Thidiazuron Stimulates Basal Bud and Shoot Formation in *Alocasia* × *Chantrieri* André

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Thidiazuron (TDZ), used to defoliate mature-green leaves in cotton before boll harvest, was first reported to possess cytokinin activity in tissue cultures of bean (Mok et al., 1982). Subsequently, it has been used to stimulate in vitro shoot formation in apple (van Niewkerk et al., 1986). However, in vivo foliar application of *Abutilon theophrasti* (Wymore et al., 1987) and greenhouse-grown *Citrus aurantium* (Pountney and Swietlik, 1988) produced various symptoms, including leaf chlorosis, distortion and cupping of new leaves, and reduced plant growth.

No reports were found in the literature concerning use of TDZ on greenhouse-grown ornamental plants. Therefore, we tested TDZ for its potential to induce basal shoot formation in *Alocasia* × *Chantrieri* André, a self-heading nonbranching ornamental tropical foliage plant.

Sixty plants of *Alocasia* × *Chantrieri*, 16 weeks out of tissue culture, growing in 2.5-cm-diameter (0.038-liter) plastic cell trays were obtained from a commercial nursery. Single plants were potted into 10-cm-diameter (0.45-liter) plastic pots filled with Vergro Container Mix A [2 Canadian peat : 1 perlite : 1 vermiculite (by volume)], and placed in a shaded greenhouse under natural photoperiod with a maximum light intensity of 250 $\mu\text{mol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$ and in the range of 18 to 35C. Plants were fertilized weekly with 1.0 g of 20N-20P-20K per liter of liquid, water-soluble fertilizer during the course of this study. Treatments were applied 1 week after potting.

TDZ (Dropp 50WP, NOR-AM Chem. Co., Wilmington, Del.) was weighed and mixed in deionized water to obtain TDZ at 0, 1, 5, and 10 $\text{mg}\cdot\text{liter}^{-1}$, which was amended with Triton X-100, as a wetting agent, one drop/liter. For each treatment, 10 ml of test solution was applied with a glass pipette to the medium at the base of a plant. There were 10 plants/treatment in a randomized complete-block design in our study, initiated 8 June 1988.

Data, recorded 12 weeks after treatment, included plant height, length, and width of the largest leaf, number of new basal shoots >1 cm, and shoot and root fresh weights.

Alocasia × *Chantrieri* treated with TDZ initiated numerous elongated buds. Total number of elongated buds increased linearly within the range of rates tested, although a significant quadratic effect was evident at the highest rate (Table 1). However, 76% to 90% of all elongated buds formed beneath the medium surface and were not visible until the soil was removed. On average, fewer than

five buds penetrated above the medium surface and produced leaves at any treatment level during the course of this experiment (Table 1). No control plants displayed any evidence of new bud development. Plant height, leaf length and width, and fresh weight of roots and shoots decreased linearly at increasing TDZ rates; shoot fresh weight also showed a significant quadratic component.

These results indicate that a single application of TDZ is effective for induction of new basal buds in *Alocasia*. However, the lowest TDZ rate resulted in 24% less root weight than controls and at higher rates some plants had almost no roots remaining, which indicates root loss following TDZ treatment. The plants we used were treated 1 week after potting, probably insufficient time before treatment for development of a root system better able to tolerate TDZ effects and support newly initiated buds.

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Table 1. Effect of thidiazuron (TDZ) on production of new elongated buds, basal shoots, and overall plant growth of *Alocasia* × *Chantrieri*.

TDZ concn ² ($\text{mg}\cdot\text{liter}^{-1}$)	Total elongated buds ¹ (no.)	Visible basal shoots (no.)	Plant ht (cm)	Leaf length (cm)	Leaf width (cm)	Fresh wt (g)		Shoot : root ratio
						Shoot	Root	
0 ³	0.0	0.0	22.7	20.4	8.9	40.1	13.0	3.2
1	13.9	1.8	23.8	20.2	9.2	50.2	9.9	6.9
5	38.3	4.6	18.1	14.3	6.3	40.8	3.1	22
10	33.6	3.5	16.9	10.8	5.6	23.8	0.9	32
Significance ⁴								
Linear	**	**	**	**	**	**	**	**
Quadratic	*	*	NS	NS	NS	**	NS	NS
Residual	NS	NS	*	NS	*	NS	NS	NS

¹Ten plants per treatment; each plant received 10 ml of treatment solution applied as a drench at its base on 8 June 1988.

²Means in this column are a combination of elongated buds and visible basal shoots.

³Regression analyses were performed on tests with significant differences between treatments as determined by an F test.

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