

HEIGHT REGULATION OF POINSETTIA WITH A GROWTH RETARDANT INCORPORATED IN THE SOIL MEDIUM¹

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Abstract. Multi-branched poinsettia 'Annette Hegg Supreme' plants grown in 15 cm pots were evaluated following treatment with a granular 0.01% formulation of ancymidol (A-Rest^(R)) incorporated in the soil medium. Comparisons were made with ancymidol or chlormequat applied as a soil drench or foliar spray. Plant heights for the granular, drench, and spray applications of 0.5 mg ai ancymidol per pot were 24.8, 25.7, and 35.0 cm, respectively, compared to 42.1 cm for the untreated plants. Chlormequat applied as a foliar spray (2000 ppm) and a soil drench (3000 ppm) in 2 applications produced plants 31.9 and 30.9 cm tall, respectively. Inflorescence diameter was reduced only by the ancymidol drench treatment of 0.75 mg ai/pot and granular treatment at 2.0 mg ai/pot.

Demand for potted poinsettias (*Euphorbia pulcherrima* Willd.), a traditional symbol of the Christmas season, has increased national sales from 15.7 to 20 million pots from 1976 to 1977 (10). Florida production has paralleled this national trend and 780 thousand potted poinsettias were sold in Florida in 1977 (10). Since the development of the self-branching 'Annette Hegg' and 'Mikkelsen' cultivars in the 1960s (4), many growers plant a single cutting in a 15 cm pot, selectively prune it to 5-6 nodes, and apply a growth regulator to maintain a plant:pot height ratio of 1.5 to 2. Chlormequat (2-chloroethyl trimethylammonium chloride), applied as a foliar spray or soil drench, is used most frequently (2, 3). Ancymidol (α -cyclopropyl- α -(4-methoxyphenyl)-5-pyrimidine) is useful as a soil drench but is not effective as a foliar spray (1, 9). Both current application methods of the growth retardant require an additional operation in the crop cycle. Attempts to eliminate this labor-consuming step have included: 1) treating stock plants with chlormequat (8); 2) soaking pots and propagation blocks in ancymidol (5, 12); and 3) applying chlormequat and ancymidol through the irrigation system (6, 7). All of these methods either adversely affected plant growth or required an impractical quantity of the chemical. A recent report indicated that a granular formulation of ancymidol incorporated in the soil medium would properly maintain plant height of multi-branched poinsettias grown in 10 cm pots for 9 weeks (11).

This study was conducted to test the effectiveness of a granular formulation of ancymidol amended to the soil medium in comparison with chlormequat and ancymidol for height retardation of multi-branched poinsettias grown in 15 cm pots.

Materials and Methods

A 0.01% granular formulation of ancymidol was prepared by spraying the concentrate on finely ground clay (Flores 30/60).² The granular material was incorporated into the medium at concentration of 0, 0.25, 0.50, 0.75, 1.0,

and 2.0 mg ai/pot. Each 15 cm diam pot contained 1200 cc, by volume, of a peat moss, vermiculite, sand, perlite (6:3:2:1, v/v) medium. Medium was amended with Osmocote^(R) 14-11.6-5.7, Osmocote^(R) 18-2.6-10, ordinary superphosphate, dolomite, hydrated lime, and Perk^(R) 3 at 3.18, 4.95, 1.36, 3.02, 1.13, and 1.13 kg/m³, respectively. Initial soil pH was 6.2. A randomized design with 3 replications of 3 pots each was established and each experimental unit consisted of a single cutting per plastic pot. Similar medium, without the granular ancymidol, was prepared for comparison with ancymidol and chlormequat foliar sprays and soil drenches. Poinsettia 'Annette Hegg Supreme' cuttings, which were rooted in Oasis Rootcubes^(R), were planted in the medium on August 27, 1977 and were drenched with Truban^(R) at 2.5 g ai/l in 150 ml aliquots. Plants were grown on a raised bed in a polypropylene structure (30% shade) with natural photoperiod. Plants were pruned to 5 nodes on September 16 and grown to maturity with min night temp of 18°C and a max temp of 34°C. Pots were spaced on 38 cm centers and hand-irrigated as needed. Ancymidol at 0.50, 0.75, and 1.0 mg ai/pot was applied to plants grown in medium without the granular formulation on October 7 as either a soil drench or as a foliar spray in 150 and 20 ml aliquots per pot, respectively. Chlormequat was applied as a 2000 ppm foliar spray in 20 ml aliquots or as a 3000 ppm soil drench in 150 ml aliquots on October 7 or October 7 and 21. Plants were sprayed weekly for disease and insect control. Plant height above the pot rim, diameter of the uppermost inflorescence, and number of bracts per inflorescence in color were recorded on December 12 and data were analyzed statistically.

Results and Discussion

Plant response to the granular ancymidol was evident within 3 weeks of planting (Fig. 1). Plants grown in medium containing ancymidol were darker green and had shorter internodes than the controls. No difference in total number of internodes or premature development of axillary branches prior to pruning was observed as a result of the granular ancymidol.

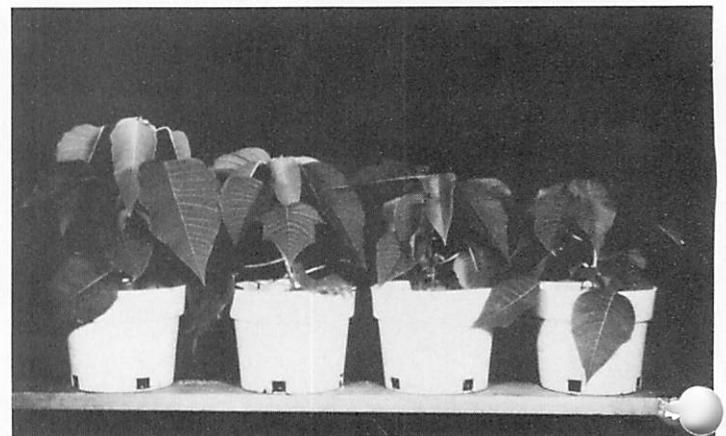


Fig. 1. Effect of granular ancymidol incorporated in medium at 0, 0.25, 0.50, and 0.75 mg ai/15 cm pot (from left to right) 3 weeks after planting established cuttings of poinsettia cv 'Annette Hegg Supreme.'

All growth regulators retarded elongation of the lateral branches (Table 1). Only the single application of chlormequat as a soil drench failed to retard lateral shoot elongation. Since the most desirable plant height range for 15 cm pots is 23-20 cm above the pot rim, the control plants were too tall and not in proportion to the container. Incorporation of the granular ancymidol at 0.50 and 0.75 mg ai/pot produced plants within the desired height range (Fig. 2). A difference in height of almost 10 cm was recorded between treatments of 0.25 and 0.5 mg ai/pot, with the latter approaching the minimum plant height desirable in a 15 cm pot. All ancymidol treatments applied as soil drenches produced plants from 24.4 to 26.1 cm tall and were not different significantly from granular ancymidol at 0.5 mg ai/pot. Although ancymidol applied as a foliar spray retarded plant elongation, at none of the rates did it produce plants less than 30 cm tall.

Table 1. Effect of growth retardant on plant height, inflorescence diameter, and number of color bracts of poinsettia cv. 'Annette Hegg Supreme.'

Treatment	Mg ai per pot	Plant height (cm)	Bract diameter (cm)	No. colored bracts Dec. 8
Control—water drench	—	42.1 az	26.8 abc	16.0 bcd
Ancymidol granular incorp.	0.25	34.5 b	29.4 a	17.8 abc
	0.50	24.8 cf	26.4 bcd	17.7 abc
	0.75	23.2 ef	28.1 ab	18.1 ab
	1.0	18.4 fg	25.9 bcde	17.7 abc
	2.0	15.2 g	23.9 de	17.2 abcd
Ancymidol drench ^a 150 ml	0.50	25.7 cde	26.5 bcd	17.8 abc
	0.75	26.1 cde	23.5 e	16.0 bcd
	1.0	24.1 ef	25.3 cde	19.4 a
Ancymidol spray ^a 20 ml	0.50	35.0 b	26.7 abc	16.1 bcd
	0.75	30.8 bcd	26.5 bcd	15.2 cd
	1.0	34.7 b	24.1 cde	15.6 bcd
Chlormequat drench ^a 150 ml				
One application	540	36.0 ab	24.5 cde	14.8 d
Two applications	1080	30.9 bcd	24.2 cde	15.7 bcd
Chlormequat spray ^a 20 ml				
One application	40	34.1 b	25.7 bcde	16.0 bcd
Two applications	80	31.9 bc	24.4 cde	15.0 cd

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



Fig. 2. Effect of granular ancymidol incorporated in medium at 0, 0.25, 0.50, 1.0, and 2.0 mg ai/15 cm pot (from left to right) of poinsettia cv. 'Annette Hegg Supreme.'

Diameter of the terminal inflorescence, which included the colored bracts, was significantly less only when ancymidol was applied as a granular material at 2.0 mg ai/pot or as a soil drench at 0.75 mg ai/pot (Table 1). During development of the lateral branches following the manual

pruning, it was observed that bracts of plants grown in medium containing granular ancymidol showed color prior to all other treatments. However, the number of colored bracts per inflorescence on December 12 was not affected by the treatments. Early development of the colored bracts would be advantageous to growers who produce plants for store displays, starting in mid to late November.

All media were made in 50 pot lots in a cement mixer and a major concern was the even distribution among the pots of the relatively concentrated formulation of granular ancymidol. Plant variability among pots containing specific concentrations of a growth regulator was minimal, which suggested the chemicals were distributed uniformly. An additional observation during the final evaluation of the plants was that plants grown in medium containing ≥ 1.0 mg ai/pot of granular ancymidol produced lateral branches which were more prostrate than upright. These laterals, if plants were handled roughly, were broken easily from the main stem.

Use of this formulation of ancymidol as an amendment to the medium prior to planting would eliminate one labor consuming step in the production of poinsettias and provide similar height control as present methods. Although the major poinsettia cultivars should be evaluated at selected concentrations of this formulation, this study indicated that the maximum amount necessary for the production of 'Annette Hegg Supreme' is 0.5 mg ai/pot when a 0.01% granular formulation is utilized.

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²Provided by Elanco Products, Eli Lilly & Co., Indianapolis, IN.

³Perk is a microelement mix manufactured by Kerr-McGee Corp., Jacksonville, FL.

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