

POSTHARVEST TREATMENT OF SPECIALTY CUT FLOWERS

North Carolina State University Report for 2015

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Every year we conduct vase life studies on promising species and cultivars from the ASCFG Perennial, Seed, and Woody trials. This year we tested ten cultivars. The charming ‘Dara’ carrot was the star with its long-lasting flowers ranging in color from white to purple.

Marigolds have been hot the last few years and this year was no different. Three cultivars, ‘Falcon Yellow’, ‘Garland Orange’, and ‘Storm Gold’ were in the postharvest trials and all performed well, lasting 12 to 19 days. But as we discuss below, marigolds tend to root in the vase, artificially extending vase life, so commercial vase life is more likely to be 9 to 16 days. Holding solutions increased vase life.

The parade of beautiful sunflowers also continued this year with five cultivars in the postharvest trials. Vase life varied from an average of 8 days for ‘Sunburst Greenburst’ to 12 days for ‘Helios Flame’. Holding solutions increased the vase life of three of the cultivars: ‘Sunburst Panache’, ‘ProCut Brilliance’ and ‘ProCut Red’.

Holding solutions also increased the vase life of ‘Champion Pro Deep Blue’ campanulas, which lasted around 14 days. The sugars in holding solutions will also improve color development of the buds that open.

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 then sorted into 4 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
- De-ionized (DI) 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 DI water and held at $68 \pm 2F$ under approximately 200 footcandles 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 are hydrating and holding solutions?” 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. They are applied for several hours, for up to approximately two days, by either growers or wholesalers before the flowers 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, commonly distributed in small packets, are generally applied by the consumer, 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 ‘Champion Pro Deep Blue’. Campanulas are well known for having a long vase life and ‘Champion Pro Deep Blue’ was no different with an average vase life of 14 days. The hydration solution added about a day to the vase life.

Carrot ‘Dara’. Despite its delicate appearance, ‘Dara’ held up well with a vase life of 13.1 days. The treatments had no apparent effect.

Marigold ‘Falcon Yellow’, ‘Garland Orange’, and ‘Storm Gold’. All three marigolds performed well, with vase lives of 12 to 19 days (see note below). A holding preservative increased vase life by up to 3 days. Marigolds have a postharvest quirk that sometimes skewed our testing: stems tend to root in the vase. Needless to say, a rooted marigold stem takes longer to die. We had to terminate some of the stems that rooted and weren’t senescing. To be safe, take 2 to 3 days off of our numbers to account for the rooting.

Sunflower ‘Helios Flame’. This stunning yellow red bicolor has a long vase life of 11 to 12 days for a sunflower. The treatments had no apparent effect.

Sunflower ‘ProCut Brilliance’ and ‘ProCut Red’. ‘ProCut Brilliance’ with its traditional yellow petals and dark centers lasted 7 to 9 days when held in water for two days, but lasted 9 to 11 days when held in a holding solution. Vase life of ‘ProCut Red’ was also extended with the use of a holding solution from 8 to 9 days for water to 9 to 10 days in a holding solution.

Sunflower ‘Sunburst Greenburst’. This green-centered, heavily double sunflower lasted 7 to 8 days. The treatments had no apparent effect.

Sunflower ‘Sunburst Panache’. This brown-centered, heavily double sunflower lasted 8 to 9 days when held in water for 2 days, but lasted 10 to 11 days when held in a holding solution.

For more cut flower information, including twenty years of trials reports, postharvest research, and production material, spend some time at John Dole’s NCSU cut flower site.



The screenshot displays the NCSU Cooperative Extension website. At the top, there is a navigation bar with the NCSU logo and the text "NC STATE State University A&T State University COOPERATIVE EXTENSION Empowering People - Providing Solutions". A search bar is located on the right side of the header. Below the header, there is a main banner image featuring a variety of colorful cut flowers, including purple hydrangeas, red and white dahlias, and orange and yellow chrysanthemums. The banner is titled "Cut Flowers" and includes a navigation menu with links for "Welcome", "Cut Flower Trials", "Postharvest Trials", "Production", "NC Cut Flowers", and "Publications". Below the banner, there is a section titled "LINKS OF INTEREST" with links to the "Association of Specialty Cut Flower Growers", "North Carolina Commercial Flower Growers Association", and "Chain of Life Network". A "DEPARTMENTS" section lists "Horticultural Science". The main content area is titled "Postharvest Information" and contains a paragraph of text: "A crop is at its highest quality at the time of harvest and must be properly handled to minimize the loss in quality. To maintain quality during marketing and in the final consumers location, cut flowers must be handled and stored at the correct temperature (as cold as possible), have a high carbohydrate level (use floral preservatives), and be free of water stress, ethylene, and microbial contamination." A "Print Content Only" icon is visible on the right side of the page. At the bottom of the screenshot, a blue banner contains the URL: <http://cutflowers.ces.ncsu.edu/welcome-2/>