‘Miami Sunrise’, ‘Miami Sunset’, and ‘Tangelo’: Three Cultivars of *Tecoma guarume*

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Tecoma Benth. (Bignoniaceae) is a genus of 14 species of shrubs and small trees, 12 of which are native to America and two to Africa (Gentry, 1992). Of these, the most widely cultivated are *Tecoma capensis* (Thunberg) Lindley, sometimes still treated as the separate genus *Tecomaria* Spach, and *Tecoma stans* (Linn.) Juss. ex. HBK. Also in the nursery trade is a hybrid of *Tecoma arequipensis* and *T. stans*, *Tecoma* × *smithii* W. Watson ‘Orange Bells’ (Huxley et al., 1992). *Tecoma guarume* A. P. de Cand. (synonym: *T. alata* A. P. de Candolle) is endemic to the Ica Department of south-central coastal Peru, mostly along rivers on sandy soils from 450 to 1200 m elevation (Gentry, 1992). It is sometimes included within *T. arequipensis* (Sprague) Sandwith. The species is a semideciduous shrub rarely reaching 3 m in height with yellowish orange flowers. In this article, we announce the formal recognition and release of three distinct floral color forms of this species. *Tecoma guarume* ‘Miami Sunrise’, ‘Miami Sunset’, and ‘Tangelo’ are seedling selections from progeny grown from seed received in 2000. We believe that these fast-growing cultivars have great potential for use as landscape shrubs in USDA Hardiness Zones 9A–11 (USDA, 1990) and probably as root-hardy perennials in Zone 8.

Origin

Seed of *Tecoma guarume* was received in 2000 from Peckerwood Garden (Hempstead, TX) as *T. alata*. Although the majority of the seedlings grown produced uniformly yellowish orange flowers, these three selections each showed consistent color variation that warranted their recognition as distinct cultivars. One (‘Miami Sunrise’) is smaller-statured

than the other two. They are propagated readily, fast-growing, and flower periodically throughout the warm months of the year.

Description

A general description of the species is given followed by the distinguishing characteristics of the three cultivars. Size measurements were derived from plants grown in the field for 6 months to 1 year. Color measurements of the surface color of fresh flowers of three *T. guarume* cultivars were evaluated with a Minolta (Osaka, Japan) CR-400 colorimeter at CIE D65/2° illumination/viewer conditions. The color parameters correspond to the uniform color space CIELAB derived from Gonnet (1993, 1998). Two color coordinates, a^* and b^* , as well as a psychometric index of lightness, L^* , are defined. The L^* is a measurement of luminosity, i.e., the equivalence of each color on the gray scale ranging from 0 (black) to 100 (white). The a^* takes positive values (0 to +60) for reddish colors and negative values (0 to –60) for the greenish ones, whereas the b^* takes positive values (0 to +60) for yellowish colors and negative values (0 to –60) for the bluish ones. This is a much more precise and repeatable analysis of color than obtained by using color charts (Ayala-Silva and Meerow, 2007; Ayala-Silva et al., 2005). The colorimeter is set to take three consecutive measurements of each sample so each set of color coordinates obtained are averages of three measurements. Analysis of variance was performed to test for significance of the color measurements

among cultivars with Analyze-It for Microsoft Excel v/2.03 (Analyze-It, Ltd., Leeds, UK).

Tecoma guarume is a multistemmed, semideciduous shrub 1.2 to 3 m tall. The slightly arching branches are mostly glabrous. Leaves are opposite but sometimes appear alternate, pinnate, five to 13 foliate, and 10 to 15 cm long. The petiole is 1 to 2 cm long and the rachis is narrowly winged. The leaflets are subsessile, elliptic to oblanceolate, acute at the apex, the laterals 1 to 3 cm long, 0.5 to 1.5 cm wide, and the terminal up to 4 cm long and 2 cm wide; the margins are serrate to serrulate. The inflorescence is a terminal raceme or several from the axils of the terminal leaves; occasionally branching basally to form a panicle, each raceme 10 to 20 flowered. The flowers are salverform–tubular. The calyx is cup-like, 3.5 to 6 mm long, 2 to 3 mm wide, split in the apical 1 to 3 mm into five keeled teeth. The corolla is 5 to 6.5 cm long, the petals fused into a typically orange to red–orange, slightly curved tube for 4.5 to 6 cm, yellow in the throat, ≈1 cm wide at its mouth, then flared into a 2.5 to 3.5 cm wide limb of spreading and recurved orange–yellow lobes each ≈5 mm long. The four biserial stamens are held in the mouth of the tube and the anthers held against the roof of the tube. The style is 5 to 6 cm long with an annular disk at its base; the stigma is 2.2 to 2.5 mm wide with two flattened lobes. The superior ovary is linear–oblong to narrowly ovate, 3 mm long, 1 to 1.2 mm wide, and densely hairy. The mature fruit is a septate, papery, linear capsule, 5.5 to 7 cm long, 6 to 8 mm wide. The seeds are thin and two-winged.

Tecoma guarume ‘Miami Sunrise’ (Fig. 1) grows no taller than 1.5 m. The leaves are 11 to 13 cm long and have mostly nine leaflets per leaf (rarely seven or 11). The flowers open orange and fade to yellow with orange–yellow striations (Table 1) passing through a bicolor stage. They are ≈5 cm long and 2.5 to 2.7 cm wide at the limb. It produces few fruits.

Tecoma guarume ‘Miami Sunset’ (Fig. 2) grows no taller than 1.2 m. The leaves are 10 cm long, typically with nine leaflets. The flowers are 4.5 to 5 cm long and 2.5 to 3 cm at the limb, crimson in bud, opening red to

Fig. 1. *Tecoma guarume* ‘Miami Sunrise’. (A) Plant after 8 months in the field from a 5.4-L container. (B) Detail of flowers.

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Fig. 2. *Tecoma guarume* 'Miami Sunset'. (A) Plant after 6 months in the field from a 2.7-L container. (B) Detail of flowers.

Table 1. Colorimeter measures of flowers for three cultivars of *Tecoma guarume*.^z

Cultivar and Corolla zone	Parameter	n	Mean	95% CI	SD
Miami Sunrise	L ^{*y}				
Dark (orange)		38	56.696	55.943–57.450	2.292
Light (yellow)		95	62.428	62.055–62.802	1.834
Miami Sunset					
Dark (red)		37	46.782	45.998–47.566	2.350
Light (reddish orange)		40	53.642	52.818–54.467	2.579
Tangelo					
Dark (orange)		36	58.803	58.312–59.294	1.452
Light (orange–yellow)		104	61.883	61.622–62.143	1.339
Miami Sunrise	a ^{*x}				
Dark (orange)		38	20.248	19.172–21.325	3.275
Light (yellow)		95	13.983	13.390–14.577	2.916
Miami Sunset					
Dark (red)		37	32.689	31.747–33.630	2.823
Light (reddish orange)		40	25.281	24.083–26.479	3.746
Tangelo					
Dark (orange)		36	19.477	18.615–20.339	2.548
Light (orange–yellow)		104	18.096	17.370–18.822	3.732
Miami Sunrise	b ^{*x}				
Dark (orange)		38	43.587	41.872–45.303	5.219
Light (yellow)		95	53.491	52.562–54.421	4.563
Miami Sunset					
Dark (red)		37	19.255	17.515–20.995	5.219
Light (reddish orange)		40	28.132	25.910–30.355	6.949
Tangelo					
Dark (orange)		36	39.858	38.177–41.539	4.969
Light (orange–yellow)		104	44.304	43.633–44.975	3.451

^zSee text for definitions of parameters.

^ySignificant at $P < 0.0001$.

^xSignificant at $P < 0.0001$.

^wSignificant at $P < 0.0001$.

n = sample size, CI = confidence interval.

Fig. 3. *Tecoma guarume* 'Tangelo'. (A) Plant after 1 year in the field from a 5.4-L container. (B) Detail of flowers.

orange–red and fading to reddish orange as they age, the upper portion remaining redder than the lower (Table 1). No fruits have been observed.

Tecoma guarume 'Tangelo' (Fig. 3) grows 1.8 to 2.0 m tall. The leaves are 13.5 to 15 cm long with mostly 11 to 13 leaflets. The flowers are uniformly orange (Table 1), except for a ventral zone of orange–yellow, 5.5 to 6 cm long, and 2.6 to 3.0 cm wide at the limb. It is very free-flowering and produces abundant fruits.

Cultural Notes

All three *Tecoma* cultivars are readily propagated from softwood cuttings throughout the year. We have found cuttings from actively growing plants treated with a 5-s basal end dip in 1000 ppm indolebutyric acid in 50% EtOH root within 4 to 6 weeks under intermittent mist.

We have successfully grown all three cultivars in 5 aged pine bark : 4 coconut coir dust : 1 coarse sand (by volume) amended with 5.0 kg·m⁻³ 17N–2.3P–10K Nutricote (Florikan, Sarasota, FL), 4.2 kg·m⁻³ dolomite, and 1.2 kg·m⁻³ Micromax (Scott's, Milpitas, CA). Substrate pH in excess of 7.8 results in iron-deficiency symptoms. Rooted cuttings placed directly into 2.7-L containers were flowering 10 to 12 weeks after transplant. Trial blocks of all three cultivars were established in the ground at the National Germplasm Repository, Miami, FL, from plants established in 5.4-L containers in Apr. 2005 in amended (10-year-old aged compost from vegetative solid waste) field soil.

In the landscape, all three cultivars of *T. guarume* should be situated in full sun on well-drained soils and fertilized regularly. In sites with lower light levels, stem internodes elongate and flowering decreases. Once each year, the plants can be cut back to half to two-thirds of their height. The soil can dry out moderately between irrigations, which can be reduced by at least half during the winter. No pest or disease problems have been observed. No adventive seedlings from fruits set by either 'Tangelo' or individuals of any of the original seedling population have been observed. They can be used as specimen plants or as an informal hedge. We also would recommend that growers experiment with training the plants as standards for a higher value crop. The rapid rate of growth, ease of propagation, and long flowering season suggest that these cultivars could be marketed as annual plants beyond their expected hardiness range.

Availability

Small quantities of each of the three cultivars are available for research purposes only by request through the USDA-ARS National Plant Germplasm System (<http://www.ars-grin.gov/npgs/>) as accessions PI 651040 ('Miami Sunrise'), PI 651041 ('Miami Sunset'), and PI 651042 ('Tangelo').

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