Timing Eleven Carnation Varieties*

Ralph Freeman and Arthur Bing
Cooperative Extension and Department of Floriculture
Ornamentals Laboratory, Farmingdale, L.I.

Forty-nine rooted cuttings of the cultivars "White Apollo",, "Iroquois", "Improved Sidney Littlefield", "White Littlefield", "Coquette", "S. Arthur Sim", "Scania", "Atlas", "Peace River", "Orchid Beauty", and "Silvanus" were obtained (courtesy of Yoder Bros, Barberton, Ohio) and planted 5 by 7 inches in 36 inches by 36 inches plots in raised benches. The plots were replicated twice and plants were planted in steam pasteurized soil on August 10, 1967.

The plants were pinched once and were grown under 18-hour photoperiods. The 18-hour photoperiod was achieved by using 60 watt incandescent lamps with built-in reflectors spaced 3½ feet apart and 4 feet above the soil surface. The lights turned on ½ hour before sunset and remained on long enough until the daylight hours plus the period from sunset to end of lighting totaled 18-hours. The light intensity ranged from 10 to 20 ft-c at the soil surface.

In the greenhouse night temperatures were 52°F and day temperatures 60°-65°F when controllable. All plants were fertilized once per week with ¼ pound 20-5-30 soluble fertilizer per 100 square feet of bench area. A regular preventative insect and disease control program was used following planting. Data recorded were date of flowering, flower number and observation on crop quality.

Results

Peak flowering time. The peak flowering periods and number of days to the peak for each of the eleven varieties grown are shown in Table 1. The earliest date of peak flowering was November 22 with many varieties flowering between December 7 and December 12. The latest flowering variety Silvanus flowered on February 10. The number of days from planting to peak flowering ranged from 104 days to 184 days.

Duration of the flowering period. The number of days required for each variety to flower are listed in Table 1. The least amount of days required were for Coquette and

(continued on page 2)

*The authors wish to express their appreciation for the help and assistance given in these studies by Suffolk County Extension Service, Nassau County Extension Service, Department of Floriculture, Cornell University, Cornell Ornamentals Research Laboratory at Farmingdale, and Mr. Finn Andresen, Experimentalist. Appreciation is also given to Fred C. Gloeckner Foundation and the New York Florists Club.

Timing

(continued from page 1)

Table 1. Peak flowering periods and duration of flowering time of eleven carnation varieties single-pinched grown and under 18-hour photoperiods.

Variety	Peak Date	Peak Days	Duration of Crop Date	Duration of Crop Days
White Apollo	Nov 22	104	Nov 22–Dec 27	37
Iroquois	Nov 25	107	Nov 22–Jan 23	61
Imp Sidney Littlefield	Dec 7	119	Dec 4–Feb 2	58
White Littlefield	Dec 8	120	Dec 4–Jan 23	50
Coquette	Dec 8	120	Nov 29–Jan 1	29
S. Arthur Sim	Dec 10	122	Dec 10–Feb 10	62
Scania	Dec 12	124	Dec 12–Feb 2	52
Atlas	Dec 25	137	Dec 4–Jan 23	50
Peace River	Jan 1	144	Jan 1–Mar 1	60
Orchid Beauty	Feb 1	175	Feb 1–Mar 22	50
Silvanus	Feb 10	184	Jan 1–Mar 1	60

White Apollo. All other varieties had a flowering duration of over 50 days and Iroquois up to 61 days.

Discussion

Previous studies (1, 2, 3, 4, 5, 6) with one or more varieties indicated carnations grown under 18-hour photoperiods flowered sooner than plants grown under 9-hour photoperiods. In these studies we have noted differences in flowering time (1, 2, 5, 6) among the varieties grown. To further evaluate and help clarify some of our observations eleven varieties were grown to determine the effect of 18-hour photoperiods on timing, cropping and general crop quality.

Peak flowering time. Data in Table 1 indicates some varieties require at least two months less to flower than other varieties when grown under 18-hour photoperiods. In a previous study (6) it was suggested carnations may have some type of response group classification. This study confirms the observation since some varieties flower relatively quick whereas others need a much longer period of time to bloom. At this time with limited information on the response of the many varieties we are unable to offer suggestions for classifying the various varieties. Perhaps following receipt of more data and information from future studies a practical classification system could be offered.

Effects of photoperiod. Photoperiod not only affected the time required for each variety to develop but also the quality of the crops. As indicated in Table 2 some varieties produced very large desirable flowers (Silvanus, Orchid Beauty, S. Arthur Sim and Peace River) whereas Atlas produced blooms which were not full and had a low petal count. Flower color was excellent in all varieties.

Stem strength was also affected. Most varieties (Table 2) produced stems which were acceptable by the trade. Scania and Iroquois yielded stems which were very weak. Apollo and Coquette yielded brittle stems. The stems on Coquette were so brittle they would often break at more than one node while harvesting.

Short stems were the only drawback on Peace River, Improved Sidney Littlefield and White Littlefield. This was expected since they normally have shorter stems than the Sim varieties. The Littlefield varieties grown thus far show promise due to their superior stem strength and bloom quality. The stem length is sufficient, however, for commercial use and sales. Previous work (6) has shown stem length is increased when Littlefield Varieties were grown under 18-hour photoperiods.

This study has yielded much valuable information. It demonstrates the varieties to be grown under 18-hour photoperiods must be evaluated closely. Things to consider when selecting varieties are effects of photoperiod on length of stem from planting to flowering, stem strength, bloom quality and stem length. We hope this study has helped evaluate some of the varieties. Further studies are currently underway to evaluate a good cross section of the many commercially available varieties. As soon as the results are received they will be reported in this bulletin.

Summary

Eleven carnation varieties were single-pinched and grown under 18-hour photoperiods to determine if they would respond favorably to this method of growing. Data collected were number of days to bloom, length of flowering period, and observations on stem length, stem quality and bloom size. The results were as follows:

1. Some varieties flowered up to 2½ months sooner than other varieties. Differences as great as this indicated carnations may eventually be classified into response groups.
2. The length of cropping time ranged from 29 to 62 days.
3. Bloom size and quality was generally excellent. Atlas was the only variety which developed poor blooms.
4. Seven of the eleven varieties yielded excellent stems with the remainder yielding weak or brittle stems. Littlefield varieties had shorter stems than the Sims varieties.

(continued on page 4)

Table 2. Effect of 18-hour photoperiods on eleven carnation varieties with respect to flower size, stem length and general quality.

Variety	Rank[a]	Flower	stem strength	Gen Comments
Silvanus	1	very large, full	excellent	—
Orchid Beauty	2	very large, full	excellent	—
S. Arthur Sim	3	large	excellent	—
Peace River	4	large, most uniform	excellent	stems shorter
Imp Sidney Littlefield	5	good	excellent	stems shorter
White Littlefield	6	good	excellent	stems shorter
Scania	7	good	very weak	—
Iroquois	8	good	very weak	—
Atlas	9	not full, petal count low	good	—
Apollo	10	good	brittle stems	difficult to handle
Coquette	11	good	very brittle	very difficult to harvest

[a]Rank was determined on the basis of flower size, quality and stem strength. The lower the number the better the rank.

Timing

(continued from page 2)

Literature Cited

1. Freeman, R. N. 1965. Some effects of photoperiod and temperature on *Dianthus caryophyllus*, L. var. CSU White Pikes Peak. M. S. Thesis. Cornell University, Ithaca, N. Y. 74 p.
2. Freeman, R. N. and R. W. Langhans. 1965. Photoperiod affects carnations. *New York State Flower Growers* Bul. 231:1-3.
3. Freeman, R. N. and R. W. Langhans. 1965. Influence of day and night temperatures on carnations. *New York State Flower Growers Bul.* 232:1-3.
4. Freeman, R. N. and R. W. Langhans. 1965. Response of carnations to photoperiod and temperature. *New York State Flower Growers Bul.* 233:1-3.
5. Freeman R. N. and A. Bing. 1968. Timing "one crop" carnations. *New York State Flower Growers Bul.* 272:1-4.
6. Freeman, R. N. and A. Bing. 1968. Timing studies with four carnation varieties. *New York State Flower Growers Bul.* 277:1-4.