

THE EFFECTS OF GROWTH RETARDANTS AND
TEMPERATURE ON THE GROWTH AND
FLOWERING OF POINSETTIA
CVS. 'ANNETTE HEGG' AND 'ECKESPOINT C-1'¹

Joseph W. Love, Roy A. Larson, and Bobby G. Hilliard
North Carolina State University, Raleigh

Abstract. Two poinsettia cultivars, 'Annette Hegg' and 'Eckespoint C-1', were grown at 60° and 65°F night temperatures, and subjected to growth retardant treatments. 2-Chloroethyl trimethyl ammonium chloride (CCC) soil drenches resulted in the shortest plants, but effective height control was achieved with combination spray applications of CCC and succinic acid 2,2-dimethylhydrazide (SADH), or CCC and N-pyrrolidinosuccinamic acid (F 529) applied once, or 2 foliar applications of CCC applied 3 weeks apart. Date of flowering was not appreciably affected by the growth retardants, but was affected by temperature. Flowering was accelerated at the warmer temperature, but plant heights and bract diameter were similar at both temperatures.

The introduction of the cultivars 'Annette Hegg' and 'Eckespoint C-1' increased the need for research on the chemical control of growth of poinsettia plants because studies (2, 3, 4, 5, 6, 8) on older cultivars were not applicable. Early reports indicated that the new cultivars were naturally slow-growing and height control measures were unnecessary. Some studies (1) stated that the slow-growing new cultivars did not respond to growth retardants effective on 'Barbara Ecke Supreme', 'Elisabeth Ecke', 'Paul Mikkelsen', and other cultivars.

Our studies were conducted in 1969 to determine the effectiveness of several combinations of 3 growth retardants on growth and flowering based on the positive results reported by Shanks (7) with Cycocel and B-Nine. Cuttings were taken August 25, 1969 and rooted in BR-8 blocks. The rooted cuttings were planted 3 per 6-inch clay pot, in soil, acid peat moss and sand, (2:1:1 by volume). The fertilizer program consisted of weekly applications of 2 1/2 lbs. soluble 20-20-20/100 gallons of water. Osmocote (14-14-14) was also used, applied as a topdressing 1 week after panning (late September) and again in late November, at a rate of 1/3 oz./6-inch pot. Plants were grown under natural day lengths at night temperatures of 60° and 65° F.

There were 10 growth retardant treatments in the study (Tables 1 and 2) and 4 pots (12 plants) of each cultivar per treatment grown in a completely randomized block. Final plant heights were obtained December 4 to the nearest half-inch from the pot rim to the plane of the primary cyathia along with bract diameter. Time of anthesis was determined by the appearance of pollen.

'Annette Hegg'. The average final heights and dates of flowering are shown in Table 1. Cycocel applied as a soil drench or foliar spray, or in combination with another growth retardant, was most effective in height control. Two Cycocel foliar applications, applied 3 weeks apart, were no more effective than one application of a Cycocel + B-Nine or Cycocel + F-529 combination treatment. Height differences were not obtained when plants were treated with 2 foliar applications of B-Nine or F-529, compared to the untreated control plants. No plant injury was observed when most combination treatments were used, but the Cycocel + B-Nine + F-529 spray combination resulted in severe foliar damage. The Cycocel spray treatment resulted in some yellowing of the foliage, but quality was not impaired at flowering. Date of flowering

was not affected by the growth retardants but bract diameter was less in all the growth retardant treatments (11-14 inches), compared with bracts on control plants (15 inches). All plants were in flower between November 21 and November 23 regardless of temperature or growth retardant treatments.

'Eckespoint C-1'. Contrary to an earlier report (1) this cultivar did respond to growth retardants. Plants treated with Cycocel spray or drench applications were several inches shorter than control plants. The retardants B-Nine and F-529 also affected plant growth, but to a lesser extent than Cycocel. The effects of the various treatments on plant height and date of flowering are shown in Table 2 and Figure 1.

Bract diameter were smaller on treated plants than on controls, but all plants would have been acceptable commercially. The quality shown in Figure 1 was typical of most plants in the experiment.



Figure 1. 'Eckespoint C-1' plants grown at night temperatures of 65°F (upper) and 60° (lower). 1, control; 5, CCC spray applications October 3 and 24; 3, CCC drench October 3. Control plants were 15 inches tall at both temperatures. Plants photographed December 19, 1969.

Table 1. Influence of 3 growth retardants and 2 temperatures on growth of 'Annette Hegg' poinsettia plants. Final data recorded December 4, 1969.

<u>Treatments</u>	<u>Average final height (inches)</u>		<u>Average bract diameter (inches)</u>	
	<u>Night temperature</u>		<u>Night temperature</u>	
	<u>60°F</u>	<u>65°F</u>	<u>60°F</u>	<u>65°F</u>
Cycocel drench (2,950ppm) 10/3 spray (2,950ppm) 10/24	7.0	8.0	11.0	12.5
Cycocel drench (2,950 ppm) 10/3	8.0	9.5	11.5	12.5
Cycocel (2,360ppm) and F-529 (7,500ppm) spray 10/3	10.0	9.5	14.0	13.5
Cycocel (2,360ppm) and B-Nine (10,000ppm) spray 10/3	10.0	11.0	12.5	14.5
Cycocel (1,967ppm), B-Nine (5,000ppm) F-529 (5,000ppm) spray 10/3	10.5	10.0	12.5	13.5
Cycocel spray (2,950ppm) 10/3 and (2,950ppm) 10/24	11.0	11.0	11.5	13.0
Cycocel spray (2,950ppm) 10/3	12.5	12.0	14.5	15.0
F-529 spray (7,500ppm) 10/ 3 and (5,000ppm) 10/24	12.5	13.5	13.5	14.0
B-Nine spray (10,000ppm) 10/3 and (5,000ppm) 10/24	14.0	13.5	13.5	14.5
Control	16.0	14.5	15.0	15.5

Table 2. Influence of 3 growth retardants and 2 temperatures on growth of 'Eckespoint C-1' poinsettia plants. Final data recorded December 4, 1969.

<u>Treatments</u>	<u>Average final height (inches)</u>		<u>Average bract diameter (inches)</u>	
	<u>Night temperature</u>		<u>Night temperature</u>	
	<u>60°F</u>	<u>65°F</u>	<u>60°F</u>	<u>65°F</u>
Cycocel drench (2,950ppm) 10/3 spray (2,950ppm) 10/24	7.0	8.5	9.5	11.5
Cycocel drench (2,950ppm) 10/3	8.5	10.0	11.5	12.5
Cycocel (2,360ppm) and F-529 (7,500ppm) spray 10/3	10.0	11.0	13.0	13.0
Cycocel (2,360ppm) and B-Nine (10,000ppm) spray 10/3	10.5	13.0	13.0	13.0
Cycocel (1,967ppm), B-Nine (5,000ppm) F-529 (5,000ppm) spray 10/3	9.5	11.5	13.0	12.5
Cycocel spray (2,950ppm) 10/3 and (2,950ppm) 10/24	9.0	10.5	11.5	11.0
Cycocel spray (2,950ppm) 10/3	11.5	12.5	12.5	14.0
F-529 spray (7,500ppm) 10/3 and (5,000ppm) 10/24	12.5	14.0	13.0	14.5
B-Nine spray (10,000ppm) 10/3 and (5,000ppm) 10/24	11.0	13.5	13.0	14.0
Control	15.0	15.0	14.5	14.5

Slightly taller plants were generally produced at the 65°F treatment than at 60°, and the plants flowered earlier at the warmer temperatures. Plants grown at 65° flowered November 25, while those at 60° flowered November 28.

We conclude for both cultivars that Cycocel drench treatment was the single most effective height control treatment and 2 spray applications were as effective as 1 drench application. One combination spray application of Cycocel + B-Nine, or Cycocel F-529, was more effective than 2 Cycocel spray applications applied 3 weeks apart. Within growth retardant treatments there was little difference in plant height between night temperature regimes of 60° vs. 65° F.

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