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# Effects of Photoperiod on Carnation

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The carnation was considered a nonphotoperiodic plant until relatively recent times. It is certainly not responsive to daylength in the same distinct way familiar to growers of chrysanthemum and poinsettia. However, the plant species that does not respond in some way to photoperiod is rare. Plant responses to photoperiod, or more realistically to the dark period, besides bud initiation and flowering are: branching habit, dormancy, foliage color, length of internodes or pedicels, and many others. Some of these responses are found in almost any species of plants.

Much has been published on lighting of carnations, starting first with the work of Harris and his colleagues at Reading University around 1955. These researchers showed that carnation was delayed in flowering by short days, hastened by 16-hour photoperiods, and that the effect of long days occurred primarily up to the time of bud initiation. Short days increased the number of nodes on a carnation.

Freeman and Langhans (1) determined the critical period in a developing carnation shoot when the bud is most sensitive to photoperiod. This period is about 3 weeks long centering around the stage of bud initiation. At this critical period short days would delay bud initiation the maximum while long days (short nights) would hasten initiation. The sensitive stage to floral induction on carnation was found by Harris and Ashford (2) to be when there were 6 to 8 pairs of leaves visible on the shoot. Harris and Ashford found that increases in photoperiod length up to 24 hours hastened initiation in carnation. Illumination throughout the night (with 14 to 40 ft-c of light) was more effective in promoting flowering than any photoperiodic treatments used previously, particularly when daytime light intensities were low. For plants bearing shoots with 7 visible leaf pairs a period of 6 weeks of continuous light from early December to mid-January

was effective in inducing flower initiation. Two or 4 weeks of continuous light was too short for the majority of plants (in England at this time of year).

Harris and Ashford concluded that the commercial potentialities of the 24-hour-day treatment lie in 4 to 6 week lighting during winter to promote flowering in May and June. At this time there were no adverse effects on flower quality and the market in England is considerably better than in July.

Lighting has been suggested for producing one fast crop for a specific marketing period. Harris and Ashford suggest the possibility of moving a part of summer production to late spring by winter lighting. Just how lighting can be used by the year-round grower of carnations and can it be made a part of our flowering and marketing control requires more information on the response of carnation to lighting in the several climates where carnations are grown. the following paper gives the first of such information obtained in Colorado at a latitude of 40°N.

## Literature Cited

1. Freeman, R. and R. W. Langhans. 1965. Photo-period effects on carnations. N. Y. St. Flower Growers Bull. 231, 1-3.
2. Harris, G. P. and M. Ashford, 1966. Promotion of flower initiation in the glasshouse carnation by continuous light. Jour. Hort. Sci. 41, 397-406.