

# Special Research Report #406: Postproduction

## Production and Genetic Factors Influencing Flowering Potted Plant Quality and Longevity

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### BACKGROUND

Production practices influence greatly the postproduction performance of potted flowering plants. The growing popularity of flowering potted plants and the increased demand from mass-market buyers and consumers for increased performance has demonstrated the need to identify factors that influence longevity and maximize quality. The production factors we investigated include fertilizer concentrations, fertilizer regime (duration), genetic influence (cultivar), and the proper stage of development for marketability. The crops tested include cyclamen, gerbera daisy, Hiemalis begonia, hydrangea, and lisianthus.

### MATERIALS AND METHODS

Plants were grown using standard cultural practices. For each crop, 4 to 6 popular

cultivars were used. Fertilizer rates ranged from 75 to 450 ppm N from Peters 20-10-20. To test fertilizer regime, fertilizer was either continued until flowering or terminated 2-3 weeks prior to flowering. To determine the proper stage of development for marketability, plants were selected at various stages of flowering from just starting to flower to full flowering. All plants went through simulated transport conditions where plants were sleeved, boxed and stored for 3 days at optimum temperatures. Plants were then placed in postproduction rooms maintained at 70°F (21°C), 70 ftc. (12 hours/day), and 50±5% relative humidity.

### RESULTS

#### *Cyclamen*

The cultivars 'Finlandia', 'Julia', 'Sierra Rose', and 'Sierra Scarlet' were tested. For optimum performance, fertilizer rate should be 150 ppm N. Slow release fertilizer such as Osmocote 14-14-14 may also be used. Terminating fertilizer 2 weeks prior to flowering increased longevity from 7 to 20 days, depending on cultivar. Longevity was based on the number of days plants flowered in

postproduction conditions. There was an increase in the percentage of flowers that opened in postproduction conditions when fertilizer was terminated.

#### Factors that maximize quality and longevity of Cyclamen.

Fertilizer rate	150 ppm
Terminate fertilizer	Yes
Stage of marketability	2-3 open flowers
Expected longevity	4-6 weeks

The proper stage of development for marketing is when at least 2-3 flowers are fully opened. All varieties flowered at least 4-6 weeks in postproduction conditions. 'Finlandia' and 'Sierra Scarlet' were outstanding cultivars.

#### *Gerbera Daisy*

The cultivars 'Dark Eye Yellow Delight', 'Dark Eye Orange Delight', 'Red Delight', and 'Swift Red/Orange' were tested. Rates of 100, 200, 300 or 400 ppm N were applied until flowering. The higher rates of fertilizer decreased longevity by 10 days. No differences were found in terminating fertilizer 2-3 weeks prior to flowering.

**Factors that maximize quality and longevity of Gerbera.**

Fertilizer rate	100-150 ppm
Terminating fertilizer	No effect
Stage of marketability	50% open flowers
Expected longevity	2.5-3 weeks

Plants marketed with buds showing color had reduced flower diameter, but lasted the longest (27 days), due to slower development. Plants lasted 21 days when marketed at 50% open and 19 days when fully open.

***Hiemalis Begonia***

The cultivars 'Takora Yellow' and 'Sonata' were tested. Fertilizer rates of 75, 150, 225 and 300 ppm N were applied until flowering. Plant growth and flowering were unaffected by fertilizer rate, but a slight fading in leaf color was observed at the 75 ppm rate. Longevity was outstanding for these varieties at all fertilizer rates, but was maximized at the lower rates.

**Factors that maximize quality and longevity of Begonia.**

Fertilizer rate	150 ppm
Terminating fertilizer	No effect
Stage of marketability	10-75% open flowers
Expected longevity	3-4 months

Terminating fertilizer prior to flowering did not significantly affect longevity. Plants can be marketed with 10 to 75% open flowers. We tested 23

cultivars and all had excellent quality and longevity, as cultivars continue to flower after 3 months indoors.

***Hydrangea***

Fertilizer rates of 125, 200, 275, 350, and 425 ppm N were evaluated on the cultivar 'Leuchtfleur'. The high rate of 425 ppm N reduced plant size and caused severe leaf damage. Longevity was also reduced 6 days at this high rate. Terminating fertilizer at first flower color did not affect longevity at rates of 200 or 300 ppm N.

**Factors that maximize quality and longevity of Hydrangea.**

Fertilizer rate	200-250 ppm
Terminating fertilizer	No effect
Stage of marketability	50-75% open flowers
Expected longevity	2-3 weeks

Plants must be marketed when at least 50% of the bracts are colored, as bract development does not occur if marketed earlier. We tested 5 cultivars and longevity ranged from 14 days for 'Leuchtfleur' to 42 days for 'Vulcan Blue'. The cultivars 'Brestenburg', 'Matilda Gutges', and 'Merritts Supreme' performed well and lasted 2.5 to 3 weeks.

***Lisianthus***

Rates of 150, 250, 350, and 450 ppm N from Peters 15-5-15 were evaluated on the cultivar 'Maurine Blue'. At flowering, plant size and plant quality were not affected, however,

longevity was reduced 6-7 days at the higher fertilizer rates. Terminating fertilizer at rates of 150 and 350 ppm increased longevity 11 days, but leaf yellowing occurred.

**Factors that maximize quality and longevity of Lisianthus.**

Fertilizer rate	200-250 ppm
Terminate fertilizer	No
Stage of marketability	75% open flowers
Expected longevity	2.5-3 weeks

Plants were marketed when 1, 6 or 12 flowers were open. Plants lasted 18-20 days at all stages, but twice as many flowers opened when marketed with 6 or 12 open flowers. The cultivars 'Maurine Lilac', 'Maurine Pink', and 'Maurine White' performed well and lasted 17-20 days.

**CONCLUSIONS**

Proper production practices will maximize quality and longevity. Choose cultivars that have long lasting characteristics and market at the proper stages.

**IMPACT TO INDUSTRY**

Growers, wholesalers, and retailers can improve postproduction performance and extend longevity for consumers.

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