

Special Research Report #409: Postproduction
Three C's of Success with Fresh Cut Flowers (1) – “Cooling”
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BACKGROUND

To be a successful retailer, questions must be answered. They are: (1) what customers want and, (2) how to provide it.

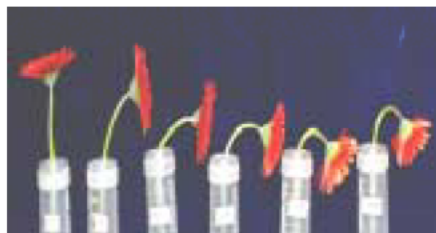
In the fresh cut flower industry, customers want flowers that last. Unfortunately, answering the second question is not easy. Scientific studies show that many factors affect cut flower quality and longevity. They include diseases, water supply, ethylene exposure, food supply, temperature, and the variety. Among these, temperature control, has been proven to be the most important factor affecting fresh cut flowers.

KEEP IT COOL!

From the moment the flower is cut until it is placed into a floral preservative solution, fresh cut flowers only have access to the food stored in their leaves and petals. Flowers stored and shipped at

high (suboptimal) temperatures respire rapidly and thus, use greater amounts of their limited resources. Consequently they age prematurely.

For example, Gerbera daisy 24 hours after 5 days of storage at different temperatures provides an excellent illustration of the drastic decline in vase life due to high temperature storage.



32 37 41 46 50 55
 Storage temperature (°F)

Keeping flowers at 33°F slows down the respiration process. Thus, when placed at room temperature, they possess a vase life similar to freshly cut flowers.

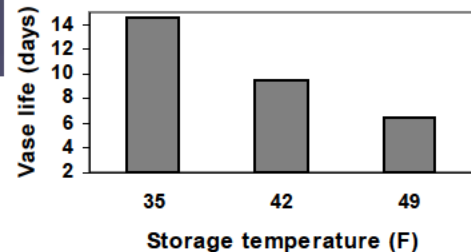
The optimum storage temperature for most non-tropical cut flowers is between 33°F and 35°F. Every degree above this range decreases vase life and increases respiration rate. Tropical flowers, e.g., anthurium, bird-of-paradise, ginger, and tropical orchids are damaged when exposed

to cold temperatures and, therefore, require warmer temperatures (50 to 55°F).

FROM GROWER TO FLORIST

The longer cut flowers are exposed at temperatures outside the optimal 33° to 35°F range, the shorter their vase life (Fig. 1). This means that flowers shipped and stored at high temperatures, have a reduced vase life before they even reach the florist.

Fig. 1. Temperature effects on vase life of ‘Valentino’ roses.



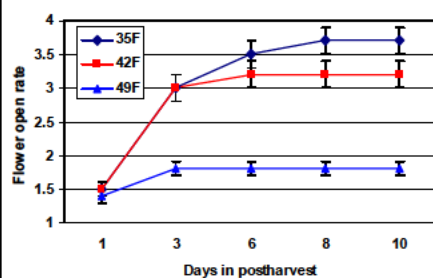
Since temperatures often vary greatly providing from the field to the flower shop, it is important for florists to question suppliers about temperature control. Also, florists must inspect shipments upon arrival to ensure quality for their consumers.

When flowers arrive, they should be visually inspected for signs of temperature fluctuations e.g., heavy

condensation in sleeves and mold on the flowers or leaves. Condensation and mold are signs that these flowers are not as fresh as they should be and will probably have a reduced vase life.

Along with a careful visual inspection, newly arrived flowers should be subjected to some simple temperature readings. To get an accurate reading for boxed flowers, insert probes behind flower heads. For flowers that were transported wet, measure the temperature of the solution. Temperatures outside the 33°F to 35°F range mean that freshness has been compromised. (see Fig. 2)

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



IN THE FLOWER SHOP

Once flowers are in the shop, florists must do their part to keep flowers cool and fresh. The most common error that florists make is ignoring their coolers. Checking wall thermometers inside coolers once in a while is not enough to guarantee flower freshness. Place additional digital

thermometers at varying heights throughout the cooler to identify warm and cool spots. Also, take the temperature of bucket solutions. This temperature won't fluctuate every time the cooler door is opened.

Flowers of 'Red Jewel' roses lasted twice as long when stored at 35°F as compared to 49°F.



35°F 49°F

Ideally, an employee should check the cooler's thermometers several times a day. At a minimum, thermometers should be checked twice a day. The cooler should be adjusted to maintain the proper 33°F to 35°F range. Flowers can easily withstand temperatures down to 32°F without sustaining damage. However, if the cooler is consistently too warm (over 35°F), a new thermostat may be necessary. If temperatures in the cooler vary too widely, the air circulation should be checked.

It is also important to keep coolers free of plant debris and to disinfect the cooler walls, floor, and shelves. Lastly, keep the time in storage to a minimum.

CONCLUSIONS

Vase life and quality is highly impacted when improper temperatures are used during transport and storage. For most cut flowers, the ideal range is from 33°F to 35°F. Tropical flowers, however, require 50 to 55°F. Temperatures above the optimum levels reduce vase life and quality. Keeping flowers cool slows down respiration rate and maximizes vase life.

IMPACT TO THE INDUSTRY

If florists take care to question their suppliers and vigilantly monitor temperatures in their coolers, they can ensure that their flowers will last when customers get them home. By providing outstanding quality flowers, florists gain customer loyalty and repeat sales.

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