Effect of Ethephon, Benzyladenine and Dikegulac Sodium on Branching and Plant Height of Woody Ornamental Species Under Greenhouse Conditions

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Abstract

Plant branching is an important aspect of ornamental plant production and increased branching is desirable in various situations. Plants with more branches usually have improved architecture, and are more compact and attractive than plants with fewer branches. Branching, and the consequent increase in the number of cuttings per plant, is also desirable in mother stock used for propagation. Branching can be induced by manually “pinching” the terminal shoot; the increase in branching is due to the breakage of the apical meristem inhibition of lateral branches. However, the labor costs, associated with this activity are high. The use of plant growth regulators (PGRs) to induce lateral branching, could reduce labor costs associated with manual pinching while improving the plant aesthetic value. The effect of sprays and drenches of ethephon (Florel, Monterey Lawn and Garden Products, Inc.), benzyladenine (Configure, Fine Americas, Inc.) and dikegulac sodium (Augeo, OHP, Inc.) on branching, was evaluated on recent transplants, and established Mandevilla sanderi (Hemsl.) Woodson (cv. Rio™ Hot Pink) and Hibiscus rosa-sinensis L. (cv. President). Florel was applied at 500 and 1000 mg.L⁻¹, Configure at 300 and 600 mg.L⁻¹, and Augeo at concentrations ranging from 1600 mg.L⁻¹ to 3200 mg.L⁻¹ depending on plant species. Plants were grown in 9 cm plastic containers filled with soilless substrate and kept in a greenhouse set at 23.9 ºC during the day and 18.3 ºC at night, and under natural photophase. Established plants were treated with the selected products 12 weeks after planting, recent transplants were treated 2 weeks after transplant. Plant height and the number of branches were recorded before treatment application and at 4, 8 and 12 weeks after treatment (WAT). The plants response to the treatments was dependent on the species. Drenches of Florel at 500 mg.L⁻¹, Configure at 300 mg.L⁻¹, and Augeo at all concentrations studied increased the number of branches on established Mandevilla plants compared to the untreated control (UTC) (Figure 1). Florel, Augeo, and drenches of Configure resulted in shorter plants compared to the untreated control (Figure 1). In recently transplanted Mandevilla plants, only sprays of Augeo increased the number of branches compared to the UTC (Figure 2). PGR applications did not have an effect on branching or height of established Hibiscus plants (data not shown); recent Hibiscus transplants sprayed with Augeo at 3200 mg.L⁻¹ had more branches than the UTC (Figure 3). Drenches of Augeo on both species resulted in stunted plants.

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Figure 1. Mean number of branches and height (cm, n=7) of water-treated (control), and PGR-treated established Mandevilla plants 12 WAT. The treatments (x-axis) were Florel (Fl), Configure (Conf), and Augeo (Au). Treatment concentration is expressed in mg.L\(^{-1}\). Bars followed by different letters are significantly different (p=0.05)

Figure 2. Mean number of branches and height (cm, n=8) of water-treated (control), and PGR-treated recently transplanted Mandevilla plants 12 WAT. The treatments (x-axis) were Florel (Fl), Configure (Conf), and Augeo (Au) Treatment concentration is expressed in mg.L\(^{-1}\). Bars followed by different letters are significantly different (p=0.05)
Figure 3. Mean number of branches and height difference (cm, n=8) of water-treated (control), and PGR-treated recently transplanted Hibiscus plants 12 WAT. Height difference represents height 12 WAT minus height immediately after transplant. The treatments (x-axis) were Florel (Fl), Configure (Conf), and Augeo (Au) Treatment concentration is expressed in mg.L⁻¹. Bars followed by different letters are significantly different (p=0.05).