



COLORADO FLOWER GROWERS
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Effects of Preharvest Environment on Keeping Life of Cut Carnations

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Comparatively little work has centered on the preharvest environmental effects on keeping quality of cut carnations. Much research on carnations has focused on the environmental influence on growth, quality, and yield. Logically, keeping life might be influenced to a degree by the growing environment, although handling of the flowers after harvest is the most critical factor in achieving consumer satisfaction through maximum vase life.

The purpose of this work was two-fold: 1) to document the amount of variability in keeping life of cut carnations under Colorado greenhouse conditions, and 2) to attempt to explain this variability in terms of the greenhouse environment.

A better understanding of the natural variability occurring and the cause of this variability may provide means of predicting potential keeping problems. While much information is known on proper handling techniques of cut flowers, little is known on how to bring substandard keeping life up to an acceptable level.

Materials and Methods

A series of measurements on postharvest life of carnation flowers was completed during 1973 and

1974. The purpose of these tests was to measure and attempt to relate variability in flower life to preharvest environmental factors.

Keeping life for individual flowers of a test was determined as the difference between the day the flower was placed in the keeping room and the day the flower was removed from the vase at senescence. Flowers were checked daily and considered senesced when the petals lost their turgor and were beginning to curl. All flowers were recut to a standard length of 18" before being placed in a vase.

A test solution was standardized as 400 ppm 8-Hydroxyquinoline Citrate, a bactericide. No sugar was added to the solution as it was not the intent to extend flower life but to measure maximum potential life. Elimination of bacteria in the holding solution should provide this maximum. Methods of the tests will be described with each individual test.

Results and Discussion

Greenhouse and outside environmental conditions are variable. This variability is compounded when comparing environmental conditions between different greenhouse ranges on different locations. Varying degrees of variability were always present in the keeping tests.

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Gross comparisons are made which do not satisfactorily emphasize the real possibility that potential keeping life might be influenced by small environmental changes that occur constantly within and between commercial greenhouse ranges. The general nature of the study gives some information on the sources of keeping variability, and the natural variability in keeping life that occurs within and among different commercial carnation ranges.

Daily Variability

Data is lacking on natural variability that occurs in the potential life of cut carnations. A test was designed to investigate how much variability in keeping life can occur from day to day.

A sample of 18 flowers of 'CSU White' was taken from each harvest from one bench for a five-month period. Flowers were cut three times per week and keeping life measured. Throughout the test variability in cut flower life was found. As an example, flower life varied from 7 to 11 days during the period December 11-22, 1973 and only 8 to 8.5 days during the preceding period from November 28 to December 9. Daily variation in keeping life of cut carnations was established.

Variability Within a Production Bench

Two benches containing 'CSU White' were used to measure variability within benches. One bench contained soil, the other gravel. Each bench was divided into four plots marked A-D with the A-section nearer the evaporative pad and the D-section nearer the fan end. The flowers were cut from the eight plots on July 11, 1973 and the harvest from each plot placed in a separate vase of test solution. This test was repeated again on December 27, 1973 except one bench was marked off in seven sections A-G and the other bench was marked in six sections A-F.

In the first test conducted during the heavy cooling season, variable results occurred in comparing the two benches (Table 1). In the soil bench significant variability occurred between sections C and D. The sample from C kept 1.1 days longer than that from D. Significant variability also occurred from the gravel bench. A difference of 1.8 and 1.6 days keeping life occurred between sections A,D and B,D. The second test conducted during the winter also produced significant variability within both benches.

Significant variability in keeping life within production benches in the same general environment

suggests keeping life might be influenced to a degree by small environmental differences within a bench. Possible sources of this variability are the plants, light differences throughout the plant canopy, temperature variation within the plant canopy, and "wet" and "dry" spots in the bench.

Table 1. Variability in carnation keeping life found within production benches.

Section	Bench (mean life in days)	
	Soil	Gravel
A	7.3	6.8
B	7.5	7.0
C	7.8	7.9
D	6.7	8.6