

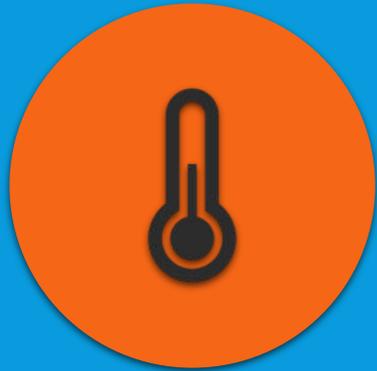


ORCHARD ESTABLISHMENT

Presenter: Marcelo Berlanda, California Olive Ranch



IMPORTANT CONSIDERATION:
OLIVE PRODUCTION HAS BEEN TRADITIONALLY
A MARGINAL BUSINESS = LOW RETURNS



CLIMATE



SOIL



TOPOGRAPHY

CLIMATE

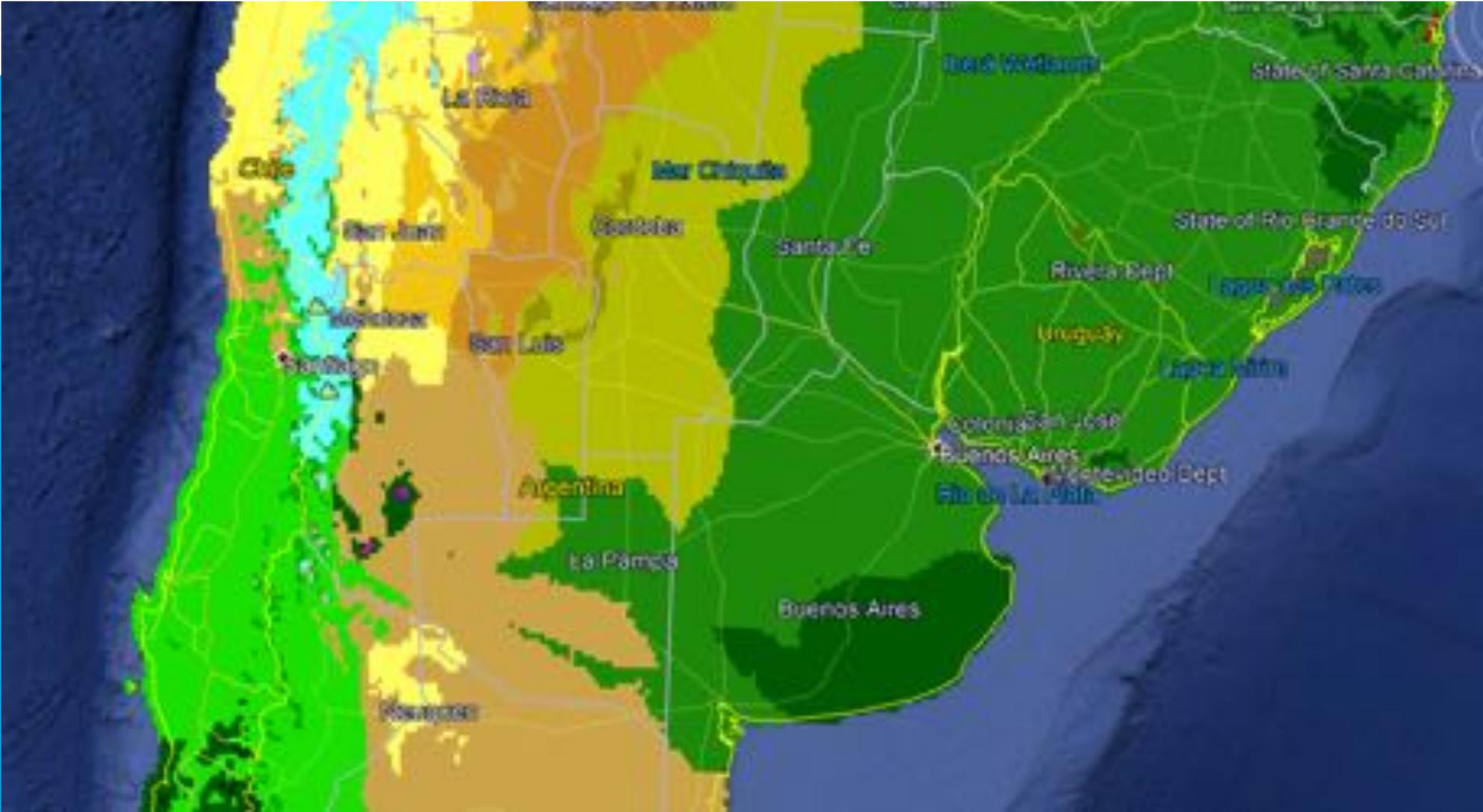
- Olives are highly adapted to Mediterranean Climate: Hot, dry summers, cool/cold wet winters
- Optimum: California, Central Chile, Western Cape - South Africa, Western Australia, South Australia, Mediterranean countries
- Sub-optimal: increased risk of negative weather conditions such as frost, extreme max. temp, damaging winds, high summer humidity



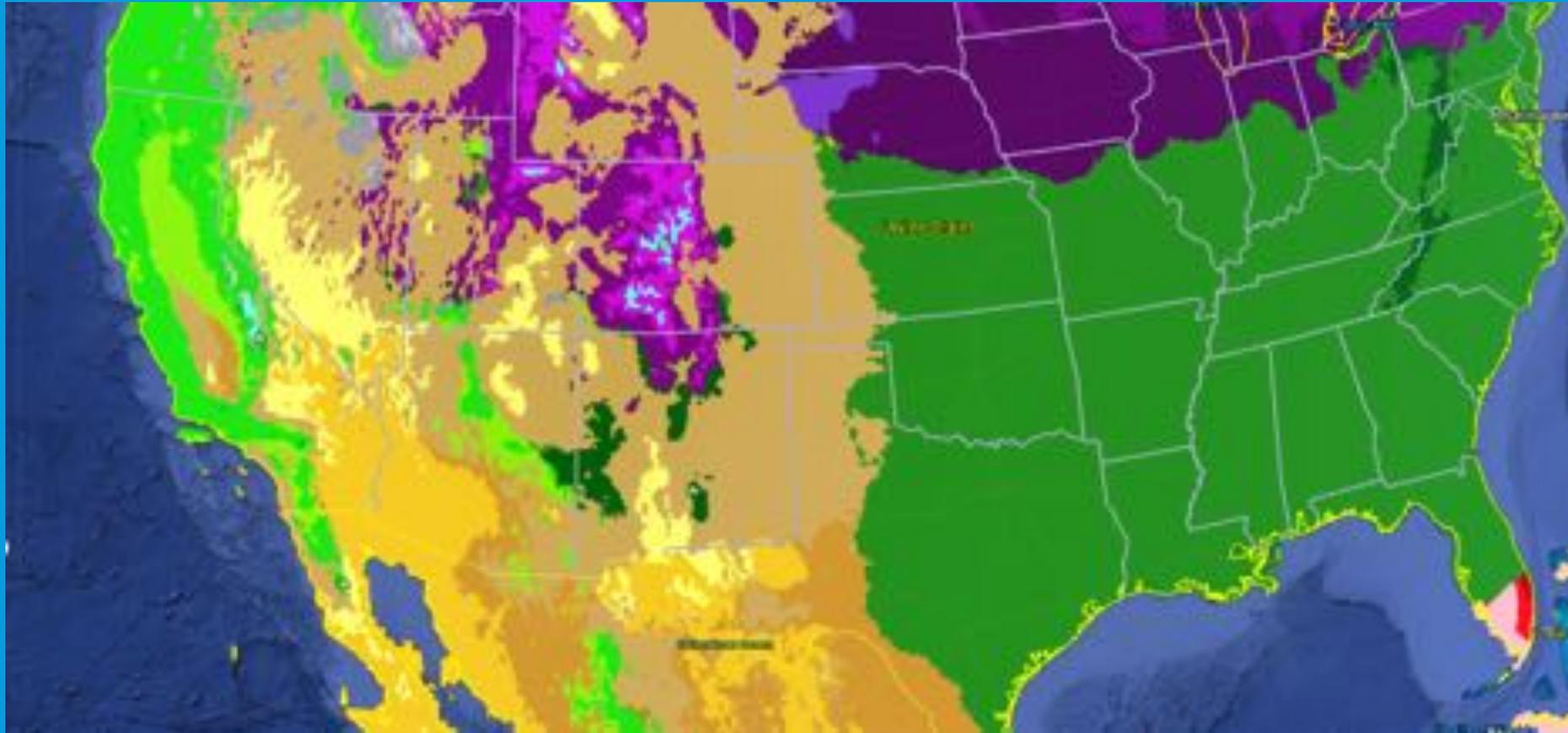
MEDITERRANEAN REGION - CLIMATE



SOUTH AMERICA REGION - CLIMATE



USA – REGIONS - CLIMATE



AUSTRALIA – REGIONS - CLIMATE



Catamarca - Argentina - Non Mediterranean

Average Monthly Rainfall



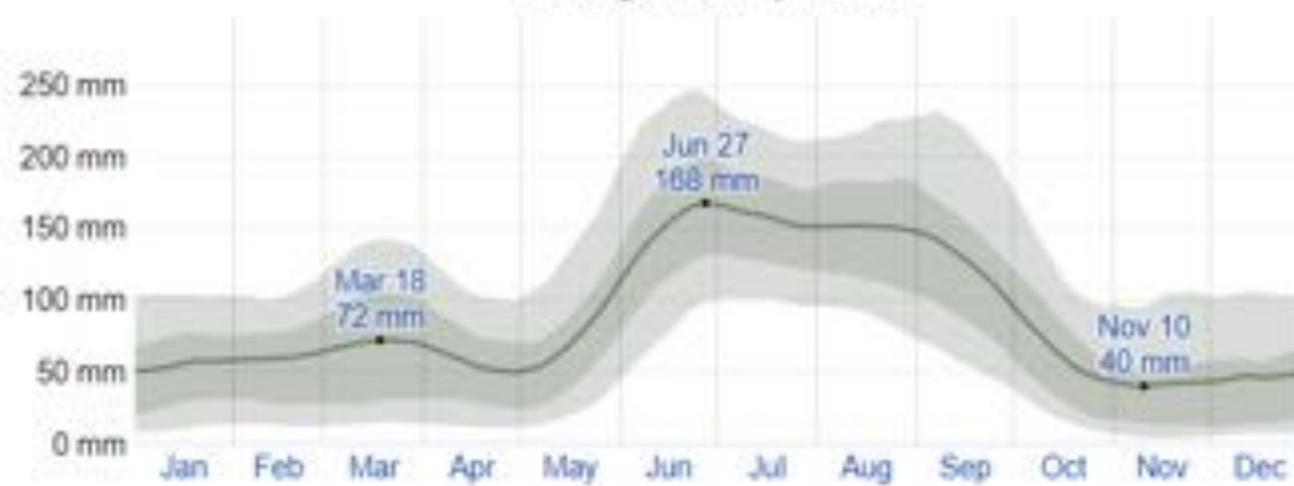
Cordoba - Spain - Mediterranean Climate

Average Monthly Rainfall



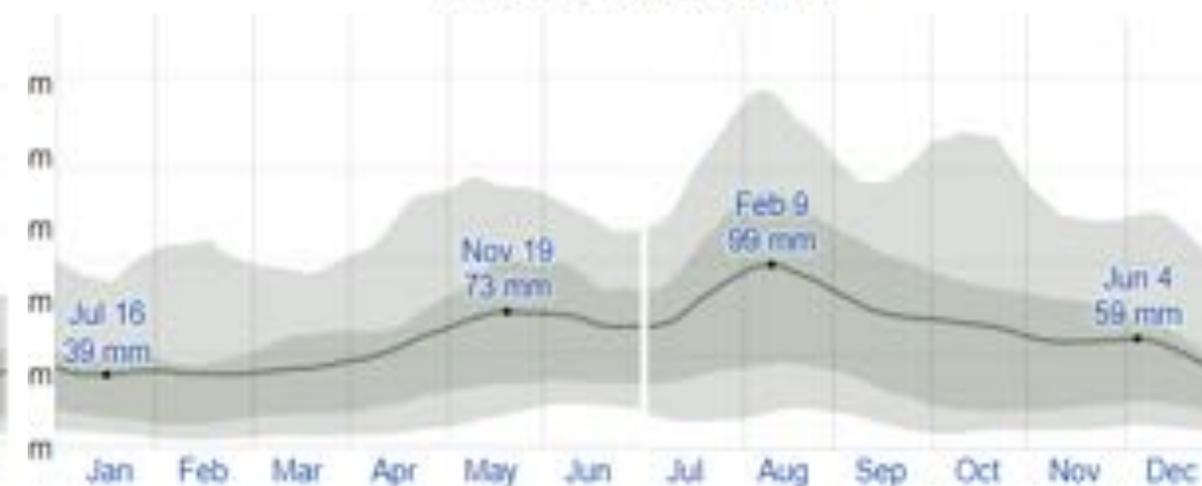
Lakeland GA - Non Mediterranean

Average Monthly Rainfall

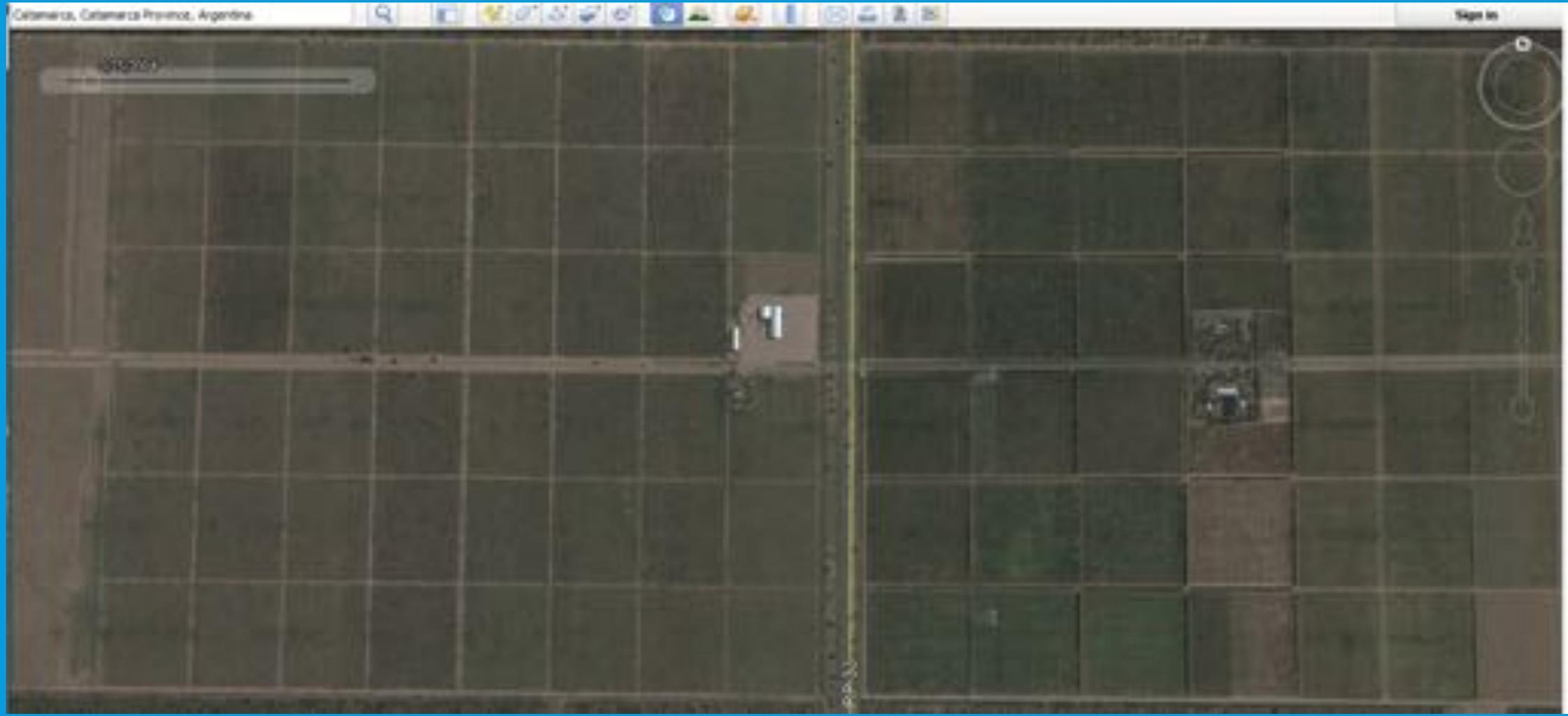


HUNTER VALLEY - AUSTRALIA

Average Monthly Rainfall



CATAMARCA 2004



CATAMARCA 2018



DECEMBER 20TH, 2018

- Headlines on the most important newspaper
- \$15,000,000 in crop loses
- High Temperatures + Low Humidity during Flowering
- Catamarca in 2000s = 98,000 Acres
- Catamarca in 2018 = Less than 24,000 and Decreasing

Clarín[®] RURAL

Economías regionales

Catamarca: el excesivo calor provoca pérdidas millonarias en los olivos

La Asociación Olivícola de Catamarca asegura que los daños alcanzan los 15 millones de dólares y piden que se declare la emergencia agropecuaria.



En Catamarca hay 12.000 hectáreas cultivadas con olivos, que generan unos 4.000 puestos de trabajo.

HUNTER VALLEY 2004 – 190 ACRES



HUNTER VALLEY 2018 – 143 ACRES



CONSEQUENCES OF HIGH HUMIDITY

VERY HIGH FUNGAL PRESURE



CONSEQUENCES OF RAIN/COLD/HEAT/WIND DURING FLOWERING



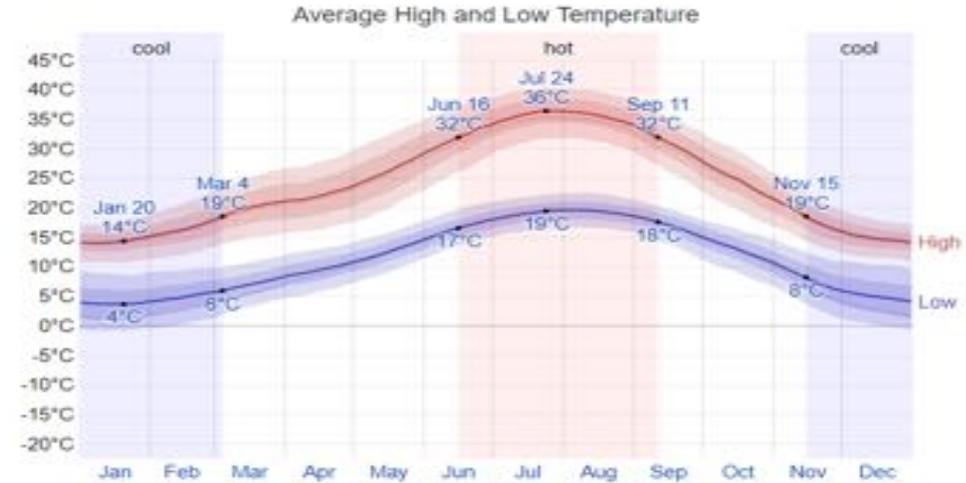
TEMPERATURE

- Winter Temp: 35 to 65
- Frost Damage: <28
- Frost duration >2hours
- Timing is highly important (flowering/harvest)
- Flowering affected by high humidity/rain also hot and dry wind
- Summer daily amplitude is important for oil accumulation
Cordoba: (Max 96 – Min 66 = **30**) 47%
- Lakeland: (Max 91 – Min 73 = **18**) 30%

Temperature

The hot season lasts for 2.9 months, from June 16 to September 11, with an average daily high temperature above 32°C. The hottest day of the year is July 24, with an average high of 36°C and low of 19°C.

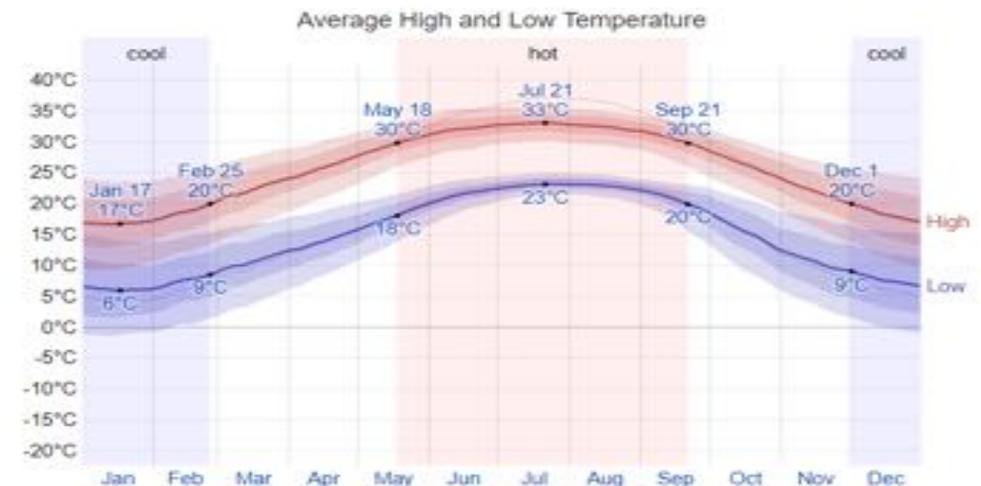
The cool season lasts for 3.7 months, from November 15 to March 4, with an average daily high temperature below 19°C. The coldest day of the year is January 20, with an average low of 4°C and high of 14°C.



Temperature

The hot season lasts for 4.1 months, from May 18 to September 21, with an average daily high temperature above 30°C. The hottest day of the year is July 21, with an average high of 33°C and low of 23°C.

The cool season lasts for 2.8 months, from December 1 to February 25, with an average daily high temperature below 20°C. The coldest day of the year is January 17, with an average low of 6°C and high of 17°C.



OLIVE ADAPTATION TO DROUGHT

- Olives can tolerate drought better than many tree crops due to a special adaptation
- Olive trees shut down with low relative humidity and high temperatures
- It is said that with 30% humidity Olives close 40% of stomata
- Closed stomata regulates dehydration but also CO₂ intake which affects photosynthesis and in turn oil accumulation.
- It is common to see low oil yields (10 to 15%) on hot climates with small temperature amplitude, high winds and low humidity



HIGH SUMMER TEMPERATURES

- High summer temperatures cause fruit damage
- Reduce oil accumulation
- Negatively affect oil quality due to physical damage
- Oil parameters outside the Extra Virgin Standard



SOIL

1

Olives are highly susceptible to wet feet/waterlogging

2

Optimum:
well drained, pH
6.5 to 7.5,
minimum of 3 feet

3

Avoid:
Heavy clay soils
with hardpan,
high water table

4

Soil saturation for
long period of
time (>week)
during the
growing season

LOW LAYING GROUND

Water unable to drain



CONSEQUENCES OF WATER LOGGING



TOPOGRAPHY

- Gentle slopes
- South facing slopes (Northern hemisphere)
- Elevation is always a plus
- Avoid low laying areas

TOPOGRAPHY

- Use slopes to your advantage
- Allows for cold air drainage
- Lower risk of water logging
- Do not plant on low ground



GROVE SETUP

- Rows running North – South direction
- Soil map (is a must)
- Adjust pH before planting if outside optimum (6 to 7.5)
- Trellis: 1 wire only at 20 to 25 inches. Unless windy area
- Bamboo stake 30 inches above ground
- Irrigation system (allow for up to 2 acre/feet of water)
- 1 dripper line – emitter spacing and output must match soil type
- Use pressure compensating emitters on steep slopes
- Minimum tree height 20 inches – Optimum >27
- Clean trunk minimum 20 inches (no branches)



GROVE SETUP

SMART TREE VS CHRISTMAS TREE

Smart tree: lower setup cost
More branches = more options later on

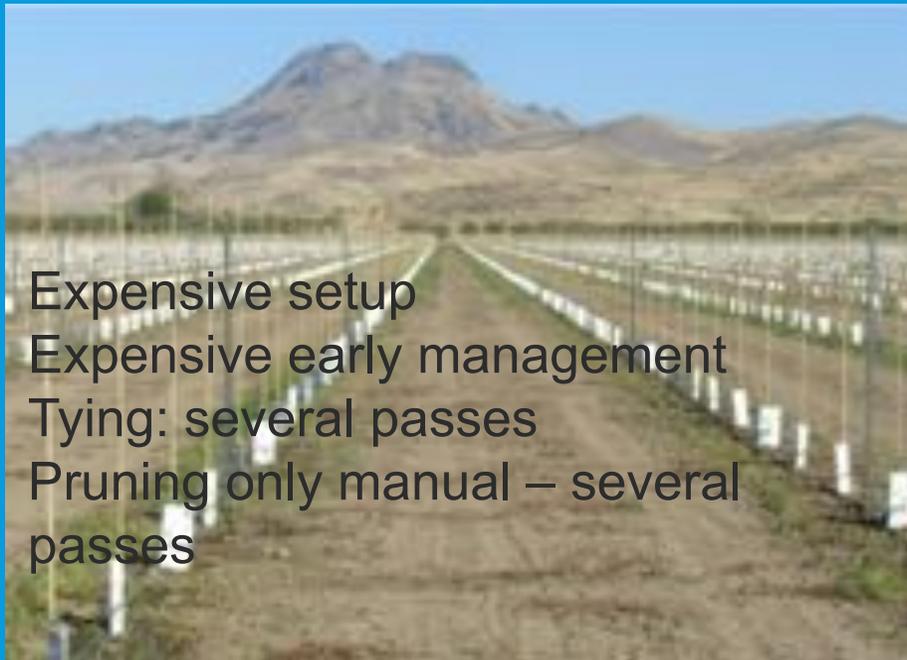


SMART TREE VS. CHRISTMAS TREE



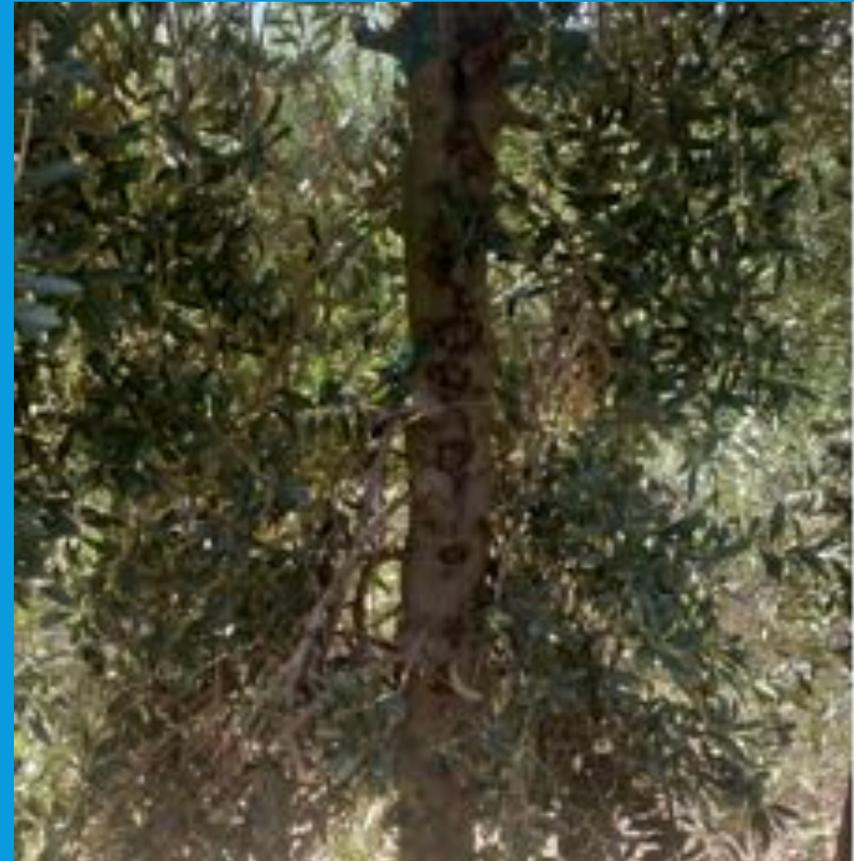
Smart tree: fills up the space quicker

CHRISTMAS TREE



CHRISTMAS TREE

- Christmas tree: main trunk = limited options on mature canopies



SUMMARY

- Mediterranean climate best
- Deep, well drained soils
- Gentle slopes are better than flat ground
- Avoid climates other than Mediterranean (if possible)
- Avoid low laying areas

THANK YOU VERY MUCH