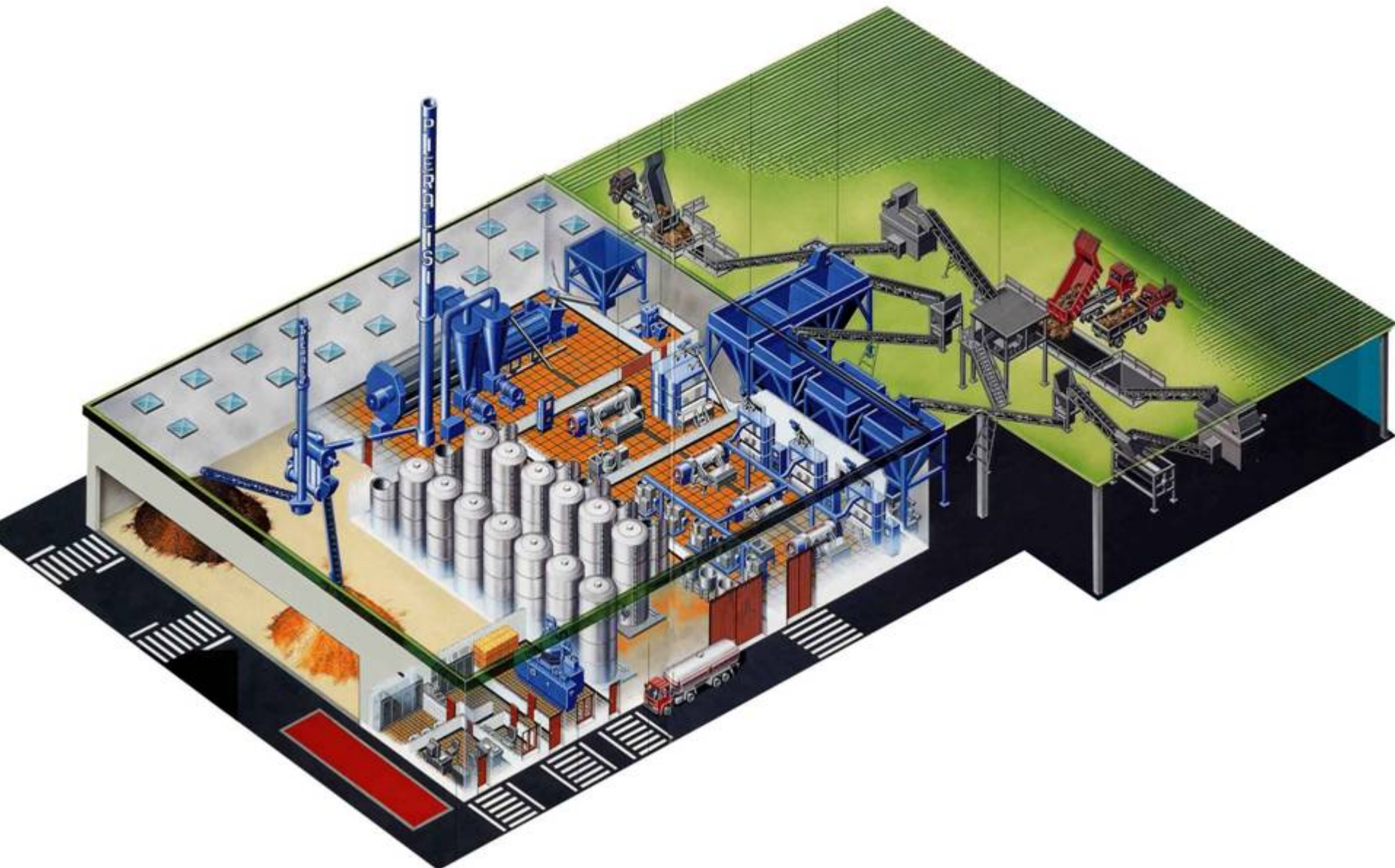


Skirted & Hedged

Over-the-row
harvest $ 42 per ton
@ 5 tons/acre


High density spacing = 4 x 12 to 5 x 13
670-900+ trees/acre

Modern Continuous Flow System



Producing Extra Virgin Olive Oil

Simple as 1-2-3-4-5

1. Good Fruit – no rot – not frozen
2. Handled carefully – no damage – short storage
3. Processed quickly – in modern clean equipment
4. Stored well – clean stainless steel - purged
5. Sold – within a year or less

Leaf and stem removal

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Horizontal Decanter

- Injection volume
- Separation ports
- Brand
- 2 or 3-phase

Vertical Centrifuge

- Cleans oil of water and solids
- Cleans wastewater of oil
- Water added to increase interface
- Volume and Temperature

Taste every batch

Continuous Flow System

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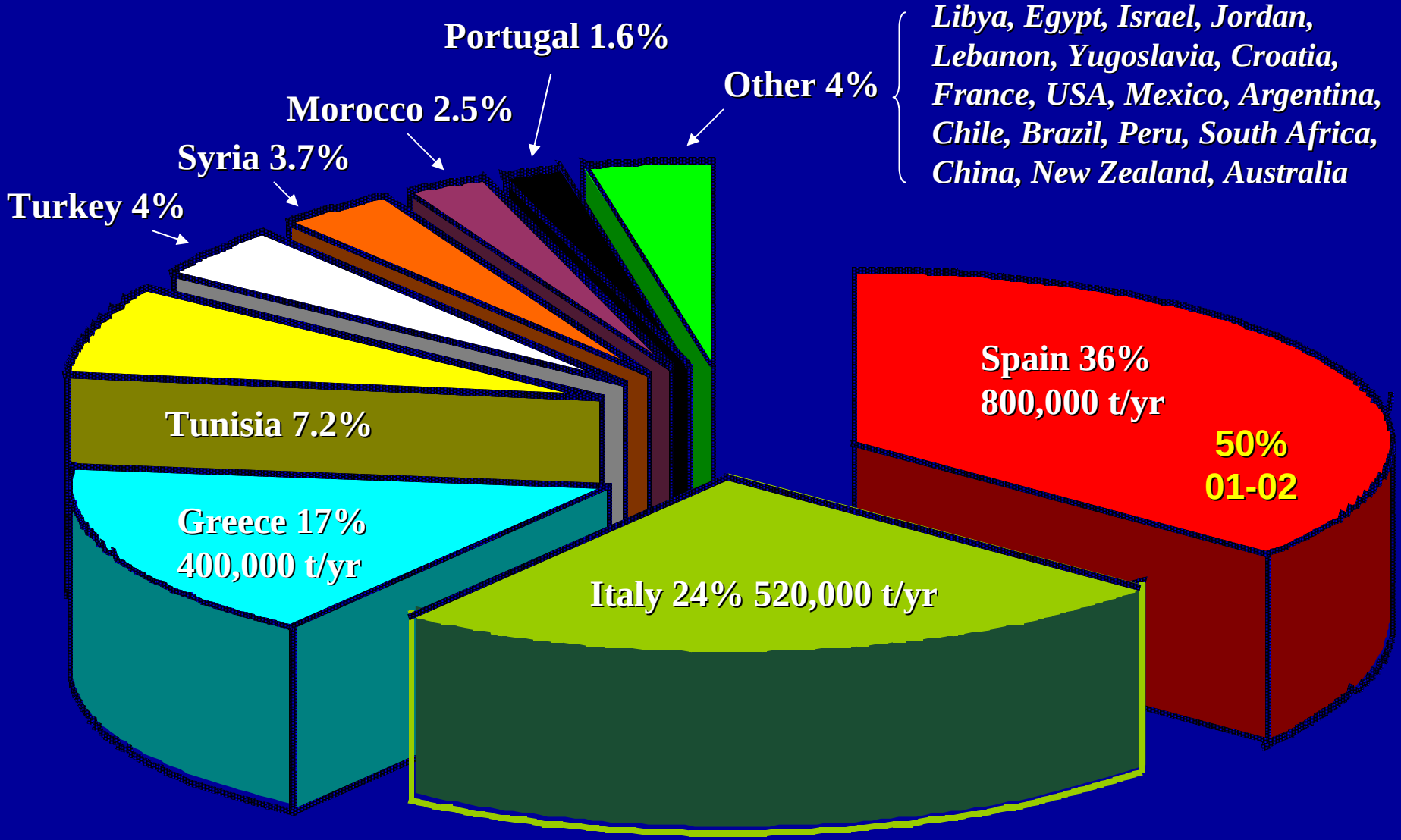
WORLD OLIVE OIL STATISTICS

WORLD OLIVE OIL PRODUCTION



Total World Production: ~ 2.2 million metric t/yr

IOOC Data 1997-2002

Olive Oil Consumption 2006

World PER CAPITA (liters)

1. Greece 23.9
2. Italy 14.4
3. Spain 13.9
4. Cyprus 10.3
5. Portugal 6.0
6. Syria 5.1
7. Tunisia 5.0
8. Palestine 3.5
9. Jordan 3.1
10. Israel 2.6
11. Morocco 1.8
12. Luxemborg 1.7
13. France 1.6
14. Libya 1.6
15. Australia 1.6
16. Algeria 1.4
17. Lebanon 1.3
18. Belgium 1.2
19. Croatia 1.1
20. UK 1.1
21. Netherlands 0.8
22. Canada 0.8
23. Turkey 0.7
24. USA 0.7

By Country

- Italy 30%
- Spain 20%
- Greece 9%
- USA 8%
- France 4%
- Syria 3%
- Other 26%

Mercacei # 50 Feb-April 2007

USA imports 99.3% of consumption

TO MEET CURRENT USA DEMAND for OLIVE OIL

We would have to grow 300,000 + acres of oil olives

@ 5 tons per acre yield

@ 40 gallons of oil per ton

= 757 liters per acre

How much might demand increase?

2004 - 08 California oil olive GROWERS & ACREAGE

• North Coast	268 growers	1,535 acres
• Central Coast	59 growers	376 acres
• S. Coast & S. Cal.	17 growers	70 acres
• Sacramento Valley	94 growers	3,216 acres*
• San Joaquin Valley	39 growers	707 acres*
• Sierra Foothills	51 growers	264 acres
TOTAL	528 growers	6,168 acres

(2005 to 2008) planted ~ 12,800 acres

(660 growers ~ 20,000 acres

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USA Production:

< 1% Texas & Arizona

> 99% California

Central Valley

- Lower land cost
- Abundant cheap water
- Low cost labor & housing
- Hotter – drier
- Higher yield

Coastal California

- High cost land
- Limited expensive water
- High cost labor & housing
- Cooler – more moist
- Lower yields
- High quality “perception”

BASIC NUMBERS

- Establish = 3rd yr. SHD ~ $6,000 – MD ~ $3,000/acre
- Years to full production = 5-10
- Average yield = 3 to 5 t/acre = 120-225 g/acre
- Bulk price = $30-75/gallon
- Retail @ $20/½ liter bottle = $112-150/gallon
- SHD: cost $13 grow + $12 process/gallon ($25)
- MD: cost $35/gallon ($80/gallon with high land values) http://coststudies.ucdavis.edu

Best scenario - $28,000/acre (w/o land value)

Average scenario - $13,000/acre (w/o land value)

(Direct sales): growing, harvest, processing & bulk storage (no bottling or marketing costs)

What Other Costs?

+ 40-55%

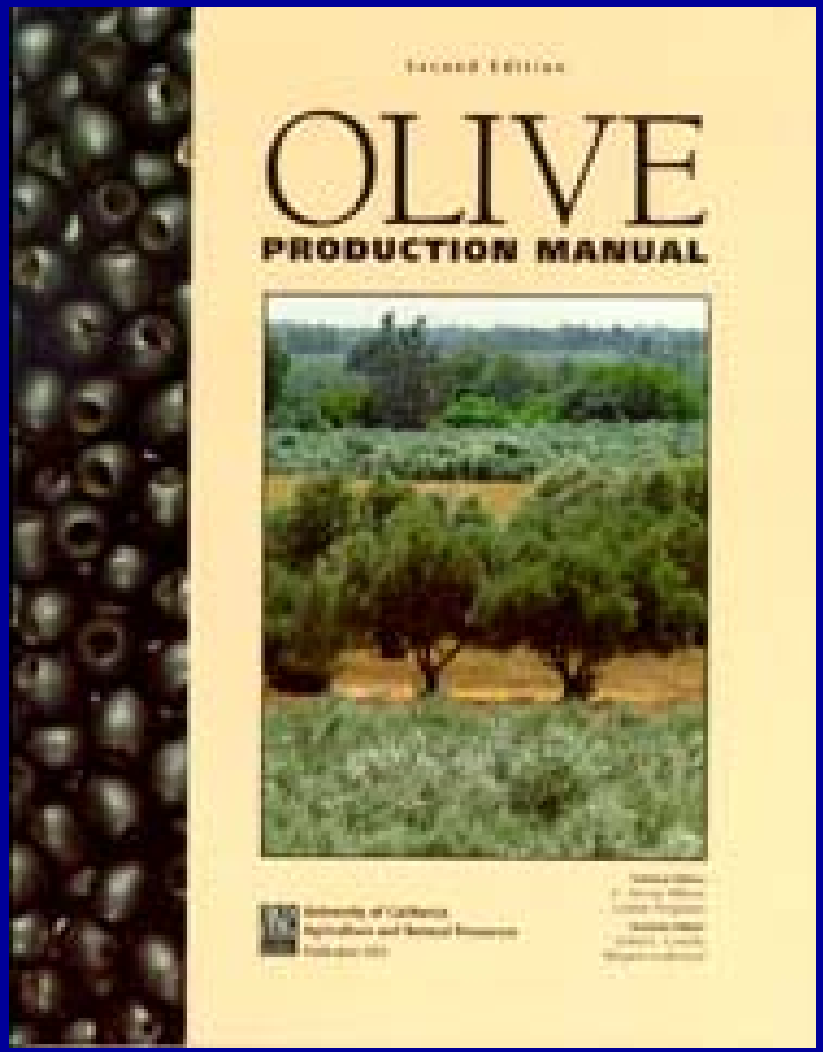
- Land (Capitol Recovery) – 13% to 25%
- Overhead – 4.7% to 5.5%
- Bottling (½ L) - 900-1,650 /acre – 6-7%
- Marketing – 17% to 18%

Potential Profit

$6-14,000/acre with lots of work and risk

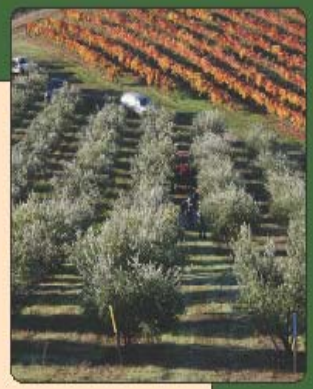
NO DISTRIBUTION

Revised Olive Production Manual University of California # 3353



- Climate & Site Selection
- Botany – Cultivars
- Physiology
- Pruning
- Irrigation
- Nutrition
- Pests
- Harvest

Organic Olive Production Manual



This manual provides detailed information for growers on production issues, economics, pest control, the conversion process, and organic certification and registration.

Using this manual you'll learn about orchard site selection considerations, irrigation needs, terrain, temperature, soil, damage from the olive fruit fly, and how these may vary for table fruit versus fruit for oil production. You'll also learn how to evaluate harvest methods—an important consideration as harvest costs typically amount to half the total production cost for olives.

This manual has been developed as a supplement to the *Olive Production Manual, 2nd Edition*, (3353). Organic growers are advised to consult both publications as they develop and refine their production systems.

Also from the University of California, two companion publications for olive growers:

Olive Production Manual IPM for Olive

ISBN 978-1-60107-440-9
90000
9 781601 074409
Printed in Canada

ORGANIC OLIVE PRODUCTION MANUAL

UNIVERSITY OF CALIFORNIA

Organic Olive

PRODUCTION MANUAL

Technical Editor
Paul M. Vossen

60% Growers are Organic

UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources
PUBLICATION 3505

Olive Oil Profitability Potential

Positives

- Big USA Market
- Competitive cost with mechanical harvest
- Mill Technology
- Excellent USA Quality
- High CA/USA Demand
- Low Import Quality
- Early Productivity
- Good Prices
- EU Subsidy decline

Negatives

- Cheap imports
- Must market Quality to US Consumers
- Unknowns of SHD System

Olive Production
$ Making Money $

- Must have basic resource
  - Land, water, climate, labor
- Must have competitive costs
  - Low labor rates
  - Mechanization
- Must have competitive yield
  - Minimum of alternate bearing
- Must produce excellent quality and sell it
  - Value to the consumer

Planting for trunk shaker

A. **Planting distance** ~ 18 to 24 ft. apart

B. **Training system**

- Trees with one trunk, high 36-40 inches
- Open canopy, 3-4 slanting branches
- Rigid reach of fruiting branches.
- Without pendulous branches.

D. **Soil slope** - Flat to about 20% slope (crawler tractors)

E. **Fruit size** - Large fruits are preferred.

F. **Fruit detachment** - Variety with low force

Most varieties work OK

Planting characteristic for trunk shaker

Application Point. Should be the trunk otherwise it takes too long.

Tombesi – Perugia, Italy

Growing Olives

Site *(climate, terrain, soil, water,)*

Varieties *(table & oil)*

Systems *(high & super density)*

Cultural Practices
(organic & conventional)

Give yourself every possible advantage

Best Olive Conditions

Regional

- Mild winters
- Dry summers
- No frost before bloom or harvest

Local

- Well drained soils
- Class 2-3 soils (not the “best” soils)
- Lack of perennial weed competition
- Limited exposure to high winds
- Able to control vigor (soil moisture)

Site Selection: Climate (Local)

- Consult with local growers and others regarding climate history
- If more info is needed, inexpensive temperature monitors can be used to determine local temperature patterns
- Look at CIMIS weather station data

  http://wwwcimis.water.ca.gov/cimis/welcome.jsp

Damaging Climatic Conditions for Olives

- Winter – young trees < 25°F
- Winter – mature trees small branches < 22°F
- Winter – mature trees killed ~ <15°F
- Autumn – fruit before harvest < 29°F
- Spring – rain, high humidity, or hot dry wind at bloom
- Summer- cloudy

Lowest spot on valley floor is not the best

Site Selection: Climate

Ideal winter temps = (35ºF to 65ºF)

Avoid Areas with:

- Temperature below 22ºF – kills wood
- Wet summers - disease
- Frost – temperature below 29ºF before harvest – ruined fruit
- Cold/wet *OR* hot/dry at bloom

Oil Quality Factors

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

Terroir

SENSORY ATTRIBUTES OF ARBEQUINA OLIVE OILS GROWN IN 3 DIFFERENT ZONES			
ATTRIBUTE	*Siurana*	*Garrigues*	*Andalucia*
Fruity	**2.4**	**2.2**	**3.1**
Green	**1.5**	**1.4**	**1.8**
Bitter	**1.1**	**1.8**	**0.6**
Pungent	**1.6**	**1.7**	**0.6**
Sweet	**1.8**	**1.8**	**2.4**
Sensory Rating (EU)	**7.7**	**7.4**	**8.9**
Tous, Romero, Plana, Guerrero, Díaz, & Hermoso. 1997			

Site Selection: Soil

- **Plant olives in good to decent soil, not "the best".**
- **Good olive soil is:**
  - **well drained**
  - **moderately deep (3-4') 1.5-2' can work**
  - **moderate slope (drainage and harvester)**
  - **moderately coarse textured**
  - **Not high vigor conditions**

Well Drained Gravely Soil

Use a backhoe to check for rooting depth and drainage

MYTH:
olive trees need good soil and high organic matter

Shallow Roots

Irrigation Water Testing

- Gallons per minute (September)
- pH (acid/base)
- Sodium (Na^+)
- Chloride (Cl^-)
- Sodium Adsorption Ratio (SAR)
- Boron (B)
- Bicarbonate (HCO_3^-)
- Nitrate (NO_3^-)

Site Selection: Irrigation Water

- **Olives need 1-2 acre feet/year** ***(325,000 – 650,000 gallons) 3-5 gpm/acre minimum***

Avoid water containing:

- **High Boron > 2 ppm**
- **Bicarbonate > 3.5 ppm**
- **Total Salt > 3 dS/m EC - 480 ppm**
- **High Sodium > 3 meq/l - 9 SAR**
- **High Chloride > 345 ppm**

HOW MUCH WATER IS NEEDED TO GROW OLIVES by CLIMATE?

- **Young Trees = 100% ET**
  - **(20” coastal – 40” interior)**

- **Mature Oil Olives = 45-55% ET**
  - **(10” coastal – 20” interior)**

BEST IRRIGATION LEVEL FOR PRODUCTION 50-70%

- Higher crop yield
  - Makes up for less oil per fruit
- Good shoot growth
- Good return bloom

BEST IRRIGATION LEVEL FOR FLAVOR 35-55%

- High level of pleasant fruitiness
- Both ripe fruit and green character
- More complexity and depth
- Artichoke, apple, grass, and nuts
- Balanced bitterness
- Balanced pungency
- More water = bland oils

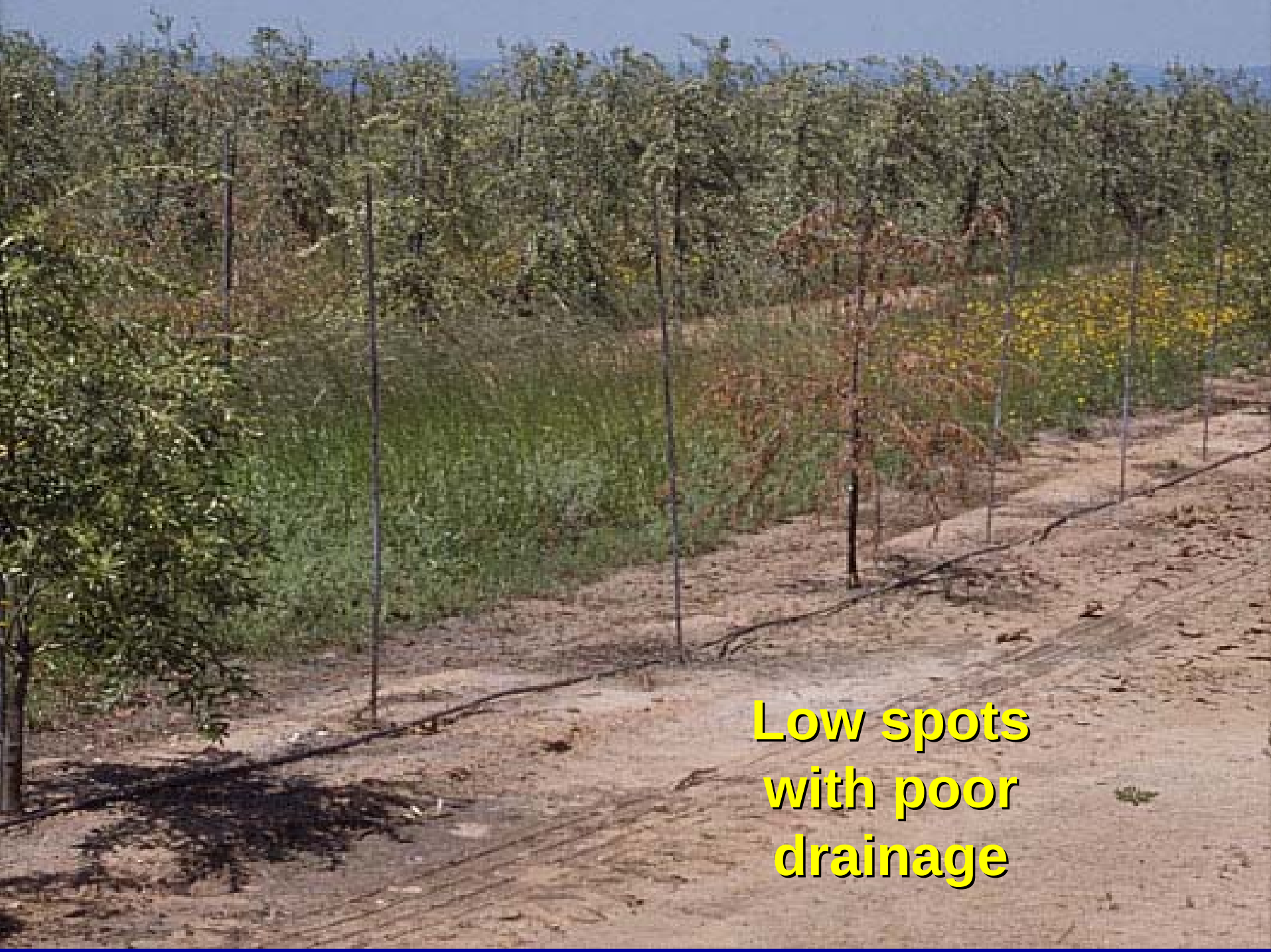
MEANS OF FRUITINESS, BITTERNESS, AND PUNGENCY

Treatment	*Fruitiness*	*Bitterness*	*Pungency*
15% ETc	3.6 a	6.0 a	4.9 a
25% ETc	3.2 a	4.2 b	3.9 b
40% ETc	2.7 b	1.7 c	1.9 c
57% ETc	2.6 b	0.93 d	1.1 d
71% ETc	2.1 c	0.30 d	0.30 e
87% ETc	1.8 c	0.22 d	0.22 e
107% ETc	1.7 c	0.20 d	0.20 e

Approximate Water Use Based on Historical ET in Four Different Climate Zones (Gallons per Tree per Day)				
Age / Size of Olive Tree (spacing)	Coastal Marine (ET 0.10 in/day)	Coastal Cool (ET 0.20 in/day)	Coastal Warm (ET 0.25 in/day)	Interior Valley (ET 0.30 in/day)
	*Gals/tree/day**	*Gals/tree/day**	*Gals/tree/day**	*Gals/tree/day**
1 ft² newly planted tree	0.5	0.5	0.5	0.5
4 ft² young tree	0.5	0.5	0.75	1
10 ft² young tree	0.75	1.3	1.6	2
25 ft² young tree	1.6	3.5	4	5
50 ft² young tree	3.2	6.5	8	10
50 ft² mature (Super High Density 13' x 5')	1.5 – 2	3 – 4	4 – 5.3	4.5 – 6
75 ft² young tree	5	10	12	15
100 ft² young tree	7	13	16	19
100 ft² mature tree (16' x 8')	3 – 4	6 – 8	7 – 9.3	9 – 12
150 ft² young tree	10	19	24	29
200 ft² young tree	13	25	32	38
200 ft² mature tree (20' x 12')	6 – 8	11.5 – 15.3	14 – 18.7	17 – 22.7
250 ft² young tree	16	32	40	47
300 ft² mature tree (20' x 16')	8.5 – 11.3	17 – 22.7	21 – 28	25.5 – 34
1 acre of mature trees with green cover crop	1,215-1,620	2,450-3,270	3,058-4,080	3,666-4,890
** Adjustments made for tree age (crop coefficient 45 – 60% of full ET for mature trees)*				

Elevation – Slope - Soil

- **Above 2,000 ft.** = *temperature problems*
- **Over 35% slope** = *equipment danger, more hand labor, erosion threat, and high cost*
- **Poor drainage** – *clay soil, seepage, high rainfall, limited surface water movement, restrictive layers*
- **Shallow soil** = *less drainage & low water holding capacity*
- **Mineral toxicity** = *high Mg – B – Na – etc.*


Low spots
with poor
drainage

Soil Testing

- Multiple sub samples (5-15)
- Two depths (6” and 18”) (separate)
- Each sample represents different area
- Mix thoroughly
- Analyze for big 6: pH, P, K, Ca, Mg, OM
- Analyze for minor nutrients if suspect (boron, sodium, chloride, etc.)

Soil Chemical Properties

saturated paste extract

- Soil pH 5.0 – 8.5
- High Magnesium (< 1:1 ratio with Ca)
- High Calcium (> 8:1 ratio with Mg)
- Adequate Phosphorous (> 10 ppm P) = OK
- Adequate Potassium (> 125 ppm K) = OK
- High Boron (> 2 ppm B)
- High Chloride (> 10-15 meq/l Cl^-)
- High Sodium (SAR > 15)

Spending a lot of money on exacting soil conditions is probably a waste for olives

Sonoma County Orchards

Alexander Valley

Dry Creek Valley

Healdsburg

Annapolis

Sebastopol

Sonoma

Sonoma

Sonoma

Sonoma

Sonoma

Sonoma

Sonoma

Kenwood

Kenwood

SRJC

Santa Rosa

Marin County
Paul Vossen

Lake County

Lake County

Lake County

Tasting Oil # 1

In order to make good oil you must be a good taster

HOW TO TASTE OLIVE OIL

- Warm & swirl to release volatiles
- Smell oil - note aroma
- Place 1-2 ml in mouth for 10 seconds
- Suck in air through the oil
- Spread the oil throughout the whole mouth
- Swallow the oil (IOOC standard)
- Close mouth and breath out through nose
- Record impressions on profile sheet

Arbequina

Oil Quality Factors

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

Variety Trial – Planted in 1996-97 – 5 locations in Northern California

OIL OLIVE VARIETIES

1. Oil flavor “style”
2. Oil yield % – quantity and extractability
3. Fruit yield – precocity
4. Harvest method
5. Growth habit
6. Maturity season
7. Resistance to disease
8. Cold hardiness
9. Pollination
10. Cost factors

Germplasm Repository

- DNA Identification
- Fruit Size
- Pit to Pulp Ratio
- Oil Content
- Quality Profile
- Cold Hardiness
- Salt Tolerance
- Removal Force
- Disease Resistance

FRUITINESS IN OLIVE OIL

Positive Characteristics

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*

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** – *herb fruity, green, bitter, pungent*

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
- Picholine

Cold Hardiness in Olives

Hardy

- Arbequina
- Aglandau
- Ascolano
- Bouteillan
- Hojiblanca
- Leccino
- Maurino
- Pendolino
- Picudo
- Picual
- Sevillano

Sensitive

- Coratina
- Empeltre
- Frantoio
- Koroneiki
- Manzanillo
- Moraiolo
- Taggiasca

Moderate

- Kalamon
- Picholine
- Mission

Ripening Season

Early

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

29ºF frozen fruit in Nov.

Medium

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

Late

- Bosana
- Cornicabra
- Coratina
- Frantoio
- Hojiblanca
- Kalamon
- Koroneiki
- Picholine
- Picudo
- Taggiasca

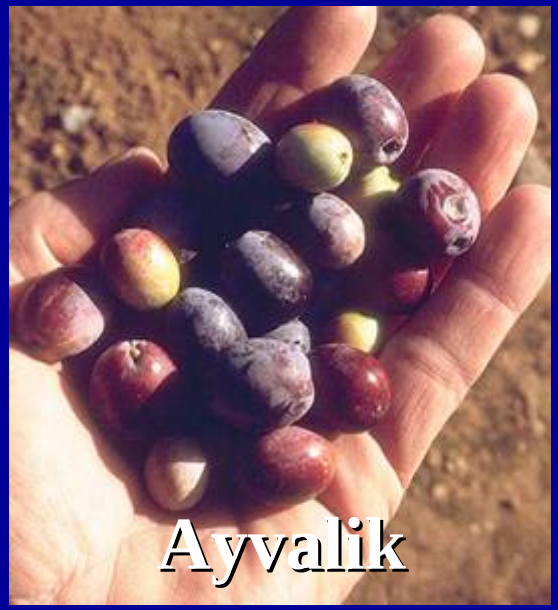
Olive Disease Tolerance

- **Manzanillo:** *gets less leaf spot (susceptible to cold olive knot and Verticillium wilt)*
- **Gordal Sevillano:** *cold hardy & less leaf spot (susceptible to olive fly)*
- **Mission:** *cold hardy (susceptible to leaf spot)*
- **Ascolano:** *cold hardy & less leaf spot & less olive knot*
- **Kalamon:** u*nknown*

Olive Variety Disease Susceptibility

Variety	*Spilocaea oleaginae* Peacock spot	*Verticillium dahliae* Verticillium wilt	*Pseudomonas avastanoi* Olive knot
Arbequina	S	VS	VS
Arbosana	VR	-	-
Ascolano	S	R	R
Coratina	R	-	-
Cornicabra	VS	VS	-
Empeltre	VS	VR	S
Frantoio	VR	VR	R
Gordal Sevillana	S	S	S
Hojiblanca	S	VS	S
Kalamon	S	S	R
Koroneiki	VR	R	S
Leccino	R	S	R
Manzanilla	S	S	VS
Maurino	R	-	-
Mission	VS	S	R
Moraiolo	R	S	S
Pendolino	S	S	S
Picholine	S	S	-
Picual	VS	VS	S
Picudo	S	VS	VS

N. AFRICA – MIDEAST



- *Algeria*
- *Lebanon*
- *Morocco*
- *Syria*
- *Tunisia*
- *Turkey*

Aglandau

Picholine

Tanche

FRENCH

Bouteillan

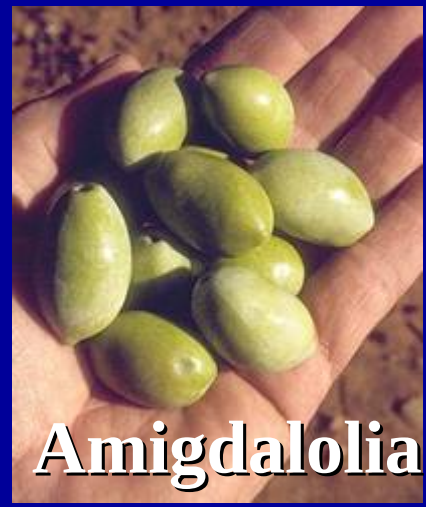
Salonenque

Grossane

Chalkidiki

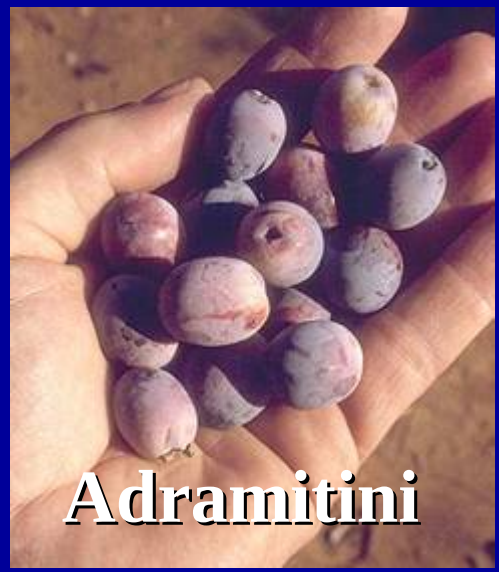
Kalamon

Koroneiki


Amigdalolia

GREEK

Mirtoia


Adramitini

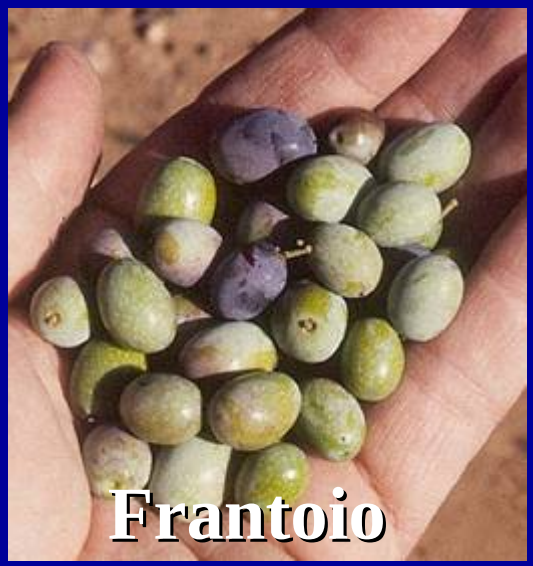
Megaritiki

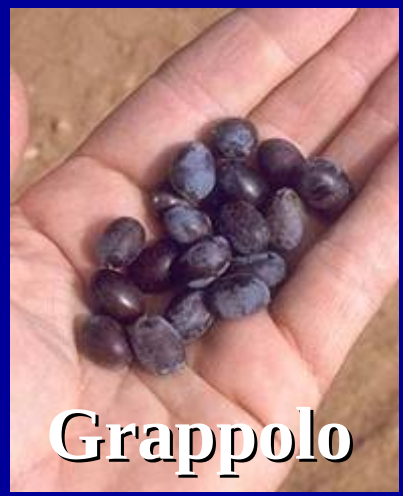
ITALIAN

Cipresino

Coratina

Dolce Agogia


Frantoio


Grappolo

Itrana

Leccino

Leccio del Corno

Moraiolo

ITALIAN

Pendolino

Santa Caterina

Taggiasca

Bical

Cornesuelo

Cornicabra

SPANISH

Lecin de Sevilla

Blanqueta

Empeltre

Farga

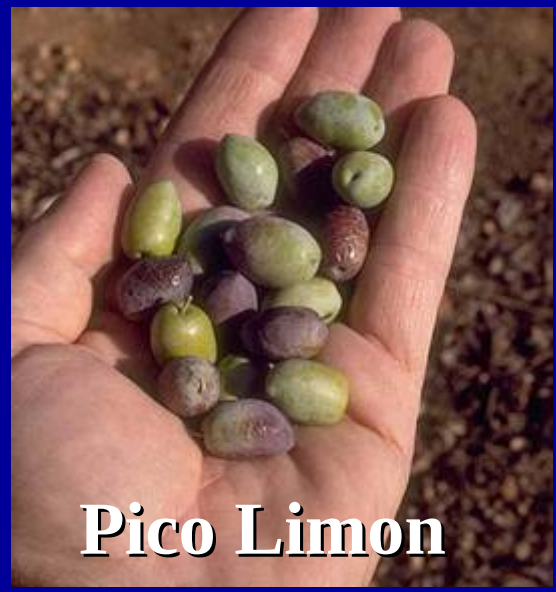
Gordal Sevillana

Hojiblanca

SPANISH

Lemeño

Morrut


Pico Limon

Picual de Jaén

Picual de Estepa

Picudo

SPANISH

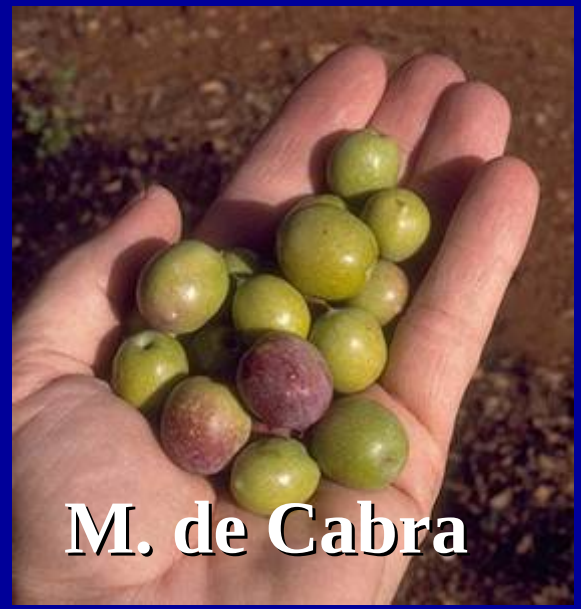
Royal de Cazorla

Verdala

Verdale

Manzanillo

M. Cordobes


M. de Cabra

M. de Sevilla

M. de Jaén

Olive Pollination

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

Tasting the 2nd oil

Taste 3rd Oil

Ascolana

- Early Ripening
- Medium yield
- Alternate bearing
- Very large fruit
- Easy to harvest
- Less foliar disease
- Low oil content
- Very Cold hardy

Tasting the 4th Oil

Bouteillan
Cayon
Aglandau

Tasting 5th Oil

Tasting 6th Oil

Frantoio

- Late Ripening
- Medium yield
- Alternate bearing
- Medium
- Ok to harvest
- Less foliar disease
- High oil content
- Cold sensitive

Leccino

- Late Ripening
- Medium yield
- Alternate bearing
- Medium fruit
- Easy to harvest
- Less foliar disease
- High oil content
- Cold hardy

Black skin – green inside

High Quality “Flavor” Oil Varieties

1. Arbequina, Ascolano, Bosana, Frantoio, Koroneiki, and Picual, and Picudo
2. Arbosana, Ayvalik, Cornicabra, Coratina, Hojiblanca, Leccino, Moraiolo, and Picholine Marocaine.

Taggiasca

- Late Ripening
- Medium yield
- Annual bearing
- Large fruit
- Difficult to harvest
- Less foliar disease
- High oil content
- Cold sensitive

Hojiblanca

- High yield
- Alternate bearing
- Large fruit
- Easy to harvest
- Late maturity
- Med oil content
- Polyphenols - 250

Hojiblanca in Portugal

Picholine

- High yield w/water
- Annual bearing
- Large fruit
- Late ripening
- Medium oil content
- Resistant to leaf spot
- Moderate cold hardy
- Difficult extraction
- Table olive

Redding Picholine

- Seedling
- Not Picholine
- Very small fruit
- Early ripening
- Medium oil content
- Resistant to leaf spot
- Cold hardy
- Difficult harvest

Picual

- Precocious
- High yield
- Annual bearing
- Large fruit
- Easy to harvest
- High oil content
- High in oleic acid
- High polyphenols (600 ppm)

Picual in Chile

6th year

Aceite de Oliva
Olive Oil
OROMAULE
EXTRAVIRGEN
EXTRAVIRGIN
PRODUCTO CHILENO / PRODUCT OF CHILE
FINA SELECCIÓN
Tradicional
Producido, embotellado y exportado por
Produced, bottled & shipped by
Olivares de Quepu
CHILE
ARESTI
ACEITE DE OLIVA
• EXTRA VIRGEN •
Selección de Familia
500 ml
Chile
1492
Aceite de Oliva / Olive Oil
EXTRAVIRGEN/EXTRAVIRGIN
Produced, bottled & shipped by
Producido, embotellado y exportado por
Olivares de Quepu
CHILE
PRODUCT OF CHILE
PRODUCTO CHILENO
Maximum Acidity 0.2%
500 ml
BANQUETE
BUENA COCINA
ACEITE DE
OLIVA
Extra
Virgen
CHILE
500 ml

Coratina

- Precocious
- High yield
- Annual bearing
- Large fruit
- Easy to harvest
- Resists foliar disease
- High oil content
- High in oleic acid
- High polyphenols (600 ppm)

Coratina in Argentina

Coratina in Italy

“Best” Two Olive Varieties in the World

- Picual – 75% of Spanish Production
- Coratina – 50% of Italian Production

Picudo

- High yield
- Annual bearing
- Large fruit
- Easy to harvest
- Less foliar disease
- High oil content
- Low oleic levels
- Med polyphenols

Nocellara del Belice

- High yield
- Alternate bearing
- Large fruit
- Easy to harvest
- Med oil content
- Med polyphenols

Nocellara del Belice in Sicily

Bosana

- Precocious
- High yield
- Annual bearing
- Large fruit
- Easy to harvest
- Med oil content
- Med polyphenols

Varieties - Superior Productivity (precocity)

1. Arbequina, Arbosana, and Koroneiki

2. Barnea, Blanqueta, Leccino, Hojiblanca, Manzanillo, and ‘Picual.

Varieties – Superior Oil Yield

1. Coratina, Koroneiki, and Picual
2. Arbequina, Arbosana, Empeltre, Frantoio, Hojiblanca, Leccino, Manzanillo, Mission, Picudo, and Taggiasca.

Very High “Stability” Oil Varieties

Coratina, Picual, Koroneiki, and Mission

Varieties – Superior Cold Hardiness

Arbequina, Arbosana, Leccino, Hojiblanca, and Picual.

Varieties – Superior Disease Resistance

Arbosana, Blanqueta, Bouteillan, Frantoio, Koroneiki, and Leccino.

Planting: Material

Container Trees

- Plant any time (with some risks)
- Best time to plant is March/April (after frost risk)
- Fall planting risks winter freeze damage.

Planting: Material

- Single trunk stock
  - Easier weed control
  - Shaker harvest.
  - Multiple shoots compete with leader
- Spacing is based on location, variety, management practices.

Planting

- Hole size – 2X container
- Deglaze hole sides with shovel after augering
- Remove or cut circling roots with minimal disturbance of root ball
- No added goodies to the planting hole.

Olive Orchard "To Do List"

- Ground preparation
- Irrigation system installation
- Layout for stakes, wires – trellis
- Planting trees
- Seeding cover crop
- Controlling weeds
- Applying compost or other fertilizers
- Training and pruning
- Olive fruit fly control
- Peacock spot control
- Harvest – transport
- Labor Management
- Machinery Maintenance
- Marketing

What to look for in an olive oil

- Fresh olive taste
- Not fermented or rancid (no defects)
- Some bitterness
- Some pungency
- Attractive fruitiness
- Depends on use

Quality is more than oil

- Standards
- Bottle
- Label
- Reputation
- Brand
- Location
- Style
- Use
- Organic
- Price

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