‘Marfil’ Olive

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‘Marfil’ olive (*Olea europaea* L.) has been released to provide a novel cultivar with ivory-colored fruit, high oil quality, and tolerance to olive leaf spot disease (*Spilocaea oleaginea* Hughes). ‘Marfil’ can be used for both commercial orchards and ornamental trees. This selection was located and identified by the IRTA-Mas Bové (Reus, Catalonia) in a survey of the native cultivars in the northeastern Mediterranean area of Spain (Catalonia) carried out between 1987 and 1988 (Tous et al., 1990; Tous and Romero, 1993). Fruits of most olive cultivars are purplish-black when ripe, but ‘Marfil’ fruits are white-ivory.

The black color of mature olives is due to a high concentration of anthocyanin. In exceptional cases, such as with ‘Marfil’ and ‘Leucocarpa Margareta’ (Lavee, 1986; Morettini, 1972), anthocyanin synthesis is blocked and the fully ripe fruit is white.

Origin

‘Marfil’ is a native cultivar, parentage unknown, selected in Nov. 1987 from the Uldecona-La Galera area, in the south of Tarragona (Catalonia, Spain). Its name derives from the ivory (“marfil” in Spanish) color of the ripe fruits. Also known as ‘Blanca’, ‘Marfil’ is commonly grown in very small quantities as isolated trees in a few traditional olive orchards. This cultivar was propagated by softwood cuttings and was planted, with three replications, in the IRTA-Mas Bové olive collection, in Reus (Tarragona), in the early 1990s. Trees were tested under non-irrigated conditions (500 mm of annual rainfall) and a 5 × 7-m planting distance, and were trained to a vase shape. The canopy developed very rapidly and the first yield was recorded the third year after planting (1993).

Description

Trees are vigorous, with an open growth habit, moderately dense canopy and with few sylleptic shoots (Fig. 1). Leaves are small to medium sized (3.84 ± 0.22 cm²), elliptical-lanceolate in shape, short, and narrow. The upper surface of the leaves is light green. Full bloom occurs in the middle of May in the

IRTA-Mas Bové collection, with relatively little variation in bloom date from year to year.

Fruit harvest is late, from the end of December to January. The olive skin ripens from green to light green-yellow, then to white, and lastly to ivory. ‘Marfil’ fruit are small to medium (average mass: 2.18 ± 0.39 g) in size, elongated in shape, and asymmetric (Fig. 2). Flesh : stone ratio is 4.54 ± 0.94 (Table 1). The tip is pointed and the cross section at maximum diameter is circular.

Stone size is medium (average mass: 0.36 ± 0.04 g), elongated, and asymmetric. The surface is rough, with 7–10 uniformly distributed fibrovascular grooves. The tip of the stone is elongated and ends in a nipple.

Performance

This cultivar is productive, with a regular bearing habit, and is considered tolerant to peacock spot (*Spilocaea oleaginea* Hughes) but susceptible to olive fly (*Bactrocera oleae* Gmelin) and frost. The cumulative yield over a period of 4 years (1993–96) was 18.4 kg per tree. The fruit ripens late (December to January) and has a low fruit removal force : mass ratio (FRF : M) which, combined with the erect-spreading growth habit, makes it suitable for harvest by shaking. Plants are easily propagated by rooting semihardwood cuttings.

Some growers in the traditional olive area in the south of Tarragona report that ‘Marfil’ oil was utilized for medical uses in the last

Fig. 1. ‘Marfil’ mature tree.

Fig. 2. Fruits of ‘Marfil’ olive.

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Table 1. 'Marfil' fruit and olive oil characteristics compared with those of standard Mediterranean olive cultivars grown at IRTA-Mas Bové Center, Reus, Catalonia (Spain). Average values from 1993 to 1996.

Cultivar	Fruit mass (g)	Fruit removal force (FRF) (g)	FRF : mass (g/g)	Pulp : stone ratio	Oil content (%, DM basis)	Main fatty acids (%)			Oil stability (h at 120 °C) ^y
						C16:0	C18:1	C18:2 M : P ^x	
'Marfil' (Spain)	2.18 b ^x	533 ab	178 ab	4.54	40.53	11.39 b	73.91 b	9.63 a 7.71 c	12.69 a-c
'Arbequina' (Spain)	1.54 c	352 c	224 a	4.26	45.18	14.74 a	70.09 c	10.93 a 6.88 c	8.24 c
'Picual' (Spain)	3.17 a	459 b	139 b	4.59	42.30	11.69 b	78.45 a	4.50 c 17.66 a	13.63 a
'Leccino' (Italy)	2.53 b	575 a	193 ab	3.86	43.09	11.69 a	75.31 b	6.26 b 11.73 b	12.03 ab

^xM : P = monounsaturated : polyunsaturated fatty acids ratio.

^yOil stability determined by Automated 617-Rancimat Method (Frank et al., 1982).

^xMean separation within columns by LSD ($P \leq 0.05$).

century, due to its white pulp color (Tous, 1990). The fruit has a medium oil content (40.5% of dry mass basis), although the oil is of good quality. 'Marfil' produces olives with characteristics (average mass, pulp : stone ratio, and oil content) similar to other standard Mediterranean olive cultivars. The oil has a light green color and its flavor is good (intense olive fruitiness, green leaf taste, medium-high bitterness, and pungent). 'Marfil' and 'Arbequina' have similar fatty acid compositions and oil stability (Table 1), while 'Marfil' oil has a significantly higher linoleic acid content and lower ratio of monounsaturated : polyunsaturated (M:P) fatty acids than 'Picual'

and 'Leccino' olive oils.

Another suggested use for this cultivar is as an ornamental tree. The fruit ripens in winter, and a few trees of 'Marfil' in any park or garden would be attractive in the landscape at Christmas.

Availability

Cuttings and trees are available from commercial olive nurseries in the south of Tarragona (Catalonia, Spain). Very limited quantities of cuttings may be obtained from the IRTA-Mas Bové Center, Apartat 415, 43280 Reus, Spain.

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