



'Berry Patch' - A New University of Florida Caladium Variety for Use in Sunny Landscapes and Containers¹

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Caladiums are valued for their colorful leaves and low maintenance requirements. Commercial caladium plants are grown from tubers. Tuber yield is one of the primary factors determining a caladium variety's production value and whether the variety will be acceptable to growers and viable in commercial production. Poor tuber yield has been one of the main reasons many early varieties were removed from commercial tuber production and many new breeding lines with novel colors or coloration patterns have not become commercialized. Developing caladium varieties with good tuber yield has been one of the main breeding objectives for the University of Florida's caladium breeding program at the University of Florida's Gulf Coast Research and Education Center (GREC) in Wimauma, FL, since the program began in 1976.

'Berry Patch' is a new, spotted, fancy-leaved variety with superior tuber yields (Figure 1). This variety is vigorous, resistant to sunburn, and performs well in full-sun landscapes. With its multiple branching habit and plant vigor, 'Berry Patch' produces high-quality plants in container forcing (Figure 2).



Figure 1. 'Berry Patch' caladium, produced by forcing four intact No. 1 tubers (1 1/2 - 2 1/2 inches in diameter) in an 8-inch pot. Photo was taken eight weeks after the tubers were planted. Credits: Nancy West (IFAS/UF)

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Figure 2. 'Berry Patch' caladium, grown in a ground bed in full sun and showing excellent vigor and sunburn tolerance. Credits: Zhanao Deng (IFAS/UF)

Origin

'Berry Patch' originated from a cross between 'Gingerland' and 'Florida Moonlight'. 'Florida Moonlight' was a progeny of the cross 'Aaron' X 'Candidum Junior'. The ancestry of 'Gingerland', 'Aaron', and 'Candidum Junior' are unknown.

Description

Leaves of 'Berry Patch' are peltate, sagittate-cordate, with green-white palmate-pinnate venation. The upper surface of 'Berry Patch' leaves has dark-green margins bordering the entire leaf, except for the basal leaf valley, where the upper leaf surface is grey-purple. Interveneal areas are green-white near the central main vein and change to dark green near the margin. Leaves have a small, red-purple blotch at the petiole attachment and numerous grey-purple spots. The undersurface of 'Berry Patch' leaves has a grey-green margin. Primary veins are grey-green, and netted venation is grey-green. Interveneal areas are green-white near the central main and large veins and change to grey-green near the margin. Grey-purple spots are numerous and scattered between primary veins. Petioles are light green at the apex, but the colors diffuse into a dark brown at the base.

Plants grown for approximately four months in full sun in ground beds had an average height of 15.7 inches. The largest leaf on plants grown in a 45-percent-shaded greenhouse produced from an

intact No. 1 tuber in a 4 1/2-inch pot averaged 7.5 inches long and 4.7 inches wide eight weeks after planting. Jumbo-sized (greater than 1 1/2 inches in diameter and less than 2 1/2 inches in diameter) tubers are multi-segmented, bearing five-to-six dominant buds. Tuber surfaces are brown with the cortical area yellow-orange.

Tuber Production

'Berry Patch' was evaluated for tuber production at GREC in 2005 and 2006. The soil was EauGallie fine sand with approximately 1 percent organic matter and pH of 6.2. Plants were grown on plastic-mulched, raised beds with a constant water table maintained using a sub-irrigation system. In 2005, ground beds were fumigated on February 25 (six weeks before planting) with a mixture of 67 percent methyl bromide and 33 percent chloropicrin (by volume) at the rate of 350 LB per acre. In 2006 the beds were fumigated on March 10, 10 days before planting, with the same fumigant mixture, but at 175 LB per acre. The beds were 32 inches wide and 8 inches high with caladium seed pieces (tuber pieces) planted 6 inches apart in three rows. As shoots were emerging from the soil, Osmocote 18-6-12 controlled release fertilizer (eight-to-nine months) was applied to the bed surface at the rate of 300 LB nitrogen per acre.

Tubers were harvested in Nov. 2005 and Dec. 2006, respectively. Each field plot was 13 square feet and was planted with 30 tuber pieces. Three major commercial varieties – 'Galaxy', 'Gingerland', and 'Miss Muffet' – were also planted in the field as controls.

Compared to the controls, 'Berry Patch' produced the most tubers in 2005 (Table 1). Its tuber weight was 42 percent, 77 percent, and 160 percent greater, respectively, than the tuber weight of 'Galaxy', 'Gingerland', and 'Miss Muffet'. Additionally, the production index for 'Berry Patch' was 51 percent, 25 percent, and 115 percent greater, respectively, than that of 'Galaxy', 'Gingerland', and 'Miss Muffet'.

'Berry Patch' produced a similar number of marketable tubers as 'Gingerland', but produced 69 percent and 56 percent more tubers respectively than 'Galaxy' and 'Miss Muffet'. In 2006, 'Berry Patch'

was also more productive than those two varieties, with a tuber weight 48 percent and 220 percent, respectively, greater than 'Gingerland' and 'Miss Muffet' and a production index 41 percent and 126 percent greater, respectively, than those two varieties and with number of marketable tubers 78 percent and 81 percent greater, respectively, than those two varieties.

However, tuber weight of 'Berry Patch' in 2006 was 27 percent less than that of 'Galaxy'. Nonetheless, 'Berry Patch' produced 18 percent more marketable tubers than 'Galaxy', and both had the same production index.

Landscape Performance

Landscape performance of 'Berry Patch' grown under full-sun conditions was evaluated in 2005 and 2006 on the same plots used for assessing tuber production. 'Berry Patch' plants were slightly taller (about 4 inches) than 'Galaxy' and

'Gingerland' plants and about 10 inches taller than 'Miss Muffet' plants. 'Berry Patch' leaves were smaller than those of 'Galaxy' and 'Gingerland', but similar in size to those of 'Miss Muffet' (Table 2).

For overall plant quality, 'Berry Patch' received the highest scores among the varieties tested in both growing seasons (2005 and 2006). 'Berry Patch' scores were significantly higher than all controls in three of the five evaluations. The leaf sun tolerance of 'Berry Patch' was rated 4 - 5 (good to excellent) in all the evaluations during the two growing seasons. Except for one evaluation in Sept. 2006, 'Berry Patch's sun tolerance ratings were higher than all of the controls.

Container Forcing

'Berry Patch's performance in container forcing was evaluated by planting No. 1 tubers in 4 1/2-inch containers. Dry tubers were planted either intact or de-eyed in a peat-vermiculite mix (VerGro Container Mix A, Verlite, Tampa, FL) on 26 March, 2007. The tests were performed in a greenhouse with 45 percent light exclusion during the summer in Wimauma, FL. Average daily temperatures during the tests ranged from a low of 61°F (night) to a high of 84°F (day).

Plants were grown on metal benches in the greenhouse.

'Berry Patch' sprouted in 37 days (intact or de-eyed) after planting, similar to 'Galaxy', but three-to-six days later than 'Candidum Junior' and seven-to-ten days later than 'Miss Muffet' (Table 3). 'Berry Patch' plants were 10.6 inches (intact tubers) or 9.8 inches (de-eyed tubers) tall, similar to 'Galaxy' in height. However, 'Berry Patch' plants were significantly taller (4 inches taller) than 'Candidum Junior' and 4 - 5 inches taller than 'Miss Muffet', a known dwarf variety.

'Berry Patch' had seven leaves on intact plants eight weeks after planting, similar to 'Galaxy', but less than 'Candidum Junior' plants or 'Miss Muffet' plants.

When tubers were de-eyed, 'Berry Patch' produced more leaves (13 per plant). In leaf size (length and width), 'Berry Patch' was similar to 'Galaxy' and 'Candidum Junior'. Tuber de-eyeing improved the quality rating of 'Berry Patch' pot plants, from 3.3 - 4.2. This improved rating indicates that 'Berry Patch' can be used for forcing in small containers, but tuber de-eyeing will be required to produce high-quality plants.

In summary, 'Berry Patch' is a new, spotted, fancy-leaved caladium variety. 'Berry Patch' has shown superior tuber production in the replicated field trials, consistent with growers' trials of 'Berry Patch' (T. Cantwell-Bates). With a vigorous growth habit, 'Berry Patch' can quickly fill a landscape space with many leaves. Additionally, 'Berry Patch' resists sunburn. These characteristics allow 'Berry Patch' to perform well in the landscape in full sun.

In container forcing, 'Berry Patch' behaves much like 'Galaxy', with a similar sprouting time, leaf size, and plant height. However, 'Berry Patch' produces pot plants of higher quality regardless of tuber treatments (intact or de-eyed). Tuber de-eyeing can improve 'Berry Patch's plant quality when forced in small containers (4-inch pots) although this practice is not required for producing pot plants in 8-inch or larger containers.

For commercial tuber production, growers are encouraged to use pre-plant, hot-water treatment (Rhodes, 1964) and standard post-harvest treatment (Harbaugh and Tjia, 1985).

Availability

A plant patent will be sought from the United States Patent and Trademark Office and plant-patent rights will be assigned to the University of Florida, Board of Trustees. Propagation and distribution will be licensed by the Florida Foundation Seed Producers, Inc., P.O. Box 110200, Gainesville, FL 32611. Information on tuber availability and propagation agreements can be obtained from the Florida Foundation Seed Producers, Inc.

Literature Cited

Harbaugh, B.K. and B.O. Tjia. 1985. Commercial forcing of caladiums. (<http://www.uflib.ufl.edu/ufdc/?c=fao1&m=hd1J&i=45052>) University of Florida/IFAS, Florida Cooperative Extension Service, Circular 621 (13 pages).

Rhodes, H.L. 1964. Effect of hot water treatment of seed tubers and soil fumigation for control of root knot on yield of caladiums. Plant Disease Reporter 8:568-571.

Table 1. Tuber weight, production index, marketable tubers, and tuber grade distribution of 'Berry Patch' and three commercial caladium varieties harvested in 2005 and 2006. (Values presented are means of three replications with 30 tuber pieces planted in each field plot – 13.5 square feet – per year.)

Caladium Variety	Tubers			Tuber Distribution (%)				
	Weight (LB)	Production Index	Marketable (Number)	Super Mammoth	Mammoth	Jumbo	No. 1	No. 2
----- Year 2005 -----								
Berry Patch	18.1	247	58	14	22	30	26	8
Galaxy	12.8	163	34	10	32	45	9	4
Gingerland	10.1	197	59		18	37	30	14
Miss Muffet	7.1	115	37		11	39	40	11
----- Year 2006 -----								
Berry Patch	19	240	70	5	26	16	32	21
Galaxy	26.2	240	59	15	21	26	17	21
Gingerland	12.8	170	39	13	32	20	23	13
Miss Muffet	6	106	39		9	29	41	21

The production index is an indicator of the economic value of the tubers harvested and is calculated as follows:

$$N(\text{No. 2}) + 2N(\text{No. 1}) + 4N(\text{Jumbo}) + 6N(\text{Mammoth}) + 8N(\text{Super Mammoth})$$
 where N = number of tubers in each grade.

Tubers graded by maximum diameter: No. 2 (1 - 1.5 inches), No. 1 (1.5 - 2.5 inches), Jumbo (2.5 - 3.5 inches), Mammoth (3.5 - 4.5 inches), and Super Mammoth (>4.5 inches).

Table 2. Plant and leaf measurements, plant-performance ratings, and sunburn tolerance of 'Berry Patch' caladium and three commercial varieties grown in ground beds in full sun (2005 and 2006).

Caladium Variety	Plant Height (in)	Leaf			Overall Plant Performance Rating ^z					Sunburn Tolerance Rating ^y				
		Number	Length (in)	Width (in)	06/05	07/05	08/05	08/06	09/06	06/05	07/05	08/05	08/06	09/06
Berry Patch	15.7	40	7.8	4.9	4.5	4.9	4.8	3.7	3.7	4.6	5	4.7	4.5	4.1
Galaxy	11.8	40	8.9	6	3.6	4.1	4.5	1.8	2.9	4.2	4.6	4.3	3.8	4.3
Gingerland	12.2	25	10.5	5.8	1.8	3.4	4	1.7	2.8	4.1	4.7	4.4	4.3	4.5
Miss Muffet	5.5	19	6.4	4	1.5	1.3	2.4	1.3	1.5	3.5	4.4	4.2	4.3	4.2

^z Plants were rated on a scale of 1 - 5 with 1 being very poor, 3 fair and acceptable, and 5 being excellent in plant vigor, fullness, and color display in June, July, and August 2005 and in August and September 2006, respectively.

^y Plants' sunburn tolerance was rated on a scale of 1 - 5 with 1 being very poor, 3 fair and acceptable, and 5 being excellent without showing any signs of leaf burn or resulting holes on leaf surfaces in June, July, and August 2005 and in August and September 2006, respectively.

Table 3. Plant performance for caladium varieties grown from No. 1 tubers in 4 1/2-in. containers in a 50% shaded glasshouse in Wimauma, FL, 2007. (Values represent the means of 10 plants produced from intact or de-eyed No. 1 – >1 1/2 and <2 1/2 in diameter – tubers planted individually per container.)

Caladium Variety	Days to Sprout ^z		Plant Height (in)		Leaves (no.)		Leaf Length (in)		Leaf Width (in)		Quality Rating ^y	
	Intact	De-eye	Intact	De-eye	Intact	De-eye	Intact	De-eye	Intact	De-eye	Intact	De-eye
Berry Patch	37	37	10.6	9.8	7	13	7.1	7.1	4.8	4.5	3.3	4.2
Candidum Junior	31	34	7.5	5.9	11	10	8	7.2	5.2	4.4	3.6	3.5
Galaxy	33	36	10.2	9.8	7	9	8.8	7.2	5.7	4.8	2.3	3.3
Miss Muffet	27	30	5.9	5.9	9	18	7.6	6.1	4.9	3.4	3.1	4.4

^z Number of days from planting to first unfurled leaf.

^y Quality (as a pot plant) was rated eight weeks after planting (May 2007) and on a scale of 1 - 5 with 1 being very poor, 3 fair and acceptable, and 5 being excellent in plant fullness and symmetry.