Crop Reports

Spathiphyllum Cultivars Vary in Flowering Response after Treatment with Gibberellic Acid

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ADDITIONAL INDEX WORDS. **plant breeding, foliage plants, growth regulators**

SUMMARY. Thirty-one *spathiphyllum* (*Spathiphyllum* Schott.) cultivars were evaluated for flowering response following treatment with gibberellic acid (GA₃). Greenhouse-grown plants were treated once with 250 mg·L⁻¹ (ppm) GA₃ applied as a foliar spray. Within 16 weeks after treatment all GA₃-treated plants had flowered but none of the untreated controls produced flowers. 'Vickilynn' (14.1 flowers/plant after 16 weeks), 'Piccolino' (12.8), 'Mascha' (12.6), 'Chris' (11.7), 'Alpha' (11.7), and 'Daniel' (11.0) produced significantly more flowers than other cultivars. The cultivars producing the fewest flowers per plant after 16 weeks were 'Sierra' (2.5), 'S1008' (3.2), 'Rica' (3.4), 'Sonya' (4.3), 'Vanessa' (5.1), 'S18'

(5.5) and 'S4002' (5.6). 'Alpha,' 'Textura,' 'Daniel,' 'Mascha,' 'S1007,' and 'Showpiece' had significantly better flower quality. 'S1008,' 'Codys Color,' and 'Petite' had poor flower quality. 'Mascha' was the earliest cultivar to bloom producing maximum flower counts during weeks 9 to 10 after treatment while 'Vanessa' was the latest to flower with peak bloom occurring 15 to 16 weeks after treatment. Most cultivars reached peak bloom at 11 to 13 weeks after treatment. Results indicate sufficient genetic variability in *spathiphyllum* flowering response to GA₃ treatment exists to permit cultivar selections based on differences in flowering time, number of flowers and flower quality.

Spathiphyllum is one of the top selling foliage plants in the \$514 million Florida foliage plant industry (Henley, 1996) because of its attractive foliage and showy white flowers. The increasing popularity of *spathiphyllum* has led to the development of many new cultivars in the past 10 years with at least 44 named *spathiphyllum* cultivars currently available (Nelis, 1997). However, only five *spathiphyllum* cultivars have been tested for their response to GA₃ treatment (Henny, 1981; Henny and Fooshee, 1985). Such information is important since days to flower and percent flower distortion varied by cultivar in response to GA₃ treatment (Henny and Fooshee, 1985). Therefore this study was conducted to compare 31 *spathiphyllum* cultivars for flowering response to GA₃.

Materials and methods

Thirty-one *spathiphyllum* cultivars, consisting of twenty-two commercial (named) cultivars and nine ex-

perimental (numbered) cultivars, were selected for this study (Table 1). Tissue-cultured plants were obtained from Agri-Starts Inc. (Apopka, Fla.), Milestone Agriculture Inc. (Apopka, Fla.), Oglesby Plant Labs Inc. (Altha, Fla.), Phoenix Foliage, Inc. (Winter Garden, Fla.), and Twyford Plant Labs Inc. (Sebring, Fla.). Plants were obtained as rooted liners growing in 10 × 20-inch (25 × 51-cm) 72-celled [each cell 30 mL (1.0 fl oz) in volume] plastic trays (1 tray of each cultivar). On 15 May 1997, 40 uniform liners of each cultivar were potted into 1.9-L (0.5-gal) pots filled with VerGro Container Mix A (Verlite Co., Tampa, Fla.). Plants were grown in a shaded greenhouse with a maximum photosynthetic photon flux (PPF) of 250 μmol·m⁻²·s⁻¹ under natural photoperiod with high and low temperature set points of 35 and 18 ± 2 °C (95 and 64 ± 4 °F). Twenty plants of each cultivar (620 total) were grown in a shaded glass greenhouse arranged in a randomized block design with each pot being the experimental unit. All plants were fertilized with 5 g (0.18 oz) 17N-2.6P-10K slow release fertilizer (Sierra Blend 17N-6P₂O₅-12K₂O; Sierra Chemical Co., Milpitas, Calif.) on 21 May and with an additional 2.5 g (0.09 oz) of the same fertilizer on 30 June. At 12 weeks after potting (13 Aug.), 10 plants of each cultivar were treated with 250 mg·L⁻¹ (ppm) GA₃ to induce flowering. Treatment consisted of applying 100 mL (3.4 fl oz) of the GA₃ solution over 10 plants (2.5 mg/plant, a.i.) as evenly as possible. At the same time ten additional plants of each cultivar were sprayed with water to serve as controls. Tween 20 (2 drops/100 mL) was used as a wetting agent for both treated and control plants.

Weekly counts of newly open flowers were taken for 16 weeks after treatment on both GA₃-treated and untreated plants. Flowers were considered open when the spathe was unfurled enough to expose the entire spadix. Flower quality was evaluated on a visual scale of 1 to 5, where 1 = poor (50% to 100% deformed flowers), 2 = fair (25% to 49%), 3 = acceptable (11% to 24%), 4 = good (1% to 10%), and 5 = excellent (0% deformed flowers). At the end of the experiment, weekly flowering data were used to determine the 2-week period that yielded maximum flower production for each cultivar.

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Table 1. Flowering response of 31 spathiphyllum cultivars for 16 weeks after treatment with gibberellic acid (GA₃) applied as a foliar spray during August 1997.

Cultivar	Total flowers	Earliest 2-week period with highest flower count	Highest 2-week total flower count	Flower quality ^z
Alpha	11.7 a-d ^y	11-12	7.5 a	4.1 a
Babyface	7.1 f-i	11-12	3.6 e-k	2.9 g-k
Ceres	7.9 e-h	10-11	5.9 a-d	3.4 b-e
Chris	11.7 a-d	11-12	6.2 a-c	2.7 i-m
Cody's Color	7.8 e-h	10-11	4.9 b-h	2.1 n-o
Cupido	8.5 d-h	12-13	3.6 e-k	3.6 b-e
Daniel	11.0 a-e	11-12	5.5 a-f	3.8 a-b
Frederik	6.9 f-i	11-12	4.6 b-I	3.3 c-g
Jetty	7.3 f-i	11-12	3.7 d-k	3.4 b-e
Mascha	12.6 a-c	9-10	5.0 b-h	3.8 a-c
Patrice	6.3 f-k	11-12	3.9 d-k	3.1 e-i
Petite	7.7 e-i	11-12	4.1 c-j	2.3 m-o
Piccolino	12.8 a-b	11-12	6.5 a-b	3.4 b-f
Rica	3.4 j-l	13-14	1.9 k-l	2.4 l-o
S1006	6.6 f-j	11-12	3.2 g-l	3.2 e-h
S1007	9.6 b-f	12-13	4.5 b-I	3.8 a-c
S1008	3.2 k-l	10-11	2.1 j-I	2.0 o
S18	5.5 h-l	11-12	4.3 b-I	2.6 j-m
S4001-1	7.0 f-i	11-12	4.5 b-I	3.3 d-h
S4001-2	9.0 d-g	11-12	5.7 a-e	3.5 b-e
S4002	5.6 g-l	12-13	2.5 i-l	2.6 j-n
S4003	6.4 f-k	14-15	3.1 g-l	2.9 f-j
S5426	9.6 b-f	11-12	4.5 b-i	3.5 b-e
Showpiece	8.5 d-h	12-13	5.2 b-g	3.7 a-d
Sierra	2.5 l	12-13	1.4 l	2.4 k-n
Sonya	4.3 i-l	10-11	3.3 f-l	2.8 h-l
Taylor's Green	5.8 g-k	10-11	2.8 h-l	2.8 h-l
Textura	6.9 f-i	12-13	3.7 d-k	4.1 a
Ty's Pride	9.5 c-f	10-11	5.7 a-e	2.6 j-n
Vanessa	5.1 h-l	15-16	1.9 k-l	3.4 b-e
Vickilynn	14.1 a	10-11	6.5 a-b	2.8 h-l

^zQuality where 1 = poor, 2 = fair, 3 = acceptable, 4 = good, and 5 = excellent.

^yMean separation within columns by Duncan's multiple range test, 5% level.

Results and discussion

All 31 cultivars treated with GA₃ flowered whereas no control plants flowered during the course of this experiment. Therefore no data from untreated plants are presented. 'Vickilynn' (14.1 flowers), 'Piccolino' (12.8), 'Mascha' (12.6), 'Chris' (11.7), 'Alpha' (11.7), and 'Daniel' (11.0) produced significantly more flowers than the other cultivars after 16 weeks (Table 1). The six cultivars producing the

fewest flowers were 'Sierra' (2.5 flowers), 'S1008' (3.2), 'Rica' (3.4), 'Sonya' (4.3), 'Vanessa' (5.1), 'S18' (5.5), and 'S4002' (5.6).

No flowers opened before 9 weeks after treatment. 'Mascha' was the earliest cultivar to flower, reaching peak bloom during weeks 9 to 10 whereas 'Vanessa' was the latest cultivar to flower, with peak bloom at weeks 15 to 16 (Table 1). Most cultivars reached peak bloom at 11 to 13 weeks after treatment. The 6-week difference in

blooming time between the earliest and latest flowering cultivars makes it important that producers test new cultivars before incorporating them into their production schedules. 'Alpha' (7.5 flowers), 'Piccolino' (6.5), 'Vickilynn' (6.5), 'Chris' (6.2), 'Ceres' (5.9), 'S4001-2' and 'Tys Pride' (5.7), and 'Daniel' (5.5) produced significantly more flowers during their 2-week peak flowering period than the other cultivars.

'Alpha,' 'Textura,' 'Daniel,' 'Mascha,' 'S1007,' and 'Showpiece' had significantly better flower quality than the remaining cultivars. These six cultivars would require little or no grooming before sale. 'S1008,' 'Cody's Color' and 'Petite' exhibited poor flower quality. Plants with poor flower quality had distorted spathes and spadices, missing flowers parts (i.e., spathes or spadices) and/or crooked peduncles as reported previously for some other GA₃-treated cultivars (Henny 1981; Henny and Fooshee, 1985).

The diversity in cultivar responses to GA₃ indicates a significant amount of genetic variability controlling these processes. Currently hybridization and selection of random sports are used to obtain new cultivars. It is apparent that sufficient genetic variability exists among spathiphyllum cultivars to allow breeders and growers to select cultivars based on their number of flowers, flowering time, and flower quality in response to GA₃. Results from this study provide a baseline from which to make those selections.

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