

‘Maurine Twilight’ and ‘Maurine Daylight’ — Heat-tolerant Lisianthus with Bi-colored Flowers

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Seedlings of most commercial cultivars of lisianthus [*Eustoma grandiflorum* (Raf.) Shinners; Gentianaceae Juss.] form rosettes when grown at or above 25 to 28 °C (Harbaugh, 1995; Harbaugh et al., 1992; Ohkawa et al., 1991, 1994; Pergola, 1992). ‘Maurine Blue’ was released in 1995 as a blue flowering and heat-tolerant cultivar of lisianthus developed at the Univ. of Florida’s Gulf Coast Research and Education Center, Bradenton, Fla. (Harbaugh and Scott, 1996). In 1998, six other heat-tolerant cultivars with either pink, pink-lilac, white, light blue, or lilac flower colors but similar vegetative and flowering characteristics were released in the Maurine cultivar group (Harbaugh and Scott, 1998). ‘Maurine Daylight’ (Fig. 1, left) and ‘Maurine Twilight’ (Fig. 1, right) plants also are heat-tolerant with vegetative and flower characteristics that are similar to ‘Maurine Blue’, and provide bi-color flower selections (white with light violet-blue rim or white with dark violet-purple rim, respectively) to the Maurine cultivar-group.

Origin

‘Maurine Daylight’ is an F_1 hybrid resulting from crossing inbred lines UF-0626 and UF-05333 (Fig. 2). UF-0626 was chosen for its pure white flowers with a vivid violet-purple rim on the petal apex, heat tolerance, and lower branching. UF-0553 was chosen for its white flowers, narrow light violet-blue petal apex, and heat tolerance.

UF-0626 was the F_5 selection of a cross between UF-96421 and UF-96426. A bi-colored flowering plant was selected in the F_2 and improved over three generations. UF-96421 was the F_2 selection of a cross between UF-94w237 and UF-94R150 and was chosen for its heat tolerance and bi-colored flowers. UF94w237 was the F_3 selection of UF-821 and UF-pdw82 selected for its basal branching and floriferousness. UF-821 resulted from a cross between two selections of a ‘Blue Poppy’ selfing improved over four generations and selected for its short, lower branching habit

and ability to flower in the summer (35 °C day). UF-pdw82 resulted from a cross between a selfing of ‘Yodel Pink’ improved over four generations. Although ‘Yodel Pink’ was a tall cut flower, UFpdw82 was selected in the F_1 for its dwarf plant habit. UF-94R150 was a cross between MG-blue and ‘Echo Misty Blue’ selected after three generations of selfing for its misty-blue flowers, compact plant habit, and bell-shaped flowers. MG-blue was a selection from a cross between a blue flowering plant of unknown parentage and ‘Mermaid Blue’. It was chosen for its dwarf plant habit and dark blue flowers.

UF-96426 was the F_5 selection of a cross between UF-94w237 and UF-404B selected for its pure white flowers, floriferousness, basal branching and heat tolerance. UF404B was the F_3 selection of a cross between UF-w25 and ‘Blue Lisa’ and it was chosen for its dwarf habit, heat tolerance and pure white flowers. UF-w25 was the F_4 selection of ‘Double Light Blue’ and UF7-53. ‘Double Light Blue’-1 (unknown parentage) was chosen for its strong stems, basal branching, and large flowers. ‘Blue Lisa’ was chosen for its early flowering and dwarf characteristics.

UF-0553 was the F_7 selection of a cross between UF-9446 and UF-94R150. A bi-col-

ored flowering plant was selected in the F_2 and improved over six generations. UF-9446 was the F_2 selection of a cross between UF-821 and ‘Mermaid Blue’ selected for its heat tolerance, floriferousness, and dwarf plant habit.

‘Maurine Twilight’ is an F_1 hybrid resulting from crossing inbred lines UF-0611 and UF-0626 (Fig. 2). UF-0611 was chosen for its flowers with a wide, dark violet-purple rim on the petal apex and heat tolerance. UF-0611 resulted from a cross between UF-94w237 and UF-94R150 improved over six generations. UF-0626 was the seed parent of ‘Maurine Daylight’ and is described above.

Growing conditions used to select seedlings for resistance to heat-induced rosetting during development of heat tolerant parents included: (1) production during summer months under greenhouse conditions at day temperatures ≥ 35 °C, (2) exposure of 2- to 4-week-old seedlings to 28 °C for 4 weeks for initial selections in early generations, and (3) exposure of 17-d-old seedlings to 31 °C for 5 weeks for selection of final parents used in F_1 hybrids.

Flower color description

Flower color was determined under natural light using the Royal Horticultural Society Colour Chart (Royal Horticultural Society, 1966). A number plus a letter are used for each color chip (e.g., 65B). Petals of lisianthus typically are one color over most of the surface, but exhibit a distinct basal eyespot (i.e., base of petals surrounding the ovary) of a different color.

‘Maurine Daylight’ and ‘Maurine Twilight’ flower petals are predominantly white (155D) on both adaxial and abaxial petal surfaces. ‘Maurine Daylight’ has a narrow (usually 0.25 to 0.5 cm) violet-blue (86C on the adaxial and 85A on the abaxial petal surface) border on the petal apex. ‘Maurine Twilight’ has a broader (0.5 to 1.0 cm) and darker violet-purple (86A on the adaxial and 86B on the abaxial petal surface) rim on the petal apex. The eyespot is a yellow-green (145A) on both cultivars.



Fig. 1. (left) ‘Maurine Daylight’ and (right) ‘Maurine Twilight’ lisianthus.

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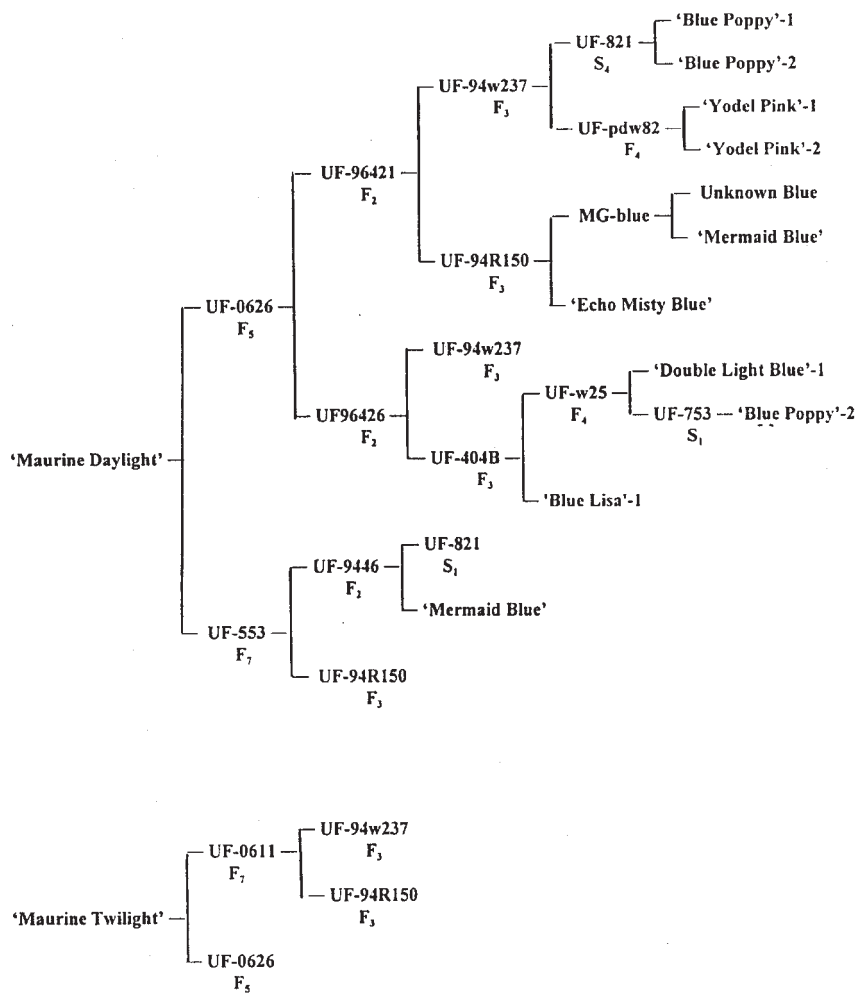


Fig. 2. Pedigrees of 'Maurine Daylight' and 'Maurine Twilight' lisianthus.

Table 1. Percentage of rosetted plants² and growth and flowering characteristics³ of five cultivars of lisianthus grown in 11.5-cm square pots (0.65-L) with capillary mat irrigation at Bradenton, Fla.

Cultivar	Rosetted (%)	Plant ⁴		Basal branches ⁵ (no.)	Flowers and buds (no.)	Petal length (cm)	Days to flower (no.)
		Ht (cm)	Width (cm)				
Flamenco Blue Rim	100 a ⁶	74 a	20 ab	2.2 b	10 c	6.0	126 a
Malibu Blue Rim	100 a	70 a	18 bc	1.8 b	24 b	5.5	109 b
Maurine Blue	12 b	64 b	21 a	4.2 a	54 a	6.1	101 d
Maurine Daylight	0 c	61 b	16 c	4.8 a	34 b	6.1	105 c
Maurine Twilight	0 c	49 c	19 ab	5.6 a	35 b	6.2 ^{ns}	105 c

²Seventeen-day-old seedlings were exposed to 31 °C for 5 weeks in a growth chamber. Seedlings were then grown in a greenhouse at 30 to 33 °C day and 13 to 15 °C night (control) and evaluated after 4 weeks for percentage of rosetted plants. Values are means of three replications with eight plants as the experimental unit arranged in a randomized block design.

³Vegetative and flowering characteristics were for nonrosetted plants that were grown in the greenhouse without exposure to high temperatures in the seedling stage. Values are means of five replications of single-plant experimental units arranged in a completely randomized design.

⁴Plant height = distance from the pot rim to the tip of the highest bud measured after three flowers had opened.

⁵Basal branches were lateral stems originating at the first four to five leaf pairs (i.e., from the basal cluster of leaves below the bolted stem).

⁶Mean separation within columns by Duncan's multiple range test, $P \leq 0.05$. ^{ns}Nonsignificant.

Characteristics and use

Heat tolerance as well as vegetative and flower characteristics of 'Maurine Daylight' and 'Maurine Twilight' were compared to 'Maurine Blue' (heat-tolerant pot type) and 'Flamenco Blue Rim' and 'Malibu Blue Rim' (bi-colored and cut flower types). Seeds of all cultivars were planted on 27 Feb. 2001, at Bradenton. Seventeen-day-old seedlings were grown either at a constant 31 °C for

5 weeks (heat-stressed) or in a glasshouse (control) with a high of 30 to 33 °C day and 13 to 15 °C night. Seedlings exposed to 31 °C were rated as rosetted if they had not bolted after growth for an additional 4 weeks in the control greenhouse. Nonrosetted plants from the control greenhouse were evaluated for plant height, number of basal branches (lateral stems originating at the first four to five leaf pairs; i.e., from the basal cluster of leaves below the bolted stem), total number of

flowers and buds per plant after three flowers were open, petal length, and the number of days from sowing to flowering.

The most important and distinguishing attribute of all the Maurine cultivar-group cultivars as compared with other commercial lines was their heat tolerance (Table 1). None of the heat stressed 'Maurine Daylight' or 'Maurine Twilight' seedlings rosetted, and only 12% of 'Maurine Blue' rosetted, while 100% of 'Flamenco Blue Rim' and 'Malibu Blue Rim' rosetted.

In addition to heat tolerance, we considered that 'Maurine Daylight' and 'Maurine Twilight' plants exhibited sufficient similarities in flower form and display, branching habit, and in the number of days from sowing to flowering in comparison with 'Maurine Blue' that they could be included in the Maurine cultivar-group. Notable differences between the Maurine cultivars were 1) 'Maurine Twilight' was the shortest of the Maurine cultivars; 2) plant width of 'Maurine Daylight' was less than the other Maurine cultivars; 3) 'Maurine Blue' had more flowers and buds and flowered an average of 4 d earlier than the other Maurine cultivars.

Maurine cultivars are intended to be used as flowering potted plants. They are shorter with more basal branching than cut-flower lisianthus (Table 1) making them more suitable for pots. While many cultivars of cut-type lisianthus are marketed in the United States with bi-colored flowers, to our knowledge, 'Maurine Daylight' and 'Maurine Twilight' are the first pot-type lisianthus with bi-colored flowers. Treatment with growth retardants is necessary for production of Maurine cultivars in ≤15-cm-diameter pots (Harbaugh et al., 1998). Three plugs per 15-cm-diameter pot is recommended for optimal marketing display.

Availability

Plugs of the Maurine cultivar-group will be offered for sale through Earl J. Small Growers, Pinellas Park, Fla. Scientists interested in seed for research purposes should contact B.K.H.

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