

Efficacy of A-Rest, Bonzi, and Sumagic on Growth of Tuberous-rooted Dahlias

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Summary

Plant growth retardant (PGR) substrate drench treatments (mg a.i./6" standard pot) of A-Rest at doses of 0.5 to 8; Bonzi from 1 to 16; and Sumagic from 0.125 to 2 were applied to tuberous-rooted dahlias (*Dahlia variabilis*) to compare their effectiveness for controlling height. When the first flower opened, the number of days from potting until flowering, leaf canopy height, inflorescence height above the foliage, and plant diameter were recorded. Total height control achieved by the use of PGRs was primarily due to a reduction of flower stalk height, rather than leaf canopy height. Bonzi, A-Rest, and Sumagic at all doses reduced total plant height of a less vigorous cultivar [Red Pigmy](#) by >21% when compared to the untreated control, with a height of 17.1 inches (43.5 cm) for the untreated control plants. Marketable potted plants were produced with Bonzi doses of 2 to 4 mg, 0.25 to 0.5 mg of Sumagic, or 0.5 mg of A-Rest. All Bonzi, A-Rest, and Sumagic doses reduced total plant height of a more vigorous cultivar [Golden Emblem](#) by >11% when compared to the untreated control, with a height of 32.3 inches (82.1 cm) for the untreated control. Marketable potted plants were produced with 4 to 8 mg Bonzi, 0.5 to 1 mg of Sumagic, or 2 mg of A-Rest.

Introduction

Plant growth retardants (PGRs) are commonly applied to containerized crops when plants are disproportionately large relative to the container. Tuberous-rooted dahlias can have excessive size relative to the container, and PGRs are 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 Sumagic 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 Mar. 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 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 (24/18 °C). 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 16.0; Sumagic at 0.125, 0.25, 0.5, 1, or 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.

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. [A-Rest](#), [Bonzi](#), 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 (43.5 cm) 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.

All [A-Rest](#), [Bonzi](#), and [Sumagic](#) concentrations significantly reduced Golden Emblem total plant height by >11% when compared to the untreated control. Golden Emblem was the more vigorous cultivar, with a height of 32.3 inches (82.1 cm) 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. 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.

Only 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 \$0.084 to \$0.169 per pot for 'Golden Emblem' and \$0.042 to \$0.084 for 'Red Pigmy', which was between 25 to 81% less expensive than A-Rest.

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 treatment	Dose (mg a.i./pot)	Days to flowering	PGR per pot 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
	2	75.4	0.330
A-Rest	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	---	***	---
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.

Literature Cited

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