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IFAS EXTENSION

'Maurine Blue' Lisianthus [*Eustoma grandiflorum* (Raf.) Shinn.] - A University of Florida Cultivar ¹

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Seedlings of commercial lisianthus cultivars form rosettes when grown at temperatures ranging from 25 to 28°C (Harbaugh et al., 1992; Ohkawa et al., 1991). Rosetted plants have a basal cluster of leaves and very short internodes typical of biennials. They do not bolt or flower for 3 to 6 months without being exposed to 3 to 4 weeks of temperatures at or below 15 to 18°C to reverse heat-induced rosetting (Ohkawa et al., 1994; Pergola, 1992). Semirosetted plants develop when seedlings are grown at a constant 22 to 25°C or at temperatures less than 22°C at night and above 28°C during the day. Although semirosetted plants have one or more side shoots that many elongate and flower, they flower unpredictably and are of poor quality as cut flowers or potted plants. Thus, commercial production of lisianthus for late spring or summer sales is limited by high temperatures in many areas of the United States and other countries. Fall plug production to produce flowering plants for early spring sales also is difficult due to rosetting of plugs caused by the interaction of high temperatures and short days (Harbaugh, 1995). 'Maurine Blue' is a heat-tolerant lisianthus developed at the Univ. of Florida's Gulf Coast Research and Education Center in Bradenton, FL. Seedlings have been produced at temperatures ranging from 28 to 31°C without rosetting.

Origin

'Maurine Blue' is the F₁ hybrid resulting from crossing inbred lines GCREC-P76 and GCREC-9104 (Fig. 1). GCREC-P76 was an F₄ selection of a cross between GCREC-8-57 and 'Yodel Pink'. GCREC-8-57 was a self-pollinated plant (S₁) selected from 'Tosen' for its ability to flower in the summer (35°C day) and for its basal and lower branching characteristics. The 'Yodel Pink' plant was a selection that flowered after seedlings were exposed to 28°C temperatures in a growth chamber. In addition to its heat-tolerant characteristics, it was used because of its bell-shaped flowers and overlapping petals. Growing conditions used to select F₁ to F₄ GCREC-P76 seedlings for resistance to heat-induced rosetting were 1) production during summer months under greenhouse conditions at ≥ 35°C day in the F₁; 2) exposure of 3- to 4-week-old seedlings to 28°C for 4 weeks in the F₂ and F₃; and 3) exposure of 17-day-old seedlings to 31°C for 5 weeks in the F₄. GCREC-9-104 was identified after 5 generations of self-pollination (S₅) from 'Blue Poppy'. Growing conditions used to select S₁ to S₅ generations for heat tolerance were 1) production of plants under summer greenhouse conditions in the S₁ and S₂; 2) exposure

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of seedlings to 28°C for 4 weeks in the S₃ and S₄; and 3) exposure of seedlings to 31°C for 5 weeks in the S₅.

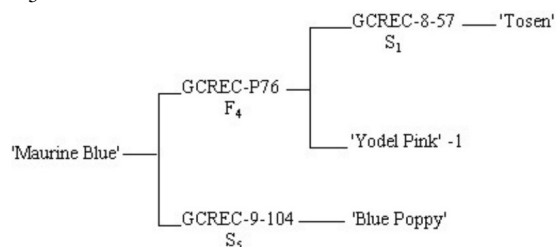


Figure 1. Pedigree for 'Maurine Blue' lisianthus.

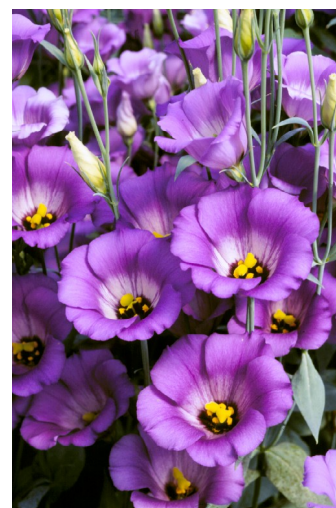


Figure 2. An array of 'Maurine Blue' lisianthus. Credits: Harbaugh

Description

'Maurine Blue' tolerated greenhouse production temperatures year-round in Bradenton in 1994 with 0% to 6% rosetting (Table 1) even though day maximum summer and fall readings reached 35°C and night temperatures were rarely below 22°C (18°C minimum). During this evaluation, 'Maurine Blue' plants ranged from 38 to 58 cm in height (depending on planting date) and were 4 to 21 cm shorter than 'Flamenco Blue' and 'Yodel White'. 'Maurine Blue' flowered 87 and 120 days following sowing on 13 June and 13 Dec., respectively. 'Maurine Blue' can be considered an early flowering cultivar since it flowered earlier than typical commercial cultivars, such as 'Flamenco Blue' or 'Yodel White'.

When seeds of 'Maurine Blue', 'Blue Lisa', and 'Heidi Deep Blue' were planted on 5 Jan. at Bradenton and 17-day-old seedlings were grown at a constant 31°C for 5 weeks, no 'Maurine Blue' plants rosetted. However, all 'Blue Lisa' and 'Heidi Deep Blue' plants were semirosetted or rosetted (Table 2). 'Maurine Blue' plants were intermediate in height when compared to 'Blue Lisa' (a dwarf cultivar) and 'Heidi Deep Blue' (for cut flowers). There were more basal breaks (lateral stems forming from the first four to five leaf pairs before bolting) and lower breaks (lateral stems forming on the central flowering stem before the first flower bud) on 'Maurine Blue' plants compared to 'Heidi Deep Blue' or 'Blue Lisa'. 'Maurine Blue' had 40 ± 6 open flowers and buds 1 week after the first flower opened.

'Maurine Blue' flowers acropetally with a "tier-type" display of some cut flowers that concentrates most of the flowers on top of the plant. Flowers are bell shaped when open with a petal length of 5.5 ± 0.1 cm. When flowers first open, petals are violet-blue [Royal Horticultural Society (RHS) violet-blue group 89C; RHS, 1966] on the adaxial petal surface, diffusing to a variegated 1.8 ± 0.2-cm white band (RHS white group 155C) at the base of the petals. As flowers mature, petal color darkens to violet (RHS violet group 86A) and the white band fades or completely disappears. The abaxial petal surface is a lighter violet (RHS violet group 86B). The center of the flowers (i.e., base of the petals surrounding the ovary) is a dark purple (RHS purple group 79A).

Characteristics and Use

'Maurine Blue' ranged in height from 51 to 67 cm during 1994 and 1995 production trials in Bradenton and is intermediate in plant height when compared to commercial dwarf and cut flower cultivars. To our knowledge, it is the first heat-tolerant lisianthus cultivar of this height. 'Florida Blue', a semi-dwarf, heat-tolerant lisianthus cultivar, was released from our lisianthus breeding program in July 1995 (Harbaugh et al., 1996).

Growth retardants are necessary for production of 'Maurine Blue' in pots 12 to 15 cm in diameter. Plant height was 50 ± 2.5 cm following foliar applications of butanedioic acid mono

(2,2-dimethylhydrazide) (daminozide) at 500 mg·L⁻¹ 3 weeks later. These plants were produced in 11.5-cm square pots (0.65-L) provided with capillary mat irrigation. Average plant height was 40 ± 2 cm for 'Maurine Blue' plants treated with (2RS,3RS)-1-(4-chlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-yl)penten-3-ol (paclobutrazol) at 0.25 mg a.i./pot applied as a soil drench when plants were to 7 cm tall.



Figure 3. 'Maurine Blue' Lisianthus.

While 'Maurine Blue' has more basal and lower branches than many commercial cultivars now forced in pots, three to four plugs per 12- to 15-cm-diameter pot are suggested for optimal marketing display. Although this cultivar is intended to be used as a tall bedding plant or flowering potted plant, 'Maurine Blue' grown without growth retardants has a height suitable for the bouquet-cut flower market.

Availability

Plugs of 'Maurine Blue' will be offered for sale through Earl J. Small Growers, Pinellas Park, FL. Scientists interested in seed for research purposes can contact Dr. Harbaugh.

Literature Cited

Harbaugh, B.K. 1995. Flowering of *Eustoma grandiflorum* (Raf.) Shinn. Cultivars influenced by photoperiod and temperature. *HortScience* 30:1375-1377.

Harbaugh, B.K., M.S. Roh, R.H. Lawson, and B. Pemberton. 1992. Rosetting of lisianthus cultivars exposed to high temperatures. *HortScience* 27:885-887.

Harbaugh, B.K., J.W. Scott, and D.B. Rubino. 1996. 'Florida Blue' Semi-Dwarf Lisianthus [*Eustoma grandiflorum* (Raf.) Shinn.]. *HortScience* 31:1057-1058.

Ohkawa, K., A. Kano, K. Kanematsu, and M. Korenaga. 1991. Effects of Air Temperature and Time on Rosette Formation in Seedlings of *Eustoma grandiflorum* (Raf.) Shinn. *Scientia Hort.* 48:171-176.

Ohkawa, K., T. Yoshizumi, M. Korenaga, and K. Kanematsu. 1994. Reversal of Heat-induced Rosetting in *Eustoma grandiflorum* with Low Temperatures. *HortScience* 29:165-166.

Pergola, G. 1992. The Need for Vernalization in *Eustoma russellianum*. *Scientia Hort.* 51:123-127.

Royal Horticultural Society. 1966. Royal Horticultural Society Colour Chart. Royal Hort. Soc., London.

Table 1. Response of lisianthus cultivars grown under greenhouse conditions in Bradenton, FL (lat. 27.5°N), with four planting dates from 13 Dec. 1993 to 12 Sept. 1994.

Cultivar	Days sown								
	14 Mar.			13 June			12 Sept.		
	Rosette ^z (%)	Plant ^y ht (cm)	Days to flower ^y	Rosette ^z (%)	Plant ^y ht (cm)	Days to flower ^y	Rosette ^z (%)	Plant ^y ht (cm)	Days to flower ^y
Maurine Blue	0	38	89	6	57	87	0	58	112
Flamenco Blue	62	43	102	47	61	105	33	79	130
Yodel White	53	47	95	75	66	107	38	71	123
LSD 0.05		5	2		6	5		9	8

^z Percentage of rosette or semirosette plants, n = 32.
^y Data of plant height and days to flower were for non-rosetted plants. Values represent the means of eight replications of single-plant experimental units arranged in a randomized complete-block design.

Table 2. Growth and flowering characteristics of lisianthus cultivars grown in 11.5-cm square pots (0.65-L) with capillary mat irrigation after exposure of seedlings to control or high temperatures^z.

Cultivar	Rosette (%) ^y		Plant ht (cm) ^x	Breaks ^x		Flowers and buds ^x
	Control	31C		Basal	Lower	
Maurine Blue	0	0	67	3.5	4.5	40
Heidi Deep Blue	0	100	81	0.2	2.9	32
Blue Lisa	12	100	34	1.6	2.8	44
LSD 0.05			6	1.1	0.8	12

^z Seedlings were grown in a greenhouse with a high of 28 to 33°C day and a low of 13 to 15°C night (control), or 17-day-old seedlings were exposed to 31°C for 5 weeks in a growth chamber and then flowered in the greenhouse.
^y Percentage of rosette or semirosette plants, n = 25.
^x Vegetative and flowering characteristics were for non-rosetted control plants. Values represent the means of eight replications of single-plant experimental units arranged in a randomized complete-block design.