

EFFICACY OF A-REST, BONZI, AND SUMAGIC ON GROWTH OF TUBEROUS-ROOTED DAHLIAS

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Tuberous-rooted dahlias can have excessive size relative to the container they are grown in, and chemical plant growth retardants (PGRs) may be required for height control. De Hertogh and Blakely (1976) recommended applying substrate drenches of A-Rest at 0.25 to 2 mg active ingredient (a.i.) per pot, 10 to 14 days after potting the tubers for height control. Whipker et al. (1995) found no

significant reduction in plant height of 'Golden Emblem' tuberous-rooted dahlia with Bonzi drench concentrations of up to 1.9 mg a.i./pot or with Sumagic drench concentrations up to 0.47 mg a.i./pot. This study was conducted to determine the effectiveness of higher concentrations of A-Rest, Bonzi, and Sumagic as a chemical height control for tuberous-rooted dahlias.

Experimental Design

Dormant tubers of 'Golden Emblem' (a tall variety) and 'Red Pigmy' (a shorter variety) dahlias were potted into 6 inch standard round plastic pots on 12 March. The root substrate contained 1 field soil : 2 sphagnum peat : 2 perlite (by volume) and was amended with (per cubic yard of mix) 24 oz. $\text{Ca}(\text{H}_2\text{PO}_4)_2$, 16 oz. KNO_3 , 16 oz. $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, 8 lbs. ground dolomitic limestone and 2 oz. Peter's fritted trace elements No. 555. Plants were fertilized at each irrigation (ppm) with 201 N, 46 P, and 200 K. Greenhouse day/night set points were 75/65 °F. The plants were grown under natural day length. Fifteen plant growth retardant (PGR) substrate drench treatments (mg a.i./pot) were applied 13 days after potting by using 4 ounces (118 ml) per pot: A-Rest at 0.5, 1, 2, 4, and 8; Bonzi at 1, 2, 4, 8, and 16; Sumagic at 0.125, 0.25, 0.5, 1, and 2; and an untreated control. A completely randomized design of eight single-plant replications of each cultivar was used. When the first inflorescence opened, the number of days from potting until flowering, leaf canopy height measured from the pot rim to the top of the foliage, flower height above the foliage, total plant height, and plant diameter (measured at the widest dimension and turned 90°, and averaged) were recorded.

Results and Discussion

The majority of total height control achieved by the use of PGRs was primarily due to a reduction of inflorescence height, rather than leaf canopy height. Bonzi, A-Rest, and

Sumagic at all concentrations significantly reduced 'Red Pigmy' total plant height by >21% when compared to the untreated control. 'Red Pigmy' is a less vigorous cultivar, with the untreated control plants being 17.1 inches high. Marketable potted plants were produced with Bonzi concentrations of 2 to 4 mg, 0.25 to 0.5 mg of Sumagic, or 0.5 mg of A-Rest (Figure 1).

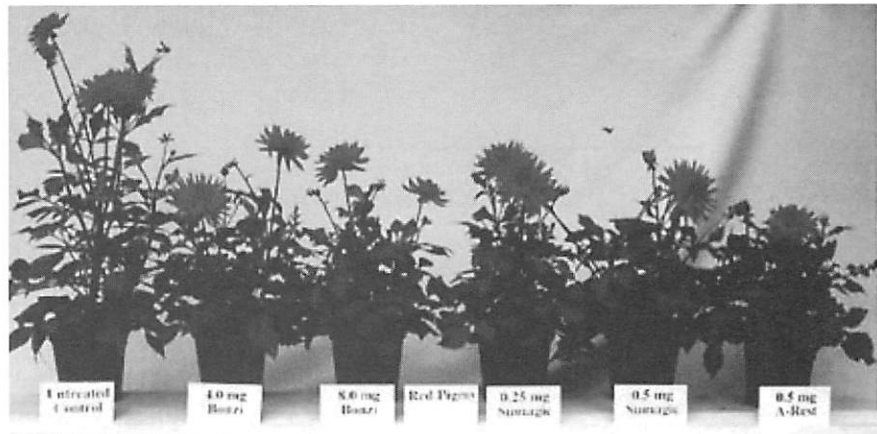


Figure 1. The effect of (left to right) Bonzi at 4 and 8 mg, Sumagic at 0.25 and 0.5 mg, and A-Rest at 0.5 mg on growth of 'Red Pigmy' pot dahlias grown in 6 inch standard pots.

All Bonzi, A-Rest, and Sumagic concentrations significantly reduced 'Golden Emblem' total plant height by >11% when compared to the untreated control. 'Golden

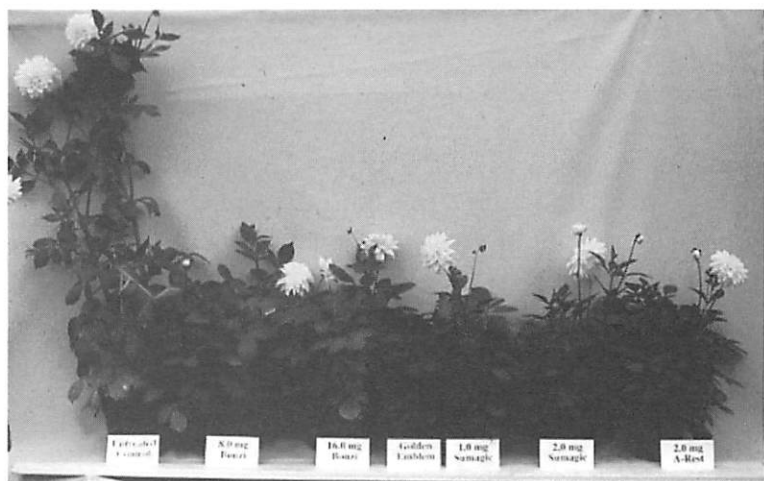


Figure 2. The effect of (left to right) Bonzi at 8 and 16 mg, Sumagic at 1.0 and 2.0 mg, and A-Rest at 2.0 mg on growth of 'Golden Emblem' pot dahlias grown in 6 inch standard pots.

Table 1. Effectiveness of PGR on days from potting until flowering and per pot costs of the PGR treatments for 'Red Pigmy' and 'Golden Emblem' dahlias grown as potted plants. Data averaged over both cultivars.

PGR	Dose mg a.i./pot	Days to to flowering	Cost (\$) ^z
Untreated control	—	68.7	—
Bonzi	1	72.3	0.021
	2	68.9	0.042
	4	71.4	0.084
	8	71.6	0.169
	16	69.3	0.338
Sumagic	0.125	69.4	0.021
	1.25	71.8	0.041
	0.5	72.7	0.082
	1	72.9	0.165
A-Rest	2	75.4	0.330
	0.5	74.2	0.112
	1	73.9	0.224
	2	75.8	0.448
	4	77.3	0.897
	8	80.4	1.793
Significance ^y		***	—
LSD (alpha 0.05)		5.2	—

^zCost (rounded) based on the use of drench applications of PGRs; costs used were \$102 per quart of Bonzi, \$78 per quart of Sumagic, and \$56 per quart for A-Rest.

^y*** Significant at P = 0.001 for the treatment interaction. Data averaged for both cultivars; n = 16.

'Emblem' was the more vigorous cultivar, with a height of 32.3 inches for the untreated control. Marketable potted plants were produced with Bonzi concentrations of 4 to 8 mg, 0.5 to 1 mg of Sumagic, or 2 mg of A-Rest (Figure 2). Even though the plants were 3 to 4 times taller than the pot height of 6 inches, the doses recommended resulted in a minimal amount of leaf distortion, reduction in inflorescence diameter, and delay in the number of days until flowering.

A-Rest and Bonzi are labeled for use on tuberous-rooted dahlias. Sumagic foliar spray rates for dahlias grown as bedding plants are listed on the label. The choice of PGRs to control the growth of tuberous-rooted dahlias should be based on the response of the cultivar and the cost of the PGR (Table 1). The desired control of growth was obtained for the lowest cost by using Bonzi at the cost of 8.4¢ to 16.9¢ per pot for 'Golden Emblem' and 4.2¢ to 8.4¢ for 'Red Pigmy', which was between 25 to 81% less expensive than A-Rest.

Literature Cited

- De Hertogh, A.A. and N. Blakely. 1976. The influence of ancymidol, chlormequat and daminozide on the growth and development of forced *Dahlia variabilis* Willd. *Scientia Horticulturae*. 4:123–130.
- Whipker, B.E., R.T. Eddy, and P.A. Hammer. 1995. Chemical growth retardant application to tuberous-rooted dahlias. *HortScience* 30:1007–1008.

