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by Joyce Latimer
jlatime@vt.edu

Use Branching Agents Early to Improve Quality of Herbaceous Perennials

We've had recent inquiries from growers on how to improve branching of herbaceous perennials this season. Our most recent research indicates that EARLY is much better than later.

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So, we're bringing a brief update on this work with the plant growth regulators that enhance crop branching. Last week's research report detailed our limited studies on Collate (ethephon, Fine Americas, Inc.). So this issue will present results and recommendations on using Configure (BA, benzyladenine, Fine Americas, Inc.) or Augeo (dikegulac sodium, OHP, Inc.) to enhance branching of herbaceous perennials.

Earlier work with *Echinacea purpurea* 'White Swan' found that treatment with 600 ppm Configure at the time of, or within a week of, potting liners resulted in earlier pot fill and a persistent improvement in finished plant branching (Figure 1). We also found that multiple treatments with Configure on responsive crops significantly enhanced finished plant quality as with *Gaura lindheimeri* 'Siskiyou Pink' treated shortly after potting the liners and again two weeks later (Figure 2).

Figure 1. *Echinacea* 'White Swan' plants treated with 600 ppm Configure on the day of potting or one week after potting had more basal branches and more complete pot fill than untreated plants (left to right, untreated plants, 600 ppm Configure at time of potting, or at one week after potting). Photo at four weeks after potting.

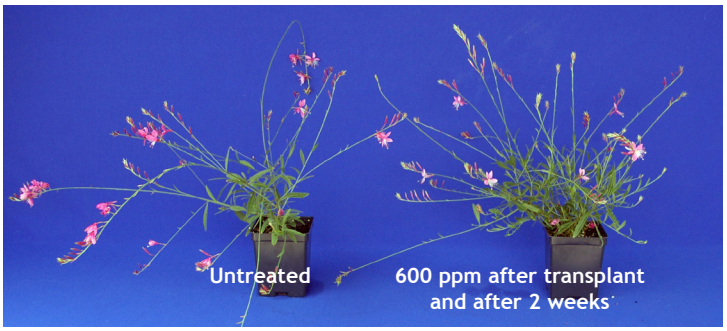

Figure 2. Multiple applications of Configure improved branching and flowering of *Gaura* 'Siskiyou Pink'; untreated (left), 600 ppm applied at shortly after transplanting and again two weeks later. Picture taken at four weeks after final treatment.

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CONTRIBUTORS

Dr. Nora Catlin
Floriculture Specialist
Cornell Cooperative Extension - Suffolk County
nora.catlin@cornell.edu

Dr. Kristin Getter
Floriculture Outreach Specialist
Michigan State University
getterk@msu.edu

Dan Gilrein
Entomology Specialist
Cornell Cooperative Extension - Suffolk County
dog1@cornell.edu

Dr. Brian Krug
Floriculture Ext. Specialist
Univ. New Hampshire
brian.krug@unh.edu

Dr. Joyce Latimer
Floriculture Extension & Research
Virginia Tech
jlatime@vt.edu

Dr. Roberto Lopez
Floriculture Extension Specialist & Research
Purdue University
rglopez@purdue.edu

Dr. Paul Thomas
Floriculture Extension & Research
University of Georgia
pathomas@uga.edu

Dr. Brian Whipker
Floriculture Extension & Research
NC State University
bwhipker@ncsu.edu

Therefore, we started working with treatments during rooting and finishing of the liners. Much of this work has been presented or published before. So I'll just hit the highlights.

What we did

We started with unrooted cuttings, which were dipped 1500 ppm IBA and stuck into 72-size plug trays filled with a peatlite media. Cuttings were rooted under mist with bottom heat at 72°F. The branching agents, Configure or Augeo, were applied as foliar sprays when roots from cuttings were evident on all four sides of the root ball, but liners were not fully rooted and ready for transplant (18 to 34 days after sticking). Typically this was just after the liners were removed from mist. Rates and frequency of treatment varied with crops and studies. Finished liners were evaluated two to four weeks after treatment and then potted for evaluation of the finished plants (3 to 6 weeks later).

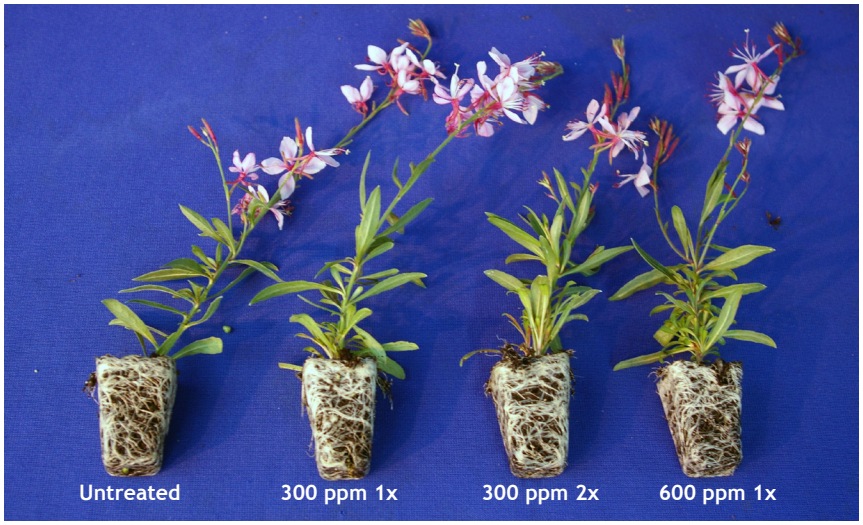

Figure 3. Configure applied to liners at 27 days after sticking increased the number of shoots and lateral branches as well as shoot dry weight of *Gaura* 'Siskiyou Pink' plugs without reducing root growth; untreated, 300 ppm applied once, 300 ppm applied twice, 600 ppm applied once (left to right). Picture taken at four weeks after treatment.

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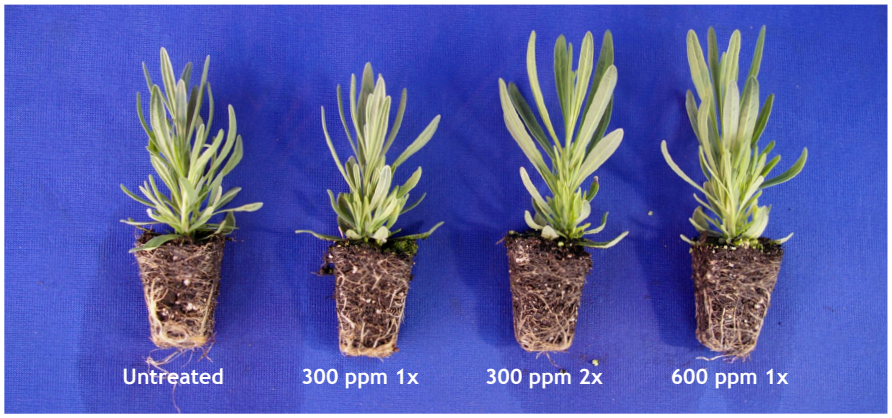

Figure 4. Configure increased the number of shoots and lateral branches as well as shoot dry weight of *Lavandula* 'Provence' liners: untreated, 300 ppm applied once, 300 ppm applied twice, 600 ppm applied once (left to right). Only the plugs treated with 300 ppm twice had reduced root growth but finished plants from this treatment had the greatest number of shoots and branches at four weeks after planting. Picture taken at four weeks after treatment.

What we found with Configure

A wide variety of herbaceous perennials were responsive to Configure which generally enhanced liner quality with increases in the numbers of lateral or basal branches in most crops and in some cases increased numbers of leaders or shoot dry weight. In other words, Configure resulted in larger liners that may finish more quickly. In some crops, like *Gaura* 'Siskiyou Pink' (Figure 3) or *Lavandula* x *intermedia* 'Provence' (Figure 4), the increase in branching of the liners resulted in finished plants with a greater number of branches than untreated plants.

From here we looked at multiple applications, the first during liner production as described above which was then followed by a second application three to five days after transplanting to the final container. For crops responsive to Configure, there was a significant increase in branching of finished plants with an additional application shortly after transplanting, e.g., *Achillea millefolium* 'Moonshine', *Gaura* 'Siskiyou Pink', *Nepeta* x *faassenii* 'Walker's Low', *Sedum spectabile* 'Autumn Joy', and *Phlox paniculata* 'Bright Eyes' (Figure 5).

Figure 5. Multiple applications of Configure at 600 ppm increased number of branches of *Phlox paniculata* 'Bright Eyes': A) untreated (left) and 600 ppm applied at liner stage (26 days after sticking). Picture taken at two weeks after initial treatment. B) untreated (left) and 600 ppm applied in liner stage and again 5 days after transplanting. Picture taken at six weeks after initial treatment. Finished plants treated twice with Configure had a 57% increase in the number of branches but development was slightly delayed as compared to untreated plants.

Recommendations for Use of Configure

- Apply foliar sprays of Configure at 300 to 600 ppm to liners shortly after removal from mist. One application of 600 ppm resulted in similar effects as two applications of 300 ppm.
- As with all new applications, test Configure for phytotoxic responses on new crops.
- Reapply Configure to the plants shortly after transplanting liners to finished containers.
    - **The interval between the applications MUST be at least two weeks to avoid potential phytotoxicity!!**
- If you are not rooting your own liners, you can still use this principle by treating your liners shortly after arrival – as long as they are actively growing. Then, treat again two weeks later.

What we found with Augeo

Augeo was applied as a foliar spray at 400, 800 or 1600 ppm using the same time of application as described above. Responsive liners included *Verbena bonariensis* 'Lollipop' in which a single Augeo treatment at any of the tested rates increased branching of the finished liners while significantly reducing height (Figure 6). Augeo caused a slight twisting of leaves on the liners but plants grew out of symptoms in grow out phase. And finished plants from liners treated with 800 or 1600 ppm Augeo still retained a greater number of branches low in the plant than the untreated plants but flowering was delayed by about three to seven days. Final plant height of plants treated with 1600 ppm Augeo was reduced only 20% compared to untreated plants.

Augeo caused a slight twisting of leaves on the liners but plants grew out of symptoms in grow out phase. *Veronica spicata* 'Goodness Grows' was sensitive to Augeo with all rates increasing branching (control 1.0 vs. 400 ppm treated 8.0 branches) of the finished liners (Figure 7a). However, the higher rates (800 or 1600 ppm) caused excessive and persistent shoot growth reductions without increased branching (Figure 7b).

One of the best examples of the benefit of multiple applications of Augeo was the study we presented on *Sedum* 'Autumn Joy' in a previous e-GRO Alert which you can access at http://e-gro.org/pdf/EGRO_2_13.pdf.

In some crops, like *Sedum* above or *Nepeta* 'Walker's Low', growth regulation is a beneficial side effect of using Augeo. However, in some crops, like *Achillea* 'Moonshine', *Nepeta* 'Walker's Low', or *Phlox* 'Bright Eyes', two applications of Augeo at rates sufficient to increase branching also caused excessive growth reduction of the finished plants.

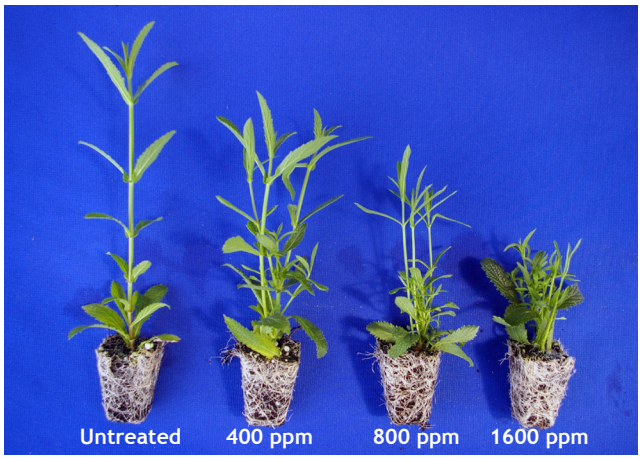

Figure 6. Augeo increased the number of lateral branches of *Verbena bonariensis* 'Lollipop' liners; untreated, 400, 800, or 1600 ppm applied once (left to right). Treated plants had 9 to 12 branches compared to 1.3 branches on untreated liners. Picture taken at three weeks after treatment.

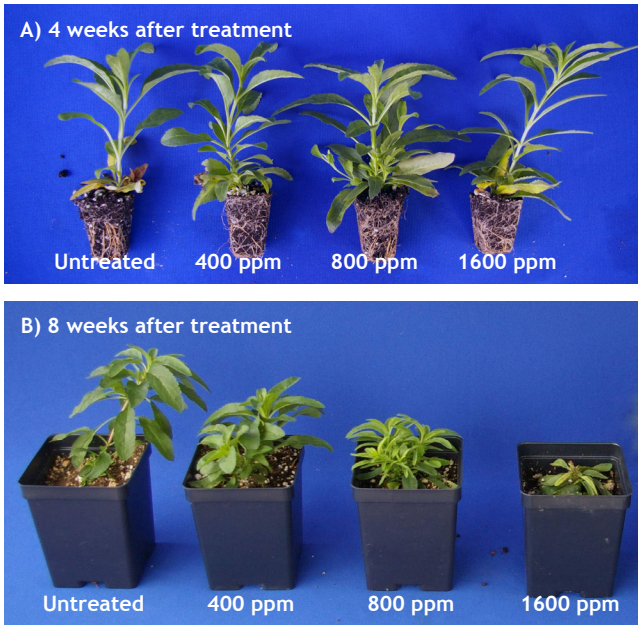

Figure 7. *Veronica spicata* 'Goodness Grows' treated with Augeo at 0, 400, 800, or 1600 ppm (left to right): A) treated finished liners had a greater number of branches, photo at four weeks after treatment; B) the increased number of branches did not persist in Augeo-treated finished plants but plant growth was significantly reduced; photo at eight weeks after treatment.

Recommendations for Use of Augeo

- Apply foliar sprays of 400 to 800 ppm Augeo to liners shortly after removal from mist. Conduct your own rate tests for new crops.
- Repeat Augeo applications within one week after potting only when growth regulation is moderate and if production time allows for adequate growth. Early application of Augeo is critical to allow any time necessary for recovery from the typical chlorosis response. Depending on the crop, this may take up to four weeks for the herbaceous perennials. Other crops show no phytotoxicity at all.
- Use the recommended spray application volume (1 gallon per 200 square feet) to thoroughly wet leaves. Do NOT use additional surfactants.
- Apply PGR foliar sprays when plants are under low stress conditions. Products like Augeo applied to plants under stress result in greater phytotoxicity symptoms.
- If you are buying in your liners, make the first application of 400 to 800 ppm Augeo in the liner tray. Liners should be actively growing with ~2 to 4 leaves at the time of spray applications. Make a second application about two weeks later if production period allows.

In summary, the branching agents, Configure and Augeo, have been very effective in improving plant branching. Using our results as guidelines, conduct tests on your own crops. Always keep notes on the details of your application as well as your results and observations to aid in improving your results with subsequent crops.