Regulating poinsettia's height

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A study determined that application of controlled water deficit can be effective as a means to regulate stem elongation in poinsettia, and that water deficit suppresses poinsettia stem elongation by reducing the length of the shoot internodes. Credit: Peter Alem

The height and size of ornamental plants such as poinsettia are important concerns for producers. Plant height is crucial both aesthetically and in regards to postharvest handling. To produce plants that meet desired heights, growers often rely on plant growth retardants, chemicals that inhibit elongation of plants. The authors of a new study say that, although there is a lot of information about the effects of plant growth retardant application rates and frequency, there is little information about the use of water deficit application as a means of plant height regulation for poinsettia.

"Poinsettia height control involves careful application of height regulation without compromising plant quality," said Peter Alem, corresponding author of the study. "The use of plant growth retardants (PGRs) is a standard practice in poinsettia height regulation, but excessive application of PGRs can result in permanent growth suppression and subsequent stunting of poinsettias, while applying too little PGR may not sufficiently suppress stem elongation." Alem and coauthors Paul Thomas and Marc van Iersel from the Department of Horticulture at The University of Georgia designed a research study to test controlled water deficit (WD) as an alternative to PGRs for regulating height in poinsettias. The results of their work were published in *HortScience* (February 2015).

The researchers used rooted cuttings of poinsettia 'Classic Red' transplanted into 15-cm pots. Three target heights (43.2, 39.4, and 35.6 cm) were set at pinching, and the scientists used heighttracking curves to monitor plants throughout the production cycle (77 days from pinching to finish). Substrate volumetric water content was maintained at 0.40 $m^3 \cdot m^{-3}$ during well-watered conditions, and reduced to 0.20 $m^3 \cdot m^{-3}$ when plants were taller than desired.

"Our results showed that plants with the 35.6-cm target height exceeded the upper limits of the height tracking curve despite being kept at a volumetric water content of 0.20 $m^3 \cdot m^{-3}$ for 70 days; these plants had a final height of 39.8 cm," the authors said. The final plant heights in the 39.4- and 43.2-cm target height treatments were 41.3 and 43.5 cm, respectively, within the acceptable range for these treatments. Control plants were maintained at a volumetric water content of 0.40 $m^3 \cdot m^{-3}$ throughout the study, and had a final height of 51.2 cm.

Previous research showed that the size of bracts - the primary ornamental part of poinsettia plants - can be affected by height regulation practices such as spray applications of PGRs in the later stages of development. Alem said that the current study showed that water deficit (WD) application reduced bract area of poinsettias, and that the reduction in bract area increased with an increase in the duration of water deficit application. Thus, the researchers recommended that water deficit be avoided during periods of bract elongation to minimize the effect of WD on bract size and the associated reduction in plant quality.

The authors concluded that application of controlled water deficit can be effective as a means to regulate stem elongation in poinsettia. "Water deficit suppresses poinsettia stem elongation by reducing the length of the shoot internodes. The

required frequency and duration of WD application is dependent on the desired final target height. However, there are limits to how much height control can be achieved," they explained. "Our results indicate that controlled water deficit can be an effective method of height control for poinsettia, but that it may also decrease bract size."

More information: *HortScience*: hortsci.ashspublications.org/c … nt/50/2/234.abstract

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