Response of Perennial Bedding Plants to Three Common Plant Growth Regulators

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The wide variety of perennial species being produced for the bedding plant market ha taxed our ability to evaluate their responsiveness to plant growth regulators (PGRs) available for ornamentals. This report presents some of the results of a survey study of the response of eight bedding plant species to three PGRs.

Materials and Methods. The following species were donated as precooled plugs by Green Leaf Enterprises, Inc.: coreopsis (*Coreopsis grandiflora* 'Sunray'), purple coneflower (*Echinacea purpurea*), blanket flower (*Gaillardia grandiflora* 'Goblin'), perennial phlox (*Phlox paniculata* 'Joliet'), cone flower (*Rudbeckia fulgida* var. *sullivantii* 'Goldstrum'), hollyhock (*Alcea rosea* mix), speedwell (*Veronica alpina* 'Goodness Grows'), and bee balm (*Monarda didyma* 'Blue Stocking'). The plugs were planted in 4" pots in April 1996 and treated with PGRs about 2 weeks later. PGR treatments included a single foliar spray (at label recommended volume of 2 qt/100 sq.ft.) of 240 ppm Bonzi or 40 ppm Sumagic. B-Nine was also applied twice at 5000 ppm. Plant height was measured at 2 and 4 weeks after treatment (WAT). Then, the plants were planted into landscape beds, mulched and measured at 4 and 8 weeks after planting (WAP). Plant flowering also was noted.

Results and Discussion. *Gaillardia* and *Phlox* were not responsive to any of the PGR applications and the data are not shown. The other species were responsive to at least one of the PGR treatments (Table 1). Only *Echinacea purpurea* was responsive to B-Nine, with treated plants 20% shorter than untreated plants at 4 WAT. The effects of B-Nine did not persist in the landscape. E. purpurea also was responsive to Bonzi (almost 50% shorter than controls) at 4 WAT, with significant height reductions persisting after 8 weeks in the landscape.

Plant height of *Coreopsis grandiflora* was moderately reduced by Bonzi (20%) and Sumagic (32%) with no persistent effects of either PGR in the landscape. Plant height of *Monarda didyma* and *Rudbeckia fulgida* was reduced comparably by Bonzi (about 30%) and Sumagic (about 40%) at 4 WAT, but only slight effects of Sumagic persisted through 4 WAP. Plant height of *Alcea rosea* was severely reduced by both Bonzi (62%) and Sumagic (71%) at 4 WAT, but the effects did not persist in the landscape. Veroniva alpina was the only species to show significant persistence of the effects of Bonzi and Sumagic in the landscape through 8 WAP.

Plant flowering did not appear to be affected except with *Rudbeckia*, where both Bonzi and Sumagic appeared to delay flowering in the greenhouse, but

most of the plants treated with these PGR rates were flowering at 2 weeks after planting in the landscape.

The PGR application rates selected were based on previous experience with Bonzi on perennial species and much higher than normally used on bedding plants. The rates of Bonzi and Sumagic selected for this study are not comparable. Based on previous research results where perennials were not responsive to Bonzi, we selected the highest rate of Bonzi considered to be economically acceptable as a foliar spray (240 ppm). The rate of Sumagic for which data are presnted was the lowest of four rates applied in the full study. Sumagic is considered to be up to 10 times as active as Bonzi.

The results indicate that Bonzi and Sumagic may have commercial application for species not responsive to B-Nine. The applications rates necessary for height control may be very high. We need to test additional rates lower than those reported here define the actual linear range of each PGR on the more important perennial crop species. The rates used here caused very little persistence of growth reduction in the landscape and therefore, give growers a good starting point for evaluation of these chemicals in their own production systems. This study was expanded in Spring 1997 to include additional plant species and PGR rates and chemicals. These treated plant materials will be on display at the 1997 UGA Turfgrass Field Day, scheduled for August 27, 1997, at the Georgia Experiment Station in Griffin, GA.

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Table 1. Plant height of six perennial bedding plant species at 4 weeks after treatment (WAT) with foliar sprays of 5000 ppm B-Nine(applied twice), 240 ppm Bonzi, or 40 ppm Sumagic and 4 and 8 weeks after planting (WAP) in the landscape.

	Plant Height (cm)			Plant Height (cm)			Plant Height (cm)		
Treatment	4 WAT	4 WAP	8WAP	4 WAT	4 WAP	8 WAP	4 WAT	4 WAP	8 WAP
	Echinacea purpurea			*Coreopsis* 'Sunray'			*Monarda* 'Blue Stocking'		
Untreated	35 a	44 a	44 a	25 a	26 b	30 a	23 b	33 a	46 a
B-Nine	28 b	43 a	49 a	27 a	30 ab	35 a	25 a	35 a	49 a
Bonzi	18 c	27 b	33 b	20 b	32 a	36 a	16 c	32 ab	49 a
Sumagic	11 c	20 b	25 b	17 b	28 b	33 a	14 c	29 b	45 a
	Veronica 'Goodness Grown'			*Alcea* mix			*Rudbeckia* 'Goldstrum'		
Untreated	17 a	29 a	30 a	31 a	30 a	31 a	22 a	35 a	38 a
B-Nine	18 a	27 a	26 b	28 a	29 a	25 a	23 a	37 a	40 a
Bonzi	12 b	21 b	24 b	12 b	32 a	31 a	16 b	34 a	42 a
Sumagic	12 b	21 b	24 b	9 b	32 a	31 a	13 c	19 b	40 a