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Comparison among ten loquat cultivars in Campania area

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SUMMARY – A study on the horticultural behaviour of 10 loquat cultivars was carried out in the Caserta area (Campania region, Italy), by the Istituto Sperimentale per la Frutticoltura. The trees, grafted on virus-free clonal quince 'BA 29', were planted in 1991 at 4 × 2 m. During the 1996-2000 period tree height, canopy, volume, vigour, production, fruit weight and quality data were recorded, and the overall productive efficiency was calculated. Among the Italian group of cultivars, Nespolone di Trabia resulted the most productive followed by Nespolone di Ficarazzi, Vainiglia, Selection 2 PA and Ferdinando; while among the foreign group of cultivars the most productive was Algerie followed by Tanaka, Peluche, Golden Nugget and Magdal. Among the Italian cultivars the highest fruit weight was recordered in Nespolone di Ficarazzi followed by Nespolone di Trabia, Vainiglia, Ferdinando, Selection 2 PA; while among the foreign cultivars Peluche had the biggest fruit size followed by Algerie, Tanaka, Magdal, Golden Nugget. Magdal was the earliest cultivar to ripen, while the Tanaka was the latest. Among the Italian cultivars, Nespolone di Ficarazzi and Nespolone di Trabia showed the best productive and qualitative characteristics; whereas among the foreign cultivars Algerie was the best for both productivity and quality characteristics.

Key words: Cultivars, production, *Eriobotrya japonica.*

RESUME – *"Comparaison de dix cultivars de néflier dans la région de Campanie". À la Section de Caserta de l'Istituto Sperimentale per la Frutticoltura on a réalisé une étude sur la potentialité productive de dix variétés de néflier du Japon; on a choisi cinq variétés d'origine italienne (Ferdinando, Nespolone di Ficarazzi, Nespolone di Trabia, Sélection 2 PA) et cinq d'origine étrangère (Algérie, Golden Nugget, Madgal, Peluche, Tanaka). Le verger a été réalisé en 1991 en greffant les cultivars sur cognassier "BA 29"; on a relevé les données productives depuis 1996 jusqu'en 2000. L'efficacité productive a été calculée. La variété italienne plus productive a été Nespolone di Trabia et, après, Nespolone di Ficarazzi, Vaniglia, Sélection 2 PA, et Ferdinando; pour les variétés étrangères, la plus productive a été Algérie et puis Tanaka, Peluche, Golden Nugget et Magdal. Les fruits meilleurs, pour les italiennes, sont donnés par Nespolone di Ficarazzi, Nespolone di Trabia, Vainiglia, Ferdinando et Sélection 2 PA ; pour les étrangères Peluche, Algérie, Tanaka, Madgal et Golden Nugget. Le premier fruit à mûrir a été Magdal ; le dernier Tanaka. Entre les variétés italiennes les deux Nespolone sont supérieures pour la production et pour la qualité ; la meilleure variété étrangère est Algérie pour la production et pour les qualités organoleptiques.*

Mots-clés : *Cultivars, production, néflier,* Eriobotrya japonica.

Introduction

70% of the Italian loquat cultivation is concentrated in the region of Sicily and in particular in the province of Palermo (Calabrese, 1995). The fruit could however be cultivated in many other areas of southern Italy.

The cultivation of the Japanese loquat is carried out in various areas of the region Campania especially along the coastal zones of the provinces of Naples, Salerno and Caserta (Insero and Monastra, 1985). They are however almost always mixed cultivations, growing varieties with little commercial value and often originating from seedlings; the introduction and the assessment of the most valid cultivars, both Italian and foreign, was carried out in the 80s by the Caserta section of the Experimental Institute for Fruit Growing in Rome.

The introduction and the comparative study of the cultivars has been going on continually as new varieties are brought to the attention of the fruit growing world.

This research deepens our knowledge of some cultivars (five Italian and five foreign) in the light of other information already submitted by other authors with reference to the floral biology (Crescimano, 1958) and to the fructification (Insero *et al.,* 1996, 2001).

Materials and methods

In 1991 the virus-free rootstock quince BA 29 was planted at a farm in Caserta in light soil at a distance of 4 meters between the rows and two meters between trees; in 1992 Italian and foreign cultivars were grafted.

During the early years of production pomological studies were carried out on five Italian cultivars: Ferdinando, Nespolone di Ficarazzi, Nespolone di Trabia, Selezione 2 PA and Vainiglia, and five foreign cultivars: Algerie, Golden Nugget, Magdal, Peluche and Tanaka; instead during the years of full production (1996-2000) the following studies were carried out on all the cultivars: (i) date of the beginning and the end of the blossoming; (ii) number of flowers per panicle; (iii) number of fruit per panicle; (iv) date of the beginning of the harvest; (v) average weight of the fruit (the average of 30 fruits); (vi) number of seeds per fruit (an average of 30 fruits); (vii) weight of seeds per fruit (an average of 30 fruits); (viii) pulp/seed weight ratio; (ix) total production per plant (TP year 2000); (x) volume of the canopy (VC year 2000); (xi) cross sectional trunk area above the graft (TSA year 2000); (xii) croppig efficiency refered to TSA (TP/TSA); (xiii) productive efficiency refered to canopy volume (TP/CV); and (xiv) sugar content with refractometer (°Brix).

The analysis of the variance was carried out by comparing the averages using the Student-Neuman-Keuls test at 5%.

Results and discussion

The results are shown in Tables 1-4.

Table 1. Date of blossoming, number of flowers and fruits per panicle

Cultivar	Date of blossoming		Number of flowers per panicle	Number of fruits per panicle
Ferdinando	1-10 Nov	1-10 Dec	130.4	5.2
Nespolone di Trabia	1-10 Nov	20-30 Nov	108.1	5.2
Golden Nugget	10-20 Oct	1-10 Nov	165.3	4.7
Magdal	10-20 Oct	1-10 Nov	125.6	7.1
Peluche	10-20 Oct	10-20 Nov	160.3	4.5
Tanaka	10-20 Oct	10-20 Nov	87.7	5.7
Nespolone di Ficarazzi	20-30 Oct	10-20 Nov	158.4	7.8
Selezione 2 PA	20-30 Oct	20-30 Nov	80.2	3.6
Vainiglia	20-30 Oct	20-30 Nov	176.2	4.3
Algerie	20-30 Oct	10-20 Nov	181.1	7.3

It is clear from Table 1 that the periods of blossoming of the various cultivars are quite close together. In Campania the early blossoming is confirmed as positive, possible periods of intense cold in January and February cause less damage if the young fruit is well formed and developed. The number of flowers per panicle, instead, differs greatly; it goes from a minimum of 80 flowers per panicle in the Selezione 2 PA to a maximum of 181 for Algerie; the fruit gathered per panicle goes from a minimum of 3.6 per panicle for Selezione 2 PA to a maximum of 7.8 for the Nespolone di Ficarazzi; it is clear from this data that also for the loquat there is not a direct relationship between the number of flowers and the harvested fruits; the cultivar Tanaka, for example, with a low number of flowers (87.7) has a high number of fruits (5.7).

Table 2. Production data

Cultivar	Date of harvest	Average weight of fruits (g)	Average weight of seeds (g)	Average number of seeds per fruit	Pulp/seed ratio	Brix value (°Brix)
Magdal	1-15 May	40.3	6.9	3.7	6.5	13.6
Golden Nugget	9-18 May	38.4	6.6	3.5	4.8	11.2
Selezione 2 PA	10-20 May	43.3	7.5	3.2	4.8	14.6
Algerie	10-20 May	57.7	7.9	4.1	6.2	14.1
Nespolone di Ficarazzi	15-25 May	53.5	7.9	4.1	5.7	14.6
Nespolone di Trabia	20-30 May	50.4	7.5	3.8	5.7	13.5
Vainiglia	1-10 Jun	44.5	6.9	3.7	5.4	13.3
Peluche	5-15 Jun	74.2	8.9	4.1	5.9	14.3
Ferdinando	10-18 Jun	44.2	7.0	3.4	5.3	12.3
Tanaka	10-20 Jun	47.1	7.3	3.8	6.4	11.1

Table 3. Trunk cross section area and volume of canopy (remarkable differences for P = 0.05 correspond to different letters)

Cultivar	TSA† - 2000 (cm^2)	Cultivar	CV†† - 2000 (m^3)
Algerie	41.57a	Golden Nugget	2.73a
Golden Nugget	49.81a	Nespolone di Ficarazzi	3.01ab
Nespolone di Ficarazzi	61.03b	Algerie	3.19b
Vainiglia	61.74b	Vainiglia	3.22b
Tanaka	62.54b	Magdal	3.36bc
Magdal	62.28bc	Tanaka	3.68c
Nespolone di Trabia	67.76bc	Nespolone di Trabia	3.69c
Peluche	68.56bc	Ferdinando	4.29d
Selezione 2 PA	74.10b	Peluche	4.51d
Ferdinando	75.77c	Selezione 2 PA	5.08e

†TSA = trunk cross section area.
††CV = canopy volume.

Table 4. Total production per plant (TP) (1996-2000), cropping efficiency on TSA (2000) and canopy volume (CV) (2000)

Cultivar	TP (kg)	Cultivar	TP/TSA† (kg/cm^2)	Cultivar	TP/CV (kg/m^3)
Magdal	35.6a	Magdal	0.57	Selezione 2 PA	9.07
Peluche	42.2b	Ferdinando	0.61	Peluche	9.36
Selezione 2 PA	46.1c	Selezione 2 PA	0.62	Magdal	10.60
Ferdinando	47.4c	Peluche	0.62	Ferdinando	10.82
Tanaka	50.2d	Tanaka	0.80	Tanaka	13.64
Golden Nugget	53.1e	Nespolone di Trabia	0.84	Nespolone di Trabia	15.42
Nespolone di Ficarazzi	53.2e	Nespolone di Ficarazzi	0.87	Vainiglia	16.99
Vainiglia	54.7e	Vainiglia	0.89	Nespolone di Ficarazzi	17.67
Nespolone di Trabia	56.9f	Golden Nugget	1.27	Golden Nugget	19.45
Algerie	68.1g	Algerie	1.64	Algerie	21.35

†TSA = trunk cross section area.

According to the data in Table 2 there is a remarkable difference in the beginning of the ripening from the first of May for Magdal to the 10th of June for Tanaka. In Campania the cultivation of the Japanese loquat aims for quality. The size of the various cultivars is remarkably different going from the highest of Peluche (74.2 g) to the lowest for Golden Nugget (38.4 g); the percentage difference between minimum and maximum values in the number of seeds per fruit, in the weight of the seeds and in the pulp/seed ratio is 32%; a remarkable difference is found in the values of the soluble solids which goes from a maximum of 14.6 in Nespolone di Ficarazzi to a minimum of 11.1 in Tanaka.

Table 3 shows the data relative to the trunk cross section area above the graft (TSA) and the canopy volume (CV); both findings were recorded in the year 2000. The differences between the cultivars are very slight; the greatest vigour for some cultivars is shown by higher values both in the TSA and in the canopy volume.

The total production per plant of Algerie (Table 4) shows the highest values, followed by the 2 Nespoloni and by Vainiglia; Magdal and Peluche give the lowest values. Table 4 shows also the productivity and cropping efficiency (calculated both from the trunk cross section area and the canopy volume); the highest cropping efficiency referring to the 2 values as given by Algerie and Golden Nugget, followed by the 2 Nespoloni and by Vaniglia. Magdal, Ferdinando and Peluche showed the lowest values.

Conclusions

The best cultivar for productivity, size and organoleptic quality is Algerie which has a positive performance in the area of Campania. Also the two Nespoloni and Vainiglia are interesting for their excellent organoleptic quality, productivity and cropping efficiency; there is little difference between the two Nespoloni on the whole, probably because of their very close genetical origin.

The Golden Nugget could be interesting for the early ripening and productivity but it is rather small, while Peluche has a larger size but its productivity is not always satisfactory and constant and it has a low productive effeciency.

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