

Special Research Report #513: Production Technology

Ornamental Gingers as Flowering Potted Plants – Part 5

Efficacy of Paclobutrazol and Gibberellins₄₊₇ on Growth and Flowering

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BACKGROUND

The genus *Curcuma* includes approximately 65 species that are native to southeast Asia. Commonly known as “hidden” or “surprise” gingers, these plants possess an attractive inflorescence with colorful bracts that enclose the flowers. *Curcuma* exhibit great diversity in color, form, and size and have few disease and insect problems. Cultural practices and optimal environmental conditions for curcuma vary according to species. The objectives of this research were to: (1) determine the effects of GA₄₊₇ on rhizome emergence of *C. alismatifolia* ‘Chiang Mai Pink’, *C. thorelii* and *C. gracillima* ‘Violet’; and (2) determine the effects of GA₄₊₇ and paclobutrazol on days to bloom, inflorescence height and number, post-production longevity, and elongation.

MATERIALS & METHODS

One-half inch diameter rhizomes of *Curcuma alismatifolia* ‘Chiang Mai Pink’, *C. gracillima* ‘Violet’ and *C. thorelii* SetCon Co., Thailand were soaked for 10 minutes in a solution containing GA₄₊₇ at 0, 200, 400, or 600 mg • L⁻¹. Dried rhizomes were planted one per 6-inch container filled with a medium of 50% peat moss, 30% pine bark, and 20% perlite (v/v), amended with 0.32 lb/ yd⁻³ dolomite limestone, and superphosphate 0.17 lb/yd.

Plants were placed in a greenhouse on eight inch centers and fertilized with 150 ppm N, Peters 24-8-16 Tropical Foliage. When shoots were 4 inches tall, substrates were drenched with 4 fl. oz. paclobutrazol at 0, 2, 3 or 4 mg (active ingredient) per container. At flowering, plants were measured and moved to a post-production room maintained at 68°F with 12 h of light at 14 μmol • m⁻² • s⁻¹.

RESULTS

Gibberellin₄₊₇ at 200, 400 and 600 mg • L⁻¹ significantly delayed shoot emergence of *C. alismatifolia* ‘Chiang Mai Pink’ (Table 1). In addition, it did not increase the number of inflorescences.

Paclobutrazol did not affect number of days to bloom.



Curcuma alismatifolia
‘Chiang Mai Pink’

Application of GA₄₊₇ at 600 mg • L⁻¹ resulted in a flower height shorter (2.4 inches) than the control, while paclobutrazol applied at 3 mg a. i./pot produced flowers 2.4 inches shorter than the 2 mg a.i./pot.

GA ₄₊₇ (ppm)	Days to emergence (d)	Days to bloom (d)	Flower height (inches)
0	44	113	36
200	53	115	35
400	57	128	34
600	55	126	34

Table 1. *C. alismatifolia*.

None of the rates of paclobutrazol however, reduced flower height compared to the controls. Post-production longevity was determined to be 4.6 weeks. Senescence occurred after 6.3

weeks. Neither GA₄₊₇ nor paclobutrazol affected quality ratings throughout the post-production study.

Gibberellin₄₊₇ concentrations of 600 mg • L⁻¹ delayed shoot emergence of *C. gracillima* ‘Violet’ and *C. thorelii* (Tables 2 & 3 respectively).



Curcuma thorelii



Curcuma gracillima

Neither paclobutrazol nor GA₄₊₇ affected flower height, days to bloom, or flower number of *C. gracillima* ‘Violet’ nor *C. thorelii*. Post-production longevity or elongation of *C. gracillima*

‘Violet’ or *C. thorelii* was not affected by GA₄₊₇ or paclobutrazol.

GA ₄₊₇ (ppm)	Days to emergence (d)	Days to bloom (d)	Flower height (inches)
0	40.5	108	9
200	44.6	114	10
400	44.6	109	10
600	47.9	121	11

Table 2. *C. gracillima*.

The post-production life of *C. gracillima* ‘Violet’ was 2.6 weeks and longevity of *C. thorelii* was 3.8 weeks.

GA ₄₊₇ (ppm)	Days to emergence (d)	Days to bloom (d)	Flower height (cm)
0	40.2	113	6
200	43.7	115	7
400	45.0	113	7
600	51.2	131	7

Table 3. *C. thorelii*.

CONCLUSIONS

Curcuma alismatifolia ‘Chiang Mai Pink’ had a post-production life of 4.6 weeks with minimal post-production elongation. The post production longevity of *C. thorelii* and *C. gracillima* ‘Violet’ was 3.8 weeks and 2.6 weeks, respectively, with minimal post-production elongation.

GA₄₊₇ might be used to prolong storage of ornamental ginger rhizomes prior to planting but should not be used to promote or increase growth. The rates of paclobutrazol were not effective on *C. alismatifolia*

‘Chiang Mai Pink’ which produced plants 34 inches tall. The standard height of a flowering potted plant grown in a 6-inch container should be approximately 9 to 12 inches tall. Thus, higher rates of paclobutrazol or other plant growth retardants must be evaluated. *Curcuma gracillima* ‘Violet’ and *C. thorelii* are naturally low growing plants. Average height for all treatments was 10 inches for *C. gracillima* ‘Violet’ and 7 inches for *C. thorelii*. Thus, the PGR is not necessary.

IMPACT TO THE INDUSTRY

1. The three (list 3 species???) *Curcuma* in this study have an excellent post-production longevity.
2. GA₄₊₇ should not be used to promote or increase flowering.
3. A plant growth retardant is necessary for *C. alismatifolia*.
4. These *Curcuma* species are an excellent flowering potted plant.

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