Passing The Vase Test: Postharvest Handling of Specialty Cuts
Astilbe

- Cut ½ to ¾ open (inflorescence does not continue opening if cut tight)

- Recommend hydration solution (compulsory for Dutch auctions)
Centranthus

- Cut when inflorescence is \( \frac{1}{2} \) open
- Process stems in chlorine solution
Daffodils

- Keep daffs separate from other species - the sap (mucilage) is deadly, especially to freesia, lilies and tulips
- Exception: research indicates daff sap increases vase life of iris flowers
- Process stems in chlorine solution
Deutzia
One ASCFG grower’s experience

- Water plants well 24 hrs before harvesting
- Cut when florets are swollen--just starting to open
- Harvest in early morning directly into hydrating solution
- Hydrate for minimum 24 hrs before selling
- We keep it constantly in hydrating solution and advise customers to never let bunches sit out of water
Hellebore

- Harvest period is very long
  - Stamens visible
  - Stamens dropped
  - Seed pods
- Water – 10.5 days
- Holding – 17.5 days
Snapdragon ‘Chantilly’

Water: 4-5 days

Holding: 7-8 days
Snapdragon Calima Pure White

- Holding 8 days
- Water 5-6 days
- 3 day minimum
Sweet Pea ‘Winter Elegance’

Retail: Treatment $P \leq 0.001$, Storage NS, T x S NS
Consumer: Treatment $P \leq 0.001$, Storage NS, T x S NS
Summer Cuts
Basil ‘Cardinal’

Hydrator: 11.5 days
Water: 4.7 days
Store at 50F
Basil ‘Aromato’

Hyd + Hold 24 days
Hold 23 days
Hyd 15 days
Water 13 days
3 day minimum
Bupleurum

- Cut stage is important for vase longevity
- Cut when flowers are at least $\frac{1}{2}$ open per stem
- Bupleurum pollutes water fast---recommend chlorine solution from harvest forward
Coleus

- Many cultivars look great and are easy to cut
- Stems wilt easy and don’t rehydrate well
- Harvest early in the morning
- Doesn’t tolerate cold storage
- Water best for holding
- Little to no effect from floral preservatives
Craspedia

- 38.7 days
- No effect from hydrator or holding preservative
Dahlia ‘Thalia’

- 7-10 day vase life in DI water
- **Increased vase life:**
  - Commercial holding preservatives
- **Decreased vase life:**
  - Long term 34°F storage
- **No effect:**
  - Ethylene
  - STS or 1-MCP
  - Hydrator
  - Foam
  - Tap water

\[ P \leq 0.003 \]
Dahlia ‘Thalia’

- Harvest breaking buds with 50% color

Bud: NS; Open flowers: $P \leq 0.0001$
**Eupatorium cannabinum**

- NC State 2002 flower trials report that flowers last 20-24 days regardless of treatment!

- Dutch auctions require that *Eupatorium* species are treated in chlorine water

- Must be picked ½ open for good vase life according to one grower in the ASCFG 2001 cut flower trials
Euphorbia marginata

- Sap can irritate eyes and skin—wear gloves
- Holding solution can increase vase life 70% over plain water
Lisianthus

Cultivars tested:
- ABC Lavender
- ABC Misty Blue
- Alice Pink
- Excalibur Pure Yellow
- Malibu Purple
- Rosita Jade
- Twinkle Blue Blush
- Twinkle Pink
- Vulcan Yellow
- Wonderous Purple

Overall results:
- Holding preservative best
  - Allows more buds to open and allows those buds to color better
- Hydrator had no effect
Mint

- Store at 34-36°F
- Ethylene sensitive
- Hydrate in chlorine solution
Rudbeckia ‘Indian Summer’

- 21+ day vase life in water
- Small % stems die quick
- Hold for 1-2 days before bunching/shipping to remove wilted flowers
Rudbeckia ‘Indian Summer’

- Shortens vaselife:
  - Foam
  - 10 or 20% sucrose pulse
- Floral preservatives either shorten or have no effect on vaselife
- No effect:
  - Dry storage
  - STS or 1-MCP
  - Tap water

![Bar chart showing vaselife comparison between foam and no foam](chart.png)
Rudbeckia ‘Prairie Sun’
23 day average
12 minimum
**Scabiosa caucasica**

- Ethylene sensitive—treat with STS or 1-MCP

- Holding solution significantly extends vase life
Tweededia

- Process stems in chlorinated water
- Store at 34-38°F
- Long vase life is temperature dependent
Lilies

- Many types
- Cultivar differences
- Orientals are sensitive to rapid cooling
- Asiatics sensitive to ethylene
- All respond well to holding and consumer preservatives
What are the Best Flower Foods for Lilies?

- Chrysal Clear
- Chrysal Clear Lily and Alstroemeria Special
- Chrysal Clear for Bulbs
- Floralife Crystal Clear
- Floralife Bulb Food
- Water (control)

- Asiatic
  - Brunello
  - Pollyanne
- LA Hybrids
  - Aladdin Dazzle
  - Samur
- Oriental
  - Camberra
  - Siberia
  - Sorbonne
  - Stargazer
Asiatic Lily ‘Brunello’
Asiatic Lily ‘Pollyanna’
LA Hybrid ‘Alladin Dazzle’
Oriental Lily ‘Camberra’
## Overall Vaselife

<table>
<thead>
<tr>
<th></th>
<th>Asiatic</th>
<th>LA</th>
<th>Oriental</th>
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<tbody>
<tr>
<td></td>
<td>Vaselife (d)</td>
<td>Vaselife (d)</td>
<td>Vaselife (d)</td>
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<tr>
<td>Control</td>
<td>10.4</td>
<td>10.6</td>
<td>11.3</td>
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<tr>
<td>Chrysal Clear</td>
<td>10.6</td>
<td>10.9</td>
<td>11.3</td>
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<tr>
<td>Chrysal Lily &amp; Alstroemeria</td>
<td>11.9</td>
<td>13.4</td>
<td><strong>13.1</strong></td>
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<tr>
<td>Chrysal Bulb</td>
<td>12.1</td>
<td>13.5</td>
<td><strong>13.1</strong></td>
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<tr>
<td>Floralife Crystal Clear</td>
<td>10.7</td>
<td>10.9</td>
<td>11.8</td>
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<tr>
<td>Floralife Bulb</td>
<td>12.6</td>
<td>12.8</td>
<td><strong>12.1</strong></td>
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<tr>
<td>Significance</td>
<td>*</td>
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</table>
Much cultivar variation
Much work has been done
## Cultivars

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Pink</th>
<th>Vase life (d)</th>
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<tbody>
<tr>
<td>James Pillow</td>
<td></td>
<td>9.5</td>
</tr>
<tr>
<td>Mister Ed</td>
<td></td>
<td>8.5</td>
</tr>
<tr>
<td>Raspberry Sunday</td>
<td></td>
<td>8.0</td>
</tr>
<tr>
<td>Monsieur Jules Elie</td>
<td></td>
<td>6.4</td>
</tr>
<tr>
<td>Edulis Superb</td>
<td></td>
<td>6.3</td>
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<tr>
<td>Sarah Bernhardt</td>
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<td>5.6</td>
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</table>

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>White</th>
<th>Vase life (d)</th>
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<tbody>
<tr>
<td>Festiva Supreme</td>
<td></td>
<td>8.6</td>
</tr>
<tr>
<td>Henry Sass</td>
<td></td>
<td>8.1</td>
</tr>
<tr>
<td>Festiva Maxima</td>
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<td>7.3</td>
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</table>

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Red</th>
<th>Vase life (d)</th>
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<tbody>
<tr>
<td>David Harum</td>
<td></td>
<td>9.0</td>
</tr>
<tr>
<td>Felix Supreme</td>
<td></td>
<td>8.5</td>
</tr>
<tr>
<td>Karl Rosenfield</td>
<td></td>
<td>7.7</td>
</tr>
<tr>
<td>Felix Crouse</td>
<td></td>
<td>7.7</td>
</tr>
<tr>
<td>Lora Dexhelmer</td>
<td></td>
<td>6.5</td>
</tr>
<tr>
<td>Kansas</td>
<td></td>
<td>5.5</td>
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</tbody>
</table>

Gast, 1995
Harvest

- Harvest stage varies with the cultivar
  - Reds tend to open the slowest
  - Pinks intermediate
  - Whites fastest
  - Cultivars with fewer petals open fastest
Harvest

- Pick faster opening cultivars tighter
- Feel firmness of buds
- Pick early in the morning
- Bring to processing area frequently
Stage of Harvest

1 = tight bud with little color showing
2 = tight bud with color showing
3 = soft bud
4 = very soft bud
5 = almost fully open, petal not reflexed
6 = fully open
Grading

- Stem length
- Stem caliper
- Bud size
## Hydration or No Hydration?

<table>
<thead>
<tr>
<th>Hydration</th>
<th>Dry</th>
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<tbody>
<tr>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Improves flower opening for consumers, esp. if stored</td>
<td>Reduces flower opening during hydration, storage or shipping</td>
</tr>
<tr>
<td>Flowers might open during hydration, storage or shipping</td>
<td>Reduces flower opening during hydration, storage or shipping</td>
</tr>
<tr>
<td>Increases chance of botrytis</td>
<td>Decreases chance of botrytis</td>
</tr>
</tbody>
</table>
Postharvest Handling

- Reduce temperature as soon as possible to 34 to 35°F
- Grade and bunch while still cold
- Botrytis is a major problem
  - Flowers and foliage must remain dry
  - Enhanced by plastic sleeves

- Consumer vase solutions (1% sugar) significantly improves longevity when and if flowers are stored longer than 2 weeks
## Long-term Storage

<table>
<thead>
<tr>
<th>Storage (weeks)</th>
<th>Edulis Superba</th>
<th>Festiva Maxima</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Vase life (d)</td>
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</tr>
<tr>
<td>0</td>
<td>6.3 a</td>
<td>7.3 a</td>
</tr>
<tr>
<td>1</td>
<td>5.5 b</td>
<td>6.6 a</td>
</tr>
<tr>
<td>2</td>
<td>4.9 c</td>
<td>4.5 b</td>
</tr>
<tr>
<td>3</td>
<td>5.1 bc</td>
<td>5.1 b</td>
</tr>
<tr>
<td>4</td>
<td>4.7 c</td>
<td>4.3 c</td>
</tr>
<tr>
<td>5</td>
<td>3.9 d</td>
<td>2.4 c</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>1.5 d</td>
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</table>

Gast, 1995
## Pretreatments

‘Shawnee Chief’

<table>
<thead>
<tr>
<th>Pretreatment (2 hr)</th>
<th>Week 0</th>
<th>Week 4</th>
<th>Week 8</th>
<th>Week 12</th>
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<tbody>
<tr>
<td>None</td>
<td>6.8 e</td>
<td>4.0 e</td>
<td>4.1 bc</td>
<td>4.4 c</td>
</tr>
<tr>
<td>Water</td>
<td>6.9 de</td>
<td>4.0 e</td>
<td>4.1 bc</td>
<td>4.7 bc</td>
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<tr>
<td>Preservative</td>
<td>8.1 b</td>
<td>4.0 e</td>
<td>4.1 bc</td>
<td>4.8 bc</td>
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<tr>
<td>10% sucrose</td>
<td>8.1 b</td>
<td>4.1 de</td>
<td>4.0 c</td>
<td>5.0 ab</td>
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<tr>
<td>20% sucrose</td>
<td>7.3 cd</td>
<td>5.9 ab</td>
<td>4.4 abc</td>
<td>5.0 ab</td>
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<tr>
<td>STS</td>
<td>7.6 c</td>
<td>5.9 ab</td>
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<tr>
<td>STS+10% sucrose</td>
<td>9.3 a</td>
<td>6.0 a</td>
<td>4.7 a</td>
<td>5.3 a</td>
</tr>
</tbody>
</table>

Vase life (d)

Gast, 1997
Sedum

- Slow release chlorine
Clematis

- Chalk Hill recommended Chrysal Professional #1 during presentation at the 2008 ASCFG convention in Portland
Hydrangea ‘Limelight’

11 days – water
12 days – preservative
Hydrangea ‘Hamburg’
Aluminum sulfate-based hydration solutions: hydrangeas love aluminum!
Lilac

- Holding solution recommended
- Dutch auctions require growers to supply flowers to clocks with special food attached (higher % sugar)
Physocarpopulifolius
‘Summer Wine’ foliage

Holding: 15.3 days
Water: 12.3 days
Cotinus

- Hydration solution
  + surfactant
Physiocarpa opulifolius ‘Diabolo’

Water: 20-22 days
Holding: 18-19 days
Rose - Garden

- Roses love low pH (3.5—4.5) solutions
- Holding solution
Viburnums

- Holding solution
Support

- ASCFG Research Foundation
- ASCFG Research Committee
- American Floral Endowment
- Floralife
- Chrysal Americas
- Smithers Oasis
- Seed and Plant Suppliers
- Growers
- Coor Farm Supply, Dillon Plastics, Fafard, Berger, Scotts