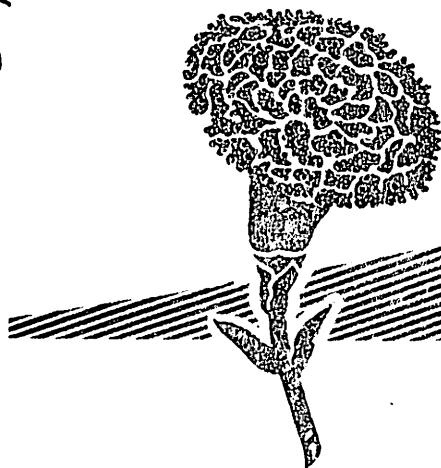


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Colorado
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IN COOPERATION WITH COLORADO STATE UNIVERSITY

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Effects of Storage on the Performance of Carnation Cuttings

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Several isolated attempts have been made to show differences in carnation cuttings stored under refrigeration and those rooted and planted directly from stock plants. Comparisons of cuttings stored rooted and unrooted have also been made. Results have invariably been inconclusive as are the results of this experiment. However, certain inferences can be drawn from the data of this experiment.

There are many factors that override storage treatment when performance of cuttings is the criterion used. The major factors affecting this performance are; 1) size of cutting when stored, including fresh and dry weight and number of expanded leaves, and 2) the environmental complex, mainly temperature and light, which produces the cutting. It is not possible to store cuttings for varying lengths of time and have them absolutely comparable. Either they are produced in a different environment or they grow under a different environment following planting.

Sixty uniform cuttings were taken from stock plants on July 12, August 12, and September 12. Half of each lot was rooted and placed in polyethylene lined boxes at 33° F. The other half was stored unrooted at this temperature until October 12. All lots were then removed and rooted along

with a lot of unstored cuttings direct from stock plants. On November 5, all rooted cuttings were removed from storage or from the propagative bench and planted at 6" x 8" spacings in a producing bench.

Removal of the apical shoot was delayed until all possible vegetative laterals had developed on the young plants. Yield of the first crop of flowers plus all buds 1/4-inch diameter or larger at the end of the experiment was considered the first crop of flowers. An indication of the effect of treatment on development speed of the first crop was obtained by calculating the time in days from the cutting of the first flower on the earliest treatment to the day when one half the crop was cut from each individual treatment. Table 1 contains the data for the experiment grouped in four ways so that differences due to individual treatment, variety, type of storage, and time in storage can be studied separately.

Results

This experiment in storage time is as comparable as is possible with present facilities. Some small differences can be seen from the data. Unrooted cuttings performed better than rooted. While rooted cuttings were 4 percent heavier and

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produced 11 percent more initial breaks, they produced 7 percent less flowers on the first crop averaging significantly lower grade.

The influence of time in storage is more difficult to assess. Fresh cuttings rooted in October performed poorest on the average while cuttings stored either one or two months were best. The initial breaks after pinching and the mean grade of flowers produced were almost the same for fresh cuttings and all storage treatments. The speed of the first crop and yield on the first crop were best for one or two months of storage. The initial fresh weight of the cuttings favored those stored one month (7.3 grams) and was least for those stored three months (5.2 grams). This could cause lower performance for the three-months-storage group which was removed from stock plants in July. Cuttings stored two months were the same size as those rooted fresh. However, performance from the two-months-storage group was significantly improved over fresh cuttings.

A varietal difference is indicated in the data favoring Red Gayety over White Pikes Peak. While average cutting size and initial breaks were simi-

lar, Red Gayety produced 16 percent more flowers in the first crop. This difference was due entirely to those cuttings of White Pikes Peak stored three months and those rooted fresh (Table 1), hence cannot be assumed a true varietal difference.

Additional Observations

There was a distinct stretching of the internodes following planting of all cuttings stored rooted. Rooted cuttings stored two and three months were a lighter color than those stored one month or those rooted fresh. This color difference disappeared after a week to 10 days in the producing bench. No color difference was observed in cuttings stored unrooted.

Cuttings stored unrooted performed better than those stored rooted under the conditions of this experiment. While cuttings stored three months did not perform as well as those stored one or two months, the three-months-storage lot was not as good when it went into storage. The quality of the cutting going into storage and the storage environment are most important in determining post storage performance of carnation cuttings.

Table 1. The performance of rooted and unrooted cuttings stored for different time periods.

Storage time	Rooted or unrooted	Variety	Fresh wt. per cutting in grams	Average no. breaks after pinch	First crop yield ^a	Mean grade flowers	Days to midpoint first crop ^b
1 month	rooted	R.G.*	7.04	7.13	9.52	4.22	36.7
	rooted	W.P.P.**	8.00	6.80	9.20	4.28	36.7
	unrooted	R.G.	6.71	6.27	9.93	4.24	31.7
	unrooted	W.P.P.	7.54	6.73	10.47	4.37	34.0
2 months	rooted	R.G.	6.34	7.00	10.13	4.15	33.7
	rooted	W.P.P.	6.44	7.00	10.00	4.27	33.9
	unrooted	R.G.	5.93	6.33	11.20	4.27	31.0
	unrooted	W.P.P.	6.58	6.67	11.26	4.34	30.0
3 months	rooted	R.G.	6.09	7.20	10.13	4.17	36.7
	rooted	W.P.P.	4.56	7.40	7.66	4.10	43.0
	unrooted	R.G.	5.41	6.13	11.47	4.41	28.3
	unrooted	W.P.P.	4.90	6.33	6.47	4.35	40.4
Fresh cuttings		R.G.	5.99	7.13	9.93	4.17	43.7
		W.P.P.	6.53	7.20	7.54	4.26	44.0
Varieties (105 plants)		R.G.	6.22	6.74	10.39	4.23	34.5
		W.P.P.	6.36	6.88	8.94	4.28	37.4
Storage (90 plants)	rooted		6.41	7.09	9.44	4.20	38.5
	unrooted		6.18	6.41	10.13	4.33	32.6
Time in storage (60 plants)	fresh		6.26	7.08	8.74	4.21	41.9
	1 month		7.32	6.73	9.78	4.28	34.8
	2 months		6.32	6.75	10.65	4.26	32.2
	3 months		5.24	6.77	8.93	4.26	37.1

a. Yield of flowers from April 5 to May 24, 1964, plus buds 1/4-inch diameter or larger on May 25.

b. Time from beginning of flowering of earliest treatment until half flowers were cut for a treatment.

* Red Gayety

** White Pikes Peak