



JC Raulston Arboretum

AT NC STATE UNIVERSITY

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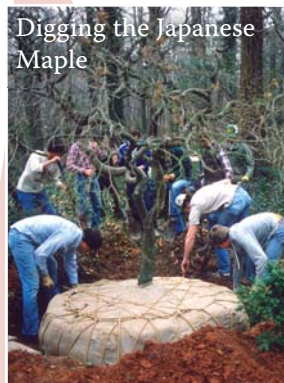
Words from the Director

It's a Beginning

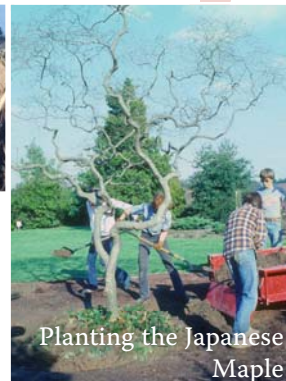
By Ted Bilderback, Interim Director

In January 1977, about 18 months after J. C. Raulston's arrival, I joined the Horticultural Science faculty at NC State. J. C. was definitely my mentor through the early years. J. C. taught HS 411–Nursery Management in the four-year curriculum and I was hired to teach HS 051–Nursery Production in the Agricultural Institute curriculum. I audited a nursery course during graduate school, but J. C. taught me how to teach nursery classes. During the first year, I sat in on J. C.'s lectures and labs. A suitable textbook was not available, so written CliffNotes style lecture notes and articles from nursery magazines were handed out. Later, they were combined into a very thick course pak which students purchased at the bookstore. The nursery labs were taught at "Method" (it was not an arboretum yet) in the ground-floor room that served as the office for John Scott, the Unit 4 Farm supervisor. The classroom always needed sweeping, the chalk board cleaned, and tables and chairs set up and arranged. It reminded me of my early days in education, where a teacher was the custodian and maintenance supervisor, too. (I started first grade in a country one-room schoolhouse for grades 1–8 in eastern Kansas. If you are interested, check out this Web site: <http://www.kansasheritage.org/orsh/library/bolton.htm>).

J. C.'s vision for the area designated to be the new arboretum included moving some large plants out and installing new plantings. In 1979, J. C. assigned my spring HS 471–Arboriculture class a big job. Five of the *Lagerstroemia fauriei* (Japanese crape myrtles), whose crowns were becoming crowded, were growing in a row in what's now the West Arboretum.



Digging the Japanese Maple



Planting the Japanese Maple

J. C. wanted to move one. The class dug the one in the middle of the row. The root ball weighed approximately 5,000 pounds. The soilball was burlapped, pinned, laced, and lifted with a crane onto a truck bound for the Horticulture Club's exhibition garden at the Southern Living Show in Charlotte. After the show, the crape myrtle was planted in a park in Charlotte. The Arboriculture class moved the red lace-leafed Japanese maple (*Acer palmatum* Dissectum Atropurpureum Group)

donated by Carl and Nancy Ward that occupies a prominent space in the Klein-Pringle White Garden in 1980. The Japanese maple had approximately a 2,000-pound root ball. The planting of the Nellie Stevens holly hedge that separates the JC Raulston Arboretum from the Horticulture Field Lab was also accomplished by students over a period of several semesters. The field nursery was located on the lower south side of HFL where the Horticulture Greenhouses are now. Most of the soil from the field was excavated for construction of the adjacent beltline so the soil in the nursery was actually sub-soil and digging was disagreeable. Nevertheless, students learned the art of B&B, moving, and replanting large trees in the row along the

Arboretum's border.

One of my visions while interim director is to involve more students in projects in the JCRA. I also have co-conspirators among the teaching faculty in the Department of Horticultural Science who are as convinced as I am that friendships for life are begun at the end of a round-nose shovel. Many fond memories held by our alums exist due to these experiences.

It is a great pleasure and honor to serve as the interim director of the JC Raulston Arboretum. I look forward to becoming acquainted with the Friends of the Arboretum. All of us at the JCRA thank you for your support.

Planning and planting for a better world.





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*Weekend hours are based on volunteer availability

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Horticulture

An Introduction to Sex Expression in Plants

By Denny Werner, Ph.D., Professor, Department of Horticultural Science, NC State University

Some time ago, while giving a tour of the JCRA to a visiting group, we happened upon the beautiful Asian fringe tree (*Chionanthus retusus*) adjacent to Elm Circle. As I pointed out the attributes of this fine plant, I also called attention to the significant fruit set on the tree last year. During the discussion, I proposed some possible explanations for the significant fruit set, which was somewhat out of character for this specific tree that generally has demonstrated only light fruit set or an absence of fruit production in prior years. Ultimately, the subject of sex expression in plants arose in my discussion, and at that time, the interest level of the group blossomed. Hence, I decided to discuss this topic in my writing for this newsletter. The subject of sex expression is expansive, and this piece is meant to provide the reader with only some general and practical information in this interesting area of plant biology.

Higher plants exhibit a myriad of sex expression phenotypes. Sex expression refers to the sexual diversification that occurs in the flowers of higher plants at the species or population level. Most flowering plants produce flowers that contain both female (pistils) and male (stamens) sexual organs. Such flowers are called perfect or hermaphroditic flowers. Perfect flowers are usually associated with high levels of self-pollination. However, genetic mechanisms that control the spatial separation of the stamens and pistils, or differences in the relative timing of pollen release and female receptivity within an individual flower or between flowers on the same plant (dichogamy), can promote considerable outcrossing even in perfect flowered taxa. For example, many species in the walnut family (Juglandaceae), such as pecan (*Carya illinoensis*) demonstrate dichogamy. In populations of these taxa, some individuals release pollen before pistils on the same tree are receptive (protandry), while in other individuals, pistils

are receptive prior to pollen dispersal (protogyny). Both mechanisms tend to encourage, but not enforce, outcrossing. Another mechanism that promotes and often enforces outcrossing is called self-incompatibility. Self-incompatibility prevents self-pollination (pollen transfer within a cultivar or clone), even though functional male and female gametes are produced by the plant. This mechanism is mediated by the lack of pollen germination or pollen tube growth through the style after self-pollination. Many of our popular fruit trees, such as apple and pear, exhibit this phenomenon. Mechanisms that promote outcrossing in plants are important in plant evolution, as outcrossing increases genetic diversity and potential fitness in a population, while self-pollination results in inbreeding, leading to a decrease in genetic diversity and a potential reduction in population fitness due to inbreeding depression.

Some flowering plant species (about 10%) produce unisexual flowers containing only male or female sexual organs. Gender variation, in which a species or a population of a species produces plants with both male and female flowers on the same plant, is called monoecy. Many members of the gourd family (Cucurbitaceae), such as melon species in the genus *Cucumis*, commonly demonstrate this sex expression condition. Conversely, dioecy describes a condition in which a species or population of that species contains separate female and male plants, such as demonstrated in *Ginkgo biloba* and many species of *Ilex*. Although these two general sex expression categories are widely recognized, rarely are circumstances that simple in biology. Many variations on these two general categories have been recognized and described. In monoecious taxa, the relative number of female and male flowers varies considerably between individual plants in a population, with some plants functioning primarily as

males, and others functioning primarily as females. Variation in the strict dioecious condition is also common. A sex expression condition called polygamodioecy refers to the phenomenon in which hermaphroditic flowers are produced in conjunction on plants that produce primarily male flowers (androdioecy) or female flowers (gynodioecy). Both the gynodioecious and the androdioecious condition exists in *Chionanthus*, meaning that plants that primarily function as males or females can be recognized, but in both cases hermaphroditic flowers may be produced in variable numbers on each type, depending on the genetics of each plant.

Also, environmental conditions during the time of flower bud initiation almost certainly plays a significant role in influencing the extent of hermaphroditic flower formation in any year, but this area of research has been largely unexplored due to the difficulty in conducting controlled experiments examining such in woody plants. Recall that in most woody taxa, flower buds are initiated the summer or fall prior to the actual time of flowering (anthesis) in the subsequent year, so it is the environmental conditions in the summer prior to flowering that most greatly influence flower bud set and sex expression of the subsequent flowers. It is interesting to ponder the basis for the significant fruit set in 2008 on our *Chionanthus retusus* that historically has set low amount of fruit. One can speculate that the highly stressful conditions of extreme heat and drought in summer of 2007 may have promoted the initiation of a greater number of hermaphroditic flowers in year 2007 on our typically male tree, as compared to a normal summer with less heat and drought stress, leading to increased fruit production in 2008. You may ask if any experimental evidence exists to support this contention. Again, the literature is limited in this area, but some interesting studies have been conducted in redvein maple, *Acer rufinerve*. A recent study by Japanese scientists (reference 2) examined sex changes in *A. rufinerve* as related to plant health and environmental conditions. Like *Chionanthus*, *A. rufinerve* is polygamodioecious. Interestingly, these scientists reported that a dramatic shift in sex expression from male to female or bisexual occurred in the spring following a year of reduced precipitation and drought stress. Perhaps a similar phenomenon is

occurring in other dioecious woody species also. This is an interesting area of biology, one that is ripe for more research, particularly in woody taxa.

Members of the arum family (Araceae) represent a particularly interesting group of plants from the perspective of sex expression. Members of this family are characterized by an inflorescence called a spadix that contains many individual flowers. The spadix is partially enclosed in a vegetative hood-like structure called a spathe. One well-studied arum, our native Jack-in-the-pulpit (*Arisaema triphyllum*), often demonstrates an interesting biannual “sex change,” where an individual plant can produce an inflorescence that contains only male (staminate) flowers in one year, a vegetative shoot containing no flowers the next year, and still the following year produce an inflorescence that contains only female (carpellate) flowers, or both staminate and carpellate flowers on the same plant (the monoecious state). This ability to undergo “sex change” from year to year is referred to as “gender lability.” For an excellent review of the topic of gender lability, see the manuscript by Helena Korpelainen, Ph.D., (reference 1).

In *Ariseama triphyllum*, the ultimate sex expression of an individual in any particular year is a function of the genetics of that individual plant, plant size, population density, sexual expression history, and environmental conditions such as temperature and moisture. Young, immature (i.e., small) plants typically produce mostly male flowers; female expression occurs later in life as the plant ages and increases in size. Population density can have an effect on sex expression, both directly through biochemical interaction between neighboring plants and indirectly through the impact of population density and competition on plant size. Plants tend toward male expression when population density is high, and female expression is favored at lower population densities, such as at the periphery of a population. Plants that exhibit largely female expression in one year, and hence set a high number of fruit, often produce no flowers or exhibit only male expression the following year. This can be explained by the fact that a net drain on stored reserve (photosynthate) occurs after significant fruit production, and plant survival is jeopardized if the plant continues to produce female flowers and fruit



in subsequent years. To ensure survival, it must reduce its reproductive effort by changing its gender to male or reverting to the vegetative state for a few years after fruiting. Hence, gender lability is an adaptive mechanism that has evolved in some plant species to ensure survival.

I would encourage you to include some *Arisaema triphyllum*, or other members of the Araceae in your garden, and observe these interesting dynamics in your own back yard. Observing and appreciating these subtle changes in the plants in our gardens from year to year increases our knowledge of the biological mechanisms taking place in our own back yards, and adds another dimension to our gardening pleasure.

References

1. Korpelainen, H. 1998. Labile sex expression in plants. *Biological Review*. 73:157-180.
2. Nanami, S., H. Kawaguchi and T. Yamakura. 2004. Sex change toward female in dying *Acer rufinerve* trees. *Annals of Botany*. 93:33-740.



Diplazium subsinuatum



Lepisorus thunbergianus 'Ichijo Nishiki'



Phlebodium pseudoaureum



Pyrrosia lingua



Pyrrosia lingua 'Hiryu'

No Lace Here!

By Tim Alderton, Research Technician

Ferns have been around for over three hundred million years, giving them just a few years to diversify into all forms and fill every environmental niche possible. Delicate, soft, lacy, deep green, glossy foliage growing in cool, moist shade: that is what we all think of the quintessential fern. Broad, undivided, thick, plastic-feeling, blue, or hairy fronds growing in baking full sun: that is the polar opposite of the quintessential fern. Many ferns, though, fit this second scenario! Oddballs, right? These un-fernlike ones fascinate me most.

I will talk about a few of these strange plants in the Arboretum as well as some we don't have, discussing ferns for shade to part shade. The first group is some ferns from the Polypodiaceae. This includes our native resurrection fern (*Pleopeltis polypodioides*) and rock polypody (*Polypodium virginianum*). Neither of these species is in the gardens because they are not easy to establish, but several of their relatives intrigue me and are easy to grow in your own garden.

The genus *Pyrrosia* is probably the most un-fernlike that we have. It is a genus that includes anywhere from 65–74 evergreen species distributed in Africa, southern and eastern Asia, and into the south Pacific islands. In the wild, they typically grow as epiphytes and lithophytes. Fine, star-like hairs are present on both the upper and lower surfaces of the typically strap-shaped fronds when they are young, and shed from the upper surface when mature. Only a few species have proven hardy in our climate, but there are others yet to be tested. Of the tried and true, there are three species that are becoming more widely available and should be used. The most common of these is *Pyrrosia lingua*. This species is native to China, south into Indochina, and is found on the islands of Taiwan and Japan. The fronds of the typical *P. lingua* are undivided, strap-like, and held upright on a ridged petiole along a spreading rhizome. Many selections of *P. lingua* have been made in Japan and China, emphasizing crested, wavy-edged, lobed, or variegated fronds. The next two species, *P. hastata* and *P. polydactyla*, look

very different from other *Pyrrosia* because they have lobed fronds. *P. hastata* hails from South Korea and Japan. Its leaves are hastately lobed with typically three, but sometimes, five lobes that give it the appearance of a bird's foot. The side lobes are individually about 3" long and the central lobe is about 5" long. All the lobes are about 0.5" to 0.75" wide. The total leaf width is about 5". The underside of fertile fronds is covered in orderly rows of cinnamon-colored sori (clusters of structures producing and containing spores). *P. polydactyla* is native to Taiwan. It is similar in appearance to *P. hastata*, but has six to eight lobes on its palmately divided frond, fitting its name perfectly since polydactyla roughly translates as "many fingers." The individual lobes may be longer than that of *P. hastata*. Both *P. hastata* and *P. polydactyla* have short rhizomes that form a tight clump, topped in foliage that grows 6" to 10" tall. All the *Pyrrosia* like well drained soils and are unfazed by drought once established.

The genus *Phlebodium* consists of only four species found in tropical and subtropical America. It is very closely allied with *Polypodium* and is often included in that genus. There is one species, *Phlebodium pseudoaureum*, which we have been growing successfully at the Arboretum. *P. pseudoaureum* is native to much of tropical America and ranges into southern Florida. Where it is native, it grows as an epiphytic evergreen; but in all but the most sheltered of locations here, it will be terrestrial and deciduous. The fronds grow 12" to 15" tall and are a glaucous blue-green, pinnately lobed, and held upright on a rigid petiole. Double rows of golden sori line the lobes of fertile fronds. Fronds arise from a spreading blue-green rhizome covered in golden hairs that match that of the sori.

Another family of ferns, the Dryopteridaceae, includes many of the most common ferns that we see in gardens, including the shield ferns (*Polystichum*), wood ferns (*Dryopteris*), and the florists' favorite, leatherleaf ferns (*Rumorha*). These are some of the most quintessential of all ferns, but one in the Lath House stands out. *Dryopteris sieboldii* just does not fit in with the bunch; it is an oddball for this family. It is one of 250–350 species

of *Dryopteris* found throughout the Northern Hemisphere. When I first saw this fern while working at Plant Delights Nursery, I almost thought there was a labeling issue since it did not look like any other *Dryopteris* that I had seen. The fronds are only once pinnately divided and have undivided pinnae (a division of a compound frond equivalent to that of a leaflet of a compound leaf). The edges of the pinnae irregularly undulate, trying to form pinnules like its fernier cousins, but it just can't do it, as they are all webbed together. The evergreen fronds' pinnae are arranged in three to five pairs up the rachis, with a terminal pinna at the tip that is 6" to 12" long. The texture of the foliage, when handled, is thick and leathery, adding to its un-ferny quality. A native of China, Japan, and Taiwan, it is perfectly at home here in the eastern United States, taking the heat and drought better than many of its lacy relatives.

Yet another family of ferns with some oddball kin is the Blechnaceae. This family includes our native netted chainfern (*Woodwardia areolata*) and Virginia chainfern (*Woodwardia virginica*), both deciduous species that have spreading rhizomes. Of the 12–20 species of *Woodwardia*, the cool one of the bunch is *Woodwardia orientalis*. This fern, as its name implies, comes from Japan and China. An evergreen to semi-evergreen

with fronds that originate from a non-spreading rhizome, it has the look of a tree fern without the trunk. The fronds can grow 3' to 6' long, arching out from the crown. Emerging fronds are glossy and often pigmented bronze to red, which age to a deep glossy green. This is a somewhat ferny fern with fronds that are pinnate with pinnatifid pinnae. The un-ferny character of this plant is its reproduction method. Most ferns have dust-like spores that float through the air and the lucky few land in a favorable location and grow. *W. orientalis* is a bit different. It produces spores in the same fashion as most ferns, but it also does more. It grows a nursery of small plantlets right on its fronds. In late summer and fall, small plantlets emerge from the upper surface of the mature fertile fronds, which then fall to the ground, and, if conditions are right, grow into new plants.

These are just a few of the shady characters that can be grown in our gardens. Many more are worth trying, like *Coniogramme japonica*, *Asplenium scolopendrium*, *Lepisorus bicolor*, and *Diplazium subsinuatum*, just to name a few. These all ignore that stereotype of lacy and delicate ferns. Lacy or not, another advantage is that deer find ferns to be inferior roughage. Try some of these un-ferns in your garden and confuse your neighbors. 🌸



Hardy Begonias

By Tim Alderton, Research Technician

To go along with my strange ferns, you might try some hardy begonias. I have been trying some different begonia species and hybrids in my own garden, as well as admiring them for years at Juniper Level Botanic Gardens. This past year, I planted one rhizomatous hybrid called *Begonia* 'Lime Swirl'. It did rather well in the neglect of my personal garden in well-drained soil in part to full shade. I dug a division last fall and placed it in the greenhouse, but left a portion in the ground to test. I have been pleasantly surprised when checking it throughout the winter months, finding that the rhizome was still firm and green with vegetative buds waiting to break when the warmth of spring returns. I also planted a few *Begonia boliviensis* 'Bonfire'. This is a tuberous

species from, you got it, Bolivia, as well as Argentina. It has beautiful bright orange flowers. This is also proving hardy in the Raleigh area.

At JLBG, I have been eyeing *Begonia heracleifolia* var. *nigricans* for a few summers now. This rhizomatous species has large dark green edged leaves with a paler central streak down each of the angular palmate lobes. While Mark Weathington was in Taiwan, he collected a few species as well, some rhizomatous as well as other, more cane-like, begonias. These will be interesting to try in the landscape. I love trying these supposedly tender begonias that would not be expected to survive the winter. I am then excited to find them return. Have fun experimenting! I hope to try some of these out in the gardens in the future, so keep an eye out. 🌸



Pollination: The Major Contribution of the Honey Bee

By Charles Heatherly, Volunteer Beekeeper

“To make a prairie it takes a clover and one bee,—
One clover, and a bee....” Emily Dickinson

Poets have a special talent for giving stature to such a simple mystery as to why a honey bee gently lands on a flower, extracts its sweet nectar, and leaves with a grain of pollen attached to its hind legs. It is an exercise of survival for the bee who manufactures the nectar into honey, essential food for the colony, and the pollen provides vital protein for the baby bees.

We first think of honey bees in terms of the honey they produce, which last year in the United States totaled some 150 million pounds, its wholesale value to the economy estimated at \$150 million. That is dwarfed, however, by the value of the pollination work honey bees do for our crops of fruits and vegetables, worth some \$19 billion, according to a recent National Research Council study.

Honey Bee Value to Agriculture

Extensive studies have quantified the benefit of honey bee pollination to various food crops. For example, we know that almonds, cucumbers, apples, avocados, melons, cranberries, asparagus, broccoli, carrots, cauliflower, and celery are entirely dependent upon honey bee pollination for their seeds to set and yield fruit. Blueberries and blackberries are 80 percent more productive with the aid of honey bees; grapefruits, and apricots, 90 percent. Seven of the nine crops that provide half of the vitamin C available to the human diet depend almost entirely upon external pollination for the production of fruits or seeds (oranges, cabbages, green peppers, tomatoes, melons, tangerines, and watermelon).

California almond growers must rent a million honey bee colonies to pollinate their billion dollar crop, for which they pay prices sufficient to entice East Coast beekeepers to truck thousands of colonies across the country and back each year.

Pollination is the process by which pollen is transferred from the anther (male) to a receptive stigma (female) flower part. In its quest for sweet nectar, which is usually secreted deep within the flower, the honey bee coincidentally comes in contact with the pollen-laden anther. As the honey bee maneuvers through the flower, it brushes the pollen grains across the stigma; hence, fertilization and seed formation occurs. The rear legs of the honey bee are miraculously equipped with Velcro-like grips that bind pollen grains securely for the return flight to the hive.

One Third of the Food We Eat ...

In North Carolina, some 10,000 beekeepers, mostly hobbyists with 10 colonies or less, produce \$15 million worth of honey each year, but the value of honey bee pollination to farm crops is estimated at nearly \$200 million.

One-third of the food we eat is dependent upon honey bee pollination. We know that because agricultural scientists, in their effort to boost production of essential food crops, have studied the honey bee for eons. Not so well known, however, is the impact of honey bee pollination to ornamentals, though we suspect it is significant.

Alfalfa, clover, and sunflowers are heavily dependent upon the honey bee. We know that because their plants and seeds are important commodities.

Honey Bees in the JC Raulston Arboretum

I can find no research that defines the benefit of honey bee pollination to ornamentals. However, I am convinced it is substantial. Take the Nellie R. Stevens holly, for example. In September of 2007, when I first established four honey bee colonies at the southeastern corner of the JC Raulston Arboretum, there were few berries on the holly trees. Last year, with honey bees in residence for a full year, the holly berries were prolific. It should be noted that a late and extended freeze over the Easter weekend in 2007 severely damaged most plants and trees flowering throughout the state.

Charles Heatherly and the JCRA Bees



I noticed one thing about the prolific crop of holly berries last year that may be an indication of a visit by the honey bees: the berries are especially thick along a band from about 8'–20' high. I have also observed bees in the Arboretum visiting plants throughout the year, even during mid-winter when there are no flowers elsewhere.

There is another side to the pollination scenario—the perspective of the honey bee who benefits immensely from the nectar and pollen available from the non-food crops, such as the tulip poplar tree, the most abundant source of nectar throughout much of the growing season in North Carolina. The tulip poplar is found throughout the state from the coastal plain, through the Piedmont and even into the western Appalachia region. While honey bees have to visit many small flowers to gather a full load for delivering to the hive, the large, yellow, bell-shaped tulip poplar flower is rich in nectar and sufficient to supply several bees with their quotas.

Another important source of nectar and pollen is the maple tree, which flowers in mid-winter, usually late January. Most people, except for beekeepers, are unaware of the maple flowers because its flowers are tiny and have no petals. Maples are very important to honey bees because their early flowers incite the

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2008 New Plantings

By Mark Weathington, Assistant Director and Curator of Collections

The past year has been a great one at the JCRA in terms of getting plants in the ground. Regular moisture for most of the growing season meant we could keep planting from early spring right through until fall. Over 900 different accessions from sources around the globe were planted during 2008 throughout the Arboretum.

A major planting area last year was the newly created Xeric Garden, installed where the Southwest Garden previously stood and utilizing the mature specimens from that collection. Forty-one agave were planted last summer with 37 of them in the Xeric Garden alone, while 16 of the 17 yucca taxa planted last year were also added to this area. The Xeric Garden became home to more than just woody lilies though. Almost one quarter of the new plantings in 2008 went to this display of drought tolerant, water-wise plants. New taxa include rare conifers like *Widdringtonia nodiflora* (African mountain cedar), *Juniperus seravschanica*, and *Wollemia nobilis* (Wollemi pine) as well as southwestern and Mexican oaks, *Quercus wislizenii*, *Q. berberidifolia*, and *Q. durata*. Broadleaf evergreens, such as *Pittosporum tenuifolium* 'Argentea Nana' (dwarf silver-leaf New Zealand pittosporum), *Callistemon brachyandrus* (prickly bottlebrush), and *Calluna vulgaris* 'Golden Carpet' (gold heather), work with the agaves and cacti to make this a truly four-season garden, while deciduous flowering shrubs add color bursts throughout the season. Highlights include the rare native *Styrax platanifolius* subsp. *texanus* (Texas snowbells) with white, bell-shaped flowers, several *Punica granatum* (pomegranate) cultivars, and the large-flowered *Chilopsis linearis* 'Bubba' (desert willow). Bulbs and herbaceous perennials complement the woody plants, providing color and texture in both summer and winter.

New selections of popular plants are always exciting to evaluate. Different flower and foliage color, vigor, or growth habit can add a lot to the garden. Some of these selections include the ground covering *Lagerstroemia indica* 'Rosey Carpet' (crepe myrtle), the variegated *Cyrilla*

racemiflora 'Spring Cloud', the respectively dwarf and fastigate *Ginkgo biloba* 'Troll' and 'Blagon', and the cutleaf *Hydrangea arborescens* 'Emerald Lace'. Some of these plants will certainly add quite a bit to the gardener's palette while others may prove to be a mere flash in the pan.

At the JCRA, we're always looking for new species that we haven't grown previously. NC State University's Jenny Xiang, Ph.D., supplied us with seed for a couple of new plants from her treks in China, and we have grown them out and planted them on the grounds. *Cornus eydeana* is a newly described evergreen species of dogwood that we are hoping will be hardy for us here in Raleigh. We'll pass on more information as we learn about this exciting plant. Another new plant for us is the horsechestnut, *Aesculus wangii* (possibly the same as *A. assamica*). Either way, it has already shown some potential by retaining its leaves until frost. Other new species that we've added to the grounds include *Phoebe formosana*, a broadleaf evergreen in the laurel family; the beautyberry *Callicarpa kochiana*; and *Hydrangea hirta*, one of the five species, along with over a dozen cultivars, of hydrangea planted last year.

We hope you take the opportunity to come by the Arboretum often to view our constantly evolving and changing collections. Let us know about plants that impress you or about new plants that you think we should evaluate. 🌸

Future Plantings

This year is shaping up to be a great year also. Watch the master plan continue to transform the JC Raulston Arboretum as we plant out the newly redesigned and expanded Asian Valley. It will feature new selections of Asian plants as well as wild collected species from "the mother of gardens." Other areas to watch for new plantings are the Lath House, Geophyte Border, and Conifer Collection.



Musings on “Great Garden Plants”

By J. C. Raulston, Ph.D., North Carolina State University Arboretum Founder

(Editor’s note: The following article was discovered in 2007 in one of the boxes that remained in Kilgore Hall after we moved out in 2002. J. C. originally prepared it for the December 16, 1993, Christmas Plantsman Luncheon hosted by William H. Frederick, Jr. The article brought back many rich memories to the few who read it so we thought we’d include it in this newsletter for everyone to enjoy.)

In an almost weekly event, I am asked to lecture here and there around the country on a wide variety of subjects—many of which carry the theme of good or recommended plants for various purposes—“native plants,” “flowering vines,” “conifers,” “most profitable/marketable,” “winter interest,” “screening,” etc., with endless variety. In general, during these events, I have the luxury of 40-60 minutes to pontificate and an 80-slide reel of photographs to give a range of the plants I feel fit the specific categories of the moment from the “thousands of plants one can’t possibly do without.”

I’ve recently been put to a new and possibly ultimate challenge which has occupied much of my daydreaming and thinking time over the last month. In two weeks, I will make a 14-hour round-trip drive to do a “slide lecture” to a select group of plantsmen peers—with a major problem inherent in the mission. The requested theme is “hardy landscape plants of the HIGHEST GARDEN MERIT”—not “curiosities,” not “esoterica,” not “profitable.” A tough enough assignment in its own right—but strengthened by the additional requirement of a limit of only five plants, and only five slides total in the presentation. AAAUUUUGGGHHH!!

The list has churned and churned endlessly (and will likely continue to do so until departure)—just what is “high garden merit”?—and how to divide them out? As necessary whittling mechanisms, I’ve decided they need to: be basically tough and not need pampering, with relatively low maintenance (little or no special environments, modified soils, watering, pruning, spraying, etc.); have interest or appeal over a fair length of time; that they have high

ornamental value at least at some point (showy or interesting flowers, fruit, bark, foliage, texture, etc.); be “available” to the public (no use of my normal “I’ve got the only one in the United States” tricks); and be represented in my slide files with an excellent photograph (an ironic, but realistically very important part of “marketing and promotion of plants” today).

And to force myself to variety, there will be one each in the categories of: an herbaceous perennial (a major concession here, but necessary); a broad-leaved evergreen; a deciduous shrub; a tree (we needed both deciduous and evergreen categories); and a conifer. Which left me without other “essential” categories of bulbs, vines, ground covers, etc. Only five plants? How painful!

The Herbaceous Perennial

In one sense, perhaps the easiest, as everyone knows I know nothing about these “things that die to the ground every year.” But I do have a variety of favorites, enough to make even this decision difficult. *Amsonia hubrichtii* was finally chosen as it has a six to seven month period of continual high ornamental interest (rare in perennials), is new enough that it is not yet in most perennial references (an American plant the English haven’t grown yet to convince Americans of its value) but available in recent years through a goodly number of native plant and speciality perennial growers. There are 25 species of blue stars (Apocynaceae) native to the United States and Japan—but only *A. tabernaemontana* is common in the ornamentals industry.

A. hubrichtii is native to the American Midwest. It has beautiful, pale blue, star-like flowers in terminal clusters in early summer; very handsome, thin, linear, graceful, green foliage through the summer on plants reaching 2’–3’ in height and 3’–4’ wide; and, rare for perennials, a long, spectacular fall foliage color display of brilliant ginkgo-yellow fading to golden brown. It is easy to propagate by seed, rooting of softwood cuttings, or division of clumps—and is exceptionally stress tolerant with no pest problems. Probably useful in USDA Zones 5–9 (4?) and best

in sun. (My five runners-up include: *Asclepias tuberosa*, *Baptisia pendula*, *Calylophus drummondii*, *Iris siberica* ‘Caesar’s Brother’, and *Muhlenbergia dumosa*.)

The Broad-leaved Evergreen

As the standard background of the entire Southern landscape, with thousands of choices—a real toughie. But my choice of *Mahonia* ‘Arthur Menzies’ is an easy and comfortable one with its many merits. In the mid-South, leatherleaf mahonia, *M. bealei*, is the standard representative of this genus—a fine plant in its own right. But in this large genus of over 70 species in the Berberidaceae family, one of the superstars is *M. lomarifolia* from Myanmar which can reach 40’ in height, with long leaves up to 2’ in length, containing dozens of leaflets, and huge terminal candelabras of yellow, fragrant flowers in midwinter—and sadly a USDA Zone 8-9 non-hardy species (at least long-term in Raleigh; we grow it as a short-lived woody perennial).

In 1961, a group of *M. lomarifolia* seedlings were sent from the Strybing Arboretum in San Francisco (where it grows magnificently) to the University of Washington Arboretum in Seattle for trial. In 1964, a severe freeze reduced this group of plants to “brown pulp” except for one seedling—which was subsequently identified as an accidental hybrid of *M. lomarifolia* and *M. bealei* that occurred by natural crossing of adjacent parent plants at Strybing.

‘Arthur Menzies’ (named in honor of “the most knowledgeable horticulturist in California”) is intermediate in characters between the two parents. The leaves are 1’+ in length—longer than *M. bealei* and shorter than *M. lomarifolia*; it will probably be 12’–18’ in height at “maturity” in most areas; and it generally flowers in Raleigh from early December through mid-January with showy and wonderfully fragrant yellow inflorescences to 1’ in length. (Similar “competitors” in the *Mahonia* world are the several *M. ×media* cultivars from *M. lomarifolia* × *M. japonica* crosses in England—but these tend to flower later in the winter here.)

Sadly, it has remained a relatively unavailable plant except for local propagation and use in the Pacific Northwest where it originated. Although propagation is fairly easy by terminal or single-node stem cuttings under mist, this requires a parent stock plant for availability of wood, and plants provide low annual yields for slow buildup. It is available in small quantities from speciality nurseries with hunting, and, happily, several large wholesale nurseries in North Carolina are now in the buildup stages, using the half-dozen older plants in the NCSU Arboretum for propagation so it can begin to enter our local market in the near future. Useful in USDA Zones 6–8 and best with winter shade to prevent foliage scorch in periods of bright sun coupled with low temperatures. (My five runners-up include: *Abelia* × *grandiflora* ‘Confetti’, *Magnolia grandiflora* ‘Little Gem’, *Nandina domestica* ‘Moonbay’, *Osmanthus fragrans* var. *aurantiacus*, and *Viburnum tinus*.)

The Deciduous Shrub

The musing on this category made me aware of how difficult the “long season of quality ornamental interest” is to achieve here. The truly long-flowering things like *Buddlejas* and dwarf spireas are of somewhat “fuzzy” ornamental interest. But a truly outstanding plant finally emerged from this sorting process—*Hydrangea quercifolia* ‘Flemygea’ (Snow Queen™)—oakleaf hydrangea (Hydrangeaceae).

This southeastern U.S. native plant has large, showy, white inflorescences in summer which dry and remain attractive through winter, interesting cut-leaf “oak-like” foliage which has good fall color, and wonderful winter bark on older plants. It is tough with good stress tolerance once established and can be grown in sun or shade, has no insect or disease pests, is easy to propagate and is rapid growing with an ultimate size of 5’–8’, and is long-lived. (My five runners-up include: *Enkianthus perulatus*, *Hamamelis* × *intermedia* ‘Sunburst’, *Hydrangea anomala* ssp. *petiolaris* (staked and eventually grown as a shrub), *Poncirus trifoliata* ‘Flying Dragon’, and *Viburnum plicatum* var. *tomentosum* ‘Summer Snowflakes’.)

The Tree

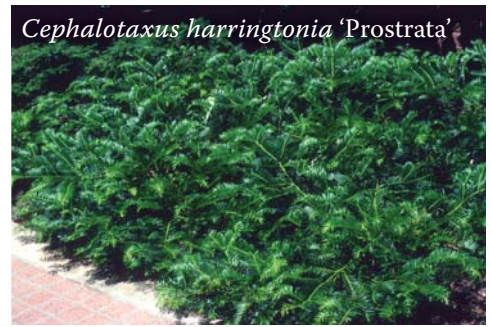
A real dilemma here—how could I possibly bypass my much beloved winter-flowering *Prunus mume*, Japanese

flowering cherry, that I’ve promoted for so many years? In a category with many outstanding candidates, it finally falls to the “long season of merit” criteria with less than wonderful foliage in summer. So, by “default,” *Cercis canadensis* ssp. *texensis* ‘Oklahoma’ (Fabaceae) becomes the automatic choice. This superior seedling variant of the Texas redbud was found in the Arbuckle Mountains of Oklahoma and was introduced by Warren and Son Nursery of Oklahoma City in 1964. A small tree to 15’–25’, with great heat and drought stress tolerance, with the specific landscape merits of a rich flower color of the darkest magenta of all redbud species and cultivars, and large, thick, leathery, glossy foliage so handsomely appealing one would grow the tree for ornamental merit even if it never flowered. It is useful in USDA Zones 6–9 and does best in full sun, though it will tolerate light shade.

The only thing keeping this exceptional plant from being one of the most widely grown in the United States is the relative difficulty of its propagation—requiring budding, and one of the trickiest of the woody plants to bud successfully due to its very thin cambium. So suppliers can never meet demand though it is grown more and more each year—and not that difficult to find now with a bit of searching. Recently, its similar “sister” plant, the white-flowering form of the same species called ‘Texas White’ has yielded to tissue culture techniques—so although propagation specialists have not yet been successful with ‘Oklahoma’ in tissue culture, it does appear possible to break this barrier to mass production in the future. (My five runners-up include: *Acer palmatum* ‘Beni Kawa’, *Lagerstroemia fauriei* ‘Fantasy’, *Prunus mume*, *Salix babylonica*, and *Styrax japonicum* ‘Emerald Pagoda’.)

The Conifer

A truly impossible choice with the diverse variety in sizes, forms, and “looks” available—and additionally tricky with my coniferaholic partner Kim Tripp breathing down my neck to check my conifer “political correctness.” “We’ve” finally settled on *Cephalotaxus harringtonia* ‘Prostrata’ for some unusual conifer properties. This slow-growing, mid-height (to 2’–3’), ground cover shrub native to Japan can be grown in either full sun or heavy shade, has a very different “feathery” texture than the ubiquitous junipers normally grown



for ground cover use, will tolerate poorly drained, hot soils of the southeast which do in many conifers, and, of increasing importance in the eastern suburban gardens, it is totally ignored by deer browsing on other garden delicacies.

It is easy (though slow) in propagation from hardwood cuttings in winter and the only negative characteristic keeping it from the mass market is the slow growth which precludes fast, cheap production for consumers. With the awarding of the Pennsylvania Horticultural Society Gold Medal in 1993, production and marketing of this outstanding plant should certainly increase. Useful in USDA Zones 5–9 in sun or shade. (My five runners-up include: *Cedrus atlantica* ‘Glauca Pendula’, *Chamaecyparis nootkatensis* ‘Pendula’, *Cryptomeria japonica* ‘Elegans’, *Juniperus deppeana* ‘McFeters’, and *Taxodium ascendens*.)

Only five plants? Absolutely ridiculous! ❀

The NAPCC Certified *Cercis* Collection at the JC Raulston Arboretum

By Mark Weathington, Assistant Director and Curator of Collections

The North American Plant Collections Consortium (NAPCC) is a program of the American Public Gardens Association in cooperation with the USDA's Agricultural Research Service and the U.S. National Arboretum. In this program, institutions commit to holding and developing a collection of documented living plants according to professional standards of collections management. They share collections information with other public gardens to compare holdings and to identify duplications and gaps. This approach makes efficient use of available resources, strengthening collections through combined collaborative activities. This network of botanical gardens and arboreta work to coordinate a continent-wide approach to plant germplasm preservation, and to promote high standards of plant collections management.

Participating institutions undergo a thorough evaluation to determine their suitability for the program. Gardens must demonstrate exceptional curatorial and management practices, meticulous record keeping, and a commitment to the long term care of a specific taxonomic group.

NAPCC Collection

The nature of the JC Raulston Arboretum's mission, combined with its small size, means that the collections are constantly evolving as new plants are added and older specimens removed. Committing to the long term curation of a single taxonomic group was only undertaken after careful consideration of the limits this would impose on the dynamic nature of the collections. Because the aims of the NAPCC to make germplasm available for selection and breeding, taxonomic studies, evaluation, utilization, and other research purposes ties in closely with the goals of the JC Raulston Arboretum, we decided that this would be a mutually beneficial collaboration.

Cercis (redbud) has been an important part of the collections of the Arboretum from the start. The first accession dates

to 1978, shortly after the Arboretum was established. While most public gardens have their share of redbuds, few have significant collections of the often hard-to-find species and cultivars. Depending on your taxonomist of choice, there are 6-11 species of *Cercis* and several other subspecific forms. The JCRA currently holds 7 species and 40 distinct taxa with a concentration in the forms of *Cercis canadensis*. While there is very little replication of taxa in the JC Raulston Arboretum, the history of freely sharing propagules with other gardens and nursery professionals has ensured that replicates of our collections can be found all over the world. The stated goal is to collect all known species and subspecies for comparison as well as collecting as many of the various named forms of redbud as possible.

Considerable confusion abounds in the literature—and consequently the marketplace—surrounding the Asian redbuds. The JCRA NAPCC collection will help to clear up the taxonomic confusion surrounding this group of landscape-worthy trees and shrubs and provide propagules to other researchers and the green industry. Side-by-side comparisons of living plant material will enable us to develop keys for identifying plants. The collection will also help the JCRA's education mission, both to the public and to NC State students, as we impress on them the importance of coordinated and collaborative efforts to preserve germplasm *ex situ*.

Introductions

By the mid 1990s, two selections of *Cercis* had been selected and named by J. C. Raulston, Ph.D. The first, *Cercis canadensis* subsp. *mexicana* 'Bonita', was grown for its exceptionally glossy leaves with regularly undulate margins. The other, *C. glabra* 'Celestial Plum' (originally named and still sometimes seen as *C. yunnanensis* 'Celestial Plum') was selected for its blue-green foliage and loads of light plum purple flowers in early spring. Once thought to be lost from cultivation, this outstanding selection is making a resurgence. In



more recent years, the JCRA *Cercis* collection has been used as source material in the breeding efforts of Denny Werner, Ph.D., plant breeder in the Department of Horticultural Science at NC State University. Over the next several years, he will be releasing new plants in conjunction with the JCRA. Plants coming out of his program in the near future include weeping forms with both variegated and purple leaves as well as the purple-leaved *Cercis canadensis* subsp. *texasensis* 'Merlot'. We anticipate even more exciting forms of our native redbud to emerge from this innovative breeding program. The newest introduction from our existing collection is a *Cercis chinensis* that we have been watching for years. It is one of the very first redbuds in our extensive collection to show color, it absolutely covers itself in lavender-pink flowers, and is one of the last to finish flowering. The exuberant flower display starting at the very beginning of March and continuing through the end of April gives us the hope of returning spring and ushers in the "March Madness" of our garden's floral display. To honor the memory of Coach Kay Yow, we have named this exceptional plant after this remarkable woman—*C. chinensis* 'Kay's Early Hope'.

Planting the Seeds for Development

By Anne M. Porter, Director of Development

2009 Gala in the Garden

Enchanted Garden: A Botanical Fantasy

Sunday, May 3, 2009
3:00 PM–7:00 PM

Please join us for an enchanted garden party. Escape the everyday for an afternoon of magical delights and merriment ... as you stroll around the gardens, perusing all the dazzling botanical and non-botanical silent auction items. The Gala is a perfect opportunity to enjoy the “enchanted gardens” and entertain family, friends, and business associates ... while sipping on a cool drink and sampling gourmet treats. It is sure to be a delightful afternoon of whimsy and merriment to delight the senses—a Raleigh garden party like no other!

Honorary Chairs

Rufus and Linda Edmisten

Event Chairs

Cyndy Allison
Tori Callanan

Event Committee

Jill Adams	Carol Fishman
Cyndy Allison	Larry Handcock
Jayne Bednarczyk	Barbara Kennedy
Ted Bilderback	Charlie Kidder
John Buettner	Anita Kuehne
Tori Callanan	Marjorie O’Keeffe
Kathy Deal	Anne Porter
Rufus and Linda Edmisten	Jackie Wynne
	Helen Yoest

Gala in the Garden Silent Auction

The silent auction is always a favorite entertainment of the Gala. Whether guests are bidding on outstanding and unusual plants, resort packages, signed memorabilia and books, concert tickets, fine handcrafted jewelry, or vintage scotch—it is guaranteed to be great fun and great competition! If you would like to donate a special item for the auction, please visit our Web site or contact Anne Porter at (919) 513-3826 or anne_porter@ncsu.edu.

Event Sponsors

The Gala in the Garden is the Arboretum’s main fund-raising event of the year, with the proceeds going to support its daily operations of teaching, research, and public garden displays. Won’t you consider supporting the JCRA by becoming a Gala sponsor? It’s an enchanting way to entertain business guests or a special treat for your staff. For more sponsorship information, please visit our Web site, call Anne Porter at (919) 513-3826, or e-mail her at anne_porter@ncsu.edu.

The JCRA Flags

Ever drive by the Arboretum or walk up the sidewalk along the District X Garden Club of North Carolina Wall Garden and suddenly a burst of color catches your eye? Well, you can thank our good friend, Vanette McKinney! Vanette has been graciously donating her time, talents, and resources for many years, and the flags make a fanciful addition to our beautiful gardens. Vanette even added three pink flags at the front entrance in remembrance of NC State Coach Kay Yow. Thanks, Vanette! We appreciate your gifts!



Members Making News

The JCRA is extremely fortunate to have so many talented friends and donors. If you are a “member making news” or know of one, please share it with us.

On November 20, 2008, Cyndy Allison, owner of Willow Tree Landscaping in Raleigh, (and the 2009 Gala Event Co-chair) was recognized with the Residential Contracting Distinction Award given by the North Carolina Nursery & Landscape Association. To learn more about Cyndy’s garden designs and other awards, visit: <http://www.willowtreelandscaping.com>. Way to go, Cyndy!

Bland Landscaping Co. was also honored on the same evening with the Commercial Landscape Installation Merit Award for their fine work on the Oberlin Court Apartments.

Pam Beck and Tony Avent are the local area subcommittee chairs for the 2009 Garden Writers Conference, being held at the Raleigh Convention Center in Raleigh, North Carolina, from September 23–27.

Helen Yoest has a new Web site and blog that are not only very cool, but she also mentions the JCRA frequently. (Thanks, Helen! We appreciate the great PR!) Check them out: <http://www.gardening-withconfidence.com> and <http://www.gardensgardens.wordpress.com>.

Something Worth Looking Into

Looking for new ways to support the JCRA ... or other charities of your choice? This could be an opportunity worth looking into!

President Bush signed the \$700 billion economic bailout bill (H.R. 1424, The Financial Rescue Package), which includes a two-year extension of the IRA Rollover provision.

Here are the highlights and limitations:

- The provision applies to IRA gifts made in 2008 and 2009 (January 1, 2008, through December 31, 2009).
- The donor must be age 70½ or older.
- The donor can give up to \$100,000 per year out of his/her IRA.
- The contribution must be a direct gift to a charity (donor cannot fund a planned gift such as a charitable trust or charitable gift annuity with his/her IRA gift).
- There is no income tax on the IRA distributions as long as they are directly transferred to a qualified non-profit.

Why This Is a Good Thing!

The IRA Rollover gives individuals more tax-efficient alternatives to support the charities of their choice—like the JC Raulston Arboretum.



Save-the-date for Open Days Garden Tours

By Anne M. Porter, Director of Development, with Garden Descriptions by Respective Hosts

The JCRA is excited to once again be part of the Garden Conservancy's Open Days. For more information regarding the program and to see the nationwide schedule of the 2009 Open Days, please visit <http://www.gardenconservancy.org>.

Tickets may be purchased for \$5 each (or books of six for \$25) at the JCRA a month prior to the Raleigh tour; or, during the event at the JCRA or any of the individual gardens. This is a wonderful opportunity to see many spectacular private and public gardens while supporting the JCRA.

The Raleigh Open Days will be September 19 and 20, 2009. The tour begins at the JC Raulston Arboretum and features the following spectacular gardens. Just a little something to whet your appetite!

Featured Gardens

Entwined

Phil Abbot and Jayme Bednarczyk
1025 Traders Trail, Wake Forest

Hopeful dreams entwined with patience and time,
Cherry trees bloom amidst whispering pines.
A hand-built home grew among fruitful trees,
Passive solar sited to capture the breeze.
Upon stone walls climbing roses scramble,
Interlaced clematis delight and ramble.
A south-facing room in need of a view,
To embrace the sunlight—geothermal too.
After clearing some pines, light and energy found,
Now a beautiful lake where habitat abounds.
Entwined gardens with curvilinear walls,
Terraced and planted, space to gather for all.
Plants for food, plants for shelter,
Plants for fragrance, interwoven color with texture.
Pathways meander, through a garden of splendor,
Hearts and souls are nourished and remember.
Villa and garden—with European appeal,
Hand-built passion entwined—the dream revealed.

Falls Revival

Jeff Bottoms and John Martin
12160 Falls of Neuse Road, Wake Forest

A historic valley provides the setting for this garden, overlooking a hillside cemetery, a quaint little church, and a cluster of old millhouses. Mature trees, remnant vineyards and orchards, heirloom shrubs, and a casual cottage style all help to anchor this garden in that nostalgic world. A backyard nursery, boasting a wide range of exotic and unusual plants, adds an unusual twist; here is a collector's garden with traditional roots but with a fresh eye for the new and different, fending for itself against modern-day environmental pressures.

Rose Cottage

Jim and Sharon Bright
115 N. Bloodworth Street, Raleigh

Rose Cottage is an intimate city garden located in Raleigh's downtown historic district. The gardens arose out of an old graveled parking lot. This once barren spot has been transformed into a lush and tranquil oasis of color and fragrance. It abounds with a large variety of plants. The garden setting includes perennial beds, a parterre filled with a annuals, a pergola draped in wisteria, a woodland garden, raised vegetable beds, a secret garden, and a compost operation. The latest addition is a garden cottage, as charming as it is useful.

The Paisley Garden

Julia Kornegay and Alfredo Escobar
5237 Leiden Lane, Raleigh

Avid do-it-yourselfers, Julia and Alfredo's one-acre garden reflects their passion for plant collections displayed in a paisley pattern of color and whim that is still evolving. In the heart of the garden is a stone-bordered pond with a stream and waterfall. Gentle paths meander through woodlands and sunny spaces. A vine-covered arbor provides a restful sitting area. In the front garden, a new vegetable garden greets visitors. A propagation greenhouse, shed, potting bench, and compost bins are located in the garden nursery.



Helen's Haven

David Philbrook and Helen Yoest
3412 Yelverton Circle, Raleigh

Low boxwood hedges are used to create a formal atmosphere to complement the formal architecture of this Georgian Colonial style home. Within these hedges are informal plantings of perennials and annuals to attract butterflies, birds, and bees. Helen's Haven is a certified wildlife habitat and a certified Monarch Watch Station. Using water-wise design principles and watered with harvested rain, this organic garden demonstrates good environmental practices, resulting in a colorful, lush garden. Enjoy a leisurely stroll through the gardens, watching the butterflies alight and seeing enough birds to delight.

The Thompson Garden

Kathleen and Walt Thompson
119 Ravenna Way, Cary

The beauty of this suburban garden begins at street side where a path beckons you to enter and share in this preview of the abundant plantings that follow. The front garden is a delight of shrubs and perennials, showcasing a spectacular thread leaf Japanese maple. Upon entering the brick walkway at the arbor, you view a gently sloping garden with curved borders and pathways outlined with recycled concrete. These recycled concrete borders and retaining walls are consistent throughout the garden. Beds are richly planted with perennials, featuring a mix of native and specialty plants, including tropicals, all in perfect harmony. A small pond can be found along the network of twisting trails that lead through the woods to a community lake. Each area of this garden will elicit a sense of discovery and serendipity in plants, woods, and water.

Seasonal Celebrations

By Helen Yoest, JCRA Board Member and Volunteer

Friends Hosting Friends Anytime in 2009!

Last year on June 21, 2008, we began a new fund raiser for the JCRA. It was such a success, many of us wanted to do it again. However, there was a problem: how could we go to a party and have one at the same time? Plus, there were others who wanted to open their gardens in winter or spring or a holiday, or ... you get the idea.

So, for 2009, we will host parties anytime! You pick the date, we will all celebrate! We will gather friends to host a party—many parties—across the state to celebrate the JC Raulston Arboretum at NC State


University. This celebration is to raise money for the Arboretum.

The party concept is the same; it can be any party of the host's choosing—it could be for cocktails, tapas, pizza, or more ... it could be burgers, chicken, fish, and s'more ... it could be cloth napkins, silver, and china galore ... your home, your garden, your style, your taste ... you set the time, menu, décor, and pace.

Each host will ask friends for a donation to attend. This set amount is up to the host. These parties will be in cottage gardens, patio gardens, rose gardens, and future gardens—each venue unique to the

friend hosting the event, thus each donation unique to those attending! Invite your book club, garden club, neighbors, or choir! Maybe even your doctor, dentist, or secret desire! Delight with friends and host an event.

The JC Raulston Arboretum will provide invitations for the host. The host underwrites the party receiving a gift-in-kind tax deduction. The guest receives a tax deduction for their donation. The money raised will help support the implementation of the Arboretum's master plan.

Contact Anne Porter at (919) 513-3463 or anne_porter@ncsu.edu or Helen Yoest at helen@gardeningwithconfidence.com if you wish to host a party or need more information. 

Annual Report

A Year in Review

The JC Raulston Arboretum is pleased to present the 2008 Annual Report, recognizing our donors, supporters, and volunteers. We extend a sincere thank you to all the individuals and organizations that supported the JCRA in 2008. Your support makes possible the continued growth and development of our gardens and educational programs. Plants and gardening nurture the human spirit and enhance our quality of life. We are honored that you have chosen to support this special arboretum as it continues to fulfill its mission of excellence in research, teaching, and outreach.

Members

It is difficult to imagine where the JC Raulston Arboretum would be without the support from our members, the Friends of the Arboretum. With the growth of our membership, we can continue to offer new educational programs, create and maintain our garden spaces, and inspire the community at large.

Philanthropist

William and Mary Joslin
Taylor's Nursery

Benefactor

Pender Nursery

Founder

Malcolm and Patty Brown
David and Catherine Duch
David Griffin
Henry Leon Lobsenz Foundation
Janet Leath
Bobby Ward and Roy Dicks

Patron

Fox Hollow Nursery
Robert and Pickett Guthrie
Neil and Margaret Harper
Cameron and Dee-Dee Harris
Hefner's Nursery
Virginia Hester
Ray and Annie Hibbs
Deborah Johnson

Julia Kornegay and Alfredo Escobar
Charles and Wanda Leffler
Kathy Mauney
Richard Pearson and Joan Robertson
Plant Delights Nursery
Redwine's Landscaping & Special Events
Sampson Nursery
Carl and Janet Shafer
Sungate Design Group
Wyatt-Quarles Seed Co.

Sponsor

Ann Armstrong
Thomas Barrett
Bartlett Tree Experts
Jean Benjamin
Berylwood Tree Farm
Richard Blanton and Candace Haigler
Jeffrey Bottoms and John Martin
Donnie and Phyllis Brookshire
Dean and Gail Bunce

James Bustrack
Carolina Seasons Nursery
Currins Nursery
Anne Dahle
Johnie and Genelle Dail
Doris Deal
Jim and Betty Deal, Sr.
Dover Foundation
Risa Ellovich
Gardeners of Wake County
Curtis Kasefang and Sharon O'Neill
Mary King
Lady Slipper Garden Club
William and Melda Lamm
Robert Lyons
Donna Mack and John Stender
Ross and Margaret McKinney
Ray Noggle
Novozymes North America
Neena Nowell
Marjorie O'Keeffe
Outdoor Images
Panther Creek Nursery
Steven and Katie Perry

Piney Ridge Nursery
Pistole
Planning Strategies
John and Marilyn Ranson, Jr.
Ellen Robertson
John and Susan Rountree
Saunders Brothers Nursery and Orchard
Mark Smith
Lois Sowers
Andrew and Esther Spaltenstein
Swift Creek Nursery
Nadine Tope
Turtle Creek Nursery
The Unique Plant
Wakefield Nursery & Landscaping
Karen Welty-Wolf
George and Claudia Wilson
Louise Wrinkle
Helen Yoest and David Philbrook

Business

IBM Global Well-being Services and Health Benefits

John Rex Endowment

Family/Dual

Angela Abbott
Donald and Jo Ann Adams
Rosanna Adams
Stephen and Darlene Aleksza
Howard and Mary Edith Alexander
Chip Allen and Sharon Spray
Lloyd and Donna Allen
Gary and Deidre Alsberry
Tom and Jeanne Andrus
Bryan and Carol Aupperle
Dianne Austin and Robert Smith
Robert and Jane Avinger
Charlotte Bailey
David and Nancy Bamberger
Melba and Camille Barden
Kaye Barker
Sandra Barnard
Mark Barnes
Amanda Barnett and David Druck
Bill and Ann Bason

Llewellyn Beaman
Joe and Karen Bearden
Clark and Gwen Beavans
Jayme Bednarczyk and Philip Abbott
Harriet Bellerjeau
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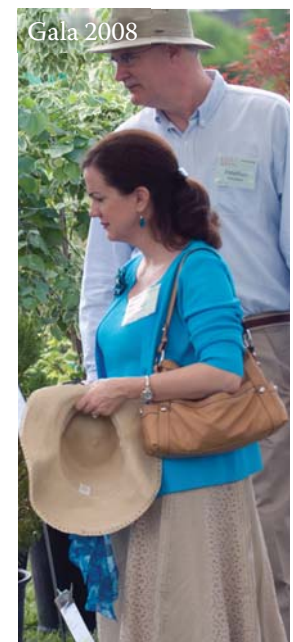
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JCRA Receives Grant from the North American Rock Garden Society

By Nancy Doubrava, Interpretive Specialist

The JC Raulston Arboretum was proud to receive a grant in 2008 from the North American Rock Garden Society's Norman Singer Endowment Fund to support the development of the rooftop gardens and the Scree Garden. Their generous funding enabled us to purchase new plants, plant identification labels, and interpretive materials for these gardens.

Be sure to come to the Arboretum and visit these popular new gardens. Here, you can see a wide diversity of drought tolerant plants from the southwestern United States, Mexico, South Africa, and similar habitats being tested for their performance in our area. These gardens continue to be a success thanks to the combined efforts of volunteer garden leader Charlie Kidder and volunteer Anita Kuehne, who generously donate their time each week to care for these gardens.

Endowments

An endowment is a lasting legacy. A special thanks to these donors for their foresight and generosity. Contributing to an endowment is a long-term investment that provides financial stability for the Arboretum year after year. For more information on how you can create an endowment to benefit the JC Raulston Arboretum, please contact Anne Porter at (919) 513-3826.

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 William and Cindy Fritz
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 Galatea
 Lena Gallitano
 George and Jill Gammon, III
 Rene and Judith Garces

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 Steven and Cindy Garris
 C. Madison Geer
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 Ed Gleason
 James and Kathleen Glenister
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 Marguerite Gray-Hearn
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 Melissa Griffin
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 Stephen Gurganus
 Janet Guthrie
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Beverly McDougall
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Ward and Charlotte Purrington
Alfred and Suzanne Purrington
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Todd and Michelle Van Gundy
Brooke Venable
George and Nickye Venters
Lisa Vera
Andrea Verykousis
Janet Vernelson and Gerald Field
Dawn and Philip Wagner
Robert Walters
Bobby Ward and Roy Dicks
Randall and Susan Ward
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Suzanne Whitmeyer
Arthur and Frances Whittington
Wilde Oaks Nursery
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A. E. Finley Foundation

Leaving a Legacy

The Top 10 Reasons to talk with us about including a gift for the JC Raulston Arboretum in your will:

- 10. A bequest is an easy, effective way to support the Arboretum.
- 9. You may designate your gift to any JCRA program or garden area.

- 8. You may create an endowment fund that will last in perpetuity.
- 7. You may create a scholarship fund to help future horticultural or landscape design students.
- 6. Regulations dealing with the estate tax are changing, almost each year.
- 5. We can help identify which assets are best to use in making your gift.
- 4. You will become a member of the NC State University Pullen Society.

- 3. We can provide information on the best way to structure your gift.
- 2. We can help plan so your gift will be used exactly as you wish.

And ...

- 1. It gives us a chance to thank you for your future gift.

Please contact Anne Porter at (919) 513-3826 or anne_porter@ncsu.edu for more details.

Volunteers

The gift of service is invaluable to the Arboretum, and we are very appreciative of the many hours our volunteers devote to the Arboretum. Our volunteers share their many talents and their time to make the Arboretum a wonderful place for all to enjoy. We couldn't do it without them. Thanks to all of them.

Volunteer Hours—January–December 2008

Our volunteers gave over 8,000 hours of their time in 2008. Their efforts have made the Arboretum a showpiece in the community.

200+ Hours

Mary Edith Alexander
Vivian Finkelstein

100-199 Hours

Rosanna Adams
Claude and Mary Caldwell
Colin Daniels
Linda Glenn
Annie Hibbs
Beth Jimenez
Margaret Jordan
Charles Kidder
Patricia Korpik
Amelia Lane
Jean Mitchell
Laddie and Edna Munger
Elaine Pace
John Pelosi
Charlotte Presley
John Schott
Ralph Whisnant
David White
Helen Yoest
Dora Zia

40-99 Hours

Angelia Beasley
Jayme Bednarczyk
Harriet Bellerjeau
Regan Brown
Tom and Marie Bumgarner
Anne Clapp
Laurie Cochran
Patrice Cooke
Sherman Criner
Genelle Dail
Dennis Drehmel
C. J. Dykes
Suzanne Edney
Jeffrey Evans
Mike Ferrell
Wayne Friedrich
Marilyn Golightly
Cindy Heinlein
Barbara Kennedy
Anita Kuehne and Bill Swint
Rudolf and Friederike Machilek
Sarah Marano
Frank Moore
Richard Pearson
Cindy Rayno
Alexandra Reid
Shannon Renard
Judy Ryan

James Schlitt
Nancy Simonsen
Ann Swallow
Betsy Viall
Kathy Violette
Dee Welker

Other Contributions of Hours

Dale Allen
Jeanne Andrus
Barbara Blackwell
Lisa Bohlen-Admire
Frances Bradow
Lynn Canada
Betty Cannady
Monika Coleman
Nancy Council-Rix
Kathy Crosby
Patricia Cross
Heather Daulton
Barbara Dechter
Cynthia Dowdy
Wendy Elliott
Mary Lou Eycke
Carolyn Fagan
Roland Flory
Chloe Francis
Tracey Francis

Benjamin Gill
Rebecca Green
Judy Harmon
Gail Harris
Paul Henehan
Timothy Hinton and Alisa Lycof-
Hinton
Mitzi Hole
Donna Horton
Marty Howard
Cheryl Kearns
Sheila Kellogg
Gloria Kimber
Jennette King
Diane Kuzdrall
Joan Little
Robert Mackintosh
Rogeania McCay
Rick McGirt
Alberta McKay
Thearon and Vanette McKinney
Verna Medeiros
Guy Meilleur
Philip Meilleur
Rita Mercer
Twila Mitchell
Bob Davis and Judy Morgan-
Davis
Harley Mudge

Julie Nazar
Lara Rose Philbrook
Catherine Poff
Martha Ramirez
Kathe Rauch
Erin Schnieders
Stanley Shieh
Stephanie Simmons
Susan Skidmore
Kristina Solberg
Ann Stellings
John Suddath
Martha Thomason
Walt and Kathleen Thompson
Christine Thomson
Anitra Todd
Ruth Updegraff
Joanne Vandermast
Donna Watkins
Bee Weddington
Elisabeth Wheeler
Bill and Libby Wilder
Bobby Wilder
Qian Wu
Jewel Wynns
Sandie Zazzara

Volunteering

Volunteer News

By Barbara Kennedy, Volunteer Coordinator

With all the rain we have had this season, the need for lots of work in the gardens is guaranteed. Before we know it, buds will be opening and plants will be poking through the soil. This is a great time to volunteer to be part of our many activities. New and returning volunteers are always welcome.

New Volunteers

Terri Benton – Gardener
Heather Daulton – Butterfly Garden
Marilyn Golightly – Mapping
Julie Nazar – Mapping
Ginny Parker – Winter Garden
Chaula Shah – Weekend Gardener
Stanley Shieh – Weekend Gardener
Stephanie Simmon – Butterfly Garden

Susan Skidmore – Winter Garden
Nancy Sosnik – Special Projects
Christine Thomson – Visitor Center

Our Volunteer Tour Guides take a trip through the gardens as part of their refresher session. Keeping up with new plants and changes in the gardens helps our guides when they give tours to visitors.



Jim Schlitt, one of our volunteer gardeners, tackles the ornamental grass in the Perennial Border. As you can see, the grass almost overpowers Jim, but he manages to get the grass pruned in short order.



Preparing Connoisseur Plants for distribution requires concentration and paying attention to detail. Elisabeth Wheeler and Regan Brown work as a team to make sure everyone gets the correct plants.

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colony foragers to bring in nectar and pollen, which inspires the queen to begin laying eggs, as many as 2,000 a day, for the quick build-up.

Aside from their economic value to agriculture, pollinated plants contribute a variety of ecosystem services to mankind, among them: water filtration, carbon sequestration, and flood and erosion control. Nor should we overlook the food value to birds and other animals of the fruit and seeds that are a direct result of honey bee pollination.

Honey Bees in Decline

There are fewer bee colonies in the United States today than at any time in the last 50 years. The number of commercial U.S. bee colonies declined from 5.9 million in the late 1940s to 4.3 million in 1985, and 2.4 million today. The decline of honey bee colony health has escalated since the 1980s with the arrival of new pathogens and pests. The spread into the United States of varroa and tracheal mites, and more recently the small hive beetle, have created major new stresses on honey bees.

The value of bee pollination to ornamental plants would be almost impossible to measure," said Stephen Bambara, Extension entomologist at NC State University. "Any plant with ornamental fruit or berries and any annual plant propagated by seed, requires pollination," he added.

The honey bee is the workhorse of pollination. When you see a bee on a flower in the garden, be assured she is fulfilling an important role, not only in producing the sweet honey we enjoy, but also in growing the food we eat. 

On the upper right-hand side of the address label, there is an entry above your address. It is the date your membership expires and the password needed to access the Members Only section on the Arboretum's Web site.



The Annual Volunteer Pot Luck is a great time to get together with volunteers and just have a fun time. Roland Flory, Elaine Pace, and Denny Werner pose for this picture at Denny's home.



Bobby Ward and Roy Dicks have just finished a great meal and now take time to relax and enjoy the surroundings.



The Annual Plant Distribution requires lots of help from our volunteers. Here, Dee Welker helps label plants that will be part of the giveaway.



The Holiday Open House brings volunteers, staff and guests together to celebrate the season and enjoy tables full of delicious food prepared by all. Volunteers are enjoying the food and the friendship of other volunteers. 



If you would like to volunteer at the Arboretum, please contact Barbara Kennedy at barbara_kennedy@ncsu.edu or (919) 513-7004.


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