‘Florida Moonlight’—A White Fancy-leaved Caladium for Pots and Shady Landscapes

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Caladiums [*Caladium bicolor* (Ait.) Vent., syn. *Caladium xhortulanum* Birdsey, Araceae Juss.] are tropical foliage plants asexually propagated from tubers. Most of the world’s tubers are produced in Highlands County in Central Florida on the muck and sandy soils around Lake Placid and Sebring. The industry plays a vital role in the local economy, with a wholesale crop worth \$11–14 million annually, produced on ≈567 ha (Bell and Wilfret, 1998).

The caladium industry also plays an important sociological role in Highlands County. Lake Placid is known as the caladium capital of the world and caladiums are an integral part of the art and history of the community. The area celebrated its 12th annual caladium festival in Aug. 2002.

The Univ. of Florida initiated a caladium-breeding program in 1976 at the Gulf Coast Research and Education Center (REC)—Bradenton under the leadership of Gary Wilfret. The program’s goal was to develop new cultivars for the industry, which had not had new introductions since the 1950s. In addition to developing new landscape-type cultivars, the program has sought to develop cultivars better adapted for container production, with shorter petioles, multi-eyed tubers, and increased leaf production. Twelve cultivars have been released since 1976: ‘Florida Cardinal’ (Wilfret, 1988a), ‘Florida Roselight’ (Wilfret, 1988b), ‘Florida Sunrise’ (Wilfret, 1988c), ‘Florida Elise’ (Wilfret, 1991a), ‘Florida Fantasy’ (Wilfret, 1991b), ‘Florida Sweetheart’ (Wilfret, 1991c), ‘Florida Calypso’ (Wilfret, 1995), ‘Florida Irish Lace’ (Wilfret, unpublished release in 1999), ‘Florida Red Ruffles’ (Wilfret, unpublished release in 1999), ‘Florida Blizard’ (Harbaugh et al., 2002), ‘Florida White Ruffles’ (Miranda et al., 2002), and ‘Florida Whitewater’ (Wilfret et al., 2002).

‘Florida Moonlight’ represents the first release from the Univ. of Florida in the ‘June Bride’ type, characterized by large, white, heart-shaped leaves and white primary veins. ‘June Bride’, although producing attractive foliage, represents only 1% of caladium tuber production in Florida (Bell and Wilfret, 1988), in part because of poor performance

in containers. ‘Florida Moonlight’ (Fig. 1) has demonstrated the potential to produce a superior number of leaves that emerge sooner compared to ‘June Bride’, and to produce an attractive plant in a 10-cm container when buds are excised (Evans et al., 1992). In addition, ‘Florida Moonlight’ has demonstrated superior vigor to ‘June Bride’ when grown in outdoor landscapes.

Origin

‘Florida Moonlight’, derived from a cross between the white heart-shaped leaf caladium cultivars ‘Aaron’ and ‘Candidum Junior’, initially was evaluated in 1985 as GC85-245. ‘Aaron’ was selected as the female parent because of its vigor, tuber yield, white-veined character, and excellent sun tolerance. ‘Candidum Junior’ was selected because of its leaf production, multi-segmented tubers, bright white color, and quality as a container plant. Ancestry of ‘Aaron’ is unknown but ‘Candidum Junior’ is believed to be a field mutation of ‘Candidum’. Tubers were propagated on

fumigated EauGallie fine sandy soils at the Gulf Coast REC and were hot water treated for nematode control (Rhodes, 1964).

Description

Descriptions of color (e.g., RHS 200B) for plant parts are based on comparison with the Royal Horticultural Society Colour Chart (Royal Horticultural Society, 1986). Plants used for describing color were grown in 15-cm containers in a 40% shaded greenhouse from 2.54-cm-diameter de-eyed tubers.

‘Florida Moonlight’ plants grown for 4 months were 32–38 cm tall. Jumbo tubers are multi-segmented, 6.4–8.9 cm in diameter, bearing 5–7 dominant buds. Tuber surfaces are brown (RHS 200B) with the cortical area yellow (RHS 13C). Leaves are peltate, sagittate-cordate, 25–29 cm long and 19–21 cm wide, with green (RHS 129D) palmate-pinnate venation. The upper surface has a green (RHS 131A) margin, 1 mm wide, bordering the entire leaf except for the basal leaf valley, where it is grayed-purple (RHS 185A). Interveneal areas are white (RHS 155C). Netted green (RHS 131A) venation occurs on 50% to 75% of leaf surface. The undersurface has a grayed-green (RHS 191A) margin, 1 mm wide. Primary veins are grayed-green (RHS 194B) and netted venation, grayed-green (RHS 191A), occurs on 50% to 75% of leaf surface. Interveneal areas are white (RHS 155B). Petioles are 4–8 mm in diameter, with grayed-orange (RHS 177D) base color densely speckled with brown (RHS 200A).

Performance

‘Florida Moonlight’ was evaluated for tuber production at the Gulf Coast REC during 1998,

Fig. 1. Caladium ‘Florida Moonlight’ forced in a 15-cm container using three No.1 (≥3.8<6.4 cm) tubers. Dominant buds were not excised from tubers before planting.

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Table 1. Tuber grade distribution of caladium cultivars harvested in 1998, 1999, and 2000, Bradenton, Fla. Values represent the means of three replications of 30 propagules per 1.2-m² plot per year, averaged over 3 years.

Cultivar	Marketable tubers by grade (%) ^a					Marketable tubers (no.)
	Super mammoth	Mammoth	Jumbo	No. 1	No. 2	
Candidum	2	18	27	28	24	41
Candidum Jr.	0	9	20	38	33	44
June Bride	1	14	36	31	17	38
Florida Moonlight	0	8	27	48	17	45
LSD ($\alpha = 0.05$)	2	5	6	6	6	5

^aTubers graded by maximum diameter; super mammoth (≥ 11.4 cm); mammoth ($\geq 8.9 < 11.4$ cm); jumbo ($\geq 6.4 < 8.9$ cm); No.1 ($\geq 3.8 < 6.4$ cm); No.2 ($\geq 2.5 < 3.8$).

Table 2. Tuber weights and the production index for caladium cultivars harvested in 1998, 1999, and 2000, Bradenton, Fla. Values represent the means of three replications with 30 propagules per 1.2-m² plot per year, averaged over 3 years.

Cultivar	Tuber wt (g)				Production index ^y
	Marketable	Seed	Total	Mean ^z	
Candidum	4728	227	4954	119	125
Candidum Jr.	3427	371	3798	80	107
June Bride	4691	129	4820	123	120
Florida Moonlight	3600	124	3723	82	120
LSD ($\alpha = 0.05$)	606	66	600	15	13

^zMean = marketable weight / marketable number.

^yThe production index is an indicator of the economic value of the crop calculated as: N (no. 2s) + 2N (no. 1s) + 4N (jumbo) + 6N (mammoth) + 6N (super mammoth); where N = number of tubers in each grade.

Table 3. Plant performance after 7 months for caladium cultivars grown in full sun from 2.5-cm tubers in 1996, 1998, and 1999, Bradenton, Fla. Values presented are means of three replications with three plants measured per plot per year, averaged over 3 years.

Cultivar	Plant		Leaf	
	height (cm)	Leaves (no.)	Length (cm)	Width (cm)
Candidum	78	15	31	21
Candidum Jr.	64	14	28	19
Florida Moonlight	73	18	27	19
June Bride	59	9	27	17
LSD ($\alpha = 0.05$)	6	4	2	2

1999, and 2000. The soil was EauGallie fine sand with $\approx 1\%$ organic matter and a pH of 6.2. Plants were grown in a plastic-mulched raised-bed system maintaining a constant water table with seep irrigation (Geraldson et al., 1965). Ground beds were fumigated 3 weeks before planting with a mixture of 67% methyl bromide and 33% chloropicrin (by volume) at 392 kg·ha⁻¹. The beds were 91 cm wide and 20 cm high with 2.54-cm caladium seed pieces planted 15 cm apart in three rows spaced 15 cm apart. Osmocote 18N–2.6P–10K 8–9 month controlled-release fertilizer (Scotts Co., Marysville, Ohio) was applied to the bed surface at the time of fumigation with N at 336 kg·ha⁻¹.

Plots were organized in a randomized complete-block design consisting of three replications. An analysis of variance combined over years was conducted in order to compare the performance of 'Florida Moonlight' to 'June Bride' and other commercially important white fancy-leaf cultivars.

Marketable tuber yields of 'Florida Moonlight' exceeded those of 'June Bride' but were similar to 'Candidum' and 'Candidum Junior' (Table 1). Sixty-five percent of 'Florida Moonlight' tubers were in the No.1 and No. 2 grades, heavily used by container plant producers, compared to 48% for 'June

Bride'. 'Candidum Junior', a popular variety with container plant growers, produced a similar number of marketable tubers as 'Florida Moonlight' but fewer jumbo and No. 1 tubers, resulting in a lower estimate of economic value based on the production index (Table 2). Although 'Florida Moonlight' had less marketable tuber weight than 'June Bride' or 'Candidum', its ability to produce a greater number of tubers, albeit smaller, resulted in a similar production index.

Landscape performance of cultivars grown under full-sun conditions was evaluated in 1996, 1998, and 1999 (Table 3) on the same plots used for evaluating tuber production. Plant height, number of leaves, and foliar characteristics were recorded ≈ 7 months after planting. 'Florida Moonlight' displayed more landscape vigor than 'June Bride' by producing taller plants with a greater number of leaves. Leaf size of 'Florida Moonlight' and 'June Bride' was similar, although slightly narrower for 'June Bride'.

'Florida Moonlight' tubers were forced in 10-cm containers, and growth was compared to three white-fancy commercial cultivars in 2001. The root medium contained 3 sedge peat: 1½ coarse horticultural vermiculite: 1 sand (by volume) amended with (in kg·m⁻³) 3 dolomitic

lime, 3 calcitic lime, 3 single superphosphate, 0.6 micronutrient mixture (Micromax, Scotts Co.) and 1.8 14N–6.1P–11.6K 3–4 month controlled-release fertilizer (Scotts Co.). The study was conducted in a glasshouse with 40% light exclusion during the summer in Bradenton, Fla. Average daily temperatures were ≈ 29 °C day/16 °C night during the experiment. Plant height, number of leaves, and foliar characteristics were recorded 3 weeks after plants reached the marketable stage.

'Florida Moonlight' was much quicker in producing a marketable container plant than 'June Bride' from either intact or de-eyed tubers and similar to 'Candidum' and 'Candidum Junior' (Table 4). Leaf production also was superior for 'Florida Moonlight' compared with 'June Bride' from either intact or de-eyed tubers.

Excision of dominant buds of 'Florida Moonlight' resulted in a reduction in plant height, leaf length, and leaf width while increasing number of leaves. Visual quality was rated when plants reached the marketable stage. The subjective rating was based on the ratio of plant height to container height, fullness of plant form, and attractiveness. The performance of 'Florida Moonlight' from intact tubers suggested that it might be unsuitable for

Table 4. Plant performance for caladium cultivars grown from intact or de-eyed No. 1 tubers in 10-cm containers in a 40% shaded glasshouse, 2001, Bradenton, Fla. Values represent the means of seven plants produced from intact or de-eyed No. 1 ($\geq 3.8 < 6.4$ cm diameter) tubers planted individually per container.

Cultivar	Days to market ²		Plant ht (cm)		Leaves (no.)		Leaf length (cm)		Leaf width (cm)		Visual quality ³	
	Intact	De-eyed	Intact	De-eyed	Intact	De-eyed	Intact	De-eyed	Intact	De-eyed	Intact	De-eyed
Candidum	61	51	26	23	10	11	20	18	16	13	3.0	3.3
Candidum Jr.	54	53	26	20	12	15	22	16	15	12	3.2	4.0
Florida Moonlight	59	58	30	26	11	13	26	21	19	14	3.7	4.4
June Bride	76	72	31	27	6	9	27	22	18	14	3.0	3.4
LSD ($\alpha = 0.05$)	11	9	7	5	3	3	5	4	4	3	1.0	0.7

²Number of days from planting to the fifth leaf unfurled.

³Rated on a 1–5 scale, where 1 = poor and 5 = excellent.

10-cm containers without de-eyeing because of plant height. When tubers were de-eyed, ‘Florida Moonlight’ produced an excellent plant with visual quality superior to ‘June Bride’ and ‘Candidum’.

‘Florida Moonlight’ is intended for forcing in containers of 10 to 20 cm diameter and is best grown in partial- or full-shade locations in the landscape. Foliage color is enhanced when plants are grown with 40% to 50% light exclusion. Although extensive research and evaluations of this cultivar have been performed on small acreages, tuber producers are encouraged to plant only limited quantities of ‘Florida Moonlight’ until they have gained experience in producing this cultivar. Standard postharvest treatment of tubers is recommended (Harbaugh and Tjia, 1985) and preplant hot-water treatment of tubers is encouraged to prolong their life.

Availability

A patent will be applied for ‘Florida Moonlight’ by the Florida Agricultural Experiment Station and production of this cultivar is to be with a licensing agreement with the Florida Foundation Seed Producers, Inc., P.O. Box 309, Greenwood, FL 32443. Information on tuber

availability and propagation agreements can be obtained from the Florida Foundation.

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