

POSTHARVEST TREATMENT OF SPECIALTY CUT FLOWERS

North Carolina State University Report for 2017

Cristian Loyolla, John Dole, Ingram McCall, and Ben Bergmann
Department of Horticultural Science, North Carolina State University



This project was supported by the Association of Specialty Cut Flower Growers Research Foundation and numerous suppliers.

Every year we conduct vase life studies on promising species and cultivars from the ASCFG Seed and Perennial Trials. We had 30 varieties in the National Seed Trial, five new unnamed sunflowers trialed only here at North Carolina State, and seven species in the Perennial Trial. Of these we tested the vase life of 25 cultivars. It was a busy year!

Sunflowers made up the largest segment of the Trial this year with 11 different cultivars tested. Although we did not see much statistical difference between the treatments, vase life was longest for most cultivars with the use of a holding solution, and for some the best results were obtained with using a hydrator before the holding solution.

Previous testing has shown us that lisianthus generally does best with a holding solution and this year was no different. ‘Rosanne 1 Black Pearl’ and ‘Rosanne 1 Green’ vase life significantly increased when they received both holding and hydrator treatments. Lisianthus ‘Rosanne 2 Deep Brown’ also performed well with a holding solution, although previous treatment with a hydrator slightly reduced vase life.

Hibiscus ‘Mahogany Splendor’ has become quite a popular cut foliage, but many growers have had issues with postharvest handling. It responded very well to a hydrator after harvest, increasing vase life by three to five days, and reducing the chances the stems would wilt within the first couple days.

The Details

Field-grown flowers were harvested into tap water (0.21 EC, 6.1 pH) at the optimum stage of flower development. Stems were sorted into four equal groups and placed in the treatments below for the specified time, then placed into vases of deionized water.

- Hydrator only (4 hours)
- Holding preservative only (2 days)
- Hydrator for 4 hours followed by holding preservative for 2 days
- Tap water only (as a control)



Floralife Hydraflor 100 was used as the hydrator at 1.0 ounce per gallon, and Floralife Professional was used as the holding preservative at 1.3 ounces per gallon (the rates listed on the packaging). After treatment, stems were placed in tap water and held at 68 ± 2 °F under approximately 200 foot-candles of light for 12 hours per day. The vase life for each stem was recorded. Termination point was typically when 50% of the flower(s)/florets on the stem were brown, wilted, drooped over, etc.

What Are Hydrating and Holding Solutions?

Some of you may be asking, “What is a hydrating and holding solution?” Floral preservatives can be categorized as either hydrating, holding, or vase solutions. Holding solutions contain a carbohydrate source (sugar) to encourage bud opening and/or flower longevity, and are applied for several hours up to approximately two days either by growers or wholesalers before they get to the final consumer. Hydrating solutions are meant to be applied right after harvest, prior to a holding solution, to facilitate water uptake and do not contain a carbohydrate source. Hydrating solutions are usually used for a short amount of time, such as four hours. Vase solutions are generally applied by the

consumer, commonly sold in those little packets, and contain a higher concentration of carbohydrates than a holding solution. While we do not test the use of vase solutions in these studies, it would be safe to assume that those flowers that perform better with a holding solution would likely last longer for your customers with a vase solution.

One More Thing

Our testing methods tend to produce the maximum vase life, which tells you the potential vase life of each species. We cut and process the stems rapidly, put one stem per jar, and use a postharvest evaluation temperature that is a bit cooler than a typical home in a southern summer. These procedures were set up to provide a consistent environment so that anyone else should be able to repeat our work and get the same results. These factors combined typically add about one to three days to the vase life of some species compared to what a grower would usually get. It is also important to note that these results do not replace in-house testing as there are many on-farm factors that affect vase life.

The Results

***Campanula rapunculoides* ‘Campbell Blue’** There were no significant differences between the treatments. Vase life in general was a bit on the short side, averaging 6 to 9 days.

***Dianthus* ‘Deep Maxine’** Flowers treated with only a holding solution had a slightly longer average vase life (15 days) than untreated flowers (14 days).

***Dianthus* ‘Magenta Bicolor’** Flowers treated with both hydrator and preservative had the longest vase life of 15 days, followed by the untreated flowers at 14 days, and flowers treated with only a hydrator at 12 days.

***Dianthus* ‘Pink Magic’** There was only a slight increase in vase life of 14 days for flowers that received both hydrator and holding solutions, compared to 13 days for those treated with only a hydrator.

***Hibiscus* ‘Mahogany Splendor’** This cut foliage responded very well to treatment with a hydrator, which increased vase life to 18 days from only 13 to 15 days without a hydrator. Treating the stems with hydrator decreased the likelihood they would wilt within the first couple of days. Interestingly, the stems started to root after about two weeks in the vase, which was too late, of course, to prevent the wilting that occurred after harvest.

***Lisianthus* ‘Rosanne 1 Black Pearl’** Flowers treated with both hydrator and holding solution had the longest average vase life (14 days) followed by flowers treated only with a holding solution (13 days) or only with hydrator (12 days). Untreated flowers had the shortest vase life (9 days).

***Lisianthus* ‘Rosanne 1 Green’** Flowers treated with both hydrator and holding solution had the longest average vase life of 16 days as compared to 12 days of flowers without any treatments or just a hydrator.

***Lisianthus* ‘Rosanne 2 Deep Brown’** Flowers that were treated with only a holding solution had the longest vase life of 15 days, but flowers treated with a hydrator as well had a vase life of 14 days. Both of these were significantly longer than untreated flowers (10 days).



Marigold ‘Oriental Gold’ Interestingly, flowers without any treatments or with both treatments had the longest vase life (22 and 20 days, respectively). This was significantly better than the flowers treated with hydrator or holding solution alone, at 18 and 19 days, respectively. In general, most marigolds perform best when treated with a holding preservative.

Marigold ‘888 Deep Gold’ Flowers treated with a holding solution had the longest vase life (15 days). Flowers treated with only hydrator (11.8 days) had the shortest vase life. Untreated flowers had a vase life of 14 days.



Penstemon hartwegii ‘Arabesque Appleblossom’ In general, this flower had a very short vase life. The longest was 5.5 days when flowers were treated with just a holding solution. Without any treatment it had a vase life of only 3.9 days.

Physostegia ‘Pink Manners’ Flowers treated with only hydrator had a longer average vase life (12 days), compared to those treated with both a hydrator and holding solution at 11 days.



Snapdragon ‘Maryland Dark Orange’ Flowers treated with a holding solution displayed a slightly increased vase life to 10 days. Untreated flowers had a vase life of 9 days.

Sunflower ‘EH16-10’ Flowers treated with only a holding solution had a slightly longer vase life (14 days) than flowers that received both treatments (13 days). Untreated flowers lasted 12 days.

Sunflower ‘EH16-13’ Flowers treated with only a holding solution had a slightly longer vase life (16 days) than those treated with both hydrator and holding solutions (15 days). Untreated flowers or those treated with only a hydrator had a vase life of 14 days.

Sunflower ‘EH16-21’ There were no statistical differences between the treatments, and vase life averaged about 12 days.

Sunflower ‘EH16-21L’ There were no statistical differences between the different treatments, vase life was around 13 days.

Sunflower ‘EH16-30L’ Flowers treated with both hydrator and holding solution had a slightly longer vase life (11 days) than untreated flowers (10 days).

Sunflower ‘ProCut BiColor DMR’ The longest vase life was achieved by flowers that received both hydrating and holding solutions (11 days). The rest of the treatments produced a slightly shorter vase life of 10 days.

Sunflower ‘ProCut Orange Excel’ There were no statistical differences between the treatments. Vase life averaged around 11 days.

Sunflower ‘ProCut White Lite’ Flowers treated with both hydrator and holding solutions had the longest average vase life (13 days) compared with 12 days for the non-treated flowers.



Sunflower ‘ProCut White Nite’ There were no statistical differences between the treatments, with vase life averaging around 13 days.

Sunflower ‘Sunfinity’ There were no statistical differences between the treatments; vase life was about 9 days.

Sunflower ‘Vincent’s Choice Deep Orange DMR’ There were no statistical differences between the treatments, with vase life averaging around 11 days.

Stokesia ‘Mel’s Blue’ There were no statistical differences between the treatments. Vase life averaged around 11 days.

