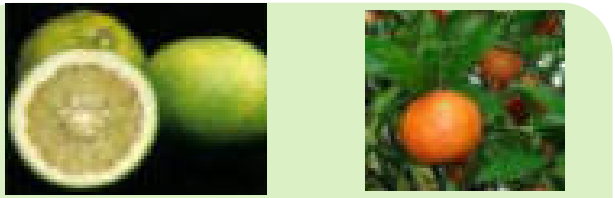
Marco Caruso, Giuseppe Russo

Novità varietali di arancio dolce, clementine, limone ed ibridi

Webinar Innoci - Innovazioni varietali di varietà e portinnesti – 8 marzo 2021

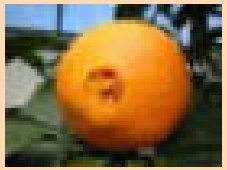
L' arancio dolce



C. maxima

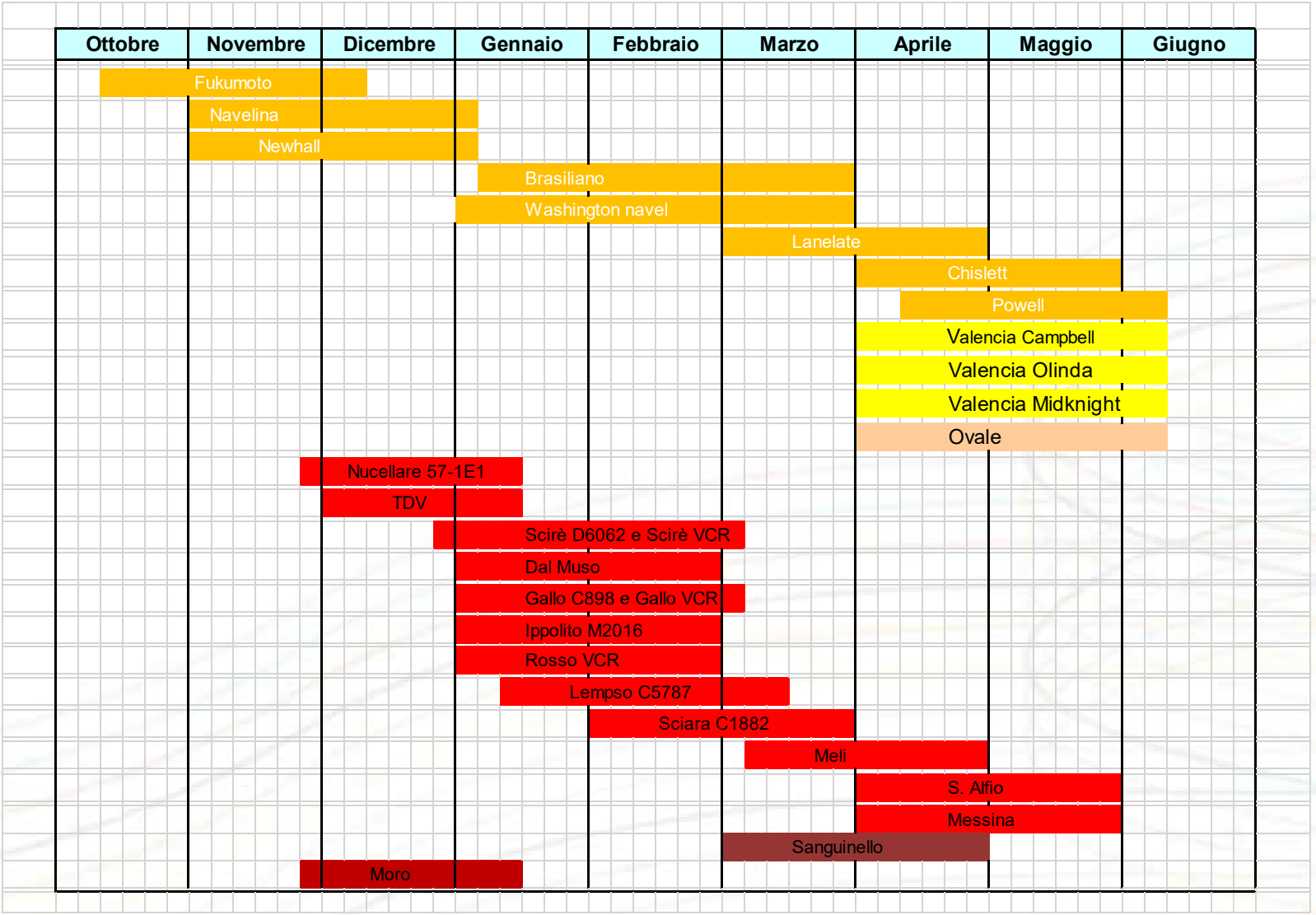
C. reticulata

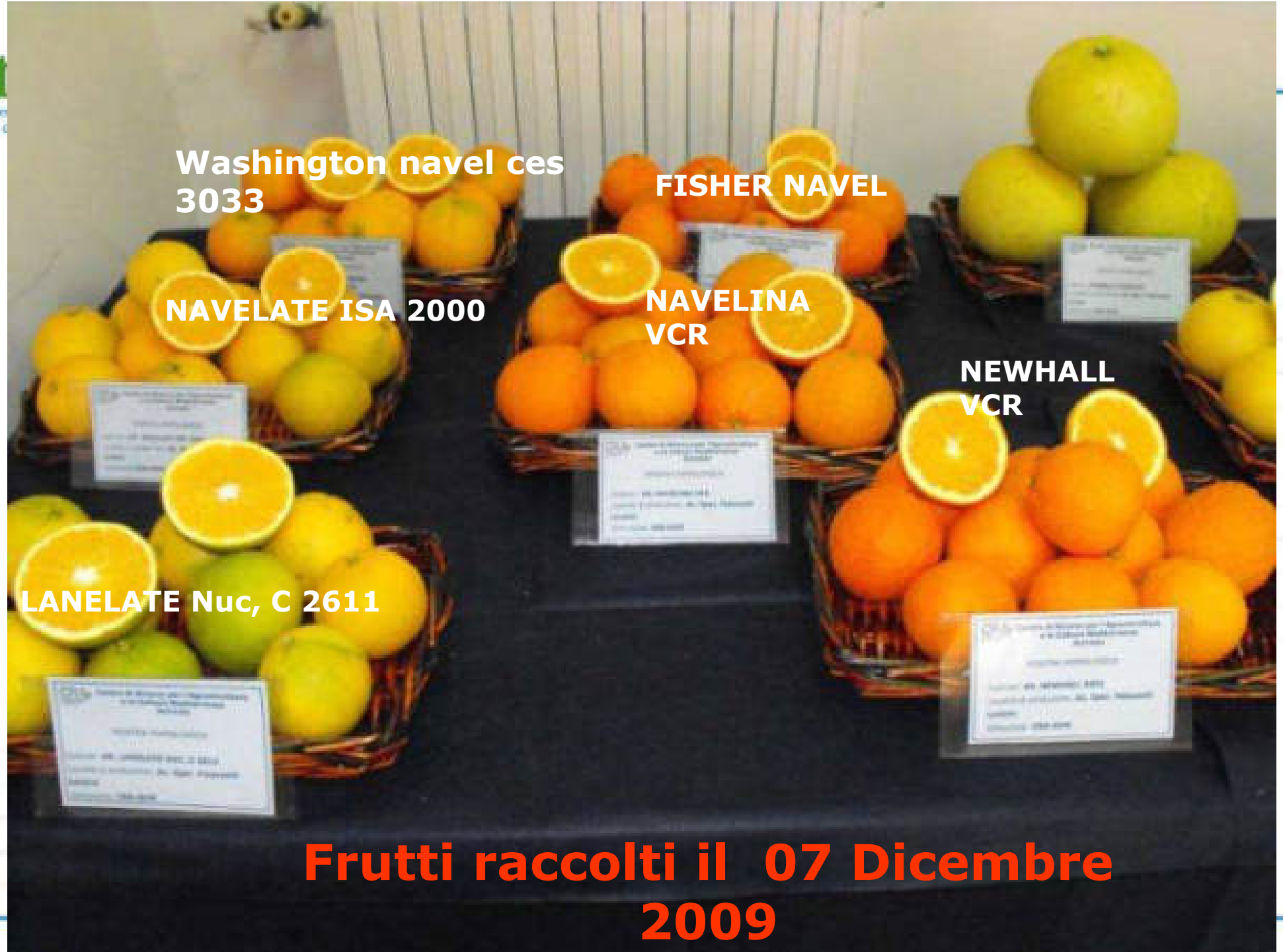
Comuni



Navel

Pigmentate


Ottobre
Novembre
Dicembre
Gennaio
Febbraio
Marzo
Aprile
Maggio
Giugno
Fukumoto
Navelina
Newhall
Brasiliano
Washington navel
Lanelate
Chislett
Powell
Valencia Campbell
Valencia Olinda
Valencia Midknight
Ovale
Nucellare 57-1E1
TDV
Scirè D6062 e Scirè VCR
Dal Muso
Gallo C898 e Gallo VCR
Ippolito M2016
Rosso VCR
Lempso C5787
Sciara C1882
Meli
S. Alfio
Messina
Sanguinello
Moro



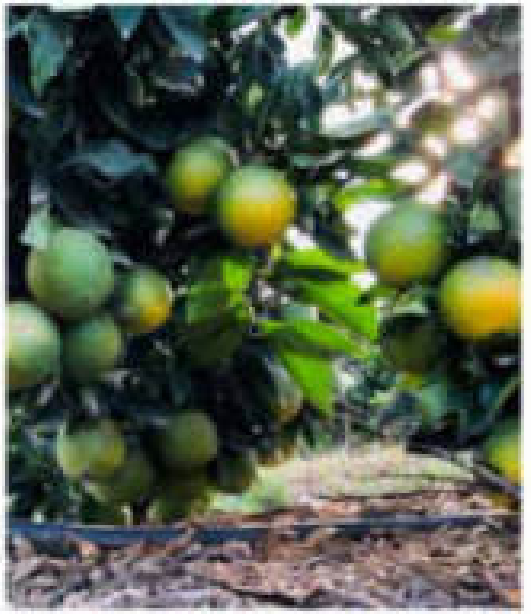
Frutti raccolti il 07 Dicembre 2009


Kirkwood


Cara Cara

CGACC, Sud Africa

Red Lina, (RosaLina)



Origin	The red Lina, PBR ZA20176317, originates from a spontaneous branch mutation discovered by the owner, Mr. Glenam Knott in a Lina Navel Orchard in 2009 in the Kat River, Eastern Cape midlands
Status	Commercial Release
Description	A new and distinct navel orange, originating from a spontaneous branch mutation of a Lina Navel tree. Distinct from the parent Lina Navel by production of red fleshed fruit, (lycopene). Red Lina is an early season Navel orange with dark orange to red pigmented rind and a pink albedo. It further distinguishes itself by ripening 3-4 weeks before Cara-Cara navel, (the current bench-mark red navel). Both flesh and juice are consistently darker than that of Cara-Cara navel. Fruit of Red Lina have a smaller navel end, with rounder fruit than the parent Lina Navel.

BACK

CAMBRIA

ADDITIONAL INFORMATION

TYPE

Late mutation of Washington navel that appeared in South Africa

CHARACTERISTICS

Vigorous and very productive trees. Fruit of superior organoleptic quality and closed navel-ends. Medium calibre size and good colour. Firm and very smooth skin, not sensitive to creasing. Good shelf-life and long season.

HARVEST TIME

From March to June (NH) / From August (SH)

SEEDLESS

Pollen and ovule are sterile. 100% seedless in all conditions.

M7 (Early maturing Navel)

GENERAL INFORMATION

Parentage	Natural mutation of Navelina
Origin	Kenley, Victoria, Australia
Status	Commercial*
Tested True to Type	Confirmed in-field

AVERAGE INTERNAL QUALITY

	Fukumoto	M7	Navelina
Juice%	44 – 50	45 – 52	45 – 52
Brix°	10 – 13	10 – 13	9 – 11
Total Acid%	0.6 – 1.1	0.6 – 1.1	0.6 – 1.0
Brix/TA Ratio	11 – 15	12 – 15	11 – 13

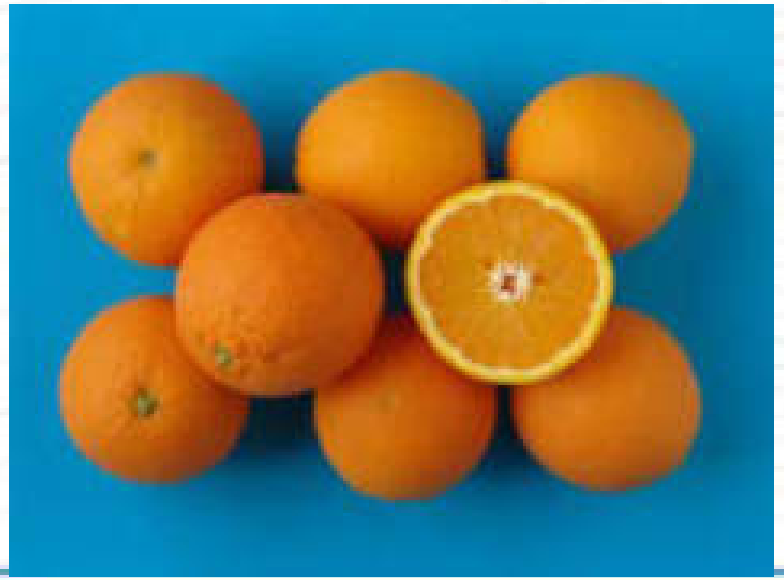
TREE CHARACTERISTICS

Growth habit	Trees are spreading but not very vigorous. Leaves have a unique thick and leathery like texture and heart-shaped petiole
Rootstocks used to date	Carrizo citrange, Benton citrange, Rough Lemon, Swingle citrumelo. Studies in Australia have found Navelina 7.5 to be incompatible with C35, FB0-5 and FB0-7 citrumelo. M7 is closely related to Navelina 7.5, and as such, should not be grafted to these rootstocks.
Alternate bearing	This cultivar can set heavy crops and fruit thinning may be required in some years. Crop manipulations may be required to prevent slight alternate bearing

Navel M7

Valencia

- I cloni più coltivati sono l'Olinda e il Campbell e quelli di più recente introduzione Delta e Midknight
- Come nel caso degli altri gruppi varietali, si è assistito ad un proliferare di selezioni clonali differenti per epoca di maturazione, colorazione, numero di semi e qualità interna. Recentemente in Florida sono stati rilasciati diversi cloni a maturazione precoce (EV1, EV2, Valquarius) e tardiva (cloni della serie OLL - *Orie Lee late*) che, per la loro qualità in termini di profili aromatici e colore del succo hanno suscitato l'interesse dell'industria dei succhi e che presumibilmente soppianteranno in un prossimo futuro le vecchie selezioni clonali.



Resources

How to Support the Collection

Rhode Red Valencia orange

Citrus sinensis L. Osbeck

CRC 3995
PI 539666
VI 487

Photos by Tom Siebert (left and center) & David Karp (right), CVC, 4/11/2003. Photo rights. Carrizo, 17 year old tree.

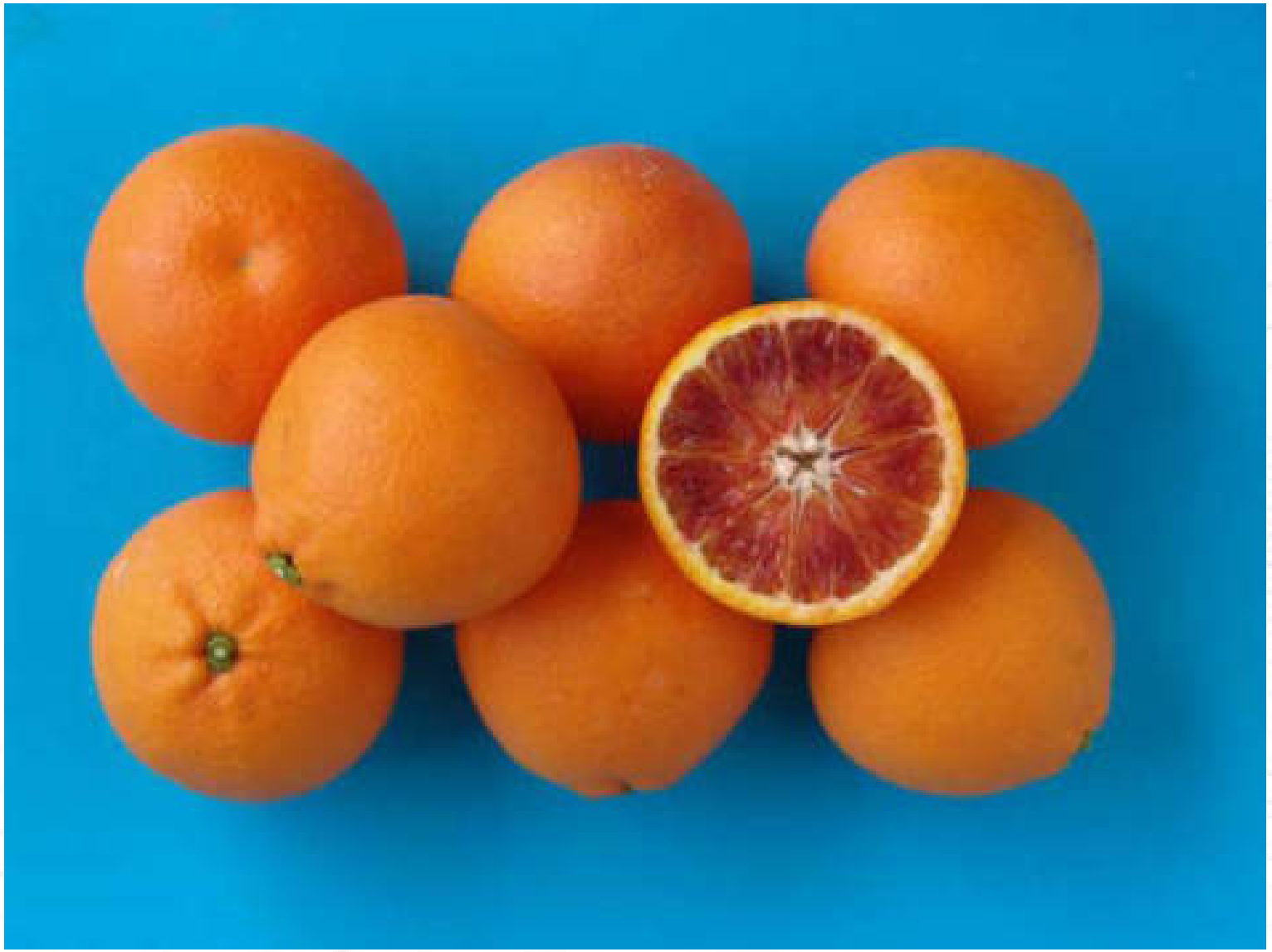
Source: Received as budwood from Florida Budwood Registration Program, Winterhaven, Fl, 1988.

Parentage/origins: Apparent this variety is a selection from a mutated branch from a normal Valencia.

Ruby Valencia

Le varietà di Tarocco

Tarocco TDV



Tarocco Rosso VCR

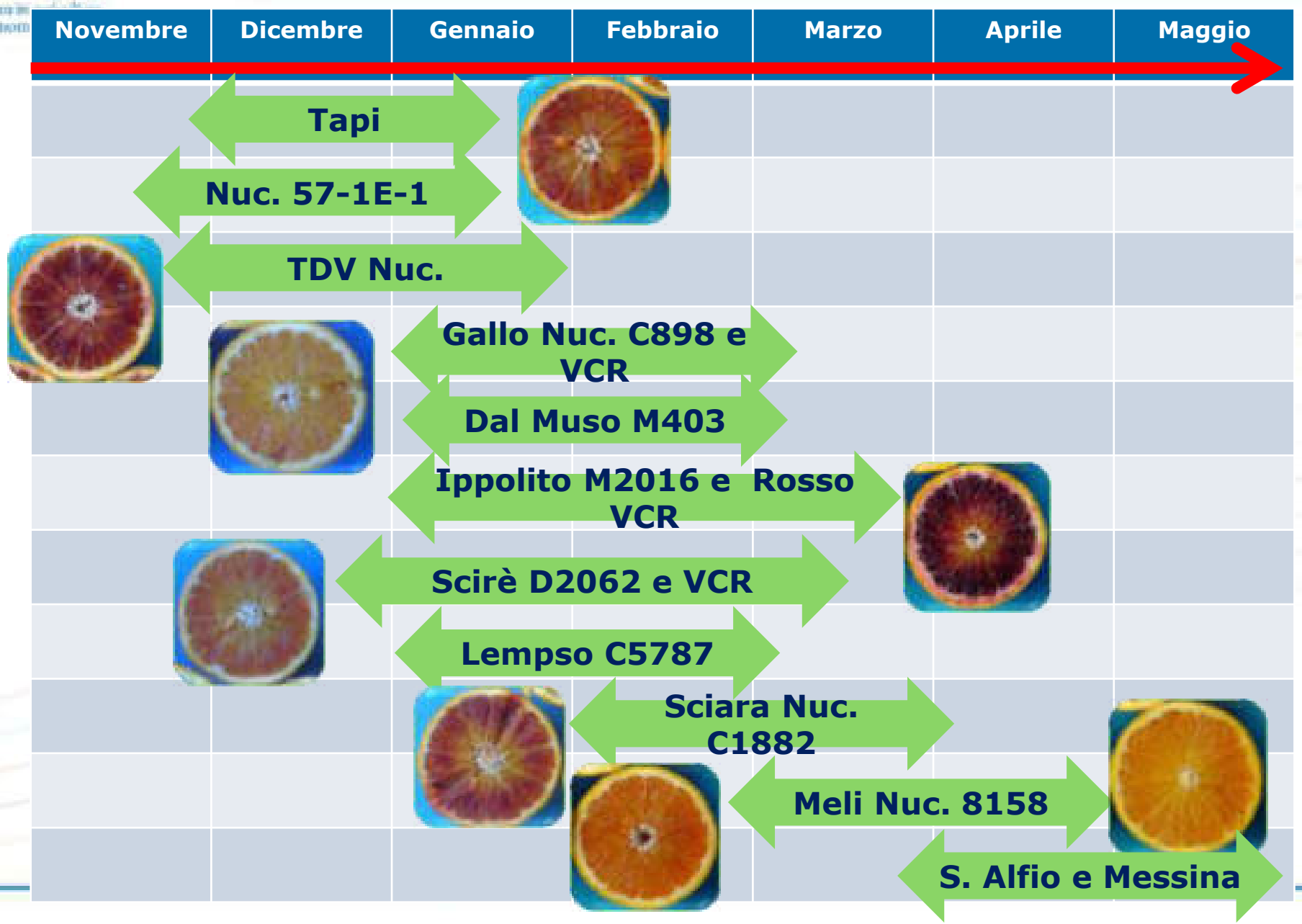
Tarocco Ippolito

Tarocco Lempso nuc. C 5787

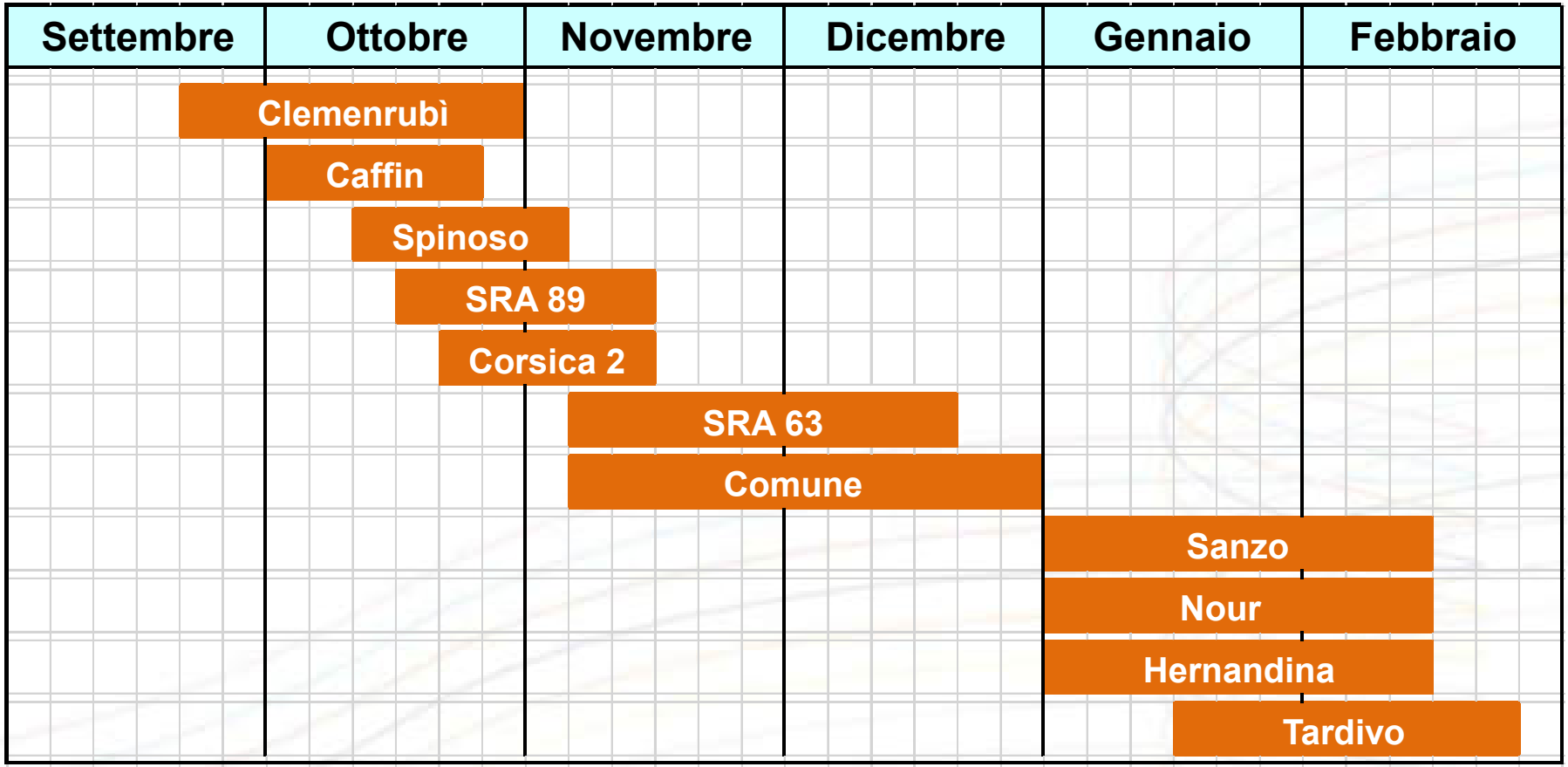
Tarocco Meli nuc. C 8158

S. Alfio

Il calendario di maturazione del tarocco

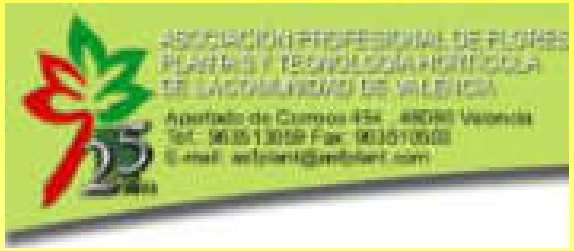


Clementine


Settembre
Ottobre
Novembre
Dicembre
Gennaio
Febbraio
Clemenrubì
Caffin
Spinoso
SRA 89
Corsica 2
SRA 63
Comune
Sanzo
Nour
Hernandina
Tardivo

Nour

Il panorama varietale Spagnolo



- Arrufatina
- Avasa Pri 21
- Avasa Pri 22
- Avasa Pri 23
- Avasa Pri 24
- Caffin
- Capola
- Clemenpons
- Clementard
- Clemenules
- Esbal
- Fina
- Hernandina
- Loretina
- Ma - 3
- Marisol
- Nour
- Orogrande
- Oronules
- Oroval
- Tardivo
- Tomatera

Il panorama varietale Spagnolo

Clementine ultraprecoci

Basol,Clemensoon,
Clemenrubi, Cultifort,
Orogos, Octubrina, …….

Clementine tardivi

Sando, Clemenlate, Neufina

Clemenruby

Clemensoon

Gli ibridi del CREA

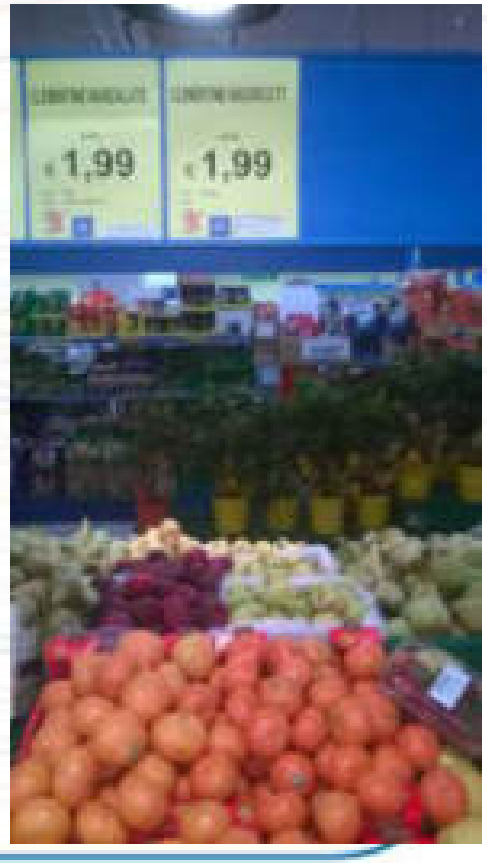
Tacle

Mandared

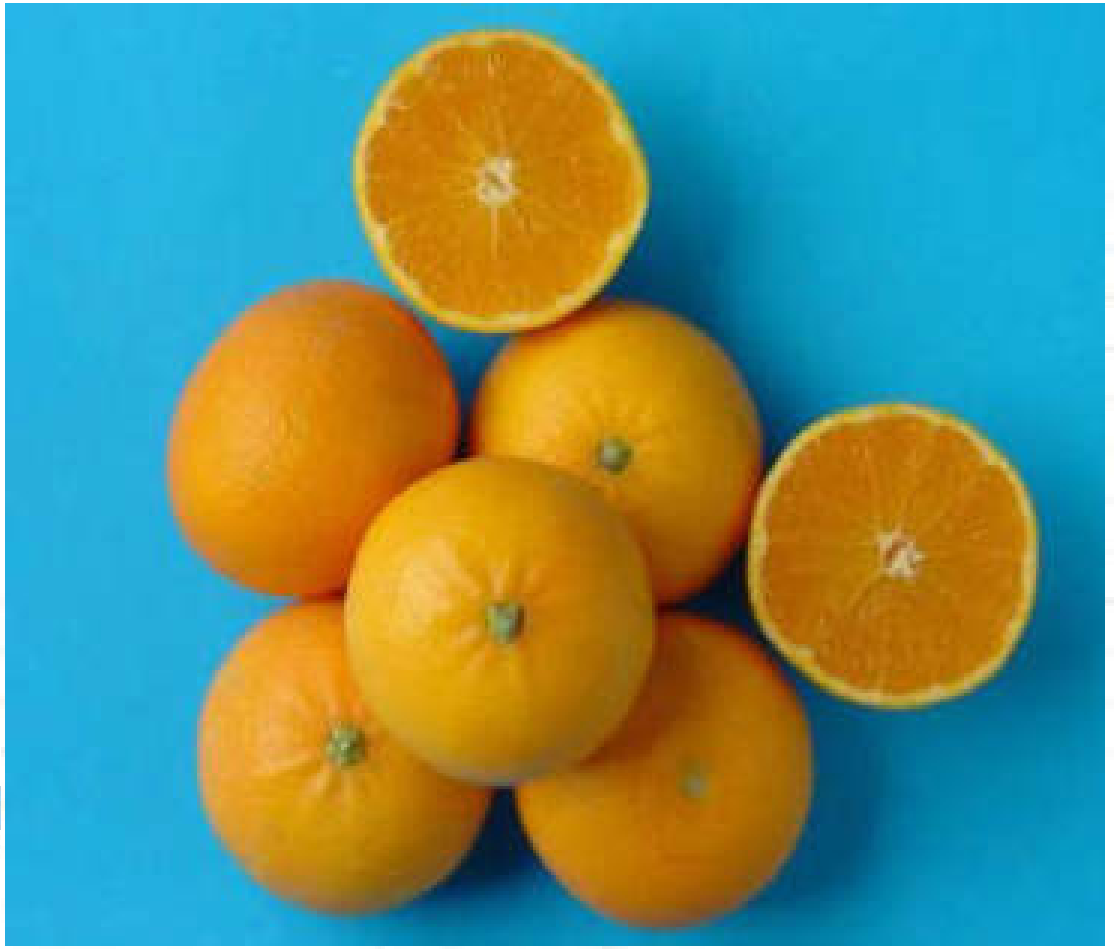
Mandalate

Tacle

Mandalate



Early Sicily



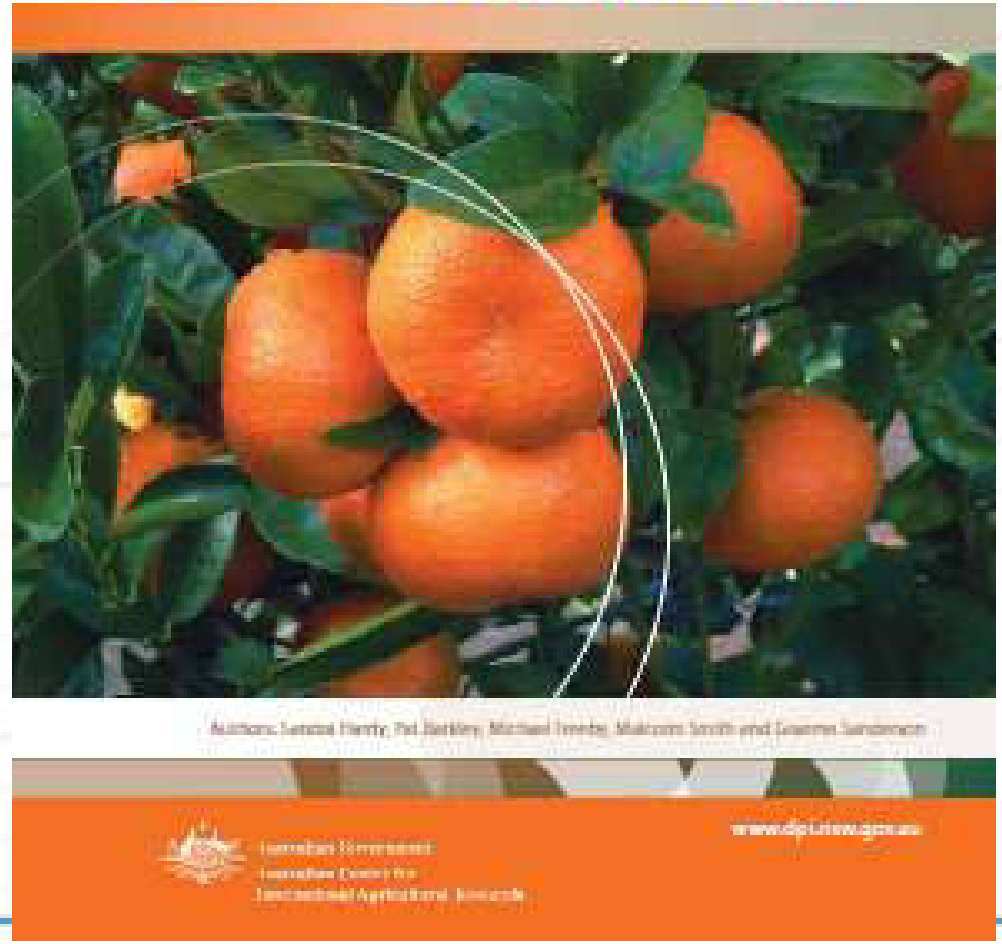
Sweet Sicily

DOSSIER AGRUMI

Sweet Sicily ed Early Sicily, due nuovi mandarini triploidi

3. **C1867 tangor** (Italy – PBR) a hybrid of Oroval clementine × tetraploid Tarocco orange. It is the best performing of these hybrids (Tacle, C1829, 1867 and Alkantara) from Italy. Trees are thorny and exhibit an alternate bearing habit. Fruit size is smaller than the other hybrids, but still acceptable. There has been no anthocyanin pigment development in the flesh under southern inland conditions, but some pigmentation was achieved with fruit stored at <5 °C for at least 3 weeks. The expression of pigment was also enhanced when the fruit received some pre-chilling on the tree prior to harvest.

Australia mandarin production manual



NOVA

Afourer o Nadorcott

Afourer su citrumelo Swingle

Tango

Le varietà del programma Israeliano

Food and Nutrition Sciences, 2014, 5, 969-952
Published Online May 2014 in SciRes.

Effects of Gamma-Irradiation Mutagenesis for Induction of Seedlessness, on the Quality of Mandarin Fruit

Livnat Goldenberg[1,2], Yossi Yaaliv[2], Ron Porat[1*], Nir Carmi[3]

[1]Department of Postharvest Science of Fresh Produce, Agricultural Research Organization, Bet Dagan, Israel
[2]Faculty of Agricultural, Food and Environmental Quality Sciences, Hebrew University of Jerusalem, Rehovot, Israel
[3]Department of Fruit Tree Crops, Agricultural Research Organization, Bet Dagan, Israel
Email: *rporat@volcani.agri.gov.il

Received 28 February 2014; revised 28 March 2014; accepted 1 April 2014

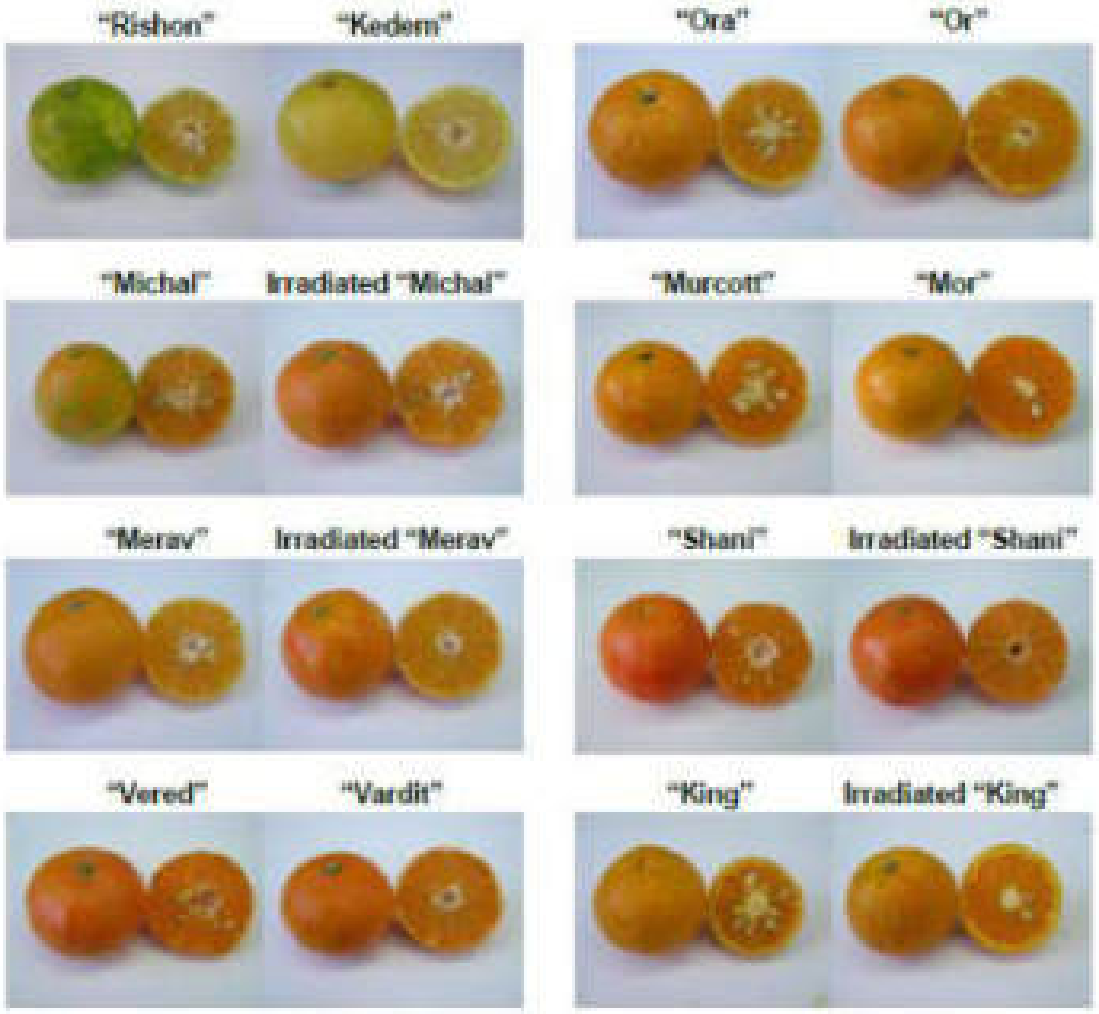


Figure 1. Photographs of eight different natural seeded mandarin varieties, compared with their corresponding gamma-irradiated low-seeded mutants.

ORRI

LEANRI MANDARIN

Biogold/Citrogold

GENERAL INFORMATION

Parentage	Induced mutation of Clementine x Murcott
Origin	Esselen Nursery, Malelane, Mpumalanga, South Africa
Ownership	Comsun (Pty) Ltd
Selected	2008
PBR Registration	ZA2015/6038
Status	Experimental
Tested True-to-Type	Yes

AVERAGE INTERNAL QUALITY TESTS

	Nova	Leanri	Nadorcott
Juice%	52	60	55
Brix°	10 - 11	11 - 15	11 - 13
TA/cit%	0.8 - 1.1	0.9 - 1.3	0.9 - 1.2
Brix/TA Ratio	10.0 - 12.5	11.5 - 12.2	10.8 - 12.2

TREE CHARACTERISTICS

Growth habit	Trees have an initial upright with later spreading growth habit. Vigorous but without thorns - similar to Murcotts.
Rootstocks used in evaluation	Carrizo Citrange and Minneola x Trifoliate. C35, X639 and Sunki Beneicke being used in new plantings.
Alternate bearing	low cropping could be a problem due to reduced seed content. Crop manipulation may be required. Alternate bearing can lead to excessively large fruit in the off-year.
Other	Fruit is firm but is prone to creasing when harvested later than normal picking period.

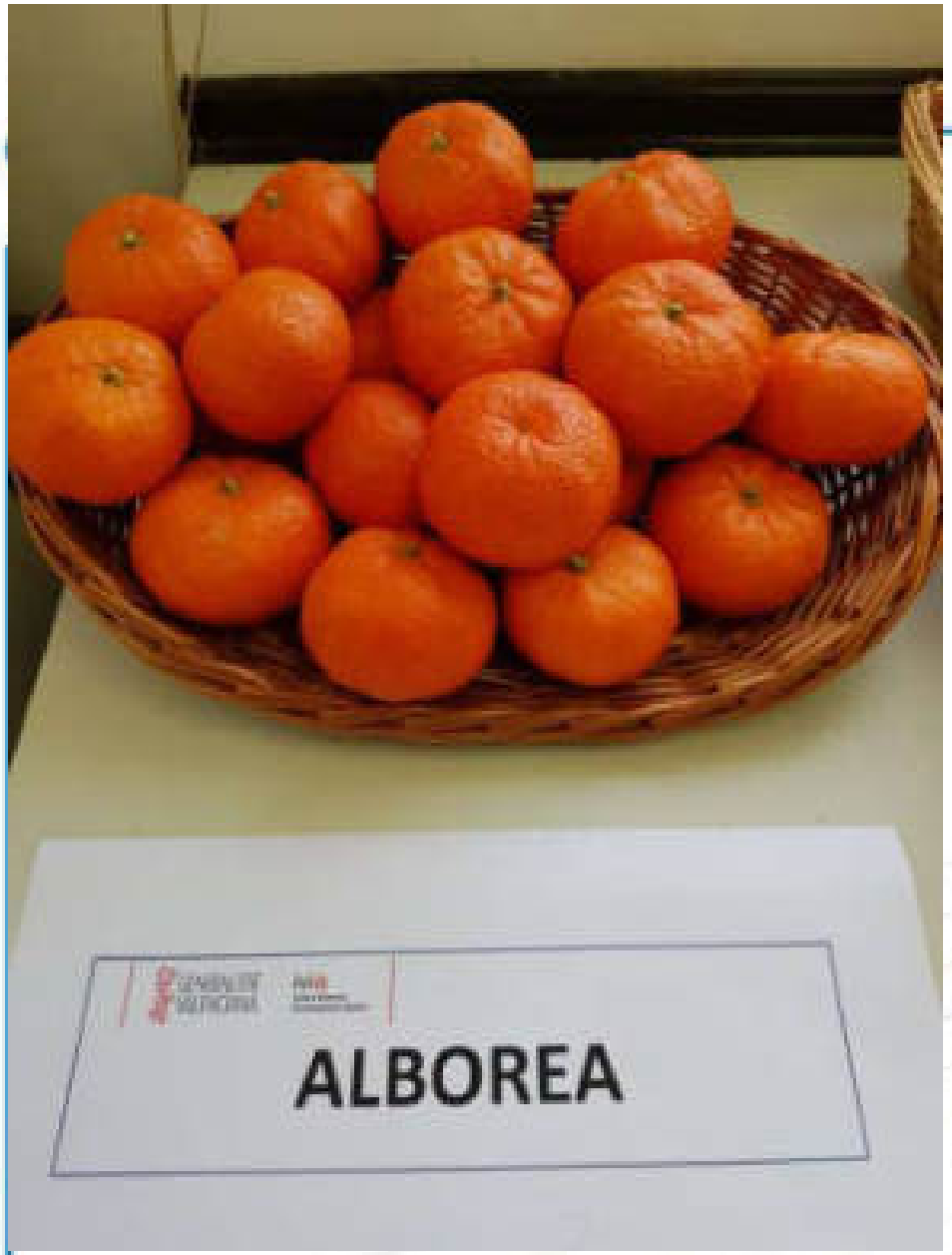
FRUIT CHARACTERISTICS

Fruit size	Hot areas: 1-1XX (68mm to 78 mm) Cool/Cold areas: 2-1XX (64mm to 72 mm)
Fruit shape	Fruit are variable, flat to round.
External appearance	Fruit is firm with a smooth thin rind which develops a deep orange rind colour at maturity.
Internal appearance	Even and large segments developing a deep orange flesh colour at maturity. Open core.
Seed	Average of two seeds in variety block. Seed expected to be lower in isolated blocks.

Gold nugget

(Wilking x kincy)

Shiranuhi, Dekopon, Hallabong, Sumo


ALBOREA


SAFOR

Safor

VOLVER

SPRING SUNSHINE

INFORMACIÓN ADICIONAL

TIPO

Mutación inducida (por la técnica de irradiación) de la mandarina Murcott desarrollada por el ARO (Volcani Center) de Israel.

CARACTERÍSTICAS

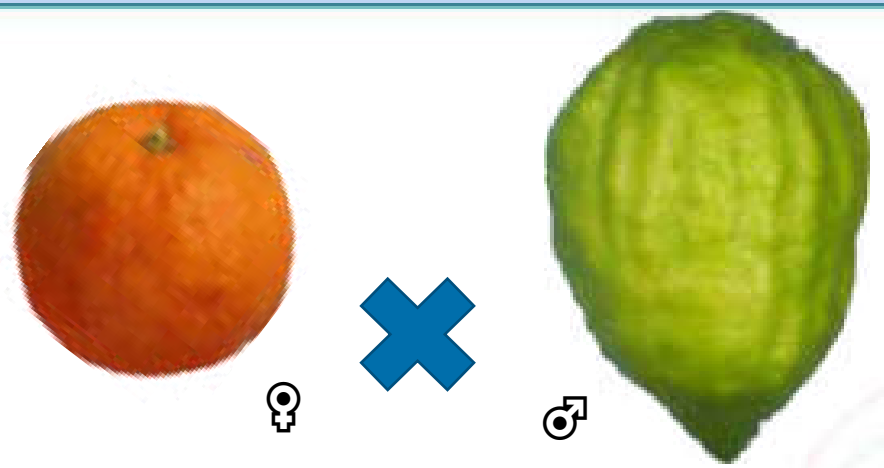
Spring Sunshine es considerada la mejor mutación de la mandarina Murcott y la más tardía de las mandarinas premium. Los árboles son de vigor medio-alto y porte erguido, sin espinas y muy productivos. Spring Sunshine es de sabor dulce, denso e intenso en boca, con un nivel de ácido superior al que presenta la variedad Murcott y excelente contenido en zumo (superior al 50%). La pulpa es de textura fundente. La fruta alcanza un color naranja intenso muy atractivo en la maduración, con piel fina pero resistente y de fácil pelado. Es de forma redonda y un poco achatada. Aunque la variedad es auto-compatible, la viabilidad del polen es baja.

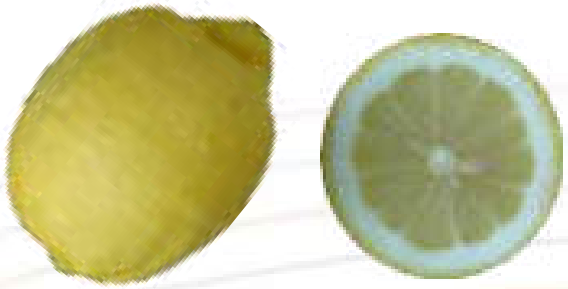
Alternaria brown spot

MOR (Murcott)

NOVA

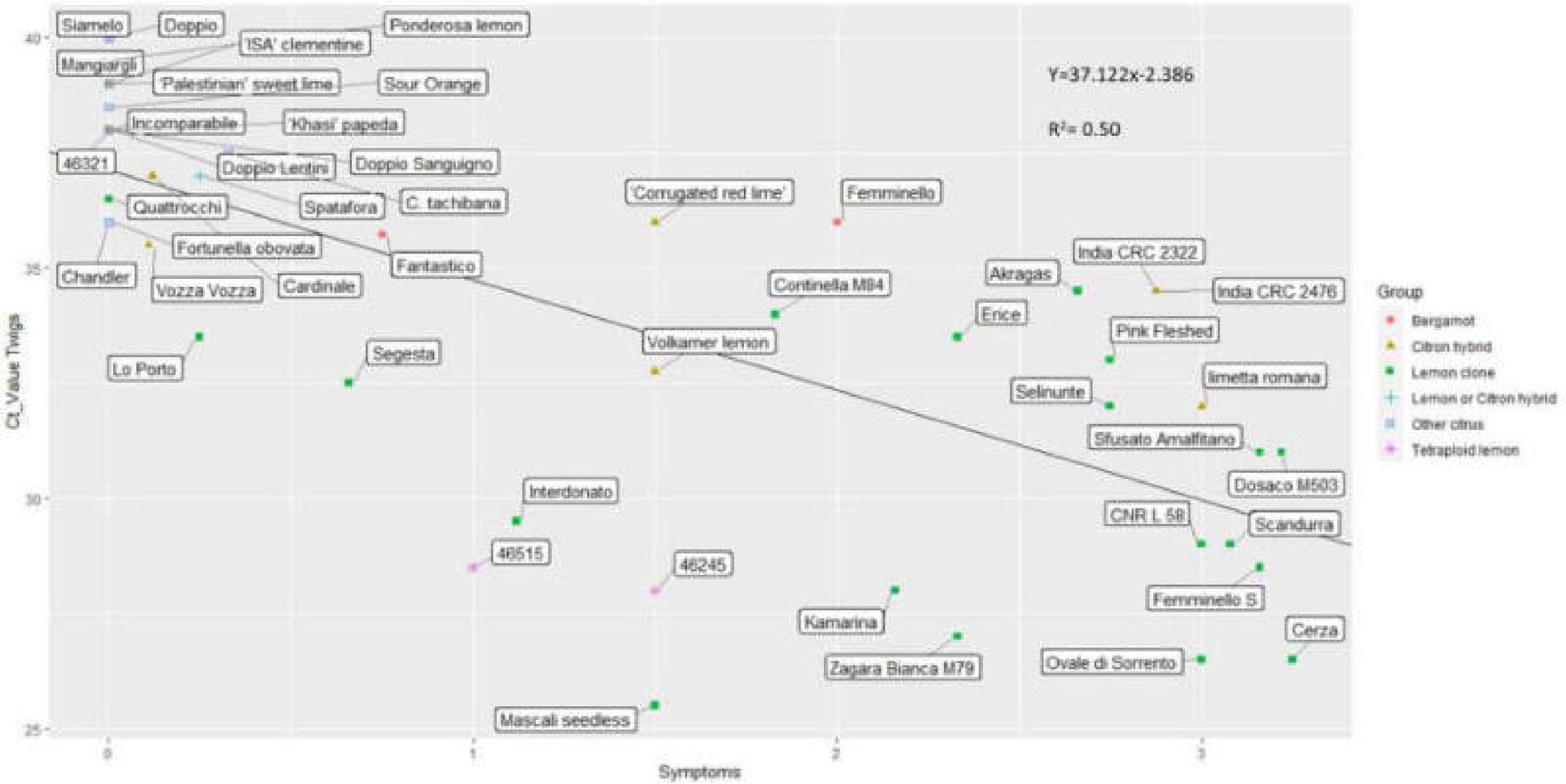
Il limone





Limone

Femminello
Siracusano 2kr su C. macrophylla



Russo et al 2020, Agronomy

Il programma di selezione del CREA

SELEZIONI TOLLERANTI AL MAL SECCO

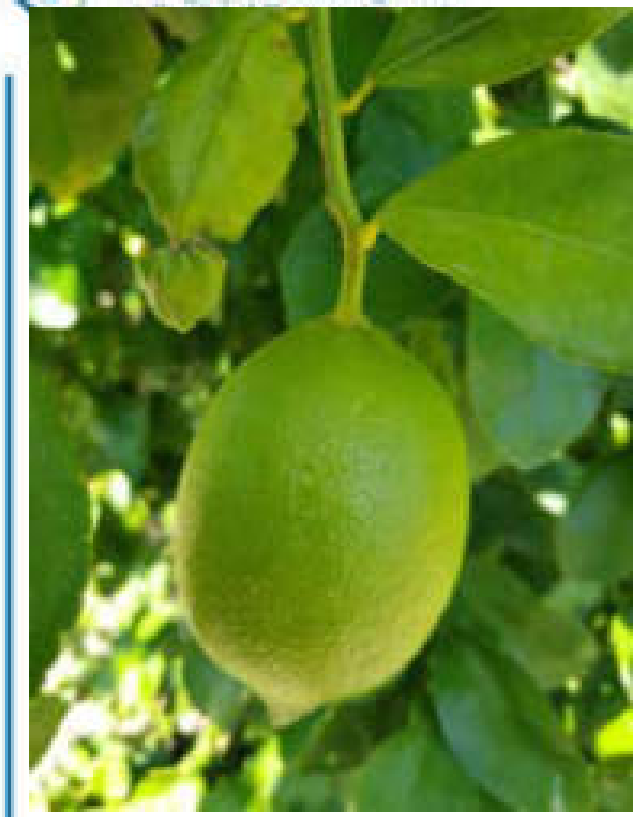
Limone Femminello Zagara Bianca

L. Femminello apireno Continella M 84

Limone Femminello Scandurra

L. Femminello apireno Adamo VCR

Interdonato



Annals of Botany 117: 565–583, 2016
doi:10.1093/aob/mcv005, available online at www.aob.oxfordjournals.org

ANNALS OF BOTANY

Phylogenetic origin of limes and lemons revealed by cytoplasmic and nuclear markers

Franck Curk[1,2], Frederique Ollitrault[3], Andres Garcia-Lor[3], François Luro[1], Luis Navarro[3,*] and Patrick Ollitrault[2,3,*]

Femminello Siracusano 2Kr

Proceedings of the Sixth International Citrus Congress
Tel Aviv, Israel, March 6-11, 1988, P. Goren and R. Mendel (Eds)
© 1988 Balaban Publishers, Philadelphia/Rehovot
Margraf Scientific Books, D-6992 Weikersheim
ISBN 3-8236-1136-4

Lemon Mutants Obtained by Gamma Irradiation of the Nucellus Cultured *in vitro*

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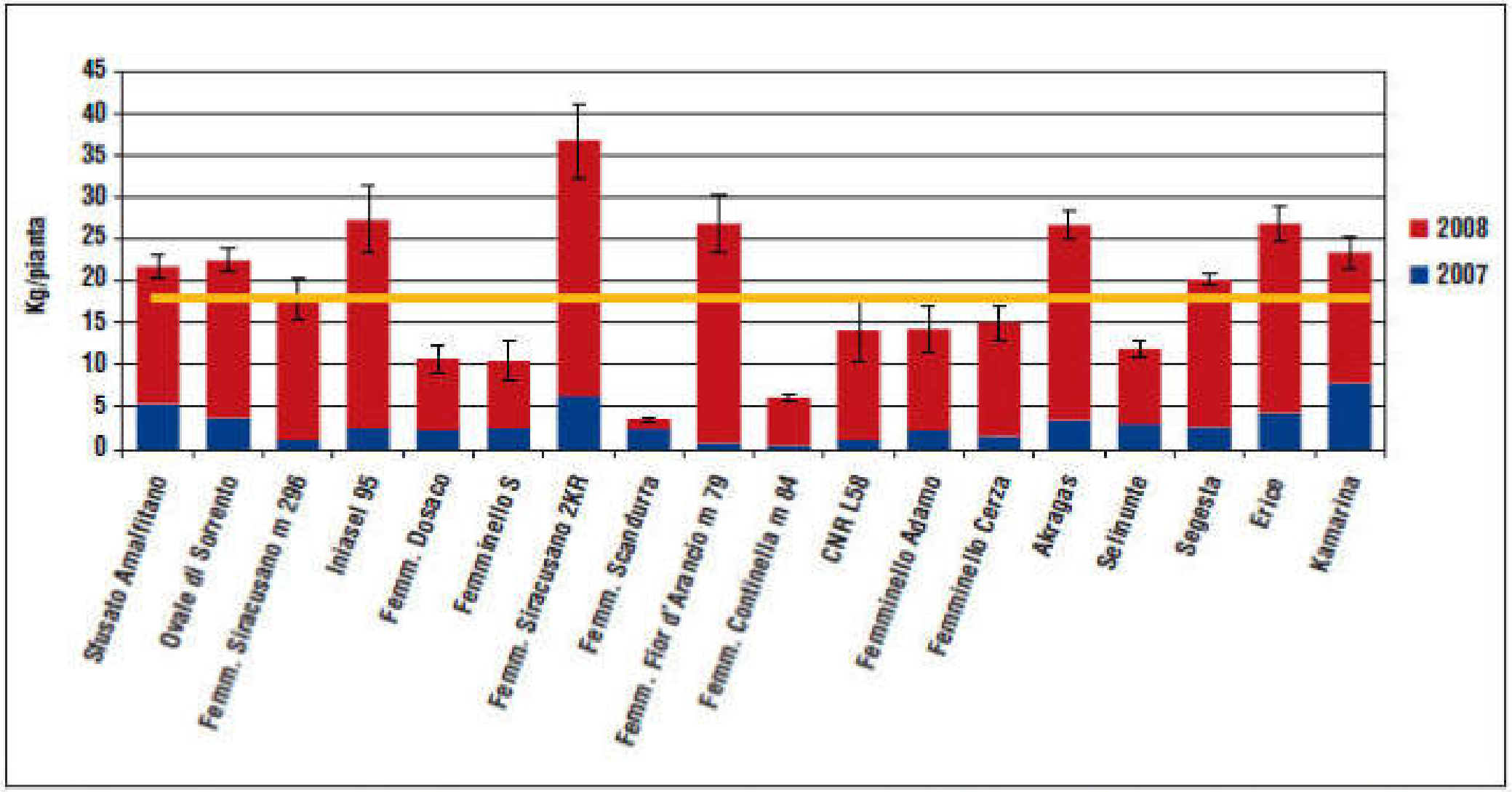
[1]Istituto Sperimentale per l'Agrumicoltura Corso Savoia 190, 95024 Acireale, Italy;
E.N.E.A., Casaccia Roma, Italy



▲ *Fig. 2 - Produzione annua e cumulata delle 18 cultivar di limone nei due anni di osservazione: la linea gialla indica il valore medio delle 18 cultivar (media ± errore standard).*

Di Vaio et al 2010, Frutticoltura

LEMOX

Interesse crescente nei contronti di limoni apireni e/o tardivi

HortScience 42(7):1723–1724. 2007.

'Ayelet' and 'Galya': New Seedless Lemon Cultivars

Pinchas Spiegel-Roy[1], Aliza Vardi[2], Yosef Yaniv[2], Luba Fanberstein[2], Avraham Elhanati[2], and Nir Carmi[3,4]

Institute of Plant Sciences, A.R.O. The Volcani Center, P.O. Box 6, Bet-Dagan 50250, Israel

Additional index words. seedless, breeding, mutation breeding, parthenocarpy, lemon

Abstract. **Two lemon (*Citrus* × *limon* L. Burm. F.) cultivars, Eureka and Villafranca, were subjected to a mutation-inducing process, which led to the production of seedless mutants in both cultivars. This mutation-inducing process did not affect many other lemon traits.**

Lemon is a highly acidic citrus fruit as a result of its high citric acid content (≈5%). As a result of its high level of vitamin C, it is used as an antioxidant to prevent browning in food and was used by the British Navy as an antiscurvy treatment. The lemon was probably first cultivated in China or northern India. Its name was probably derived from the Persian "limun."

There is evidence from 700 C.E., and speculation from as early as 200 C.E., of cultivated lemon in Italy. During the Crusader period, the lemon spread throughout the Mediterranean region. Previously, the citron (*Citrus medica* L.), which was probably first imported into the region by Alexander the Great, was the only citrus species in this region. Lemon is relatively cold-sensitive and is therefore cultivated in regions with mild winters.

When fruit development is separated from fertilization and seed development, the resulting parthenocarpic fruits are seedless (Fos et al., 2000; Robinson and Reiners, 1999; Talon et al., 1992; Varoquaux et al., 2000). We have observed that, in the absence of pollination, the two lemon cultivars

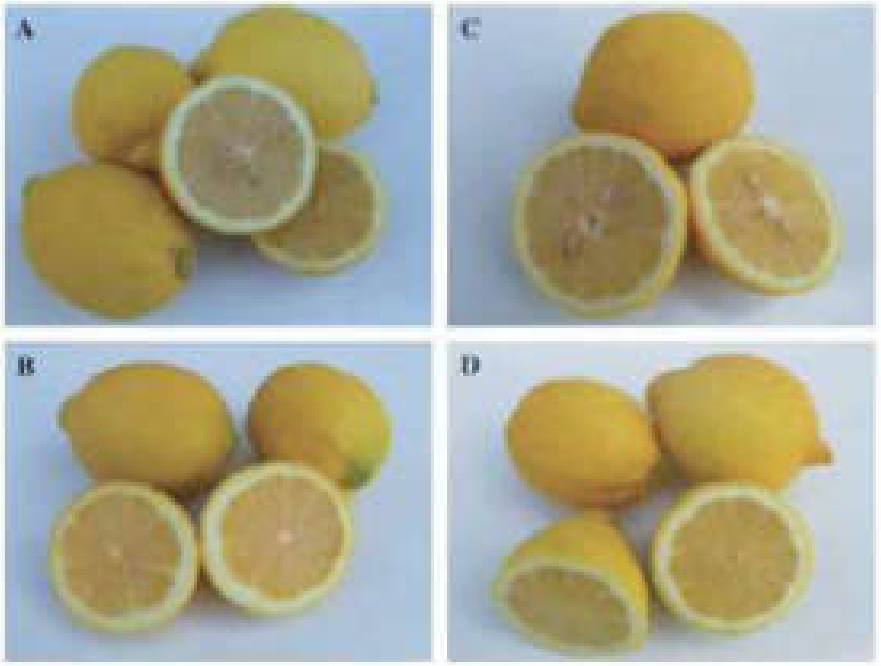


Fig. 1. Seeded and seedless lemon cultivars. (A) 'Villafranca'; (B) 'Ayelet'; (C) 'Eureka'; (D) 'Galya'.

6 months later. The mV_2 plants were planted in the field and screened for seedlessness. We successfully produced a seedless cultivar of 'Eureka', which we named 'Galya', and a seedless cultivar of 'Villafranca', which we named 'Ayelet' (Fig. 1A–D). Approximately 300 budwoods were irradiated and four mV_2 individuals of each irradiated budwood were planted.

The total soluble solids (TSS) was measured by refractometer (PAL-1; ATAGO, Tokyo, Japan). The acidity was determined by 0.1 N NaOH titration.

Results and Discussion

Approximately 1% of the trees (mV_2) produced seedless fruit. From each of the

Agriculture

Tools and Information

- Contact us
- Israeli Missions Worldwide
- Israel Export Institute
- Ministry of Science, Tech & Space
- Ministry of Economy
- Invest in Israel

Sweet and sour innovations: Introducing the seedless lemon

12 Feb 2020

Eight new citrus varieties, including a seedless lemon variety, were launched at the annual Citrus Conference held by the Ministry of Agriculture last January.

(Communicated by the Ministry of Agriculture and Rural Development Spokesperson)

Seven new citrus varieties, alongside veteran varieties, led the display of citrus fruits at the annual Citrus Conference held by the Fruit Division of the Agricultural Extension Service of Israel (Shaham) at the Ministry of Agriculture. Showcased at the conference were 4 mandarin varieties (similar to clementines), 2 varieties similar to grapefruits and oroblancos (sweeties), and one variety of seedless lemons.

Most Israelis are familiar with local variety developed in Israel - the Orri mandarin, which is considered the finest in the world. At the conference this week, four new mandarin varieties were presented. Joining the famous Orri variety were Tamar, Einav, Orit and Sigal, - extra sweet mandarins of excellent quality that are easy to peel, have a deep red color and are seedless.

The seedless Ayelet lemon variety presented at the annual Citrus Conference

Programma fast track

- ✓ Questo sistema viene proposto per incoraggiare la partecipazione delle aziende private (associate ad OP) alla valutazione di nuove selezioni promettenti, ma che devono essere valutate in diversi ambienti per studiarne **l'adattabilità.**
- ✓ Prevede degli **obblighi** da parte dei produttori, compensati da **vantaggi** sull'eventuale sfruttamento commerciale

  - Potranno effettuare impianti commerciali con un **vantaggio temporale** rispetto ad altre OP che non hanno firmato accordi di valutazione su una specifica varietà.
  - Avranno **sconti sulle royalty**. Tali royalty verranno stabilite dal CREA sulla base dell'effettivo interesse commerciale delle selezioni, nonché delle produzioni medie per ettaro che verranno definite alla fine della valutazione.

Le selezioni del CREA rilasciate nel 2017

- Sun red
- A145 (Galatea)
- D2238 (Bellini)
- C6925 (Ionio)
- H4991
- 3 selezioni di Moro (Amoa 2, Amoa 4, Amosi 11)

Il programma fast track del CREA

- 11 OP coinvolte
- 5 Regioni
- Numerosi ambienti pedoclimatici
- Primo impianto semi-commerciale di Ionio e Galatea

C6925 -IONIO

CAMPIONE	località	DATA PRELIEVO	ACIDITA'	SOLIDI TOTALI	RAPPORTO DI MATURAZIONE
IONIO	OP	28/10/2020	0.91	11.66	12.8
IONIO	CREA	28/10/2020	1.17	10.96	9.4
IONIO	OP	09/11/2020	0.91	12.62	13.9
IONIO	CREA	09/11/2020	1.15	11.52	10.0
IONIO	OP	04/12/2020	0.85	13.05	15.4
IONIO	CREA	04/12/2020	1.1	12.05	11.0

A145 (Galatea)

CAMPIONE	località	DATA PRELIEVO	ACIDITA'	SOLIDI TOTALI	RAPPORTO DI MATURAZIONE
GALATEA	OP	28/10/2020	0.83	10.96	13.2
GALATEA	CREA	28/10/2020	0.98	9.56	9.8
GALATEA	OP	09/11/2020	0.76	11.02	14.5
GALATEA	CREA	09/11/2020	0.98	10.42	10.6
GALATEA	OP	04/12/2020	0.70	12.35	17.6
GALATEA	CREA	04/12/2020	0.92	11.05	12.0

Le nuove selezioni di Moro

11 dicembre 2020

Le nuove selezioni di Moro

2 dicembre 2020

Selezione di Moro	località	ACIDITA' (%)	SOLIDI TOTALI (°BRIX)	RAPPORTO DI MATURAZIONE
AMOA 2	OP	1.23	10.99	8.9
AMOA 2	CREA	1.52	9.49	6.2
AMOSI 11	OP	1.09	10.59	10.6
AMOSI 11	CREA	1.42	9.39	6.61
AMOA 4	OP	1.22	10.89	8.9
AMOA 4	CREA	1.62	9.39	5.79

Data Prelievo 11/12/20

3 nuove selezioni, oltre le 8 previste nei precedenti bandi:

- ✓ **Red sunset**: ibrido di mandarino apireno pigmentato, con epoca di maturazione tra metà gennaio e fine febbraio

- ✓ **CREA-1** e **CREA-2**: selezioni di Tarocco precoci.

Red Sunset

DATA PRELIEVO	SOLIDI TOTALI	ACIDITA'	S/T	PESO MEDIO	RESA IN SUCCO
21/12/2010	12,39	1,42	8,70	176	45,49
13/01/2011	12,54	1,24	10,08	167	44,77
08/02/2011	12,64	1,21	10,43	163	41,96
16/12/2011	11,59	1,44	8,04	163	46,68
04/01/2012	12,94	1,34	9,65	140	41,52
18/01/2012	12,49	1,25	10,00	164	43,71
09/02/2012	12,14	1,21	10	157	40,17
24/02/2012	12,84	1,18	10.88	175	41,17


8 febbraio 2019


30 gennaio 2019


23 gennaio 2020

Tarocco CREA-1

9 gennaio 2020

Tarocco CREA-2

9 gennaio 2020

Tarocco TDV

18-12-2015

Selezione	SST	acidità %	SST/acidità	Antocianine mg/l
Tarocco TDV	10.47	1.42	7.37	**10.5**
Tarocco CREA-2	10.45	1.18	8.85	**4.67**
Tarocco CREA-1	10.12	1.25	8.01	**4.51**

09-01-2020

Selezione	SST	acidità %	SST/acidità	Antocianine mg/l
Tarocco TDV	11.32	1.46	7.75	**19.65**
Tarocco CREA-2	11.20	1.18	9.49	**8.44**
Tarocco CREA-1	10.43	1.18	8.83	**3.76**


Grazie per l’attenzione