UF 4412 and UF 4424—Red Lance-leaved Caladium Cultivars

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Cultivated caladiums (Caladium × hortulanum Birdsey, Araceae Juss.) are valued for their colorful and variable-shaped leaves (Harbaugh and Tjia, 1985; Wilfret, 1993). Cultivars generally are divided into three groups according to leaf shape and size: fancy-, lance-, and strap-leaved (Wilfret, 1986). Fancy-leaved caladiums produce large round-ovate to triangular leaves with three main veins, two large basal lobes partially to fully joined, and a petiole attached to the back of the leaf blade. Strap-leaved caladiums have linear leaves with one main vein and no obvious basal lobes. Lance-leaved caladiums produce leaves intermediate between fancy and strap types: leaves sagittate to cordate–lanceolate in shape, basal lobes obvious to barely obvious, and petioles attached to the base of the leaves (Deng and Harbaugh, 2006a). The majority of caladium cultivars in commercial production are fancy-leaved (Bell et al., 1998; Deng et al., 2011). However, there has been an increasing demand for lance-leaved cultivars, Florida growers, the primary supplier of caladium tubers used in the world, reported greater than 50% more acres used for producing lance-leaved caladiums in 2008 than in 1998 (Bell et al., 1998; Deng and Alleyne, 2009; Deng et al., 2011). Plants of lance-leaved cultivars generally are more compact with smaller leaves and shorter petioles than fancy-leaved caladiums. Tubers produced by lance-leaved caladiums tend to be more branched (Deng and Harbaugh, 2008). Therefore, lance-leaved caladiums are adaptable to different container sizes, do not require tuber de-eyeing for pot plant production, and are less expensive and easier to ship from production sites to markets. These characteristics result in significant benefits to growers producing and marketing potted caladium plants (Deng and Harbaugh, 2008). Lance-leaved caladiums may be more resilient to wind damage, drought, sunburn, and shading than fancy-leaved caladiums and may do better than the latter in the landscape when such stresses occur (Deng and Harbaugh, 2008). However, many lance-leaved caladiums often produce small tubers (Wilfret, 1983). Tubers are both the planting stock and the crop for caladium growers. Thus, tuber yield is one of the most important factors determining a cultivar’s economic value for commercial production of caladium tubers. Growers cannot produce cultivars profitably without adequate tuber yield and have to eliminate them from commercial production. Thus, developing new lance-leaved caladium cultivars with adequate tuber yield potential has been a priority breeding objective for the University of Florida (UF) caladium breeding program since its beginning in 1976.

Currently, ‘Florida Sweetheart’ is the most popular lance-leaved commercial cultivar of any color, and ‘Florida Red Ruffles’ is the most popular red lance-leaved commercial cultivar among caladium growers, greenhouse growers, and nurseries (Bell et al., 1998; Deng and Alleyne, 2009; Deng et al., 2011). Both cultivars were introduced by the UF caladium breeding program. Plants of ‘Florida Sweetheart’ are compact and produce wide lance leaves with a rosy color and relatively large tubers (Wilfret, 1991a). ‘Florida Red Ruffles’ has a compact, upright growth habit and excellent sunburn tolerance (Wilfret 1991b).

UF 4412 (Fig. 1) and UF 4424 (Fig. 2) are attractive lance-leaved cultivars with novel, distinct combinations of plant and foliar characteristics. UF 4412 leaves are heart-shaped like ‘Florida Sweetheart’ but have a large red center and numerous netted red veins. UF 4412 plants are taller and produce longer and wider leaves than ‘Florida Sweetheart’ plants. UF 4424 leaves are cordate–lanceolate-like ‘Florida Red Ruffles’ leaves but have a large, glossy, red center and numerous red, thick veins. UF 4412 and UF 4424 were comparable or superior in replicated field, greenhouse, and landscape trials
to ‘Florida Red Ruffles’ and ‘Florida Sweetheart’ in tuber yield, pot plant quality, and landscape performance. UF 4412 and UF 4424 are suitable for producing pot plants, and tuber de-eyeing was not required for forcing in small containers. These characteristics should make UF 4412 and UF 4424 economically viable and profitable cultivars for commercial production of caladium tubers. The availability of UF 4412 and UF 4424 can help expand the caladium plant palette for greenhouse growers, nurseries, and gardeners.

**Origin**

Both UF 4412 and UF 4424 are progeny of crosses between ‘Florida Sweetheart’ (Plant Patent 8,526) and ‘Red Flash’ (Fig. 3) that were made in Bradenton, FL, in Spring 2004. UF 4412 and UF 4424 were selected initially in Aug. 2005 and have been propagated asexually by tuber division over seven generations. Growth characteristics of these cultivars were stable and consistent. ‘Florida Sweetheart’ was selected as the seed parent because of its plant vigor, pot plant growth habit, bright leaf color, excellent sun tolerance, high tuber yield potential. ‘Red Flash’ was used as the pollen parent because of its strong plant vigor, red leaf color, and excellent sun tolerance. ‘Florida Sweetheart’ was developed by Wilfret (1991a) from a 1977 cross between ‘Candidum Junior’ and ‘Red Frill’. ‘Red Flash’ is an unpatented commercial cultivar reportedly selected by Frank M. Joyner in Tampa, FL, in the 1950s (Terri Cantwell-Bates, personal communication). Ancestry of ‘Candidum Junior’, ‘Red Flash’, and ‘Red Frill’ 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). Three 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) de-eyed tubers.

**UF 4412.** UF4412 plants grown in the commercial potting mix Fafard 3B (Fafard, Inc., Apopka, FL) under shade for approximately two months have an average height of 40.5 cm and produce 35 to 47 leaves per plant. Large leaves have an average size of $\approx 21.5$ cm long and 14.5 cm wide. Leaves are ovate and have a cordate base, an acuminate to acute apex, an entire and slightly undulate margin, and two relatively large basal lobes. On the upper leaf surface, a green (RHS 139A) margin, up to 10 mm wide, borders the entire leaf except for the basal leaf valley where it is grayed purple (RHS 183B). The leaf center is red (RHS 53C to 53D). Venation pattern is pinnate with as many as 16 grayed purple (RHS 185A) veins radiating from a central main vein of red (RHS 46A) and connecting marginally with a thin grayed purple vein (RHS 184A) that parallels the leaf margin. Secondary and tertiary veins tend to be netted across the entire leaf. Small blotches of green (RHS 139A) and/or numerous specks of white (RHS 155B) may appear along margin and between primary veins. Occasionally red (RHS 36C) specks may appear between the primary veins. The leaf undersurface has a grayed green (RHS 191A) margin up to 15 mm wide, a grayed purple (RHS 185C) center, a grayed red (RHS 182D) midrib vein, and several grayed green (RHS 197A) primary veins. Irregular grayed yellow (RHS 162D) and grayed green (RHS 191A) mottling, up to 40 mm wide, parallels the margin. Petioles are mostly erect, curving outwardly with development, grayed red (RHS 182D) at the apex, but the colors diffuse into a black (RHS 202A) at the base. In addition to numerous short brown to dark streaks, a few long brown to dark streaks may extend from the apex to the base of the petiole. Jumbo tubers are multisegmented, bearing six to nine dominant buds. Tuber surfaces are brown (RHS 200B) with the cortical area yellow–orange (RHS 15A).

**UF 4424.** Plants grown in the commercial potting mix Fafard 3B and under shade for approximately two months have an average height of 42 cm and produce 40 to 55 leaves, up to an average of 21.5 cm long and 13.5 cm wide. Leaves are ovate and have a sagittate base, an acuminate to acute apex, an entire and slightly undulate margin, and two obvious basal lobes. On the upper leaf surface, a broad, green (RHS 139A) margin, up to 15 mm wide, borders the entire leaf except for the basal leaf valley where it is grayed purple (RHS 187B). The leaf center is red (RHS 53A to 53B) and can be highly glossy. As many as 16 large, red (RHS 53A) veins radiate from a central main vein of red (RHS 53A) and connect marginally with a thin grayed purple vein (RHS 184B) that parallels the leaf margin. Irregular grayed green (RHS 139A) mottling parallels the margin. The leaf undersurface has a grayed green (RHS 189A) margin up to 20 mm wide, a grayed purple (RHS 187C) center, and grayed red (RHS 187C) veins. The center and veins are covered with grayed white (RHS 156C) wax. Irregular grayed green (RHS 191A) mottling, up to 20 mm wide, parallels the margin. Petioles are grayed red (RHS 182B) at the apex, and the colors diffuse into a light grayed purple (RHS 182D) at the base. The upper portion of the petiole below the apex is frequently covered with...