AGRICULTURAL EXTENSION UNIVERSITY OF CALIFORNIA

FLOWER AND NURSERY REPORT

FOR COMMERCIAL GROWERS

IMPROVE THE LONGEVITY OF PROBLEM CARNATION CROPS

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SUMMARY

During periods when carnation flower longevity is poor, growers can use bud opening methods to improve cut flower performance. Silver nitrate stem dips, when combined with sugar solutions of deionized or nursery tap water, were as effective as complete preservative solutions for bud opening. Blooms opened from buds outperformed those opened on the plant. Overnight conditioning improved the longevity of open blooms, but when the same kinds of solutions were used to open blooms from buds, longevity was better.

INTRODUCTION

Growers occasionally encounter periods when carnation blooms do not last long enough to reach the consumer at eastern markets. Conditioning treatments that would provide adequate vase life during the problem periods would benefit the grower, wholesaler, and consumer.

In October 1972, shipping problems were encountered at Carmel Greenhouse, Salinas, California. The environmental controls for the new fiberglass greenhouse were incomplete at the time of the experiment, which partially accounted for the poor flower longevity.

PROCEDURES USED

On October 2, 1972, 280 fancy grade 'Dusty Sim' carnation flowers were harvested from the greenhouse and bunched into groups of 10. The next day, 140 'Dusty Sim' buds were harvested from the same greenhouse and bunched into groups of 5. The open flowers and the buds were treated in the same series of solutions in either deionized or tap water that contained 0, 2.5, 5, or 10 percent sugar. Flower and bud stems were dipped for 10 minutes in a 1,000 ppm deionized water solution of silver nitrate.

Two complete preservative or bud opening solutions were included in the experiments to serve as standards. They were: Modified Cornell Solution, which contained 200 ppm 8-quinolinol citrate, 25 ppm silver nitrate, 50 ppm aluminum ion from aluminum sulfate plus 10 percent sugar; and Everbloom®, 2 ounces per gallon, with sugar adjusted to 10 percent. Stems of open 'Dusty Sim' flowers or buds were not dipped in 1,000 ppm silver nitrate when either of the two complete preservative solutions were used for overnight conditioning or bud opening.

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Two groups of blooms or buds were subjected to each conditioning or bud opening treatment. Stems of one group were recut following a 24-hour simulated shipment period. The blooms were placed in a packing box and held at uncontrolled shed temperature for 24 hours to simulate shipment. Stems of the remaining group were not recut. Vase life was determined in deionized water at uncontrolled shed temperature.

RESULTS

The longevity in days for the blooms opened in the greenhouse and the blooms opened from harvested buds are summarized in tables 1 and 2. The 10-minute silver dip treatment alone did not significantly improve vase life of open flowers compared to that of untreated blooms. Longevity of the open blooms increased with sugar concentration when sugar was added to vases that contained silver-dipped stems. Flowers performed best if they were not recut before they were placed in vases. Silver and sugar treatments improved flower longevity even when stems were recut. Since most carnation flowers are recut before they are arranged for or by the consumer, the sugar and silver treatments at the grower level would increase longevity.

'Dusty Sim' carnation buds were harvested on October 3, 1972, and opened in the same kinds of solutions that were used to condition the opened flowers overnight. The longevity of the flowers is summarized in table 2. The flowers lacked reserve carbohydrates to open without sugar being added to the solution. The 2.5 percent sugar solution appeared to be adequate and the tap water Everbloom® solution was the least satisfactory. Dissolved solids in the tap water probably interfered with microbial control by the Everbloom® chemicals since good results were obtained with Everbloom® in deionized water. Overall flower performance was better in deionized water and stem recutting did not improve flower performance.

When longevity data for open blooms and buds are compared, the blooms opened from buds outperformed those opened on the plant. Longevity of the control blooms (table 1) shows the flowers would have a hard time getting through market channels and still have vase life for the consumer. Conditioning stems of open blooms overnight in deionized water plus 10 percent sugar improved the performance, but longevity was still marginal. Bud opening would have produced a higher quality commercial carnation flower in this case.

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TABLE 1. Longevity of 'Dusty Sim' Carnation Flowers as Affected by 10-Minute Silver Nitrate Dip, Sugar Concentration, and Water Quality When Flowers Were Conditioned Overnight Before Simulated Shipment. Carmel Greenhouses, October 3, 1972.

Conditioning Method	Percent Sugar in Solution	Longevity of Open Blooms (Days)[1]			
		Stems recut[2]		Stems not recut	
		deionized water	tap water	deionized water	tap water
10-Minute Silver Dip	0	5.5	5.5	6.0	5.5
	2.5	5.5	5.0	7.0	6.0
	5.0	6.5	6.0	7.0	6.5
	10.0	8.0	8.5	9.5	9.0
No Silver Dip					
Modified Cornell Solution[3]	10.0	7.0	7.0	7.5	7.5
Everbloom® 2 oz./gal.[4]	10.0	8.5	7.0	9.0	8.0
Control	0	5.0	5.0	5.0	5.0

[1] Average longevity of ten replications determined in deionized water following a 24-hour simulated shipment after open blooms were conditioned overnight.

[2] Three inches cut from stems after 24-hour simulated shipment period.

[3] Modified Cornell Solution contains 200 ppm 8-quinolinol citrate, 25 ppm silver nitrate, and 50 ppm aluminum ion from aluminum sulfate, plus 10% sugar.

[4] Two ounces Everbloom® per gallon of water plus sugar to 10%.

TABLE 2. Longevity of 'Dusty Sim' Carnation Flowers as Affected by 10-Minute Silver Nitrate Dip, Sugar Concentration, and Water Quality When Flowers Were Opened as Buds and Conditioned Overnight Before Simulated Shipment, Carmel Greenhouses, October 5, 1972.

Conditioning Method	Percent Sugar in Solution	Longevity of Open Blooms (Days)[1]			
		Stems recut[2]		Stems not recut	
		deionized water	tap water	deionized water	tap water
10-Minute Silver Dip, 1200 ppm	0	0	0	0	0
	2.5	14	10	14	12
	5.0	13	14	12	13
	10.0	15	9.5	14	14
No Silver Dip					
Modified Cornell Solution[3]	10.0	15	13.5	13.5	14
Everbloom® 2 oz./gal.[4]	10.0	16	4	15	13.5
Control	0	0	0	0	0

[1] Average longevity of five replications determined in deionized water following a 24-hour simulated shipment after buds were opened.

[2] Three inches cut from stems after 24-hour simulated shipment period.

[3] Modified Cornell Solution contains 200 ppm 8-quinolinol citrate, 25 ppm silver nitrate, and 50 ppm aluminum ion from aluminum sulfate, plus 10% sugar.

[4] Two ounces Everbloom® per gallon of water plus sugar to 10%.