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FORT LAUDERDALE TRIAL GARDEN—YEAR 3

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Abstract. **Rooted cuttings of vegetatively propagated annuals from Danziger "Dan" Flower Farm, Fides North America, Euro American (Proven Winners), and Fischer were planted over three planting dates (26 August, 21 October, and 8 December, 2004). The plants were planted as three groups of six plants, with the groups being randomly placed in the garden. All of the cutlivars were planted under 30% shade. Plants were watered three times per week for 30 minutes using overhead irrigation. Monthly evaluations were conducted to record plant height, plant width, flower number, number of plants with flowers, insect and disease damage, and quality rating. Quality was rated on a scale of 0 to 5 with 5 = top performance, 3 = plants of interest, 1 = poor performance, and 0 = dead. One consumer preference survey was conducted with in March 2005. Results from the consumer preference survey and from the monthly quality ratings are presented in the text.**

The winter trial garden at the University of Florida's Fort Lauderdale Research and Education center is in its third year (Moore et al. 2003, 2004). Because of the ideal weather in Fort Lauderdale during the winter (26.1 N, 80.2 W, AHS Heat Zone 11, USDA Hardiness Zone 10a), the trial garden was developed to assist bedding plant companies who wish to trial vegetatively propagated cultivars before summer trials in the rest of the nation. The goal of the statewide program is to develop unbiased evaluations of cultivar performance of both vegetative and seed grown annuals and perennials. The trial garden in 2004–2005 also investigated the effect of different planting times on overall quality and performance.

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Materials and Methods

Transplant production. Rooted liners from commercial companies were transplanted into 400 mL round pots filled with Pro-mix 'BX' (Premier Horticulture Inc, Red Hill Pa.). After transplanting, plants were placed in an open-sided greenhouse exposed to ambient air temperatures of ≈30°C day/21°C night. Plants were watered daily and fertilized twice a week with 150 $mg \cdot kg^{-1}$ of nitrogen (N) from Peter's 21N-2.2P-16.6K (The Scotts Company, Marysville, Ohio).

Cultivars were placed in the greenhouse in July 2004 [Danziger "Dan" Flower Farm (Israel)], September [Fides North America (Costa Rica) and Euro American/Proven Winners (Bonsall, CA.)], and October [Fischer (Boulder, Colo.)] (Table 1).

Field evaluation. The 100 ft x 100 ft garden has a Margate fine sand soil with 1.6% organic matter, a pH of 6.74, a soluble salt level of 0.30 $mS \cdot cm^{-1}$, a NO_3-N concentration of 9.00 $mg \cdot kg^{-1}$, a NH_4-N concentration of 5.00 $mg \cdot kg^{-1}$, a P concentration of 27.00 $mg \cdot kg^{-1}$, and a K concentration of 3.7 $mg \cdot kg^{-1}$ (samples collected from top 6 inches of soil). Samples were

Table 1. Plants evaluated in the Fort Lauderdale Trial Garden in 2004. Cultivars from Danziger were planted in the garden on 26 Aug. 2004, those from Fides North America and Euro America were planted on 21 Oct. 2004, while cultivars from Fischer were planted on 8 Dec. 2004.

Company	Plant	Cultivar
Danziger "Dan" Flower Farm	Double impatiens	Musica
	New Guinea impatiens	Harmony Dark Orchid, Orange Cream, Red Glow
	Petunia	Purple
Fides North America	Osteospermum	Margarita
	New Guinea impatiens	Tamarinda
Euro America (Proven Winners)	Arctotis	Pumpkin Pie
	Bidens	Solaire Yellow
	Brachycome	Blue Zephyr
	Centradenia	Purple Showers
	Diascia	Trailing Red, Coral, Coral Belle, Appleblossom
	Euphorbia	Diamond Frost, Faded Jeans
	Geranium	Jolly Bee
	Gypsophila	Festival Star
	Heuchera	Crème Brulee, Key Lime Pie, Peach Pie,
	Heucherella	Gold
	Nemesia	Sunsatia
	Oenothera	Lemon Drop
	Oxalis	Zinfandel
	Phlox	Intensia
	Penstemon	Lilliput Rose
Fischer	Geraniums	Bright Cascade; Freestyle; Holiday; Reggae; Rocky Mountain; Sofie Cascade; Tango
	New Guinea impatiens	Sonic; Super Sonic

Table 2. Average mean air and soil temperature, solar radiation, and rainfall measured at the University of Florida's Fort Lauderdale Research and Education Center during winter 2004–2005. The Florida Automated Weather Network (http://fawn.ifas.ufl.edu) collected the weather data.

Month/Year	Avg. mean air temperature (°C)	Avg. mean soil temperature (°C)	Avg. mean solar radiation ($W \cdot m^{-2}$)	Monthly rainfall (inches)
August, 2004	28.2	29.7	223	0.46
September, 2004	27.0	27.7	166	12.56
October, 2004	25.1	26.2	181	3.22
November, 2004	22.8	23.9	151	0.47
December, 2004	19.4	21.5	129	1.76
January, 2005	19.2	20.3	149	1.16
February, 2005	19.8	20.9	161	0.48
March, 2005	20.5	22.5	216	4.20
April, 2005	24.9	24.8	261	1.73

analyzed by the University of Florida's soil testing laboratory. A 3-inch mulch layer was spread over the garden to help control weeds.

Plants from Danziger were planted into the garden on 26 Aug. 2004, plants from Fides and Euro American were planted on 21 Oct. 2004, and plants from Fischer were planted on 8 Dec. 2004. On each planting date, 18 plants of each cultivar were planted in the garden as three randomly placed groups of six plants per cultivar. All cultivars were planted in the 10,000 ft^2 area of 30% shade. At planting, each plant was top dressed with 5 g of Nutricote Total 18N-2.6P-6.6K type 70 (Florikan Corp., Sarasota, Fla.). Plants were watered overhead three times a week for 30 min with each pot receiving 150 to 200 mL of water.

Data collection. Monthly mean temperature and rainfall were collected. Once a month plant height, width, flower number, and quality were recorded for each individual plant in the garden. Plant quality was based on the appearance of the three groups of six plants of each cultivar and took into account the number of plants in flower in a group as well as uniformity in growth and appearance. Plant quality was based on a scale of 5 to 0 with 5 = top performance, 4 = strong display of color and good growth habit, 3 = plants of interest, 2 = plants are green and growing, 1 = poor performance, and 0 = dead.

One consumer preference survey also was conducted in which 68 participants were asked to check all of the cultivars that they liked. Percentages were calculated by dividing the number of individuals who selected a specific cultivar by the total number of respondents. The survey was conducted in Mar. 2005. Data were analyzed using analysis of variance and means separations were done using least significant difference tests at $P \leq 0.05$ (SAS Systems, SAS Institute, Cary, N.C.).

Results and Discussion

Weather. Temperatures during the winter of 2004–2005 were again fairly mild and dry (Table 2) and similar to the previous year (Moore et al., 2004). The Danziger plants also experienced the southern edge of two hurricanes in Sept. 2004 (Hurricane Frances and Jeanne), which increased our monthly rainfall for September (Table 2).

Table 3. Consumer preference survey and plant quality rating of Danziger "Dan" Flower Farm cultivars planted on August 26, 2004. Data was collected 60, 85, 146 and 197 days after planting (DAP).

Cultivar	Survey[z] (%)	Quality			
		Oct. 2004 60 DAP	Nov. 2004 85 DAP	Jan. 2005 146 DAP	Mar. 2005 197 DAP
Double impatiens Musica					
Bicolor Red	12	3.5	2.5	2.2	2.0
Dark Pink	16	3.3	2.7	2.8	2.0
Orange	9	3.0	2.3	2.0	2.0
Orange Glow	10	1.7	1.7	2.0	2.0
Red Double	13	2.0	2.8	2.7	2.0
Scarlet	7	3.0	2.7	2.5	2.0
Soft Pink	10	2.1	2.0	2.0	2.0
White Blush	13	2.3	2.0	2.2	2.0
Purple Petunia	15	3.1	2.3	2.0	2.0
New Guinea impatiens					
Harmony Dark Orchid	22	3.0	3.0	3.7	2.0
Harmony Orange Cream	15	3.0	2.5	2.8	2.0
Harmony Red Glow	21	2.1	2.5	2.5	2.0
LSD ($P \leq 0.05$)	8	1.5	1.4	1.3	0

[z]Consumer preference survey was conducted in March 2005. Results are based on the percentage of respondents who chose that cultivar as one that they liked. A total 68 surveys were completed.

Table 4. Consumer preference survey and plant quality ratings of Fides North America cultivars planted on October 21, 2004. Data was collected 4, 28, 60, 89, and 140 days after planting (DAP).

		Quality				
Cultivar	Survey[z] (%)	Oct 2004 4 DAP	Nov 2004 28 DAP	Jan 2005 89 DAP	Mar 2005 140 DAP	Apr 2005 186 DA
Osteospermum						
Margarita Carmen	66	3.5	3.2	4.2	4.5	3.0
Margarita Maria	50	3.7	2.3	3.2	4.5	3.0
Margarita Rosita	66	3.7	2.7	3.7	4.5	3.0
New Guinea impatiens						
Tamarinda Dark Salmon	10	3.7	2.7	3.8	3.0	2.0
Tamarinda Light Violet	7	3.2	3.2	4.0	3.0	2.0
Tamarinda Red	38	3.0	2.8	4.3	3.5	2.0
Tamarinda Scarlet Red	7	3.0	3.0	3.5	3.0	2.0
LSD ($P \leq 0.05$)	8	0.9	0.6	0.8	0.8	0.4

[z]Consumer preference survey was conducted in March 2005. Results are based on the percentage of respondents who chose that cultivar as one that they liked. A total 68 surveys were completed.

Table 5. Consumer preference survey and plant quality rating of Euro America (Proven Winners) cultivars planted on October 21, 2004. Data was collected 4, 28, 60, 89, and 140 days after planting (DAP).

		Quality				
Cultivar	Survey[z] (%)	Oct 2004 4 DAP	Nov 2004 28 DAP	Jan 2005 89 DAP	Mar 2005 140 DAP	Apr 2005 186 DAP
Arctotis 'Pumpkin Pie'	34	4.0	3.0	3.0	4.5	3.0
Bidens 'Solaire Yellow'	32	3.5	3.0	5.5	4.0	3.0
Brachycome 'Blue Zephyr'	40	2.7	2.0	4.0	4.5	4.0
Centradenia 'Purple Showers'	34	3.5	4.0	5.0	4.0	3.0
Diascia						
Appleblossom	19	3.8	3.0	2.3	1.7	2.7
Coral	22	3.3	3.3	3.7	2.5	2.3
Coral Belle	21	3.5	3.0	2.3	2.0	2.7
T railing Red	8	3.5	3.0	2.0	1.3	2.5
Euphorbia						
Diamond Frost	47	—	3.5	4.0	5.0	4.0
Faded Jeans	53	3.7	3.0	3.0	4.5	4.0
Geranium 'Jolly Bee'	12	4.0	2.0	2.0	4.0	2.0
Gypsophila 'Festival Star'	28	3.7	3.0	4.5	4.0	3.0
Heuchera						
Crème Brulee	10	4.0	3.0	4.0	4.5	4.0
Key Lime Pie	10	4.0	2.0	4.0	4.5	4.0
Peach Pie	18	3.0	2.5	4.0	4.0	3.0
Heucherella 'Gold'	7	4.0	3.0	4.0	4.0	3.0
Nemesia						
Sunsatia Coconut	7	3.0	2.7	4.3	2.7	1.0
Sunsatia Cranberry	4	2.7	2.0	0	—	—
Sunsatia Peach	18	3.2	2.3	4.2	3.8	1.0
Sunsatia Pineapple	4	2.7	1.8	0.5	—	—
Oenothera 'Lemon Drop'	28	3.5	3.0	4.0	3.0	3.0
Oxalis 'Zinfandel'	22	2.8	2.5	5.0	4.5	3.0
Phlox						
Intensia Lavender Glow	54	2.3	2.3	1.3	3.3	4.5
Intensia Lilac Rose	37	2.5	2.5	3.0	3.5	4.5
Intensia Neon Pink	62	2.7	2.7	3.0	4.0	4.5
Penstemon 'Lilliput Rose'	24	4.0	3.0	5.0	5.0	1.0
LSD ($P \leq 0.05$)	8	0.9	0.6	0.8	0.8	0.4

[z]Consumer preference survey was conducted in March 2005. Results are based on the percentage of respondents who chose that cultivar as one that they liked. A total 68 surveys were completed.

Plant Growth and Rating. All cultivars planted in the garden in 2004 did grow and show an increase in plant height, width, and flower number. This data is available on the Fort Lauderdale Trial Garden web site (http://flrec.ifas.ufl.edu/Tgrdn/trial_grdn_hm.htm).

Despite the two hurricanes, the Danziger cultivars continued to grow and flower. Best quality ratings were observed in Oct. 2004 for the majority of the cultivars (Table 3). Plant quality decreased over the following months. Although the Harmony New Guinea impatiens were not at peak quality for the March survey, approximately 20% of respondents did indicate that they liked the Harmony Dark Orchid and Harmony Red Glow New Guinea impatiens.

Table 6. Consumer preference survey and plant quality rating f Fischer cultivars planted on December 8, 2004. Data was collected 42, 93, and 139 days after planting (DAP).

		Quality		
Cultivar	Survey[z] (%)	Jan 2005 42 DAP	Mar 2005 93 DAP	Apr 2005 139 DAP
Geranium				
Bright-Cascade	19	3.5	4.2	3.3
Freestyle Artic Red	37	2.8	4	3.0
Graffiti Pink	41	3.3	5	3.3
Holiday Purple Dream	32	3.8	4.3	3.3
Holiday Ruby Dream	34	2.8	4.2	3.7
Maxime	22	3.0	4.5	3.0
Reggae Bright Red	7	3.2	4.5	3.8
Rocky Mtn. Dark Red	40	3.3	4.8	4.2
Rocky Mtn. Deep Rose	37	3.0	4.8	3.7
Rocky Mtn. Lavender	37	3.2	4.8	4.2
Rocky Mtn. Lavender Pink	34	3.3	5	3.3
Rocky Mtn. Light Salmon	35	3.2	5	3.8
Rocky Mtn. Magenta	28	3.5	4.5	3.3
Rocky Mtn. Orange	34	2.8	4.2	4.0
Rocky Mtn. Red	32	2.7	4.8	4.0
Rocky Mtn/ Salmon	32	3.0	4.6	3.8
Rocky Mtn. Salmon Rose	22	3.3	4.8	4.0
Rocky Mtn. Scarlet	29	2.8	5	4.0
Rocky Mtn. Violet	37	3.3	4.8	4.2
Sofie-Cascade	31	3.8	4.2	3.5
Tango Fire	41	3.0	4.3	3.3
Tango Neon Pink	29	3.5	4.5	3.8
Tango Pink	25	2.8	4.3	3.8
Tutti Frutti	25	2.7	4	3.8
New Guinea Impatiens				
Sonic Cherry	22	3.3	4.3	4.2
Sonic Light Pink	28	3.8	4	4.5
Sonic Lilac	38	4.0	4.5	3.5
Sonic Pink	44	4.0	4.8	4.2
Sonic Red	29	3.5	4	3.0
Sonic Red on Gold	51	3.7	4.2	4.2
Sonic Rose on Gold	21	4.0	4.5	4.2
Sonic Salmon	32	3.7	4.2	4.3
Sonic Scarlet	25	3.3	4.3	3.8
Sonic Sweet Burgundy	60	3.5	4.2	4.5
Sonic Sweet Cherry	44	3.3	4.2	4.0
Sonic Sweet Orange	57	3.5	4.5	4.2
Sonic Zorro	35	3.0	4	4.2
Super Sonic Flame	47	3.7	4.5	4.5
Super Sonic Hot Pink	22	3.5	4	4.2
Super Sonic Magenta	46	3.7	4	3.8
Super Sonic Orchid	38	4.0	4.2	3.3
Super Sonic Pastel Pink	32	3.7	4.3	4.3
Super Sonic Peach	24	4.2	4	3.5
Super Sonic Red	31	3.3	4	4.3
Super Sonic Salmon	40	3.8	4.5	4.0
Super Sonic Violet Ice	19	3.5	4	3.0
LSD ($P \leq 0.05$)	8	1.3	0.5	0.9

[z]Consumer preference survey was conducted in March 2005. Results are based on the percentage of respondents who chose that cultivar as one that they liked. A total 68 surveys were completed.

The best quality ratings for the osteospermum and New Guinea impatiens cultivars from Fides were observed in January and March 2005 (Table 4). More than 50% of the participants in the March survey marked the three Margarita osteospermum cultivars as plants they liked. Almost 40% also liked the Tamarinda Red New Guinea impatiens. Unfortunately, between January and March, the majority of the New Guinea impatiens plants became infested with thrips, which detracted from their overall appearance and may be the reason fewer people chose these cultivars in the March survey.

Best quality Euro American (Proven Winner) diascia cultivars were observed in Oct. and Nov. 2004 while best quality phlox cultivars were observed in Apr. 2005 (Table 5). The remaining Euro American cultivars quality ratings were highest in Jan. and Mar. 2005. The Euro American cultivars that 40% or more consumers chose as a cultivar they liked included brachysome 'Blue Zephyr', euphorbia 'Diamond Frost', euphorbia 'Faded Jeans' and phlox 'Intensia Lavender Glow' and 'Intensia Neon Pink'.

The quality ratings for the Fischer geranium cultivars were highest in Mar. 2005 while the highest quality ratings for the Fischer New Guinea impatiens cultivars was in Mar. and Apr. 2005 (Table 6). The geranium cultivars that 40% or more survey participants choose included: Graffiti Pink, Rocky Mountain Dark Red, and Tango Fire. The New Guinea impatiens cultivars that 40% or more participants picked included: Sonic Pink, Sonic Red on Gold, Sonic Sweet Burgundy, Sonic Sweet Cherry, Sonic Sweet Orange, Super Sonic Flame, Super Sonic Magenta, and Super Sonic Salmon.

Planting date did appear to have an impact on plant quality and consumer preference. Cultivars planted in August were at their peak in October (average rating of 3) while cultivars planted in October looked their best in January (average rating 4.5) and those planted in December looked their best in March (average rating 4.5). It appears that approximately 2 to 3 months after planting, most cultivars were at their peak.

Summary

Information about bedding plant field performance is important when making recommendations for landscape use. Because of the mild climate in south Florida, early trials are useful to evaluate plant growth, plant and flower uniformity, and floral display. Consumer surveys also help in marketing flower colors and plants that appeal to the general public.

Acknowledgement

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Literature Cited

Moore, K. K., E. C. Worden, and W. Vendrame. 2003. Fort Lauderdale winter trial garden. Proc. Fla. State. Hort. Soc. 116:179-183.

Moore, K. K. E. C. Worden, and W. Vendrame. 2004. Fort Lauderdale trial garden – year 2. Proc. Fla. State Hort. Soc. 117:330-334.