

# Ornamental Section

Proc. Fla. State Hort. Soc. 108:1-3. 1995.

## AN EVALUATION OF THE PELFI POINSETTIA CULTIVARS GROWN IN FLORIDA

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*Additional index words.* Ornamentals, *Euphorbia pulcherrima*.

**Abstract.** Eight poinsettia cultivars of the European developed Pelfi series ('Bonita', 'Cortez', 'Flirt', 'Maren', 'Nobelstar', 'Picacho', 'Puebla', and 'Sonora') and two commercial cultivars ('Freedom' and 'Supjibi') were grown in a mesh shadehouse in Bradenton (BDTN). The Pelfi cultivars were also grown in a glasshouse at Gainesville (GVL). Single plants were grown in 6-inch pots, pinched to six nodes, provided long-day lighting until 5 Oct. at BDTN and until 14 or 21 Oct. at GVL and evaluated at flowering. At BDTN days to first bract color ranged from 41.3 ('Picacho') to 63.7 ('Puebla'), to marketable ranged from 49.0 ('Maren') to 68.2 ('Puebla'), and to anthesis ranged from 55.6 ('Picacho') to 68.2 ('Puebla'). Number of days for 'Freedom' to attain these development stages were 40.0, 47.8, and 57.1, respectively. Extremes of plant height of the Pelfi cultivars at BDTN were 10.8 inches ('Cortez') to 13.9 inches ('Bonita') and of inflorescence diameter were 8.5 inches ('Puebla') to 12.0 inches ('Maren').

Preliminary observations on post production qualities indicated that 'Puebla' had the best leaf retention while 'Bonita' exhibited the worst. The most promising cultivars for use in Florida were 'Maren' (early pink), 'Sonora' (dark red) and 'Nobelstar' (medium rose).

Poinsettia (*Euphorbia pulcherrima* Willd.) production in Florida and other subtropical areas of the world has increased significantly over the past 10 years, further establishing poinsettias as the number one flowering potted plant during the Christmas holidays. In 1994 57.3 million flowering poinsettias were sold in containers in the United States (U.S. Dept. Agr., 1995), with a value of \$205.8 million. Of this total Florida produced 3.37 million flowering poinsettias, with a value of \$10.23 million, which was a 25% increase over 1993. The major red cultivars grown in Florida were 'Eckespoint Freedom', 'Gross Supjibi', and 'Gutbier V-14 Glory', all of which have been developed and introduced since 1981. Poinsettia seedling and cultivar evaluations at the University of Florida during the past 25 years have identified genotypes which are better adapted to Florida's environmental and cultural conditions (Nell and Whealy, 1991; Wilfret, 1981, 1994; Wilfret and Sheehan, 1982; Wilfret et al., 1995), and have contributed to

the production of the above three cultivars by Florida growers. A new series of poinsettias, called Pelfi, were developed by European breeders, introduced to the United States by Fischer in 1994, and made available in limited quantities to researchers and growers. The purpose of this research was to evaluate the poinsettia cultivars of the Pelfi series and to compare them with standard commercial cultivars when grown in a shadehouse at Bradenton and a glasshouse in Gainesville, FL.

### Materials and Methods

**Bradenton.** Single poinsettia cuttings (Table 1), which were established in Oasis<sup>®</sup> blocks, were planted in 6-inch diameter plastic pots (1.6 qt.) on 6 Sep. 1994, pinched to six nodes on 16 Sep., and provided long day photoperiods with incandescent lights (8 ft-c) from 2200 to 0200 hr from 16 Sep. to 5 Oct. Established plants were drenched (5 oz.) with ancymidol (A-Rest<sup>®</sup>) at 0.25 mg ai/6-inch pot on 10 Oct. Soil medium consisted of a mixture of Florida sedge peat, coarse white builder's sand, coarse vermiculite, and perlite (6:2:3:1, v/v). Soil medium amendments (per yd<sup>3</sup>) were 18 lb of Nutricote<sup>®</sup> 13N-10.8P-5.6K (100 day), 7.5 lb of dolomitic limestone, 7.5 lb of granular calcium carbonate, 3 lb of hydrated lime, 5 lb of single superphosphate, and 1.5 lb of Nutrilite<sup>®</sup>, a minor element mixture. Initial pH was 6.2. After planting the cuttings, the medium was drenched with 5 oz of Banrot<sup>®</sup> [5-ethoxy-3-trichloromethyl-1,2,4-thiadiazole (15%) plus dimethyl 4,4-O-phenylenebis (25%)] at 4 oz/100 gal. Plants were grown at ambient temperatures on capillary mat beds in a shadehouse covered with black polypropylene mesh to exclude 25% of ambient light. Light intensity was between 6,000 and 7,000 ft-c during the crops. Plants were spaced three across on 15-inch centers on 3.3-foot wide beds and the medium was drenched with 5 oz of a soluble 20N-16.6P-8.7K fertilizer. Plants were protected from insects, mites, and diseases by a weekly spray program. In addition, one quarter teaspoon of Marathon<sup>®</sup> insecticide (imidocloprid, 1-[(6-chloro-3-pyridingl)methyl]-N-nitro-2-imidazolidinimine) was applied to the medium on 23 Sep. to control the whitefly population. Data collected included date the first true bract was in full color, the date when five bracts were in color (marketable), and date of anthesis. Vegetative and floral measurements, which included plant height and diameter and inflorescence diameter, were taken on 9 Dec. The experimental design was a randomized complete block, with three replications of three pots each. ANOVA was computed for recorded data and means were separated by least significant differences (LSD).

**Gainesville.** Rooted Oasis<sup>®</sup> cuttings were planted on 2 Sep. 1994, pinched to seven nodes on 16 Sep., and grown under long days until either 14 or 21 Oct. Single plants were grown in 6-inch diameter pots which contained Metro 500<sup>®</sup> medium. Plants were fertilized with Peter's<sup>®</sup> 20N-8.3P-8.7K at 300 ppm N at every watering. Plants were grown on 12-inch cen-

Table 1. Floral and vegetative description of poinsettia cultivars.

Cultivar	Bract Characteristics			
	Color	Shape	Texture	Leaf Color
Pelfi Bonita	Dark Blue Red	Elliptical	Rippled	Med. Green
Pelfi Cortez	Medium Red	Dentate	Smooth	Med. Green
Pelfi Flirt	Light Pink	Elliptical	Rippled	Med. Lt. Green
Pelfi Maren	Medium Pink	Elliptical	Rippled	Med. Lt. Green
Pelfi Nobelstar	Claret Rose	Elliptical	Rippled	Med. Green
Pelfi Picacho	Deep Blue Red	Elliptical	Rippled	Med. Green
Pelfi Puebla	Rose/Creme	Elliptical	Rippled	Lt. Green
Pelfi Sonora	Medium Red	Dentate	Sl. Smooth	Dark Green
Eckespoin Freedom	Dark Red	Dentate	Sl. Smooth	Dark Green
Gross Supjibi	Med. Rose Red	Ovoid	Sl. Smooth	Med. Green

ters on raised benches in a glasshouse with approximately 5000 ft-c of light and temperatures were maintained at 75 F day/64 F night. Pots were spaced in a randomized complete block design with three replications of two pots per replication. Data included plant height, plant diameter, and inflorescence diameter. On 9 Dec. plants from the 21 Oct. short day treatment were sleeved, boxed, and held for 3 days at 65°F. Plants were removed from the boxes on 12 Dec. and placed in interior rooms maintained at 70°F at a light level of 70 ft-c (12 hours daily). Leaf counts were made after 15 and 30 days in the rooms. Data were analyzed in a factorial analysis for vegetative and floral characteristics. Standard errors of the means for leaf abscission were determined.

### Results and Discussion

**Bradenton.** The fall of 1994 was characterized by normal rainfall but with warmer temperatures late in the season than the 30 year average (Stanley, 1995). Number of days to first bract in full color from start of short days ranged from 40.0 to 63.7 days, represented by 'Freedom' and 'Puebla', respectively (Table 2). 'Bonita', 'Picacho', and 'Supjibi' were as early to exhibit bract color as 'Freedom', whereas the remaining Pelfi cultivars showed bract color between 44.1 and 48.5 days. 'Supjibi' (47.1 days) and 'Freedom' (47.8 days) were the earliest cultivars to be marketable. Four of the Pelfi cultivars ('Bonita', 'Maren', 'Nobelstar', and 'Picacho') were marketable between 49.0 and 49.3 days and three ('Cortez', 'Flirt', and 'Sonora') were marketable between 55.5 and 56.2 days. 'Puebla' was the latest cultivar and was marketable at 68.2 days. Number of days to anthesis, which has often been used

as a reference for the marketable date (Ecke et al., 1990; Larson et al., 1978; Martens and Pyle, 1993), was generally 4 to 10 days later than the marketable stage established in this study. Days to anthesis ranged from 55.6 ('Picacho') to 68.2 days ('Puebla'), with all of the remaining cultivars reaching anthesis less than 60.3 days.

Plant heights ranged from 10.8 to 13.9 inches, represented by 'Cortez' and 'Bonita', respectively (Table 3). Since most retailers require the overall height of poinsettias to be 18 inches or less, a plant height of 11 to 13 inches above the pot rim was considered ideal. 'Bonita', 'Puebla', and 'Sonora' were taller than 13 inches and would require more growth retardant to be acceptable. Plant diameters ranged from 17.4 ('Cortez') to 22.8 inches ('Bonita'), which were indicative of the growth habit of the two cultivars. 'Cortez' had an upright growth while 'Bonita' had a multi-level spreading habit. 'Sonora' also had an upright growth habit whereas the remaining Pelfi cultivars were similar to 'Bonita'. Both 'Freedom' and 'Supjibi' had a mounded upright growth. Inflorescence diameter of all cultivars was similar except for 'Cortez' and 'Puebla', which were significantly smaller. 'Cortez' had smaller bracts which had a tendency to droop while 'Puebla' had smaller and fewer bracts that were late to develop color and size. Bract colors ranged from the variegated rose on creme of 'Puebla' to the deep blue-red of 'Bonita' and 'Picacho'. The latter cultivars looked dull, especially when placed under fluorescent lights. 'Cortez' and 'Sonora' have bracts of an orange-red color. 'Flirt' has lighter pink bracts than 'Maren' and fades in high temperature/high light intensity conditions. When the older bracts fade and the new bracts develop, the inflorescence has a two-tone look. 'Maren' did not fade. 'Nobelstar' had an unusual claret-rose bract color that remained intense through anthesis.

Table 2. Number of days to first bract color, marketable, and anthesis of poinsettia cultivars grown in a shadehouse at Bradenton, FL.

Cultivar	Number of Days From Start of Short Days		
	First Bract Color	Marketable <sup>a</sup>	Anthesis
Bonita	41.9	49.1	56.8
Cortez	46.2	56.2	60.3
Flirt	48.5	55.5	56.9
Maren	45.1	49.0	55.9
Nobelstar	44.1	49.3	57.1
Picacho	41.3	49.1	55.6
Puebla	63.7	68.2	68.2
Sonora	46.2	55.9	59.7
Freedom	40.0	47.8	57.1
Supjibi	40.2	47.1	56.9
LSD ( $\alpha=0.05$ )	3.1	2.6	2.8

<sup>a</sup>Determined when five colored bracts were expanded.

Table 3. Vegetative and floral dimensions of poinsettia cultivars grown in a shadehouse at Bradenton, FL.

Cultivar	Plant Height (inches)	Plant Diameter (inches)	Inflor. Diameter (inches)
Bonita	13.9	22.8	11.6
Cortez	10.8	17.4	9.4
Flirt	12.6	19.8	11.3
Maren	13.1	20.9	12.0
Nobelstar	11.9	18.4	11.2
Picacho	11.1	18.5	11.1
Puebla	13.3	18.1	8.5
Sonora	13.4	19.1	10.6
Freedom	12.1	19.8	11.1
Supjibi	12.5	19.7	12.2
LSD ( $\alpha=0.05$ )	1.8	2.2	2.0

Table 4. Vegetative and floral characteristics of poinsettia cultivars grown in a glasshouse in Gainesville, FL.

Cultivar	Plant Height (inches)	Plant Diameter (inches)	Inflor. Diameter (inches)
SD on 14 Oct.			
Bonita	11.6	23.6	16.1
Cortez	13.2	26.8	17.1
Flirt	12.0	24.4	16.5
Maren	12.2	23.6	17.5
Nobelstar	12.8	24.2	16.9
Picacho	11.6	22.6	15.0
Puebla	15.0	25.4	14.6
Sonora	13.8	20.5	15.0
SD on 21 Oct.			
Bonita	13.4	24.6	15.9
Cortez	13.4	25.6	16.3
Flirt	13.0	27.4	16.1
Maren	12.6	24.2	17.1
Nobelstar	12.8	26.0	17.1
Picacho	12.0	23.6	15.4
Puebla	14.0	24.8	12.0
Sonora	13.8	21.8	15.2
Factorial Analysis Pr>F			
Cultivar	NS	0.0001	0.0001
Short Day Date	NS	NS	0.0094
Cultivar × Date	NS	NS	NS

*Gainesville.* Although plants grown in the greenhouse were not treated with growth retardants, they did not grow excessively tall, even with the extended long day treatments. Temperatures were cooler in Gainesville with night temperatures 5 to 6°F below those at Bradenton. ‘Picacho’ was numerically the shortest cultivar in both light treatments (Table 4) but ‘Bonita’ was of a similar height when short days were initiated on 14 Oct. Three cultivars (‘Cortez’, ‘Puebla’, and ‘Sonora’) were taller than the optimum 13 inches when short days were started on 14 Oct. and four (‘Bonita’, ‘Cortez’, ‘Puebla’, and ‘Sonora’) were too tall when short days started on 21 Oct. Growth retardants would be necessary for all of these cultivars, even when grown with cooler temperatures. Plant diameters were similar among the cultivars except for the smaller ‘Sonora’, which was indicative of its upright growth. ‘Puebla’ had the smallest inflorescence, which reflected both the smaller and fewer bracts and the lateness of bract development. No differences were evident in cultivar-date interaction.

Post-production results indicate that major differences existed in the leaf retention of the cultivars (Table 5). After 14 days in the interior room ‘Bonita’ had lost 50% of its leaves while ‘Puebla’ had lost only 10%. The remaining cultivars fell within two groups: 1) those that lost 15.5 to 17.5% of their leaves (‘Flirt’ and ‘Cortez’); and 2) those that lost 21.5 to 26.5% (‘Maren’, ‘Picacho’, and ‘Sonora’). After 28 days, the

Table 5. Post-production leaf drop under interior conditions.

Cultivar	Leaf Drop (14 days)		Leaf Drop (28 days)	
	%	SE <sup>a</sup>	%	SE
Bonita	50.0	10.0	58.5	8.5
Cortez	17.5	5.5	22.5	6.5
Flirt	15.5	3.5	19.0	3.5
Maren	21.5	6.5	26.0	9.0
Picacho	22.0	2.0	31.5	8.5
Puebla	10.0	4.5	14.5	3.0
Sonora	26.5	2.0	37.5	5.0

<sup>a</sup>Standard error of means.

cultivars graded into the same categories as at 14 days but it was evident that most of the leaf drop occurred within the first 14 days. Bract necrosis was observed on all cultivars and appeared to be more prevalent on ‘Bonita’, ‘Maren’, ‘Nobelstar’, and ‘Picacho’. Further research needs to determine if these cultivars are more susceptible to bract necrosis than ‘Freedom’, ‘Supjibi’, or ‘V-14 Glory’.

Evaluation of the Pelfi cultivars at both Florida locations indicate that ‘Maren’, ‘Nobelstar’, and ‘Sonora’ show the most promise under Florida environmental conditions. ‘Maren’ and ‘Nobelstar’ have a multi-level growth habit similar to ‘Gutbier Angelica’, with elongated, elliptical, slightly rippled bracts and medium green leaves. ‘Sonora’ has an up-right growth with medium-large dentate bracts that are intertwined with medium-dark green dentate leaves. These cultivars need to be evaluated further as stock plants for cutting production and in 4 to 6-inch containers.

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