Uniconazole Restricts Growth of Seed-propagated *Physostegia virginiana* (L.) Benth. 'Alba'

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Floricultural crops are often treated with plant growth retardants to control height. Growth of vegetatively propagated *Physostegia virginiana* 'Summer Snow' and 'Vivid' was restricted with a 2.5 mg a.i. per pot (0.9 liter) drench of uniconazole; foliar application of either 0.125 mg a.i. uniconazole per pot, 0.250 mg a.i. paclobutrazol per pot, or drench application of 5.0 mg paclobutrazol per pot had little effect on plant height of either cultivar (Beattie et al., 1990).

Physostegia virginiana can be readily propagated by seeds or stem cuttings. Since plant morphology can differ between seed vs. vegetatively propagated plants (L. Glienstein, personal communication), the effectiveness of growth retardants on seed-propagated *P. virginiana* is uncertain. The objective of this research was to evaluate drench applications of uniconazole in restricting vegetative growth in seed-propagated *P. virginiana* 'Alba'.

Seeds of *P. virginiana* 'Alba' were sown on 12 Jan. 1990 using a commercial medium of sphagnum moss peat and perlite (Fafard #2, Fafard Peat Moss Co, N.B., Canada). Plants were transplanted into cell packs (cells 3.8 × 3.8 × 5.7 cm) on 30 Jan. and repotted into 1.5-liter pots on 19 Feb. using a medium of 7 pine bark : 1 sand (v/v) amended with (kg·m⁻³) 3.6 dolomitic limestone, 3.6

Osmocote 14N-6.2P-11.6K (Grace/Sierra, Milpitas, Calif.), and 0.9 Micromax micro-nutrient fertilizer (Grace/Sierra). Plants were maintained in a greenhouse with air at a night minimum of 21C. Night-break incandescent lighting of 10 μmol·m⁻²·s⁻¹ from 2200 to 0200 HR was used since long-day photoperiods enhance flowering (Beattie et al., 1989). On 6 Mar., when plants had about three pairs of leaves, uniconazole was applied as a drench of 0, 0.75, 1.50, 2.25, 3.00, or 3.75 mg a.i. per pot in a volume of 50 ml. Ten single-plant replicates were arranged in a completely randomized design. When the first floret opened on the terminal inflorescence of each plant, plant height, number of lateral shoots, number of inflorescence buds longer than 5 mm, and time to flowering were recorded. Rate response to uniconazole was determined by regression analysis.

Drench applications of uniconazole from 1.50 to 3.75 mg a.i. per pot restricted vegetative growth (Table 1). Plant height decreased linearly as drench rate increased. Plants receiving 3.75 mg a.i. uniconazole were judged to be proportional to the 1.5 liter container size. However, the numbers of lateral shoots and inflorescence buds decreased as drench rate increased. A drench application of 2.25 or 3.00 mg a.i./pot re-

duced plant height compared to untreated plants without adversely affecting plant quality, as determined by the numbers of inflorescence buds and lateral shoots. Plants exhibited no phytotoxicity symptoms.

Time to flower was not affected by application rate, and most plants flowered within 14 weeks of treatment. In contrast, Beattie et al. (1990) observed a 5 to 23 day delay in flowering for vegetatively propagated 'Summer Snow' and 'Vivid', respectively, when a 2.5 mg a.i./pot (0.9 liter) drench of uniconazole was compared to the control. These differences in delay of flowering by uniconazole may be attributed to differences in cultivars or propagation methods used.

There was noticeable variation within treatments for all variables measured, especially plant height, as indicated by the SD (Table 1). A problem with producing *P. virginiana* from seed, as well as many other species of herbaceous perennials, is the large variation in some plant characteristics that are assumed to be genetically influenced. Pinnell et al. (1985) noted that many herbaceous perennials do not come true from seed. However, treatment with uniconazole at 2.25 or 3.00 mg a.i./pot appears to hold promise for restricting growth of *P. virginiana* 'Alba'.

Literature Cited

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Table 1. Response of seed-propagated *P. virginiana* 'Alba' to drench rates of uniconazole (SD in parentheses).

Drench rate (mg a.i./pot)	Plant ht (cm)	Lateral shoots (no.)	Inflorescence buds (no.)	Days to flower	Flowering (%) ^y
0	70 (12)	6 (4)	10 (5)	69 (6)	100
0.75	77 (19)	4 (2)	12 (5)	69 (6)	90
1.50	65 (13)	2 (1)	11 (4)	72 (12)	90
2.25	54 (13)	2 (2)	9 (4)	68 (7)	100
3.00	48 (16)	2 (1)	9(4)	73 (9)	80
3.75	34 (12)	1 (1)	8 (4)	73 (8)	90
Significance	L***	L*	L*	NS	

^yData taken when the first floret opened on the first inflorescence of each plant.
^yPercentage of plants to flower within 14 weeks of treatment.
^{ns}*,***Regression analysis nonsignificant or significant at P = 0.05 or 0.001, respectively.

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