'LA Early': A New Early Marketing Satsuma Mandarin

W.J. Bourgeois¹, R.J. Constantin², and M.J. Falcon³

Louisiana State University, AgCenter, Citrus Research Station, Louisiana Agricultural Experiment Station, 22193 Highway 23, Port Sulphur, LA 70083

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'LA Early' (Fig. 1), a new early maturing satsuma mandarin cultivar (*Citrus unshiu* Marcovitch), is a product of the Louisiana State Univ. (LSU) AgCenter citrus research program. The objective of the program is to develop fresh market lines of citrus fruits (navels, satsumas, and other cultivars) with improved quality, fruit characteristics, and production (Bourgeois et al., 1993, 1995; Brown et al., 1976; Reuther et al., 1967). 'LA Early', field tested as 'LA3-3', is an improved quality satsuma mandarin that ripens in early September to mid-October.

Origin

'LA Early' is an open-pollinated cultivar of unknown satsuma mandarin parentage. It was selected in the early 1980s from a group of seedlings planted in the late 1960s by the late Ralph Brown, first superintendent of the Citrus Research Station in Port Sulphur, La.

Description

Fruit characteristics. 'LA Early' produces medium to large fruit, oblate in shape, and with greater yield than 'Early Armstrong' (Table 1). Fruit weight and diameter of 'LA Early' are slightly larger than 'Early Armstrong'. 'LA Early' has a light yellow, thin, leathery skin with an attractive appearance. Skin adherence is slight to moderate, but still easy to peel. Fruit puffiness ranges from none to slight. Flesh color is orange and slightly more intense than 'Early Armstrong'. The flesh is tender and melting with easily separated segments. Fruits are essentially seedless. Taste and flavor are excellent with fruits being juicy and slightly acid. Overall quality is higher than 'Early Armstrong' (Table 1).

Foliage characteristics. Leaves are dark green, large (7.6–10.2 cm long and 2.5–5.1 cm wide), lanceolate, tapering at the base and apex, and have a thin petiole.

Tree characteristics. 'LA Early' trees are medium in size but very productive. The growth habit is similar to 'Early Armstrong'

with spreading drooping, and thornless branches. Fruit buds and blossom sets are heavy with even distribution throughout the tree. An acceptable solids : acid ratio (10:1 ratio required for legal sale in Louisiana) is attained early in the season (Table 2). Maturity

evaluation indicates that 'LA Early' harvest can occur from early September into mid-October, slightly ahead of 'Early Armstrong' (Table 3).

Recommendations

'LA Early' has performed well for several years in experimental trials at the Citrus Research Station in Louisiana. This cultivar is not intended to replace any existing cultivar but to complement early marketing of improved satsuma mandarins. Several factors that warrant attention in production of this cultivar are: 1) fruit susceptibility to brown rot (*Phytophthora citrophthora*) just prior to harvest which will require control measures; 2) fruit susceptibility to attack from the leaf-footed plant bug (*Leptoglossus phyllopus*) will require scouting and control

Fig. 1. 'LA Early' satsuma.

Table 1. Average yield and fruit quality of early maturing satsuma cultivars from 1993–2000. Planted: Apr. 1992 at Port Sulphur, La.

Cultivar	Yield ^a (kg/tree)	Fruit wt ^b (g)	Fruit diam ^c (cm)	Rind thickness ^w (mm)	Juice pH	Juice (%)	Soluble solids ^v (%)	Solids : acid ratio ^u
Early Armstrong-R ^t	41.3 c ^s	153.3 a	7.14 a	2.6 a	4.2 a	41.5 a	6.9 b	12.8 d
LA Early-R	52.1 b	154.0 a	7.24 a	2.4 b	4.3 a	41.5 a	7.4 a	14.8 ab
LA Early-S	75.4 a	164.2 a	7.37 a	2.4 b	4.4 a	43.2 a	7.4 a	14.0 a–c
LA Early-C35	71.9 a	161.8 a	7.29 a	2.4 b	4.3 a	40.3 a	7.3 a	14.4 a–c
LA Early-C32	79.4 a	160.3 a	7.32 a	2.4 b	4.3 a	43.8 a	7.0 b	13.6 c

^aYield: Represents means of 4 reps at 2 trees/scion/rootstock/plot.

^bFruit weight: Average of five fruit/plot (4 reps).

^cFruit diameter: Measuring by placing a caliper over the apex of five fruit/plot (4 reps).

^wRind thickness: Measuring with caliper the rind of five fruit/plot that has been horizontally cross-sectioned (4 reps).

^vSoluble solids: Determined by applying blended juice of five fruit/plot to a hand held brix refractometer.

^uSolids acid ratio: Titration of juice sample with 0.1 N NaOH to determine titratable acid then calculating the solids : acid ratio using the following S/A = soluble solids divided by titratable acid.

^tLetter refers to rootstock upon which trees were budded: R = Rubidoux; S = Swingle; C35 = Citrange C35; C32 = Citrange C32.

^sMeans within columns followed by the same letter are not significantly different (Duncan's multiple range test 0.05).

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¹Professor.

²Professor and Resident Director.

³Former Research Associate.

Table 2. Soluble solids and solids : acid ratio as fruit maturity indicators of early satsuma cultivars for two seasons at Port Sulphur, La.

Cultivar	Maturity evaluation factors			
	Soluble solids (%)		Solids : acid ratio	
	9/24/99	9/8/00	9/24/99	9/8/00
Early Armstrong-R ^z	7.5	7.5	9.7	8.9
LA Early-R	8.5	8.0	14.6	12.4

^zLetter refers to the rootstock upon which trees were budded: R = 'Rubidoux'.

measures; and 3) heavy fruit set can occur, resulting in reduced individual fruit size. 'LA Early' has performed well on various rootstocks such as *Poncirus trifoliata* 'Rubidoux', Swingle citrumelo, and Citranges C35 and C32. 'LA Early' is recommended for commercial and home planting of early market satsumas in Louisiana's citrus growing areas.

Availability

Limited quantities of budwood will be available from the LSU AgCenter Citrus Research Station, 22193 Highway 23, Port Sulphur, LA 70083.

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Table 3. Fruit maturity range of satsuma cultivars.

Cultivar	Harvest period											
	Sept.				Oct.				Nov.			
	7	14	21	29	7	14	21	29	7	14	21	29
Early Armstrong												
LA Early												
Early St. Ann												
Brown's Select												
Owari												

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