

OSU Learning Gardens: 2008 Mixed Container Trial

By Bart Hayes and Claudio Pasian

Mixed containers continue to be an important component in the total sales of ornamental products. For the past five years, the OFA Short Course and the Ohio State University (OSU) have organized an annual workshop on this topic. Each year, attendance at the workshop was high, and the event often sold out. To achieve such success for so long testifies to the importance of this topic.

Also, for the past six years, OSU has been conducting Mixed Container Trials, evaluating plants' performance over the length of the season. In other words: A newly prepared combination always looks good, but how does it behave over time, based on plant size, color, texture and other factors? For example, do the designs deteriorate, improve or stay the same? This evaluation represents a measure of the sustainability of the design.

The sixth year of the Mixed Container Trial offered new insight into the performance and durability of plants grown in large combination planters. Four companies participated, and the trial's director and manager evaluated the combinations as a whole — plus individual plants in each combination — on a monthly basis in July, August and September. Consumer-preference evaluations also were conducted monthly by a team of Master Gardeners.

We established two objectives. First, we wanted to evaluate over time the combination of plants (design) as a whole as well as each individual plant in the combination. Second, we wanted to compare cultivars grown in mixed-container plantings versus the same cultivars grown in single-cultivar (monoculture) containers.

With plants from four companies and plenty of monocultures and mixed containers to evaluate over the summer, the sixth year of this university's trials focused on the combinations' sustainability of design.



General Information

Transplanting date: June 3, 2008

Container size: 12-inch diameter for monocultures; 16-inch diameter for combination plantings

Location: outdoor, full-sun location in secured gravel area just west of our Columbus departmental greenhouses

Weather conditions: Dry and sunny conditions for most of the summer, following a very wet June

Media: Metro-Mix 300

Preventive drench: Plugs were treated with a Plantsield drench just before transplanting

Replications: up to three for monocultures; three for combination plantings

Cultural Practice

Irrigation: The plants were watered by a drip-irrigation system on a timer, which was adjusted according to the size of the plants and the time of year.

Fertilization: The 16-inch mixed containers received 120 grams of Osmocote 16-9-12, and 12-inch monoculture containers got 90 grams.

Pruning: Monoculture pelargoniums were periodically deadheaded, but none of the other combinations received pruning or deadheading.

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• Jaap Van Staalduinen, Dutch Flower House, Inc.



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• Mark Watkins, Bogie Lake Greenhouse



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• John Van Vugt, Van Vugt Greenhouse



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Pests and Diseases

Two-spotted spider mites were a problem on verbena, and Japanese beetles were an issue on Sunpatiens, but they quickly recovered. There were no serious disease issues. The remnants of a hurricane caused wind damage late in the season, and some of the more vigorous varieties tended to outcompete less vigorous varieties.

Results

Evaluations

Consumer preference evaluations, which evaluated overall appearance and aesthetics of the containers based on personal preference, and OSU performance evaluations took place in July, August and September. Some results of these evaluations are printed on page 19.

The OSU performance evaluations examined the balance/dominance of the containers as a whole, as well as the individual plants' contributions to the design. Balance/dominance describes the dominance of a particular component of the mix (for example, one plant may be "taking over"). Balance/dominance is a measure of the sustainability of the mixed-container design, and it is not related to aesthetics: a perfectly balanced combination may not look appealing, and vice versa.

Top Monoculture Cultivars

All the plants in the mixed-container designs were also separately trialed in 12-inch monoculture containers and evaluated on the same dates as the combinations.

The best performing monocultures with an overall season average in the range of 4 to 5 (on a five-point scale):



Perilla 'Magilla Purple'
(Photo: Ball Horticulture)

Perilla 'Magilla Purple',
petunia 'Tiny Tunia Rose',
ornamental millet 'Jester',
Sedum makinoi 'Salsa Verde',
scaevola 'Summer Fan',
portulaca 'Rio Scarlet',
talinum 'Limon', juncus 'Javelin',
begonia 'Solenia Red Improved',
coleus 'Trailing Plum' and 'Midnight Train'.

Also performing well, with ratings from 3.65 to 3.99:

Petunia 'Tiny Tunia Cabernet' and 'Tiny Tunia Cranberry',
dichondra 'Silver Falls',
impatiens 'Sunpatiens Orange',
calibrachoa 'Celebration Indigo',
verbena 'Aztec Red Velvet',
begonia 'Solenia Dusky Pink',
petunia 'Tiny Tunia Blue',
purslane 'Hot Shot Rose',
ipomoea 'Sweet Caroline Bewitched',
cali-

brachoa 'Celebration Red' and impatiens 'Sunpatiens Spreading Salmon w/ Variegated Leaf'.



For a look back at the OSU Learning Gardens results from 2004 to the present, visit

www.gpnmag.com and search for "OSU Learning Gardens."

Results tables and photos are available at floriculture.osu.edu

variety information

Conclusions

Through all these years of evaluating mixed containers, we learned that aesthetic appeal *is* important, but long-term performance also should be considered when planning new designs.

Most combinations deteriorate over time; there's nothing new with this finding! But how fast do the designs tend to deteriorate? In other words, how sustainable are they? Most become unbalanced, and the quality of some plants

decreases; consumer preference decreases as a result. At best, some combinations maintain quality, but very few improve over time.

Shade-loving plants, such as impatiens, lamium and some coleus, benefit from shade pro-

vided by companion plants. Lamium, for example, is largely a prostrate, shade-loving perennial that benefits from the shade of any other plant in the combination. Always know the light requirements of the plants you are using for your mixed containers.

It also is important to know the growth habit of the plants in your combinations; slow-growing plants should be planted when they have achieved a size that will allow them to compete with more vigorous plants. PGR applications, such as dipping the root balls of vigorous liners, should be considered to slow temporarily the growth of these plants and even the competition field. Slower-growing/less vigorous plants, such as argyranthemum, diascia, lobelia, nemesia, leucanthenum and agastache, are poor competitors, and most of them thrive in cooler temperatures, so they don't kick into gear until toward the end of the season. Choose companion plants carefully for them.

Some plants are very responsive to fertilizers, for example sweet potato vines and some coleus cultivars. At high fertility levels, they grow so much that they dominate the combinations. In some trial containers, the only visible plants were coleus or ipomoeas. Ipomoeas are wonderful, vigorous plants for mixed containers but can overpower some of their companion plants. Use them with caution, and always know the growth habit of the plants you are using in your mixed containers.

You should also learn the pH requirements of the plants you are using in your mixed containers; some crops, like petunias and calibrachoa, tend to show chlorosis symptoms related to incorrect pH. Although the problem is usually cultivar specific, it is important to treat these plants differently (using an acidic fertilizer, for example). Unfortunately, some plants, like geraniums, do not like low pH and should not be planted next to acid-loving plants. [GPN]

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Top Combinations

Consumer Preference Results

The following results are the average consumer preference ratings for the months of July, August and September. The best-performing combinations with an overall season average in the range of 3.59 to 3.6 (on a five-point scale) were: Ball-5, Ball-1, Bodger-5, Ecke-3 and Carnival.

Design codes for mixed containers:

Ball Horticulture: BL-1 – BL-5

Bodger: B-1- B-5

Paul Ecke Ranch: E11 – E-5

Westflowers: Carnival and Orient

Ball



1. Sedum 'Angelina': 3.5, 3.0, 4.0, 3.5
2. Portulaca 'Rio Scarlet': 5.0, 5.0, 5.0, 2.5
3. Sedum 'Makinol': 5.0, 4.5, 4.0, 4.5
4. Juncus 'Blue Arrows': 5.0, 4.5, 4.0, 3.5

Consumer preference: 4.11, 3.8, 3.98
Balance/Dominance: 4.0, 3.5, 5.0, 4.5

Bodger



1. Begonia 'Gumdrop Cherry Blossom': N/A, 5.0, 3.75, 3.0
2. Diascia 'Miracle Carmine Red': N/A, 3.25, 2.75, 2.0
3. Petunia 'Tiny Tunia Cranberry': N/A, 4.5, 4.0, 3.5
4. Salvia 'Stampede Cherry': N/A, 4.0, 2.75, 1.5

Average scores: 3.64, 3.8, N/A
Balance/Dominance: N/A, 4.0, 3.5, 2.25

ECKE
RANCH



1. Pelargonium 'Patriot White': 3.0, 3.5, 2.75, 1.75
2. Pelargonium 'Global Stars & Stripes': 3.0, 4.0, 3.0, 2.25
3. Scaevola 'Summer Fan': 4.0, 5.0, 5.0, 5.0
4. Begonia 'Solenia Red Velvet': 2.5, 2.75, 3.0, 3.0
5. Impatiens, Double 'Cameo White': 4.0, 2.0, 2.0, 1.5

Average scores: 3.44, 2.95, 3.25
Balance/Dominance: 4.0, 2.75, 3.5, 1.75

Carnival



1. Calibrachoa 'Celebration Red': N/A, 5.0, 3.5, 2.5
2. Calibrachoa 'Celebration Blue': N/A, 4.0, 2.75, 2.0
3. Calibrachoa 'Celebration Sun': N/A, 5.0, 3.5, 2.25

Average scores: 4.25, 3.95, 2.80
Balance/Dominance: N/A, 5.0, 3.0, 2.0

Ratings were based on a five-point scale: 1 = poor/not acceptable, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

Acknowledgements

Without the product donations and efforts of many industry members these trials would not be possible. We would like to acknowledge several companies for participating in the trial.

Plant Sponsors: Ball Horticulture, Bodger Botanicals, the Paul Ecke Ranch and Westflowers

Supply Donors: Dillen Products (containers), Dramm Corporation (irrigation supplies), Sun Gro Horticulture (potting media), Bioworks (Plantshield), Buckeye Resources (mulch)

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