

Culture Notes

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The Art and Science of Growth Regulators on Perennials

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Perennials have become one of the fastest growing sectors of floriculture and as such, growers continue to search for strategies to produce the best possible perennial plant for consumers. The winter season offers growers the time to evaluate the use of plant growth regulators (PGRs) on their perennial crops.

Try and try again

Growers producing a wide variety of perennials have successfully used PGRs on perennial seedlings during the plug stage and for finishing. The potential benefits of PGRs on perennials include growth control throughout the production process; improved branching and growth habit; consistency across crops; reduction in pruning and mowing; reduced plant size for more efficient shipping; improved quality and shipping characteristics; and reduced labor costs.

While countless PGR trials have been conducted, achieving the best results with PGRs is both an art and a science. Success requires science tempered with trial and error and a good understanding of which PGR will produce the highest-quality crop.

Five varieties study

To help take some of the guesswork out of working with PGRs on perennials, several trials have been conducted on popular perennials using Concise. Concise, produced by Fine Americas, Inc., is a growth regulator for use on a broad variety of annual and perennial crops from bedding and potted plants to woody ornamentals and bulb crops. Concise contains the active ingredient uniconazole-p, a triazole plant growth regulator that inhibits the production of gibberellins, the primary plant hormones responsible for cell elongation. Concise reduces plant height by limiting internode elongation and reducing elongation of stem, petiole and flower stalk tissues.

A study done by Sonali Padhye, Mike Olrich and Erik Runkle in the Horticulture Department at Michigan State University reviewed height control of five herbaceous perennials using Concise.

Plugs for five varieties—*Delphinium elatum* Pacific Giant, *Gaura lindheimeri* Whirling Butterflies, *Nepeta subsessilis* Walker's Low, *Rudbeckia fulgida* Goldsturm and *Echinacea purpurea* Magnus—were grown in

a greenhouse and transplanted into 5.5-in. square containers. Two foliar spray applications of two quarts of Concise per 100 sq. ft. were made on delphinium, gaura, nepeta and rudbeckia. Three spray applications were made for *Echinacea purpurea* Magnus. The first application was made at bolting and the second sprays (or third application for echinacea) were applied 14 days later. Plants were grown at a constant 68F with a 16-hour photoperiod delivered from high-pressure sodium lamps. After growing under a 16-hour photoperiod for nine weeks, rudbeckia Goldsturm was transferred to a nine-hour photoperiod for three weeks to promote flowering. It was subsequently grown under a 16-hour photoperiod until the end of the experiment.

Study Results

Delphinium elatum Pacific Giant: Concise provided height control, but results showed that the rates used were too high for delphinium, and plants were too short for 5.5-in. containers. Lower rates are recommended (see Table 1).

Foliar spray typically delayed flowering by one week or less and significantly suppressed plant height at flowering but did not influence the inflorescence number. The study's researchers noted that growers must be careful not to excessively suppress PGR-treated stems or allow them to remain wet for long periods after overhead watering.

Gaura lindheimeri Whirling Butterflies: Concise effectively suppressed internode elongation compared to non-treated control plants. The application of Concise didn't influence the flowering time or inflorescence number at flowering. Also, sprays of 10 ppm Concise provided adequate height control at flowering and no phytotoxicity was observed following any application at the rates tested.

Nepeta subsessilis Walker's Low: Concise sprays provided sufficient height control for seven weeks in the greenhouse. Application didn't influence the plant's flowering time or inflorescence number at flowering. *Rudbeckia fulgida* Goldsturm: The influence of Concise on height control of rudbeckia was variable. Although the average height of plants sprayed with Concise didn't increase (most of the plants remained as rosettes), the flowering of these plants was delayed as indicated by very low flowering percentage. Also, Concise didn't influence inflorescence number.

Echinacea purpurea Magnus: For determinate species such as echinacea, PGRs often provide their best height control when applied at the time of bolting. PGR applications made too early or late in the flowering cycle are not as effective. Variable bolting times of Magnus seedlings made the choice of application timing difficult. This can contribute to the variable plant heights within a treatment. Note that Concise spray applications were made three times and two weeks apart to account for flowering time variability. Three sprays of 10 ppm Concise provided good height control, while plants sprayed with 20 ppm Concise were too short for 5.5-in. pots. Additionally, 20 ppm Concise resulted in a lower flowering percentage although flowering time did not appear to be influenced by Concise sprays. Also, the Concise application didn't influence the inflorescence number at flowering of this echinacea cultivar.

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