



2016 ASCFG

Cut Lily Trial

John M. Dole,
Ingram F. McCall, and
Judy M. Laushman

Lilies are the most important specialty cut flower grown in the United States. In 2015 the value of cut lilies was over \$60 million. Considering their value and importance to so many growers, in 2016 the ASCFG coordinated a trial of lily cultivars in cooperation with Zabo Plants and Our American Roots.

Large-scale production of cut lilies is usually accomplished in heated greenhouses using bulb crates. However, many small-scale producers grow in high tunnels, either in the ground or in crates, and some growers produce lilies in the field. In this program, most of the trialers grew the lilies in high tunnels. However, NC State University grew their lilies in a heated greenhouse, and two of the trialers grew the lilies in the field. At NC State, we also planted the bulbs in the field after harvest. We have heard that some growers do this and wanted to see for ourselves how the practice works, and then collect data. We will report on this method in the future.

Of the 23 cultivars from two companies, the top-ranked cultivars were ‘Francesca’, ‘Garnacha’, ‘Logan’, ‘Paramillo’, and ‘Revello’, based on the combined ratings score: market appreciation + repeat again + ease of cultivation. Not only will these cultivars be nominated for the ASCFG Cut Flower of the Year, but they are a great place to start talking about the results of the Trial.

‘Francesca’ produced beautiful rosy pink flowers on 33-inch stems. Bud count was relatively low, 2.5, for single-stem or florist sales, but flowers were great for bouquets. This LA hybrid flowered an average of 80 days from planting. Note that the crop time was an average of the relatively fast flowering in the greenhouse and the slower flowering in the field; see table for the range in crop times.

The LA ‘Garnacha’ was noted by participants for its rich red color and very large flowers. Stems averaged 36 inches long with a little over three buds per stem. It was one of the last cultivars to flower.

‘Logan’ had a relatively high bud count, averaging a little over four per 38-inch stem. The creamy white flower of this LA hybrid had a few burgundy specks at the base of the petals.

‘Obvio’ had a lightly sweet fragrance on a nice-sized white bloom, all were ready to harvest on the same day, that was nice.

The golden-yellow flowers of ‘Paramillo’ were very large. Buds counts averaged 2.4 on 39-inch stems. This LA hybrid flowered an average of 88 days from planting.

One trialer remarked about the “stunning orange flowers” of the LA hybrid ‘Revello’. Stems averaged close to three buds each and were about 42 inches long.

Other notable cultivars include ‘Vierne’, which had the highest bud count in the trial, almost five per stem. The flowers were white and stems averaged 35 inches long. ‘Paciano’ had the second highest bud count, close to 5 per stem, and the longest stems in the trial. Petals were a beautiful

soft pink. ‘Royal Sunset’ is well named as one trialer noted that “the colors definitely remind me of the colors of a sunset”. Stems had close to four buds each and flowered relatively quickly in 79 days.

Interpreting the trial results: The numbers reported are averages of all the respondents and many factors will affect the success of any plant species. Our participants grow and harvest trial plants using several methods. After looking at the average, check the range of responses listed below each number to see how the cultivar performed at its best and its worst. If the range of responses in the ratings is nar-



‘Pedara’

Photos by Tanis Clifton



row and high, i.e., 3-5 or 4-5, the plant was a winner for most of the respondents and is likely to do well for you. The 'Repeat Again Rating' is particularly important because it indicates if the trialer would take the time, money, and space to actually grow the cultivar again. Review the trial results carefully. If a variety sounds interesting, but did not appear to do well, try it anyway; it may work well for you.

Acknowledgments: A major thank you to each of the seven evaluators who returned their trial reports. The Lily Trial was more involved than our typical Seed Trial, and we greatly appreciate the time and energy of the trialers. We also want to thank Zabo Plants and Our American Roots for providing such great cultivars. Congratulations to Tanis Clifton for being the first trialer to return her evaluations! We would also like to thank Nathan Jahnke, Ben Bergmann, and Peyton Daly for assisting with the NCSU trials. In preparing the report we did a bit of editing of the comments for space and clarity; our apologies if we've altered the tone or content of anyone's comments.

Participating Companies

Zabo Plant

Pittsburgh, Pennsylvania
www.zaboplant.com

Our American Roots

Woodland, Washington
www.americanlilies.com

Participating Trialers and Production Information

Emily Capule

The Honey Bee and the Hound, Corpus Christi, Texas

Planted Zabo lilies March 13 and
 Our American Roots lilies April 15 in the field.

Tanis Clifton

Happy Trails Flower Farm, Dennis, Mississippi

Planted Zabo lilies March 14 and Our American Roots lilies April 10 in a high tunnel. Temperatures were average, but did reach 100 a couple of times in early June in the high tunnel. Shade cover installed May 31. All lilies were planted in crates in our own soil mixture of composted bark mulch, sand, and sphagnum peat moss. Lilies were planted, then stored in the cooler at 50 degrees for 3 weeks, to establish roots before placing into the high tunnel.

Thea Folls

Folls Flower Farm, Auburn, New York

Planted Zabo lilies March 15 and
 Our American Roots lilies April 17 in the field.

Jim Kelly

Emerald Farm, Glen Cove, New York

Planted Zabo lilies March 15 and
 Our American Roots lilies April 8 in the field.

Ingram McCall and John Dole

North Carolina State University, Raleigh, North Carolina

Planted Zabo lilies March 10 and
 Our American Roots lilies April 7 in a greenhouse.

Kathryn Klotzbach

Flower Fields Forever, Lyndonville, New York

Planted Zabo lilies March 16 and
 Our American Root lilies April 7 in a high tunnel.

Quinton Tschetter

Tschetter Flowers, Oskaloosa, Iowa

Planted Zabo lilies March 12 and
 Our American Root lilies April 6 in a high tunnel.

Paula Rice

BeeHaven Flower Farm, Bonners Ferry, Idaho

Planted Zabo lilies March 11 in a high tunnel in crates and
 Our American Root lilies April 28 in the field.

Summary of Comments

Note: many respondents did not make specific comments on each cultivar and in a few cases, comments have been shortened because of limited space.

‘Abrazo’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.

Comments: This lily produced a fluorescent red flower with enormous blooms!; Nice deep rich jewel tone red, freckles with slight or deep in center, large plum buds, very fleshy feeling, even with the low bud count, still very usable and actually very manageable; Red with yellow throat—loved it.

‘Canino’ (Zabo Plant) LA hybrid. No bud drop or abortion reported by any trialers; one trialer reported leaf yellowing.

Comments: This lily produced a beautifully-colored orange flower, I would grow again in a larger size bulb to get more buds, 1-2 buds is not acceptable for our purposes; I can always use fewer amounts of buds, especially in today’s design work, often times the others just have too many, but for making florist bunches it doesn’t work; Beautiful, good vase life, brilliant orange.

‘Dolly Madison’ (Our American Roots) Asiatic hybrid. Five out of seven trialers reported bud drop or abortion; two trialers reported leaf yellowing.

Comments: Only 20% of our stems did not have aborted buds, vase life was 8.5 days; This cultivar was a pretty pink with freckles, the shape reminded me of an Oriental lily, it was somewhat fragile and did not hold up as well as other lilies; May have planted too late in season—stems yellowed, barely produced buds; Beautiful clear, clean dark pink; Weak stems, small buds, beautiful.

‘Eniac’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.

Comments: Inconsistent bud formation from none to 4 buds, for this reason I would never grow this again; Super clear, clean orange; There was one plant with no blooms.

‘Francesca’ (Zabo Plant) LA hybrid. No bud drop or abortion reported by any trialers; one trialer reported leaf yellowing.

Comments: Buds clustered close together and straight up, which is nice for bouquet work, but the bud count was too low with only two buds, also, petals did not maintain a nice smooth texture in a vase, after only a few days they got a slight crinkled appearance like an aged bloom; Nice-sized blooms; Bulbs were sprouted when received.

‘Garnacha’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.



Comments: Deep rich color!! high bud count, super tall—the tallest of them all, very uniform and awesome all the way around, stood out among all the rest; A pure deep red, petals were slightly textured, kind of thick-like with a few freckles deep in the throat; Huge blooms, beautiful color.

‘John Hancock’ (Our American Roots) Asiatic hybrid. Two out of six trialers reported bud drop or abortion; two trialers reported leaf yellowing.

Comments: Lots of aborted buds, this cultivar had very weak stems, vase life was 8.5 days; This cultivar was beautiful and unusual with a deep burgundy splotch on each yellow petal, very interesting; Clients liked color combinations, secondary flowers held longer than ‘Yellow Diamond’; May have planted too late in season—stems yellowed, barely produced buds; This is weird but this came up in mixed colors; Weak stems, sprawling.

‘Logan’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.

Comments: Nice creamy white color; Clients liked the “freckles”; Nice, smaller blooms.

‘Meryl’ (Our American Roots) Oriental lily. One trialer reported bud drop or abortion; one trialer reported leaf yellowing.

Comments: Several stems had brown spots on the buds, vase life was 12 days; This cultivar is similar to a ‘Stargazer’ in ap-

‘John Hancock’ was beautiful and unusual with a deep burgundy splotch on each yellow petal, very interesting.



*‘Meryl’ was late flowering...
like waiting for Godot; hot,
dry summer may have
contributed.*

pearance, blooms are side facing which makes them easier to design with, farmers’ market customers love this type of lily, but not enough market to grow Oriental lilies so would probably not grow it on a commercial scale, this cultivar got so tall that the stems bent, so they had to be staked; Late flowering... like waiting for Godot, hot, dry summer may have contributed, had to be staked which I rarely do; May have planted too late in season—stems yellowed, barely produced buds; Beautiful, large, customers loved them.

‘Obvio’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.

Comments: Slightly sweet fragrance on a nice-sized white bloom, all were ready to harvest on the same day, that was nice; Really nice and plump buds, clear cream color (could be called a cream or white) sporadic bud count, but I have many types of markets so can get away with that; There was one plant with no blooms; Unique bloom, large, good vase life.

‘Paciano’ (Zabo Plant) LA hybrid. No trialers reported bud drop or abortion; one trialer reported leaf yellowing.

Comments: Nice to have a lily with higher bud count than most of the others trialed; Super light pink with a few dark freckles, half bloomed early and half bloomed later; Spotty colored flowers, ‘Tsajkovski’ was far superior in my view; Excellent cut flower; Very strong stems, good bud count.

‘Palentino’ (Zabo Plant) LA hybrid. One trialer reported bud drop or abortion; one trialer reported leaf yellowing.

Comments: The blooms were enormous; Huge flowers, but stems collapsed in the wind, where most others did not; There was one plant with no buds; Deformed buds, good vase life though.

‘Paramillo’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.

Comments: Nice bright yellow color with black speckles and a slight fragrance, blooms were huge!, I would grow this one again; This was a beautiful jewel-toned yellow, very rich and nice and deep golden color, this one I tortured a bit as it was the furthest away and in a corner, so maybe other

trialers had more buds on average, I really like the color of this yellow; In general clients like “freckles” on otherwise solid color flowers; Loved the flower and petal shape, good; Nice yellow lily.

‘Pedara’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.

Comments: The most unusual white LA hybrid. It had a slight blush pink/coral undertone to the white bloom. Can’t decide if I like it or if it looks like a washed-out white; Later blooming than other LAs, in general, I avoid white varieties due to staining; Lovely peach turns to white.

‘Ravello’ (Zabo Plant) LA hybrid. No bud drop or leaf yellowing reported by any trialers.

Comments: Very uniform, pretty much all the same; Stunning orange flowers, but good number flopped over; Rich color, good vase life vibrant; Just average to small size bloom, standard orange color.

‘Rokanje’ (Zabo Plant) LA hybrid. No bud drop or abortion or leaf yellowing reported by any trialers.

Comments: All the bud counts were either 3 or 5; Smaller white bloom than most LA hybrids I’ve grown, nice bud count though; Whites are difficult to bring to market; Very nice; Large buds, beautiful pure white.

‘Royal Sunset’ (Our American Roots) LA hybrid. One trialer reported bud drop or abortion; two out of seven trialers reported leaf yellowing.

Comments: Vase life was 10.5 days; The colors definitely reminded me of the colors of a sunset, perfect name, I like this cultivar but the petals seem somewhat fragile; Have grown for years, originally thought it might be too radical for my customers, but they loved them; I love this lily; May have planted too late in season—stems yellowed, barely produced buds; I’m not sure what may have different about this ‘Royal Sunset’ but it was so much more vibrant than any ‘Royal Sunset’ I have grown before, it amazed me; Customers loved it, but it was not as strong as past years that we have grown it.

‘Sorbonne’ (Our American Roots) Oriental hybrid. One trialer reported bud drop or abortion; one trialer reported leaf yellowing.

Comments: This cultivar is similar to ‘Stargazer’ in appearance, blooms are downward facing which makes it difficult to design with, farmers’ market customers love this type of lily, but not enough

I'm not sure what may have different about this 'Royal Sunset' but it was so much more vibrant than any 'Royal Sunset' I have grown before, it amazed me.

market to grow Oriental lilies so would probably not grow it on a commercial scale; Beautiful color and markings, customers liked it; Vase life was 10 days; I always grow, very pretty pink variety, standard for florists with “pink” clients; May have planted too late in season—stems yellowed, barely produced buds.

‘Sweet Desire’ (Zabo Plant) LA hybrid. One trialer reported bud drop or abortion; two out of six trialers reported leaf yellowing. *Comments:* The blooms opened cream with burgundy speckles, then changed to more of a creamy yellow in the cooler, pretty unique color, people either loved it or did not care for it; Huge flowers, but stems could not support them in a breeze or wind; There were two plants that did not produce buds; Good vase life, customers loved it, speckled.

‘Tayrona’ (Zabo Plant) LA hybrid. One trialer reported bud drop or abortion; one trialer reported leaf yellowing. *Comments:* The blooms were huge; Beautiful large white, simple yet striking.

‘Tsjaikovski’ (Zabo Plant) LA hybrid. One trialer reported bud drop or abortion; one trialer reported leaf yellowing. *Comments:* This pink lily was inconsistent in bud count, also experienced bud abortion on a few stems, for this reason I would not grow this one again; Nice compact heads; Petals shattered easily; Best pink variety in the LA group; Pastel, maybe too light, used in a wedding and the customer loved it.

‘Vierne’ (Zabo Plant) LA hybrid. No trialers reported bud drop or abortion; two out of six trialers reported leaf yellowing. *Comments:* The bloom was on the small side and a basic white, no wow factor; Customers like freckles, one very short stem; Beautiful but opened too quickly.

‘Yellow Diamond’ (Our American Roots) LA hybrid. Four out of six trialers reported bud drop or abortion; one trialer reported leaf yellowing. *Comments:* Vase life was 7.5 days; Nothing special about this yellow lily and inconsistent bud development will deter me from growing this cultivar; ‘John Hancock’ was superior in many ways; This was the only variety from Our American Roots to perform; Nice.



Trial Results for lilies. First row of data for each cultivar is the average and the second row is the range of responses. Note when only one response is listed in the range line, several trialers responded and all gave the same rating.

Cultivar	Ratings ²								
	Days to 1 st flower ¹	Days to last flower ¹	Low bud count	High bud count	Average bud count	Stem length (in.)	Market appreciation	Ease of cultivation	Grow again
‘Abrazo’	86	92	2.1	3.4	2.6	32	3.8	4.7	3.5
	61-106	63-116	2-3	3-5	2-4	23-43	2-5	4-5	1-5
‘Canino’	79	85	1.0	3.2	1.9	37	3.7	4.8	3.0
	52-101	56-110	1-1	2-4	2	30-40	2-5	4-5	1-5
‘Dolly Madison’	80	85	3.0	6.0	4.6	32	3.5	4.0	3.6
	60-103	64-110	1-5	2-9	2-7	24-38	1-5	1-5	1-5
‘Eniac’	88	92	2.8	4.7	3.7	42	5.0	4.8	4.0
	55-110	56-116	0-5	3-7	2-6	33-55	5-5	4-5	1-5
‘Francesca’	80	85	1.9	3.6	2.5	33	4.8	5.0	4.2
	52-101	52-110	1-2	2-5	2-4	24-36	4-5	5	3-5
‘Garnacha’	88	94	2.0	4.7	3.2	36	5.0	5.0	4.8
	55-106	57-121	1-4	3-7	2-6	24-50	5	5	4-5
‘John Hancock’	76	80	2.0	4.1	3.1	35	3.8	3.8	4.0
	62-88	69-89	0-3	0-7	0-5	24-48	1-5	1-5	1-5
‘Logan’	87	92	2.9	5.3	4.2	38	4.8	4.8	4.7
	55-108	57-116	2-4	3-7	3-5	30-50	4-5	4-5	3-5
‘Meryl’	98	103	2.3	5.1	3.6	40	3.8	3.7	3.2
	78-114	83-120	1-4	2-7	2-6	24-50	1-5	1-5	1-5
‘Obvio’	91	97	2.0	5.2	3.6	37	4.3	5.0	4.4
	67-109	74-116	0-3	4-6	3-4	33-45	3-5	5	3-5
‘Paciano’	86	91	3.9	5.9	5.0	42	4.3	4.8	4.2
	71-103	74-116	2-5	4-7	4-6	33-53	2-5	4-5	1-5
‘Palentino’	79	84	2.5	5.0	3.8	38	4.0	4.4	3.6
	52-98	54-103	0-3	4-7	3-5	28-47	3-5	3-5	1-5
‘Paramillo’	88	92	1.5	3.1	2.4	39	5.0	4.9	4.6
	52-111	56-116	1-2	3-4	2-3	32-53	5	4-5	3-5
‘Pedara’	86	90	2.5	3.7	3.0	42	4.3	4.8	4.2
	52-104	56-111	2-3	3-5	2-4	33-54	3-5	4-5	3-5
‘Ravello’	82	86	2.6	4.6	3.8	35	5.0	4.8	4.3
	55-97	59-101	2-3	4-5	3-5	26-53	5	4-5	3-5
‘Rokanje’	84	89	2.8	5.3	4.2	34	4.4	4.9	3.9
	52-107	56-112	2-4	5-7	3-6	30-40	4-5	4-5	2-5
‘Royal Sunset’	79	86	2.1	5.6	3.8	31	4.2	4.1	4.0
	62-88	71-96	1-4	2-7	2-6	24-40	1-5	1-5	1-5
‘Sorbonne’	82	90	1.7	4.3	3.8	35	3.8	3.8	3.6
	69-95	74-108	0-5	0-7	2-5	24-48	1-5	1-5	1-5
‘Sweet Desire’	76	80	2.0	4.5	3.2	36	4.0	4.8	3.6
	52-96	56-96	0-3	3-5	3-4	29-44	3-5	4-5	1-5
‘Tayrona’	82	85	2.0	3.3	2.6	35	4.0	4.8	3.8
	61-98	61-104	1-3	3-5	2-3	28-51	3-5	4-5	2-5
‘Tsjaikovski’	84	89	2.3	5.1	3.8	41	4.5	4.8	4.0
	61-101	61-112	1-3	4-7	3-5	33-52	3-5	4-5	1-5
‘Vierne’	81	87	3.7	5.5	5.1	35	4.7	4.8	3.8
	94-96	63-110	2-6	5-7	4-7	26-49	4-5	4-5	2-5
‘Yellow Diamond’	65	71	2.4	5.7	3.9	32	3.3	4.2	2.8
	43-81	43-88	1-3	4-7	3-5	24-41	2-5	3-5	1-5

¹Crop time varied greatly since the plants were grown in a broad range of environments from heated greenhouse to high tunnels to field.

²1 to 5 scale, with 5 being the best. Market ratings are based on sales to wholesalers, retailers or final consumers.

2016 Perennial Trial Report, Year 1

John M. Dole, Ingram F. McCall,
and Judy M. Laushman



Eupatorium 'Baby Joe'

Eupatorium 'Baby Joe' was the stand-out in the first year of the 2016-2017 ASCFG cut flower perennial trial. This charming filler flowered well in mid to late summer of the first year, producing 12- to 36-inch long stems of small fuzzy, purplish pink flowers. One trialer commented that the color blended well with the "pink/burgundy/grey colors that are popular in wedding work right now." Plants produced an average of three stems each, with some trialers getting up to seven. The cultivar name 'Baby Joe' refers to the fact that this is a shorter version of the native species, which occurs in the eastern United States and Canada. Is this good, considering that we like our cut flowers to have long stems? In this case yes, since it is not too short and the flower heads are more compact and showy. Since 'Baby Joe' is reported to grow up to five feet tall, we are expecting longer stems next year. Plants should be cold hardy in Zones 3 to 9. It should be noted that the various eupatoriums have undergone changes in their scientific names: *Eupatorium* 'Baby Joe' is actually *Eutrochium dubium* 'Baby Joe' and you might find it under that name.

A second filler flower, *Filipendula* 'Venusta', also performed well for some trialers, but hasn't yet flowered for others. It produces large clusters of small soft pink blooms that some also harvested in the bud stage, or in the "pod" stage, after the petals had dropped. The common name, queen of the prairie, gives you an idea of its elegance. Plants produced one or two stems ranging in length from 10 to 36 inches. This plant is native to the north central U.S. in Zones 3 to 8. Reports say that it does best in the shade, but can be grown in the sun if kept very moist. We will see what our trialers tell us next year.

Another native species, *Stokesia* 'Mel's Blue', showed potential in the first year for its large purplish blue flowers. Stem length was still quite short, however, ranging from 10 to 18 inches. The native form of this species, *Stokesia laevis*, is found in the southeastern U.S. and is cold hardy in Zones 5 to 10. Note that stokesia flowers will close at night, which might limit sales. Makes a great story to tell customers, however.



Stokesia 'Venusta'

Interpreting the trial results: The numbers reported are averages of all the respondents, and many factors will affect the success of any plant species. Our participants are growing and harvesting the trial plants using several methods. After looking at the average, check the range of responses listed below each number to see how the cultivar performed at its best and its worst. If the range of responses in the ratings is narrow and high, i.e., 3-5 or 4-5, the plant was a winner for most of the respondents and is likely to do well for you. The 'Repeat Again Rating' is particularly important because it indicates if the trialer would take the time, money, and space to actually grow the cultivar again. Review the trial results carefully. If a cultivar sounds interesting, but did not appear to do well, try it anyway; it may work well for you.

Acknowledgments: A major thank you to each of the 11 evaluators who returned their trial reports. We also want to thank Pioneer Garden for providing such great varieties. Congratulations to Jeanie McKewan for being the first trialer to return the evaluations this year! We would also like to thank Nathan Jahnke, Ben Bergmann, and Peyton Daly for assisting with the NCSU trials, as well as Linda Twining and Emma Denman for repacking and shipping the liners. In preparing the report we did a bit of editing of the comments for space and clarity; our apologies if we've altered the tone or content of anyone's comments.

Supplier

Pioneer Gardens
Deerfield, Massachusetts
www.pioneergardens.com

Trialers

Renee Clayton
Wild Scallions Farm
Timberlake, North Carolina
Zone 7b

Tanis Clifton
Happy Trails Cut Flower Farm
Dennis, Mississippi
Zone 7b

John Dole/Ingram McCall
NCSU
Raleigh, North Carolina
Zone 7

Michelle Elston
Roots Cut Flower Farm
Carlisle, Pennsylvania
Zone 6

Kate Field
Gateway Technical College
Kenosha, Wisconsin
Zone 5b

Bailey Hale
Ardelia Farm & Co.
Irasburg, Vermont
Zone 3b

Jeanie McKewan
Brightflower Farm
Stockton, Illinois
Zone 5

Rebecca Perry
Sabatia Flower Farm
Centerville, Massachusetts
Zone 7a

Paula N. Rice
BeeHaven Flower Farm
Bonners Ferry, Idaho
Zone 3/4

Richard Uva
Seaberry Farm
Federalsburg, Maryland
Zone 7a

Emily Watson
Stems Cut Flowers
Milwaukee, Wisconsin
Zone 5

Summary of Comments

The number in a parenthesis refers to the number of respondents who made the comment. If no number is present, only one person made the comment. Comments by each individual are separated with a semicolon (;). Note: many respondents did not make specific comments on each cultivar and in some cases, comments have been shortened because of limited space.

Astrantia 'Roma'

Good qualities: Astrantia did best in full sun, I had it in cloth, I planted the other half in the shade and it did not thrive there, the florist market and wedding design market loves this; Long lasting; Nice size flower, producing several small flowers on each stem adds to our bunches, good color easy to grow; Unique flower.

Problems: Short (2); It is not a showy flower, but a very desirable "filler" flower for the wedding industry; Hoping for longer stems next year; Plants did not do well, very little growth, then died back in the heat and humidity of summer.

Notable insects/diseases: None (4).

Additional comments: Similar to strawflower (2); We also purchased 100 of these bare-root from Pioneer one month earlier, they rooted better than the plugs we received, we were able to harvest about 3 stems per plant of the bare-root ones first year, stems were still pretty short (10-15 inches) but we're hopeful for next season, this plant handled our extremely dry summer well!; Plants were healthy and vigorous, but hardly flowered and no stems were usable, looking forward to their second year; Plants were planted out in the field within a couple days of receipt, they were very small and we planted them according to the instructions given and it was too much space and they were engulfed by weeds, after about 6-7 weeks, we dug up and repotted into gallon pots to grow on and will replant next spring; Low vigor with this species; All of these plants died; I did not harvest any stems this year.

Postharvest handling: No special handling required.

Eryngium ‘Big Blue’

Good qualities: In general we love this form of eryngium.

Problems: Difficult to establish.

Additional comments: Plugs were quite yellow and weak on arrival (4), about 25% died, and the others produced a few tiny green leaves, but don’t look especially “established”, they may surprise me and be great next year, but they seemed unhappy on arrival and never appeared to recover; We have planted many, many eryngiums (and killed quite a few), it seems that if they establish, they are amazing, they often die down in late summer, but reappear in spring, we have definitely lost more than we’ve had success with, these plants arrived in very rough shape and did not have a great chance of success, however, I also received a full flat of this same plant from Pioneer a few weeks earlier, and they also really struggled to establish, we will need to decide on its merits next season after they come back; The ones that lived just never seemed to grow, plants are still extremely small in the field; Our plants did not flower this year, 71% of the plants died over the summer; This one did not take off at all, I never saw any plants take hold and grow; We potted into gallons to grow on and will plant in the field in the fall; Due to their late arrival, this plant did not survive our field, staff too busy for constant hand watering to get established.

Eupatorium ‘Baby Joe’

Good qualities: Awesome filler flower, has a very desirable “muddy”-type color of pink/purple, super drought tolerant which makes it more versatile and easy to grow (this is weird because apparently it grows wild in marshy ditches in certain parts of the USA), it would fill up a bouquet very fast which is a big bonus; Lovely pink color nice form, great filler looks great with pink/burgundy/grey colors that are popular in wedding work right now, vigorous, fast growing, stays short and doesn’t shade other plants around it, can

grow dense in rows to maximize production; Vigorous and quick to establish; Nice spray to fill wholesale market bouquets; Flowers are tall and strong, foliage is clean; Nice flower color, size and shape easy to grow. Editor’s note: See also Postharvest article in this issue.

Problems: Color is dull pink or purple (2); Not a valuable main flower;

None, it’s great that it isn’t as crazy tall as the regular; Short vase life, we harvested when flowers were in bud, as we did not care for the frizzy open flowers. perhaps they’d last longer if harvested later; It’s a nice plant with compact size, easy to grow and adaptable, early to flower and fairly long lasting, just no “wow” factor about it, it will be good for a filler but certainly not feature flower; Deer love these, the color was unique, hard to mix with other blooms unless working on a muted palette; Open flowers dull quickly, we preferred using flowers in full color bud; Cutting flowers at proper time and conditioning is important; A little short, but that may change in year two?

Notable insects/diseases: None (5); The blooms were not in a rounded crown as expected, but looked more like ratty side shoots, I suspect insect damage took out the center of the inflorescence, I cut hundreds of stems of the native *Eupatorium* that don’t have this problem; Insects flocked to open flowers and rendered unattractive; There were corn rootworm beetles all up in the flowers.

Additional comments: I would say that it would take the place of a statice-type filler or baby’s breath....but way more specialty...which makes a small grower unique and different; ‘Gateway’ is very similar just taller; Grew with great vigor; We liked this so much that I purchased another flat in August, we did lose some of this second planting due to dry weather, it seems to prefer moisture upon establish-



Filipendula ‘Venusta’

ment, but was extremely drought tolerant after establishment; Based on the first year, the native wildflower is superior to ‘Baby Joe’, there seemed to be insect damage to the inflorescence that was not seen on the native stand on our property, perhaps the second season will yield better results, found this color bloom difficult to work into my more typical bright pallet, it did hold for a couple weeks in the cooler, however, the deer pruning actually stimulated branching and more usable stems, the un-chewed made rather large heads; This cultivar has good potential, I am very interested to see how it will do next year; Again I really did not harvest any in hopes of having a stronger plant next year.

Filipendula ‘Venusta’

Good qualities: Good vigor, tall stem; Nice fluffy pink flower in the middle of summer, will be especially good for events and weddings; Vigorous growth, nice color and texture; We preferred the flowers after they have completed blooming and buds were bronze in color; Could probably be harvested in different stages, it remained attractive after flowering. Editor’s note: See also Postharvest article in this issue.

Problems: We lost all these late in the season due to extreme drought (we lost some established perennials this season due to the dry weather), I am hoping they went dormant and will return in spring; Not a main focal flower from a design standpoint, amorphous flower form; Flowers

shattered very easily after stems were cut; The tiny little petals shatter and fall like snow, they can become very messy in short order, perhaps there is a postharvest treatment, or better stage of harvest that will make them more usable, they may be best suited for event work rather than general retail sale; Flowers shattered, we cut in full colored bud, partial flower/partial bud, full flower, and after flowering, the colored bud stage wilted quickly and had troubles rehydrating, any stage of flower, shattered, we finally tried the “pods” and were happiest with those.

Notable insects/diseases: None (2); Japanese beetles liked to hang out on the flowers, but they didn’t seem to do much damage.

Additional comments: The flower shape and color reminded me of astilbe (2), which is pretty hard to grow here; Similar to spirea; I love filipendula and it is very much desired and loved at every level of the floral industry, I will be excited to see this one bloom; Vigorous, I expect many more stems once established; Another one I am very interested to see next year; Not enough stems to make much of an impression; It is worth further experimentation to see if the petal drop can be reduced, because the color, and texture of the flower is lovely, and they seem quite vigorous; I did not harvest any stems since a first-year harvest frequently leads to failure the next year.

Heucherella ‘Art Nouveau’

Good qualities: Did survive our very dry summer but barely!, no marketable stems or leaves, leaves are pretty; Very vigorous, and established quickly, seems to prefer part shade.

Problems: Low vigor overall, poor survival in sunny areas, better in shade area; These little plants came in looking very sad, I was able to get 2 to make it through the season and I hope they make it through the winter, we had a very hot and dry summer; May not be vigorous enough for production, needs a ton of water; Plants grew slowly; This plant seems to be primarily a foliage plant, remains to

Stokesia ‘Mel’s Blue’ had a lovely flower and an unusual color for the middle of summer.

be seen if it produces marketable flowers; These plants remained very small through the season.

Notable insects/diseases: None.

Additional comments: We’ve tried many other heucheras/heucherellas and have had only limited success, we prefer more vigorous perennials with more usable stem length; I am a little worried I have them in too much shade; 1st year trial not an accurate evaluation of this plant, potential to use leaves as filler if they get the advertised height of 16-18 inches, no flowers produced in first year, leaf stems not long enough to use as a cut as yet; All plants were alive when delivered, but not in good shape, 71% died by the end of the summer, our plants did not flower this year; I cut only a few leaves off for trial, and they held well. I wanted to keep most on the plants to build strength for next season, they may be a useful foliage for sale to florists, they had a similar vase life of heucheras, they seem to be tough, I saw some sit on the clearance rack at the local Tractor Supply for a few months this summer, they still looked surprisingly good despite the abuse.

Physostegia ‘Pink Manners’

Good qualities: Beautiful shiny dark leaves, clean strong pink flowers, strong stems, good appearance; Tolerated very dry summer well; Grows well in partial shade, a nice spike flower in the middle of summer, pollinators love it; Late-blooming vigorous plant.

Problems: None worth noting; Was not a color or form that appeals to us, flowers bloomed low in plant (open from bot-

tom of cluster) and did not look great in bouquets; Weak color; Flowers did not develop uniformly, I didn’t cut any to help the plant develop strength, but none looked worth cutting.

Notable insects/diseases: None (3). The sporadic and contorted flowering may have been the result of unseen insect damage. Our primary pest is Tarnished Plant Bug, but I can’t confirm they were the issues.

Additional comments: Out of all the plants in this trial, during the first year, this is the most promising, I will expect more stem length in subsequent years; A vigorous plant but not substantial enough flower for our style; Excellent potential for next year, once the plants are established.

Stokesia ‘Mel’s Blue’

Good qualities: Nice blue color (4); Good vase life, attractive flower shape; Loved dry weather, great promise to be vigorous and taller as it establishes next year; Hardy plant requiring little attention, did well in a pretty brutal summer here, plants that did not flower had good basal growth and could flower well next year; Doesn’t stop blooming; Cute.

Problems: Too short (3) this year; Not an impressive flower, inside browns quickly, plants got competition from weeds, but we preferred ‘Matsumoto’ asters over this plant; Unusable; So many flowers on a stem, hard to use in small bunches, have to decide to harvest stem either early before all flowers open, or late after some have passed their peak; We did not harvest any stems.

Notable insects/diseases: None (4).

Additional comments: Flower looks like scabiosa; In the vase, the flowers closed every evening and opened up again in the morning; One of our two favorites of the trial (also *Eupatorium*), great in small, low arrangements, we are very hopeful for this next year!; A lovely flower and an unusual color for the middle of summer; They bloomed too short to be of much use this season, but I look forward to their second year.



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Trial Results for Year 1 of perennial cultivars. First row of data for each cultivar is the average and the second row is the range of responses. Note when only one response is listed in the range line, several trialers responded and all gave the same rating.

Species	Cultivar	Plants flowering (%)	Yield (stems/plant)	Stem length (inches)	Ratings ¹		
					Market appreciation	Ease of cultivation	Grow again
<i>Astrantia</i>	Roma	32 0-100	5.0 4-6	9 4-13	2.3 1-4	3.3 1-5	2.7 1-4
<i>Eryngium</i>	Big Blue	72 50-80	- -	- -	1.0 1	2.0 1-3	4.0 3-5
<i>Eupatorium</i>	Baby Joe	88 0-100	3.2 1-7	23 12-36	3.3 2-5	4.6 4-5	3.5 2-5
<i>Filipendula</i>	Venusta	54 0-100	1.3 1-2	26 10-36	2.3 1-4	3.9 1-5	2.9 1-4
<i>Heucherella</i>	Art Nouveau	- -	- -	- -	1.0 1	3.2 2-5	1.8 1-3
<i>Physostegia</i>	Pink Manners	72 0-100	2.7 1-4	17 12-24	3.0 2-4	4.6 4-5	3.3 2-4
<i>Stokesia</i>	Mel's Blue	78 0-100	2.7 1-5	13 10-18	3.2 1-4	4.3 3-5	3.9 1-5

¹1 to 5 scale, with 5 being the best. Market ratings are based on sales to wholesalers, retailers or final consumers.

POSTHARVEST TREATMENT OF SPECIALTY CUT FLOWERS

North Carolina State University Report for 2016

Nathan Jahnke, John M. Dole, and Ingram F. McCall

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. The authors would like to thank Ben Bergmann and Peyton Daly for assisting with growing and harvesting the cut flowers.

Every year we conduct vase life studies on promising species and cultivars from the ASCFG Perennial, Seed, and Woody Trials. With the ASCFG's new trial format this year we tested a variety of greenhouse-grown lilies and a few perennials.

Lilies were the largest part of the trial this year. We enjoyed staking them as well as experiencing orange-dusted palms while handling these beauties. Don't assume plants from the same genus will have the same postharvest handling requirements. Some lilies such as 'John Hancock', 'Meryl', and 'Sorbonne' did not show a statistical increase in vase life when treated with hydrator or holding solution. On the other hand, a holding solution increased the vase life of 'Royal Sunset' and 'Dolly Madison'. Generally, holding solutions increased the number of buds that open, and prolonged vase life.

Of the perennials we received and planted this year, a few bloomed, but only two produced stems tall enough to harvest. *Eupatorium* 'Baby Joe' was the most resilient cut of the trial, lasting an average of 20 days. It was not affected by postharvest solutions, but produced harvestable flowers in its first year. It also boasted a high yield, and the longest vase life of any cultivar in the trial. We did not get enough *Filipendula* 'Venusta' stems to fill the whole experiment, but the stems tested needed a holding solution to reach their maximum average vase life.

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 four equal groups and placed in the treatments below for the specified time and 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 DI water and held at $68 \pm 2^\circ\text{F}$ 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) or 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 or 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, by either 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 time, such as four hours. Vase solutions are generally applied by the consumer, commonly small 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 1 to 3 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

Eupatorium ‘Baby Joe’ This was the fastest growing and most prolific bloomer of the trial. It flowered its first year in the ground and produced a shorter, second harvest. There was no difference between any of the treatments, but with an average vase life of 20 days this is one resilient flower. Be sure to get stems into water quickly. We noticed that if a stem was allowed to wilt, it never recovered.

Filipendula ‘Venusta’ This dainty flower resembles *Astilbe* from a distance, but with a flatter panicle. Growing it under part shade, we were able to harvest 16 stems long enough for the vase life treatments. Treating with holding solution provided the best average vase life at 6.7 days, while vase life in water averaged 4.3 days. We noticed some shattering throughout postharvest. Since production was on the low side the summer of 2016, we expect to get a better read on the vase solution requirements for this crop during the 2017 season.

Lily ‘Dolly Madison’ Although hydrator and holding solutions did not statistically improve vase life, they are still recommended as the average vase life was highest, 9 days, when treating with both.

Lily ‘John Hancock’ John Hancock was one of our favorites with its bright yellow-gold color and rusty, brown speckles. There was no increase to the 8.5-day vase life when treating with hydrator or holding solutions.



‘Baby Joe’



‘Venusta’



‘Dolly Madison’



‘John Hancock’

Lily ‘Meryl’ This was the most fragrant lily in the whole trial. It lasted for an average of 11.3 days, regardless of treatments.

Lily ‘Royal Sunset’ The variation in oranges made ‘Royal Sunset’ the most unique lily of the trial. Definitely treat this with a holding solution as it significantly increased vase life to 11 days compared to 9.5 in tap water. If possible, provide hydrator before the preservative as this will give the vase life a little boost. Hydrator alone did not statistically increase vase life.

Lily ‘Sorbonne’ ‘Sorbonne’ was very similar to ‘Meryl’. The average vase life was 9.8 days regardless of treatments.

Lily ‘Yellow Diamond’ Hydrator and holding treatments did not statistically affect vase life, giving ‘Yellow Diamond’ an average vase life of 7.7 days.



‘Meryl’



‘Royal Sunset’



‘Sorbonne’



‘Yellow Diamond’

Perennial Project - Production and Postharvest

Nathan Jahnke, John M. Dole, and Ingram F. McCall

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This project was supported by Ball Horticultural Company through their generous donation of plant material. The authors would like to thank Ben Bergmann and Peyton Daly for assisting with growing and harvesting the cut flowers.



Perennials are gifts that keep on giving. With the bonus of planting once, and harvests over multiple years, these plants are must-haves for field cut flower producers. Perennials offer a wide variety of shapes, colors, and postharvest durability. However, it can be difficult to find the right varieties and cultivars in today's industry, which is breeding for compact plants. Through our trialing we provide recommendations on a number of perennials for you to try.

We received rooted liners from Ball Horticultural Company, and planted three blocks of 12-16 plants each. All flowering stems were harvested and measured if over 12 inches in length. Stems were then processed by recutting to a similar length and putting them into a vase life study. These are the treatments we used during our postharvest trial:

- 1) Hydrator only (4 hours)
- 2) Holding preservative only (2 days)
- 3) Hydrator for 4 hours followed by holding preservative for 2 days
- 4) 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 $68 \pm 2^\circ\text{F}$ 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) or florets on the stem were brown, wilted, drooped over, etc. This study helps us provide accurate information how long these flowers will last and how to increase vase life.

If you are looking for more information on our postharvest trials or production information on the varieties we tested in years past, check out any of our articles in *The Cut Flower Quarterly* or go online to: <https://cutflowers.ces.ncsu.edu/>.

Agastache 'Blue Boa'

Production: 100% of plants bloomed with an average yield of 21 useable stems per plant. Stems averaged 14 inches long.

Postharvest: Overall, stems lasted an average of 8 days in tap water. With the addition of holding preservative for 2 days, the vase life was increased to 9 days.

Notes: 'Blue Boa' took a little while to get started, but did produce throughout the growing season. Flowers continued blooming after harvest, and were lavender to violet. With its great mint-like fragrance it can add another dimension to arrangements.

Final Thoughts: Fragrant filler with production all season long.



Agastache 'Blue Fortune'

Production: 100% of plants bloomed with an average yield of 43 stems per plant. Stems averaged 19.5 inches in length.

Postharvest: The average vase life increased from 8 days in tap water to 9 days using holding preservative for 2 days.



Notes: 'Blue Fortune' differs from 'Blue Boa' in several aspects. The flowers are a lighter lavender, but the stems are much longer, easier to cut, and stronger due to thickness. It bloomed throughout the summer providing multiple harvests. When cut, it releases a licorice-like fragrance.

Final Thoughts: Sturdy filler with long stems, and reliable production throughout the growing season.

Coreopsis 'Cerise'

Notes: Stems were short, brittle, and branched, producing a low quality cut. Although plants produced a large number of flowers, we were not able to get stems long enough to conduct postharvest tests.

Final Thoughts: Not recommended for cut flower use.



Coreopsis 'Ruby Frost'

Production: 100% of plants bloomed, with each plant producing an average of 53 stems. Stems were an average of 15 inches.

Postharvest: Vase life in tap water averaged 8 days, and was not affected by hydrator or preservative.

Notes: 'Ruby Frost' was by far the most prolific bloomer throughout the entire growing season. The flowers are a beautiful red and gold. Although it produced a plethora of stems, in postharvest new buds failed to open, decreasing its potential.

Final Thoughts: Has great potential as a filler for small bouquets if it is used quickly after harvest.



Helenium 'Ruby Tuesday'

Notes: Plants did not produce stems long enough to harvest or obtain postharvest data.

Final Thoughts: Not recommended for cut flower use at this time.



Mondarda 'Cranberry Lace'

Notes: Too short for production and postharvest experiments.

Final Thoughts: Not recommended for cut flower use.

Monarda 'Jacob Cline'

Production: 100% of plants bloomed, with each plant producing an average of 9 useable stems. Stems were an average of 15 inches. 23% of plants died by the end of summer.

Postharvest: The longest vase life was in tap water at 7 days. Hydrator and holding preservative did not statistically increase vase life.

Notes: The stems often fell over and curved, so netting may be needed. Plants flowered throughout the growing season giving steady production. We experienced periods of heavy rain and intense heat, causing our plots to lose quite a few plants by the end of the summer. Make sure to have adequate drainage.

Final Thoughts: It has potential, but may require more labor to produce high quality stems.



Perovskia ‘Longin’

Production: 100% of plants bloomed with each plant producing an average of 23 useable stems. Stems were an average of 18.5 inches long.

Postharvest: There was a no difference between any of the treatments. The overall average vase life was 5 days.

Notes: Although the vase life is short, ‘Longin’ does have silver-grey, long, straight stems and a great fragrance. The purple flowers do not open well, and shatter during postharvest.

Final Thoughts: Not highly recommended for use as a cut, but it could provide great fragrance and color contrast with its silver-grey stems for events where a long vase life is not needed.



Rudbeckia ‘Viette’s Little Suzy’

Production: 100% of plants bloomed with each plant producing an average of 13 useable stems. Stems were an average of 15 inches.

Postharvest: Hydrator, holding and hydrator + holding treatments all increased vase life to 18 days compared to 12 days in just tap water. We recommend using holding preservative, if nothing else, as it also decreased the variability in vase life.

Notes: Plants produced one large harvest about midsummer. Harvesting was relatively easy as stems were a good length and held high above the foliage. Flowers had a long vase life and colors did not fade after harvest.

Final Thoughts: Highly recommended due to its long vase life, ease of harvest, and gold-yellow color.



Salvia ‘Burgundy Candles’

Production: 100% of plants bloomed, with each plant producing an average of 8.5 useable stems. Stems were an average of 13.5 inches long.

Postharvest: No treatment statistically improved vase life from an average of 5 days.

Notes: Very slow to start, and there was no peak harvest throughout the season. Plants may need a season to bulk up for better harvest. Flowers were a deep purple and had a great fragrance.

Final Thoughts: Not highly recommended at this time as the stem length and vase life were on the short side, but future seasons may provide different results.



Veronica ‘Charlotte’

Production: 100% of plants bloomed with each plant producing an average of 4.5 useable stems. Stems were an average of 12.5

inches in length. 6% plants died by the end of the summer.

Postharvest: There was no statistical difference between treatments, but the holding preservative did increase the average vase life from 13 to 15 days.

Notes: This was one of our favorites, because it had a variety of attractive characteristics like variegated leaves, white flowers, and upright habit. However, with an average length of just over 12 inches, and low production numbers, it may be difficult to justify growing this as a cut.

Final Thoughts: Main drawbacks are the shortness and minimal production, but with a great vase life it should be considered. Stem length may be longer next year.



Veronica ‘Tranquility’

Production: 100% of plants bloomed with each plant producing an average of 13 useable stems. Stems were an average of 13.5 inches.

Postharvest: The average vase life was 11 days and no treatments statistically increased it.

Notes: The upright habit made harvesting easy and each plant produced a high number of stems. Stems were usually straight and flowers continued to open during postharvest.

Final Thoughts: Recommended for cut flower use due to the high production and long vase life. Stem length may be longer next year.

