

Garry Legnani, Ph.D.
Senior Postharvest Scientist - FloraLife

Introduction:

Cut peony production reached nearly 140 million stems annually in 2019, with production occurring in 20 countries (Kamenetsky-Goldstein and Yu, 2022). The large flowers, diversity of flower color and characteristics, and the high value per stem contribute to its popularity. Peony availability is no longer dependent on the local season as production occurs from southern Chile to Alaska, providing availability nearly year-round.

Peony can be stored for weeks with refrigeration and much of the current academic research is focused on optimizing storage conditions to maintain flower quality. Peonies also dry ship well. They are harvested when the round flower bud starts showing color and begins to soften (the 'marshmallow' stage). Harvesting at this stage maximizes packing density and minimizes susceptibility to physical damage, while promoting consistent opening. Some growers are hesitant to provide newly harvested flowers with any initial hydration prior to storage and shipping for fear that they will open prematurely. We are currently investigating the effects of this 'no hydration' technique on peony vase life.

Methods:

A grower based in the United States provided us with three cultivars ('Festiva Max' white, 'Jules Elie' rose pink, 'Felix Supreme' raspberry red) of freshly harvested peony with no initial hydration treatment. Flowers were pre-cooled in the packing house and dry-shipped for next-day arrival. Upon arrival at the lab the flowers were unpacked, given a fresh cut, and treated with the following hydration pulse treatments for approximately 18 hours in the flower cooler at 2°C / 36°F:

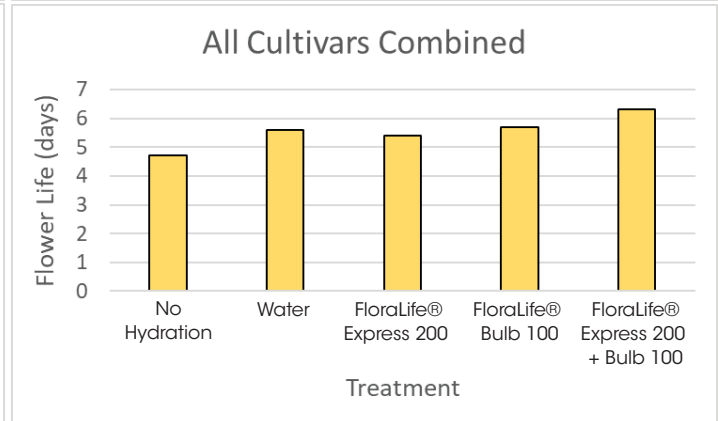
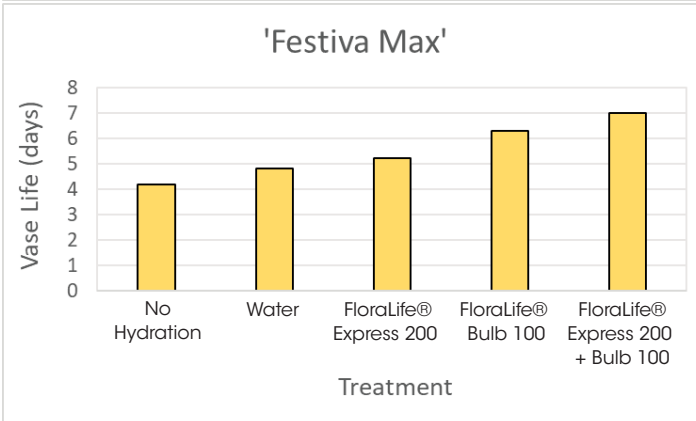
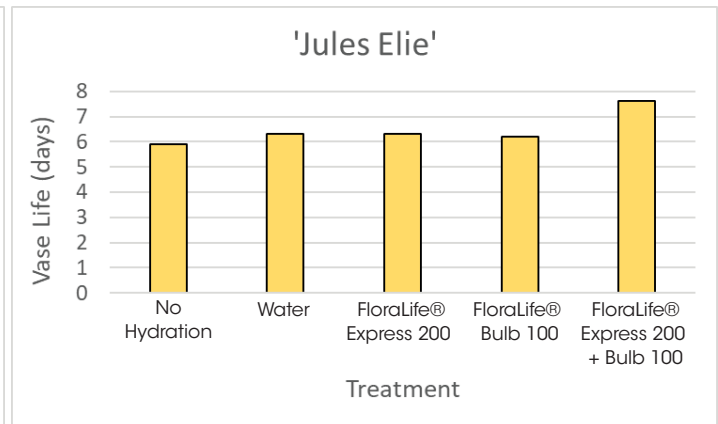
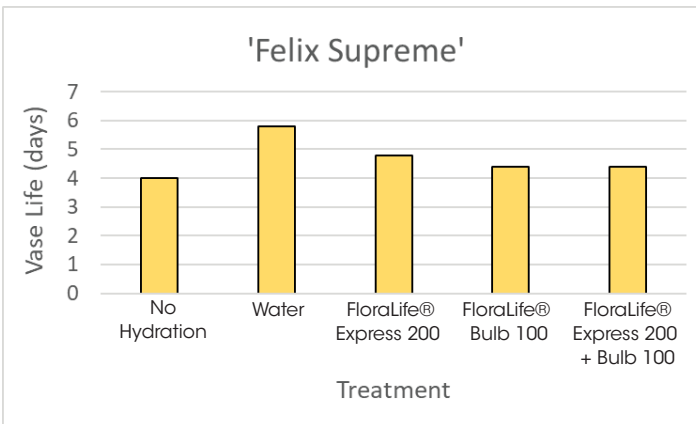
1. No Hydration (control) – stems were not re-cut
2. Water
3. FloraLife® Express 200 (at a dose of 10 ml/L)
4. FloraLife® Bulb 100 (at a dose of 2 ml/L)
5. FloraLife® Express 200 + FloraLife® Bulb 100

Following the hydration pulse treatment, the stems were dry packed in boxes and remained in the flower cooler for 5 days. Stems were then processed into vases filled with FloraLife® Express 300 solution for vase life evaluation. Criteria for flower elimination were petal color fading, petal browning, petal wilting, and petal shattering.



Garry Legnani, Ph.D.
Senior Postharvest Scientist - FloraLife

Results:



Peonies that received hydration treatments prior to storage displayed increased bud development compared to control; however, foliage was visibly more hydrated and fresher looking than controls. Flowers were initially processed into hydration treatments at room temperature because we do not have a walk-in cooler. Buds began to enlarge during this room temperature processing. It is likely that bud development can be reduced by processing inside a refrigerated packing house or flower cooler directly into a pre-chilled solution.

The non-hydrated controls showed the shortest vase life with all cultivars. 'Felix Supreme' showed premature petal bluing while 'Festiva Max' displayed poor opening and petal expansion. 'Jules Elie' were much more tolerant of no hydration showing the longest vase life of all the controls. Hydrating in plain water resulted in increased vase life for all cultivars with 'Felix Supreme' showing the greatest benefit. When vase life data for all cultivars was combined, hydration in plain water increased vase life by one day compared to non-hydrated controls.

Interestingly, plain water was the best treatment for 'Felix Supreme'. With 'Jules Elie', FloraLife® Express 200 and FloraLife® Bulb 100 treatments showed no difference compared to water only; however, the combination of FloraLife® Express 200 and FloraLife® Bulb 100 increased vase life by 1.3 days compared to water only. With 'Festiva Max', hydration with plain water provided a 0.6-day increase compared to control while FloraLife® Express 200 and FloraLife® Bulb 100 increased vase life by 1 and 2 days respectively. Like 'Jules Elie', combining FloraLife® Express 200 and FloraLife® Bulb 100 showed the longest vase life for 'Festiva Max' (2.8 days longer than non-hydrated control). Flower opening was also increased by FloraLife® Express 200 and FloraLife® Bulb 100 treatments. The combination of FloraLife® Express 200 and FloraLife® Bulb 100 provided the longest vase life when all cultivars were averaged together.



Garry Legnani, Ph.D.
Senior Postharvest Scientist - FloraLife

Conclusions:

- Pulse hydration treatments (18 hours at 2°C/36°F) increased vase life of all the peony cultivars, but also increased bud size. This might be prevented by processing the flowers in a refrigerated packing house or flower cooler using a pre-chilled solution.
- Hydration in plain water provided the longest vase life for 'Felix Supreme' (5.8 days).
- Hydration in a combination of FloraLife® Express 200 and FloraLife® Bulb 100 provided the longest vase life for 'Jules Elie' (7.6 days).
- Hydration in a combination of FloraLife® Express 200 and FloraLife® Bulb 100 provided the longest vase life for 'Festiva Max' (7 days) and promoted flower opening.
- Results indicate that an initial hydration pulse after harvest, prior to refrigerated storage and shipping, has a positive effect on vase life.
- Follow-up testing will compare the effects of the FloraLife® Express 200 and FloraLife® Bulb 100 combination on the vase life of flowers displayed into vases of FloraLife® Express 300 or water only.

Photos:



Dry pack prior to 5-day storage at 2°C/36°F



No hydration control post storage



FloraLife® Express 200 + Bulb 100 post storage



Garry Legnani, Ph.D.
Senior Postharvest Scientist - FloraLife



No hydration (day 5)



Water (day 5)



FloraLife® Express 200 (day 5)



FloraLife® Bulb 100 (day 5)



FloraLife® Express 200 + FloraLife® Bulb 100 (day 5)