Rooting Pentas: Influence of Macro- and Microelement Fertilization

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Pentas (*Pentas lanceolata*) are primarily propagated by rooting vegetative stem cuttings. Factors affecting rooting have been studied on many floriculture crops which are propagated by vegetative cuttings. However, published information on cultural factors which influence rooting of pentas is scarce or lacking.

Pentas are still considered a minor floricultural crop although their popularity has increased recently. New cultivars, new colors, better vegetative characteristics, demand for drought tolerant plants, and use of pentas in butterfly gardens have all contributed to a new demand for this crop.

Because plant nutrition can affect rooting characteristics, a study was implemented to determine the effects of macro- and microelement fertilization practices on rooting of stem cuttings of pentas.

Material and Methods

Two fertilizer solutions were prepared which contained either macroelements alone or microelements in addition to macroelements.

Solutions were applied either as a drench to saturate the rooting medium or as a foliar spray to wet the foliage to run-off. These four fertilization practices were compared to propagation with water only.

The macroelement fertilizer solution contained the following (in ppm): 500 N : 250 P : 500 K : 200 Ca : 25 Mg. The second solution contained the same macroelements but also contained the following microelements (in ppm): 10 Mn : 5 Zn : 5 Cu : 1 B.

Single-node stem cuttings approximately 2 inches in length of 'Ruby Red' pentas were used for this study. The root medium was a v/v mix of 4 sphagnum peat : 2 vermiculite : 1 sand : 1 perlite amended with 4.5 hydrated lime, 4.5 calcitic lime, and 1 dolomite (pounds per cubic year). The resulting rooting medium pH was approximately 6.5.

Cuttings were dipped in an aqueous solution containing 0.1% IBA and 0.05% NAA before they were planted in 1.5 inch pyramidal cells of propagation flats. Cuttings were misted lightly for 1 minute at 30-minute intervals from 8 a.m. to 5 p.m.

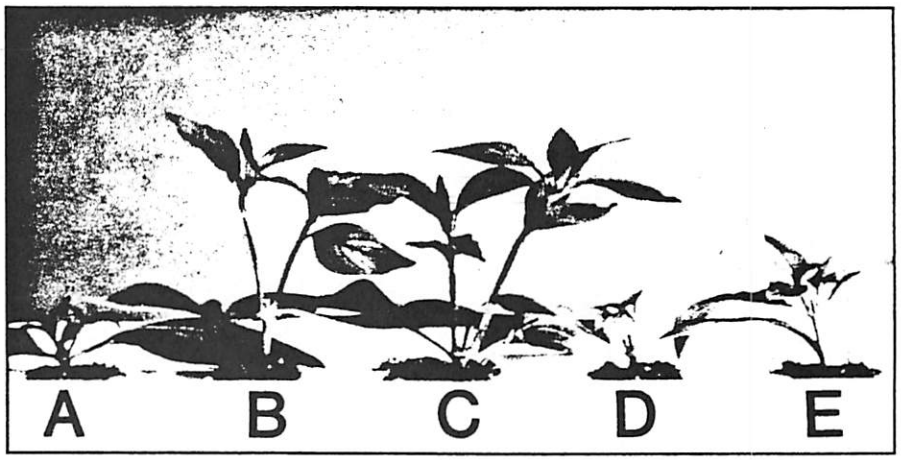
Twice-weekly fertilizer applications were started six days after stem cuttings were placed in rooting trays and continued for a total of four applications.

Half of the cuttings were evaluated after 23 days in propagation for root fresh weight and lateral branch (break) length and fresh weight.

The rest of the cuttings were transplanted into 4-inch pots with the above medium and grown for four weeks to determine if fertilization practices during propagation would affect final plant height or days to flower. Potted plants were fertilized twice weekly with 500 ppm N from a soluble 15-16-17 with microelements.

Results

Root fresh weights were higher for cuttings with drench applications of fertilizer compared to cuttings propagated with water only (Table 1). Addition of microelements to fertilizer solutions containing macroelements had



Influence of fertilization practice on rooting of 'Ruby Red' Pentas. Plants photographed 23 days after single node stem cuttings were placed under mist. Treatment: A. No fertilizer. B. Macroelement drench. C. Macro- and microelement drench. D. Foliar macroelements. E. Foliar macro- and microelements.

Table 1. Influence of fertilization practices during propagation on cutting root development and lateral branch development after 23 days under mist, and subsequent flowering of 'Ruby Red' pentas.

	CUTTINGS				
		Lateral branch		Finished potted plant	
Fertilization practice	Root fresh weight (g)	Length (cm)	Fresh weight (g)	Height (cm)	Days to flowers
Water	0.73	0.8	0.19	32	52
Drench application					
macroelement[z]	1.18	8.1	1.40	34	47
macro + micro[y]	1.13	9.0	1.90	33	49
Foliar application					
macroelement	0.96	1.8	0.37	33	53
macro + micro	0.79	1.9	0.35	32	51
LSD P=0.05	0.26	2.1	0.47	NS	3.9

[z]Macroelements (in ppm): 500 N : 250 P : 500 K ; 200 Ca : 25 Mg.

[y]Microelements (in ppm): 10 Mn : 5 Zn : 5 Cu : 1 B.

little effect. Cuttings with foliar applications of macroelement-fertilizer had intermediate root fresh weights compared to cuttings with water or drench fertilization.

Cuttings had the longest lateral branches and highest fresh weights with drench applications of either fertilizer. Foliar applications of either fertilizer had little effect on lateral branch length or fresh weight. Finished plant heights were similar regardless of fertilization practices during cutting production. However, the number of days-to-flower was least for cuttings produced with macro-element-fertilizer applied as a drench.

Summary

In summary, rooted cuttings of pentas produced with drench applications of macroelement-fertilizer had greater than 1.5 x root fresh weight, 10 x lateral branch length, 7 x lateral branch fresh weight, and flowered 5 days earlier than cuttings propagated with water only. Addition of microelements to the macro-element-fertilizer solution had little effect on any measured variable. Foliar applications of fertilizer also did not benefit cutting production. These results indicate that further studies would be warranted on use of controlled release fertilizer incorporated into the rooting medium. This fertilization practice would afford a more practical means of supplying nutrients through the rooting medium without additional concerns of over-watering and leaching that occur with drench fertilization.

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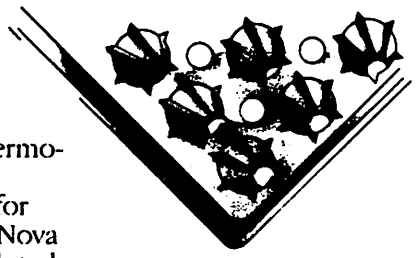

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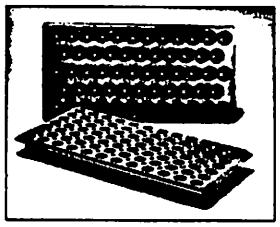

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