

GROWERTALKS

Features

4/1/2024

More Than Just Height Control

Lauren Kilpatrick & Brian A. Krug

Plant growth regulators (PGRs) are a critical tool in a grower's toolbox to control the height and/or growth habit of crops and it's critical to learn how to use them effectively to save you time, money and headaches. Increased branching is desired in many perennial crops to get a fuller, more floriferous plant in a shorter time and some PGRs can be applied to promote branching at different points during production. There's no one-size-fits all approach, so we designed a trial to compare two chemistries applied at different times at two concentrations to several perennial crops.

Branching Chemistry Recommendation Summary for Select Perennials						
PGR Treatments	Barbican Yellow Red Ring Gaillardia	Bordeau Steel Blue Salvia	Castello Pom Pom Yellow Coreopsis	HayDay Red Bicolor Helenium	Sentivia Early Blue Lavender	
Applied in Propagation (when roots began to develop)						
Configure	300 ppm	Can increase branching but may reduce rooting speed	Not recommended	Can increase branching but may reduce rooting speed	Can increase branching but may reduce rooting speed	Not recommended
	500 ppm	Not recommended				
Florel	250 ppm	Not recommended	Recommended	Not recommended		
	500 ppm	Not recommended	Not recommended	Can increase branching but may reduce rooting speed	Not recommended	
Applied During Finish (when roots were established)						
Configure	300 ppm	Recommended	Recommended	Recommended	Not recommended	Not recommended
	500 ppm					
Florel	250 ppm	Increases branching, but may delay flowering	Increases branching, but may reduce leaf expansion and delay flowering	Recommended	Not recommended	Recommended
	500 ppm		Not recommended			

Figure 1. Summary of results when five different perennial crops were treated with Configure (300 or 500 ppm) or Florel (250 or 500 ppm) during propagation or finish production. Data from Monroeville, NJ December 2021 to March 2022

The two PGRs that are typically used as branching agents are ethephon (Florel or Collate) and 6-Benzylaminopurine, commonly referred to as BA (Configure). The purpose of a branching agent is essentially to get a chemical "pinch" where the product causes lateral buds to break and produce branches just as if the growing point was physically removed. Using these branching agents to create a chemical pinch can be advantageous over a physical pinch by saving time, labor and reducing the risk of cross-contamination in the greenhouse. However, despite all these benefits, it's important to know when and what they can or can't be used on, or there could be some negative side effects. Side effects might include reduced rooting when applied in propagation, reduced or delayed flowering when applied after transplant, or chlorosis and leaf distortion at any time during production. When used properly and at the correct rate these side effects shouldn't be significant.

What we did

To evaluate the efficacy of branching chemistries, applications of either Florel or Configure were applied to five different perennial species: Gaillardia (Barbican Yellow Red Ring), Salvia (Bordeau Steel Blue), Coreopsis (Castello Pom Pom Yellow), Helenium (HayDay Red Bicolor), and Lavender (Sentivia Early Blue). Treatments were applied as foliar sprays in either propagation or during finish when the plants were actively growing and roots reached the bottom of the container.

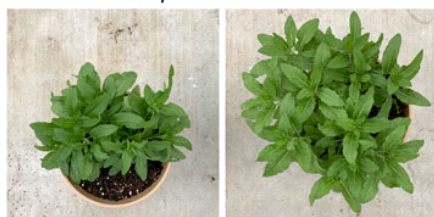
Plants were propagated from unrooted cuttings in 102-cell propagation trays beginning in the second week of

September 2021. Once plants were well rooted, they were transplanted into an 8-in. pot with three plants per pot and grown inside a greenhouse maintaining an average daily temperature (ADT) of 66F (18C) and the photoperiod was provided by natural light.

PGRs were either applied in propagation 2.5 weeks after sticking (when roots began to develop) or during finished production, three weeks after transplant (when roots were established in the pot). Regardless of application timing, Florel was applied at rates of either 250 or 500 ppm and Configure was applied at either 300 or 500 ppm; both products were applied at an application rate of 0.5 gal./100 sq. ft. (about the area of an apartment bedroom). Plants that were treated with a PGR during propagation were also transplanted into finished containers as described above and grown through finished production.

Plants were evaluated nine weeks (about two months) after transplant, except for the Lavender Sentivia Early Blue, which was placed in a colder house to overwinter and then evaluated 21 weeks after transplant. Plant height, width, branch count and vigor were recorded and subjected to statistical analysis. Overall plant appearance, rooting speed and flower timing were observed and noted, but not subjected to statistical analysis.

Salvia x superba Bordeaux Steel Blue



Control

Configure at 300 ppm

Salvia x superba Bordeaux Steel Blue untreated control and treated in finished production with Configure at 300 ppm.

Gaillardia aristata Barbican Yellow Red Ring

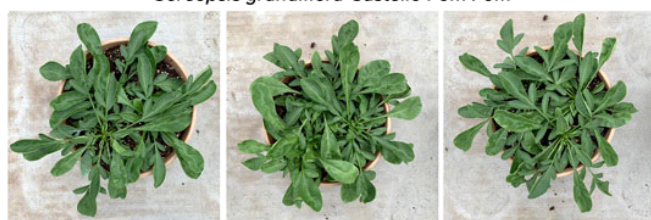


Control

Configure at 300 ppm

Gaillardia aristata Barbican Yellow Red Ring untreated control and treated in finished production with Configure at 300 ppm.

Coreopsis grandiflora Castello Pom Pom



Control

Configure at 300 ppm

Florel at 250 ppm

Coreopsis grandiflora Castello Pom Pom untreated control and treated in finished production with Configure at 300 ppm or in propagation with Florel at 250 ppm (far right).

What we learned

Results from this trial demonstrate how the effect of the branching product varies between genus, chemistry, concentration and timing. Based on these trial results, a summary table was built to provide recommendations for each variety for which chemistry to use, when and at what concentration with notes on other potential side effects (Figure 1). This emphasizes the importance of trialing and growers should conduct their own trials using these guidelines as a starting point, as results can be dependent on multiple factors.

Gaillardia Barbican Yellow Red Ring

Propagation: Configure applied during propagation at 300 ppm increased branching by 75% compared to the control, but may reduce rooting speed. Significantly reduced rooting speed was observed when Configure was applied during propagation at 500 ppm. Florel during propagation reduced rooting speed and didn't significantly increase branching once the liners were grown out to finish.

Finished production: Configure applied during finish at 500 ppm increased branching by 41% compared to the

control. Florel applied at 250 ppm or 500 ppm increased branching by 62% and 75%, respectively, compared to the control. Delayed bud set was observed in plants treated with Florel during finish—all other treatments had buds present.

Salvia Bordeaux Steel Blue

Propagation: Both treatments of Configure and Florel exhibited phytotoxicity (distorted growth and chlorosis), and reduced rooting.

Finished production: Configure applied during finish increased branching by 33%. Florel applied at 250 ppm during finish increased branching by 66% compared to the control, but delayed flowering and reduced leaf expansion.

Coreopsis Castello Pom Pom Yellow

Propagation: Applying Configure in propagation at 300 ppm or 500 ppm increased basal branching, but delayed rooting was observed. Florel at 250 ppm increased basal branching and didn't delay rooting.

Finished production: Configure applied during finish at 300 ppm or 500 ppm increased the vigor by 16% and 12% respectively, when compared to the control.

Helenium HayDay Red Bicolor

Propagation: Although Configure and Florel increased branching, they both resulted in phytotoxicity and reduced rooting of the liners and they aren't recommended for use.

Finished production: Configure applied during finish exhibited phytotoxicity with distorted growth and chlorosis. No response was observed when Florel was applied.

Lavender Sentivia Early Blue

Propagation: It's not recommended to apply Configure (at either concentration) or Florel (at 500 ppm) in propagation, as the liners exhibited significant phytotoxicity (distorted growth and chlorosis), reduced rooting and death. Florel applied at the lower rate (250 ppm) did increase branching, but use it with caution; it also reduced rooting speed.

Finished production: An increase in branching and vegetative growth was observed with Florel applied 5.5 weeks after transplant at either 250 ppm or 500 ppm once the lavender broke out of dormancy 21 weeks after transplant.

GT

Lauren Kilpatrick and Brian A. Krug, Ph.D. are employees of Syngenta Flowers North America.