PINE BARK AND PEAT-BASED MEDIA INFLUENCE EFFECTS OF UNICONAZOLE DRENCH ON POINSETTIAS

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Abstract

The objective of this study was to determine the effects of eight commercial media, four peat-based and four pine bark-based, on the effects of uniconazole applied as a media drench to 'Gutbier V-14 Glory' poinsettias. The peat-based media were Baccto Grower's Mix, Baccto High Porosity Professional, Baccto High Porosity Professional with Bacctite, and Baccto Rockwool Mix. The pine bark-based media were Metro 300, 360, 500, and 700. Uniconazole was applied to plants grown in each media at five rates (0, 2, 4, 6, and 8 mg/15 cm pot). Uniconazole effectively reduced plant height and width, bract dry weight and bract number in all media. Plants grown in the Metro products, however, tended to be larger than those grown in the Baccto products. Bract size and number, plant weight, width and height were greatest in Metro 360. Plants in the rockwool mix were smallest. Plants grown in the peat-based media were shorter than those in bark media when drenched with uniconazole. Plants grown in Metro 360 were the shortest when drenched with uniconazole.

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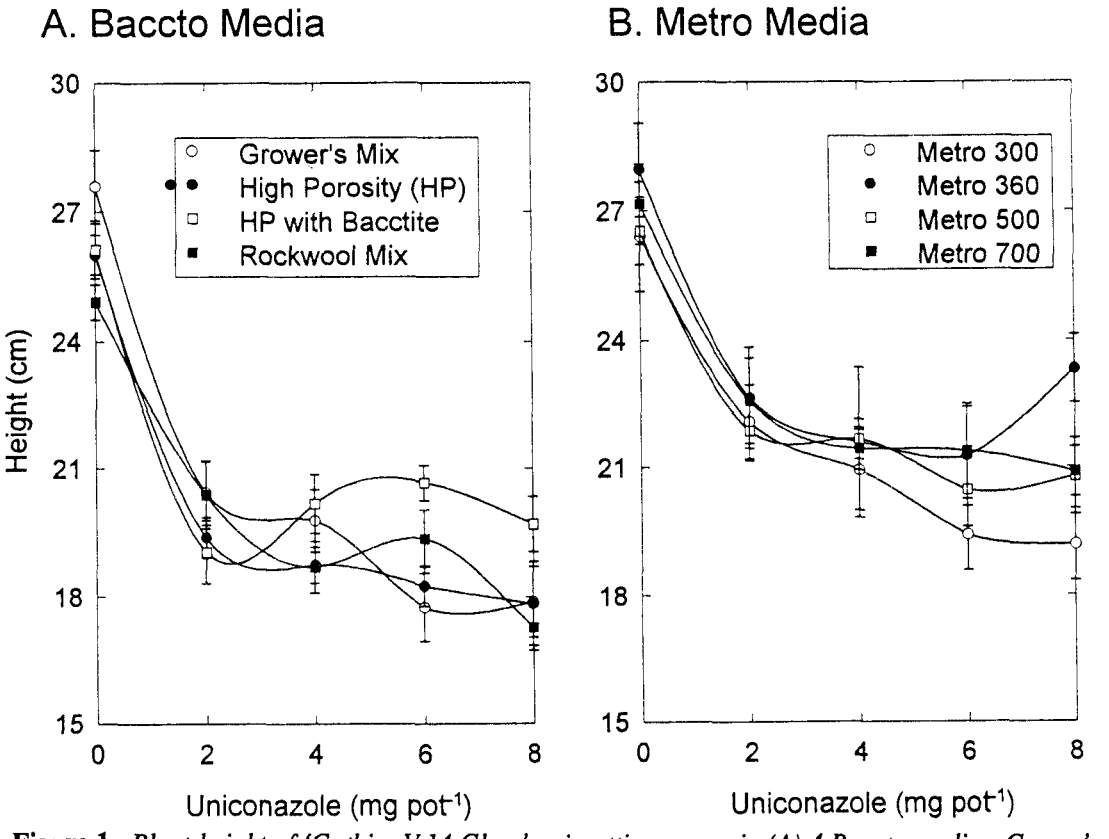

Figure 1. *Plant height of 'Gutbier V-14 Glory' poinsettias grown in (A) 4 Baccto media: Grower's Mix, High Porosity Professional (HP) with Bacctite and Rockwool; and (B) 4 Metro media: M300, M360, M500 and M700.*

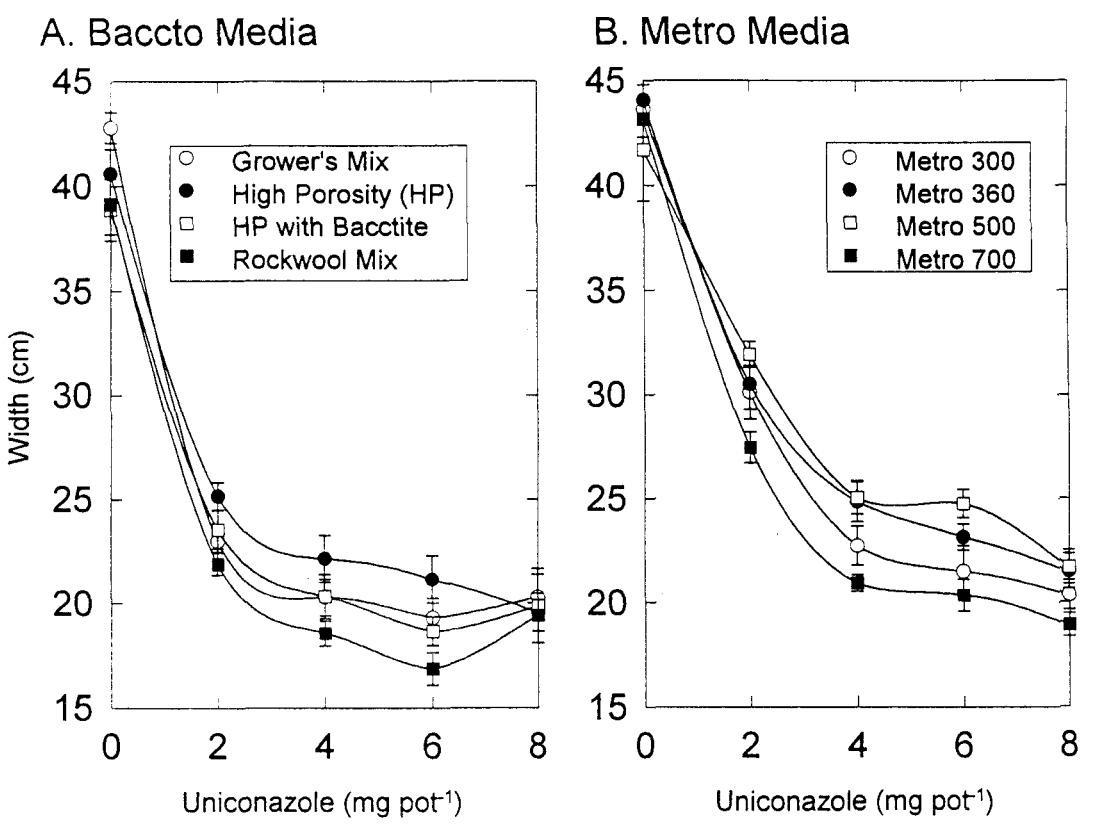

Figure 2. *Plant width of 'Gutbier V-14 Glory' poinsettias grown in (A) 4 Baccto media: Grower's Mix, High Porosity Professional (HP) with Bacctite and Rockwool; and (B) 4 Metro media: M300, M360, M500 and M700.*

Poinsettia production in the southern United States requires chemical growth retardant applications to reduce plant height and improve plant quality.

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Introduction

Poinsettia production in the southern United States requires chemical growth retardant applications to reduce plant height and improve plant quality. Traditionally, most growers have used chloromequat, but it frequently causes leaf spotting, requires multiple applications, and is less active under warm conditions (Barrett, 1991). Some growers have begun using chloromequat in combination with daminozide or paclobutrazol for greater control (Barrett, 1991).

Uniconazole, a more active isomer of paclobutrazol, has recently been labeled for use by the greenhouse industry. Uniconazole has proven to be active on all crops at a cost comparable to daminozide (Barrett and Nell, 1991). Uniconazole is currently labeled for poinsettias, Easter lilies, chrysanthemums, azaleas, ixora (Florida only), and several bedding plants (Valent USA Corp., Walnut Creek, Calif.). Uniconazole applied as a drench is currently labeled only in Florida.

There are many variables that may occur during poinsettia production, which may influence the effectiveness of a growth regulator application. Considerable research has been devoted to the effects of greenhouse temperatures on growth retardant rates for effective use by northern as well as southern growers. The root-zone medium also influences the effectiveness of a plant growth regulator when it is applied as a drench. Bonamino and Larson (1978) and Tschabold et al. (1975) demonstrated that ancymidol had less activity in media containing pine bark than in those containing peat moss. Barrett (1982) determined that ancymidol, paclobutrazol, and flurprimidol applied as a drench on chrysanthemums were less effective in media containing bark.

The objective of this study was to determine the influences of eight commercial media, four peat-based and four pine bark-based, on the effects of uniconazole applied as a media drench to 'Gutbier V-14 Glory' poinsettias.

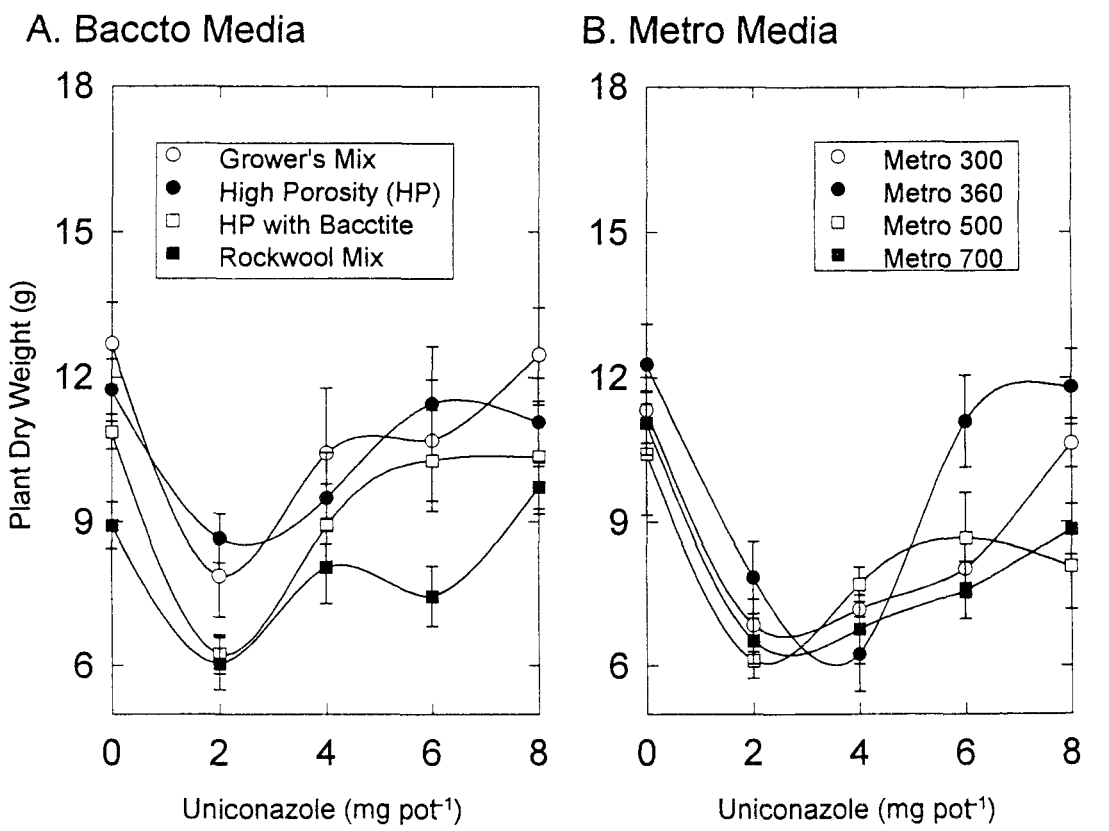

Figure 3. *Plant dry weight of 'Gutbier V-14 Glory' poinsettias grown in (A) 4 Baccto media: Grower's Mix, High Porosity Professional (HP) with Bacctite and Rockwool; and (B) 4 Metro media: M300, M360, M500 and M700.*

Plant height, width (average of the widest linear extent and that perpendicular), plant dry weight (after 48 hours at 60°C), bract dry weight, bract number (all bracts showing color regardless of size) and weight per bract were determined December 12, 1991.

Materials and Methods

Rooted cuttings of *Euphorbia pulcherrima* (Willd. ex Klotzch) 'Gutbier V-14 Glory' were transplanted into 15-cm plastic azalea pots August 27, 1991. Eight commercial media were obtained from two manufacturers, Baccto (Michigan Peat Co., Williamston, MI) and Metro (Grace/Sierra, Inc., Fogelsville, PA). The Baccto products were Baccto Grower's Mix (BG), Baccto High Porosity Professional (HP), Baccto High Porosity with Bacctite (HPB) and Baccto Rockwool Mix (RW). The Metro products were Metro 300 (M300), Metro 360 (M360), Metro 500 (M500) and Metro 700 (M700).

The plants were spaced 35 cm on center on 1.25-m by 2.5-m lath benches in a double-layer polyethylene quonset-style greenhouse. Two benches on opposing sides of the greenhouse were allocated to each medium representing two complete blocks. After 14 days, all plants were pinched to five to seven nodes. Fourteen days after pinching, the breaks were approximately 4 cm long and uniconazole was applied in 250 ml of water as a drench to plants in each medium at five rates (0, 2, 4, 6 and 8 mg/15-cm pot).

Plant height, width (average of the widest linear extent and that perpendicular), plant dry weight (after 48 hours at 60°C), bract dry weight, bract number (all bracts showing color regardless of size) and weight per bract were determined December 12, 1991. The experiment was conducted as a randomized split plot arrangement of treatments where media were whole plots and uniconazole rates were subplots.

All plants were hand watered as needed with 250 mg N/liter at each irrigation with 15 N-2.2 P-20.75 K (15-5-25 Peter's Poinsettia Peatlite Special, Grace Sierra, Inc., Fogelsville, PA). One irrigation each week was 250 mg N/liter calcium nitrate ($CaNO_3$) followed by a tap water irrigation according to standard poinsettia production protocols for the southern United States (Ecke et al., 1990). The average day temperature was 28.6°C ± 0.6 (SE) and average night temperature was 19.4°C ± 0.3 over the entire study.

Results and Discussion

Uniconazole effectively reduced plant size in all media as with previous studies (Newman et al., 1989). Poinsettia plants grown in the Metro products, however, tended to be larger than those grown in the Baccto products. Two mg/liter uniconazole effectively controlled plant height in both Baccto and Metro media; however, uniconazole was generally more effective in the Baccto media than the Metro media (Figures 1-4).

All of the Baccto media are peat-based while the Metro products all contain some pine bark or pine bark ash. Of the plants grown in Baccto media, uniconazole was less effective in the HPB medium (Figure 1A). Uniconazole tends to be withheld from plants by pine bark in the medium (Barrett, 1982). This medium contained a new product call Bacctite that is a highly compressed form of peat moss designed to hold more water and nutrients (personal communication, C.L. Bethke, Michigan Peat Co., Williamson, MI).

Of the Metro products, uniconazole appeared to be the most effective on plants grown in M300, which has the least amount of pine bark or pine bark ash compared to peat moss of the four Metro Products (Figure 1B). Bract size and number, plant weight, width and height were greatest in Metro 360 (Figures 1-4).

In conclusion, the RW mix produced the smallest plants (Figures 2A and 3A). Plants growth in the peat-based media were more sensitive to uniconazole drenches. Plants grown in Metro 360 were the least sensitive to uniconazole drenches.

Acknowledgments

The authors acknowledge the donation of media from Terry Wilbourn of Grace/Sierra, Inc., andAllen Oswalt of Michigan Peat, Inc.; as well as the donation of growth retardants from Jimmy Bryson of Valent USA, Inc. Plant material was provided by David Hartley of Paul Ecke Poinsettia Ranch.

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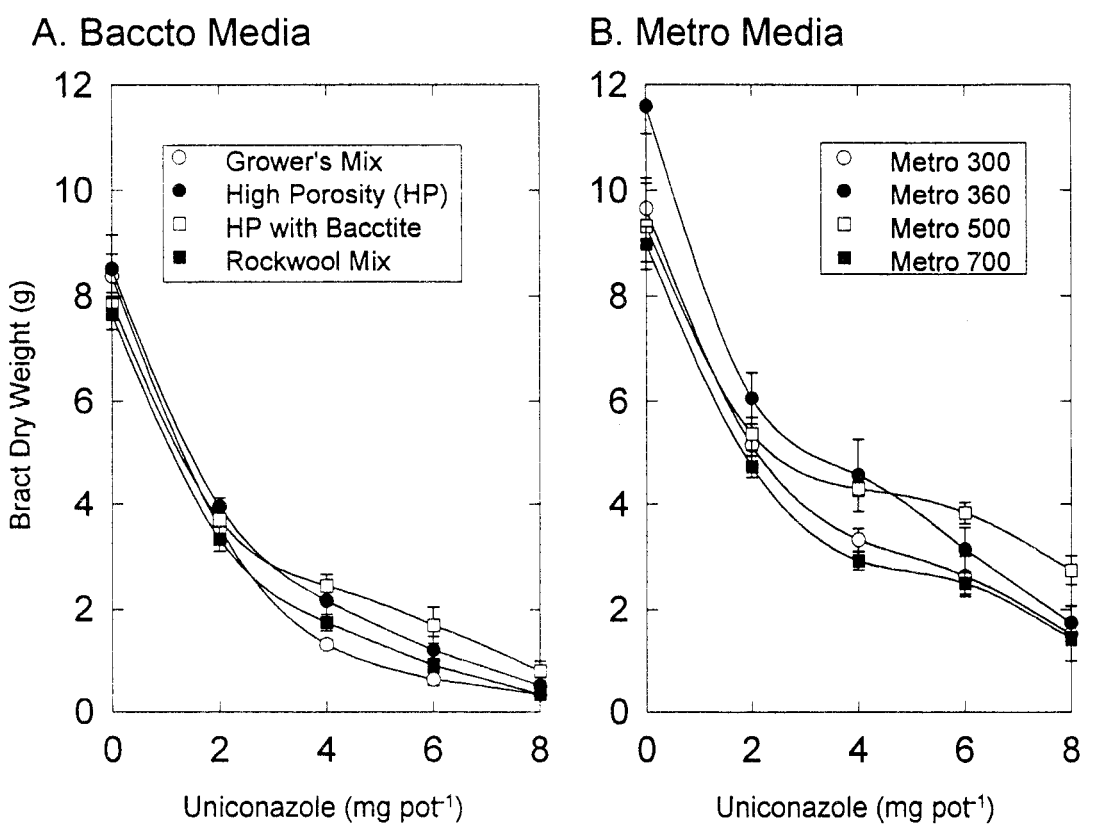

Figure 4. *Bract dry weight of 'Gutbier V-14 Glory' poinsettias grown in (A) 4 Baccto media: Grower's Mix, High Porosity Professional (HP) with Bacctite and Rockwool; and (B) 4 Metro media: M300, M360, M500 and M700.*

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