

# What's New in Plant Growth Regulators?

New products are fewer and farther between these days, but PGR research continues to help growers be more efficient

By Jim Barrett, Carolyn Bartuska and L.L. Mount

“What's new in the PGR arena?”

We get that a lot. The answer: several things. We're working on more products in more areas than ever in the 30-plus years of the University of Florida's PGR program. Here's a quick summary of some of our current projects.

## Water: ABA

A major portion of our work the past five years has been on ConTego, which contains abscisic acid, the natural plant hormone that causes reduced transpiration in response to drought. The initial objective is to apply ConTego prior to shipping to prevent plants from drying out at retail so quickly without watering. ConTego works on almost all crops, and it is easy to demonstrate the delayed wilting. We are also looking at ABA on vegetable crops; it has a lot of potential here because it occurs naturally in all plants. Valent BioSciences has set a spring 2011 target for the introduction of ConTego on

flower crops, and labeling for vegetables will be one to two years later.

The use of PGRs that are currently important in greenhouse crop production demands a good understanding of the variables involved with species, variety, crop culture and weather. We have the same situation with ConTego, and the focus of our research now is to identify what growers will need to know to be successful with ConTego. This is the first time we have had a commercial agricultural product containing ABA, so we are on a steep learning curve.

## Water: Other

Because of the industry's concerns for water-use issues and loss because of wilting at retail, we get numerous questions about what products are available to address these concerns. While these products work through different mechanisms, we have compared the performance of a few of the products to ConTego; some of the results are shown in Table 1. In this work, we could increase the effect of Stasis by doubling the amount used. In our

**PGR use demands a good understanding of the variables involved with species, variety, crop culture and weather.**



Salvia farinacea in 6-inch pots, left without watering. Control plant (left) wilted by the end of day 2; plant treated with ConTego drench wilted during day 5. Picture was taken on day 3.

Top: Topflor G on media surface when applied at planting

several years of experience with Hydretain, it has worked well on a wide range of crops and often doubles the time it takes plants to wilt. It is applied as a drench prior to shipping and must be washed off foliage to avoid a residue. Geohumus is another very new product we are

just starting to explore. It is a new type of granular gel that is incorporated into the growing media before planting.

## Strobilurins

The strobilurins are an important class of fungicides, but recent



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**PGRs on Coleus**

Product *	Rate	Percent decrease in water use	Percent increase in time to wilt
ConTego drench	250 ppm	59	29
ConTego drench	500 ppm	63	43
Hydretain drench	2 oz. /gal.	36	36
LeafShield spray	8 oz. /gal.	18	0
Stasis drench	2 oz. /gal.	10	0
Stasis drench	4 oz. /gal.	16	0

\* LeafShield data from one study. Others are summaries of three studies.

Table 1. 'Royal Glissade' coleus were treated with different products, then we determined the amount of water used in transpiration over 24 hours. The plants were not irrigated, and the time to wilt was recorded.

research indicates that they may have important positive physiological effects on plants apart from disease control. The basic physiology of these effects has mostly been studied in major grain crops like corn. We are just starting to evaluate their potential in nursery and greenhouse crops. Plants treated with strobilurins can have greatly increased photosynthetic efficiency and growth rates. Strobilurins interact with the hormones ethylene, auxin and ABA in the plant, helping to moderate plants' responses to environmental stress.

Treated plants may have delayed wilting and leaf yellowing during drought and may be more resistant to freezing and heat stress.

This may all sound a little too good to be true. It is early in this work and not everything will pan out. Not all strobilurin chemicals have the same effect, but eventually we will likely find the best fits for particular chemicals on crops to yield those beneficial effects.

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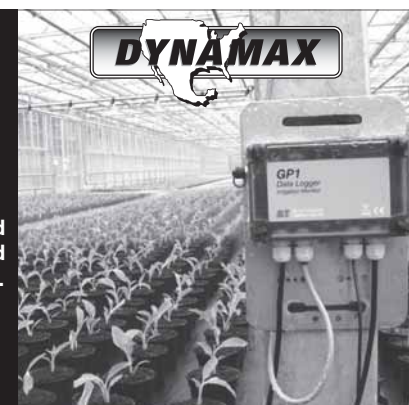
Many researchers have been interested in finding chemicals that would

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## GREENHOUSE CHEMICALS

protect crops against freezing and/or chilling injury. Several products have shown at least some effectiveness in research trials, including strobilurins and even ABA. Freezepruf was recently introduced and has received considerable recognition. There is good evidence that it has performed well in controlled studies. However, this is an example that not everything works out in our studies. We conducted three tests with impatiens last February on nights that were between 28° F and 30° F. All treated and control plants died from freezing. Plants that were outside, covered by frost cloth, and those that had been treated and left in the greenhouse survived.

## Branching

Augeo is a new product for the greenhouse and nursery market that is a chemical pinching agent that can slow growth of the main terminal and stimulate lateral growth. The active ingredient, dikegulac, is the same as in Atrimmec, which is now labeled only for landscape use. Dikegulac has been around for some time but has not been fully evaluated on many crops. Configure, Florel and Fascination, to some extent, have been used to stimulate branching, and development work continues on all of them. For induced branching, we are not going to end up in a one-size-fits-all



*These 'Red Velvet' were flowered in December and January when we have cooler conditions and lower light levels. The plant on right was sprayed with Bonzi 10 days prior to shipping. The timing of this application was probably earlier than desired; there was still some effect on bract expansion.*

## Poinsettias

I know by this point, some readers are starting to wonder whether we are still doing PGR work on poinsettias. We are continuing to learn more about Topflor and Bonzi as early, low-dose drenches. But here we will highlight some different work that isn't as well understood.

Cyathia retention has always been important, but in the past few years it seems to have become a bigger issue. In doing post-production trials we have seen the potential for Fascination applications during bract development to cause a problem with cyathia development that results in immature cyathia falling out prematurely. On the other hand, we have seen that very late Bonzi sprays directed at the cyathia may promote cyathia retention. The timing of this application is at shipping after bract expansion has occurred. In both of these situations there appears to be differences with varieties and there are sure to be other variables that will come out.




*These 'Prestige Red' were flowered in December and January when we have cooler conditions and lower light levels. The plant on the right was sprayed with Fascination at seven weeks after start of short days. Plants were moved to shelf-life evaluation rooms in week 10; the picture was taken after two weeks.*



'Wave Lavender' petunias in trade gallon pots. Clockwise from top left: control; Topflor G applied at planting; Topflor G applied at two weeks; Topflor drench (1 ppm) applied at two weeks. Picture was taken at six weeks.

situation. Individual crops responded better to one chemical than to others. For many crops, none of these are going to work, and in some cases, we will likely be tank mixing products.

### Granular Topflor

All of our main size-control PGRs are applied in water, but Topflor G is a new granular formulation that should have registration soon. The use of drench applications has greatly increased and Topflor has proven very effective when applied to the growing media or as a liner dip. The potential for a granular formulation is that it can be pre-incorporated in the media at mixing or applied to the surface at planting. We have seen very good performance with dropping it into the hold before inserting a liner. Topflor G also can be useful with larger pot sizes where it would be easy to apply and in situations where a large-volume drench is inconvenient. After some initial studies to prove the concept, our Topflor G research is focusing on strong growing crops that benefit from early control. 

**Jim Barrett is professor of floriculture, Carolyn Bartuska is senior biologist and L.L. Mount is a research assistant at the University of Florida in Gainesville. Barrett can be reached at [jbarrett@ufl.edu](mailto:jbarrett@ufl.edu).**



Row of plants on left are control plants and ones on right were treated with Freezepruf the day before both sets of plants were placed outside over night. Low temperature was between 28 and 30 degrees. Picture was taken the next day.

### Acknowledgements

We are very appreciative for many companies' support of our research program and for their willingness to submit their products to independent testing.

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