

Special Research Report #417: Postproduction Storage Temperature Effects on Cut Rose Varieties

T.A. Nell, Professor and Chairman, R.T. Leonard, Biological Scientist, Department of Environmental Horticulture, University of Florida, Gainesville, 32611



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TODAY & TOMORROW

Phone: 618/692-0045

Fax: 618/692-4045

E-mail: afe@endowment.org

Website: www.endowment.org

BACKGROUND

Proper transport and storage conditions for cut roses can be difficult to maintain from the farms in Central and South America to the distribution chains in North America. Flowers can be exposed to long transport times and less than ideal temperatures. The objective of this study was to determine which cut rose varieties can withstand stressful storage conditions. Knowing which varieties can tolerate unfavorable conditions will assist in selecting tolerant varieties and, in turn, improve vase life and quality for the consumer.

MATERIALS AND METHODS

The 14 rose varieties tested were grown and harvested in Colombia, transported by air to Miami and commercially

transported on refrigerated trucks to the University of Florida. Flowers arrived 4 to 6 days after harvest.

Upon arrival, the sleeved flowers were kept boxed and placed directly into storage coolers maintained at 35, 42 or 49°F. After 7 days of storage, stems were cut dry (not underwater) and placed in vases containing Floralife Crystal Clear flower food. Flowers were maintained at 70°F and 70 ftc (12/hr day) at a relative humidity of 50±5% for vase life evaluations.

Vase life was calculated from the time flowers were placed in vases until decline occurred. Flower open rate was recorded over time. Flower open rate ranged from 1 (tight) to 5 (fully open).

RESULTS

Vase Life

Vase life was significantly reduced for most varieties stored at 49°F as compared to 35°F. The extent, to which the vase life was shortened, was variety dependent. 'Valentino' had an 8 day reduction in vase life, while 'Saturn' was unaffected by storage temperature.

Fig. 1. Vase life of cut rose varieties stored at 35, 42 or 49°F for 7 days.

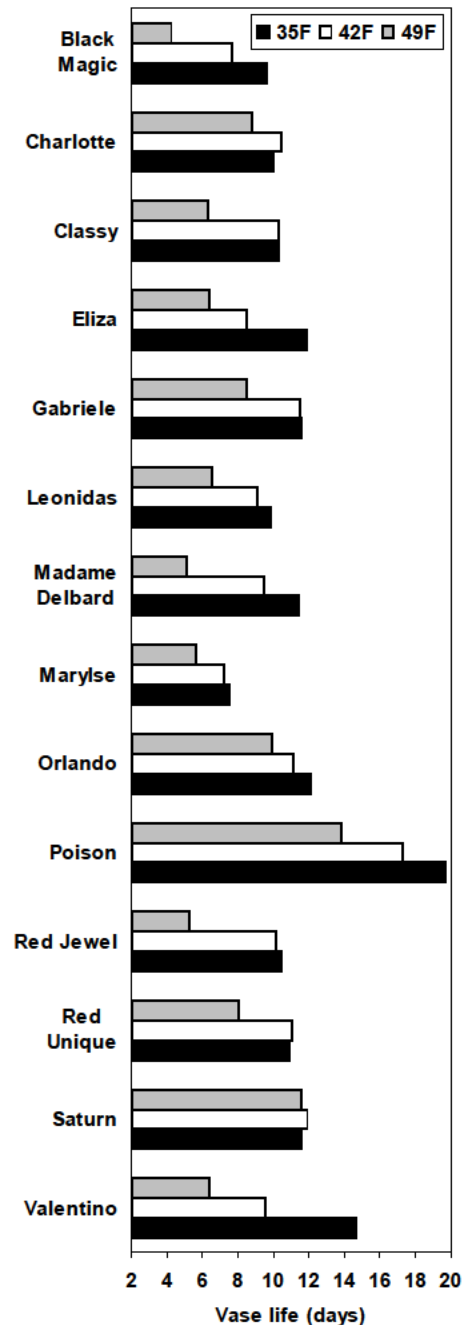


Photo 1. 'Charlotte' (top photo) withstood unfavorable storage temperatures, while 'Red Jewel' did not (bottom photo).

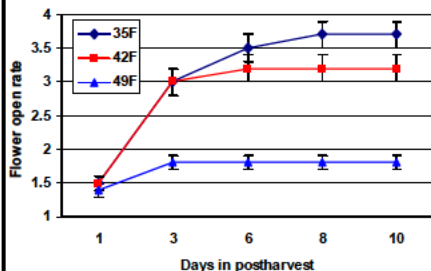


35°F 49°F

Flower Opening

For most varieties, flower opening was adversely affected by high temperature storage. This trend can be seen in 'Black Magic'.

Fig. 2. Effect of storage temperature on flower opening of 'Black Magic'.



'Orlando' and 'Saturn' were the only varieties in which flower opening was not affected by storage temperature. 'Eliza' and 'Charlotte' opened

satisfactorily at all temperatures. 'Red Unique' and 'Marylse' had less than optimal flower opening, regardless of storage temperature. Varieties that opened adequately at storage temperatures of 42°F and below, but did not open satisfactorily when stored at 49°F include: 'Red Jewel', 'Gabriele', 'Madame DelBard', 'Poison', 'Valentino', 'Black Magic', 'Leonidas' and 'Classy'.

Fig. 3. Differences in flower opening among varieties stored at 49°F for 7 days.

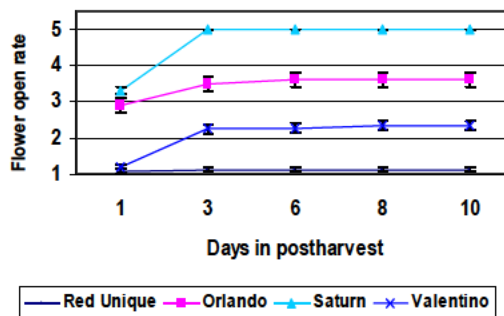


Table 1. Summary of variety responses to 7 days storage at 49°F.

Variety	Postharvest problem		Overall response
	Reduced flower opening	Reduced vase life	
Black Magic	yes	yes	sensitive
Charlotte	no	no	tolerant
Classy	yes	yes	sensitive
Eliza	no	yes	moderate
Gabriele	yes	yes	moderate
Leonidas	yes	yes	sensitive
Madame DelBard	yes	yes	sensitive
Marylse	yes	yes	sensitive
Orlando	no	no	tolerant
Poison	yes	yes	sensitive
Red Jewel	yes	yes	sensitive
Red Unique	yes	yes	sensitive
Saturn	no	no	tolerant
Valentino	yes	yes	sensitive

CONCLUSIONS

The most tolerant varieties to stressful storage conditions were 'Charlotte', 'Orlando' and 'Saturn'. Highly sensitive varieties include: 'Madame Del Bard', 'Leonidas', 'Black Magic', 'Valentino', 'Red Jewel', 'Red Unique' and 'Marylse'. Varieties showed considerable variation in vase life and quality in response to storage temperature. Vase life decreased 2 to 8 days as storage temperature increased. Flowers failed to open or were significantly reduced in size on sensitive varieties when stored at 49°F.

IMPACT TO THE INDUSTRY

Maintaining proper storage temperature plays a major role in postharvest quality and vase life of cut roses. Therefore imperative to choose varieties that perform well and display long-lasting characteristics after being exposed to inappropriate storage temperatures in order to maximize quality and vase life for the consumer. Identifying tolerant varieties enable breeders to incorporate these varieties into their breeding programs.

For Additional Information Contact:
tnell@mail.ifas.ufl.edu

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