

LATE SEASON APPLICATION OF BONZI TO CONTROL STRETCH OF POINSETTIA

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Traditionally it has been recommended that plant growth regulators (PGRs) not be applied after mid-October or the start of short days (Hartley and Wilfret, 1992). Late applications may result in excessive height reduction and/or reduced bract size. However, some recent recommendations (Hammer, 1996; Moore, 1996) suggest that growth medium drench applications of very low concentrations (1-2 ppm) of Bonzi or A-Rest can be used late season stretch of poinsettia with minimal affect on bract diameter.

Many growers report too tall or "stretching" poinsettias late in the season. Some of the reasons for stretch include: missed early season PGR applications, periods of unusually favorable growing conditions, or elongation due to too close spacing or low light intensity due to cloudy weather. Using low levels of PGRs after the start of short days may help control stretch in these situations.

Drench applications of PGRs are laborious and mistakes in mixing or applying solutions could be disastrous in terms of too much growth control, uneven results, or bract injury. Also, based on my personal observations in some local greenhouses, it is sometimes hard to tell whether there has been any actual control of stretch to justify the effort invested in making the drench treatments. The objective of this study, supported by the Massachusetts Flower Growers' Association, was to test Bonzi for late season height control by studying the effects of Bonzi concentration, drench volume applied, and number of doses.

How the plants were grown

Rooted cuttings of 'Red Sails' poinsettia were potted on 29 July 1999 in 6-inch azalea pots of Fafard 3B. Plants were grown using standard commercial practices under natural light conditions. Plants were pinched on 17 August leaving five or six nodes. All plants were treated twice in September with a foliar spray of B-Nine and Cycocel. The first treatment of 2000 ppm B-Nine and 1000 ppm Cycocel was applied 10 September when the lateral shoots were about two inches long. On 24 September, when the lateral shoots were about four inches long, plants were sprayed with a solution of 1000 ppm B-Nine and 500 ppm Cycocel.

All plants, with the exception of the control group, were treated with a Bonzi drench as soon as 2 or 3 of the uppermost leaves showed some red coloring (28 October). At this stage coloring and bract expansion were just beginning. One-half of the Bonzi-treated plants received a second dose two weeks later (11 November). At this time 5-6 bracts were fully colored and close to full expansion while many smaller leaves were in earlier stages of coloring and expansion.

Growth medium drench treatments were 1, 2, or 3 ppm Bonzi applied in volumes of 3, 4, or 5 fl. oz./pot. The amount of active ingredient applied in each dose are shown in Table 1.

Plant height, plant diameter, and bract diameter were measured at the conclusion of the experiment (9 December). Bract internode length (measured from the top of the cyathia to the lowermost bract showing red color) was also measured at the end of the experiment to determine how treatments affected bract spacing.

Results

Plant Size. Bonzi applied during the early stages of bract information and coloring generally resulted in shorter plants and smaller plant diameter compared to the control treatment (Table 2). Treatment effects on plant height were similar with one or two doses.

There were no significant differences in plant height among Bonzi-treated plants due to Bonzi concentration, drench volume, or number of doses. However, smaller plant diameter resulted from increases in Bonzi concentration or drench volume, but not number of doses.

Bract size. Bract diameter of Bonzi-treated plants was not different from the control treatment when one dose of PBZ was applied at 1 ppm at all drench volumes and 2 ppm at 3 and 4 fl. oz. One dose of Bonzi at 2 ppm applied at 5 fl. oz., one dose of 3 ppm at all drench volumes, and two doses of all combinations of Bonzi and drench volume resulted in smaller bract diameter than the control. Overall, bract diameter was reduced by increases in Bonzi concentration, drench volume, and number of doses.

In some treatments the bracts were puckered and twisted in a manner suggesting the occurrence of uneven growth rates within different parts of the individual bracts. This distortion occurred on the bracts of some, but not all, plants drenched with one dose of Bonzi applied at 3 ppm and 5 fl. oz. and two doses of 3 ppm applied at 4 and 5 fl. oz. No bract distortion was evident in any of the other treatments.

All Bonzi treatments resulted in shorter bract internode length compared to the control. Bract internode length decreased with increases in Bonzi concentration and number of doses, but it was not affected by drench volume. In the opinion of some, closely-spaced bracts make a more desirable poinsettia "flower."

Table 1. Amount of active ingredient (mg a.i./pot) applied with each dose of Bonzi drench.

Bonzi (ppm)	Drench Volume (fl. Oz)		
	3	4	5
1	0.09	0.12	0.15
2	0.18	0.24	0.30
3	0.27	0.36	0.45

Table 2. Effect of Bonzi drench applications on plant and bract size of 'Red Sails' poinsettia.

Treatment		Plant height (cm ²)		Plant diameter (cm)		Bract diameter (cm)		Bract internode length (cm)	
Bonzi (ppm)	Drench (fl. Oz)	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses
Control (no Bonzi)		39.0		59.3		33.5		5.1	
1	3	35.7 ^y	<u>33.8</u>	<u>53.9</u>	56.0	31.8	30.8	<u>4.3</u>	<u>4.1</u>
1	4	<u>33.7</u>	36.1	<u>50.6</u>	<u>54.5</u>	31.7	<u>29.3</u>	<u>4.2</u>	<u>3.9</u>
1	5	<u>34.4</u>	<u>35.4</u>	54.8	<u>53.7</u>	30.8	<u>29.4</u>	<u>4.2</u>	<u>3.8</u>
2	3	<u>35.6</u>	<u>34.5</u>	<u>53.4</u>	55.1	30.3	<u>29.4</u>	<u>4.2</u>	<u>4.1</u>
2	4	<u>34.3</u>	36.4	<u>52.4</u>	<u>52.4</u>	31.8	<u>28.4</u>	<u>4.1</u>	<u>4.1</u>
2	5	<u>35.1</u>	<u>35.3</u>	<u>51.4</u>	<u>52.0</u>	<u>28.8</u>	<u>28.4</u>	<u>3.9</u>	<u>4.0</u>
3	3	36.8	<u>34.1</u>	<u>53.6</u>	<u>50.0</u>	<u>28.8</u>	<u>27.5</u>	<u>3.9</u>	<u>3.8</u>
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3	5	<u>33.7</u>	<u>32.3</u>	<u>51.6</u>	<u>49.4</u>	<u>27.4</u>	<u>25.1</u>	<u>3.6</u>	<u>3.8</u>

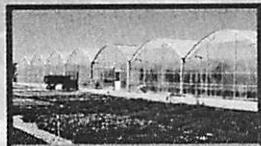
^z2.54 centimeters (cm)=1 inch

^y Underlined means are significantly different from the control by Dunnett's procedure, p=0.05

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Conclusions

My results demonstrate that Bonzi applied as a drench at low concentrations during the early stages of bract expansion and coloring is effective at suppressing the height and diameter of poinsettia. Plant height and diameter reductions in this study were not excessive and would meet the objectives of late season stretch control for most growers.

An unexpected outcome was that differences in height among Bonzi-treated plants did not result from different concentrations, drench volumes or number of doses. Control of late season stem elongation did not require the highest concentrations of Bonzi, large drench volumes, or two doses. Thus it isn't necessary to use the high levels of active ingredient which led to the reduced bract diameter recorded in this experiment. Also, by avoiding the highest levels of active ingredient (two doses of 0.36 mg a.i./pot or one or two doses of 0.45 mg a.i./pot), so too can the bract distortion observed in some treatments.

When making PGR drenches, remember that the amount of active ingredient (mg a.i./pot) applied is more important than the concentration (ppm) of the drench solution. The volume of the drench together with ppm determines mg a.i./pot (Table 1). This explains why at any ppm, level different application volumes may affect plant growth to a different degree and why inaccurate volume measurement during drenching leads to uneven results.

Based on my results, the use of two doses of Bonzi drench or any combination of Bonzi concentration and drench volume resulting

in a level of active ingredient above 0.24 mg a.i./pot risks a reduction in bract diameter and bract distortion.

A desirable level of plant size reduction without a reduction in bract diameter and no bract distortion resulted from one dose of 1 ppm Bonzi (all drench volumes) and 2 ppm (3 and 4 fl. oz.). These treatments provided active ingredient in the range of 0.09-0.24 mg a.i./pot.

References:

Hammer, P.A. 1996. Poinsettia primer. *GrowerTalks*. 59(14):42, 44, 46-50.

Hartley, D.E. and G.J. Wilfret. 1992. Poinsettias (potted). Section 13, pp. 75-77 in: H.K. Tayama, R.A. Larson, P.A. Hammer, T.J. Roll, Eds. *Tips on the use of chemical growth regulators on floriculture crops*. Ohio Florists' Assoc., Columbus, OH.

Moore, S.R. 1996. Late growth regulator tips. *GrowerTalks*. 60(7):52.

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