

'Florida Pink' and 'Florida Light Blue' – Semi-dwarf Heat-tolerant Cultivars of Lisianthus

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'Florida Blue' was released in 1995 as a blue flowering, semi-dwarf, and heat-tolerant cultivar of lisianthus [*Eustoma grandiflorum* (Raf.) Shinnery; Gentianaceae Juss.] developed at the University of Florida's Gulf Coast Research and Education Center, Bradenton, FL (Harbaugh et al., 1996). It was the first semi-dwarf cultivar whose seedlings could be grown at 28 to 31°C without rosetting. Seedlings of commercial cultivars of lisianthus form rosettes when grown at 25 to 28°C (Harbaugh et al., 1992; Ohkawa et al., 1991). Rosetted plants have a basal cluster of leaves, very short internodes typical of biennials, and do not bolt or flower for 3 to 6 months unless exposed to ≤ 15 to 18°C for 3 to 4 weeks (Ohkawa et al., 1994; Pergola, 1992). Semi-rosetted plants develop when seedlings are grown at a constant 22 to 25°C or a <22°C nights with >28°C days. Although semi-rosetted plants have one or more side shoots that may 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. Also, rosetting of plugs caused by the interaction of high temperatures and short days makes fall plug production to produce flowering plants for early spring sales difficult (Harbaugh, 1995). 'Florida Pink' and 'Florida Light Blue' are F₁ semi-dwarf, heat-tolerant, low rosette-forming lisianthus similar to 'Florida Blue', but are shorter and more compact, and provide different flower color selections in the Florida cultivar-group.

Origin

'Florida Pink' is an F₁ hybrid resulting from crossing inbred lines UF95-309 and UF95-321 (Fig. 1A). UF95-309 was the F₆ selection of a cross between two 'Yodel Pink' plant chosen for lower branching characteristics and vivid pink flower color. The F₁ of the cross produced a dwarf plant that was improved over six generations. UF95-321 was the F₄ selection of a cross between UF92-80 (the F₃ selection from two 'Yodel Pink' plants) and UF92-17 (the F₅ selection of 'Double Light Blue' and UF7-53). 'Double Light Blue'-1 was chosen for its strong stems, basal branching, and large flowers. UF7-53 resulted from selfing of 'Blue Poppy'-2, which was selected for its short, lower branching habit and ability to flower in the summer (35°C day).

'Florida Light Blue' is an F₁ hybrid resulting from crossing inbred lines UF95-459 (the F₄ selection of a cross between UF92-17 and 'Blue Lisa') and UF95-858 (the F₅ of a cross between UF8-21 and 'Mermaid Blue') (Fig. 1B). 'Blue Lisa' was chosen for its early flowering and dwarf characteristics. UF8-21 was selected after three generations of self-pollination of 'Blue Poppy'-2, and 'Mermaid Blue' was chosen for its lower branching dwarf characteristics.

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 $\leq 35^\circ\text{C}$, 2) exposure of 3- to 4-week-old seedlings to 28°C for 4 weeks for initial selections in early generations,

and 3) exposure of 17-day-old seedlings to 31°C for 5 weeks for selection of final parents used in F₁ 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.

'Florida Blue' flower petals are a violet blue (90C) on the adaxial petal surface, diffusing to a variegated 1.6 to 2.0-cm white band at the base of the petals. As the flower matures, the petal color darkens to dark purple (79A) and white band fades or completely disappears. The abaxial petal surface is a lighter violet (90D) and then darkens to purple (86B) as the flower matures.

'Florida Pink' petals are light pink (65B) on the adaxial surface. The abaxial surface is a lighter pink (65D). The eyespot is a dark red-purple (61A).

'Florida Light Blue' petals are violet-blue (90D) on the adaxial surface. The abaxial surface is a dark violet-blue (89B).

Characteristics and use

Cultivars used in our research belonged to four cultivar-groups. Cultivars in the Lisa and Mermaid cultivar-groups are dwarf, while cultivars in the Tiara and Florida cultivars are semi-dwarf. 'Florida Blue' was the only cultivar that was known to have heat-tolerance and low rosette formation. Seeds of all cultivars were planted on 13 Dec. 1995, at Bradenton. Seventeen-day-old seedlings were grown either at a constant 31°C for 5 weeks or in a greenhouse (control) with a high of 33 to 35°C day and 13 to 15°C night. Seedlings exposed to 31°C were rated as rosette 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 lower branches (lateral stems forming on the central stem below the first flower bud), total number of flowers and buds per plant after three flowers were open, and the number of days from sowing to flowering.

The most important and distinguishing attribute of all the Florida cultivar-group cultivars as compared with dwarf and semi-dwarf commercial lines was their heat tolerance (Table 1). The range in rosetting for Florida cultivars exposed to 31°C was 0 to 12%. However, 42% of 'Lisa Pink' seedlings and 100% of the other commercial cultivars exposed to 31°C rosetted. While most of the cultivars did not rosette in the control greenhouse, 33%, 25%, and 38%, respectively, of 'Mermaid Blue', 'Mermaid Pink', and 'Tiara Pink' plants rosetted.

In addition to heat tolerance, we considered that the two new Florida cultivars had enough similarities in flower form and display, branching habit, and in the number of days from sowing to flowering in comparison with 'Florida Blue', that they could be included in a Florida cultivar-group to expand the range of flower colors. Notable differences (Table 1) between 'Florida Blue' and the two new Florida cultivars when evaluated in 1997 were that 'Florida Blue' was significantly taller and had more flowers and buds.

Florida cultivars are intended to be used as bedding plants or for flowering potted plants. Treatment with growth retardants is necessary for production of Florida cultivars in ≤ 11.5 -cm-diameter pots (Harbaugh et al., 1998). One to three plugs per 7.6-to 11.5 cm-diameter pot is recommended for optimal marketing display.

Availability

Seed of the Florida cultivar-group will be offered for sale through PanAmerican Seed Co., West Chicago, IL. Scientists interested in seed for research purposes should contact Dr. Harbaugh.

Table 1. Percent rosette plants^z and growth and flowering characteristics^y of nine cultivars of *lisianthus* grown in 11.5-cm-square pots (0.65-L) with capillary mat irrigation at Bradenton, FL.

Cultivar	Rosette (%)		Plant ht ^x		Lower branches ^w (no.)	Flowers and buds (no.)	Days to flower (no.)
	31°C	Control	1 (cm)	2 (cm)			
<i>Florida cultivar-group</i>							
'Florida Blue'	0	0	30	43	9.4	82	128
'Florida Light Blue'	12	0	23	35	7.8	54	125
'Florida Pink'	4	0	20	33	7.7	53	127
<i>Lisa cultivar-group</i>							
'Lisa Blue'	100	0	14	27	6.8	51	111
'Lisa Pink'	42	0	17	31	4.8	41	107
<i>Mermaid cultivar-group</i>							
'Mermaid Blue'	100	33	20	30	7.7	43	127
'Mermaid Pink'	100	25	18	27	8.8	50	128
<i>Tiara cultivar-group</i>							
'Tiara Blue'	100	0	29	41	11.6	63	131
'Tiara Pink'	100	38	29	43	7.5	50	128
LSD _{0.05}			3	4	2	13	3

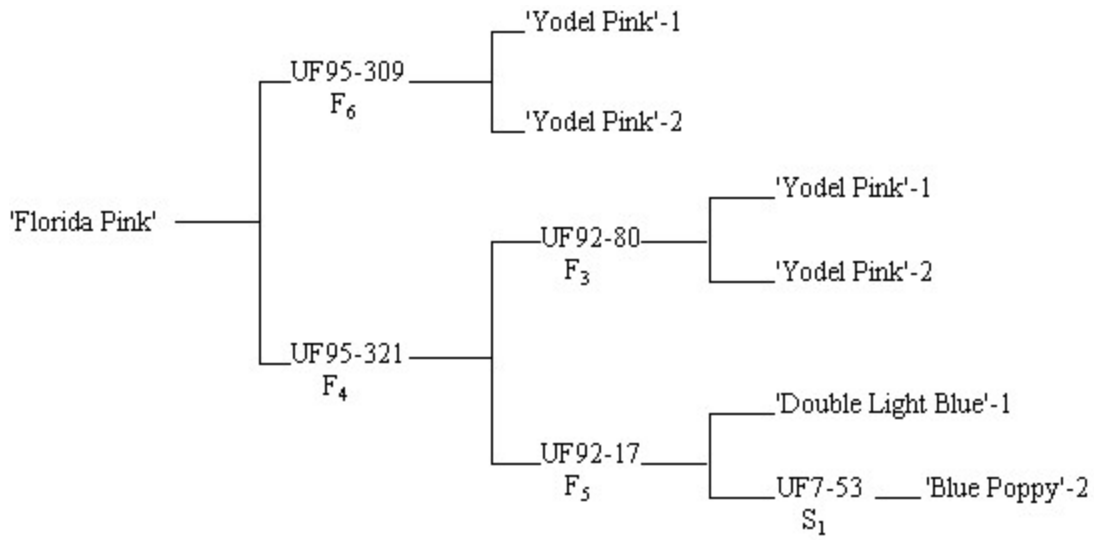
^zSeventeen-day-old seedlings were grown in a greenhouse at 33 to 35°C day and 13 to 15°C night (control), or exposed to 31°C for 5 weeks in a growth chamber and evaluated after 4 weeks for percentage of rosette plants, n = 24.

^yVegetative and flowering characteristics were for nonrosetted control plants. Values are means of six replications of single-plant experimental units arranged in a completely randomized design.

^xPlant height 1 = distance from the pot rim to the base of the first opened flower; plant height 2 = distance from the pot rim to the tip of the highest bud measured after three flowers had opened. No growth regulators were used.

^wLateral stems originating on the central flowering stem (bolted stem) but below the first flower bed.

1A



1B

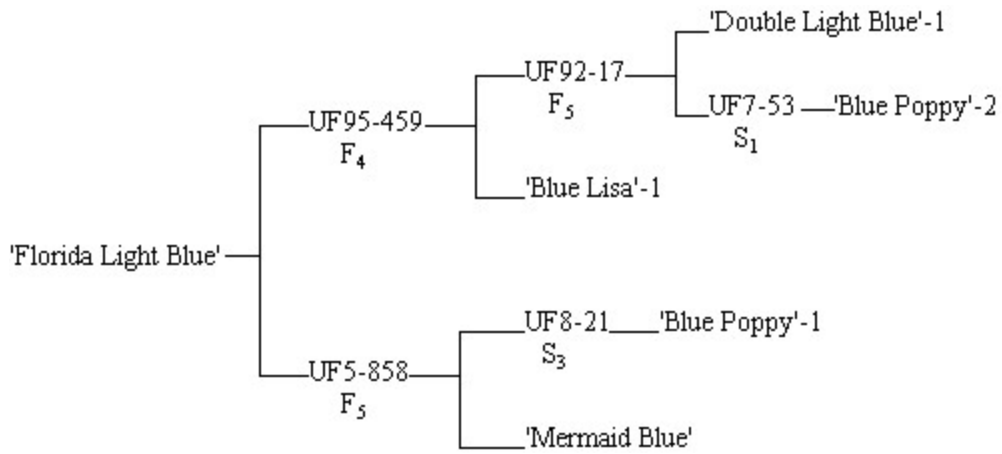


Fig. 1. Pedigrees of (A) 'Florida Pink' and (B) 'Florida Light Blue' lisianthus.

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