Herbaceous Perennial Growth Control Using Dormant Season Container Drenches

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The popularity of herbaceous perennials with the gardening public has resulted in a dramatic production increase in the nursery industry. Along with this increased production is the need to effectively control the growth of these plants during the shipping and marketing season. Many herbaceous perennials require the application of plant growth regulating chemicals (PGR) to maintain these plants at a size that can be handled and shipped with a minimum of damage to the plants (3). Typically, PGRs are applied during the spring when the plants are actively growing. Unfortunately, this is a period of time when most nurseries are placing the greatest emphasis on loading and shipping for spring sales. It would be advantageous if these PGR applications could be applied prior to the shipping season.

Growth of *Achillea*, *Coreopsis*, *Chrysanthemum* and *Rudbeckia* was effectively controlled with Bonzi and Sumagic container drenches providing applications were made prior to resumption of active growth (1). Effective growth control of *Coreopsis* has also been reported using PGR container drenches made prior to entering dormancy (2). Dosage is also extremely important as excessive application rates with inhibit flowering of herbaceous perennials. The objective of this research was to determine the effectiveness of plant growth regulator container drenches made during winter dormancy.

This project was conducted at the Nursery Research and Service Center at Tennessee Technological University. Uniform liners of *Coreopsis lanceolata* 'Early Sunrise' and *Achillea millefolium* 'Summer Pastels' were transplanted into trade gallon (2.8L) containers May 1999 into 100% pine bark fines. Fertilization and irrigation were applied following best management practices. All plants were placed in a poly house in December 1999 and moved to cold frames in January 2000 for winter protection. Container drenches of Bonzi (0, 1, 2.5, 5 mg/container), Sumagic (0, 0.25, 0.5, 1 mg/container) and A-Rest (0, 0.375, 0.75, 1.5 mg/container) were applied on January 21, 2000 using a drench volume of 100ml. All containers were irrigated prior to treatment application. All plants were removed form winter protection on April 1, 2000 and topdressed with 15g 14-7-7 granular fertilizer. Data included growth index using the (W1+W2+H)/3 method, height and flower number. Data was recorded on April 28, 2000 (*Achillea*) and May 26, 2000 (*Coreopsis*).

Achillea: Bonzi drenches at 5 mg a.i. produced the only significant differences in both height and growth index in *Achillea* (Table 1) There were no differences in flower production. There were similar reductions in plant height at all Sumagic rates. As Sumagic rates increased an associated decrease in flower production was observed. This is consistent with previous reports of Sumagic adversely affecting flowering at higher application rates. Growth index was reduced with increasing A-Rest treatment rates. There were no differences in height or flower production with A-Rest container drenches.

Coreopsis: Height and growth index were reduced with Bonzi drenches at the two highest treatment rates (Table 1). There was no difference in *Coreopsis* flowering, however there was a decreasing trend with increasing treatment rates. Sumagic drenches reduced both growth index and flower number at the highest drench rate (1 mg a.i.). Height was decreasing with increased Sumagic treatment rate. A-Rest produced similar reductions in both height and growth index at all treatment rates.

The application of plant growth regulators during a time of reduced pressures on the labor force at a nursery would be advantageous for the grower. The results of this research and of other reported results suggest that application of PGRs to herbaceous perennials during an alternative time period can be a viable tool for growers to use to manage the growth of these popular plants during the production phase.

Literature cited:

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Table 1. Growth response of *Achillea millefolium* 'Summer Pastels' and *Coreopsis lanceolata* 'Early sunrise' as measured by height, growth index, and flower number to dormant season plant growth regulator container drenches.

	Achillea millefolium 'Summer Pastels'			*Coreopsis lanceolata* 'Early Sunrise'		
	Height (cm) April 28	Growth Index April 28	Flower No. May 26	Height (cm) May 26	Growth Index May 26	Flower No. May 26
Bonzi (mg a.i.)						
0	15.6 a	24.7 a	15.7 a	28.7 a	23.1 a	35.0 b
1	11.6 b	22.5 a	13.5 a	25.4 ab	21.4 a	39.6 a
2.5	11.0 b	21.8 a	10.8 a	24.2 b	20.6 ab	52.0 a
5	7.4 c	16.3 b	12.0 a	19.5 b	18.1 b	40.2 a
Significance	***	***	ns	*	*	ns
LSD	3.2	3.4	5.5	4.1	2.1	14.3
Sumagic (mg a.i.)						
0	14.8 a	23.6 a	17.7 a	28.7 a	23.1 a	35.0 a
0.25	12.8 b	23.7 a	15.5 ab	22.2 b	19.2 a	42.0 a
0.50	12.0 b	24.1 a	10.4 bc	22.5 b	20.2 a	41.2 a
1.0	16.6 b	21.6 b	6.5 c	16.0 c	16.7 b	22.6 b
Significance	**	*	**	**	**	**
LSD	1.7	1.8	5.1	3.8	1.9	9.5
A-Rest (mg a.i.)						
0	11.8 a	22.7 ab	17.7 a	28.7 a	23.1 a	35.0 bc
0.375	12.8 a	24.6 a	13.4 a	23.7 b	20.4 b	63.5 a
0.75	10.2 a	20.9 bc	14.2 a	21.1 b	19.3 b	28.9 c
1.5	10.1 a	20.1 c	12.6 a	22.9 b	20.2 b	44.5 b
Significance	ns	**	ns	***	**	**
LSD	2.9	2.5	6.1	2.6	1.7	15.4