

## Evaluation of Impatiens Cultivars as Bedding Plants – Fall 2000

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**Summary.** We evaluated 59 cultivars of impatiens (*Impatiens wallerana*), in replicated class tests at the University of Florida Gulf Coast Research and Education Center at Bradenton, Fla. [lat. 27.4 N, long. 82.5 W; AHS Heat Zone 10; USDA (American Horticultural Society, 1999); USDA Cold Hardiness Zone 9b (U. S. National Arboretum, 1990)] in the fall of 2000. In this report we provided objective plant measurements of vegetative and flower characteristics (Table 1), earliness of flowering, flower divergence, as well as 3 subjective ratings (Nov. 13, 28 and Dec. 16) that permit readers to evaluate foliage and flower characteristics (Table 2) at different times during the season, and to evaluate performance over time. Subjective ratings were on a scale from 1 to 7 with the highest rating of 7 for excellent. Cultivar performance in this trial was generally good in all classes. As a result, cultivar performance standards were high in this trial with vegetative and floral ratings  $\geq 5.5$  being considered outstanding, 4.5 – 5.4 as good performers, and  $\leq 4.4$  – 1.0 as fair to poor. Cultivars were grouped into classes based on flower color alone. Outstanding cultivars (overall rating  $\geq 5.5$ ) for selected color hues were: ‘Carnival Orange’ and ‘Impact Orange’ (orange class), ‘Dazzler Pink’, ‘Deco Pink’, ‘Infinity Pink’, and ‘Tempo Pink’ (pink class); ‘Impact Red Improved’ and ‘Showstopper Red’ (red class), ‘Impact Rose’ (rose class); ‘Carnival Salmon’, ‘Dazzler Salmon’, and ‘Infinity Salmon’ (salmon class); ‘Super Elfin White’ (white class). Outstanding cultivars for assorted shades/tints and color mixes were: ‘Tutti Frutti Mix’ and ‘Impact Formula Mix’ (mix class); ‘Dazzler Deep Pink’ (pink shades/tints class); ‘Dazzler Violet Improved’, ‘Impact Lavender’ (non-replicated observation plot) (purple shades/tints class); ‘Impact Scarlet’ (red shades/tints class), ‘Impact Rose Pink’ (rose shades/tints class); ‘Impact Coral’, ‘Super Elfin Blush Improved’ and ‘Impact Deep Salmon’ (non-replicated observation plot) (salmon shades/tints class).

Best of class cultivars will be used in future trials as a standard by which all new entries will be judged, and they only will be replaced if a new cultivar outperforms them. Best of class: ‘Impact Orange’ (orange class); ‘Deco Pink’ (pink class); ‘Impact Purple’ (purple class); ‘Impact Red Improved’ (red class); ‘Impact Rose’ (rose class); ‘Infinity Salmon’ (salmon class); ‘Super Elfin White’ (white class); ‘Impact Formula Mix’ (mix class); ‘Infinity Salmon Orange’ (orange shades/tints class); ‘Dazzler Deep Pink’ (pink shades/tints class); ‘Dazzler Violet Improved’ (purple shades/tints class); ‘Impact Scarlet’ (red shades/tints class); ‘Impact Rose Pink’ (rose shades/tints class); ‘Super Elfin Blush Improved’ (salmon shades/tints class); ‘Showstopper Buttercream’ [white shades/tints class (creams)].

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## Introduction

The United States wholesale value of floricultural crops was \$4.6 billion in 2000, estimated from growers with sales  $\geq$  \$10,000. (United States Department of Agriculture, 2001). Bedding and garden plants comprise 50% of the floriculture value at \$2.12 billion. Florida (\$107.4 million) ranks fifth behind California, Michigan, Texas and Ohio, who together generate 42% of the bedding/garden plant wholesale value. Impatiens is ranked first (\$98.9 million) and fifth (\$18.9 million) in the United States for wholesale value in flat and pot culture, respectively (United States Department of Agriculture, 1998).

The bedding plant industry by its nature requires timely evaluations of varieties for an extremely competitive market. Most of the bedding plant variety trials currently conducted in the United States are performed without multiple experimental units replicated in an appropriate experimental design that allows statistical analysis, thus these variety trials provide results that are of questionable scientific merit. This study was conducted to evaluate impatiens performance in a seasonal replicated trial in order to provide timely evaluations that may be used by growers, landscapers, consumers and seed companies as well as the scientific community.

## Materials and methods

Seeds of 59 cultivars of impatiens were sown on 16 Aug. 2000 into a soil mix containing peat and vermiculite (1:1, volumetric) prepared and amended with dolomite 11.3 lb/yd<sup>3</sup> (6.7 kg/m<sup>3</sup>), superphosphate 5.6 lb/yd<sup>3</sup> (3.3 kg/m<sup>3</sup>) and hydrated lime 2.8 lb/yd<sup>3</sup> (1.7 kg/m<sup>3</sup>) and used for seed germination at 72 to 75 °F (22 to 24 °C) in a growth room with a photosynthetic photon flux (PPF) of 30  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$  for 12 h from cool-white fluorescent lamps. Immediately after germination, seedlings were transplanted into Todd<sup>®</sup> planter flats [model 128: 1.5 inches x 1.5 inches x 2.5 inches (3.1 cm x 3.1 cm x 6.4 cm) cells; Speedling Incorporated, P. O. Box 7220, Sun City, Florida] and placed into a screen-sided, fiberglass-covered greenhouse. Seedlings were fertilized weekly with a 20N-16.6P-8.7K water soluble fertilizer (20-20-20 Ca-Mg Excel; Scotts Co., Maryville, Ohio) solution containing 500 mg·L<sup>-1</sup>.

On 18 (pink, red and white) and 19 (all other colors) Sept., plugs were transplanted into raised ground beds with five plants per plot spaced 12 inches (30.5 cm) apart in a staggered layout in two 3-bed bays of a saran covered structure with 30% shade. Beds

were 32 inches wide x 6 inches high (81.3 cm x 15.2 cm). Nutricote® 13N-5.7P-10.8 K fertilizer (13-13-13 100-d slow release type; Florikan, Sarasota, Florida) was applied by hand to each plant on the soil surface approximately an inch from the plant stem under the plastic mulch at 261 lb/row acre (293 kg·ha<sup>-1</sup>) of nitrogen. Beds were fumigated at least 14 days before planting with a mixture of 66% methyl bromide and 33% chloropicrin at 392 kg·ha<sup>-1</sup> (350 lb/acre) and covered with white-on-black polyethylene film. Irrigation water was supplied through two trickle tubes (Chapin Turbulent Twin Wall®) placed on either side of the center plants.

Integrated pest management was employed to determine when pesticide applications were needed to control arthropod pests and plant pathogens. Temperature @ 2ft (61.0 cm) during the remainder of the experiment ranged from a low of 5.2 °C (41 °F) to a high of 34.3 °C (94 °F) for the ratings period in the sprayed lands, but reached lows of -2.14 (Dec. 21) and -1.2 °C (Dec. 22) before pest ratings were undertaken. Total rainfall of 4.5 cm (1.7 inches) occurred through 6 Dec.

On 13 and 14 Nov. three plants per plot were selected from the center and edge of each plot, and the plant height (from the stem base to the inflorescence tip) and plant width were recorded for each plot. Plants in each plot were selected from the same positions in that plot. Subjective ratings were made for each cultivar on Nov. 13, 28 and Dec. 16. Each cultivar was rated on a 1 to 7 scale with the highest rating of 7 for excellent. Plant characteristics that merited a 7 were: (1) all plants in a plot had full and uniform foliage; (2) foliage and flowers were free of pest symptoms; (3) plants were free of abnormalities or weaknesses such as lodging; and (4) flowers were numerous and uniformly distributed over the plant.

In order to provide meaningful performance comparisons, cultivars were divided into two groups of classes based on color names assigned by the seed companies: (a) classes of selected pure and more common color hues (orange, pink, purple, red, rose, salmon and white) and (b) classes of seed mixes, and assorted color shades and tints [examples: salmon orange (orange shades/tints); light pink (pink shades/tints); metallic lilac (purple shades/tints); orange scarlet (red shades/tints); deep rose (rose shades/tints); metallic deep salmon (salmon shades/tints); and cream (white shades/tints)]. The latter group of shades and tints may be split into individual classes should more variety be offered for evaluation in the future. For this test, we tried to choose the better performer within a chromatic range.

The choice of best of class for 2000 was conducted in the following manner. The cultivar with the highest overall rating received best of class honors. Differences in these ratings may not be statistically significant. If two or more cultivars had equal overall ratings, another rating category, such as average flower ratings was used to make the choice, and so forth, until a better performer was selected. This type of choice is necessary in order to select a single cultivar every season as the standard by which all others in the class may be compared in future seasons, thus limiting the number of cultivars necessary in a trial. If a class only contains one cultivar, that cultivar becomes the uncontested best of class.

Each class was analyzed as a separate experiment. A randomized complete block experimental design was used with three blocks each containing six plants that represented the experimental unit. All data were analyzed by analysis of variance (ANOVA) methods, and means of dependent variables significant at the 0.05 level of probability were separated using Duncan's multiple range test (PROC ANOVA, SAS Institute, Cary, NC).

## **Results and Discussion**

### **Selected Color Hues**

**Orange.** All plant dimensions for 'Carnival Orange' and 'Impact Orange' were similar, with height ranging from 23-24 cm (9.1-9.4 inches), width ranging from 47-52 cm (18.5-20.5 inches), and flower diameters from 5.5-5.7 cm (2.2 inches). First flower emergence and flower divergence ranged from 48-49 d, and 8.3 to 8.8 d respectively. Superior foliage and flower ratings occurred all season, yielding an overall rating of 5.6 for 'Carnival Orange' and 5.7 for 'Impact Orange'. Therefore, 'Impact Orange' was selected best of class for its higher rating.

**Pink.** Plant height ranged from 15 cm (5.9 inches) for 'Super Elfin Pink' to 26 cm (10.2 inches) for 'Infinity Pink'. Plant width ranged from 43 cm (16.9 inches) for 'Super Elfin Pink' to 54 cm (21.3 inches) for 'Tempo Pink'. Flower diameter ranged from 5.0 cm (2.0 inches) for 'Super Elfin Pink' to 5.7 cm (2.2 inches) for 'Tempo Pink'. Flowering began at 46 d ('Tempo Pink' and 'Infinity Pink')-47 d ('Super Elfin Pink'), and ranged to 51 d for 'Showstopper Pink'. Divergence was variable and the values not statistically significant, ranging from 5.5 d for 'Super Elfin Pink' and 'Infinity Pink' to 15.5 d for 'Showstopper Pink'. Foliage and flower ratings were generally outstanding for every cultivar in the class all season, yielding good overall ratings ranging from 5.3 for 'Super Elfin Pink' to an outstanding 6.3 for 'Deco Pink', the cultivar chosen for best of class.

**Purple.** 'Impact Purple' was the only entry in this pure color. The plant height was 17 cm (6.7 inches), and plant width was 36 cm (14.2 inches). The flower diameter was 4.8 cm (1.9 inches). First flower occurred at 57 d, and divergence was 18.5 d. Early foliage and flower ratings were fair to poor on 13 Nov, but were good to outstanding the rest of the season, yielding a good overall rating of 4.8, a performance that was similar to the purple shades/tints. 'Impact Purple' was uncontested best of class.

**Red.** This class had the largest representation. Plant height ranged from 14 cm (5.5 inches) for 'Dazzler Red Improved' to 24 cm (9.4 inches) for 'Impact Red Improved', significantly taller than all others in the class. Plant width ranged from 39 cm (15.4 inches) for 'Dazzler Red Improved' to 49 cm (19.3 inches) for 'Impact Red Improved'. Flower diameter ranged from 5.0 cm (2.0 inches) for 'Deco Red' to 5.6 cm (2.2 inches) for 'Infinity Red'. First flowers began opening after 44 d for 'Super Elfin Red' and ranged to 49 d for 'Deco Red' and 'Impact Red Improved'. Flower divergence was variable, and comparisons not statistically significant, ranging from 7.0 d for 'Impact Red Improved' and 'Infinity Red' to 13.3 d for 'Carnival Red'. The foliage rating ranged from 3.9 for 'Dazzler Red Improved' to 6.3 for 'Impact Red Improved'. Flower ratings

ranged from 4.4 for ‘Dazzler Red Improved’ and ‘Tempo Red’ to 5.3 for ‘Impact Red Improved’. The overall ratings ranged from 4.4 for ‘Dazzler Red Improved’ and ‘Tempo Red’ to 5.9 ‘Impact Red Improved’. ‘Impact Red Improved’ () was best of class.

**Rose.** Two cultivars from the same breeder were represented in this class. Differences in plant height or width were not significant, with height ranging from 19 cm (7.5 inches) for ‘Impact Rose’ to 20 cm (7.9 inches) for ‘Infinity Rose’, and width ranging from 42 cm (16.5 inches) for ‘Infinity Rose’ to 43 cm (16.9 inches) for ‘Impact Rose’. Flower size was 6.3 cm (2.5 inches) for ‘Infinity Rose’ and 5.0 cm (2.0 inches) for ‘Impact Rose’. Performance was similarly good to outstanding for both cultivars; however, ‘Impact Rose’ (5.5) had significantly higher average flower ratings than ‘Infinity Rose’ (4.9). Overall ratings were 5.6 for ‘Impact Rose’ and 5.3 for ‘Infinity Rose’. ‘Impact Rose’ was best of class.

**Salmon.** Plant height for the three cultivars in this class ranged from 21 cm (8.3 inches) for ‘Dazzler Salmon’ to 28 cm (11.0 inches) for ‘Infinity Salmon’. Plant widths ranged from 45 cm (17.7 inches) for ‘Dazzler Salmon’ to 50 cm (19.7 inches) for ‘Infinity Salmon’. ‘Infinity Salmon’ [5.9 (2.3 inches)] had the largest flower compared to ‘Carnival Salmon’ and ‘Dazzler Salmon’, both 5.3 cm (2.1 inches). All foliage and flower ratings were generally outstanding and not significantly different. Average foliage ratings ranged from 5.9 for ‘Carnival Salmon’ to 6.5 for ‘Infinity Salmon’, while average flower ratings ranged from 5.5 for ‘Carnival Salmon’ to 5.9 for ‘Dazzler Salmon’. ‘Infinity Salmon’ was best of class.

**White.** Height ranged from 17 cm (6.7 inches) for ‘Tempo White’ to 20 cm (7.9 inches) for ‘Carnival White Improved’. Plant widths ranged from 45 cm (17.7 inches) for ‘Infinity White’ to 57 cm (22.4 inches) for ‘Showstopper White’, significantly wider than all but the similar ‘Tempo White’ [54 (21.3 inches)]. Flower diameters ranged from 4.9 cm (1.9 inches) for ‘Tempo White’ to 5.8 cm (2.3 inches) First flowers opened from 43 d for ‘Tempo White’ to 51 d for ‘Carnival White Improved’. Flower divergence ranged from 3.8 d for ‘Tempo White’ to 15.3 d for ‘Carnival White Improved’. Average flower ratings were good for all cultivars and ranged from 4.9 for ‘Carnival White Improved’ to 6.2 for ‘Showstopper White’ and ‘Super Elfin White’. Average flower ratings ranged from 4.3 for ‘Infinity White’ to 5.6 for ‘Super Elfin White’, significantly higher than all others in the class. Overall ratings ranged from 4.6 for ‘Infinity White’ to 5.9 for ‘Super Elfin White’. ‘Super Elfin White’ was best of class.

### **Assorted color shades, tints and mixes**

**Mixes.** Plant height ranged from 22 cm (8.7 inches) for ‘Impact Formula Mix’ to 24 cm (9.4 inches) for ‘Carnival Mixture’ and ‘Tutti Frutti Mix’. Plant width ranged from 46 cm (18.1 inches) for ‘Impact Formula Mix’ to 47 cm (18.5 inches) for ‘Carnival Mixture’ and ‘Tutti Frutti Mix’. Flower diameter ranged from 5.3 cm for ‘Tutti Frutti Mix’ and ‘Impact Formula Mix’ to 56 cm (22.0 inches) for ‘Carnival Mixture’. ‘Carnival Mixture’ flowered in 54 d, which was significantly later than ‘Tutti Frutti Mix’ (49 d) and ‘Impact Formula Mix’ (45 d). ‘Infinity Formula Mix’ flowered in 51 d and flower divergence was 9 d. Flower divergence for the replicated cultivars ranged from 4.0 d for

‘Tutti Frutti Mix’ to 15.3 d for ‘Impact Formula Mix’. Average foliage ratings ranged from 5.0 for ‘Carnival Mixture’ to 6.0 for ‘Tutti Frutti Mix’ and ‘Impact Formula Mix’. Similar average flower ratings ranged from 4.8 for ‘Carnival Mixture’ to 5.5 for ‘Impact Formula Mix’. Significantly better overall ratings were higher for ‘Tutti Frutti Mix’ (5.8) and ‘Impact Formula Mix’ (5.9) than for ‘Carnival Mixture’ (5.0). ‘Infinity Formula Mix’\*<sup>4</sup> had a 5.3 average flower rating and a 5.2 overall rating. Plant height was 19 cm (7.5 inches), plant width was 40 cm (15.7 inches), and flower diameter was 6.5 cm (2.6 inches). The average foliage rating was 5.0, and the average flower rating was 5.3. The overall rating was 5.2. ‘Impact Formula Mix’ was selected for best of class.

**Orange shades/tints.** ‘Infinity Salmon Orange’\* had a plant height of 15 cm (5.9 inches). The plant width was 38 cm (15 inches), and the flower diameter was 5.9 cm (2.3 inches). First flower opened in 52 d after sowing, and flower divergence was 16 d. The average foliage, average flower and overall rating ratings were each 4.7. This uncontested cultivar was best of class.

**Pink shades/tints.** Flower height ranged from 14 cm (5.5 inches) for ‘Impact Light Pink’ and ‘Infinity Light Pink’ to 19 cm (7.5 inches) for ‘Carnival Deep Pink’. Plant widths ranged from 36 cm (14.2 inches) for ‘Dazzler Deep Pink’ and ‘Infinity Light Pink’, to 40 cm (15.7 inches) for ‘Carnival Deep Pink’ and ‘Super Elfin Light Pink’. Flower diameters ranged from 5.0 cm (2.0 inches) for ‘Dazzler Deep Pink’ and ‘Super Elfin Light Pink’ to 5.6 cm (2.0 inches) for ‘Infinity Light Pink’. First flower ranged from 43 d for ‘Super Elfin Light Pink’ to 55 d for ‘Impact Light Pink’, and flower divergence from 6.3 d for ‘Super Elfin Light Pink’ to 13.5 d for ‘Infinity Light Pink’. Similar average foliage ratings ranged from 4.8 for ‘Infinity Light Pink’ to 5.7 for ‘Super Elfin Light Pink’. Average flower ratings ranged from 3.9 for ‘Infinity Light Pink’ to 6.0, for ‘Dazzler Deep Pink’. Overall ratings ranged from 4.4 for ‘Infinity Light Pink’ to 5.5 for ‘Dazzler Deep Pink’. ‘Dazzler Deep Pink’ was best of class.

**Purple shades/tints.** Plant height ranged from 18 cm (7.1 inches) for ‘Carnival Lilac’ to 27 cm (10.6 inches) for ‘Carnival Metallic Lilac’. Plant width ranged from 43 cm (16.9 inches) for ‘Carnival Lilac’ to 52 cm (20.5 inches) for ‘Carnival Metallic Lilac’. Flower diameters ranged from 5.0 (2.0 inches) for ‘Carnival Metallic Lilac’ to 5.4 (2.2 inches) for ‘Carnival Lilac’ and ‘Dazzler Violet Improved’. The first open flower ranged from 46 d for ‘Dazzler Violet Improved’ to 50 d for ‘Carnival Metallic Lilac’. Flower divergence ranged from 9.5 d for ‘Dazzler Violet Improved’ and 12.8 d for ‘Carnival Metallic Lilac’. Average foliage ratings ranged from 5.2 for ‘Carnival Lilac’ to 6.4 for ‘Dazzler Violet Improved’. Average flower ratings ranged from 4.6 for ‘Carnival Lilac’ to 5.8 for ‘Dazzler Violet Improved’. Overall ratings ranged from 4.7 for ‘Carnival Metallic Lilac’ to 6.0. ‘Impact Lavender’\*, had a plant height of 17 cm (6.7 inches), plant width of 38 cm (15 inches), flower diameter of 4.8 cm (1.9 inches), first flower at 50 d, flower divergence of 12 d, average foliage rating of 5.3, average flower rating of 5.7, and an overall rating of 5.5. ‘Dazzler Violet Improved’ was best of class.

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<sup>4</sup> This cultivar was a non-replicated single plot. We cannot confirm the observations scientifically without statistical analysis, which requires plot replication; this applies to all data collected from this and other cultivars marked with an asterisk (\*) that could only be trialed in one plot.

**Red shades/tints.** Plant heights ranged from 17 cm (6.7 inches) for ‘Impact Orange Scarlet’ to 23 cm (9.1 inches) for ‘Carnival Cranberry’. Plant widths ranged from 42 cm (16.5 inches) for ‘Infinity Orange Scarlet’ to 46 cm (18.1 inches) for ‘Carnival Cranberry’. Flower diameters ranged from 5.0 cm (2.0 inches) for ‘Impact Scarlet’ to 5.8 cm (2.3 inches) for ‘Carnival Cranberry’. The first open flower ranged from 47 d for ‘Carnival Cranberry’ to 51 d for ‘Infinity Orange Scarlet’, and flower divergence ranged from 4.3 d for ‘Carnival Cranberry’ to 10.5 d for ‘Impact Scarlet’. Average foliage ratings were similarly high, ranging from 4.9 for ‘Infinity Orange Scarlet’ to 6.2 for ‘Impact Scarlet’. Average flower ratings ranged from 4.8 for ‘Infinity Orange Scarlet’ to 6.0 for ‘Impact Scarlet’. Over all ratings ranged from 5.4 for ‘Carnival Cranberry’ to 6.1 for ‘Impact Scarlet’. ‘Impact Scarlet’ was best in class.

**Rose shades/tints.** Plant heights ranged from 13 cm (5.1 inches) for ‘Impact Carmen Rose’ to 25 cm (9.8 inches) for ‘Carnival Deep Rose’. Plant widths ranged from 36 cm (14.2 inches) for ‘Impact Carmen Rose’ to 51 cm (20.1 inches) for ‘Carnival Deep Rose’. Flower diameters ranged from 4.7 cm (1.9 inches) for ‘Impact Carmen Rose’ to 6.2 cm (2.4 inches) for ‘Infinity Rose Pink w/Eye’. The first open flower ranged from 51 d for ‘Carnival Deep Rose’ and ‘Infinity Rose Pink w/Eye’ to 55 d for ‘Impact Carmen Rose’ and ‘Impact Rose Pink’. Flower divergence ranged from 7.3 d for ‘Impact Rose Pink’ to 18.8 d for ‘Impact Carmen Rose’. Average foliage ratings ranged from 4.1 for ‘Impact Carmen Rose’ to 5.8 for ‘Impact Rose Pink’. Average flower ratings ranged from 4.6 for ‘Impact Carmen Rose’ to 5.8 for ‘Impact Rose Pink’. Overall ratings ranged from 4.3 for ‘Impact Carmen Rose’ to 6.1 for ‘Impact Rose Pink’. ‘Impact Rose Pink’ was best of class.

**Salmon shades/tints.** Plant heights ranged from 14 cm (5.5 inches) for ‘Carnival Coral’ to 23 cm (9.1 inches) for ‘Carnival Metallic Deep Salmon’. Plant widths ranged from 32 for ‘Impact Coral’ to 46 for ‘Super Elfin Blush Improved’. Flower diameters ranged from 4.8 cm (1.9 inches) for ‘Impact Coral’ to 5.1 cm (2.0 inches) for ‘Carnival Metallic Deep Salmon’ and ‘Super Elfin Blush Imp’. First flowers ranged from 46 d for ‘Impact Coral’ to 57 d for ‘Carnival Coral’. Flower divergence ranged from 8.5 d for ‘Impact Coral’ to 18.3 d for ‘Carnival Coral’. The average foliage ratings ranged from 4.3 for ‘Carnival Metallic Deep Salmon’ to 6.6 for ‘Impact Coral’ and ‘Super Elfin Blush Improved’. The average flower ratings ranged from 3.9 for ‘Carnival Metallic Deep Salmon’ to 5.9 for ‘Super Elfin Blush Improved’. The overall ratings ranged from 4.1 for ‘Carnival Metallic Deep Salmon’ to 5.9 for ‘Super Elfin Blush Improved’. ‘Impact Deep Salmon’\* had a plant height of 15 cm (5.9 inches), a plant width of cm 40 (15.7 inches), and flower diameter of 5.3 cm (1.7 inches). The first open flower occurred at 55 d, and divergence was 7.0 d. The average foliage rating was 5.7 , and the average flower rating was 5.3 , yielding an overall rating of 5.5 . The best of class was ‘Super Elfin Blush Improved’.

**White shades/tints.** ‘Showstopper Buttercream’ had a plant height of 17 cm (6.7 inches), a plant width of 42 cm (16.5 inches) and a flower diameter of 5.7 cm (2.2 inches). The first flower opened in 47 d, and the divergence was 4.3 d. The average foliage rating was 4.9, and the average flower rating was 4.8. The overall rating was 4.9. ‘Showstopper Buttercream’ was the uncontested best of class.

## Conclusions

While early or late season performance, a particular plant height, or shade of the same color may be a selection criteria outweighing seasonal performance, the combined foliage and flower ratings represent an overall view of performance for each cultivar in its class over the entire season. We consider cultivars with a combined rating average  $\geq 5.5$  as outstanding, 4.5 to 5.4 as good performers, and  $\leq 4.4$  as fair to poor. This is a summary of overall performance and best of class: **orange class:** all cultivars were outstanding throughout the season, and ‘Impact Orange’ was best of class. **Pink class:** all cultivars were good to outstanding all season, and ‘Deco Pink’ was best of class. **Purple class:** ‘Impact Purple’ was the only member of this class, becoming the uncontested best of class. **Red class:** ‘Dazzler Red Improved’ and ‘Tempo Red’ were the only cultivars in the class that had fair performance; all others were good to outstanding, ‘Impact Red Improved’ and ‘Showstopper Red’ had the highest overall ratings. ‘Impact Red Improved’ was best of class. **Rose class:** all entries were good to outstanding most of the season, with ‘Impact Rose’ having significantly higher average flower ratings than ‘Infinity Rose’. ‘Impact Rose’ was selected best of class. **Salmon class:** all cultivars were outstanding, and ‘Infinity Salmon’ was best of class. **White class:** ‘Super Elfin White’ had outstanding performance and was best of class. **Mix class:** ‘Tutti Frutti Mix’ and ‘Impact Formula Mix’ had significantly higher overall ratings to ‘Carnival Mixture’. All had good to outstanding ratings, and ‘Impact Formula Mix’ was best of class. ‘Infinity Formula Mix’ had good to outstanding performance all season, but was a non-replicated observational trial in which performance cannot be confirmed. **Orange shades/tints:** early performance was fair to poor, but improved to yield a good overall rating for ‘Infinity Orange’. ‘Infinity Orange’ is the uncontested best of class. **Pink shades/tints:** most of the entries had good to outstanding performance with the exception of ‘Infinity Light Pink’ with a fair rating. ‘Dazzler Deep Pink’ was best of class. **Purple shades/tints:** ‘Dazzler Violet Improved’ had outstanding performance, , and was best of class. ‘Impact Lavender’\* had overall ratings of 5.5. **Red shades/tints:** ‘Impact Scarlet’ was outstanding all season, and was best of class. **Rose shades/tints:** ‘Impact Rose Pink’ was outstanding, and was best of class. **Salmon shades/tints:** ‘Impact Coral’ and ‘Super Elfin Blush Improved’ were outstanding; ‘Super Elfin Blush Improved’ was best of class. **White shades/tints:** ‘Showstopper Buttercream’ was the only cultivar trialed in this class, having low early ratings that increased over time to yield good overall ratings; it was picked best of class, uncontested.

Best of class cultivars will be considered as standards for comparison for new releases in future tests, thus eliminating the need for re-evaluation of so many cultivars. While our irrigation/soil type/fertilization practices may not represent cultural practices in other landscape situations, our choice of these growing conditions was to provide uniform and satisfactory nutrients and moisture to allow for outstanding growth and flowering of impatiens. Soil amendments and irrigation are typically used in bedding plant trials (Pemberton and Roberson, 2001), and indeed most gardeners and landscapers modify their soil and provide irrigation/fertilizer to maximize growth and flowering. Thus, performance evaluations for bedding plants are more likely influenced by climatic conditions than by culture. We believe these performance evaluations would provide

useful information for the bedding plant industry in the southeastern United States or other parts of the world with similar climatic conditions.

### **Note**

The information in this report is a summary of experimental results and does not provide recommendations for crop production. Where trade names are used, no discrimination is intended or endorsement implied.

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