The JC Raulston Arboretum at North Carolina State University, contains areas with overstory specimens and understory trees and shrubs, herbaceous perennials and groundcover plants. All are continuously assessed for garden-worthiness. See pages 216 to 221.

JC Raulston Arboretum

MARK WEATHINGTON, Director of this teaching collection, writes about its history, ethos and achievements.

In May 1996, the International Dendrology Society made a brief stop at the North Carolina State University Arboretum, now the JC Raulston Arboretum (JCRA) at North Carolina State University, as part of a whirlwind tour of the region. The visit was a very big event for J. C. Raulston, Ph.D. who had only started the Arboretum 20 years prior. It was a chance to show off the astounding collection of trees and shrubs he had amassed in a very short time to some of the most knowledgeable and enthusiastic plants-people. The group was treated to a special showing, the first public unveiling of the hybrid *Calycanthus* which would ultimately bear his name and the name of the student, Richard Hartlage who made the actual cross, *Calycanthus* × *raulstonii* 'Hartlage Wine'. According to J. C. in his July 1996 newsletter, 'the IDS tour group went berserk, crowding and pushing to get photographs like rock star paparazzi!'

J. C. Raulston built the Arboretum as a place to test plants for suitability for greater landscape use and used the collections to supply nurseries around the country and globe with propagules. He arrived at North Carolina State University (NCSU) in 1975 with the job of teaching students nursery management, plant physiology, and plant ID and, as part of the Extension mission of a land-grant university, to support the nursery industry across the state. J. C. had noted that most nurseries in any region of the US were growing mostly the same palette of plants and he was determined to, 'diversify the American landscape.' The JCRA grew out of that passion, not as a way to accumulate specimens but as a method to evaluate them and distribute the worthy ones far and wide and to educate the public.

The JCRA is a living laboratory for students in the Horticultural Science

Department but also for the Plant Biology, Forestry, Entomology and Plant Pathology, Chemistry, Agricultural Engineering, and Agricultural Education departments as well as students and researchers from near and far. As fewer students enter the plant sciences, the JCRA has branched out into youth education to feed a pipeline from preschool through teens with the goal of bringing more students into the field.

While youth education has been a relatively new development in the past decade and a half for the JCRA, educational programming is certainly not new. Beyond college students, the JCRA presents lectures, workshops, courses and multiple symposia throughout the year. The annual Southeastern Plant Symposium in June features a who's who in horticulture from around the globe while more regionally, green industry professionals use our programs to further their knowledge and careers.

In 2020 when the pandemic hit and necessitated re-thinking our communications strategies, the JCRA quickly shifted to an online model. While this change has had some difficulties, it has allowed our impact to expand even further than ever before. A free gardening program is still presented online each Wednesday and then uploaded to our YouTube page, 89 new videos in 2022 alone with over 173,000 views, London and Andong, South Korea (presumably due in part to VPNs from behind the great firewall of China) are two of our top five viewer locations. An average of nearly 150 people show up via Zoom each week even as lives and operations have otherwise returned to some normality. Rather than move away from an online presence, we now offer most of our symposia and courses in a hybrid format available either in

Opposite, top, the IDS group on their whistle-stop visit to the arboretum in May 1996.

Right, the Ruby C. McSwain Education Center, characterised by its brutalist architectural style, softened by intelligent planting, is a living laboratory for students of varying disciplines.

person or online allowing us to reach more people than we ever could before.

The Arboretum itself is situated in Raleigh, North Carolina in the Piedmont region above the fall line. The area is characterized by hot, humid summers and relatively short, mild winters. The average high temperature in July is 31.6 °C with very little cooling overnight thanks to a relative humidity of over 80%. More than half the years since 2000 have seen temperatures over 37.8 °C with the record high of 40.5 °C being reached in more than one year and month, most recently in July 2012. The average yearly low temperature is -1 °C. Since 2000, annual low temperatures have ranged from -17 °C to -4 °C with an all-time record of -22 °C set in 1985. Rainfall is spread evenly throughout the year, averaging 114 cm with between 7.5 cm to 11.5 cm each month although the full monthly rainfall during July through October may come in a single rain event.

The intense summer heat and long growing season allow woody plants to harden off exceptionally well. Cold temperatures can test plants but it is a rare winter where temperatures stay below 0 °C for more than 48 consecutive hours. High summer night temperatures and excessive winter precipitation make some Mediterranean, many Southern Hemisphere, and alpine plants a challenge to grow. Southeast Asian genera generally thrive under the heat and humidity and perform spectacularly if able to tolerate a freeze or two.

'Hartlage Wine' continues to be a mainstay to this day but J. C. unfortunately

The 2021 Chelsea Flower Show Plant of the year, *Cercis canadensis* 'NC2016-2' sold as Eternal Flame in Europe and Flame Thrower in the U.S., is being produced in the thousands to meet the exceptionally large demand. New joint redbud releases between Dennis Werner and the JCRA will be on the market soon.

This sport of *Stachyurus chinensis* 'Magpie' discovered at the JCRA and named 'Carolina Parakeet' has proven to be a much more vigorous grower than the parent plant with some of the longest flower racemes in the genus to 25 cm.

passed away in a fatal car accident in December of 1996 before seeing its success. The NCSU Arboretum was re-named in his honor and his work continues still. While some of J. C. Raulston's introductions like 'Hartlage Wine' and *Styrax japonicus* 'Emerald Pagoda' are still widely grown, he was not a plant breeder and introduced relatively few plants directly. More often, he served as the conduit sharing the right plant with the right people. In more recent years the JCRA, especially in partnership with director emeritus Dennis Werner, Ph.D., has introduced numerous selections most notably a series of redbuds (*Cercis canadensis*) such as 'Ruby Falls', Golden Falls, 'Whitewater', and the 2021 RHS Chelsea Flower Show Plant of the year, *Cercis canadensis* 'NC2016-2' Eternal Flame (Flame Thrower in the US). The JCRA continues in its breeding efforts having recently developed a new offsite JC Raulston Arboretum Research Farm to expand capacity for research.

As times have changed and new plants flood the market, often with little or no evaluation under landscape conditions, the Arboretum increasingly focuses on extolling the virtues of the plants which rise to the top, promoting underused genera and species for landscape use, and wild collecting germplasm for *ex situ* conservation and breeding opportunities. A recent trip to northern Vietnam with colleagues from the Vietnamese Institute for Biological and Ecological Diversity (IBED), Atlanta Botanic Garden (ABG), and Windcliff was undertaken to study, document and collect the newly described, yellow flowered, *Loropetalum flavum*. While the original plant had been bulldozed to make way for road widening, we were able to find nearby populations. These mutually beneficial partnerships help conserve endangered and vulnerable germplasm both *in situ* and *ex situ*, fund work by IBED, and provide an opportunity for the JCRA to share our nursery production and horticultural experience with the botanists working to save and study their flora. Collaborations in China, Taiwan, and Japan, both formal and informal allow for mutually beneficial, long-term relationships which provide much more value to all involved than short-term, transactional ones.

The JC Raulston Arboretum's plant collections continue to be the backbone which supports all of our education, research, and extension programs. With

less than 4.5 hectares and over 9,150 unique taxa, the Arboretum is a dynamic collection with a constant influx of new plants and a regular culling of the old. Plants are evaluated over time but ones which don't measure up are removed to make way for new possibilities. Some of these plants are shared with colleagues in different regions which may be better suited for the needs of the plant, others become compost and mulch. Likewise, excellent plants which rise to the top and become embraced by the nursery trade are no longer needed and make their exit as well.

The goal of the JCRA has never been about amassing collections of exciting plants, instead it is about sharing those plants. In this industry we are able to make more plants and so there is no need to hoard our plants, rather we think access should be as wide as possible. In 2022, we distributed some 15,550 plants not including the many requests for research samples we fulfilled from all corners of the globe. We are one of the few institutions who share our annual *index semina* with like-minded nurseries as well as our botanical colleagues at other gardens and we offer that seed with no stipulations attached.

While the JCRA is known for our woody plant collection, a 90 m perennial border has been a central showpiece for decades.

One of the plants Dr J. C. Raulston was most enamored with was the Japanese apricot or *Prunus mume*. This weeping selection from Camellia Forest Nursery called 'Bridal Veil' adds additional seasons of interest to the late winter flower display.

As our plant collections grow and shift over time, we often will gather specific taxa to evaluate and study in depth. One group we have been exploring is *Aucuba* with about 130 taxa including nearly a dozen unidentified or questionably identified species and seven good species including the uncommon *A. albopunctifolia* and *A. obcordata*, both from wild collected sources. In addition to the 100+ *A. japonica* cultivars are six distinct *A. omeiensis* collections and several *A. eriobotryifolia* collections. Other recent deep dives include *Ardisia japonica* represented by 43 cultivars and *Illicium* with 34 taxa. Legacy collections include *Acer* (259 taxa), *Magnolia* (175), *Ilex* (141), *Cornus* (106), *Cercis* (69), and Styracaceae (46). Due to the JCRA's relatively mild winters and hot summers focus for magnolia, oak, and maple acquisitions in recent years has centered on evergreen taxa, both Asian and Mexican which are underrepresented in most North American collections.

While the methods of disseminating knowledge and educational programming have grown easier over the past 50 years and the ability to freely distribute plants has become more difficult, the JC Raulston Arboretum continues to follow the exhortation J. C. closed all of his correspondence to, 'Plan – and Plant a better world!' The methods have changed, the collections have grown, the operations have become more complex but the mission to share our passion, our plants, and our knowledge continues unabated as we look to inspire new generations of plant lovers around the corner and around the globe.