Effect of GA on Inflorescence in. Uniconazole-treated Chrysanthemums

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Growth retardants are applied to most potted chrysanthemums produced commercially. The reduced peduncle length gives the inflorescence on the plant an undesirable "clubby" shape. Holcomb and Homa (1980) reduced the clubby appearance of chrysanthemums by delayed pinching. Foliar sprays of gibberellic acid (GA₃) reduced clubby growth of spray chrysanthemums (Lert and Nishimoto, 1959). Foliar sprays of GA₃ at 20 mg-liter⁻¹ applied on the 21st or 28th short day produced elongated peduncles without causing flower abnormalities (Kofranek and Cockshull, 1985). Holcomb and Tukey (unpublished data) found potted chrysanthemums not-treated with uniconazole had inflorescences that were clubby.

The objective of this experiment was to determine the optimal timing of foliar sprays of GA₃ on potted chrysanthemums, previously root-treated with uniconazole, to correct for a clubby inflorescence.

Cuttings of *Dendranthema* × *grandiflorum* (Ramat.) Kitamura 'Echo' were planted, one cutting per pot, in 900-cm³ pots during mid-January and pinched 2 weeks later. The plants were grown with night-break lighting to keep them vegetative. Short days (SD) were started the day after the plants were pinched. On 10 Feb. 1988 (week 0), the cuttings were large enough (≈10 cm) for treatment. The growth retardant (E)-1-(p-chlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-penten-3-ol (uniconazole) was applied to the roots, at 0.1 mg a.i./plant in 10 ml of water as a trunk soil-line pour (TSLP) (Tukey, 1986). Plants then were sprayed at weekly intervals with 20 mg GA₃/liter (≈4 ml/plant). Treatments (see Table 1) were replicated 10 times using a completely randomized design. Date of flowering was determined when the first inflorescence on a plant was fully open. The number of days to flower was determined as the difference between the planting and flowering dates. Data were tested by analysis of variance and mean separation by Duncan's multiple range test at *P* = 0.05. Data on length of peduncle as a percentage of total height were transformed

by square-root transformation before analysis.

GA₃ applied as a foliar spray increased final plant height, while uniconazole reduced it (Table 1). GA₃ applied at week 1, 2, or 3 increased the height of all uniconazole-treated plants, while GA₃ applied at week 4 or 5 had little effect on plant height, probably because most of the peduncle elongation had already occurred.

Foliar GA₃ caused elongation of suppressed terminal peduncles on uniconazole-treated plants when applied at certain times (Table 1). When GA₃ was applied 1 week after uniconazole, it had no significant effect on peduncle length. The peduncles on plants treated with GA₃ 2 and 3 weeks after uniconazole were significantly longer than those treated with GA₃ after 4 weeks. By weeks 4

and 5, the plants were mature; therefore, the terminal peduncle was not greatly affected by GA₃. GA₃ applied 3 weeks after uniconazole resulted in the most elongation of the peduncle and the most open flower spray (Fig. 1).

The percentage of the total height contributed by the peduncle on uniconazole-treated plants was 10% (Table 1); in untreated plants, it was almost twice as much. For plants treated with GA₃, the proportion increased up to week 3. The effect of GA₃ application at 3 weeks was similar to that found by Kofranek and Cockshull (1985) on cut chrysanthemums.

Application of GA₃ at 3 weeks after uniconazole was applied caused the peduncle to elongate and created a marketable flowering potted chrysanthemum of desirable proportion rather than a clubby one.

Literature Cited

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Fig. 1. Plants root-treated with uniconazole (0.1 mg a.i./pot) followed by a GA₃ spray (20 mg-liter⁻¹). (left to right) Untreated, GA₃ 1, 2, and 3 weeks after uniconazole application.

Table 1. Uniconazole and GA₃ effects on 'Bright Golden Anne' chrysanthemum.*

Treatment		Plant ht (cm)	Peduncle	
Uniconazole applied to roots ^b	Foliar GA ₃ * (week no.)		Length (cm)	Length as percent total ht
—	None	27.5 e	5.0 b	18 b
—	0	32.2 f	8.0 c	25 c
+	None	12.4 a	1.2 a	10 a
+	1	21.3 c	2.2 a	10 a
+	2	25.6 d	4.6 b	18 b
+	3	27.1 de	8.8 c	33 d
+	4	12.5 a	1.4 a	12 a
+	5	17.5 b	4.1 b	23 c

*Means based on 10 replications. Mean separation within columns by Duncan's multiple range test, *P* > 0.05.

^bAll applications (+) at week 0, Feb. 1988, 0.1 mg a.i./pot.

^cGA₃ at 20 mg-liter⁻¹.

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