Loquat under conversion and biological culture

Calabrese F., Barone F., Castello C., Peri G.

in

Llácer G. (ed.), Badenes M.L. (ed.).
First international symposium on loquat

Zaragoza : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 58

2003
pages 61-66

Loquat under conversion and biological culture

F. Calabrese, F. Barone, C. Castello and G. Peri
Dipartimento di Colture Arboree dell'Università degli Studi di Palermo,
Viale delle Scienze, 11, 90128 Palermo, Italy, E-mail calabres@unipa.it

SUMMARY – Some of the best Italian loquat cultivars were compared with several foreign varieties in Sicily. They were planted in 1994, kept under conversion (until 1997) and biological culture (since 1998). The best productive cultivars were 'Peluche' (the biggest fruit) and 'Algerie', the earliest to bloom and ripen (March) 'Magdall', 'Bueno', 'El Buenet'. After 7 days from picking, changes in chroma (+), hue and brightness (–), °Brix, pH, acids (–), SS/A (+) occurred. "Russeting" spots caused by wind were worst on 'Peluche', lighter on 'Algerie' fruits. Small "Mancha morada" (purple spot) spots were found only on some Spanish varieties. Commercial prizes of the biological products were almost twice as much as the ordinary ones (about €2).

Key words: Loquat, cultivars, conversion, biological culture.

RESUME – *"Le néflier sous conversion et culture biologique". Quelques-unes des meilleures variétés italiennes de néflier ont été comparées à plusieurs variétés étrangères en Sicile. Elles ont été plantées en 1994, gardées sous conversion (jusqu'en 1997) et culture biologique (depuis 1998). Les variétés les plus productives ont été 'Peluche' (le fruit le plus grand) et 'Algérie'. Celles qui ont fleuri et mûri le plus tôt (Mars) sont 'Magdall', 'Bueno', 'El Buenet'. Après 7 jours de la cueillette, des changements du chroma de la peau (+), de la tonalité et de l'éclat (–), de °Brix, pH, acides (–), SS/A (+) ont été enregistrés. Les taches de "Russeting" provoquées par le vent ont été les plus marquées sur 'Peluche', les plus légères sur les fruits d''Algérie'. Les produits biologiques ont été vendus presque le double des produits ordinaires (€2).*

Mots-clés : *Néflier, cultivars, conversion, culture biologique.*

Introduction

Some of the best Italian loquat cultivars have been compared with several foreign varieties in Sicily. They were planted in 1994, kept under conversion (until 1997) and biological culture (since 1998). This has been realized thanks to the financings of the EU-Sicilian Region (P.O.P. – Sicily 1994-1999).

Materials and methods

A loquat field was planted in 1994 in Palermo area. The cultivars, grafted on loquat seedlings, were: 'Algerie', 'BRT 20', 'Bueno', 'Claudia', 'El Buenet', 'Fiore', 'Golden Nugget', 'La Mantia', 'Magdall', 'Marcenò', 'Nespolone Bianco Dolce', 'Nespolone di Trabia', 'Peluche', 'Sanfilippara', 'Tanaka' and 'Virticchiara'.

The field was divided in eight blocks, every one with 3 plants per variety. The trees were kept under conversion until 1997. From 1998 on they were cultivated according to the biological culture method. They were manured with organic fertilizers, irrigated from June to September, pruned in June. Watering was stopped in August, in order to slow down the biological tree activity and concentrate flowering in the early autumn. Secondaries panicles were eliminated in autumn. Fruit thinning was applied in February; one fruit every 2.5-3.0 leaves was left. All the trees were treated with cupper products from October to February-March.

Observations were made on tree growth, vegetative and blooming period, fruit set, ripening time, production amount, fruit quality, "Russeting" and "Mancha morada" (purple spot) incidence.

Chemical characteristics, as well as peel lightness, chroma and hue, changes in °Brix, pH, acids,

SS/A were checked at picking and after seven days.The effects on fruit peel and pulp of a small ball (50 g) dropped in a 10 cm high cylinder was obseved after 12 and 24 hours.

Results and discussion

Quickest tree growth was observed in 'Peluche' variety, slowest in 'Nespolone di Trabia' (Table1).

Table 1. Tree tallness, canopy volume, trunk diameter (1996 and 2001)

Cultivar	January 1996				January 2001			
	Tree height (cm)	Canopy volume (m^3)	Trunk diameter (cm)		Tree height (cm)	Canopy volume (m^3)	Trunk diameter (cm)	
			Ab.†	Be.††			Ab.†	Be.††
Algerie	169.55	0.48	3.71	3.61	274.00	4.19	7.07	7.95
BRT 20	152.92	0.37	3.47	3.66	244.17	4.12	5.03	5.33
Bueno	150.43	0.31	3.10	3.11	235.00	4.74	6.52	6.80
Claudia	122.61	0.25	2.87	2.95	261.33	3.93	7.29	8.17
El Buenet	144.35	0.38	3.52	3.39	265.00	5.35	8.57	8.50
Fiore	157.50	0.28	3.20	3.18	206.67	5.81	7.22	6.63
Golden Nugget	147.08	0.28	3.13	3.23	250.33	4.63	6.80	6.89
La Mantia	144.35	0.27	3.10	3.11	256.67	4.62	6.99	7.58
Magdall	146.25	0.61	3.27	3.40	244.33	5.47	6.80	6.30
Marcenò	130.87	0.26	2.92	3.04	221.00	3.93	7.16	6.91
N. Bianco Dolce	149.58	0.23	3.18	3.17	206.00	2.83	5.70	6.02
N. di Trabia	118.75	0.18	2.91	2.95	240.00	1.55	4.92	6.00
Peluche	147.08	0.99	3.42	3.51	257.78	8.37	9.20	8.92
Sanfilippara	151.25	0.35	3.51	3.64	242.78	3.25	6.27	6.47
Tanaka	147.39	0.42	3.29	3.35	186.11	4.51	6.38	6.52
Virticchiara	169.17	0.55	3.57	3.65	254.67	5.13	7.47	7.59

†Ab. = 5 cm above the grafting point.
††Be. = 5 cm belove the grafting point.

Shoot growing was similar in all cultivars and occurred from March to November. Blooming and ripening were earlier in 'Bueno', 'El Buenet', 'Magdall' cultivars (Figs 1 and 2). The most productive cultivars were 'Peluche' (42 kg per plant in the first 5 years) and 'Algerie', the less productive one 'Nespolone di Trabia' (Fig. 3). Fruit quality of all cultivars is reported in Table 2. Highest fruit °Brix at maturity, as well as highest SS/A, was detected in 'Peluche', 'Nespolone Bianco Dolce', 'Fiore', 'BRT 20'. The most acid fruits belonged to 'El Buenet', 'Bueno', 'Magdall'. Fruits most damaged by "Russeting" spots were found on 'Peluche' and 'Bueno' trees. Small spots of "Mancha morada" were observed only in some Spanish varieties.

There was a little lightness decreasing, chroma and SS/A increasing after seven days from picking, while hue decreased (Table 3), as well as acids and fruit weight (Table 4). Due to the acids drop, SS/A had an evident increase.

The most damaged by the ball dropped on fruit (spots) were: 'Peluche', 'BRT 20', 'Nespolone Di Trabia', 'Claudia', 'Fiore', 'Marcenò'. Prizes of the biological fruit were almost twice as much as the ordinary ones (about €2).

Conclusions

Beyond such cultivars as 'Nespolone di Trabia', 'Sanfilippara' and 'Virticchiara', traditionally grown in the Palermo territory, other varieties can be advised to farmers. Among these, 'Bueno', 'Magdall'

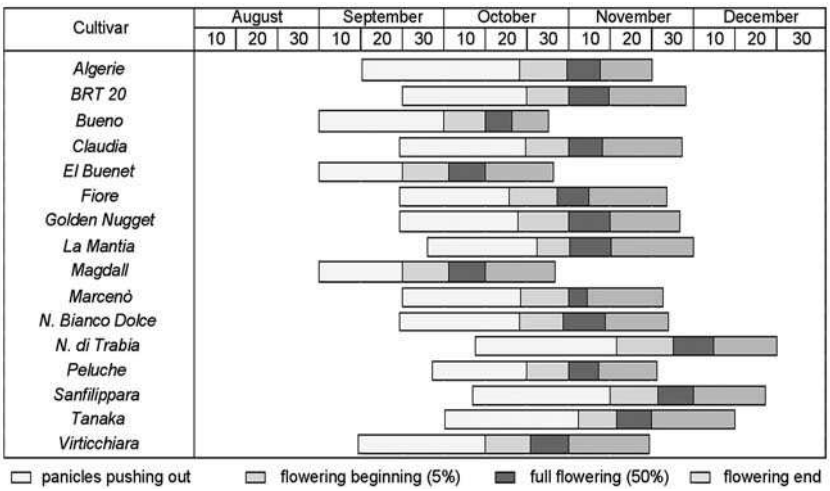

Fig. 1. Cultivars blooming (1996-2000).

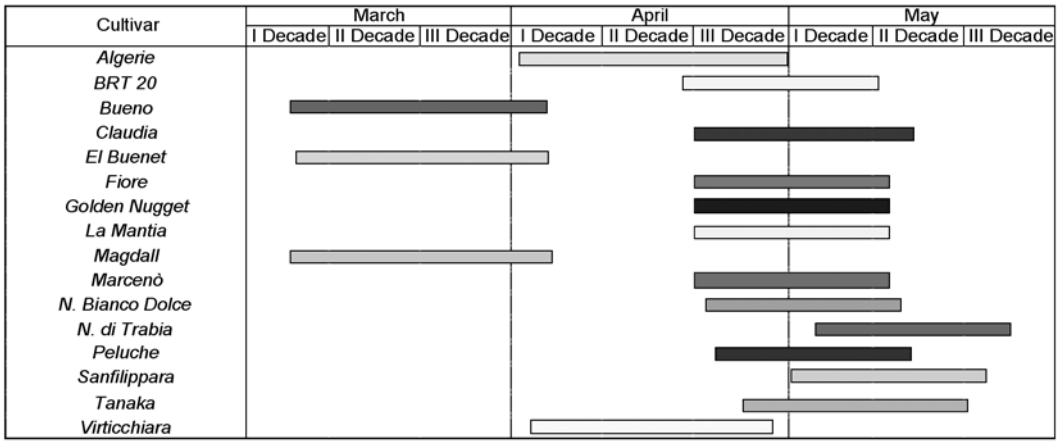

Fig. 2. Fruit ripening time.

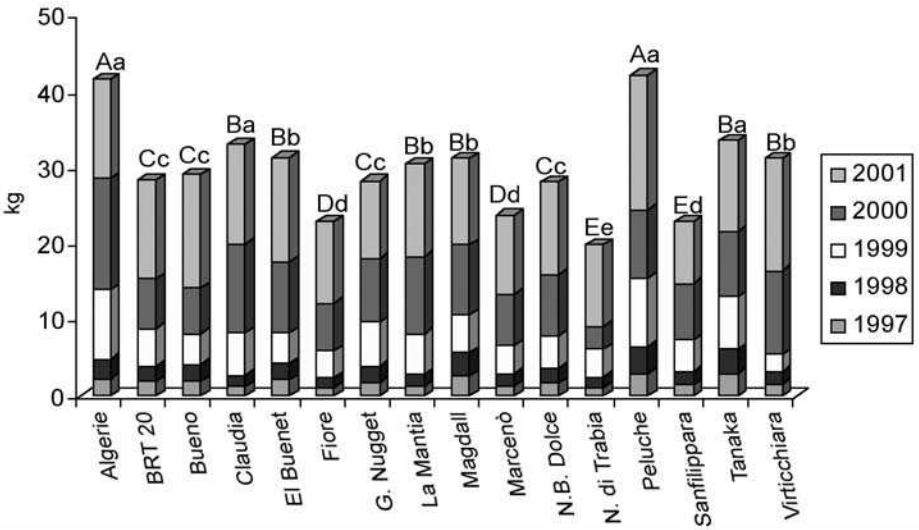

Fig. 3. Yearly and cumulative production (1997-2001). P = 0.05; p = 0.01.

Table 2. Fruit characteristics (average 1997-2001)

Cultivar	Pulp thickness (cm)	Peeling†	Seeds (no.)	Fruit weight (g)	Pulp/ seeds (g)	Russeting (%)	Mancha morada (%)	°Brix	Acids (%)	SS/A
Algerie	1.06	E	3.59	49.25	5.36	5.20	1.19	12.62	1.07	11.79
BRT 20	1.22	E	3.69	50.89	5.58	7.07	0.00	12.78	0.70	18.26
Bueno	0.83	M	3.15	30.65	6.25	21.06	0.35	10.31	1.54	6.69
Claudia	1.36	E	2.25	51.00	8.58	6.00	0.00	12.40	0.73	16.99
El Buenet	0.80	M	3.10	29.48	4.65	15.07	0.41	13.55	1.64	8.26
Fiore	1.09	E	3.36	47.39	5.98	11.63	0.00	14.50	0.82	17.68
Golden Nugget	1.10	E	3.35	51.21	5.23	17.00	0.19	12.61	1.02	12.36
La Mantia	1.03	M	4.44	46.38	3.65	15.45	0.00	13.35	1.06	12.59
Magdall	0.81	D	3.36	29.25	3.51	12.78	0.21	9.75	1.20	8.13
Marcenò	1.11	M	2.53	46.22	6.99	7.30	0.00	13.25	1.03	12.86
N. Bianco Dolce	1.12	E	2.89	43.36	4.65	5.50	0.00	13.96	0.55	25.38
N. di Trabia	1.31	E	2.53	52.15	8.35	14.20	0.00	12.21	1.04	11.74
Peluche	1.46	E	3.72	79.01	6.02	22.89	0.20	14.60	0.53	27.55
Sanfilippara	1.37	E	2.83	60.26	7.35	8.00	0.00	13.52	0.62	21.81
Tanaka	1.16	E	3.65	45.65	4.12	17.15	1.25	11.89	0.75	15.85
Virticchiara	0.91	M	4.29	39.21	4.80	8.45	0.00	10.59	0.86	12.31

†F = easy, M = medium, D = difficult to peel.

Table 3. Lightness, chroma, hue at picking and after 7 days from picking (1997-2001)

Cultivar	Beginning			After 7 days			Difference		
	l†	c††	h°†††	l†	c††	h°†††	l†	c††	h°†††
Algerie	62.31	45.61	91.07	62.24	47.99	88.00	-0.07	2.38	-3.07
BRT 20	62.13	45.01	83.40	63.23	46.60	79.85	1.10	1.59	-3.55
Bueno	66.67	46.88	88.90	66.67	49.41	82.80	0.00	2.53	-6.10
Claudia	61.36	42.92	83.16	60.48	44.02	77.55	-0.88	1.10	-5.61
El Buenet	66.80	46.92	88.49	65.74	48.45	82.34	-1.06	1.54	-6.14
Fiore	62.18	48.77	76.66	61.57	50.70	72.60	-0.60	1.93	-4.07
Golden Nugget	58.58	47.59	75.10	56.68	47.67	69.86	-1.91	0.08	-5.24
La Mantia	60.57	47.28	75.49	61.54	50.63	70.96	0.98	3.35	-4.53
Magdall	65.55	47.95	88.50	64.87	49.11	84.03	-0.68	1.16	-4.46
Marcenò	63.80	45.20	83.20	62.77	46.88	77.95	-1.03	1.68	-5.25
N.Bianco Dolce	59.04	45.37	77.57	60.01	47.58	73.14	0.96	2.21	-4.42
N. di Trabia	57.46	42.01	76.66	56.02	43.88	71.50	-1.44	1.86	-5.16
Peluche	68.60	56.53	88.91	69.17	56.39	86.45	0.58	-0.14	-2.46
Sanfilippara	59.89	45.71	77.43	60.42	49.58	72.44	0.53	3.87	-4.99
Tanaka	62.19	46.41	77.51	61.34	47.26	73.40	-0.85	0.85	-4.11
Virticchiara	64.87	52.72	81.92	64.85	55.25	76.96	-0.03	2.53	-4.96

†l = lightness.
††c = chroma.
†††h° = hue.

and 'El Buenet' for their early ripening (March), even if they do not produce a large fruit of excellent quality. A positive judgment can be also given on 'Peluche', since it produces extraordinary heavy fruits (medium weight 75-80 g and beyond) and good quality fruit, although it must absolutely be protected from winds in order to reduce "Russeting" spots. "Mancha morada" has been found in traces in some Spanish cultivars and 'Tanaka'.

Biological culture can be easily applied in Sicily. The only problem to solve is how to substitute cupper, which will be excluded by the EU at the beginning of 2003. Average prizes of the biological fruits have been almost twice as much as the ordinary ones (about €2).

Table 4. Fruit changes after 7 days from picking (average 1997-2001)

Cultivar	Weight			At picking				After 7 days				Differences			
	Picking	After 7 days	Differences	°Brix	pH	Acids (%)	SS/A	°Brix	pH	Acids (%)	SS/A	°Brix	pH	Acids (%)	SS/A
Algerie	43.26	40.44	-2.81	12.60	3.59	1.06	11.94	13.83	3.91	0.66	20.95	1.23	0.32	-0.40	9.02
BRT 20	54.08	53.00	-1.08	12.75	3.63	0.69	18.95	14.00	4.30	0.44	32.14	1.25	0.67	-0.25	13.19
Bueno	25.46	23.40	-2.06	10.33	3.22	1.55	6.66	13.71	3.46	1.22	11.61	3.38	0.24	-0.33	4.95
Claudia	41.88	38.92	-2.96	12.37	3.56	0.73	18.07	14.07	3.95	0.58	26.91	1.70	0.39	-0.15	8.84
El Buenet	25.08	22.95	-2.13	13.45	3.12	1.63	8.28	13.53	3.38	1.20	12.53	0.08	0.26	-0.43	4.25
Fiore	39.98	36.86	-3.12	14.30	3.51	0.80	17.92	15.80	4.28	0.44	35.55	1.50	0.77	-0.36	17.63
Golden Nugget	41.52	37.71	-3.81	12.50	3.51	1.01	13.08	12.83	4.05	0.62	21.96	0.33	0.54	-0.39	8.78
La Mantia	42.22	38.87	-3.35	13.15	3.35	1.05	12.78	15.15	4.19	0.52	29.52	2.00	0.84	-0.53	16.74
Magdall	22.56	20.78	-1.77	9.70	3.38	1.19	8.15	11.65	3.60	0.82	15.18	1.95	0.22	-0.37	7.03
Marcenò	36.92	34.43	-2.50	13.15	3.43	1.02	12.91	13.63	4.07	0.51	27.20	0.48	0.64	-0.51	14.29
N. Bianco Dolce	33.23	31.46	-1.78	13.83	3.78	0.53	26.12	14.93	4.22	0.32	52.06	1.10	0.44	-0.21	25.94
N. di Trabia	43.79	40.61	-3.18	12.03	3.40	1.03	11.64	12.87	3.74	0.75	16.07	0.84	0.34	-0.28	4.43
Peluche	70.39	68.64	-1.75	14.35	3.69	0.50	26.09	15.87	4.32	0.46	34.50	1.52	0.63	-0.09	8.41
Sanfilippara	49.63	47.33	-2.30	12.71	3.18	1.34	9.48	13.30	3.38	0.94	14.23	0.59	0.20	-0.40	4.75
Tanaka	37.40	34.61	-2.79	11.88	3.48	0.74	16.11	13.20	4.02	0.44	30.82	1.32	0.54	-0.30	14.71
Virticchiara	31.02	28.55	-2.47	10.57	3.31	0.85	12.43	13.52	4.05	0.76	21.64	2.95	0.74	-0.09	8.12

Further reading

Bazan, E., Palazzolo, E., Calabrese, F., De Michele, A., Barone, F. and Glaviano, A. (1999). Caratteristiche qualitative dei frutti in diverse cultivar di nespolo. In: *Proceedings I Fruttiferi Tropicali e Sub-tropicali in Italia,* Ragusa Ibla, 4-6 November.

Calabrese, F. (1993). *Frutticoltura Tropicale e Subtropicale. II. Fruttiferi Legnosi*. Edagricole, Bologna.

Calabrese, F. (1995). Nespolicoltura italiana e spagnola a confronto. *Frutticoltura* No. 1.

Calabrese, F., De Michele, A., Barone, F. and Diana, M. (1999). Confronto di cultivar di nespolo. In: *Proceedings I Fruttiferi Tropicali e Sub-tropicali in Italia*, Ragusa Ibla, 4-6 November.

Rodriguez, A. (1981). *El Cultivo del Níspero y el Valle de Algar-Guadalest*. Soc. Coop. de Crédito de Callosa d'en Sarria, Alicante.