

The University of Arkansas Plant Evaluation Program

Jon T. Lindstrom,¹ James A. Robbins,² Gerald L. Klingaman,³ Scott Starr,⁴ and Janet Carson⁵

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SUMMARY. The University of Arkansas established a new, replicated, woody ornamental plant evaluation program in 1999. Three sites were used across the state and these sites encompassed the three different USDA Plant Cold Hardiness Zones found in Arkansas, Zones 6, 7 and 8. In the first year, 17 different woody ornamental plants were established in the evaluation. Information obtained from performance in this evaluation will be used in Arkansas Select, a marketing program for customers and nurserymen in the state. Nonpatented and nontrademarked plant material will be made available for propagation purposes. Woody plants will be evaluated for 5 years and herbaceous perennials will be evaluated for 3 years.

The University of Arkansas initiated a statewide plant evaluation program in 1999. The objectives of this program are to 1) evaluate plant material on a statewide basis, 2) identify plants that would be suitable for Arkansas Select, a marketing program for consumers and nurserymen, and 3) provide growers with a propagation source for promising nonpatented and nontrademarked plant cultivars. Evaluation on a statewide basis is necessary because three different USDA Plant Cold Hardiness Zones (USDA, 1990) are found in Arkansas. The northern tier of counties is in USDA Zone 6a or 6b whereas the central half of the state is either Zone 7a or 7b. USDA Plant Hardiness Zone 8a is found along the southern border of the state. To serve these three zones, trials with identical plants were established in Fayetteville (Zone 6b), Little Rock (Zone 7a) and Hope (Zone 8a), Arkansas.

Trees and shrubs were selected for the trial program based on the following guidelines: 1) adaptability of broadleaf evergreens in Zones 6, 7 and 8 with particular emphasis on cold hardiness in Zone 6; and 2) underused evergreen or deciduous plants with a specific landscape use (e.g., hedge). For herbaceous perennials, fall-blooming plants are emphasized. Several broadleaf evergreens used in Zones 7 and 8 have not been adequately trialed in Arkansas in Zone 6b. These include Japanese cleyera (*Ternstroemia*), anise shrub (*Illicium*) and Indian hawthorn (*Rhaphiolepis*). See Table 1 for a list of plant in the 1999 trial.

Department of Horticulture, University of Arkansas, Fayetteville, AR 72701.

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¹Assistant professor; e-mail: tranell@uark.edu.

^{2,5}Extension horticulture specialist.

³Professor.

⁴Research specialist.

Table 1. Plants in the 1999 University of Arkansas Plant Evaluation trial. For each taxon, four plants were tested at each site.

| Common name | Scientific name | Cultivar |
|------------------------|--|-----------------------|
| Trees | | |
| None | <i>Quercus ×comptoniae</i> (<i>Q. lyrata</i> × <i>Q. virginiana</i>) | --- |
| Japanese snowbell tree | <i>Styra ×japonicum</i> | --- |
| Shrubs | | |
| Chinese fringe flower | <i>Loropetalum chinense</i> | Plum Delight™ |
| Virginia sweetspire | <i>Itea virginica</i> | Henry's Garnet |
| Japanese privet | <i>Ligustrum japonicum</i> | Green Meatball |
| Foster's holly | <i>Ilex ×attenuata</i> | Dixie Dream™ |
| Oakleaf™ holly | <i>Ilex</i> | Oakleaf™ |
| Little Red™ holly | <i>Ilex</i> | Little Red™ |
| Crapemyrtle | <i>Lagerstroemia indica</i> | Velma's Royal Delight |
| Crapemyrtle | <i>Lagerstroemia</i> (<i>L. indica</i> × <i>L. fauriei</i>) | Chickasaw |
| Crapemyrtle | <i>Lagerstroemia</i> (<i>L. indica</i> × <i>L. fauriei</i>) | Pocomoke |
| Encore azalea™ | <i>Rhododendron</i> (<i>R. oldhamii</i> × <i>R. 'Watchet'</i>) | Autumn Embers™ |
| Encore azalea™ | <i>Rhododendron</i> (<i>R. oldhamii</i> × <i>R. 'White Gumpo'</i>) | Autumn Coral™ |
| Encore azalea™ | <i>Rhododendron</i> (<i>R. oldhamii</i> × <i>R. 'Karens'</i>) | Autumn Amethyst™ |
| Indian hawthorn | <i>Rhaphiolepis indica</i> | Bay Breeze™ |
| Hot Flash™ camellia | <i>Camellia sasanqua</i> | Hot Flash™ |
| Glossy abelia | <i>Abelia ×grandiflora</i> | Sunrise |

The University of Arkansas plant evaluation program is based loosely on programs in other states (Flanagan et al., 1993). The Arkansas program uses three different testing locations across the state and plants are replicated at each of the locations.

Methods and materials

Trial sites typically consisted of 3-ft (0.9-m) wide rows separated by a grassy 7-ft (2.1-m) alley. A completely randomized design was used and plants were grouped by plant type, e.g., trees were in the same block. Within a row, trees were spaced 10 ft (3 m) apart, shrubs 6 ft (1.8 m) apart, and herbaceous perennials 4 ft (1.2 m) apart.

Treatments were replicated four times. Plants were fertilized with N at 2.0 lb/1000 ft² (1.1 kg·ha⁻¹), watered and mulched at planting. Drip irrigation was used as needed throughout the growing season. Plants that traditionally require shade in the landscape [for example camellia (*Camellia*) and azalea (*Rhododendron*)] were planted under natural shade at all three locations.

A growth index was calculated for shrubs. This index is calculated by the formula, πbr^2 , where b is shoot height, $r = 0.5d$, and d is the mean of two diameter measurements taken at a 90° angle from each other. Caliper at 6 inches (15.2 cm) above the ground, and height were measured for trees. In the

first year after planting, measurements were taken both spring and fall. In subsequent years, measurements are only taken in the fall. Qualitative information including flowering, disease and insect problems, and ornamental value are monitored throughout the year. Temperature and precipitation data are collected at all three test sites. Trees and shrubs will be evaluated for 5 years and herbaceous perennials for 3 years.

At the end of each growing season (October or November) a written report that summarizes the performance of each plant is sent to all individuals and companies that donated plants for evaluation. This report is available on the World Wide Web at <<http://www.uark.edu/cam->

Table 2. Mean annual change in growth index (ft³) for shrubs, n = 4, 1999 growing season.^z

| Common name | Cultivar | Location | | |
|-----------------------|-----------------------|----------|-------------|--------------|
| | | Hope | Little Rock | Fayetteville |
| Encore azalea™ | Autumn Amethyst™ | 8.3 | 9.1 | 5.3 |
| Encore azalea™ | Autumn Coral™ | 1.9 | 3.6 | 2.2 |
| Encore azalea™ | Autumn Embers™ | 0.9 | 3.4 | 1.7 |
| Hot Flash™ camellia | Hot Flash™ | 2.3 | 0.1 | 1.9 |
| Little Red™ holly | Little Red™ | 14.9 | 44.5 | 5.7 |
| Oakleaf™ holly | Oakleaf™ | 6.0 | 9.8 | 3.8 |
| Foster's holly | Dixie Dream™ | 6.5 | 8.2 | 2.9 |
| Glossy abelia | Sunrise | 0.9 | 6.2 | 3.4 |
| Japanese privet | Green Meatball | 12.4 | 39.0 | 23.2 |
| Virginia sweetspire | Henry's Garnet | 2.8 | 10.9 | 8.5 |
| Indian hawthorn | Bay Breeze™ | 0.4 | 1.6 | 0.6 |
| Chinese fringe flower | Plum Delight™ | 1.4 | 41.6 | 5.7 |
| Crapemyrtle | Pocomoke | 0.8 | 1.2 | 0.4 |
| Crapemyrtle | Chickasaw | 0.2 | 0.5 | 0.07 |
| Crapemyrtle | Velma's Royal Delight | 1.5 | 1.3 | 0.7 |

^z1.0 ft³ = 0.028 m³.

Table 3. Mean annual change in inches in shoot height and trunk diameter for trees grown at three locations, n = 4, 1999 growing season.^z

| Common name | Scientific name | Location | | | | | |
|------------------------|----------------------------|----------|------------|-------------|------------|--------------|------------|
| | | Hope | | Little Rock | | Fayetteville | |
| | | Shoot ht | Trunk diam | Shoot ht | Trunk diam | Shoot ht | Trunk diam |
| Japanese snowbell tree | <i>Styrax japonicum</i> | 3.9 | 0.3 | 15.0 | 0.3 | 8.3 | 0.3 |
| None | <i>Quercus ×comptoniae</i> | 13.8 | 0.8 | 17.3 | 0.3 | -0.4 | 0.3 |

^z1.0 inch = 2.54 cm.

Table 4. Plants in the 2000 Arkansas Plant Evaluation trial. Three plants of each taxon are evaluated at each site.

| Common name | Scientific name | Cultivar |
|-----------------------|--|-----------------|
| Trees | | |
| Hardy rubber tree | <i>Eucommia ulmoides</i> | --- |
| Trident maple | <i>Acer buergerianum</i> | --- |
| Shrubs | | |
| Fragrant sumac | <i>Rhus aromatica</i> | Gro-Low |
| Chinese abelia | <i>Abelia chinensis</i> | --- |
| Indian hawthorn | <i>Raphiolepis indica</i> | Eleanor Taber™ |
| Indian hawthorn | <i>Raphiolepis umbellata</i> | Gulf Green™ |
| Viburnum | <i>Viburnum (V. burejaeticum × V. rhytidophylloides)</i> | Emerald Triumph |
| Viburnum | <i>Viburnum ×burkwoodii</i> | Conoy |
| Viburnum | <i>Viburnum awabuki</i> | Chindo |
| Bush honeysuckle | <i>Diervilla lonicera</i> | Copper |
| Small anise tree | <i>Illicium parviflorum</i> | --- |
| Boxleaf honeysuckle | <i>Lonicera nitida</i> | Ernest Wilson |
| Japanese cleyera | <i>Ternstroemia gymnanthera</i> | Bronze Beauty™ |
| Herbaceous perennials | | |
| None | <i>Dicliptera suberecta</i> | --- |
| California fuschia | <i>Epilobium canum ssp. canum</i> | Western Hills |
| None | <i>Agastache cana</i> | --- |
| Cherry chief sage | <i>Salvia greggii</i> | Cherry Chief |
| Blue little bluestem | <i>Schizachyrium scoparium</i> | The Blues |
| None | <i>Scutellaria resinosa</i> | --- |

pus-resources/cotinus/arboretum_html/1999report.htm> (Lindstrom, 2001).

Other information on this site includes plants in the evaluation program, plants under consideration for the program, and size and sources of the plants.

Results and discussion

Examples of the data that we collect each year from woody plants in the trial are shown in Tables 2 and 3. Differences in plant growth across the sites were evident even in the first year of the trial. For all but two plant species, best growth was obtained in Little Rock. This may be a result of late afternoon shade received by all plants at this location. Conversely, the Fayetteville and Hope sites are open and the Fayetteville site is very windy.

In general, the first year of the program was a success. The overall impression of the plant donors in the first year has been positive with an increase in the number of commercial nursery operations willing to donate plant material. Perhaps the greatest

challenge has been developing funding sources for the program. Fortunately, the Arkansas Green Industry Association, a statewide industry organization, has supported the program financially. This funding has been used to obtain plant material and supplies for the evaluation program. Additional funding is received through a onetime fee assessed to evaluate patented and trademarked plants in the trial program.

A list of plants evaluated beginning in 2000 is included (Table 4). Our program has evolved so that about 75% of the plants are obtained through commercial suppliers and the balance from university propagation efforts. The plants propagated by the university are usually lesser-known plants.

In the future, we hope to integrate plants that prove successful in all three sites into the Arkansas Select program, a separate program initiated by the cooperative extension service to market specific plants in the retail industry. As the

Arkansas Plant Evaluation program grows in size, we will possibly need to reevaluate the criteria by which plants are selected so not to overlap other programs. Given constraints in area for the trial it may also be necessary to reduce to 4 years the time shrubs and trees are evaluated. Limitation on plot space was one reason why the number of replications was reduced from four to three with the year 2000 evaluation.

Literature cited

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