

# 2014 Florida Pomegranate Association Annual Meeting and Conference

October 10, 2014

Lake Alfred Citrus Research and Education Center  
Ben Hill Griffin Jr., Auditorium



## Growing Pomegranates in Uruguay

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# Uruguay in South America



▣ Surface area:  
176.215 sq.km.

▣ Population:  
3.3 million

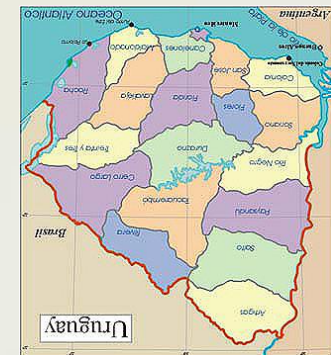


▣ Population density:  
18.7 per sq. km.

# Latitude and Longitude Map

- Between 30 and 35 Latitude South.







LOCATION	LATITUDE	ABOVE LEVEL SEA
Elche (Spain)	38°N	90 mts (295 ft)
Yazd (Iran)	32°N	1.200 mts (3.937 ft)
Kabul (Afghanistan)	34°N	1.800 mts (5.905 ft)
Sholapur (India)	18°N	460 mts (1.509 ft)
Garrygala (Turkmenistan)	38°N	350 mts (1.148 ft)
Lost Hills, CA (USA)	35°N	130 mts (426 ft)
Lake Alfred, FL (USA)	28°N	Sea level
Cape Town (South Africa)	33°S	120 mts (393 ft)
Cordoba (Argentina)	31°S	400 mts (1.312 ft)
Humay (Perú)	14°S	500 mts (1.640 ft)
Montevideo (Uruguay)	35°S	Sea level

# Climate comparison

	Montevideo (Uruguay)	Orlando (Florida)
Precipitation growing season	Sept - April 749 mm (29,5 inches)	March - Oct 1.051 mm (41,4 inches)
Precipitation harvesting season	March - April 193 mm (7,6 inches)	Aug - Sept 305 mm ( 12,01 inches)
Avge. Temp Max	28°C (83°F) January	34,5 °C (94°F) July - Aug
Avge. Temp Min	6,8°C (44°F) July	9,4°C (49°F) January
Avge. Relative Humidity	70 - 75 %	74 %

# Climatic index

- ▣ Huglin (Huglin, 1978)
- ▣ Cool Night Index (Tonietto (1999) and Tonietto and Carbonneau (2004))
- ▣ Fregoni (Fregoni and Pezzuto, 2000)

# Huglin Index (Huglin, 1978)

- ▣ Related to the thermal requirements (developed for grapes).

$(\text{Max temp} - 50 + \text{Mean temp} - 50) / 2$  per day

- ▣ Northern hemisphere (April to Sept)
- ▣ Southern hemisphere (Oct to March)

City (Year 2013)	Max Avg Temp ° F	Mean Avg Temp ° F	Index
Montevideo	461	412	386,5
Lake Alfred	532	476	454
Fresno	556	470	463

# Fregoni Index (Fregoni and Pezzuto, 2000)

- ▣ 30 days before harvest
- ▣ (Max mean temp – Min mean temp) x number of days with temp below 50°F

Year 2013		Number of days below 50 °F	Max mean – Min mean	Max mean – Min mean
Lake Alfred	August/September	0 / 0	16	16
Montevideo	March/April	7 / 7	18	18
Fresno	August/September	0 / 0	30	27

# Cool Night Index (Tonietto and Carbonneau (2004))

Minimum air temperature (°F) in the month (average of the daily minimum of the month)

Cool Night Index	Year 2013	Avge Min (°F)	Avge Min (°F)
Lake Alfred	August/September	75	73
Montevideo	March/April	55	53
Fresno	August/September	68	64



# Pomegranates in Uruguay

- ▣ Probably introduced by Spanish immigrants between the end of S XVI or SXVII.
- ▣ Spanish type (Mollar). Yellow to pink color rind with pink arils and sweet flavor.
- ▣ Isolated trees in old farms near the houses
- ▣ Generally in the south of the country.
- ▣ Some trees with more than 100 years.

# Year 2008

- ▣ Material selection from old trees in different locations.
- ▣ Multiplication
- ▣ Establish a comparison and evaluation block.
- ▣ Conclusions 2012.

# Year 2009 - 2010

- ▣ Project between ANII (National Agency for Investigation and innovation), INIA (National Institute for Agricultural Research) and group of 4 growers.
- ▣ Introduction, multiplication and evaluation of different pomegranates varieties.
- ▣ Origin: Wolfskill USDA Germplasm Repository, Texas A&M AgriLife Research and Extension Center, India (Himachal Pradesh), Spain, Argentina and local selections.
- ▣ More than 70 varieties at this moment

# Multiplication

- ▣ In vitro propagation
- ▣ Green cuttings
- ▣ Hardwood cuttings

# In vitro propagation

- ▣ Overseas introductions
- ▣ Maximize the vegetative material
- ▣ Greenhouse budburst for material introduction.
- ▣ Acclimation from Lab to greenhouse is critical

# In vitro propagation





# In vitro propagation



# Green cuttings

- ▣ 2 inches green cuttings taken from mother hardwood cuttings and young plants produced in vitro.
- ▣ Accelerate process
- ▣ Perlite with foggers (humid environment)
- ▣ Ideal root zone temperature 75°F
- ▣ Treat base with IBA 2000 ppm (up to 10.000 ppm) solution for 5 sec

▣ *Ready to pot plant*



# Hardwood cuttings

- ❑ Winter pruning and suckers from old plants
- ❑ 8 to 12 inches long
- ❑ Pre pot media (bin): Perlite and peat (80 -20)
- ❑ Pot media: Coconut fiber and peat (60 - 40)
- ❑ Slow release complete fertilizer
- ❑ ½ gallon plastic bag for 1 year

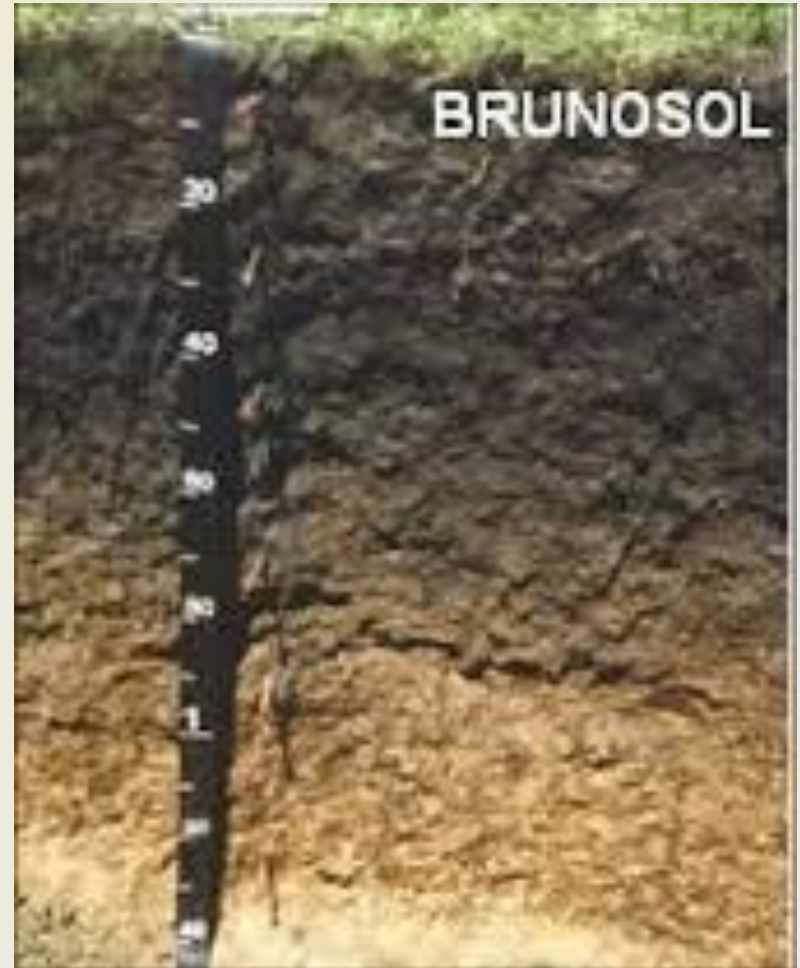




# Soil type

## ▣ Brunosol:

- ▣ Dark soil with high content of clay and lime (35 - 55 %)
- ▣ Medium to good drainage
- ▣ Very good water holding capacity
- ▣ Organic matter about 2 %
- ▣ High basal fertility, high in K (potassium)
- ▣ PH (water) value is between 5,5 and 6



# Orchards

- ▣ Spacing 12 x 7 ft (4x 2 mts)
- ▣ Single trunk
- ▣ No irrigation system
- ▣ Varieties selected for production: Wonderful, Sumbar, Vkushnyi, Parfianka, Molla Nepes and Neozhidanyi.

# New Orchards





# New Orchards





# New Orchards



# Orchards





# Orchards. Wonderful 2009





# Orchard. Angel Red 2011





# Tree pruning

- ▣ Central leader
- ▣ First floor about 2 ft from soil.
- ▣ Short branches in opposite orientation
- ▣ Summer pruning is extremely important. At least 2 times a year
- ▣ De suckering and shortening long branches





# Varieties

- ▣ There is a block for comparison and evaluation of 76 varieties.
- ▣ 3 plants each trained and managed under the same way.
- ▣ Foreign, Domestic and Ornamental varieties.
- ▣ Not all the varieties are producing yet.
- ▣ A lot of differences in vigor, precocity and growing habit.

# Varieties

## ▣ Evaluation block





# Varieties



Bagwaha (India) and Haku Botan (Ornamental)

# Varieties



# Varieties

EARLY WONDERFUL





# Varieties

SUMBAR



VIKUSHNY



# Varieties



BAGWHA

# Varieties





# Weed Control

- ▣ Problems with glyphosate resistance in ryegrass and conyza (horseweed or fleabane).
- ▣ Dormant: Glyphosate plus Clethodim and Fluroxipyr or MCPA.
- ▣ After budburst: Glufosinate plus Clethodim.
- ▣ No preemergence herbicides yet.

# Suckering

- ▣ Manual
- ▣ Paraquat
- ▣ Glufosinate (gives not good control)
- ▣ This year: Pyraflufen methyl (Venue)



# Insects

- ▣ Insects
- ▣ Mites (*Aceria granati*)
- ▣ Aphids (*Aphis punicae*)
- ▣ Ants!!! (*Acromyrmex lundii*)



Young plant ant damage





# Diseases



***Borytis cinerea* (Gray mold)**

# Diseases



**Botryosphaeria ??**

# Diseases





# Diseases



**Pillidiela Granati ???**



# Production and commercialization

- ▣ Pomegranates total area: 50 acres
- ▣ Not all in production.
- ▣ Main variety: Wonderful (older blocks)
- ▣ New varieties first crop, fall 2015.
- ▣ Commercialization:  
Supermarkets, and wholesale market: fresh fruits.  
Direct to costumers: Fresh fruit and juice.



# Production and commercialization

## FRESH FRUIT



- ▣ Plastic bins 40 pounds (supermarket)
- ▣ Wooden case 11 pounds (wholesale)

## JUICE

- ▣ Basket press whole fruit
- ▣ Protein for tannins (egg whites or gelatin)
- ▣ Cold stabilization
- ▣ Potassium Sorbate (not pasteurized)
- ▣ Cold storage preservation (up to 4 months)

# Production and commercialization

## ▣ Products developments

- Vinegar (100% pomegranate, blend and balsamic type)
- Pomegranate “grappa” (distillation) 100% pomegranate and blend
- Pomegranate jelly



- Arils: fresh and dried
- Dried flowers for tea
- Future: Pomegranate juice blends with other rich antioxidants fruits (persimmon, elderberry, berries and tomato)



Questions ?????



# Thanks for your attention!!!!

