OSU Learning Gardens:

2007 Mixed Container Trials

In this year's trial, university researchers dealt with unusually hot, dry conditions, which yielded interesting results.

By Bart Hayes and Claudio Pasian

The fifth year of the mixed container trials has given us more results and provided more insight into the performance and durability of plants grown in large combination planters. We had two companies participate this year in addition to the in-house designed combinations and designs from previous years. The trials director evaluated plants on a monthly basis in July, August and September, and our 14-member team of Master Gardeners conducted monthly consumer-preference evaluations.

We had two objectives in mind: to evaluate, over time, the combination of plants (design) as a whole, as well as each individual plant in the combination; and to compare cultivars grown in mixed-container plantings versus the same cultivars grown in single-cultivar (monoculture) containers.

Trial Information

Varieties were transplanted May 30, 2007, into a Metro-Mix 300 media. Rooted cuttings received a Plantshield preventive drench just before transplanting, with up to three reapplications for monocultures and three for combination plantings. Monocultures were placed in 12-inch pots; combinations were placed in 16-inch containers. The trial area was located outdoors in full sun, just west of our departmental Columbus greenhouses. Abnormally dry and sunny conditions made this year's trial especially important in evaluating heat tolerances. Heat and full sun made some of the more vigorous varieties grow at an accelerated rate. Some more vigorous varieties tended to out-compete less vigorous varieties.

The plantings were watered as needed using a drip irrigation system. The 16-inch mixed containers got 4.23 ounces of Osmocote 16-9-12, and the 12-inch monocultures were given 3.17 ounces.

The monoculture geraniums were deadheaded periodically, but no other combinations had pruning or deadheading during the trials.

Where pests and diseases are concerned, western flower thrips were found on dahlias and verbenas, while whiteflies were the primary problem for lantana and coleus. There was also some downy mildew on light-colored coleus varieties. Yellowing of new foliage, possibly because of an iron deficiency, was noticed in some calibrachoas.

Container Evaluation

The consumer preference evaluations and the OSU performance evaluations were performed in July, August and September. The consumer preference evaluated overall appearance and aesthetics of the containers on the basis of personal preference.

The OSU performance evaluations assessed the balance/dominance of the containers as a whole, as well as the individual plants' contribution to the design. Balance/dominance is an index used to describe the dominance of a particular component of the mix (one plant may be "taking over"). In other words, balance/dominance is a measure of the sustainability of the mixed-container design. This index is not related to aesthetics: A very balanced combination may not look appealing and vice versa.

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

Mixed Container Trial Results

A complete record of past and present trial results, tables and photos can be seen at floriculture.osu.edu/trials/MixedPage.html. This year's results are listed below:

OSU evaluations. The best-performing combinations, with an overall balance/dominance season average in the range of 4.67 to 4.08, were Bodger-5, OSU-11, Ecke-3, OSU-8, Ecke-1 and Bodger-7. Also performing very well, with ratings in the 4.00 to 3.58 range, were OSU-7, OSU-1, Ecke-5, OSU-9, OSU-10 and Ecke-10.

Consumer preference results. The best-performing combinations, with an overall season average in the range of 4.59 to 4.14, were OSU-9, Bodger-5, OSU-15, OSU-12, Ecke-5, Ecke-10, Ecke-4 and Bodger-8.

Monoculture Container Trial Results

The monocultures were trialed separately from the mixed combinations. All the plants that were part of the mixed-container designs were also trialed separately in 12-inch monoculture containers.

OSU evaluations monoculture containers. The best-performing monocultures, with an overall season average in the range of 5.00 to 4.58, were agastache 'Acapulco Orange', ipomoea 'Sweet Caroline Bronze', begonia 'Doublet Rose', solenostemon 'Wedding Train', helichrysum 'Silver Spike', ipomoea 'Sweet Caroline Green/Yellow', crossandra 'Orange Marmalade', anigozanthus 'Kanga Red', impatiens 'SunPatiens Magenta', begonia 'Gumdrop Rose', ipomoea 'Sweet Caroline Bewitched', geranium 'Patriot Red' and lantana 'Morning Glow Passion'.

Also performing very well, with ratings in the 4.50 to 4.00 range, were ipomoea 'Sweet Caroline Red', solenostemon 'Stained Glassworks Witch Doctor', gazania 'Sun Bathers Gold Coast', pentas 'Bismarck Pink', solenostemon ➧

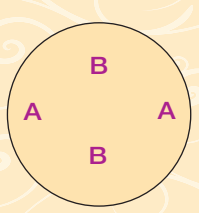
Design Codes for Mixed Containers

Ecke Designs:
Ecke 1-11

Bodger Designs:
Bodger 1-10

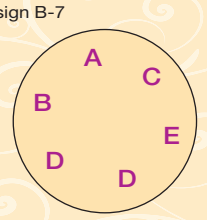
Master Gardener Designs:
OSU 1-19

Bodger Botanicals
Consumer preference: 4.41, 4.32
Balance/dominance: 5, 5, 4
Design B-5



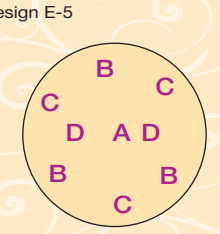
Individual Plant Evaluations
Petunia 'Blanket White': 4.5, 4.0, 3.5 **(A)**
Petunia 'Blanket Purple': 4.5, 4.0, 3.0 **(B)**

Bodger Botanicals
Consumer preference: 4.1, 3.95
Balance/dominance: 4.25, 4, 4
Design B-7



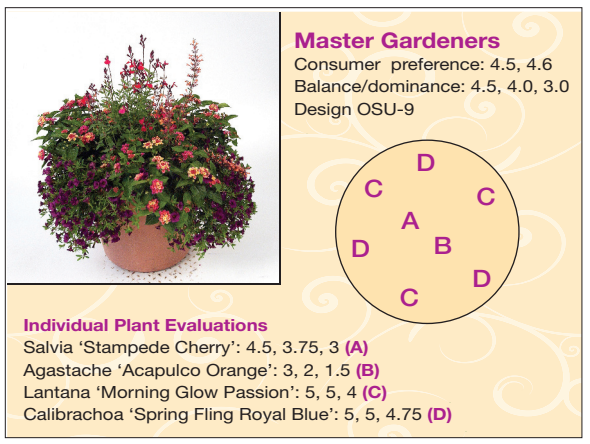
Individual Plant Evaluations
Salvia 'Stampede cherry': 4.75, 4.75, 3.5 **(A)**
Begonia 'Gundrop Rose': 4.5, 4.75, 4.5 **(B)**
Diascia 'Miracle Pink': 4, 3.5, 3.75 **(C)**
Portulaca 'High Noon Rose': 3, 2.5, 1.5 **(D)**
Calibrachoa 'Spring Fling Royal Blue': 4.75, 4.75, 3.75 **(E)**

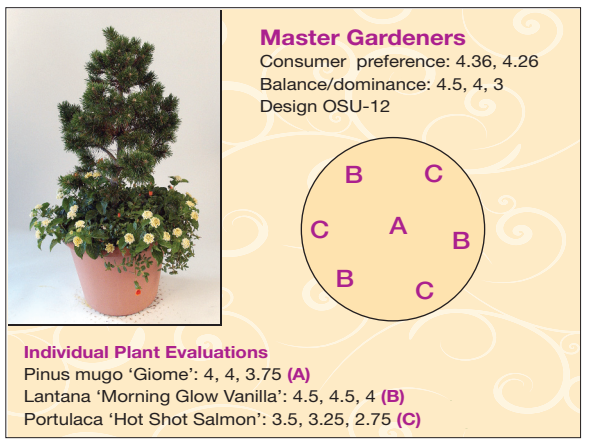
Ecke Ranch
Consumer preference: 4.32, 4.42
Balance/dominance: 3.75, 4, 3.75
Design E-5

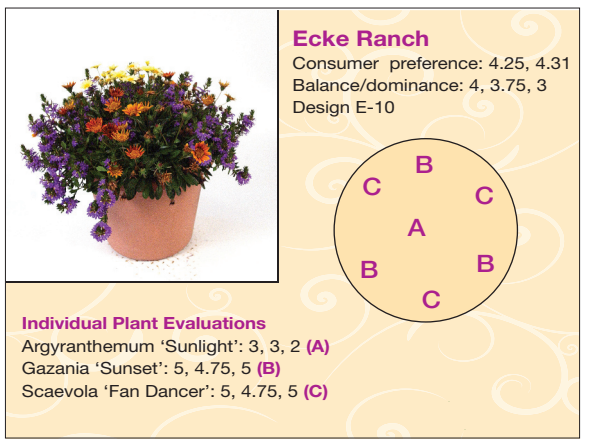


Individual Plant Evaluations
Gaura 'Pink Fountain': 3, 2.75, 2.75 **(A)**
Begonia 'Doublet Rose': 4.75, 4.75, 4.75 **(B)**
Verbena 'Tropical Breeze Crimson': 5, 4, 2.75 **(C)**
Pentas 'Bahamas White': 3.25, 3.75, 3 **(D)**

variety information







'Stained Glassworks Emerald and Snow', pentas 'Lava Pink', salvia 'Stampede Cherry', solenostemon 'Stained Glassworks Saw Grass', bracteantha 'Brilliance Lemon', solenostemon 'Big Blonde', lantana 'Morning Glow Vanilla', lantana 'Morning Glow Rose/Gold', agastache 'Acapulco Rose', salvia 'Stampede Citron', solenostemon 'Stained Glassworks Midnight Train', gaura 'Pink Fountain', pentas 'Bahamas White' and torenia 'Yellow Moon'.

Consumer preference monoculture evaluations. The best-performing monocultures in the consumer evaluation, with an overall average score of 4.75 to 4.56, were solenostemon 'Wedding Train', begonia 'Doublet Rose', diascia 'Miracle Pink', begonia 'Gumdrop Rose' and diascia 'Miracle Red'.

Also performing very well, with ratings in the 4.44 to 4.00 range, were lantana 'Morning Glow Passion', agastache 'Acapulco Orange', pentas 'Bahamas White', pentas 'Bismarck Pink', solenostemon 'Stained Glassworks Emerald and Snow', helichrysum 'Silver Spike', petunia 'Blanket Purple', lantana 'Morning Glow Orange/Yellow', agastache 'Acapulco Rose', crossandra 'Orange Marmalade', ipomoea 'Sweet Caroline Green/Yellow', lantana 'Morning Glow Vanilla', impatiens 'SunPatiens Magenta', verbena 'Tropical Breeze Purple and White' and torenia 'Yellow Moon'.

Conclusions

Most combinations deteriorate over time. However, how fast do the designs tend to deteriorate — in other words, how "sustainable" are your designs? Most designs tend to become unbalanced, and the quality of some plants decrease. As a consequence, consumer preference also decreases. At best, some combinations maintain quality while very few improve over time.

Shade-loving plants such as impatiens, lamium and some coleus benefit from shade provided by companion plants. Lamium is a prostrate, shade-loving perennial — although there are some cultivars that are sun tolerant — that benefits from the shade of other plants of any height in the combination. Do you know the light requirements of the plants you are using for your mixed containers?

Slower-growing or less-vigorous plants are poor competitors. Most of these thrive in cooler temperatures too, so they tend to kick into gear more at the end of the season. These varieties include argyranthemum, diascia, lobelia, nemesia, leucanthemum and agastache. Choose these plants' companions carefully!

It is important to know the growth habit of all plants in a combination. For example, ipomoeas are wonderful plants for mixed containers, but they have to be used with caution: They are vigorous and can overpower their companion plants. Slow-growing plants should be planted

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when they have achieved a substantial size, which will allow them to compete with the more vigorous cultivars. The use of plant growth regulators (e.g., dipping the root balls of vigorous liners in a mild PGR solution) should be considered to temporarily slow the growth of these plants and even the competition field.

Some crops, such as petunias and calibrachoas, tend to show chlorosis symptoms. Although the problem is usually cultivar specific, it is important to treat these plants differently (e.g., using an acidic fertilizer). Unfortunately, some plants, such as geraniums, do not like low pH and should not be planted next to acid-loving plants. Do you know the pH requirements of the plants you are using in your mixed containers? GPN

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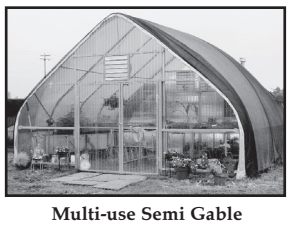
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