



By Erik Runkle



# Increasing Plant Height

Small-scale trials at low rates are suggested with GA products to determine appropriate rates for the desired responses.

The production of containerized floriculture crops often involves techniques to limit extension growth to produce compact plants. In some situations though, a grower may wish to increase plant height, such as when plants are too small for their container or to overcome an over-application of a plant growth retardant (PGR). There are numerous ways to promote extension growth, including changes to plant culture or the growing environment, or applying a plant growth regulator that includes gibberellic acid (GA).

**Plant culture strategies.** Several strategies are used to inhibit extension growth, and in many cases, the opposite can be done to increase plant height. Most of these growth-promoting strategies are used for prolonged periods of time (many weeks) and sometimes throughout the production period. This is necessary because elongation occurs continuously as the plants develop. Modifying the culture for a short period usually has a small and often unnoticeable effect. Therefore, the following strategies need to be used for a significant portion of the crop period to be effective.

- Increase fertility, especially phosphorus. If you are using low levels of phosphorus (less than 15 ppm, on average, at each irrigation) then an increase in phosphorus can increase stem elongation. However, if you are already using moderate or high fertility rates, then additional fertilizer will likely have no effect on plant height.
- Positive DIF. A warmer day than night temperature creates a positive temperature differential, which is referred to as a positive DIF (+DIF). Elongation of stems increases when the day is increasingly warmer than the night. For example, plants grown at a 16° F +DIF (76/60° F day/night) will be taller than those at a 4° F +DIF (70/66° F day/night).
- Close plant spacing. Plants sense their neighbors to compete for light, so plants spaced closely elongate more than plants with generous spacing. However, close plant spacing often means that each plant is able to capture less light, which can reduce plant quality. For example, closely

spaced plants can have thinner shoots and fewer branches and flowers than the same plants given more space.

**Application of GA.** Gibberellic acid is a hormone that plants naturally produce to regulate elongation. There are more than 100 types of GA synthesized by plants, some of them active forms and others inactive. Their concentrations and conversions from inactive to active types are influenced by environmental factors, especially light and temperature, as well as other factors such as the transition to flowering. The most common active forms used in floriculture are GA3, GA4 and GA7.

Fascination and Fresco are products that contain GA4 and GA7 as well as benzyl adenine (BA). These products are labeled for use on floriculture crops as a foliar spray and are typically applied at 2 to 3 quarts per 100 sq. ft. of crop area. To promote stem extension, an application of Fascination or Fresco is usually made once at a concentration of 3 to 5 ppm, although if needed, another application can be made at least seven to 10 days later. Applications should target shoot tips to have the greatest effect. Substrate drenches are also sometimes effective, at similar concentrations, although the products are not labeled for drench applications.

Florgib and ProGibb T&O contain GA3, which is usually more active than GA4+7. Therefore, to promote extension growth of floriculture crops with Florgib or ProGibb T&O, start with a spray application at 1 to 2 ppm.

Regardless of product, it is important to realize that while a PGR overdose can be at least partly overcome by a GA application, an over-application of GA cannot be overcome by a PGR. Therefore, small-scale trials at low rates are suggested with GA products to determine appropriate rates for the desired responses. To maximize results, make spray applications under slow-drying conditions, such as early in the morning or on a cloudy day. 

**Erik Runkle is professor and floriculture extension specialist in Michigan State University's department of horticulture. He can be reached at [runkleer@msu.edu](mailto:runkleer@msu.edu) or 517.355.5191 ext. 1350.**