

Special Research Report #507: Production Technology

Production Protocol for *Geranium dalmaticum*

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BACKGROUND

Enjoyment of perennials should extend beyond the garden and into the home environment.



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Geranium dalmaticum is a compact, hardy geranium that is long-lived in the garden. Small in stature with a final height of 6-8", it is perfectly suited to 5" diameter or smaller containers. One of the limitations to marketing *G. dalmaticum* in flower is its relatively short flower life. The initial flush of flowers is generally maintained for three weeks after which plants

produce only a few flowers although sparingly. Although Dalmatian geranium is a typical spring flowering perennial, plants could be scheduled to flower in the fall and planted to flower in the following spring.



Geranium dalmaticum flowering in the crevice of a stone wall.

MATERIALS & METHODS

Flowering Requirements.

G. dalmaticum plants were evaluated for their response to photoperiod (10-, 12-, 13-, 14-, 16-, 24-hr, or a 4-h night interruption), cold duration (0, 3, 6, 9, 12 or 15 weeks at 41°F and forcing temperature of 57-79°F to precisely determine flowering requirements.

Postharvest and Garden Performance

Plants were forced into flower on May 15 or allowed to flower naturally. Half of the forced plants were stored for two weeks in a postharvest

evaluation chamber set at 22°F and 50-70% RH with ~15-20 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ from cool white fluorescent lights. Flower longevity, flower quality, bud abortion, leaf yellowing, and other quality changes were recorded. Plants not stored in the chamber remained in the greenhouse until planted on May 31 in garden plots. They were evaluated for a period of two years.

RESULTS

Starting Material

G. dalmaticum is vegetatively propagated by tip cuttings or divisions. Cuttings root in approximately three weeks at 75 °F. Juvenility is not a factor in flowering. However, divisions should be of sufficient size prior to application of the cold treatment to adequately fill the final container. Thus, once rooted, plugs should be pinched and bulked under natural day lengths for several weeks before being cooled.

Also, previous research has shown that plugs with 12 to 15 leaves before cooling produced nearly twice as many flowers as those having 6 to 8 leaves.

Cold Treatment

For flowering *G. dalmaticum* requires a minimum of six weeks of cooling at 41 °F. When necessary, plants can be cooled up to 15 weeks, however, increased cold provides no positive benefits for flowering characteristics. Plants can be effectively cooled in a minimally heated greenhouse with natural light or in a cooler with 9 hours of light per day.

Photoperiod

G. dalmaticum is a facultative LD plant. It flowers under all photoperiods, but earlier under long days (>16-h photoperiods) following the cold treatment. Electric lamps can be used to extend the photoperiod to 16 hours when the daylength is naturally short. Night interruption lighting (NI) from 22:00 to 02:00 hours is also effective in providing long days. Lights must provide a minimum light intensity of 10 foot candles.

Forcing Temperatures

Temperature influences flower timing, quality, and size. Plants will flower in six weeks at 74°F and 8 weeks at 64°F. Although plants flower earlier when grown at temperatures \geq 68°F, flowers are larger with better coloration when grown at cool to moderate greenhouse temperatures \leq 68°F.

Geranium dalmaticum flowers at 63°F (left) and 84°F (right).

Supplemental Lighting

When light levels are naturally low flower number and plant quality can be improved during the winter months by using supplemental lighting. High intensity discharge lights are suitable.

Growth Regulation

Plant growth regulators are not needed.

Postharvest Quality

Plants held at 72 °F under low light levels maintained their flowers for 7 to 10 days. Newly developed flowers were pale in comparison to those developed in the greenhouse. However, they were ornamental and did not detract from overall plant quality. Plants are fairly drought tolerant and continue to produce leaves during the postharvest treatment. Overall, the foliage remained ornamental for 14 or more days in the postharvest environment.

Garden Performance

Garden performance of *G. dalmaticum* was basically unaffected by forcing or postharvest treatments. However, once plants have finished flowering they will not reflower until after they receive another cold treatment. Therefore, plants that have

been forced to flower and held in a retail setting for several weeks may not flower in the garden until the following year.

In the garden, *G. dalmaticum* is ideal for rock gardens and prefers cool locations.

CONCLUSIONS

The keys to producing superior flowering *G. dalmaticum* plants are four-fold: (1) starting material, (2) adequate cooling, (3) proper photoperiod and (4) moderate greenhouse temperatures. Forcing *G. dalmaticum* into flower for spring sales did not have deleterious effects on garden performance or overwintering.

IMPACT TO THE INDUSTRY

Detailed production information on plants such as *G. dalmaticum* permits growers and retailers to effectively provide consumers with flowering herbaceous perennials on any given date. These perennials are added value products that consumers can enjoy in their homes and gardens.

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