

# Plant Growth Stimulants: DO THEY WORK?

RECENT RESEARCH SHOWS THAT THE USE OF CERTAIN SUPPLEMENTS MAY BE WORTH CONSIDERATION.

By Lucia Villavicencio

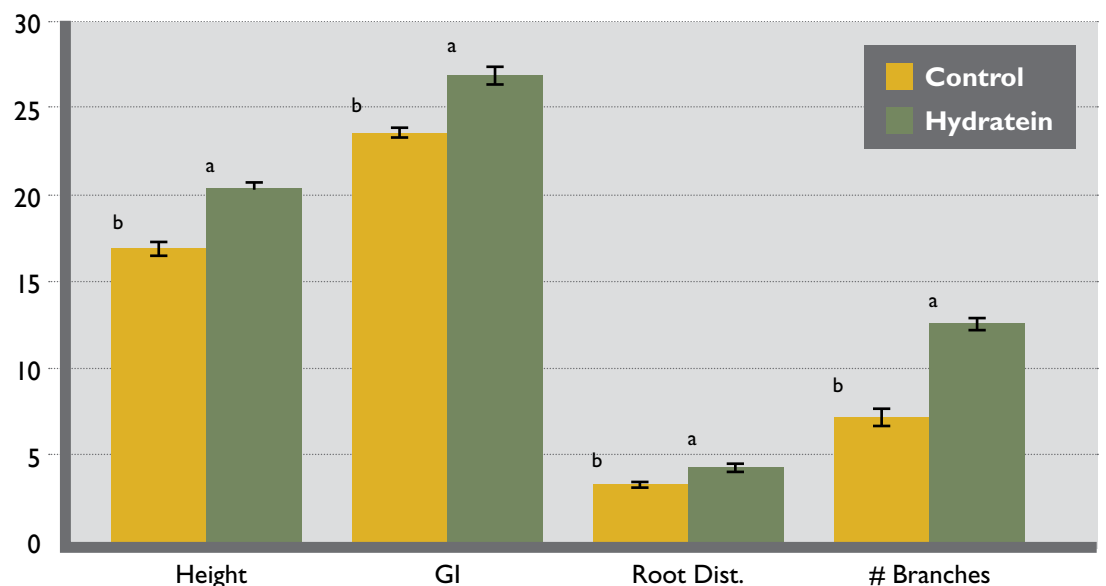
Newly developed natural products are offered to growers every day. Depending on the type of product, the label claims can include increased insect and disease resistance, increased water use efficiency, higher plant quality and longer shelf life.

Several of these products have been tried in agriculture with positive results; however, natural soil amendments, microbial concentrates and plant extracts interact differently with soil than they do with peat substrates. Nursery and greenhouse production is often very intensive. Vegetable transplants and bedding plants can be finished anywhere from three to six weeks, depending on the season. This short crop cycle sometimes determines poor performance of plant growth stimulants and other natural products. Other products might confer an advantage when plants are stressed, however, under optimal conditions, there are often no advantages to using these products.

Since many growers have a small margin of profit on each plant, sometimes just pennies can be the difference between making a profit or not. The cost of additional products besides the ones absolutely essential for plant production might be prohibitive, even when it represents only cents per plant.

## Trialing Available Products

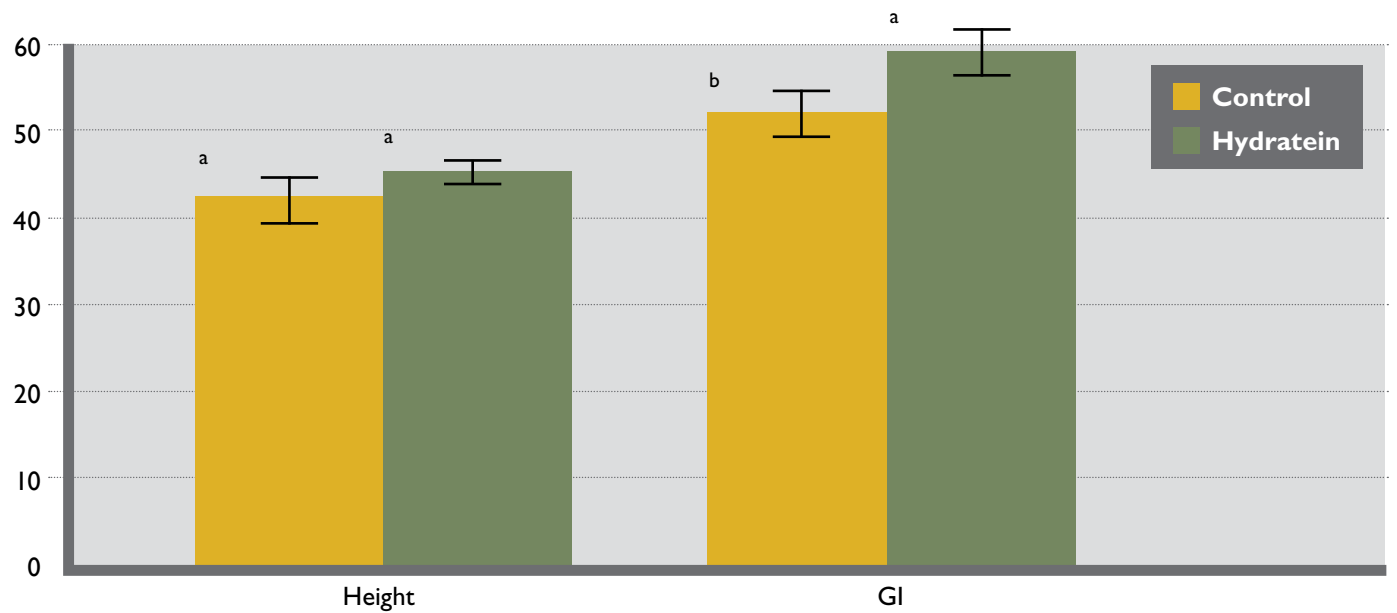
Testing each kind of natural product commercially available can be costly and time consuming,



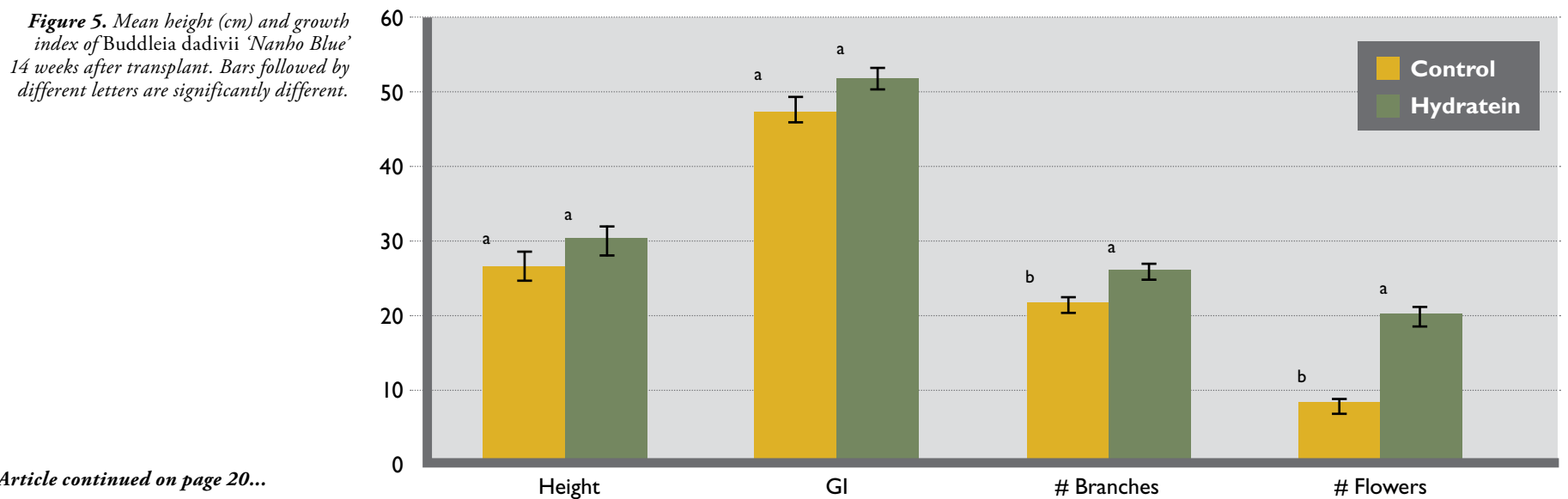
**Figure 1 (top).** Mean height (cm), growth index (GI), root distribution and number of branches of echium 'Star of Madeira' seven weeks after transplant. Bars followed by different letters are significantly different.  
**Figure 2 (bottom).** Hydratein ES Plus-treated (right) and water-treated (left) echium 'Star of Madeira' seven weeks after transplant.



**Figure 3.** Hydratein ES Plus-treated (right) and water-treated (left) salvia 'Winifred Gilman' plant appearance 12 weeks after transplant.



**Figure 4.** Mean height (cm) and growth index (GI) of salvia 'Winifred Gilman' 12 weeks after transplant. Bars followed by different letters are significantly different.



**Figure 5.** Mean height (cm) and growth index (GI) of Buddleia davidii 'Nanho Blue' 14 weeks after transplant. Bars followed by different letters are significantly different.

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but data generated by independent institutions in a variety of plants and environments would give growers a real advantage when trying to decide on the use of these products. A grower-submitted trial to the Center for Applied

Horticultural Research asked for a review of the commercially available product Hydratein. The product is marketed as a blend of hygroscopic and humectant compounds that increase plant water use efficiency by facilitating water absorption from

the air, making it available to the plant. Hydratein ES Plus also contains a non-ionic surfactant to improve soil penetration. Although the ingredients are proprietary, the manufacturers state the product is a mixture of a sugar alcohol and a surfactant.



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Other products such as Root Zone are also sugar alcohol based and claim to reduce plant transpiration and protect against environmental stress. Glycerin, another kind of sugar alcohol, has been reported to stimulate plant growth and protect against the effects of salinity. Hydratein ES Plus could be used to reduce irrigation frequency and improve quality of drought tolerant plants. These plants need to be established in the landscape before they can tolerate drought, since they usually have deep and rapid expanding roots systems. Containerized plants like *Salvia spp.* and other drought tolerant plants usually demand constant irrigation.

### Varieties Tested

Selecting *Echium candicans* 'Star of Madeira', *Buddleia davidii* 'Nanho Blue', and *Salvia clevelandii* 'Winifred Gilman' for trial, plugs were planted in 1-gallon containers filled with a commercial peat/perlite substrate amended with a complete slow release fertilizer. The plants were grown outdoors under natural irradiance and commercial nursery production practices. Hydratein at

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2 ounces per 100 gallons was applied as a drench immediately after transplant to half of the plants; the other half received water only. Buddleia and salvia received a second application three months after transplant.

Plants were watered when needed using two individual lines of an irrigation system. This arrangement allowed for the control group and the Hydratein-treated group to be watered separately. Irrigation need was visually

determined based on plant and substrate appearance. Once the plants reached market size, plant growth index, plant quality and root distribution were measured, the number of branches and the number of flowers were counted when applicable.

## Results

Echium, salvia and buddleia plants reached market quality at seven, 12 and 14 weeks after transplant, respectively. Hydratein-treated echium plants were bigger, and had better quality, root distribution, and a higher number of branches than the untreated control (UTC) (Figures 1 and 2). The product increased growth index of salvia, improved the plant quality and slightly improved root distribution (Figures 3 and 4) and although it did not have an effect on buddleia plant size, it improved plant quality, root distribution, and it increased the number of flowers and branches (Figure 5). The product did not decrease the frequency of irrigation, as Hydratein-treated plants used the same amount of water as the untreated plants during the growth cycle.

We also tested the effect Hydratein on plant shelf life after water stress. We allowed a group of treated and untreated plants to wilt and reapplied water to test the effect of the product on plant recovery and quality. Hydratein ES Plus did not increase shelf life (number of days to wilt) in any of the species tested compared to the UTC. After the plants were allowed to wilt and recover, there was a decrease in plant quality for all the species. Since Hydratein plants had higher quality before the water stress period, their final quality at one and five days after water stress was higher than the quality of the UTC. The results show that in certain conditions, and for specific plants, the use of supplements such as Hydratein ES Plus is worth to consider. However, growers need to conduct tests in their individual conditions to determine product performance under specific conditions. ☒

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