



UNIVERSITY OF PALERMO



Faculty of Agricultural Science
Department S.En.Fi.Mi.Zo.
Section of Mediterrean, Tropical and
SubTropical Horticulture

Prof. Francesco Calabrese: Citrus, Tropical and Subtropical fruit crops

Prof. Luigi Di Marco: Mediterrean fruit crops

Prof. Maria Antonietta Germanà : Biotechnology

Dr. Riccardo Lo Bianco: Plant physiology

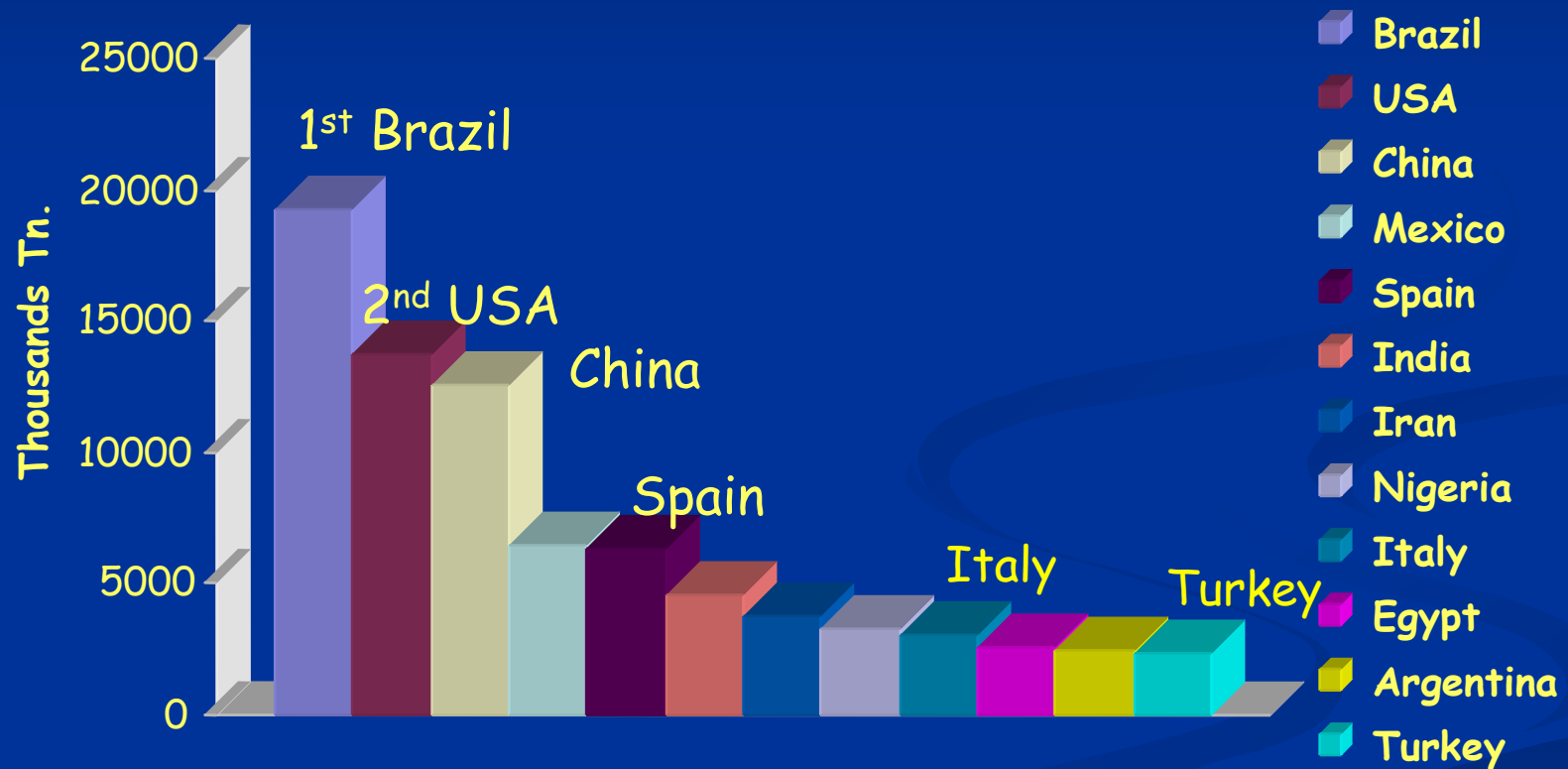
Dr. Vittorio Farina: Fruit Quality and Postharvest

Dr. Benedetta Chiancone: Tissues Culture

Introducing by Dr Giorgio Volpe, PhD

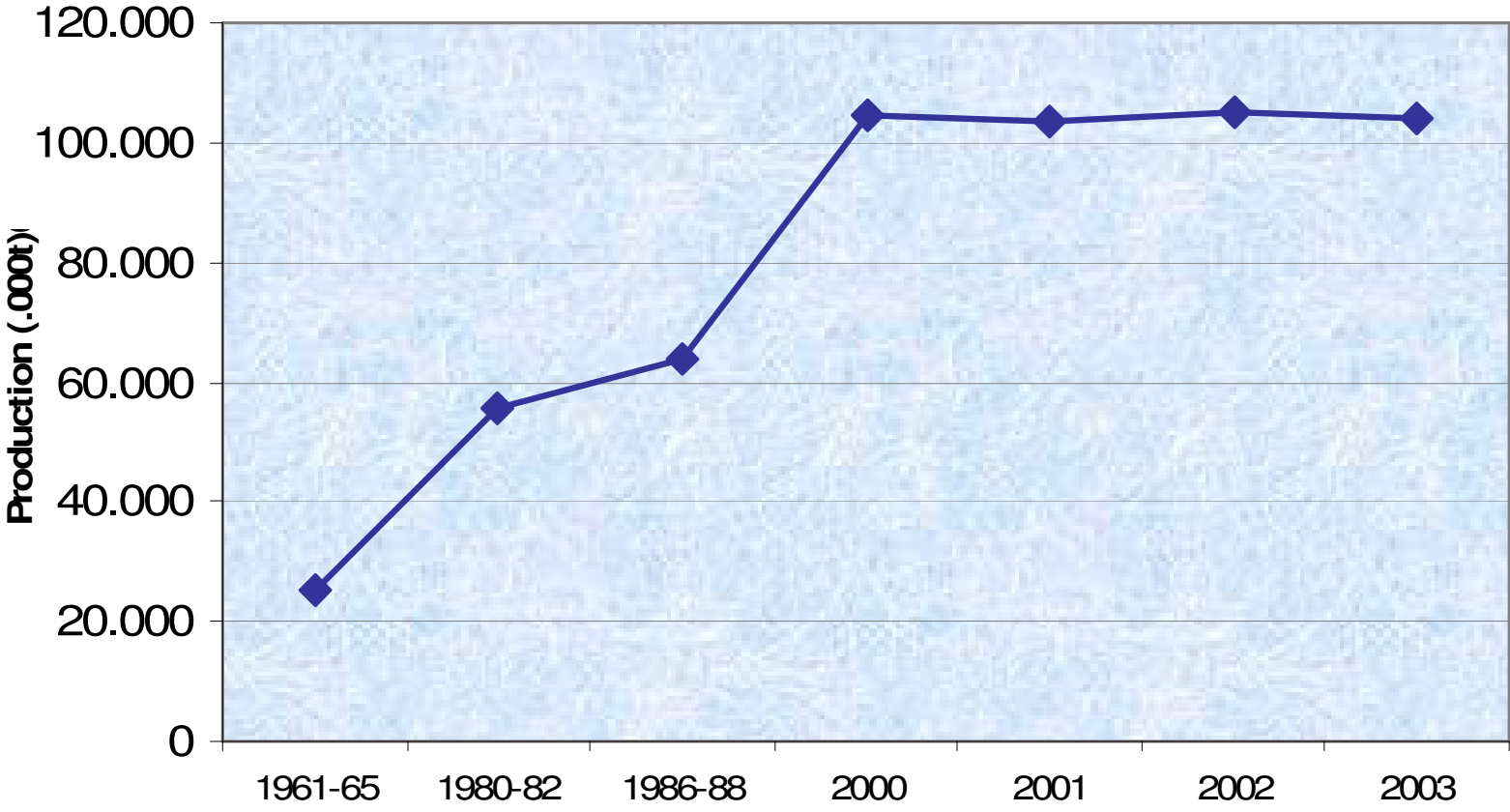
Production of citrus in the world

TOTAL 104,000,000 Tn.








FAO 2005

PRODUCTION TREND OF CITRUS IN THE WORLD 1961-2003

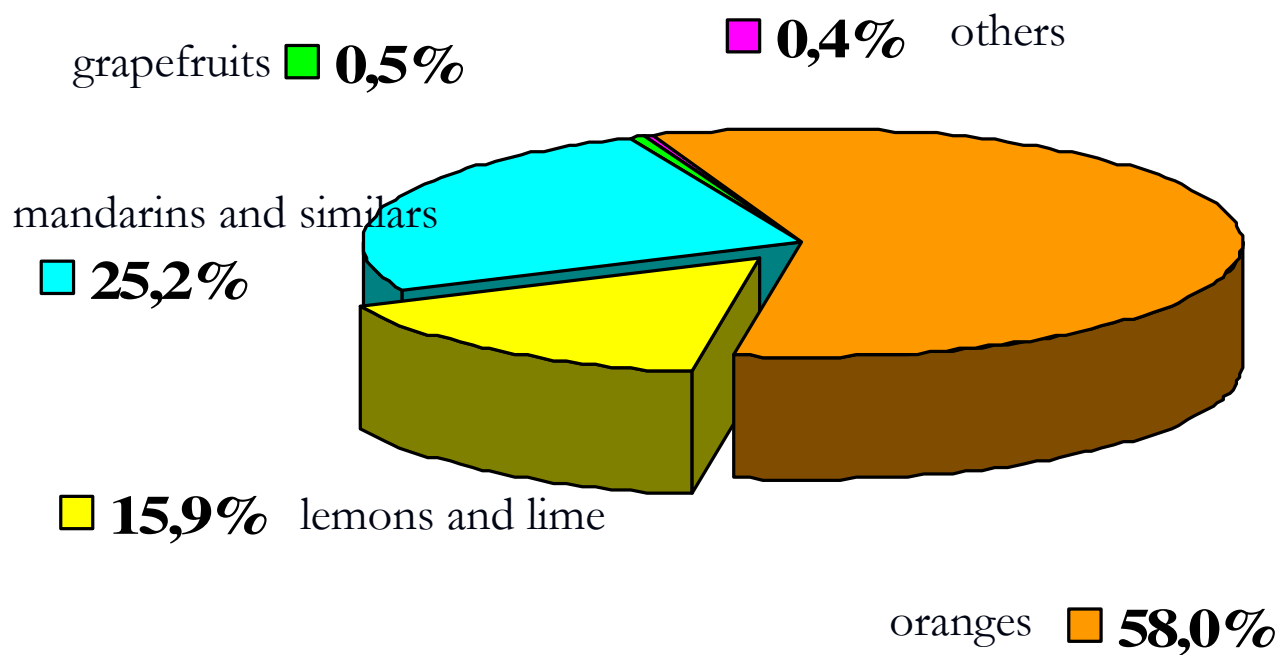


Fao

Citrus partiton in the world and trend

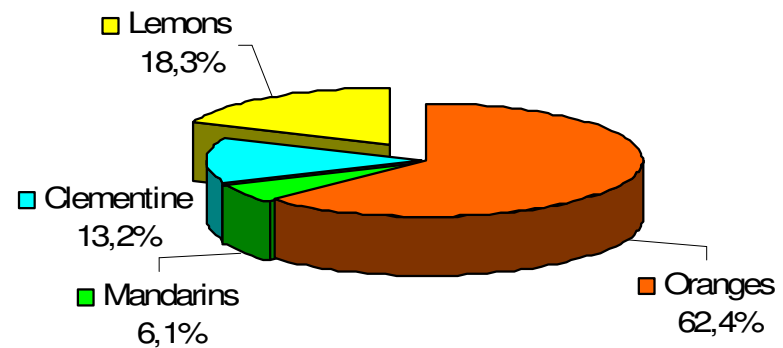
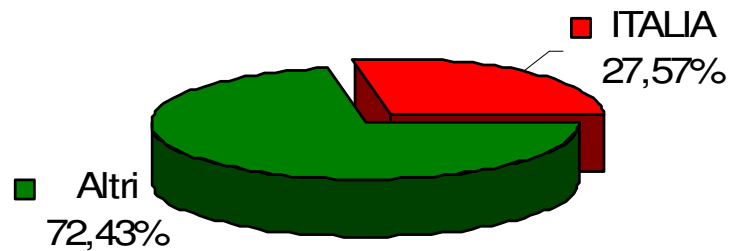
CITRUS PRODUCTION (.000 T)	2001	2002	2003	2004
MANDARINS AND MANDARIN-SIMILIARS 	17.944	20.493	20.736	20.950
ORANGES 	64.305	60.463	61.724	60.046
LEMONS AND LIME 	11.454	11.821	11.862	12.451
GRAPEFRUITS 	5.402	5.209	4.928	4.697
OTHER CITRUS 	5.502	5.734	5.716	5.676

Citrus partition in Europe

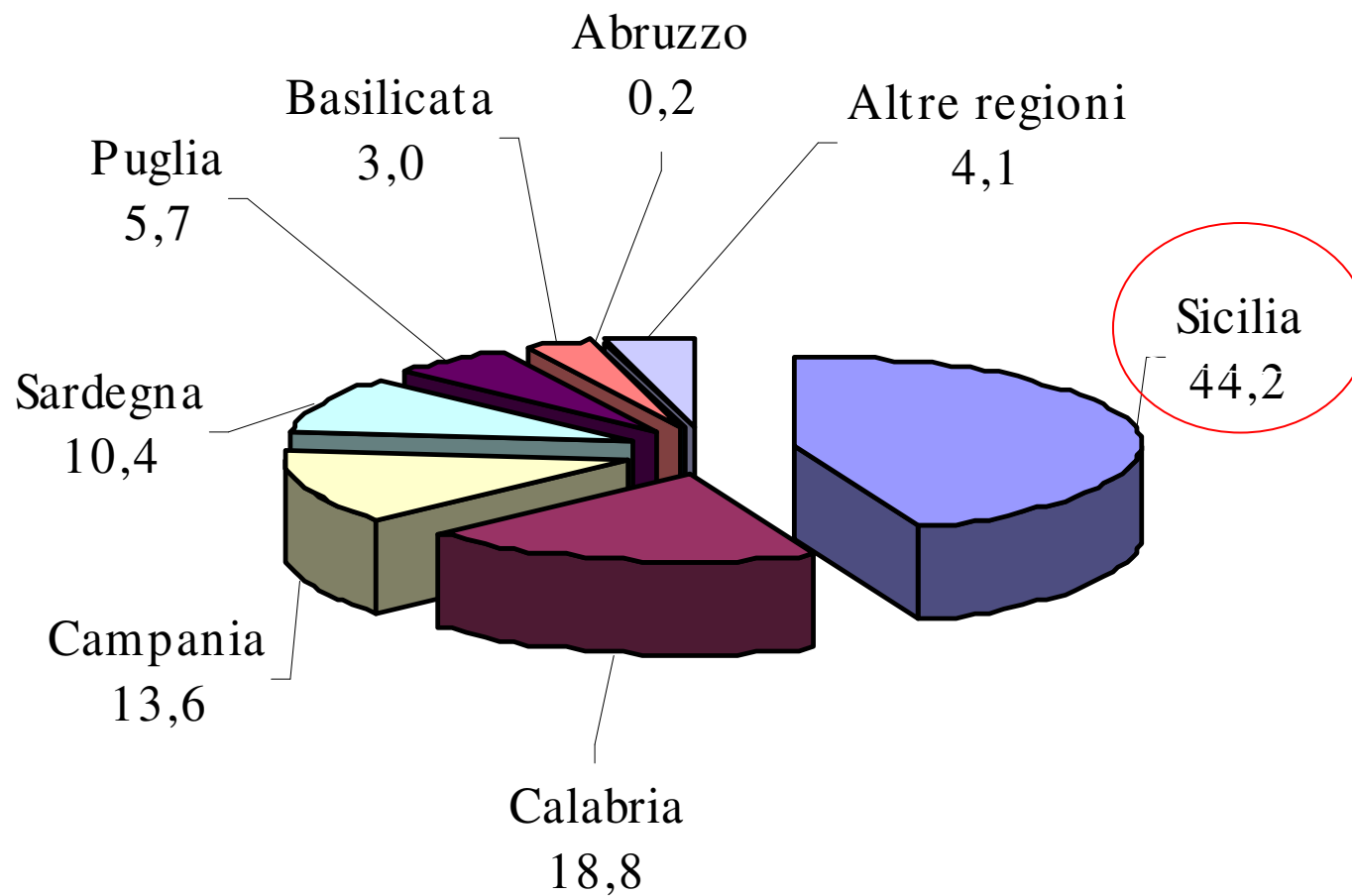


Fao 2005

Italian production in Europe



...in Italy



Citriculture in Sicily 2004 (Istat)

CULTURE	Total Surface (ha)	Surface producing (ha)	Yield x ha (t)	Total Yield (t)	Harvest (t)
Citrus	100.315	99.989	16,3	1.633.238	1.605.958
Oranges	63.040	62.900	16,5	1.041.550	1.019.445
Mandarins	5.843	5.827	13,0	76.003	75.710
Clementine	3.644	3.589	15,3	54.955	54.138
Lemons	27.788	27.673	16,6	460.728	456.663

Area Distribution

- 80% production concentrated in :
 - Palermo
 - Catania
 - Messina
 - Ragusa
 - Agrigento (Ribera) Washington navel
- Almost the total of lemon production is produced in Sicily

Market

- 50 % fresh product - 50 % processing
- The industries are in: Palermo, Messina and Catania
- 52% Lemons, 40% oranges and 18% mandarins mainly for juices, cosmetic products and liquors
- Majors markets:
 - Uk and USA **essential oils**
 - UE, China, Japan, Australia and USA **juices**
 - North Italy **fresh market**

Objectives of research activities at University of Palermo

- Control of Tristeza virus for sour orange rootstock (98%) in combination with:
 - orange
 - mandarin
 - grapefruit
- innovation in Sicilian citriculture
- organic production
- mineral nutrition
- ornamental citrus varieties

Guidelines in Sicilian citriculture against Tristeza virus

- Improving knowledge on ecotypes of tristeza virus
- setting up new diagnostic systems
- monitorating vectors of infection (toxoptera citrus and aphid gossypii)
- new tolerant rootstocks
- new varieties

Strategies

Innovative tools for:

- varieties selection
- new cultivars
- new rootstocks to substitute sour orange tolerant to the main biotic and abiotic stress

Alternative rootstocks

Poncirus trifoliata, Carrizo, Citrange...

- Comparison between alternative rootstocks and sour orange
- Evaluation of production characteristics
- Agronomic behaviour related with abiotic and biotic stress
- Use of functional genomic to identify genic sequence related with main abiotic and biotic stress

Water management

- Determination of WUE (water use efficiency) on several rootstocks
- Correlation of water potential in soil and in plant
- Partial Root Drying
- Fertirrigation and subirrigation

New varieties in Sicily

- New clones of Tarocco orange
- New cultivars of blonde orange
- New mandarin and tangerine varieties

**Citrus research activity in our
Department**

- Partial Root Drying on valencia orange
- Anatomic and physiologic study of pixat in clementine
- Comparison between grapefruit and sour orange rootstock in ‘Tardivo di Ciaculli’ mandarin
- Peel essential oil and fruit characteristics in different Sicilian citrus varieties
- Selection of new cultivars of mandarin, tangerine and orange also by biotechnological methods
- Vitro-replication of citrus tolerant rootstocks (troyer and carrizo)