

REPORT ON 1962 POINSETTIA HEIGHT CONTROL STUDIES

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Grower interest in the use of growth retardents for poinsettia height control is very keen, and sources of information are numerous. However, growers are hesitant to rely too heavily on recommendations based on research conducted in a different geographical area. This report has been prepared primarily for two reasons:

1. Acquaint North Carolina growers with results obtained in studies at N. C. State College in 1962.
2. Present data for Barbara Ecke Supreme and Indianapolis Red. Much of the poinsettia height control work has been conducted only on Barbara Ecke Supreme, the most popular red variety in most regions of the country. In North Carolina, Barbara Ecke Supreme and Indianapolis Red are almost equally popular, and studies were conducted on both varieties at N. C. State College.

The grower is urged to note that the report is confined to research done in the Fall of 1962.

There have been many questions raised, with regard to the use of growth retardants on poinsettias. "When is the best time to treat? What is the effect on pinched plants? Does it pay?" are just samples of the inquiries received.

When is the best time to treat?

The majority of the plants treated are those propagated in August. Cuttings propagated earlier than August 1 are best treated as "cut-backs", though plants propagated in mid-July and treated with a growth retardant 30 to 40 days later can be of acceptable size at Christmas. Plants propagated after August 31 will generally be satisfactory in height, without the application of a growth retardant. Application after October 15 is not recommended for plants in 2½ or 3" pots, and November 1 is the suggested deadline for panned material.

Research was conducted in 1962, to determine the optimum time to treat. Some plants were treated while in 3" pots, and others were treated after final panning.

A. Single-stem plants

Four-inch cuttings were propagated August 1, August 15, August 31, and September 14, 1962. All cuttings were rooted in 3" peat pots, in a soil mixture of 1 part soil, 1 part sand, and 1 part acid peat moss. Intermittent mist and 70° F bottom heat was used. After 10 days under mist the cuttings were fertilized with 17-17-17 or 20-20-20, at 1½ pounds per 100 gallons of water. This rate of application was continued every 3-4 days until the rooted cuttings were removed from the mist. Approximately 3 weeks were required for rooting.

Some plants were treated one month after propagation, while still in 3" peat pots. Sixty ml. of solution were applied per pot. Three treated plants were then planted/ 6" pot 2 weeks after the application of the growth retardant. Another treatment involved panning one month after propagation, and the chemicals were applied 2 weeks later. A quantity of 250 ml. of solution was required to treat 3 plants in a 6-inch pot.

Cycocel, supplied by the American Cyanamid Company, was applied as a soil drench, at 1 quart of 11.8% active material per 10 gallons of water. B 995, furnished by Naugatuck Chemical Company, was applied at rates of 5,000, 10,000, and 15,000 ppm. Triton was applied as a spreader-sticker (1 drop/100 ml. solution), as B 995 was applied as a foliar spray.

Recommended fertilizer schedules were followed, as were sanitary greenhouse practices. All plants were lighted from September 15 to October 10 (from 10 pm to 2 am). Data collected in this study were: plant height at time of treatment, plant height when flower buds were macroscopically visible, plant height when pollen was first evident, date of visible bud, date of flower, and bract diameter. Bract diameter was measured when pollen was first evident, which was also considered to be the date of flower.

There were 244 plants of each variety in this study.

Results

1. August 1 propagation:

As can be seen in Table 1, Barbara Ecke Supreme plants treated with Cycocel while still in 3" pots averaged 23" in final height, while the check plants averaged 36". The plants which were panned and later treated had an average height of 20", while the check plants again averaged 36".

The effects of Cycocel on Indianapolis Red were similar to those reported for Barbara Ecke Supreme, as shown in Table 1.

Table 1. The effects of Cycocel on Barbara Ecke Supreme and Indianapolis Red, propagated August 1.

Treatment	Final height		Bract diameter		Date of flower	
	B.E.S.	Ind. R.	B.E.S.	Ind. R.	B.E.S.	Ind. R.
1. Treat 8/31-3" pots Pan 9/20 to 6" pots	23.1"	22.8"	13.5"	14.2"	12/15	12/10
2. Check	36.4	38.1	13.7	14.6	12/10	12/10
3. Pan 8/31 to 6" pots Treat 9/20	20.4	20.5	11.9	13.3	12/18	12/15
4. Check	36.4	39.8	13.2	13.4	12/10	12/14

The results of the B 995 treatments are shown in Table 2. A difference of approximately 12" was obtained when Barbara Ecke Supreme plants were treated with 10,000 and 15,000 ppm, compared to the check plants. Flowering was delayed 8 days in the highest treatment, but the plants were saleable for Christmas. Bract diameter was not affected. The lowest rate of B 995 (5000 ppm) resulted in a 9" difference between treated and untreated plants.

Table 2. The effects of 3 rates of B 995 on height of poinsettias propagated August 1, treated September 10, and panned September 20, 1962.

Concentration ppm	Final height		Bract diameter		Date of flower	
	B.E.S.	Ind. R.	B.E.S.	Ind. R.	B.E.S.	Ind. R.
5,000	27.7"	31.4"	14.9"	15.9"	12/10	12/15
10,000	25.0	29.3	14.2	14.7	12/10	12/15
15,000	24.5	25.2	13.8	14.7	12/18	12/15
Check	36.4	38.0	13.7	14.6	12/10	12/10

2. August 15 propagation:

The effects of Cycocel on Barbara Ecke Supreme plants are shown in Table 3 and Figures 1 & 2. Treated plants were usually only half as tall as the check plants, whether the material was applied to rooted cuttings in 3-inch pots, or to plants already panned in 6" pots. The bract diameters of treated plants were 2 to 3 inches smaller than the bracts on the check plants. The date of flowering was not seriously affected.

Table 3. The effects of Cycocel on Barbara Ecke Supreme and Indianapolis Red, propagated August 15.

Treatment	Final height		Bract diameter		Date of flower	
	B.E.S.	Ind. R.	B.E.S.	Ind. R.	B.E.S.	Ind. R.
1. Treat 9/15-3" pots Pan 10/1 to 6" pots	15.0"	12.8"	14.5"	10.3"	12/14	12/10
2. Check	28.7	26.4	16.9	14.2	12/14	12/10
3. Pan 9/15-6" pots Treat 10/1	13.2	13.1	12.0	10.5	12/18	12/18
4. Check	29.1	28.7	14.7	14.2	12/15	12/14

The results of Cycocel on Indianapolis Red are shown in Table 3 and Figure 1 & 2. The effects on height were similar to those reported for Barbara Ecke Supreme, as treated plants were approximately half as tall as the untreated plants. Bract diameter was reduced by about 4 inches when Cycocel was applied.

Plants of both varieties which were panned on September 15 and treated October 1 had crinkled, chlorotic foliage and extremely hard, reddish-colored stems. These symptoms were first noted on November 17. The plants flowered, but the cyathia were crowded in the center of the inflorescence, and lop-sided flowers were produced.

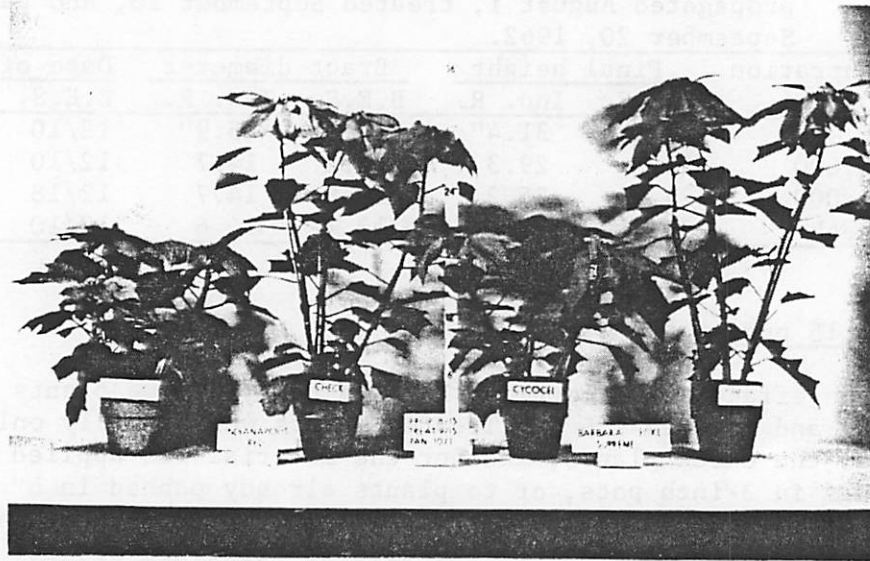


Figure 1. Indianapolis Red and Barbara Ecke Supreme, propagated August 15, treated with Cycocel September 15, and panned October 1. Photographed December 20, 1962.

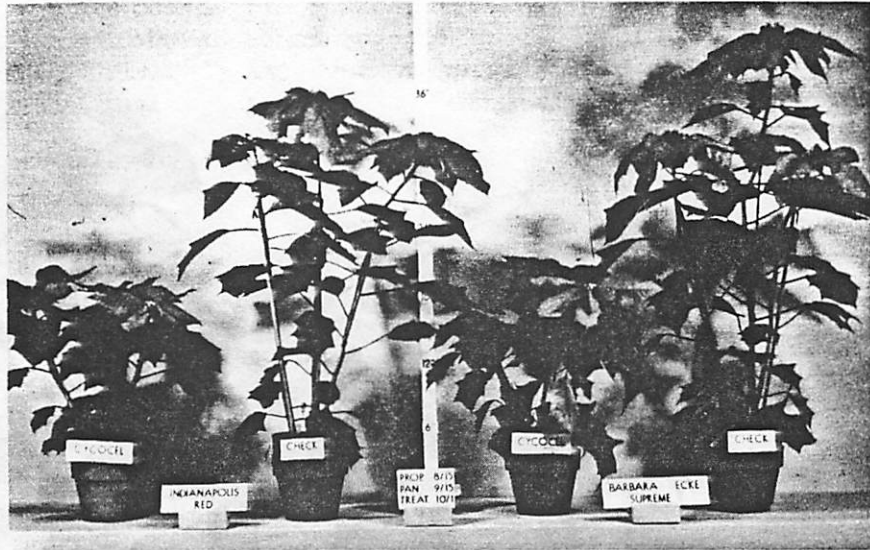


Figure 2. Indianapolis Red and Barbara Ecke Supreme, propagated August 15, panned September 15, and treated with Cycocel on October 1. Photographed December 20, 1962.

The effects of B 995 on plants propagated August 15 are shown in Table 4. Barbara Ecke Supreme plants, treated with 10,000 and 15,000 ppm, were 10 to 11 inches shorter than the check plants, while the 5000 ppm rate resulted in a 7-inch difference. Typical plants are shown in Figure 3. Average bract size was 2 inches smaller for the treated plants versus the untreated plants. Height differences of 10, 8, and 7 inches were recorded for the 15,000, 10,000 and 5,000 ppm concentrations, respectively, when compared with the untreated plants, for the variety Indianapolis Red, as shown in Table 4 and Figure 4.

Table 4. The effects of 3 rates of B 995 on height of poinsettias propagated August 15, treated September 25, and panned October 11, 1962.

Concentration ppm	Final height		Bract diameter		Date of flower	
	B.E.S.	Ind. R.	B.E.S.	Ind. R.	B.E.S.	Ind. R.
5,000	21.5"	19.0"	14.7"	15.4"	12/15	12/14
10,000	18.1	18.2	14.9	14.2	12/14	12/17
15,000	17.9	15.8	14.7	13.3	12/15	12/17
Check	28.7	26.2	16.9	13.2	12/14	12/14

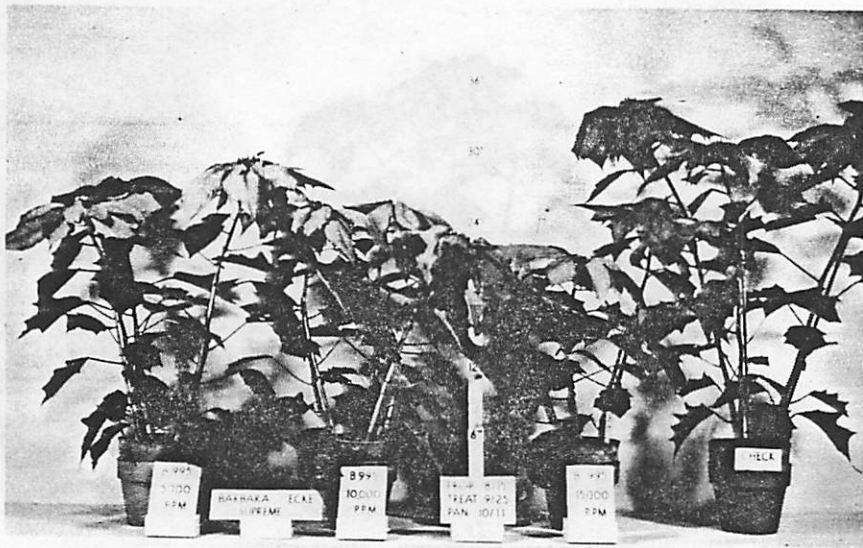


Figure 3. Barbara Ecke Supreme, treated with 5,000, 10,000 and 15,000 ppm B 995, and an untreated plant. The plants were propagated August 15, treated September 25, and panned October 11. Photographed December 20, 1962.

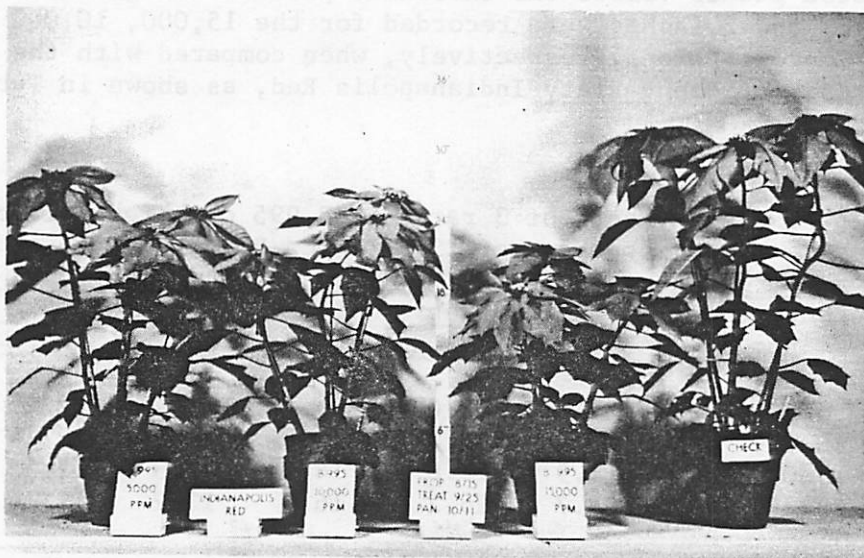


Figure 4. Indianapolis Red, treated with 5,000, 10,000 and 15,000 ppm of B 995, and an untreated plant. The plants were propagated August 15, treated September 25, and panned October 11. Photographed December 20, 1962.

3. August 31 propagation:

The effects of Cycocel on both varieties shown in Table 5.

Table 5. The effects of Cycocel on Barbara Ecke Supreme and Indianapolis Red, propagated August 31, 1962.

Treatment	B.E.S.	Ind. R.	B.E.S.	Ind. R.	B.E.S.	Ind. R.
1. Treat 9/30-3" pots Pan 10/15 to 6" pots	4.5"	5.4"	10.0"	9.1"	12/17	12/17
2. Check.	11.4	8.3	15.0	12.4	12/20	12/17
3. Pan 9/30 to 6" pots Treat 10/15	8.2	8.9	11.2	9.6	12/14	12/15
4. Check	20.6	20.1	15.0	15.1	12/14	12/14

Excessive height control was achieved in this phase of the study, particularly when the plants were treated when still in 3" pots. Even the check plants in this treatment were short, while the check plants which were panned on September 30 were approximately 20 inches tall, for both varieties. Plants treated with B 995 were also short, and averaged 8 inches, while the check plants were only 11 inches tall.

4. September 14 propagation:

Plants of both varieties averaged approximately 4 inches in height when treated in 3-inch pots on October 15 and panned November 1. Bract diameter was also reduced, by about 5 inches. Untreated plants which were panned November 1 were only 7.5 inches tall. Plants which were panned on October 15 and treated November 1 averaged 8 inches in height, while the check plants were 15 inches tall.

Plants treated with B 995 were 4 to 6 inches tall, regardless of concentration.

B. Pinched Plants

Cycocel was the only growth retardant used in the pinching study, and the propagation dates were August 1 and 15. The normal procedure was to pan 3 rooted cuttings per 6-inch pot, 1 month after removal of the cuttings from the stock plants. The plants were pinched on the day of panning, and Cycocel was applied when the breaks were 1-inch in length. The plants were pruned to 2 breaks, or a total of 6 potential flower heads per pot.

The results of the height control study on pinched plants are shown in Table 6, and Figure 5 for Barbara Ecke Supreme, and Figure 6 for Indianapolis Red.

Table 6. Effects of Cycocel on height control of pinched poinsettia plants, varieties Barbara Ecke Supreme and Indianapolis Red.

Treatment	Final height		Bract diameter		Date of flower	
	B.E.S.	Ind. R.	B.E.S.	Ind. R.	B.E.S.	Ind. R.
1. Propagated August 1 Panned August 31 Pinched September 1 Treated September 20	13.1"	15.7"	10.3"	12.5"	12/14	12/15
2. Check for Trt. 1	26.1	28.2	11.9	13.7	12/15	12/15
3. Propagated August 15 Panned September 15 Pinched September 15 Treated October 1	10.6	12.4	10.9	10.4	12/14	12/18
4. Check for Trt. 3	26.5	26.2	12.7	13.2	12/14	12/14



Figure 5. Barbara Ecke Supreme plants, propagated August 1, panned August 31, pinched September 1, and treated with Cycocel on September 20. Photographed December 20, 1962.



Figure 6. Indianapolis Red plants, propagated August 1, panned August 31, pinched September 1, and treated with Cycocel on September 20. Photographed December 20, 1962.

The pinched plants treated with Cycocel were much shorter than the check plants, and all 6 shoots per pot were uniform in size. Treated plants of the variety Indianapolis Red lost the foliage below the breaks, but Barbara Ecke Supreme plants were not affected.

Discussion

Cycocel was definitely effective in controlling height of poinsettia plants, when applied at the rate recommended by the American Cyanamid Company. B 995 was effective as a growth retardant when used at concentrations of 10,000 and 15,000 ppm.

From the N. C. State College studies conducted in 1962 it would appear that time of application could be varied, depending on date of propagation. The best plants in this study were obtained in the treatments where the growth retardant was applied to plants in 3-inch pots, and panned 2 weeks later. Though these plants were 2 to 3 inches taller than plants propagated on the same date but panned and then treated, the bracts were larger, and the plants were of better quality. This was true for the August 1 and August 15 propagation dates. However, the treatment of panning, and then treating plants in the 6-inch pots 2 weeks later, was better for the August 31 and September 14 propagation dates. A suggested schedule, only to be tried on a limited scale, could be:

Single-stem plants:

Early August propagation....treat 1 month later....pan 2 weeks after treatment.

Late August, early September....pan 1 month later....treat 2 weeks after panning.

Pinched plants:

Late July, early August propagation....pan 1 month later....pinch on date of panning....treat when breaks are 1" long (approximately 20 days). Pruning to 2 or 3 breaks per plant is suggested, though some growers may get uniform plants without pruning.

The rate recommended by the American Cyanamid Company (1 quart 11.8% Cycocel to 10 gallons of water) appears to be satisfactory. Less information is available on B 995. The material with which these studies were conducted was a 10% liquid formulation, while the material on the market, called B-Nine, is a 5% liquid formulation. The following dilution table is from the manufacturer's Technical Data Sheet No. 300-B1:

Desired Concentration	Ozs. of 5% B 995	Ml. of 5% B 995	
% PPM	soln./gallon water	soln./liter water	
1%	10,000	25 ozs.	200 ml.
0.75	7,500	19	150
0.50	5,000	12	100
0.25	2,500	6	50

The best results in 1962 at N. C. State College were achieved with 10,000 and 15,000 ppm.

The poinsettia grower should:

1. Carefully follow the manufacturer's label recommendations.
2. Contact research and development representatives of the manufacturer, or State College personnel, if he has any questions pertaining to the use of the growth retardants.
3. Expect height control.

The poinsettia grower should not:

1. Expect the material to solve any root rot or nutritional problems.
2. Let the plants get to the desired height, and then apply the material. The response is not instantaneous.
3. Treat his whole crop, particularly if he has not used the materials before.
4. Have to fold over properly-treated plants.