Response of Poinsettia to Preplant Root-zone Soaks in Uniconazole

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Current methods of growth retardant application, such as root-zone drenches and topical sprays, may lack precision of dosage and thus accuracy of plant height control (Tayama, 1990). Bulb soaks, as used by Bearce and Singha (1990) and by McDaniel (1990), have the advantage of restricting application of growth retardant to the plant material and can be performed before placing plants in the growing environment. The objective of the present study was to evaluate preplant root-zone soaks in uniconazole as a method for achieving height control in poinsettia plants.

'Brilliant Diamond' poinsettia (*Euphorbia pulcherrima* Willd. ex Kl.) cuttings rooted in Oasis Rootcube Strips (Smithers-Oasis, Kent, Ohio) were received 26 July 1988 and placed under 50% shade in a greenhouse at 29/16C and immediately irrigated. Plants were divided into two groups of 32 plants each, with one group receiving a second irrigation just before uniconazole treatment (36 h later). Preplant root-zone treatments were applied by soaking Rootcubes for 15 min to a depth of 2.5 cm in a 1.5-liter solution of 0, 0.1, 1.0, or 10 mg uniconazole/liter. Volume of solution absorbed by Rootcubes was recorded by weighing each before and after soaking. Cubes were then allowed to drain for 30 min, and plants were individually planted in 1.8-liter (15-cm) plastic pots in a commercial peat, vermiculite, and perlite mix (Sunshine Mix, Fison, Vancouver, B.C.) and placed in full light in the greenhouse. There were eight single plants per treatment, with pots placed in a completely randomized arrangement on the bench.

Plants were fertilized weekly with 2.3 g of a soluble 0.15N-0.088P-0.22K fertilizer/liter plus 0.28 mg Na₂MoO₄/liter. On 24 Aug., plants were pinched to a height of seven

to eight nodes and spaced 30 cm apart. Plant height was measured on 29 Nov. from the soil line to the highest point on each plant. The number of bract clusters on the outside of each plant was counted, and bract cluster diameter was recorded as the mean of the widest diameters of the largest cluster on each plant. The study was repeated in 1989. Procedures used were the same as those followed during the first trial, except that Rootcubes were soaked in water and allowed to drain for 10 min before treatment with uniconazole. Also, a plant quality comparison based on extent of bract cluster maturity, bract cluster display and brightness, plant symmetry, and leaf color was performed. Data were subjected to analysis of variance with single-degree-of-freedom contrasts.

Preplant root-zone soak in uniconazole reduced plant height and bract cluster count and diameter; the reduction was most pronounced with the highest concentrations of uniconazole (Table 1). Reduction in growth and flowering was greater in plants irrigated 36 h before treatment with uniconazole than in plants irrigated just before treatment. Re-

duction in bract size was especially pronounced at 10 mg-liter⁻¹.

Mean uniconazole solution uptake per Rootcube was significantly greater (19.8 ml) when plants were not irrigated for 36 h before treatment than when irrigated immediately before treatment (10.5 ml). The increased growth reduction by uniconazole with the 36-h treatment is attributed to the increased per-plant dosage. Thus, both the concentration of the growth retardant and the volume of uptake into the Rootcube influenced the extent of growth suppression. To achieve a predictable response, it is important that Rootcubes have a defined water content.

The 1989 crop response was similar to that obtained in 1988. Overall plant quality ratings were especially low at the higher uniconazole levels (Table 1). These results indicate that preplant root-zone soaks have potential as an effective method of applying growth retardants. Careful regulation of growth retardant concentration and volume of solutions taken up by root zones is necessary to achieve desired height reduction without excess reduction of bract cluster count and size.

Literature Cited

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Table 1. Effect of preplant root-zone soaks of uniconazole on plant height and number and size of bract clusters of 'Brilliant Diamond' poinsettias (1988 crop).

Uniconazole concn (mg-liter ⁻¹)	Plant ht (cm)	Bract clusters (no.)	Bract cluster diam (cm)	Quality rating ^z (1989 crop)
<i>Rootcubes irrigated 0 h before treatment</i>				
0	32.3	8.3	22.0	3.8
0.1	31.3	7.8	25.5	3.6
1.0	20.8	5.5	20.9	2.0
10.0	12.1	3.0	15.3	1.0
<i>Rootcubes irrigated 36 h before treatment</i>				
0	31.4	5.1	24.0	
0.1	21.4	6.1	22.4	
1.0	16.4	4.8	20.0	
10.0	13.6	2.8	11.2	
Control ^y vs. 0 h	**	**	*	**
Control ^y vs. 36 h	**	NS	**	
0 vs. 36 h	**	*	**	
0 h				
Linear	**	**	**	**
Quadratic	**	**	*	**
36 h				
Linear	**	**	**	
Quadratic	**	**	*	

^yPlants were rated for flower maturity, bract display and brightness, plant symmetry, and leaf color on a scale of 5 to 0, best to worst.

^zControl refers to the 0 uniconazole concentration in the specified irrigation regime.

NS, *, ** Contrast or treatment nonsignificant or significant at $P = 0.05$ or 0.01 , respectively.

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