

‘Maurine Dawn’—A Heat-tolerant Lisianthus with Pink/White Bicolored 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; Ohkawa et al., 1994; Pergola, 1992). ‘Maurine Blue’ was released in 1995 as a blue flowering, heat-tolerant cultivar of lisianthus developed at the University 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). In 2003, ‘Maurine Daylight’ and ‘Maurine Twilight’ were released as blue-white bicolored flowering cultivars in the Maurine cultivar group. ‘Maurine Dawn’ plants also are heat-tolerant with vegetative and flower characteristics that are similar to ‘Maurine Blue’, and add a pink-white bicolor flower color to the Maurine cultivar-group (Fig. 1).

Origin

‘Maurine Dawn’ is an F1 hybrid resulting from crossing inbred lines UF03-596 and UF03-573 (Fig. 2). Both parents were chosen for their stable expression of pink-white bicolored flowers and heat-tolerance.

UF03-596 was the F3 selection of a cross between UF01-94 and UF01-306. A bicolored flowering plant was selected in the F2 and inbred one generation. UF01-94 was the F1 selection of a cross between UF00-579 and UF00-689 and was chosen for its bright pink-white bicolored flowers and basal branching. UF00-579 was the F7 selection of UF-94-237 and UF94-393 selected in the F2 for its pink-white bicolored flowers, basal branching and floriferousness.

Stable expression of the pink petal border often is problematic with an undesirable bleeding of the pink color downward into the white portion of the petal, completely pink flowers developing, or the thickness and length of the

pink border may vary from just a small blotch to the entire petal apex. Thus, the F2 was improved over five generations before uniform and stable plants were developed. UF94-237 was used as a source of heat-tolerance (Harbaugh and Scott, 1998), branching habit, and floriferousness. It was also used as a source of

bright white flower color as the white portion of the bicolored petal can vary from a dull cream color to a bright white. The latter is necessary to achieve the ideal contrast with the dark pink border. UF94-393 was selected for its dwarf plant habit and blue-white bicolored flowers. UF94-393 was selected in the F2 and improved two generations. Although UF94-393 had blue petal borders, it primarily was used to introduce bicolored flower traits into our heat-tolerant lines. UF94-393 was the result of crossing the F1 of an unknown tall parent (large blue flower) × ‘Mermaid Blue’ (dwarf habit) with ‘Double Echo Misty Blue’.

UF00-689 was the F4 of a cross between UF96-393 and UF96-255 selected in the F2 for its pink-white bicolored flowers and improved two generations. UF96-393 was chosen for its bright pink flowers and stem strength and used as a source of pink color for the petal border.

Fig. 1. ‘Maurine Dawn’ lisianthus.



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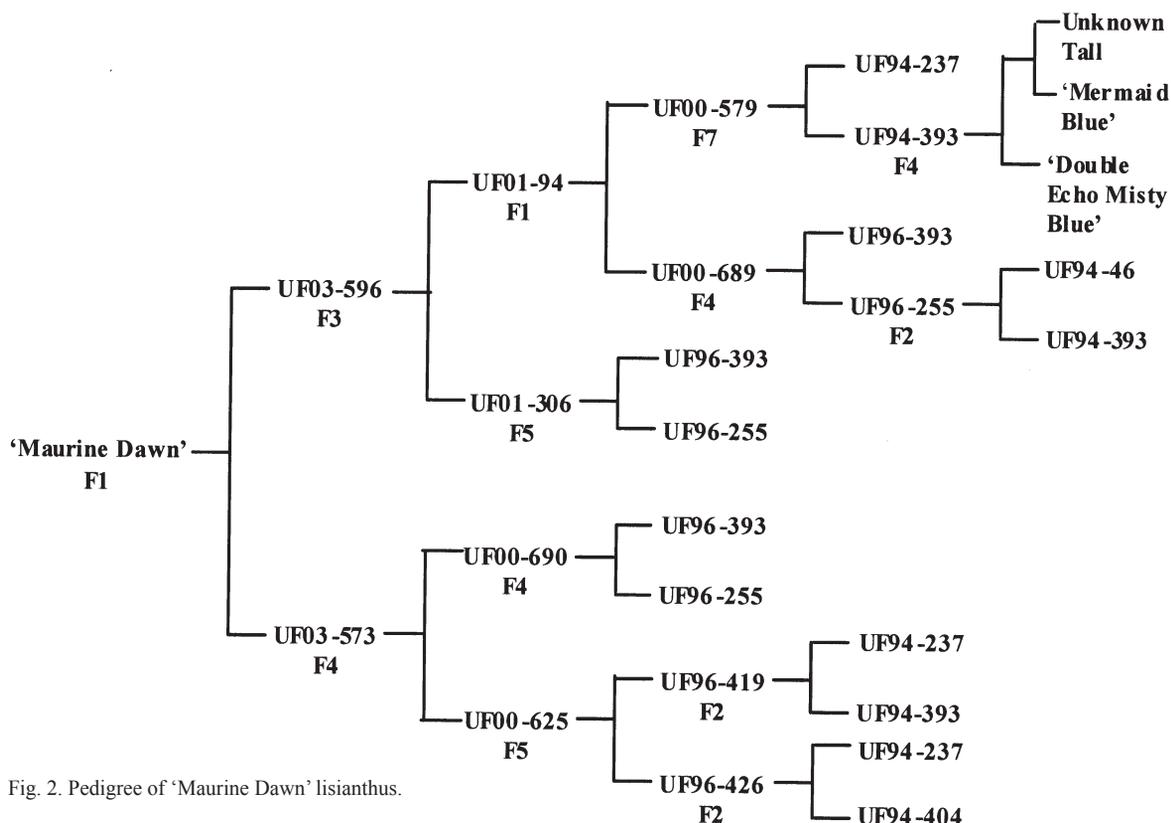


Fig. 2. Pedigree of 'Maurine Dawn' lisianthus.

Table 1. Percentage rosetted plants^a and growth and flowering characteristics^b of seven cultivars of lisianthus grown in 11.5-cm (0.65-L) square pots at Bradenton, Fla.

Cultivar	Rosetted (%)	Plant ^c		Basal branches ^w (no.)	Flowers and buds (no.)	Petal length (cm)	Days to flower (no.)
		Ht (cm)	Width (cm)				
'Florida Blue'	4	31	21	4.2	39	5.7	139
'Heidi Pink Rim'	100	78	17	3.2	28	6.7	143
'Maurine Blue'	0	65	25	4.6	43	6.5	136
'Maurine Dawn'	0	49	21	2.4	35	6.4	135
'Maurine Twilight'	0	63	18	1.2	35	6.2	140
'Mermaid Pink'	100	27	18	2.8	37	4.9	141
'Sapphire Pink Rim'	71	25	20	6.6	35	5.0	127
LSD ($\alpha = 0.05$)	31	5.2	2.2	1.1	10.5	0.4	3.8

^aSeventeen-day-old seedlings were grown at 31 °C for 5 weeks in a growth chamber and evaluated after 4 weeks for percentage of rosetted plants. Value are means of three replications with eight plants as the experimental unit arranged in a randomized block design.

^bVegetative and flowering characteristics were for plants grown in a greenhouse at 33 to 35 °C day and 13 to 15 °C night. Values are means of five replications of single-plant experimental units arranged in a completely randomized design.

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

^wLateral stems forming from the first four to five leaf pairs before bolting.

UF96-393 was the F2 selection of a cross between UF94-226 and UF94-230. They were used as a source of heat-tolerance and dwarf plant habit. UF94-226 was a selection of UF95-309 described by Harbaugh and Scott, 1999, and UF94-230 was the F3 of a cross between 94-214 (Harbaugh and Scott, 1998) and a sister line of UF95-309. UF96-255 was the F2 of a cross between 94-46 and 94-393 chosen for its blue-white bicolored flowers, large flowers, and compact dwarf plant habit. UF94-46 was used as a source of heat-tolerance (Harbaugh et al., 1996) and dwarf plant habit.

UF01-306 was the F5 selection of a cross between UF96-393 and UF96-255 selected in the F2 and improved over three generations to stabilize its dark pink-white bicolored flowers,

sturdy stems, and heat-tolerance. UF96-393 and UF96-255 are described above and were used to further improve bicolor expression.

UF03-573 was the F4 selection of a cross between UF00-690 and UF0-625. A pink-white bicolored flowering plant was selected in the F2 and improved two generations. UF00-690 was the F4 of a cross between UF96-393 and UF96-255. A pink-white-bicolored flower was selected in the F2 and improved two generations. UF96-393 and UF96-255 are described above.

UF00-625 was the F5 if a cross between UF96-419 and UF96-426 selected in the F2 for its blue-white bicolored flowers, basal branching, and floriferousness and advanced three generations. UF96-419 resulted from

a cross between UF94-237 and UF94-393 (described above) was chosen for its heat-tolerance, blue-white bicolored flowers and basal branching.

UF96-426 resulted from a cross between UF94-237 and UF94-404 (Harbaugh and Scott, 2001). They were used as a source of heat-tolerance, bright white flowers, and branching habit.

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 in a growth chamber for initial selections in early generations, and 3) exposure of 17-d-old seedlings to 31 °C in a growth chamber for 5 weeks for selection of final parents used in F1 hybrids. The photosynthetic photon flux in growth chambers was 150 to 190 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ from cool-white fluorescent bulbs.

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., 155D). 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 Dawn' flower petals are predominantly white (155D) on both adaxial and abaxial petal surfaces. Petals have a narrow (usually 0.5 to 1.0 cm) pink (63C on the adaxial and

63 D on the abaxial petal surface) border on the petal apex. The eyespot is a yellow-green (145A).

Characteristics and Use

Heat tolerance as well as vegetative and flower characteristics of 'Maurine Dawn' were compared to 'Heidi Pink Rim' (bicolored and cut flower type), 'Maurine Blue' and Maurine Twilight (heat-tolerant pot types), 'Florida Blue' (heat-tolerant semi-dwarf bedding plant type), and 'Mermaid Pink' and 'Sapphire Pink Rim' (dwarf bedding plant type). Seeds of all cultivars were planted on 16 Dec. 2003 (control) or 21 Jan. 2004 (heat-stress test), at Bradenton. Seventeen-day-old seedlings were grown either in a glasshouse (control) with a high of 30 to 33 °C day and 13 to 15 °C night or at a constant 31 °C for 5 weeks in a growth chamber (heat-stressed).

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, plant width, 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). The exception was that 'Florida Blue' had few

rosetted plants, but it was also released from our program as a semi-dwarf and heat-tolerant line (Harbaugh et al., 1996). None of the heat stressed Maurine cultivar group rosetted while 71% of 'Sapphire Pink Rim' and 100% of 'Heidi Pink Rim' and 'Mermaid Pink' rosetted.

In addition to heat tolerance, we considered that 'Maurine Dawn' 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 it could be included in the Maurine cultivar group. Notable differences were that 'Maurine Dawn' was shorter and had fewer basal branches than 'Maurine Blue'.

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. 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

Distribution of seed is through the Florida Foundation Seed Producers, P.O. Box 309, Greenwood, FL 332443. Scientists interested in small amounts of seed for research purposes should contact B.K.H.

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