

# Special Research Report 443: Postproduction

## Best Practices that Enhance Postharvest Quality of Cut Roses

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



FUNDING INDUSTRY SOLUTIONS  
THROUGH RESEARCH AND EDUCATION

Phone: 703-838-5211

Fax: 703-838-5212

E-mail: afe@endowment.org

Website: www.endowment.org

### BACKGROUND

We have developed a care and handling protocol for all segments of the floral industry to maximize rose quality and vase life. One missed step, whether by the grower, wholesaler, or florist, reduces rose vase life.

### MATERIAL AND METHODS

Cut roses were commercially grown, processed, and shipped from Ecuador or Colombia. We tested variety performance, ethylene sensitivity, and protocols at harvest, wholesale, retail, and consumer levels. Vase life and quality were evaluated at 70 °F, 70 ftc light (12 hrs/day), and 50% RH at the University of Florida.

### RESULTS

#### VARIETY TESTS

Rose varieties differ in vase life, quality, and stress

tolerance. Therefore, choosing the right variety has a major impact on vase life. Our current tests on roses have identified high performing varieties (Table 1).

Table 1. High performing rose varieties that last  $\geq$  12 days and open properly.

Amber	Gabriele
Bloody Mary	Hot Princess
Carrousel	Mona Lisa
Charlotte	Papaya
Classy	Ravel
Clear Ocean	Red Intuition
Eliza	Red Sensation
Erin	Reward
Escimo	Saturn
Esperence	Vendela
Forever Young	Verdi
Freedom	

We tested 39 popular rose varieties and found that 34 (87.2%) were ethylene sensitive. Exposing roses to 1 ppm ethylene for 24 hours at 70 °F typically accelerated petal wilting and reduced or prevented flower opening. It also caused petal and leaf drop on a few varieties.

#### ETHYLENE PROTECTION

Based on our results, we recommend treating roses at the farm or at the wholesaler with commercially available anti-ethylene chemicals such as EthylBloc™ (1-MCP) and

silver thiosulfate-based materials like Chrysal AVB. In our tests, we found the new EthylBloc™ sachet placed in shipping boxes to be effective in protecting roses from ethylene damage. The sachets provide an easy method of application.

Photo 1. EthylBloc™ sachet protected 'Osiana' roses from ethylene damage.



Control EthylBloc™ sachet

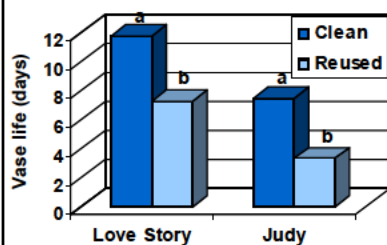
#### HYDRATION

Cut roses must be hydrated at every level of distribution. The most significant factor that negatively influences this vital step is when the hydration or holding solutions are reused or buckets are not sterilized properly. This practice promotes bacterial growth which clogs the stem and prevents water uptake.

We hydrated roses in a freshly made commercial hydration solution or in an 11

day old solution previously used to hydrate roses. After holding flowers for 7 days at 42 °F, the reused solution had 2,600,000 cfu/ml of bacteria while the fresh solution had 0 cfu/ml. Vase life was reduced up to 50% when hydrated in the reused solution (Fig. 1).

Fig. 1. Vase life of cut roses hydrated in a clean or reused hydration solution.



If roses are hydrated in dirty solutions at the farm, the microbes on the stems contaminate solutions used by wholesalers or retailers. High microbial levels (> 100,000 colonies per ml of solution) clog the water transport system.

Based on our research, best results occur when stems are hydrated immediately after harvest for 1-3 hours at room temperature in clean buckets with freshly mixed solutions. Hydration time should be extended if roses are hydrated in the cooler.

Upon arrival, retailers should cut the stems and hydrate in clean, freshly made solutions. Cutting stems underwater is not recommended due to microbial contamination in the cutting water. Our tests

show cutting stems dry does not diminish vase life.

### PACKING

After hydration and prior to packing, growers should place roses in a container without water in a 35 °F cooler for 2-3 hours at a relative humidity of 75%. This allows moisture on leaves, stems, or petals to dry prior to packing. Packing in the cooler instead of packing at room temperature will prevent additional condensation caused from fluctuating temperatures. Dry stems reduce free moisture in shipping boxes, which can help reduce the incidence of *Botrytis*.

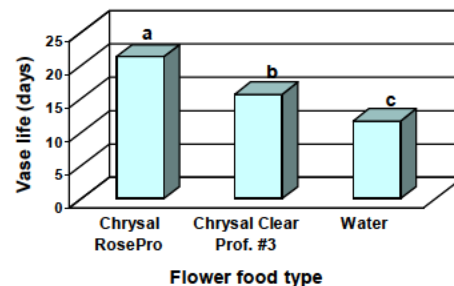
### TEMPERATURE

Many retailers display cut roses at room temperature which drastically shortens vase life intended for the consumer. By holding roses in floral display coolers that allow consumers to view and purchase product under cold temperatures, we found vase life was increased from 30 to 50%.

### FLOWER FOOD

Retailers MUST provide a flower food to customers for flowers to open and last. Our tests on specialized rose foods showed a 27% increase in vase life compared to all purpose foods (Fig. 2.).

Fig. 2. Specialized rose food improves cut rose vase life.



### CONCLUSIONS

Postharvest performance of roses depends on maintaining proper conditions and implementing proper handling practices from the farm to the consumer (see below).

- \* Select lasting varieties
- \* Hydrate in clean, freshly made solutions; Don't reuse!
- \* Treat for ethylene exposure
- \* Pack inside cooler
- \* Ship and store at 34-38 °F
- \* Hydrate after shipping
- \* Avoid prolonged storage
- \* Sterilize buckets, tools, work areas, coolers, vases
- \* Sell from floral coolers
- \* Provide flower food to customers

### IMPACT TO THE INDUSTRY

Long-lasting flowers yield loyal and satisfied customers. This promotes continued and increasing business for cut flower growers, wholesalers, and retailers.

Contact: [tanell@ufl.edu](mailto:tanell@ufl.edu)  
 2009 August© Copyright  
 American Floral Endowment  
 All Rights Reserved.