

Increasing Height of Chrysanthemum with Fresco® Drenches

Cathy Whitman, Nate DuRussel, and Erik Runkle, Department of Horticulture



Introduction & Objective

It's not uncommon for chrysanthemum to induce flowers early, which occurs when temperatures during the summer are relatively cool, especially at night. When flowers induce early, or when plant growth retardants are over-applied, there is a need to increase plant height. One technique to increase stem elongation is to make an application of a product that contains gibberellic acid (GA). Several products that contain GA (with or without benzyladenine, BA) are available for use on floriculture crops, including Fresco® from Fine Americas.

We have conflicting information about the efficacy of GA when applied as a substrate drench. The existing paradigm is that GA is only effective when applied to the plant shoots. However, some growers have reported positive responses when GA is applied as a drench by repeated foliar sprays delivered from booms, or when applied directly to the media, without contact with the foliage. Drench applications could also be useful on other potted flowering crops such as poinsettia, when a uniform plant response is desired without any negative effects on flowering, as well as on bedding plants. Fresco® contains 1.8% GA 4+7 and 1.8% 6-BA.

Our objective was to determine the efficacy of Fresco® as a substrate drench to increase height of garden chrysanthemum, and compare its effectiveness to that of spray applications.

Experimental Protocol

We obtained mature chrysanthemum liners of 'Barbie Lavender', 'Chelsea Coral', 'Eventide Dark Bronze', 'Gigi Coral', and 'Jacqueline Pearl' from a commercial producer on July 21, 2016. Liners were transplanted into 5-inch pots filled with a standard peat and perlite medium on July 27. On August 1, all received a moderately hard pinch except for 'Eventide Dark Bronze', which received a soft pinch. Watering and nutrition followed standard floriculture production practices in the Plant Science Research Greenhouses at Michigan State University. Plants were maintained at a constant 68 °F with a 16-hour long day with supplemental lighting from high-pressure sodium lamps. On August 30, we initiated 9-hour short days (SD) by pulling blackout cloth at 5:00 pm and opening it at 8:00 am daily.

Ten plants were assigned to each treatment, and we planned to give plants a single application at 3 different times: when SD began, or after 2 weeks of SD, or after 4 weeks of SD. We observed little response after the first treatment, so we modified the initial protocol, adding applications at higher rates to be made 1 week after each initial treatment. Thus, all treated plants received 2 applications 1 week apart. After SD began, heights were measured every week until the first flower opened on each plant. On that date, we recorded plant height and number of inflorescences showing color.

Application rates and methods:

1. None (control)
2. 2.5 ppm drench (at 0, 2, or 4 weeks after start of SD) followed by 4.0 ppm drench 1 week later
3. 5.0 ppm drench (at 0, 2, or 4 weeks after start of SD) followed by 8.0 ppm drench 1 week later
4. 5.0 ppm spray (at 0, 2, or 4 weeks after start of SD) followed by 8.0 ppm spray 1 week later

Application notes:

- Drenches did not contact the foliage. The growing media was saturated, so that the solution ran to the bottom of the pot.
- The spray was a heavy application (3 quarts/100 ft²) and the product was applied to initial runoff.
- The surfactant CapSil was added to all spray treatments to ensure thorough coverage.

Results

Responses varied by cultivar. Fresco® applications increased height in ‘Barbie Lavender’, ‘Eventide Dark Bronze’, and ‘Gigi Coral’: plants were 2 to 3½ cm (1-1½ inches) taller at first flower than untreated plants (Figures 1, 2 and 3). Height of ‘Chelsea Coral’ and ‘Jacqueline Pearl’ was not affected by the treatments. Sprays were more effective in some varieties while drenches were more effective in others; overall, when applied at the same rate, responses were similar. Treatments were more effective when applied within 3 weeks of starting SD.

Time to first flower was delayed by 1-5 days in ‘Barbie Lavender’ and ‘Chelsea Coral’ treated with sprays beginning at the start of SD. The 5+8 ppm drenches delayed flowering by 2 days in ‘Eventide Dark Bronze’ when initiated 2 weeks after the start of SD.

Flower bud numbers were variable, and reduced by some treatments, but all plants were very attractive and suitable for market. However, the earliest spray treatment resulted in fewer visible buds on every cultivar. Sprays resulted in slight, temporary foliar chlorosis.

Our results confirm that Fresco® drenches do increase stem elongation in at least some varieties of garden mums, and offer potential advantages compared to spray applications: less delay in flowering, more buds visible when the first flower opens, and no chlorosis.



Figure 1. Chrysanthemum ‘Barbie Lavender’ in flower. Plants received 2 applications of Fresco 1 week apart. Plants in the treatment marked with a star were taller at first flower than untreated plants.



Figure 2. Chrysanthemum ‘Eventide Dark Bronze’ in flower. Plants received 2 applications of Fresco 1 week apart. Those marked with a star were taller at first flower than untreated plants.

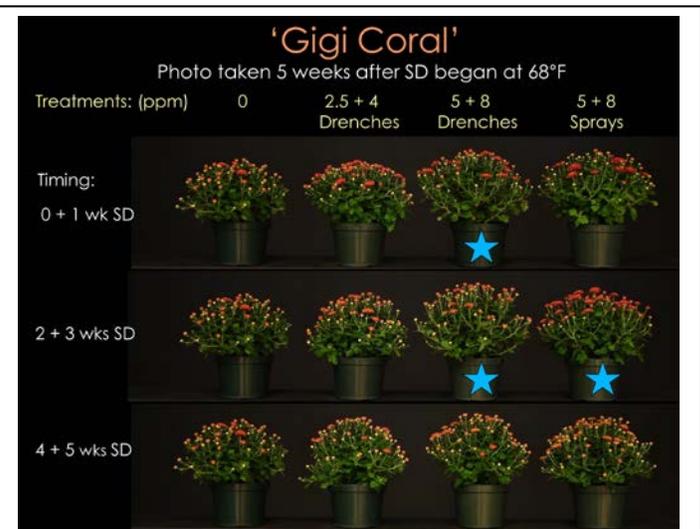


Figure 3. Chrysanthemum ‘Gigi Coral’ in flower. Plants received 2 applications of Fresco 1 week apart. Those marked with a star were taller at first flower than untreated plants.

Acknowledgements: This research was supported by the Western Michigan Greenhouse Association, the Metropolitan Detroit Flower Growers Association, and Fine Americas. We also thank C. Raker & Sons for donation of the plant material.