

Plant Growth Regulator Trials on Perennial Ornamental Plants[©]

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Based on a series of research trials on perennial ornamental plants, effective rates of several plant growth regulators are given. Genera include *Artemisia*, *Cosmos*, *Coreopsis*, *Digitalis*, *Fuchsia*, *Gaura*, *Hemerocallis*, *Monarda*, *XSolidaster*, *Veronica*, *Arenaria*, and *Dianthus*. Plant container sizes ranged from 1-gal field grown to one-true-leaf-sized plugs in the greenhouse.

INTRODUCTION

Research conducted on height control of perennial ornamental plants in the nursery has shown varied results. Species, cultivar, chemical, and stage of growth when treated are all important factors determining effectiveness of plant growth regulation. Even method of application—spray or drench—can affect results. Our research has included 24 species of common perennials. Sizes have included 1-gal pots, outside grown, 3- to 6-inch potted plants in the greenhouse. Current research is on plug plants in the 1- to 2-true-leaf stage in the greenhouse.

Effective spray treatments for height control based on these earlier trials are:

Plant	Container	Treatment
<i>Artemisia</i>	1 gal	50 ppm paclobutrazol (Bonzi)
<i>Cosmos</i>	4-inch pot	40 ppm paclobutrazol; Drench - 10 ppm paclobutrazol
<i>Coreopsis</i>	6-inch pot	40 ppm paclobutrazol; Drench 2 ppm paclobutrazol
<i>Digitalis</i>	1 gal	15 ppm ancymidol (A-Rest); Drench 4 ppm ancymidol
<i>Fuchsia</i>	4-inch pot	50 ppm paclobutrazol; Drench 5 ppm paclobutrazol
<i>Gaura</i>	1 gal	3000 ppm daminozide (B-Nine); Spray-50 ppm paclobutrazol
<i>Hemerocallis</i>	1 gal	50 ppm paclobutrazol
<i>Monarda</i>	3-inch pot	160 ppm paclobutrazol
<i>XSolidaster</i>	1 gal	2500 ppm daminozide + 30 ppm paclobutrazol
<i>Veronica</i>	1 gal	2500 ppm daminozide + 20 ppm paclobutrazol

MATERIALS AND METHODS — CURRENT RESEARCH

The spray treatments were made to plug plants at the 1- to 2-true-leaf stage. The spray volume was 1.4 liter 10 m⁻². The plants were in plug trays, 288 cells per 27 cm × 52 cm tray size. Standard nursery irrigation and fertilization practices were maintained.

Species.

- *Coreopsis* 'Sonnenkind' (syn. *Coreopsis* Baby Sun)
- *Arenaria montana* 'Avalanche'
- *Dianthus* 'Stagirond', Rondo[®] pinks (syn. *Dianthus* Rondo Mix)

Treatments (Spray).

- A) Daminozide (B-nine) – 2500 ppm
- B) Daminozide – 2500 ppm, repeated after 2 weeks
- C) Daminozide – 2500 ppm + 1250 ppm chlormequat chloride (Cycocel)(CCC)
- D) Paclobutrazol (Bonzi) – 5 ppm
- E) Water only – control

Table 1. Effect of various plant growth regulators on the height of three bedding plant species. Values followed by the same letter were not significantly different using Duncan's Multiple Range Test, $P = 0.05$. WAT = Week(s) after treatment.

<i>Dianthus</i>	Treatment	Pre	1 WAT	2 WAT	3 WAT
	A	0.6	1.6 a	2.8 b	4.1 a
	B	0.7	1.6 a	2.8 b	4.1 a
	C	0.6	1.1 b	1.6 c	2.4 b
	D	0.7	1.2 b	1.3 c	1.5 c
	E	0.6	1.8 a	3.4 a	4.2 a
		ns			
<i>Coreopsis</i>	Treatment	Pre	1 WAT	2 WAT	3 WAT
	A	0.2	0.7 b	1.2 b	2.5 b
	B	0.3	0.5 bc	1.2 b	2.2 b
	C	0.2	0.4 c	0.6 c	1.8 c
	D	0.2	0.6 bc	0.6 c	1.1 d
	E	0.2	1.0 a	1.7 a	3.8 a
		ns			
<i>Arenaria</i>	Treatment	Pre	1 WAT	2 WAT	3 WAT
	A	0.5	2.1 a	3.4 a	5.9 a
	B	0.6	2.1 a	3.6 a	6.3 a
	C	0.5	2.0 a	3.5 a	5.7 a
	D	0.6	1.2 b	1.3 b	2.1 b
	E	0.6	1.9 a	3.0 a	5.3 a
		ns			

Treatments (Spray)

Daminozide (B-nine) – 2500 ppm.

Daminozide – 2500 ppm, repeated after 2 weeks.

Daminozide – 2500 ppm + 1250 ppm chlormequat chloride (Cycocel)(CCC).

D. Paclobutrazol (Bonzi) – 5 ppm.

E. Water only – control.

RESULTS AND DISCUSSION

Dianthus. One week after treatment (WAT), Bonzi and B-Nine plus Cycocel produced significantly shorter plants (Table 1). At 2 WAT, the same results were evident, with the smallest plants produced by Bonzi and B-Nine plus Cycocel, followed by B-Nine alone. At 3 WAT, the smallest plants were Bonzi treated, followed by B-Nine plus Cycocel.

Coreopsis. At 1 WAT, all treatments produced shorter plants than the untreated controls. At 2 and 3 WAT, all treated were shorter, with those treated with Bonzi the shortest followed by B-Nine plus Cycocel and B-Nine alone.

Arenaria. At 1, 2, and 3 WAT, only Bonzi produced significantly shorter plants.

LITERATURE CITED

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Questions and Answers: General Session VI

Don Merhaut: When you apply these growth regulators, do you change the fertility programs or do you see a need to reduce the fertility?

Gary Hickman: We have not found that to be necessary in our work.

Dave Barcel: On the practical side for growers, if there is a standard fertilization program it is generally left alone and with the addition of plant growth regulators there is plenty to do.