

‘Summer Pink’: A New Pink Fancy-leaved Caladium

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Caladiums (*Caladium ×hortulanum* Birdsey, Araceae Juss.) are ornamental aroids commonly used as container and landscape plants (Evans et al., 1992; Harbaugh and Tjia, 1985). They are valued for bright colorful leaves and low-maintenance requirements. Pink caladiums have been very popular (Evans et al., 1992). Developing new pink cultivars has become an important breeding objective for the University of Florida/IFAS caladium breeding program. ‘Summer Pink’ is a new fancy-leaved cultivar with novel leaf coloration, a bright pink leaf face and veins on a white background (Fig. 1), and is desirable for use in large containers and shady locations in the landscape. In replicated field and greenhouse trials, ‘Summer Pink’ performed comparably or better than ‘Fannie Munson’ and ‘White Queen’, two very popular commercial caladium cultivars (Bell et al., 1998; Deng et al., 2008).

Origin

‘Summer Pink’ was derived from a cross made in 2000 between ‘Red Flash’ and ‘Candidum Junior’ and first selected as GCREC-48-5 in 2001. ‘Red Flash’ was used as one of the parents for its plant vigor, excellent performance in large containers and landscapes, large tubers, and large plant and leaves. ‘Candidum Junior’ was selected as the parent because of its attractive coloration patterns (netted veins and bright white face) and desirable growth habit when grown in containers. The ancestry of ‘Red Flash’ and ‘Candidum Junior’ is unknown.

Description

Descriptions of color [e.g., Royal Horticultural Society (RHS) 200B] for plant parts are based on comparison with the Royal Horticultural Society Color Chart (Royal Horticultural Society, 1986). Plants used for describing color were grown in 20.3-cm containers in a ≈30% shaded greenhouse from No. 1 (3.8 to 6.4 cm) intact tubers.

Leaves of ‘Summer Pink’ are peltate, sagittate-cordate, with palmate-pinnate venation.

The upper surface has a yellow-green (RHS 147A) margin, 2 to 4 mm wide, bordering the entire leaf except for the basal leaf valley where it is red (RHS 54C). Primary veins are red (RHS 54B) near the center and change into mostly grayed purple (RHS 183A) toward the margin. Netted secondary veins occur on 50% to 80% of the leaf surface and are red (RHS 54B). Bands of red (RHS 54C) bleed along primary and secondary veins. Variable white (RHS 155D) blotches appear between secondary veins. The undersurface has a grayed green (RHS 191A) margin and a few white blotches (RHS 155A). Primary veins are red (RHS 36B), and secondary veins are grayed green (RHS 194B). Inter-veinal areas vary from red (RHS 55B) near the center to green (RHS 137A) near the margin. Petioles are 3 to 7 mm in diameter and grayed red (RHS 182D) at the apex, and change to 6 to 12 mm in diameter and grayed red (RHS 182C) near the base. Numerous brown (RHS 200B) streaks are present on the lower two-thirds of the petioles. Jumbo tubers are multisegmented, bearing three to five dominant buds. Tuber surfaces are brown (RHS 200C) with patches of grayed orange (RHS 165A), and tuber cortical area is yellow (RHS 10C).

Performance

‘Summer Pink’ was evaluated for tuber production and plant performance at the Gulf

Coast Research and Education Center in Wimauma, FL, in 2006 and 2007. The soil was EauGallie fine sand with ≈1% organic matter and pH values between 6.2 and 7.4. In 2006, raised ground beds (91 cm wide, 20 cm high) were fumigated on 30 Mar. with a mixture of 67% methyl bromide and 33% chloropicrin (by volume) at the rate of 196 kg·ha⁻¹ and covered with white-on-black plastic mulch. Caladium seed pieces (tuber pieces, ≈2.5 cm × ≈2.5 cm × ≈2.5 cm) were planted in the beds on 11 Apr. with ≈15-cm spacing between rows and in rows. A constant water table was maintained below the beds using a seepage irrigation system (Geraldson et al., 1965). Osmocote 18N–2.6P–10K 8- to 9-month controlled-release fertilizer (Scotts Co., Marysville, OH) was applied to the bed surface when young plants were emerging from the soil with nitrogen (N) at 336 kg·ha⁻¹. Tubers were dug in Dec. 2006. Dried tubers were weighed, counted, and graded. Tuber grading was by maximum diameter: No. 2 (2.5 to 3.8 cm), No. 1 (3.8 to 6.4 cm), Jumbo (6.4 to 8.9 cm), Mammoth (8.9 to 11.4 cm), and Super Mammoth (greater than 11.4 cm). Tuber counts and grades were converted into a production index (PI) to show the relative economic value of the harvested tubers per experimental plot: $PI = n(\text{No. 2}) + 2n(\text{No. 1}) + 4n(\text{Jumbo}) + 6n(\text{Mammoth}) + 8n(\text{Super Mammoth})$; where n = number of tubers in each grade.

In 2007, field beds (71 cm wide, 21 cm high) were fumigated on 3 Apr. using the same fumigant mixture (196 kg·ha⁻¹). Caladium seed pieces were planted on 16 Apr. with ≈25.4 cm between-row spacing and ≈15.2 cm in-row spacing. A drip irrigation system was used to provide water (≈6 mm·d⁻¹) and 6N–0.8P–3.9K soluble fertilizer with N at the rate of ≈1.9 kg·ha⁻¹·d⁻¹ (total N at 290 kg·ha⁻¹ per growing season). Tubers were dug in Jan. 2008 followed by drying, weighing, counting, and grading using the same procedure as used in the previous growing season.

In both years, experimental plots were arranged in the field following a randomized complete block design consisting of three



Fig. 1. Plants of ‘Summer Pink’ produced by forcing one de-eyed No. 1 tuber (3.6 to 6.4 cm in diameter) in a 12.3-cm square pot. Tubers were planted early Apr. 2007, plants were grown in a shaded greenhouse, and the photograph was taken 9 weeks after planting.

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replications. Each field plot was planted with 30 caladium propagules (seed pieces). An analysis of variance was conducted using the GLM procedure in the SAS program (SAS Institute, 2010) to compare the tuber yield and PI of 'Summer Pink' with that of 'Fannie Munson' and 'White Queen', which are the most similar to 'Summer Pink' in color or coloration pattern among commercial pink caladium cultivars.

In 2006, 'Summer Pink' tuber weight was 43% to 71% greater and PI was 31% to 35% higher than those of 'Fannie Munson' and 'White Queen' (Table 1). In 2007, 'Summer Pink', 'Fannie Munson', and 'White Queen' had similar tuber weights, marketable tuber numbers, and production indices. 'Summer Pink' appeared to produce larger tubers than 'Fannie Munson' and 'White Queen': more tubers in Mammoth (14.7% vs. 3.0% to 3.3%) and in No.1 (49.7% vs. 25.3% to 43.3%) in 2006. In 2007, no significant differences in tuber size distribution were observed between 'Summer Pink' and the two commercial cultivars. These data indicate that 'Summer Pink' is as good as, or better than, 'Fannie Munson' and 'White Queen' in tuber production.

Landscape performance under full-sun conditions was evaluated in 2006 and 2007 on the same plots used for evaluating tuber production. The overall plant performance was rated on 2 Aug. and 7 Sept. in the 2006 growing season

and on 26 July, 28 Aug., and 25 Sept. in the 2007 growing season on a scale of 1 to 5 with 1 being very poor (few leaves and lack of vigor) and 5 being excellent (full plants, numerous leaves, and bright color display). At the same time of plant performance evaluation, leaf sunburn tolerance was rated on a scale of 1 to 5 with 1 being very susceptible to sunburns and showing numerous sun-damaged areas or holes on leaves and 5 being resistant to sunburns and not showing any sun-damaged areas. At ≈ 4 months after planting, plant height, number of leaves, and foliar characteristics were measured. Plants of 'Summer Pink' were significantly taller than plants of 'Fannie Munson' and 'White Queen' (Table 2). 'Summer Pink' plants produced similar numbers of leaves with similar lengths and widths with 'Fannie Munson' and 'White Queen'. 'Summer Pink' performed similarly with 'Fannie Munson' and 'White Queen' in 2006 and 2007 (Table 2). In full sun, leaves of 'Summer Pink' did not show any leaf tissue damages from sunburns (holes or "windows" on leaf blades) but did fade into light pink, especially in July and August when sunlight levels and air temperatures in Florida were extremely high. As a result, 'Summer Pink' received lower sun tolerance ratings than 'White Queen' (Table 2). This indicates that 'Summer Pink' is more suited for partially shady locations in landscape use.

The suitability of 'Summer Pink' for container forcing was evaluated by forcing tubers in 11.4-cm containers. The commercial cultivar Kathleen was included as a control cultivar, because 'Summer Pink' would be marketed in the same leaf color/coloration pattern as 'Kathleen'. No. 1 tubers were planted intact or de-eyed in a peat/vermiculite mix (VerGro Container Mix A; Verlite, Tampa, FL) in Mar. 2007. The study was conducted in a greenhouse with 45% light exclusion during the summer in Wimauma, FL. Average daily temperatures ranged from a low of 16 °C at night to 29 °C during the day during the experiment. Potted plants were arranged on metal benches in the greenhouse in a randomized complete block design with eight replications. Plant height, number of leaves, and foliar characteristics were recorded 8 weeks after planting. When intact tubers were planted, 'Summer Pink' sprouted in ≈ 31 d, nearly 6 d later than 'Kathleen'. De-eyed tubers of 'Summer Pink' sprouted 13 d later than those of 'Kathleen' (Table 3). Plants from intact 'Summer Pink' tubers were taller and developed fewer but larger leaves than plants of 'Kathleen', resulting in lower plant quality ratings for plants produced in small pots. De-eyed plants of these cultivars were similar in height, but leaf number was smaller and leaf size larger for 'Summer Pink' compared with 'Kathleen'. However, plant quality ratings were higher for 'Summer Pink' than 'Kathleen' as a result of the striking color and leaf display of 'Summer Pink'. Overall, tuber de-eyeing improved 'Summer Pink' plant quality considerably.

Table 1. Tuber weight, production index, marketable number, and grade distribution of 'Summer Pink' and two commercial caladium cultivars (2006 and 2007).^z

Cultivars	Tuber			Tuber distribution (%) ^y				
	Wt (kg)	Production index ^x	Marketable (no.)	Super mammoth	Mammoth	Jumbo	No. 1	No. 2
<i>Year 2006</i>								
Summer Pink	5.3 a ^w	173 a	59.0 NS	0	14.7 NS	25.7 NS	49.7 a	9.7 NS
Fannie Munson	3.1 b	132 ab	54.5	0	3.0	27.7	43.3 a	25.3
White Queen	3.7 b	128 b	47.1	0	3.3	46.3	25.3 b	25.3
<i>Year 2007</i>								
Summer Pink	4.4 NS	117 NS	38.2 NS	1.0 NS	15.0 NS	30.0 NS	38.7 NS	15.7 NS
Fannie Munson	3.8	108	42.0	0.7	8.3	18.0	54.7	18.7
White Queen	4.7	166	50.9	0.7	12.3	42.0	34.0	11.3

^zValues presented are means of three replications with 30 propagules planted in a plot.

^yTubers graded by maximum diameter: No. 2 (2.5 to 3.8 cm), No. 1 (3.8 to 6.4 cm), Jumbo (6.4 to 8.9 cm), Mammoth (8.9 to 11.4 cm), and Super Mammoth (greater than 11.4 cm). Tuber distribution data (%) were transformed using the formula arcsine [square root (percentage/100)] before analysis of variance and mean separation.

^xThe production index is an indicator of economic value of the crop harvested and is calculated as: $n(\text{No. 2}) + 2n(\text{No. 1}) + 4n(\text{Jumbo}) + 6n(\text{Mammoth}) + 8n(\text{Super Mammoth})$, where n = number of tubers in each grade.

^wMean separation within column by Fisher's least significant difference test at $P \leq 0.05$.

NS = Nonsignificantly different within column by F test at $P = 0.05$.

Recommendation

'Summer Pink' is a new addition to the fancy-leaved pink cultivar group and it is intended for use in large containers and shady locations in the landscape. It is expected that 'Summer Pink' will behave much like 'Kathleen' in container forcing, but a few more days may be needed to produce finished 'Summer Pink' plants. Tuber de-eyeing is necessary for producing high-quality plants in containers 10 to 15 cm in diameter.

Availability

A patent will be applied for 'Summer Pink' ('UF-485') by the Florida Agricultural Experiment Station and production of this cultivar

Table 2. Plant characteristics, performance and sun tolerance from planting 2.54-cm caladium tuber propagules in ground beds in full sun (2006 and 2007).^z

Cultivar	Plant ht ^y (cm)	Leaf ^y			Performance rating ^x					Sun tolerance rating ^w				
		Number (no.)	Length (cm)	Width (cm)	Aug. 2006	Sept. 2006	July 2007	Aug. 2007	Sept. 2007	Aug. 2006	Sept. 2006	July 2007	Aug. 2007	Sept. 2007
Summer Pink	36.7 a ^v	18.8 NS	28.5 NS	17.7 NS	2.7 a	3.8 a	3.1 a	3.7 NS	4.4 NS	3.0 NS	3.9 b	1.8 b	2.4 c	3.9 b
Fannie Munson	27.6 b	15.7	26.1	17.0	1.7 ab	2.5 b	2.1 b	2.7	3.5	3.3	4.1 ab	3.3 a	3.9 b	4.0 b
White Queen	28.1 b	13.7	24.9	17.8	1.0 b	1.2 c	3.3 a	3.5	3.6	3.8	4.3 a	3.5 a	4.8 a	4.6 a

^zValues presented for plant height, leaf number, length and width are means of three replications with three plants measured per plot per year, whereas performance and sunburn tolerance ratings are means of three replications based on whole plot evaluation.

^yData were taken over two growing seasons (2006 and 2007), ≈ 4 months (Aug. 2006 and 2007) after tubers were planted in April each year.

^xPlants were rated on a scale of 1 to 5, with 1 being very poor, 3 fair and acceptable, and 5 being excellent in plant vigor, fullness, and color display.

^wPlants' sunburn tolerance was rated on a scale of 1 to 5 with 1 being very poor, 3 fair and acceptable, and 5 being excellent without showing any signs of leaf burns or resulted holes on leaf surfaces.

^vMean separation within columns by Fisher's least significant difference test at $P \leq 0.05$.

NS = Nonsignificantly different within column by F test at $P = 0.05$.

Table 3. Plant performance for ‘Summer Pink’ and ‘Kathleen’ caladiums grown from No. 1 tubers in 11.4-cm containers in a 45% shaded glasshouse, 2007, Wimauma, FL.^z

Cultivar	Days to sprout ^y		Plant ht (cm)		Leaves (no.)		Leaf length (cm)		Leaf width (cm)		Quality rating	
	Intact	De-eye	Intact	De-eye	Intact	De-eye	Intact	De-eye	Intact	De-eye	Intact	De-eye
Summer Pink	31.4 NS	35.8 a	31.6 a	27.7 a	6.1 b	12.3 b	33.9 a	23.3 a	23.7 a	15.0 a	2.4 b	4.4 a
Kathleen	25.7	22.8 b	24.1 b	23.5 b	13.9 a	20.0 a	19.0 b	14.9 b	12.0 b	8.7 b	3.2 a	3.6 b

^zValues represent the means of eight plants produced from intact or de-eyed No. 1 (3.8 to 6.4 cm in diameter) tubers planted individually per container. Data were taken 8 weeks after planting.

^yNumber of days from planting to the first unfurled leaf. Mean separation within column by Fisher’s least significant difference test at $P \leq 0.05$.

NS = Nonsignificantly different within column by F test at $P = 0.05$.

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 Seed Producers, Inc.

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