

Extending Cut Dahlia Vase Life

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Cut dahlias are perennially popular with growers and consumers because of their stunning beauty, and amazingly diverse colors, shapes, and sizes. Unfortunately, they also typically have a short vase life. We wondered if treating cut dahlias with plant growth regulators (PGRs) would increase vase life as with other flowers treated with cytokinin (iris, petunia, and wintersweet) or gibberellic acid (daffodil, lantern lily, and rose). We pulsed dahlia stems with benzyladenine (BA, a cytokinin), gibberellic acid (GA_{4+7}), or both at the same time before observing flower quality and vase life.

We used flowers from two sources: 1) Three cultivars ('Karma Amora', 'Karma Prospero', 'Nathalie G.') dry packed and shipped from a commercial grower in Virginia (received 48 hours post cut, Fig. 1) and 2) Mixed cultivars held continuously in water from three ASCFG farmers close to NCSU (received 36 hours post cut, Fig. 2). We delivered PGRs to stems by recutting and placing them into the treatment solutions (Table 1) and holding them at $40\pm2^{\circ}\text{F}$ for 24 hours. Two control treatments were applied in the

same way: tap water or Chrysal BVB. Post pulse treatment stems were recut and placed individually into jars in tap water for observation in conditions that mimic a typical home ($70\pm2^{\circ}\text{F}$ under 200 foot-candles of fluorescent light for 12 hours per day at 40-60% relative humidity).

Several PGR pulse treatments improved flower quality after 4 days in vase and extended vase life for both dry- and wet-handled flowers compared to tap water (Table 1). The combination of 20 ppm each of BA and GA resulted in the same or better flower quality after 4 days and the same or longer vase life than either PGR used alone at 20 ppm. The maximum benefit of the combined PGRs was achieved at a lower concentration for dry-handled flowers than for wet-handled flowers, perhaps because they took up more solution during the pulse treatment. Flowers pulsed with 2 ml/liter Chrysal BVB did not perform as well as the better BA/GA combinations.

Compared to flowers treated with tap water only, pulsing stems with a solution containing BA and GA increased vase life of wet- and dry-handled flowers by up to

1.8 days (45%) and 2.0 days (43%), respectively, and flower quality was notably better during this extended time (Fig. 3).

Preparation of a solution containing 20 ppm BA and 20 ppm GA is simple and may be cost effective for a small-scale grower. There are commercially available products that contain equal amounts of these two PGRs such as Fresco® (made by Fine Americas, Inc. and what we used) and Fascination® (made by Valent Bio-Sciences LLC). Both of these are readily available, contain 1.8% BA and 1.8% GA, and come with simple instructions to make a 20 ppm solution, i.e. 0.14 fluid ounces per gallon tap water. A quart of these products costs approximately \$150, so a gallon of the 20 ppm diluted solution costs ~\$0.65, or ~\$0.02 per stem if a gallon is used to pulse 30 stems.

Because previous work showed that dahlia vase life can be extended by placing flowers in a holding solution overnight, it may be that combining a PGR pulse with a holding solution treatment, either simultaneously or sequentially, will promote longer vase life than either alone, but we have not tested this idea as yet.

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Fig. 1. Dry-handled 'Karma Prospero', 'Karma Amora', and 'Nathalie G.' (left to right) shown while hydrating after we received them.



Fig. 2. Mixed cultivars grown by local ASCFG members were used for the wet-handled flowers, including 'Belle of Barmera', 'Blue Bell', 'Henriette', 'Boom Boom White', 'Jowey (Jowie) Linda', 'Karma Fiesta', 'Karma Gold', 'Karma Sangria', 'Snoho Doris', and 'Woodland Taco Time'.



Fig. 3. Flower quality rating was assessed after 4 days in vase using a five-point scale from 1 = 0-10% wilting or discoloration to 5 = 76-100% wilting or discoloration. Shown is a 'Boom Boom White' flower rated 4 (right) pulsed with tap water and a flower rated 1 pulsed with 10 ppm BA+GA. A stem was terminated when about half of the flower was discolored or wilted or the stem bent past a right angle.

Table 1. Cut dahlia flower quality after four days and vase life following a 24-hour pulse treatment with the plant growth regulators benzyladenine (BA) and gibberellic acid (GA).

Treatment	Flower quality ^z after 4 days			Vase life (days)		
	Dry-handled	Wet-handled	Both	Dry-handled	Wet-handled	Both
Tap Water	4.0	2.9	3.5	4.0	4.7	4.4
20 BA	3.4	1.8	2.6	5.3	6.1	5.7
20 GA	3.4	2.0	2.7	4.8	5.5	5.2
5 BA+5 GA ^x	3.2	1.8	2.5	5.6	6.0	5.8
10 BA+10 GA	3.1	1.5	2.3	5.8	6.1	6.0
20 BA+20 GA	3.6	1.6	2.6	4.9	6.7	5.8
30 BA+30 GA	3.3	1.6	2.5	5.1	6.5	5.8
50 BA+50 GA	4.1	1.9	3.0	4.2	5.7	5.0
2 Chrysal BVB	4.0	1.7	2.9	4.5	6.3	5.4

^z Rating: 5-point scale from 1 = 0-10% to 5 = 76-100% wilt/descolor.

^y All quantities are in ppm except Chrysal BVB which is in ml/liter.

^x Combined BA+GA treatments were prepared with Fresco ® (contains equal amounts of BA and GA₄₊₇).