e-GRO Research Update

Poinsettias:

Paclo Drenches for 4.5-inch pots

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We continually receive positive comments from both growers and consumers about our smaller 4.5-inch poinsettias being grown as part of the National Poinsettia Trial at North Carolina State University.

When producing in smaller pots, balancing plant height to avoid top-heavy plants is a large concern. Additionally, plants need to be more compact to ensure the limited nutrient and water resources are not overtaxed by the plant. To avoid these potential issues, our traditional production program centers around three plant growth regulator (PGR) applications. We use foliar sprays on Week 38 and Week 39 of chlormequat chloride (Citadel) at 750 ppm plus daminozide (Dazide) at 1000 ppm, which is followed with a 0.25 ppm drench of paclobutrazol (Piccolo 10XC) on Week 44.

The above program is costly in both time and resources, hence last year we tried to simplify the production protocol by only making a single PGR drench application. This report outlines an experimental evaluation of a single Piccolo 10XC drench for season-long control of growth on smaller sized (4.5-inch) poinsettias.

Summary of Findings

- Piccolo 10XC substrate drenches evaluated on 10 cultivars grown in 4.5-inch pots.
- The recommended rates are between 0.5 to 1.0 ppm for most cultivars grown under North Carolina conditions.

Supported by

Poinsettia Breeders:
Ball Horticulture, Beekenkamp, Dümmen Orange, Lazzeri, Rinehart Poinsettias, Selecta, Suntory, & Syngenta

Fine Americas, Koba, Flopak & Oldcastle

Experimental Set-up

Rooted poinsettia cuttings were transplanted into 4.5-inch pots on 9 August, 2019. Ten cultivars were evaluated:

'Premium Red' and 'Premium White' from **Dümmen Orange**;

'Mars Early Red', 'Mars Pink', and 'Mars White' from **Syngenta Flowers**;

'Princettia Dark Pink', 'Princettia Dark Pink', 'Princettia Pink', 'Princettia Pure White', 'Princettia Red' from **Suntory**.

The substrate used was Sunshine Mix #1, an 80% peat and 20% perlite blend (v:v). The plants were fertilized with 13-2-13 Cal-Mag at 150 ppm N. The greenhouse temperature set points were 75 F Days / 65 F Nights [24/18 C]. The plants were pinched to 5 nodes on 27 August.

The PGR applications were applied on 19 September (Week 38). Piccolo 10XC drenches were applied at 0, 0.25, 0.5, 0.75, and 1 ppm, with 2 ounces (59 ml) of solution dosed per pot. There were 8 replications per treatment. Plants were evaluated on 3 December and data obtained included plant height, plant diameter (taken in 2 directions and averaged), and bract diameter (for 2 of the largest bracts, taken in 2 directions and averaged).

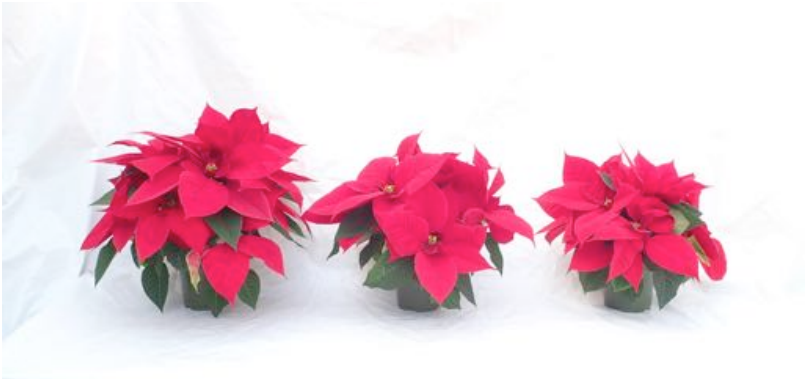

Figure 1. 'Premium Red' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

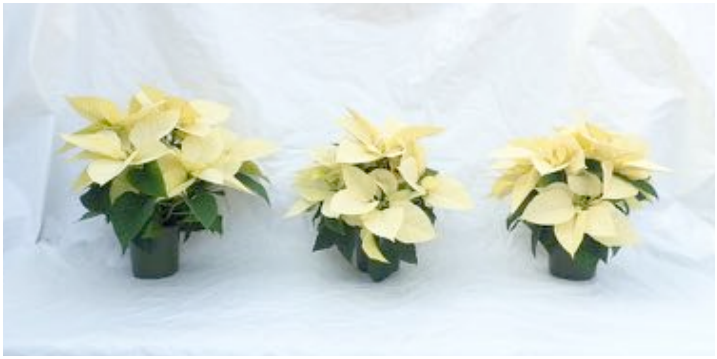

Figure 2. 'Premium White' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

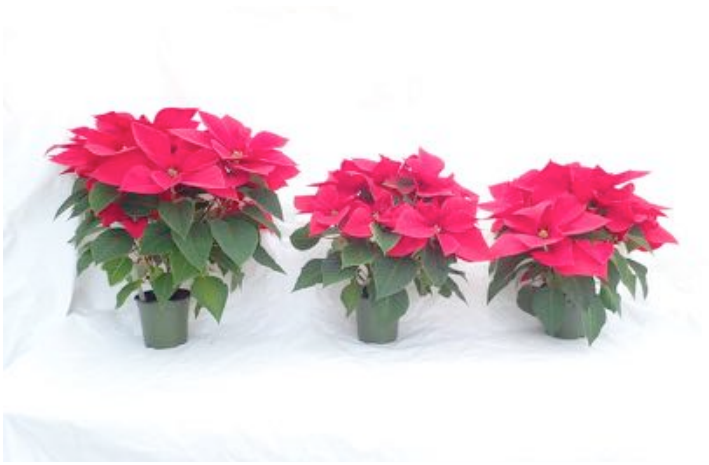

Figure 3. 'Mars Early Red' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

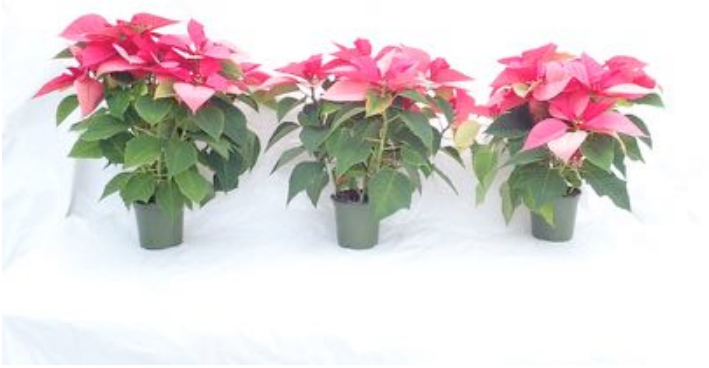

Figure 4. 'Mars Pink' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right). Consider using higher rates to obtain greater control.

Results

At the concentrations used (0, 0.25, 0.5, 0.75, and 1 ppm) growth control occurred with the use of Piccolo 10XC substrate drenches. Results for 0, 0.5 to 1.0 ppm drenches are presented in the below photos (Figs. 1-10) to illustrate the control trends. These concentrations resulted in more compact plants, with greater effect occurring with plant height than plant diameter.

Growth control was greatest with 'Princettia' cultivars, followed by the Premium 'Red' and 'White' cultivars and Mars 'Early Red'. Limited control occurred with the two Mars cultivars ('Pink' and 'White'); thus for those two cultivars, higher rates should be trialed.

Growth control data for Princettia 'Red' is presented in Table 1. Plants treated with 1 ppm Piccolo 10XC were over 31% shorter than the untreated control. Plant diameters were approximately 19% more compact with the use of Piccolo 10XC. Bract diameter was smaller as the Piccolo 10XC rate increased. With a 1 ppm drench, bracts were 15% smaller than the controls. The degree of bract control achieved with 1 ppm Piccolo 10XC made the plant proportionally sized for optimal visual appeal in a 4.5-inch pot. Similar trends in growth control highlighted in Table 1 are applicable to all the 'Princettia' cultivars trial, Premium 'Red', Premium 'White', and Mars 'Early Red'.

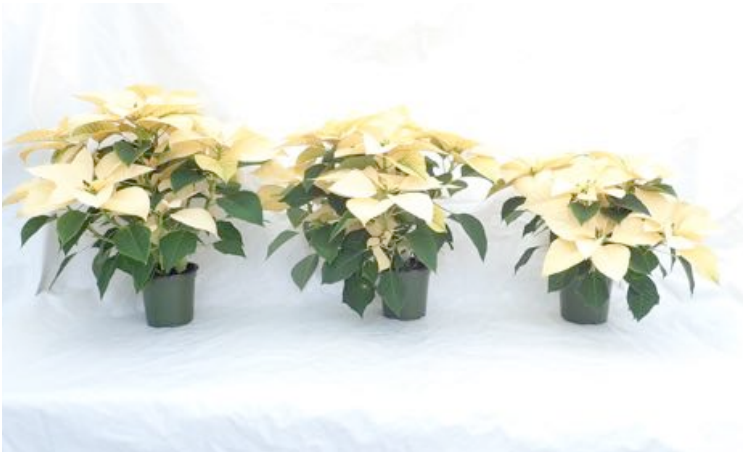

Figure 5. 'Mars White' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right). Consider using higher rates to obtain greater control.

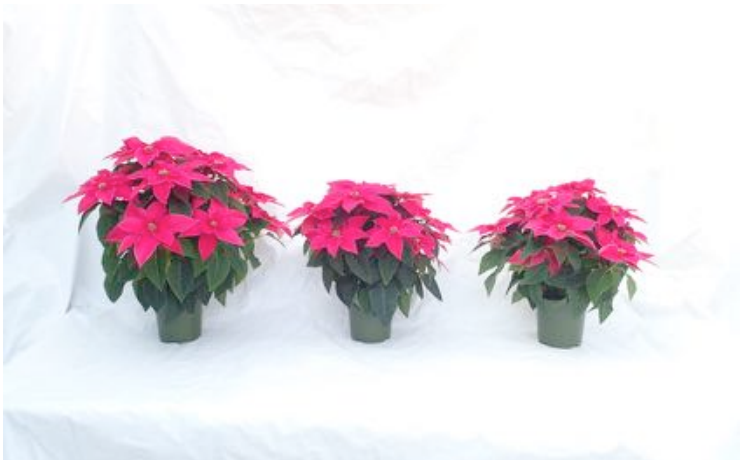

Figure 6. 'Princettia Dark Pink' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

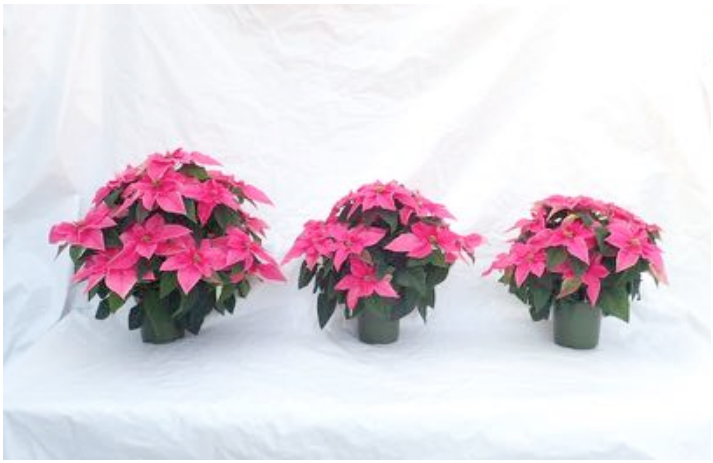

Figure 7. 'Princettia Hot Pink' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

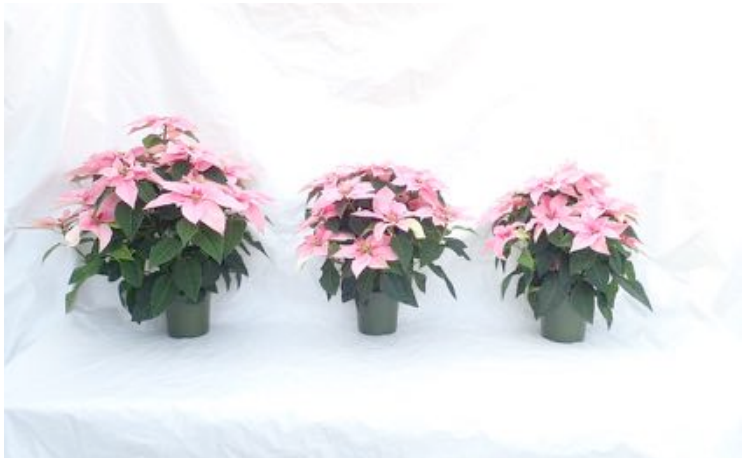

Figure 8. 'Princettia Pink' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

Conclusions

Piccolo 10XC substrate drenches of 0.5 to 1 ppm provided suitable growth control for the majority of cultivars grown in 4.5-inch pots. The degree of control increased with the rate. Higher rates that 1 ppm will need to be trialed for more vigorous cultivars such as Mars 'Pink' and 'White'. Growers will need to determine the degree of control they desire when selecting an optimal rate to use. These rates were determined under North Carolina growing conditions (35.78 °N Latitude). Growers further north may want to reduce the rate by up to 50% for their environmental conditions and for operations further south, a rate increase of up to 50% more may be appropriate to trial.

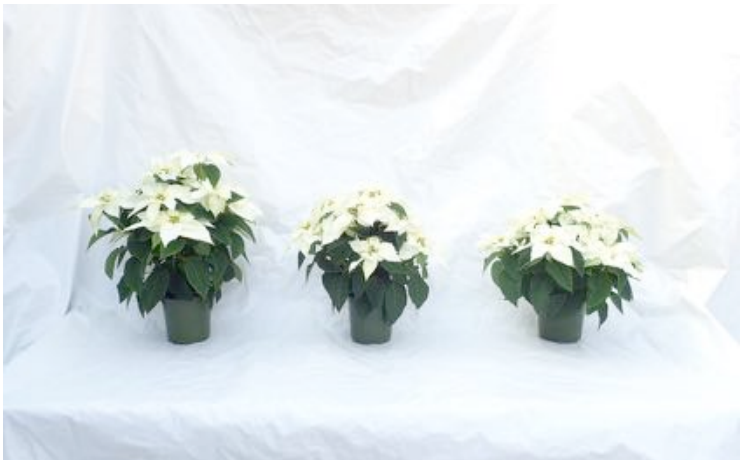

Figure 9. 'Princettia Pure White' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

Acknowledgements

We would like to thank Dümmen Orange, Syngenta Flowers, and Suntory for donating the cuttings, Sungro for the substrate, and Fine Americas for research support.

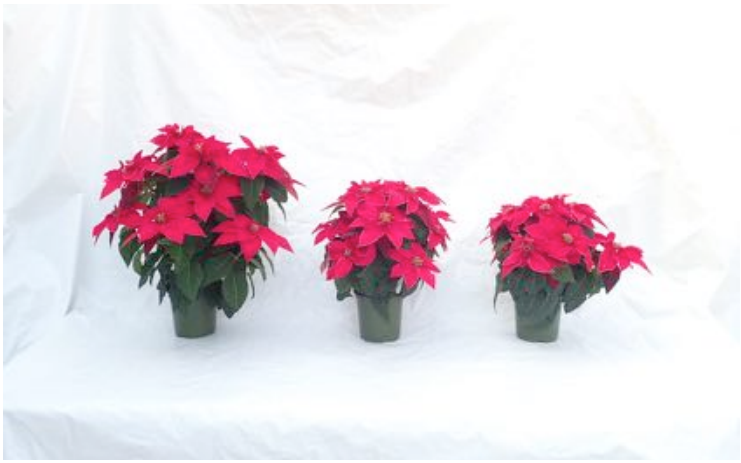

Figure 10. 'Princettia Red' poinsettia growth control provided by Piccolo 10XC (paclo) substrate drenches at 0, 0.5, and 1 ppm (left to right).

Table 1. 'Princettia Red' poinsettia growth control (in centimeters and percentage) for plants treated with Piccolo 10XC (paclobutrazol) substrate drenches of 0 to 1 ppm.

Concentration (ppm)	Plant Height[1] (cm) [% Control]	Plant Diameter[2] (cm) [% Control]	Bract Diameter[3] (cm) [% Control]
0	31.7	35.7	15.7
0.25	25.8 [-18.6%]	33.7 [-5.6%]	15.1 [-3.8%]
0.5	24.6 [-22.4%]	30.8 [-13.7%]	13.8 [-12.1%]
0.75	23.6 [-25.6%]	29.0 [-18.8%]	13.5 [-14.0%]
1.0	21.8 [-31.2%]	28.7 [-19.6%]	13.3 [-15.3%]
Significance[4]	***	***	***

[1]Plant height was taken from the soil line to the highest point on the plant.
[2]Plant diameter was taken at the widest point, and the plant turned 90 degrees, and measured again. The value is the mean of those two measurements.
[3]Bract diameter was taken from the largest two bracts, with diameter was taken at the widest point, and the bract turned 90 degrees, and measured again. The value is the mean of those two measurements from two bracts.
[4]Significant at $P < 0.001$. Letters with a different letter in a column represent statistically significant differences based on LSD at $P < 0.05$.

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