

Evaluation of Viola Cultivars as Bedding Plants for Florida¹

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Florida has been an important region for the growing and testing of bedding plants. According to the USDA Floriculture Crops 2005 summary, bedding and garden plants accounted for 51 percent of the wholesale value (\$2.61 billion) of all the floricultural crops reported in the United States, while Florida was ranked fifth among all the bedding plant producers in this country. Violas, grouped statistically by the USDA with pansies, were one of the top three bedding plant crops grown in flats (\$111 million). Florida ranked second in the United States for the value of potted pansy/violas produced (\$3.9 million). Parts of the southeastern United States, and parts of Asia, Europe, and Australia share a similar climate with central Florida. Thus, Florida has also been an important testing ground for new viola cultivars and other bedding plants to be grown and marketed in those regions.

Violas, also known as bedding pansies, horned violets, or tufted pansies, are native to Spain and the Pyrenees Mountains (includes Andorra and southern and southwestern France). Like pansies (*Viola xwittrockiana*), violas [*Viola cornuta* and *V. xwilliamsiana* (name used by some seed companies)]

have been bred with wild species of violas such as johnny jumpups (*Viola tricolor*).



Figure 1. *Viola tricolor*. ©William S. Justice. Courtesy of Smithsonian Institution, Dept. of Systematic Biology, Botany. Credits: William S. Justice

Unlike pansies, which have been selected for large flowers, the violas have been repeatedly back-crossed with johnny jumpups. This breeding process has resulted in viola cultivars that can hold up to heat and diseases better than pansies (see EDIS publication ENH 1031 <<http://edis.ifas.ufl.edu/EP260>>), as observed season after season in central Florida winter/early spring

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trials conducted at the University of Floridas Gulf Coast Research and Education Center in Bradenton (2000-2004) and Wimauma (2006), Florida.

There are over 150 cultivars of viola available on the market today. Since many of these cultivars are developed and tested in more temperate climates, will these cultivars perform well in Florida, where climate can be harsh at times and rife for the development of plant pests? To answer this question and to select those that can do well in Florida, we conducted five cultivar trials between Dec. 2000 and April 2006. In the early trials, we created classes based upon growth habit (creeping vs. normal) and flower color, and then selected the best performing cultivar (standard) from each class. In each subsequent trial, we compared these class "standards" with new untested entries from the major seed companies in Europe, Japan, and the United States. Some new entries outperformed the standards and replaced them, while some standards continued to outperform the new entries. On occasion, an entire class would perform poorly, while another class might contain all good performers. Nevertheless, we chose one cultivar to represent each class for subsequent comparisons. This system of standards allowed us to continually upgrade performance without having to re-evaluate large numbers of previously evaluated cultivars; however, if a cultivar was not selected for the standard, but was later improved through further breeding, it could be reevaluated.

Field Trials and Evaluations

Each cultivar was planted in two fields. Each field had multiple plots (three or four) planted for each cultivar in different parts of the field to compensate for variations in soil pH and moisture and pest infestations that might occur within different parts of the field and cause differences in plant condition between plots. Each plot contained five or six plants.

One field was sprayed (if necessary, after scouting for pests) to simulate a commercial setting and to produce plants in the best possible condition for measuring plant height, width and flower diameter, recording earliness of flowering, and comparing cultivar foliage and flower quality. The

other field was not sprayed to observe the effects of plant pests on foliage and flowers as they would appear in a homeowners setting. Ratings were on a scale from 1 to 7 for both fields, with 7 being free from any flaw, such as lack of plant or flowering uniformity, color fading or variability, plant lodging or splitting, or pest symptoms such as insect feeding scars, leaf spots or plant blights, or distortions, discolorations and stunting due to virus infestation; 4 was average, but still acceptable; 1 was poor and unacceptable. The ratings in both fields were taken three to four times during the season to show performance over the entire season, and then the ratings from both fields were combined and averaged to yield an overall performance rating, which was used to select each class standard.

Seed was sown in seeder trays (model P-Seed20; Landmark Plastic Corp., Akron, Ohio) and germinated at 72-75°F in a growth room illuminated 24 hours a day with cool-white fluorescent tubes. Immediately after germination, seedlings were transplanted into Todd planter flats (model 128; Speedling, Sun City, Fla.) and grown to mature, non-flowering plugs (production stage: 4). Soluble liquid fertilizers (example: 15-2-20 Ca-Mg Excel[®]; Scotts Co., Maryville, Ohio) were applied at 50 to 250 ppm (0.7 to 3.3 oz./100 gal) twice weekly. Low-phosphate fertilizer helped to prevent stretching. To encourage root development, the soil mix (example: Vergro Container Mix A; Verlite Co. Inc., Tampa, Fla.) was kept wet (black and glistening) during germination (radicle emergence; production stage: 1), and moist (black to medium brown) beginning at cotyledon expansion through the development of the first true leaves (production stage: 2 and 3). When seedlings were ready for field planting, the roots formed a firm plug; the soil mix was kept alternately wet with less moisture (light brown), which also helped to lessen plant stretching.

To provide optimal conditions for growth, beds, fumigated with a mixture of methyl bromide and chloropicrin, and covered with white-on-black polyethylene film. Plugs were transplanted into raised ground beds 32 inches wide x 8 inches high of EauGallie fine sand (pH range = 6.2 to 6.8); one week later, slow-release fertilizers [example: Osmocote Plus[®] 15-9-12 (5-6 mo.) with

micronutrients; The Scotts Co., Maryville, Ohio] were applied by hand to each plant on the soil surface approximately one inch from the plant stem under the plastic mulch.

Summary

From 2000 to 2006, we evaluated 80 cultivars from 8 seed companies. The following cultivars included those that were selected as class standards, and unique cultivars without comparison (to date). All these cultivars had an overall performance rating 5.5. 'Angel Frosted Yellow Blotch', 'Angel Violet Duet', 'Angel Violet Blotch', 'Eryln Purple Yellow', 'Four Seasons Yellow With Pink Wing', 'Gem Antique Apricot', 'Gem Antique Lavender', 'Gem Antique Pink', 'Gem Deep Blue', 'Hobbit Bilbo', 'Hobbit Cream With Yellow Lip', 'Hobbit Frodo', 'Hobbit Pure White', 'Hobbit Sam', 'Jewel Lemon Yellow', 'Penny Azure Twilight', 'Penny Beaconsfield', 'Penny Classic Jump-Up', 'Penny Orange Jump-Up', 'Penny Orchid Frost', 'Penny Violet', 'Penny Yellow Jump-Up', 'Princess Lavender Yellow', 'Princess Purple & Gold', 'Rebel Yellow', 'Skippy Red-Gold', 'Skippy White With Violet Wing', 'Sorbet Babyface White', 'Sorbet Babyface Yellow', 'Sorbet Black Delight', 'Sorbet Coconut Swirl', 'Sparkler Purple Orange Face', 'Sparkler Purple Wing', 'Venus Light Blue', and 'Venus Purple'.

Detailed performance data of these cultivars are presented in Table 1. Pictures of each cultivar's flower are provided (Table 2). These cultivars can provide Florida growers and gardeners with a great pool of violas from which to choose for their landscaping needs. Though they do not produce gigantic flowers like pansies do, these violas can provide a great variety of color patterns or color combinations and generate large swaths of bright, vibrant colors that hold up very well to harsh conditions and to pests.

Additional Information

Visit the seed-propagated bedding plant variety trials at <http://vtgcrec.ifas.ufl.edu> for detailed information for all viola cultivars on plant height, width, days to flower, flower divergence, flower size and individual ratings; plot and pest/pest symptom

pictures taken during the season, and more flower pictures.

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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Table 1. Plant and flowering characteristics and performance ratings for outstanding viola cultivars with the highest overall performance ratings values for their class in winter/spring trials in Bradenton (2000-04) and Wimauma (2005-06) Florida.

Cultivar	Seed Co.	Latest trial year evaluated	Measurements (inches)		Days to first flower	Cultivar quality		Pest Symptoms		Overall Performance
			Plant width	Flower dia.		Foliage	Flower	Insects and mites	Diseases	
Angel Frosted Yellow Blotch	Floranova	2003	9	1.7	74	5.6	4.2	7.0	6.7	5.9
Angel Violet Duet	Floranova	2002	9	1.1	90*	5.3	5.0	6.4	5.4	5.5
Angel Violet Blotch	Floranova	2002	8	1.1	108	5.0	5.0	7.0	5.9	5.7
EryIn Purple Yellow	Kieft	2003	12	1.2	66	5.3	4.7	6.7	6.3	5.8
Four Seasons Tellow w/Pink	Sahin	2003	10	1.3	72	5.5	4.3	7.0	6.5	5.8
Wing Gem Antique Apricot	Takii	2004	9	1.0	65	5.1	5.4	7.0	7.0	6.1
Gem Antique Lavender	Takii	2004	9	1.1	49	5.0	5.7	7.0	6.3	6.0
Gem Antique Pink	Takii	2004	9	1.2	53	5.7	5.9	7.0	6.9	5.9
Hobbit Bilbo	Sahin	2003	9	1.5	79	5.5	4.0	7.0	6.8	5.7
Hobbit Cream With Yellow Lip	Sahin	2006	7	1.0	46	6.7	6.6	6.7	7.0	6.8
Hobbit Frodo	Sahin	2006	12	1.1	63	6.1	6.0	6.3	7.0	6.4
Hobbit Pure White	Sahin	2006	9	1.0	56	5.6	6.1	6.8	6.9	6.4
Hobbit Sam	Sahin	2006	12	1.1	67	5.9	5.0	5.5	6.9	5.8
Jewel Lemon Yellow	Takii	2006	11	0.9	54	6.3	6.3	6.5	7.0	6.5
Penny Azure Twilight	Goldsmith	2003	7	1.4	62	5.0	6.2	6.8	6.4	6.1
Penny Beaconsfield	Goldsmith	2003	9	1.6	66	5.1	4.6	7.0	6.8	6.9
Penny Classic Jump-Up	Goldsmith	2004	9	1.3	48	5.8	5.5	6.9	6.2	6.1
Penny Orange Jump-Up	Goldsmith	2003	9	1.2	64	4.5	5.9	6.8	6.7	6.0
Penny Orchid Frost	Goldsmith	2001	7	1.3	60	5.3	5.3	6.9	6.4	6.0
Penny Violet	Goldsmith	2002	8	1.2	78	5.3	5.3	6.8	5.3	5.6
Penny Yellow Jump-Up	Goldsmith	2001	8	1.2	59	5.0	5.0	5.1	6.9	5.5
Princess Lavender Yellow	PanAmerican	2001	7	1.2	71	4.7	4.8	6.8	7.0	5.8
Princess Purple & Gold	PanAmerican	2001	7	1.1	72	5.4	5.0	5.6	7.0	5.7
Rebel Yellow	Ball	2002	9	1.4	107	5.5	5.3	7.0	6.0	6.0
Skippy Red-Gold	Kieft	2006	13	1.3	67	5.8	5.3	5.6	6.6	5.8
Skippy White With Violet Wing	Kieft	2004	9	1.6	57	6.3	5.3	7.0	5.8	6.1
Sorbet Babyface White	PanAmerican	2002	8	1.1	101	4.9	4.4	7.0	5.4	5.5
Sorbet Babyface Yellow	PanAmerican	2003	9	1.5	70	5.4	5.8	7.0	6.7	6.1
Sorbet Black Delight	PanAmerican	2003	11	1.7	75	5.1	5.0	6.9	6.5	5.9
Sorbet Coconut Swirl	PanAmerican	2002	10	1.1	99	5.7	4.8	7.0	6.1	5.9
Sparkler Purple Orange Face	Floranova	2003	7	1.3	73	4.7	5.2	6.6	6.5	5.8
Sparkler Purple Wing	Floranova	2003	10	1.6	83	5.0	3.8	6.7	6.2	5.5
Venus Light Blue	Sakata	2006	11	1.1	52	4.9	4.2	6.3	6.8	5.6
Venus Purple	Sakata	2006	12	1.3	60	5.6	4.9	5.6	6.7	5.7

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Table 2. Digital images of viola cultivars with the highest overall performance rating values for their class in winter/spring trials in Bradenton (2000-04) and Wimauma (2005-06) Florida.

<p>Class¹: black</p>  <p>'Sorbet Black Delight' Seed: PanAmerican</p>	<p>Class: blue (dark)</p>  <p>'Gem Deep Blue' Seed: Takii</p>	<p>Class: blue (dark) with blotch</p>  <p>'Hobbit Sam' Seed: Sahin</p>	<p>Class: cream</p>  <p>'Hobbit Cream With Yellow Lip' Seed: Sahin</p>
<p>Class: orange with purple, red-violet cap</p>  <p>'Penny Orange Jump-Up' Seed: Goldsmith</p>	<p>Class: orange shades/tints</p>  <p>'Gem Antique Apricot' Seed: Takii</p>	<p>Class: pink shades/tints</p>  <p>'Gem Antique Pink' Seed: Takii</p>	<p>Class: Purple (dark), blue-violet with red violet cap</p>  <p>'Angel Violet Duet' Seed: Floranova</p>
<p>Class: purple (dark), blue-violet with dark eye and light cap</p>  <p>'Penny Beaconsfield' Seed: Goldsmith</p>	<p>Class: purple, blue-violet with dark eye and light cap</p>  <p>'Angle Violet Blotch' Seed: Floranova</p>	<p>Class: purple, blue-violet/white/cream</p>  <p>'Sorbet Coconut Swirl' Seed: PanAmerican</p>	<p>Class: purple, blue-violet with white</p>  <p>'Venus Light Blue' Seed: Sakata</p>
<p>Class: purple, blue-violet/yellow/white</p>  <p>'Eryln Purple Yellow' Seed: Kieft</p>	<p>Class: purple (light), blue-violet with yellow face and blotch</p>  <p>'Hobbit Frodo' Seed: Sahin</p>	<p>Class: purple (light), blue violet/yellow/white</p>  <p>'Princess Lavender Yellow' Seed: PanAmerican</p>	<p>Class: purple, blue-violet with yellow face and blotch</p>  <p>'Hobbit Bilbo' Seed: Sahin</p>
<p>Class: purple (dark), red-violet</p>  <p>'Penny Violet' Seed: Goldsmith</p>	<p>Class: purple (dark), red-violet with light blotch</p>  <p>'Venus Purple' Seed: Sakata</p>	<p>Class: purple (dark), red-violet with orange eye</p>  <p>'Sparkler Purple Orange Face' Seed: Floranova</p>	<p>Class: purple (dark), red-violet with yellow eye</p>  <p>'Princess Purple & Gold' Seed: PanAmerican</p>

<p>Class: purple, red-violet with white</p>  <p>'Penny Orchid Frost' Seed: Goldsmith</p>	<p>Class: purple, red-violet/yellow/white</p>  <p>'Gem Antique Lavender' Seed: Takii</p>	<p>Class: red with gold blotch</p>  <p>'Skippy Red-Gold' Seed: Kieft</p>	<p>Class: white</p>  <p>'Hobbit Pure White' Seed: Sahin</p>
<p>Class: white face with purple (dark), red-violet cap</p>  <p>'Skippy White With Violet Wing' Seed: Kieft</p>	<p>Class: white/yellow to blue color shift</p>  <p>'Penny Azure Twilight' Seed: Goldsmith</p>	<p>Class: white/yellow w/blotch</p>  <p>'Sorbet Babyface White' Seed: PanAmerican</p>	<p>Class: yellow</p>  <p>'Jewel Lemon Yellow' Seed: Takii</p>
<p>Class: yellow with blotch</p>  <p>'Sorbet Babyface Yellow' Seed: PanAmerican</p>	<p>Class: yellow with blotch and blue-white cap</p>  <p>'Angel Frosted Yellow Blotch' Seed: Floranova</p>	<p>Class: yellow with pink cap</p>  <p>'Four Seasons Yellow With Pink Wing' Seed: Sahin</p>	<p>Class: yellow with purple, blue-violet cap</p>  <p>'Penny Yellow Jump-Up' Seed: Goldsmith</p>
<p>Class: yellow/white face with purple (dark), blue-violet cap</p>  <p>'Penny Classic Jump-Up' Seed: Goldsmith</p>	<p>Class: creeping white/yellow/purple (light) with purple (dark), blue-violet cap</p>  <p>'Sparkler Purple Wing' Seed: Floranova</p>	<p>Class: creeping yellow</p>  <p>'Rebel Yellow' Seed: Ball</p>	