ENH1040

UF UNIVERSITY of FLORIDA
IFAS Extension

'Firecracker Red' Caladium - a University of Florida Cultivar for Sunny Landscapes and Large Containers[1]

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Caladiums (*Caladium* x*hortulanum* Birdsey) are often forced in containers or planted in landscapes. More than 95% of the caladium tubers used throughout the world for container forcing and landscape planting are produced in south-central Florida (Lake Placid, Sebring, and Avon Park). Red fancy-leaved caladium cultivars are popular for containers and landscapes and represented 21% of the total production acreage in Florida (Deng et al., 2005). Two primary cultivars in the red fancy group are 'Frieda Hemple' and 'Postman Joyner'. Their leaves have intense red color, but their tuber production is poor and plants are susceptible to soilborne diseases. The UF/IFAS caladium breeding program, since its beginning in 1976, has aimed to develop new red-leaved cultivars with improved tuber production and plant performance (Wilfret, 1988). Toward this objective, 'Florida Cardinal' was developed and released in 1988 (Wilfret, 1988). 'Firecracker Red', a new release in 2005, produces large leaves with intense red color and performs well in sunny landscapes and large containers. It is also improved in tuber production over 'Frieda Hemple' and 'Postman Joyner'.

Origin

'Firecracker Red' was derived from a cross between two commercial cultivars 'Red Frill' and 'White Queen'. 'Red Frill' was selected as the female parent because of its bright red color, production of many leaves, and excellent sun tolerance; 'White Queen' was selected because of its large leaves and bright red vein color. Ancestry of 'Red Frill' and 'White Queen' is unknown.

Description of Tuber and Leaf Characteristics

Jumbo-sized tubers of 'Firecracker Red' are multi-segmented, usually bearing three dominant buds. Tuber surfaces are brown with the cortical area yellow to a darker yellow-orange.

Leaves are peltate, sagittate-cordate, with palmate-pinnate venation. The center veins are red and diffuse into a red-purple color toward the leaf edge. The upper surface has an irregular green margin, bordering the entire leaf except for the basal leaf sinus where it is grayed-purple. Interveinal areas are red in the leaf center diffusing into a grayed

1. This is document ENH1040, a publication of the Environmental Horticulture Department, Florida Cooperative Extension Service, UF/IFAS, University of Florida October 2006. Please visit the EDIS Website at http://edis.ifas.ufl.edu.

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purple toward the leaf margin. Petioles are streaked dark red-purple and light red-purple.

'Firecracker Red' plants grown for approximately 4 months in full sun in ground beds had an average height of 22 inches. Its leaves are similar in size to other red-leaved fancy cultivars, averaging 13 inches long and 9 inches wide. The largest leaf on plants grown in a 25% shaded greenhouse produced from an intact number one tuber in a 5-inch pot averaged 9 inches long and 7 inches wide 7 weeks after planting.

Figure 1. Caladium 'Firecracker Red' forced in a 4-inch-container using one No. 1 tuber. Credits: Univ. of Florida/IFAS Gulf Coast REC

Tuber Production

'Firecracker Red' was evaluated for tuber production and plant performance at University of Florida's Gulf Coast Research and Education Center–Bradenton, Fla., during 2003 and at Dover, Fla., in 2004. The soil in Bradenton was an EauGallie fine sand with about 1% organic matter and a pH of 6.2, and the soil in Dover was a Seffner fine sand with about 1% organic matter and a pH of 6.5. Plants were grown in a plastic-mulched raised-bed system. The beds were 36 inches wide and 8 inches high with 1-inch caladium seed tuber pieces planted 6 inches apart in three rows (Bradenton) or 1-foot apart in two rows (Dover). Osmocote 18N–2.6P–10K 8- to 9-month controlled-release fertilizer was applied to the bed surface when shoot tips were emerging from the soil with N at 300 pounds per acre.

'Firecracker Red' tuber production was excellent with tuber weights nearly 1.5 times greater than that of 'Frieda Hemple' or 'Postman Joyner'. 'Firecracker Red' tuber weight exceeded all cultivars, except 'Florida Cardinal' in 2004, whose yield was similar. Similarly, the production index (an economic indicator of crop value) was highest for 'Firecracker Red' compared to all other cultivars, except 'Florida Cardinal', which had similarly high values. Although 'Firecracker Red' did not have the greatest number of marketable tubers, it ranked high compared to many other cultivars. Since it forms a “solid” tuber with few side tubers, it does not break apart into many small tubers during harvest. Tuber breakage is a problem with some other cultivars, e.g., 'Frieda Hemple'. The lack of breakage for 'Firecracker Red' is also evident in the high percentage of Mammoth, Jumbo and No. 1 tubers (95% in 2003 and 84% in 2004), ideal sizes for tubers sold for use in the landscape.

Container Forcing

'Firecracker Red' tubers were forced in 4 1/2-inch containers, and its growth parameters were compared to four red-fancy commercial cultivars. No. 1 tubers were planted in a peat/vermiculite mix (Vergro Container Mix A) on 24 June, 2002. The study was conducted in a glasshouse with 50% light exclusion during the summer in Bradenton, Florida. Average daily temperatures ranged from a low of 70°F night to 85°F day during the experiment. 'Firecracker Red' had similar performance in pots compared to the other red-leaved cultivars tested or was essentially “average” with no significant differences for all measured parameters (plant height, number of leaves, and foliar characteristics). Thus, although 'Firecracker Red' has potential as a container plant, it appears to be better suited for use in the landscape.

Landscape Performance

Landscape performance of cultivars grown under full-sun conditions was evaluated in 2003 and 2004. Plant height, number of leaves, and foliar characteristics were recorded about 4 months after

planting. 'Firecracker Red' had excellent overall plant performance ratings for the first two rating periods (22 July, and 31 Aug.), and a lower, but good rating for 16 Nov. 'Firecracker Red' was the tallest cultivar evaluated in this test and, again, exhibited desirable landscape traits.

Summary

In summary, 'Firecracker Red' is intended for use in the landscape or large containers. It should perform well in full sun or partial shade conditions making it an ideal plant for the garden. Although extensive research and evaluations of this cultivar have been performed on small acreages, tuber producers are encouraged to plant only limited quantities of 'Firecracker Red' 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 has been applied for for 'Firecracker Red' 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 Seed Producers, Inc.

Literature Cited

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Table 1. Perforamnce of plants grown from 1-inch tuber propagules in ground beds under full sun.

			Leaf[z]				
	Plant height[z]	Leaves[z]	Length	Width	Overall plant performance[y]		
Cultivar	(inch)	(number)	(inch)	(inch)	Early	Middle	Late
Florida Cardinal	18.5	16	11.8	7.5	3.7	4.1	4.3
Firecracker Red	22.0	13	12.6	8.7	5.0	4.6	3.8
Frieda Hemple	19.7	21	12.2	7.9	2.7	4.3	4.3
Postman Joyner	15.4	13	11.4	7.1	2.5	2.7	3.7
Red Flash	17.3	12	13.4	7.9	3.2	4.0	4.0
LSD (*a* = 0.05)	3.1	3.3	1.1	0.7	0.8	0.5	0.6

[z] Values presented are means of three replications with three plants measured per plot per year, averaged over 2 years (2003 and 2004).
[y] Overall plant performance was rated July 22 (early), August 31 (mid), and November 16 (late), 2004.

Table 2. Plant performance for caladium cultivars grown from No. 1 tubers planted 24 June, 2002, in 4.5 inch containers in a 50% shaded glasshouse, Bradenton, FL. Values represent the means of eight plants produced from intact or de-eyed No. 1 (1.5 to 2.5 inch diameter) tubers planted individually per container.

Cultivar	Days to sprout[z]		Plant height (inch)		Leaves (no.)		Leaf length (inch)		Leaf width (inch)	
	Intact	De-eyed	Intact	De-eyed	Intact	De-eyed	Intact	De-eyed	Intact	De-eyed
Firecracker Red	17	19	14.6	16.5	9	16	8.7	8.7	6.7	5.9
Frieda Hemple	16	17	16.5	15.0	10	20	9.8	7.5	6.7	4.7
Postman Joyner	21	23	17.7	18.1	6	11	10.6	9.1	7.1	6.7
Scarlet Beauty	17	20	15.4	14.6	9	22	10.6	8.7	7.5	5.9
LSD (*a* = 0.05)	ns	5.2	ns	3.4	ns	5.8	ns	1.0	ns	0.8

[z] Number of days from planting to the first unfurled leaf.

Table 3. Tuber weights, production index, and tuber grade distribution of caladium cultivars harvested in 2003 and 2004. Values presented are means of three replications with 30 propagules per 13.5 sq ft plot per year.

Cultivar	Tuber			Tuber distribution[y] (%)				
	Weight (lb)	Production index[z]	Marketable (number)	Super Mammoth	Mammoth	Jumbo	No. 1	No. 2
				Year 2003				
Florida Cardinal	9.2	125	37	0	23	32	31	14

Table 3. Tuber weights, production index, and tuber grade distribution of caladium cultivars harvested in 2003 and 2004. Values presented are means of three replications with 30 propagules per 13.5 sq ft plot per year.

Firecracker Red	10.3	155	43	0	17	49	29	5
Frieda Hemple	6.5	110	45	0	2	30	46	21
Postman Joyner	7.0	107	34	1	6	48	32	11
Red Flash	9.7	133	45	0	16	29	28	27
LSD (*a* = 0.05)	0.55	10	8	2	12	37	30	14
				Year 2004				
Florida Cardinal	13.6	168	41	8	21	39	25	7
Firecracker Red	13.4	151	40	10	15	33	36	6
Frieda Hemple	8.7	124	50	0	4	27	51	19
Postman Joyner	6.9	104	47	0	0	23	56	21
Red Flash	10.6	133	32	1	29	48	19	3
LSD (*a* = 0.05)	2.1	23	2	11	20	5	17	9

[z] The production index is an indicator of economic value of the crop harvested and is calculated as: N (No. 2s) + 2N (No. 1s) + 4N (Jumbos) + 6N (Mammoth) + 8N (Super Mammoth); where N = number of tubers in each grade.
[y] Tubers graded by maximum diameter; No. 2 (1" to 1.5"), No. 1 (1.5" to 2.5"), Mammoth (2.5" to 3.5"), and Super Mammoth (>4.5").