

Potted plant production of *Gaura lindheimeri*

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INTRODUCTION.

Twenty-one species of *Gaura* (Evening Primrose family, Onagraceae) are native to North America (Carr, et al., 1990). *Gaura* translates as "gorgeous" or "superb" and is commonly sold with the same common name. Most species are found in the southwestern region of the U.S. and, consequently, are drought/heat tolerant, providing continuous flowering throughout the growing season (reportedly a day-neutral plant). Other species are constituents of prairie communities, e.g. *G. coccinea* in Minnesota and Canada. Some species, *G. drummondii*, are fragrant, night-bloomers (Shaver, et al., 1997).

Gaura lindheimeri Engelm. & Gray have been described as "extremely graceful and a long-blooming plant" (Gardens North, 1999). Each plant sports spikes of delicate flowers, providing constant color throughout the summer and late into the fall for northern gardeners. If grown as an annual, it will flower from July through October from seed in the first year. Since perennial *Gaura* species have deep tap roots, good

drainage is imperative for stand establishment and increased winter survival. The most popular cultivars on the market are *G. lindheimeri* 'Siskiyou Pink' (light pink flowers) and 'Whirling Butterflies' (white flowers), both reported to be selections from populations collected in the wild (Siskiyou Nursery, 1999). Other new vegetatively-propagated cultivars have recently been introduced, including 'Dauphine', 'Corrie's Gold' (Siskiyou Nursery, 1999), 'Crimson Butterflies', 'Blushing Butterflies', and 'Sunny Butterflies' (Pride of Place Plants, 2000). One seed propagated cultivar, 'The Bride', is open-pollinated (B&T World Seeds, 1999) and a flowering plant can be produced in 9+ weeks from seed (Nau, 1999).

Gaura may be useful as a flowering potted plant, although no cultural work has been performed. The objective of this research was to conduct an initial forcing regime for *Gaura* as a flowering potted plant to determine floriferousness and plant size with pinched/unpinched plants.

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Gaura lindheimeri

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‘Siskiyou Pink’ and ‘Whirling Butterflies’ were selected for initial production trials. Cuttings were rooted under mist at 21C/70F (night) with long day photoperiods supplied by HID lights (16 HR) during March-April, 2000. Terminal stem cuttings were treated with 1,000 ppm IBA in 50% EtOH. Upon rooting, plants were potted in 6" standard pots in high porosity soil medium (SunGro Horticulture, Bellevue, WA). Pinching treatments (hard pinch, unpinched as a control) were applied two weeks after transplanting. There were n=10 replications/treatment/cultivar. Plants were grown in a randomized complete block design from transplanting to the date of 100% flowering under greenhouse conditions of long-days (0800-2200

HRS, HID high pressure sodium lighting) at 21C/70F (night temperature). Each replicate was evaluated for the number of days (weeks) to flower, number of flowering spikes/pot, and plant dimensions (crown height, crown width [averaged from the two widest points], plant height, spike height [average of three spike measurements/plant]). Crown heights were measure in cm from the soil line to the top of the foliage where the flower spikes emerged. Plant height measurements (cm) were taken from the soil line to the uppermost part of each flowering plant, following a vertical line. Height measurements were then compared with the aesthetic ratio of 44.5 cm for 6" standard pots, calculated as 2.6 x, where x=the container diameter (Bailey, 1999). Flower spike heights (cm) were

derived from the total length of three individual spikes/plant, measured from the top of the crown to the tip of each floral spike; these total length measurements did not necessarily follow a vertical line. Thus, plant height measurements may be shorter than the spike heights for the same plant.

Pinching treatment had no significant effect on any of the traits measured. Cultivar effects were highly significant for crown height (F=63.4, P<0.001), plant height (F=145.3, P<0.001), spike height (F=75.1, P<0.001), and the number of flowers/spike (F=29.6, P<0.001). Crown widths were significant (F=5.7, P=0.02), while the number of days to flowering was not significantly different between the two cultivars (F=4.1, P=0.05). Pinching treatment x cultivar interactions were non-significant with the

Table 1. Average ±SD crown height (cm), crown width (cm), and plant height (cm) for *Gaura lindheimeri* ‘Siskiyou Pink’ and ‘Whirling Butterflies’, grown as pinched and unpinched plants for potted plant production.

Cultivar	Treatment	Crown height ¹		Crown width ²		Plant height ³	
		Mean	SD	Mean	SD	Mean	SD
Siskiyou Pink	Pinched	10.6	+1.1 a	14.4	+1.9 a	23.2	+3.2 a
	Unpinched	10.3	0.9 a	15.9	1.8 a	24.4	6.0 a
Whirling Butterflies	Pinched	17.8	3.3 b	18.0	4.2 b	55.2	8.8 b
	Unpinched	17.3	4.3 b	17.3	4.0 b	51.7	6.1 b

¹5% Least Significant Difference (LSD) test. LSD = 1.81.

Means followed by the same letter are not significantly different from each other.

²5% LSD = 2.2

³5% LSD = 4.8

exception of the number of flowers/spike ($F=4.8$, $P=0.03$). However, pinching of 'Siskiyou Pink' served to shape the plant, creating a more uniform specimen without undesirable bypass shoots.

Mean values for 'Siskiyou Pink' ranked lower than 'Whirling Butterflies' for crown height, crown width, and plant height (Table 1), due to the dwarf habit of 'Siskiyou Pink'. Plant height for 'Whirling Butterflies' exceeded the aesthetic ratio, although 'Siskiyou Pink' was approximately half (Table 1). 'Whirling Butterflies' would require the application of plant growth regulators to maintain acceptable plant height in potted plant production. 'Siskiyou Pink' would fit an aesthetic ratio of a 4"

pot better than the 6" standard pots used in the current study.

Despite the dwarf habit of 'Siskiyou Pink', this cultivar displayed significantly greater numbers of flowers/spike than 'Whirling Butterflies' (Table 2). Floral coverage, plant dimensions, and pot coverage by 'Siskiyou Pink' and 'Whirling Butterflies' are illustrated in Figs. 1A and 1B, respectively. Since these plants are day neutral, pinching did not impose a significant difference in flowering time (Table 2). Production time from transplanting to 100% flower ranged from 3.4 ('Whirling Butterflies', pinched) to 4.5 weeks ('Siskiyou Pink', pinched) (Table 2). With the addition of two weeks each for propagation of rooted

cuttings and vegetative growth after transplanting, the total production time ranges from 5 – 9 weeks. *Gaura* would be classified as a fast-cropping potted plant species for the market, finishing in less time than the industry standard of 16-18 weeks (W. Healey, 1997, personal communication).

Gaura would provide a color display to spring potted plant sales with the added advantage for the consumer of a "dual-use" product, since it could be enjoyed in the home and then transplanted outside for continuous flowering throughout the summer months. Future work is necessary to determine the appropriate plant growth regulators and application rates to reduce the plant and spike height.



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Table 2. Average +SD spike height (cm), number of flowers/spike and number of days to flowering for *Gaura lindheimeri* 'Siskiyou Pink' and 'Whirling Butterflies', grown as pinched and unpinched plants for potted plant production.

Cultivar	Treatment	Spike height ¹		Number of flowers/spike ²		Number of days to flowering ³	
		Mean	SD	Mean	SD	Mean	SD
Siskiyou Pink	Pinched	22.3	+13.1 a	17.7	+4.7 c	32.0	+4.2 a
	Unpinched	24.1	12.3 a	12.7	4.6 b	25.0	6.7 a
Whirling Butterflies	Pinched	48.7	16.5 b	7.8	3.3 a	24.0	7.8 a
	Unpinched	47.5	15.8 b	9.3	1.7 a	24.0	9.4 a

¹5% Least Significant Difference (LSD) test. LSD = 7.2.

Means followed by the same letter are not significantly different from each other.

²5% LSD = 2.63.

³5% LSD = 4.7