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Does Configure (BA) affect the vase life of cut sunflower and dahlia?

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Introduction

Cut flower vase life depends on a variety of factors, including the production environment and postharvest handling techniques. Proper handling procedures should be followed to optimize the vase life of cut flowers. Vase life of cut flowers can be extended by some chemical applications, including the use of PGRs, however handling procedures differ among taxa.

Cut sunflowers are gaining in popularity with the introduction of new pollen-less cultivars. However, vase life of sunflowers can be limited by the rapid loss of petals after harvest. Dahlias are another popular cut flower with short vase life. In these experiments, Configure (benzyladenine; Fine Americas, Inc., Walnut Creek, CA) was applied to cut sunflowers (*Helianthus annuus* L.) 'Procut Lemon' and 'Moulin Rouge' and to cut dahlia (*Dahlia* × *hybrida*) 'Park Princess' and 'Karma Yin Yang.' Vase life of the flowers was observed in order to determine possible benefits of applying Configure to these taxa. This research is part of ongoing research at Virginia Tech to investigate practices to help growers optimize vase life of cut flowers with funding from the Association of Specialty Cut Flower Growers.

Summary of Findings

- Configure applied as a pre-harvest spray or a postharvest dip did not change the vase life of cut sunflower 'Procut Lemon' or 'Moulin Rouge'.
- Configure applied as a postharvest dip did not change the vase life of dahlia 'Park Princess' or 'Karma Yin Yang.'
- Petal wilting was observed at the end of vase life for the majority of sunflowers and all dahlias.

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Materials and Methods

Sunflower Experiment

Sunflower (*Helianthus annuus* L.) 'Procut Lemon' and 'Moulin Rouge' were grown from seed (Johnny's Selected Seeds, Winslow, ME). Seeds were planted in trade gallon containers containing soilless media (Fafard 52, Sungro Horticulture, Agawam, MA) in a polyethylene-covered greenhouse in Blacksburg, VA. Each cut stem received one of four treatments: pre-harvest spray with 300 ppm Configure, pre-harvest spray with water (spray control), postharvest dip in 300 ppm Configure, or postharvest dip in water (dip control). Pre-harvest sprays occurred 6 weeks after seeding and were applied to flowering plants to achieve run-off (294 $mL \cdot m^{-2}$ for 'Procut Lemon' and 769 $mL \cdot m^{-2}$ for 'Moulin Rouge'). Dip treatment was applied after cutting stems on the day of harvest. For stems receiving dip treatment, the entire flower was submerged in solution for 5 seconds before stems were placed in vases.

Dahlia Experiment

Dahlia × *hybrida* 'Park Princess' and 'Karma Yin Yang' tubers (Brent and Becky's Bulbs, Gloucester, VA) were planted in ground beds in Blacksburg, VA. Flower stems were harvested 13 weeks after planting. Each cut stem received one of three postharvest treatments: dip in 300 ppm Configure, dip in water (dip control), or no dip treatment (dry control). Dip treatment was applied as described for sunflower experiment.

Postharvest evaluation

Sunflowers and dahlias were harvested based on flower stage (Figures 1 and 2). For sunflowers, harvests occurred 2 to 8 days after the Configure spray was applied. Sunflower and dahlia stems were re-cut to a length of 50 cm and 20 cm, respectively, then placed individually in vases containing deionized water. To observe the length of vase life, stems were kept in a postharvest evaluation room with a mean temperature of 23° C and relative humidity of 54%. Average instantaneous daytime light intensity was 127 $\mu mol \cdot m^{-2} \cdot s^{-1}$, provided by ambient lighting supplemented with fluorescent bulbs for ~8 $hr \cdot day^{-1}$. End of vase life was determined visually and

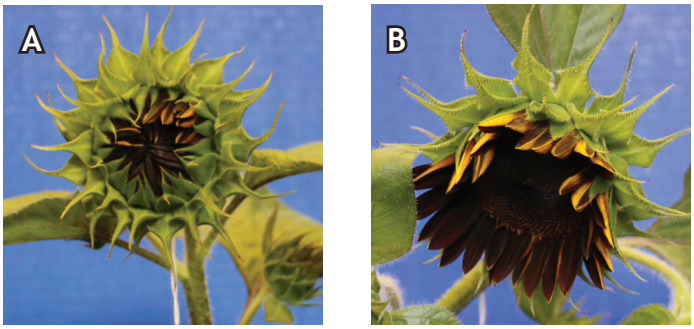

Figure 1: Sunflower harvest stage. Earliest harvest stage occurred when green bracts had lifted to reveal petals covering at least 60% of the flower head (A). Latest harvest stage occurred when all petals had lifted, but were not yet fully extended (B). Photos by Leslie Peck.

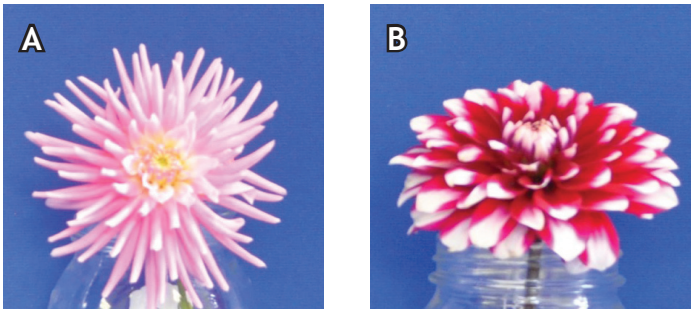

Figure 2: Dahlia harvest stage. Dahlia 'Park Princess' flowers (A) were harvested when 50-70% of petals had opened from center bud. 'Karma Yin Yang' flowers (B) were harvested when 60-80% of petals had opened from the center bud. Photos by Leslie Peck.

occurred when at least 50% of the cut stem exhibited undesirable aesthetic qualities. Undesirable aesthetic qualities included: wilting of petals, loss of petals, closing of flower head, discoloration of flower head, bending at the top of the stem, and stem breakage.

Results and Discussion

Sunflower Experiment

Mean vase life for all 'Procut Lemon' cut stems was 12 days. Mean vase life for 'Moulin Rouge' stems was just under 10 days. Treatment with Configure by spray or dip applications did not significantly alter postharvest longevity of either cultivar. Applications of Configure by spray or dip are not recommended for increasing the postharvest vase life of either sunflower 'Procut Lemon' or 'Moulin Rouge.'

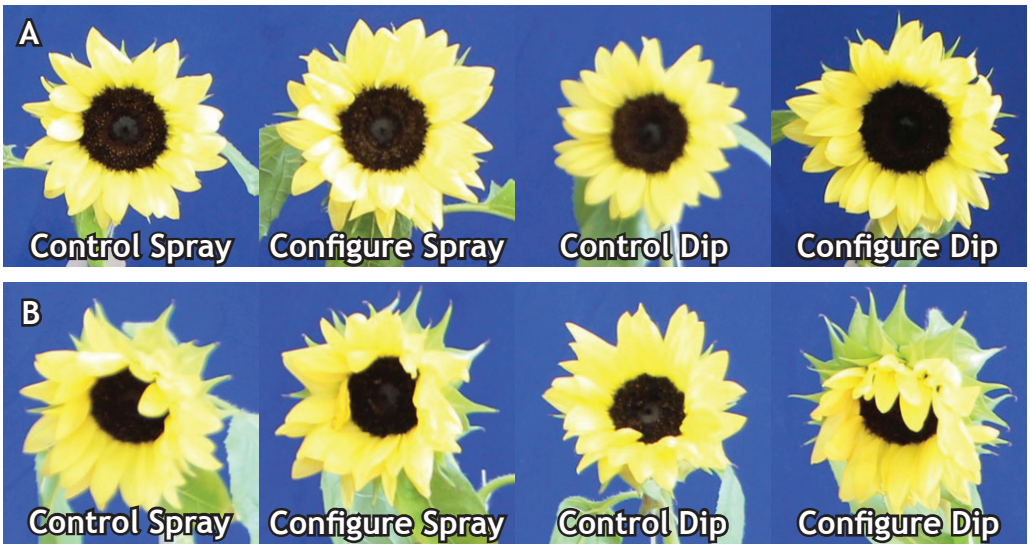

Figure 3. Sunflower 'Procut Lemon' at 4 days (A) and 11 days (B) after harvest. Spray applications were applied 2-8 days before harvest; dip treatment was applied by submerging the flower for 5 seconds after harvest. Configure treatment rate was 300 ppm. Photos by Leslie Peck.

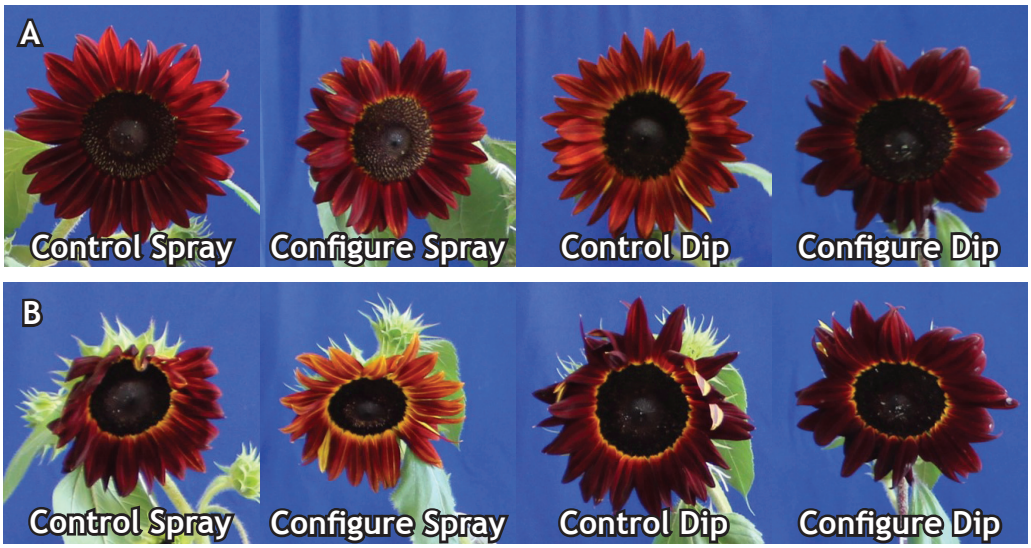

Figure 4. Sunflower 'Moulin Rouge' at 5 days (A) and 9 days (B) after harvest. Spray applications were applied 2-8 days before harvest; dip treatment was applied by submerging the flower for 5 seconds after harvest. Configure treatment rate was 300 ppm. Photos by Leslie Peck.

The most common aesthetic quality leading to the end of vase life was wilting of petals, which occurred on 95% of 'Procut Lemon' stems and 93% of 'Moulin Rouge' stems. Other aesthetic criteria for ending vase life of 'Procut Lemon' flowers were petal loss, closing of the flower head, discoloration, bending at the top of the stem, and breakage of the stem. Undesirable aesthetic criteria observed on 'Moulin Rouge' cut stems were loss of petals and closing of the flower head. Though often cited as a cause for short vase life in sunflower, the incidence of petal loss in this experiment was low for both cultivars, 3% for 'Procut Lemon' and 26% for 'Moulin Rouge'. Proper harvesting techniques and postharvest environmental conditions may be more important than PGR application for postharvest quality and longevity of these cultivars.

Dahlia Experiment

Mean vase life of dahlia 'Park Princess' and 'Karma Yin Yang' was 7 days. For all flowers, wilting of petals was the cause for ending vase life. Dip application of Configure did not significantly affect vase life for either cultivar. Postharvest responses to benzyladenine application may be different for other dahlia cultivars and requires further research.

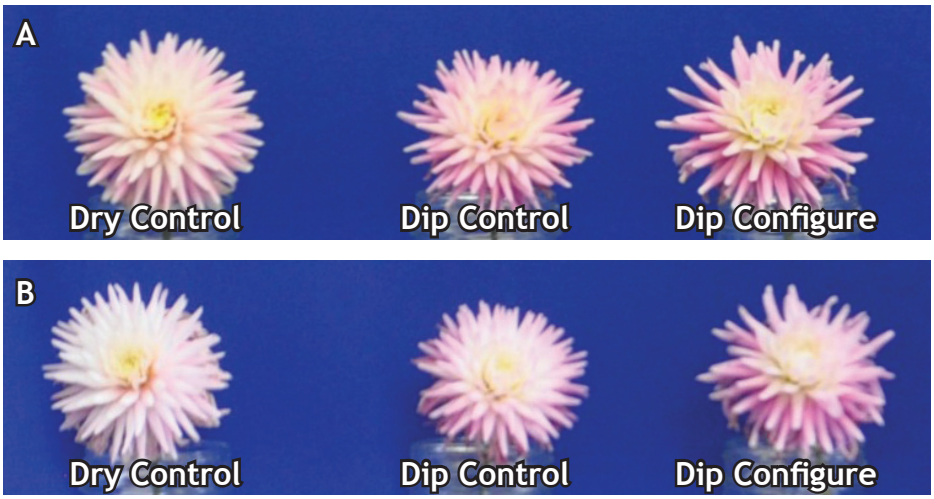

Figure 5. Dahlia 'Park Princess' at 5 days (A) and 7 days (B) after harvest. Flowers in dip treatments were submerged in water (dip control) or 300 ppm Configure for 5 seconds on the day of harvest. Photos by Leslie Peck.

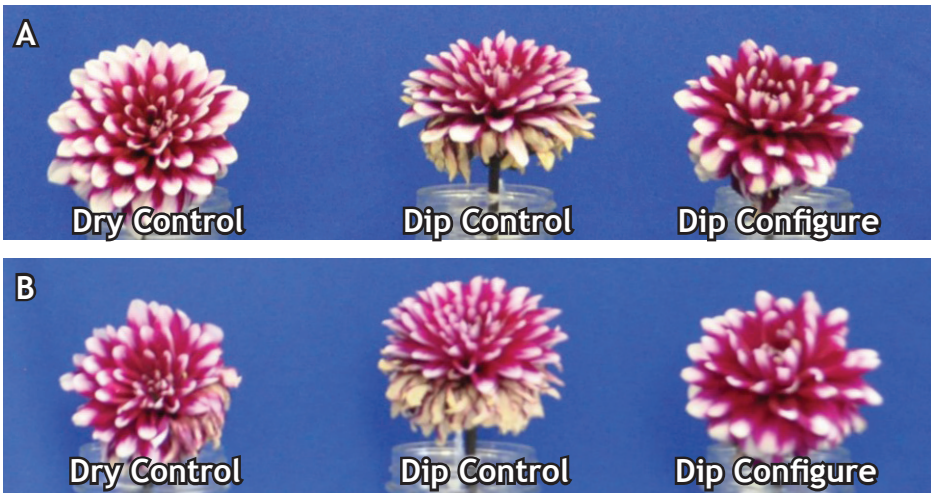

Figure 6. Dahlia 'Karma Yin Yang' at 5 days (A) and 7 days (B) after harvest. Flowers in dip treatments were submerged in water (dip control) or 300 ppm Configure for 5 seconds on the day of harvest. Photos by Leslie Peck.

Summary

Configure was applied by pre-harvest spray or postharvest dip to sunflower 'Procut Lemon' and 'Moulin Rouge' cut flowers. Vase life of these cultivars was not altered by either application of Configure. Average vase life was 12 days for 'Procut Lemon' and 10 days for 'Moulin Rouge.' Most of the cut stems showed petal wilting at the end of vase life, but few flowers lost petals in this experiment. Configure applied by postharvest dip did not effect the vase life of dahlia 'Park Princess' or 'Karma Yin Yang' flowers. Vase life for both cultivars was 7 days with all stems showing petal wilt at the end of vase life. Configure applied by these methods is not recommended for extending vase life of these cut flower taxa.

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