Reprinted from the Spring 2019 Journal of the American Rhododendron Society

Curating a Collection: The Rhododendrons at Jenkins Arboretum & Gardens

Steven A. Wright

Devon, PA

Introduction

For as long as people have roamed the earth, we have been collecting things. Most collections focus on the inanimate—non-living objects whether they be material (e.g., antiques, coins, or baseball cards), natural (e.g., shells, rocks, or "bugs"), or mechanical (e.g., cars). Collecting can be fun, challenging, and time-consuming, and depending on the level of enthusiasm, could be completely overwhelming. After all, where do you stop? How do you determine which items you will add to your collection and which you will not? It is an issue that we as plant collectors also face. What will we collect? Where will our collection end? What species or varieties do we feel are worthy of our collection? Some plant groups contain so many taxa (unique species, hybrids, or selections) that having a "complete" collection would be nearly impossible. Can you imagine trying to collect all of the Orchidaceae or Asteraceae? Of course, there are additional challenges that complicate living plant collections.

Fig. 2. Wildflowers mixed with rhododendrons.

Jenkins wedding photograph - 1925.

Unlike non-living objects, plant collections are limited by factors over which we have no control—namely climate, geology, topography, hydrology, soil conditions, light conditions, and so on. It's true, it's not easy being green, but here at Jenkins Arboretum & Gardens, answering the "what will we collect" question was perhaps the easiest decision of all.

Creating a Garden

The groundwork for Jenkins Arboretum & Gardens was laid in 1968 when H. Lawrence Jenkins preserved his 20-acre (8.1 ha) property as a living memorial to his wife, Elisabeth, who had passed away five years earlier (Fig. 1). Elisabeth was an avid gardener and wildlife enthusiast, and Mr. Jenkins directed in his will that the property was to become a "public park, arboretum, and wildlife sanctuary for the study of arboriculture, horticulture, and wildlife for educational and scientific purposes." Unfortunately, although there were 20 acres to work with, there were no existing gardens, trails, or facilities; Jenkins Arboretum would be started from scratch.

In 1971, George Erwin Patton, a noted Philadelphia landscape architect

Fig. 3. Mixed hardwood forest as seen from the Educational Center.

and professor at the University of Pennsylvania, was hired to develop a proposal on how best to convert the property into a public garden. His early surveys found the site to be rocky, well-drained, and acidic, with a pH as low as 4.5 in some places. Oaks, hickories, and beeches dominated the overstory of the mostly wooded property, and American chestnut sprouts dotted the landscape. Rhododendrons, mountain laurels, and blueberries were among the most common understory plants found growing wild on the site. The conditions were therefore perfect for growing plants in the heath family (Ericaceae) and Patton recommended these plants knowing that the family was not well represented among the gardens of Philadelphia. As rhododendrons and azaleas are the showiest members of the Ericaceae family, they would become the highlight of this new collection.

Patton also suggested native trees, shrubs, and wildflowers as companion plantings to add interest, extend the blooming season, provide habitat for wildlife, and, perhaps most importantly, to help to round out a complete "plant association" in the existing mixed hardwood forest (Fig. 2). This would create a premier woodland garden in the Philadelphia region and a garden that remained true to the vision of Mr. Jenkins and the interests of his wife (Fig. 3).

In 1974, shortly after Mr. Patton's plans were accepted, the Arboretum's first Director, Leonard H. Sweetman was hired. Mr. Sweetman was a renaissance man with countless interests includ-ing entomology, agriculture, botany, archaeology, geology, and especially horticulture. When he moved to Pennsylvania from Colorado in 1960, he became Director of Grounds for the Coatesville Veteran's Administration Hospital, and later became Assistant Director of the Scott Arboretum of Swarthmore College under Dr. John Wister, a world-renowned authority on plants and the Director of the Scott Arboretum for fifty years.

With George Patton's vision and Leonard Sweetman's tireless work ethic, trails were created, a pond was dug, a parking lot was constructed, and a small education facility was built. By the time the Arboretum opened to the public in 1976, just two years after work began, more than 2000 rhododendrons and azaleas had already been planted (Fig. 4).

Growing the Collection

Under the leadership of Leonard Sweetman, and then his son Harold Sweetman (Executive Director, 1986-present), the rhododendron collection has grown significantly. Though Leonard started it, it is Harold who is responsible for developing the collection that we see today. He has been very involved in the American Rhododendron Society from the start, earning the Valley Forge Chapter's Bronze Medal in 1995 and serving as Chairman of the ARS Research Committee since 2001. It is this involvement that led to some of the more interesting additions to the collection when, in the 1990s, Harold explored the high

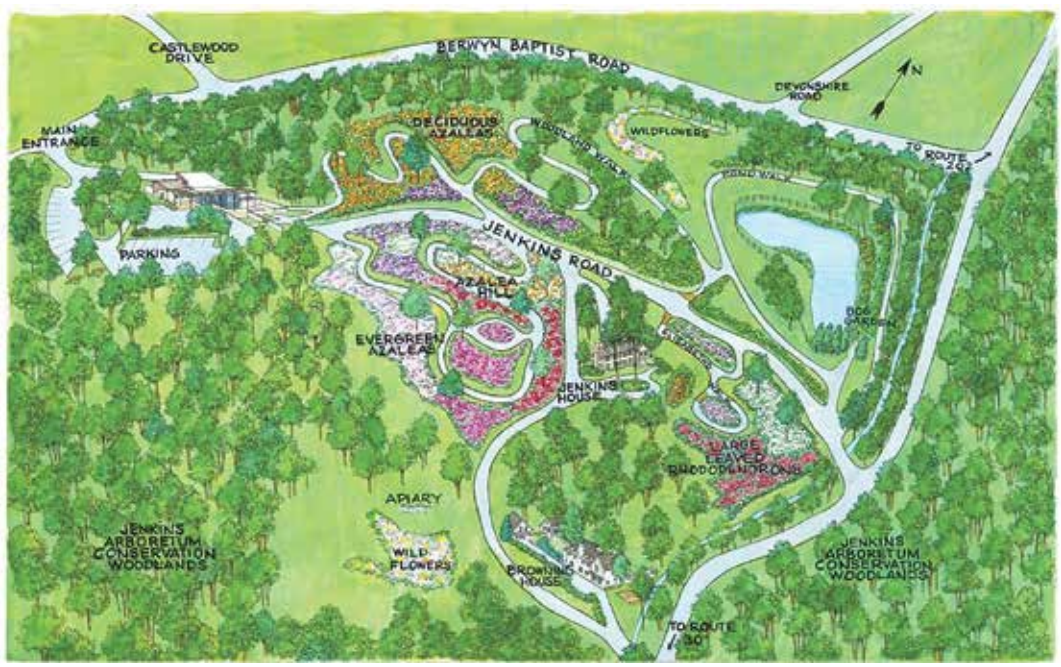

Fig. 4. The arboretum layout today closely follows Patton's plans.

Fig. 5. Harold Sweetman in search of rhododendrons in China.

Himalayas and collected many rhododendrons, particularly *R. decorum, R. racemosum,* and *R. rubiginosum*, in the remote regions of Yunnan, China, and Arunachal Pradesh, India (Fig. 5). Harold has added thousands of others over the years, and Leonard's original plantings have now matured to become an attraction that draws thousands of visitors each year.

Today, with over 2000 different accessions representing more than 1400 taxa, the rhododendron collection at Jenkins Arboretum & Gardens is among the most extensive in the country. The collection is incredibly diverse and represents four of the five major divisions within the genus—both large and small leaf rhododendrons, and both deciduous and evergreen azaleas. The exception is vireyas, which are mostly tropical epiphytes and in Pennsylvania, they cannot be successfully grown without a climate-

Fig. 6a. Mother's Day evergreen azaleas.

Fig. 6b. Evergreen azaleas on Azalea Hill.

Division/Type	# of Taxa	# of Plants	Represented Hybridizers (selection)
Elepidote Rhododendron Hybrids	372	732	Dexter, Gable, Pride, Rhein, Waterer
Elepidote Rhododendron Species	60	726	
Lepidote Rhododendron Hybrids	87	203	Delp, Herbert, Lewis, Nearing, Weston
Lepidote Rhododendron Species	30	103	
Deciduous Azalea Hybrids	104	249	Aromi, Exbury, Knaphill, Weston, natural
Deciduous Azalea Species	79	613	
Evergreen Azalea Hybrids	681	1,952	Glenn Dale, Back Acres, Beltsville, Gable, Harris, Hershey, Holly Springs, Kurume, Satsuki
Evergreen Azalea Species	17	34	

Table 1. The collection as it exists today.

Fig. 7. Evergreen azaleas in full bloom,

controlled conservatory. This diversity allows for a very long bloom season, starting with *R. mucronulatum* and *R. dauricum* as early as February and ending with the Encore azaleas, which bloom well into December. However, depending on the year's weather, there could be an azalea or rhododendron in bloom in all twelve months of the year. The garden bloom peaks in early May, just in time for Mother's Day, when the majority of the evergreen azalea collection is in full bloom and visitor attendance is at its highest (Fig. 6).

The success of this collection can be attribut-ed to a number of factors. The well-drained acidic soil and high open shade mention-ed previously are certainly major factors, but there are others as well. Jenkins is blessed to exist in a horticultural sweet spot – a sweet spot that has allowed Philadelphia to become "America's Garden Capital." We receive ample precipitation, averaging about 3.5 inches (nine mm) per month throughout the year, with the highest volumes occurring during the growing season. Also, being situated on the edge of USDA Hardiness zones 6b and 7a, we are able to grow both cold hardy and heat tolerant plants.

We are also blessed with both north- and south-facing slopes and take advantage of micro-climates that support great botanical diversity. Evergreen azaleas, many of which typically grow best further south, as well as large leaf rhododendrons, many of which typically grow best further north, both grow well on the site. The Table 1 shows the collection as it exists today.

The total number of rhododendron and azaleas plants currently in the Jenkins collection is 4612.

Asian evergreen azaleas are the most well-represented group in the collection in both number and diversity, with approximately 681 taxa. Though they are planted in several different areas of the garden, the greatest concentration of these is displayed in a garden area we refer to as "Azalea Hill" – a south-facing slope with high open shade, that is packed "cheek to jowl" with plants that light up the woodland garden in early May (Fig. 7).

Elepidote rhododendrons (those with non-scaly leaves) are the second most numerous in the collection, with nearly 1500 plants representing nearly 450 taxa. There is great diversity in foliage,

Fig. 8. A particularlly beautiful elepidote.

Fig. 9. *Rhododendron vaseyi* on woodland walk.

Fig. 10. *Rhododendron flammeum* 'Double Pleasure'.

Fig. 11. Lepidote rhododendron in early spring.

form, flowers, and fragrance. The majority of this collection resides in a part of the garden we call "Elisabeth's Walk", as it is the slope nearest the Jenkins house and likely the only area in which Elisabeth Jenkins would have gardened (Fig. 8).

The deciduous azaleas, most of which are eastern USA native species, are a staff favorite at Jenkins and have received significant attention in recent years. With the exception of *R. canadense* (Rhodora), which does not perform well in Philadelphia's summer heat and humidity, all of the eastern native species are represented in the collection. Of those species, *R. vaseyi* (Pinkshell azalea) is most abundant in the collection, with 84 plants of 27 different accessions (Fig. 9) Ironically, this is also the rarest of the native azalea species in the wild. They are followed by *R. periclymenoides* (Pinxterbloom azalea), most of which are naturally occurring on the site, and among the native species noted by Patton. The most diverse, however, is *R. flammeum* (Oconee azalea) with 53 plants of 16 different taxa (Fig. 10). The majority of the deciduous azalea collection can be seen in a garden area aptly named "Woodland Walk," as it is the main display of native woodland plants.

The lepidote rhododendrons (those with scaly leaves) round out the collection. With over 300 plants, these early bloomers provide a welcome punch of color in late winter/early spring before the rest of the garden has woken up from its winter slumber (Fig. 11).

National Accreditation

By 2010, the *Rhododendron* collection at Jenkins had grown so much in scale and prominence that applying for national accreditation seemed like a logical step. After a meticulous site review, the collection was accepted into the Plant Collections Network as a Nationally Accredited Plant Collection™. The Plant Collections Network (PCN) is a collaboration between the USDA Agricultural Research Service and The American Public Gardens Association that coordinates a continent-wide approach to plant germplasm preservation. This accreditation is recognition of not only significant collections, but also a long-term commitment to preserving those collections and achieving a high standard of excellence in plant collections management. Institutions participating in this program are encouraged to collaborate with others to compare plant lists and identify duplications and gaps in their collections. This makes efficient use of available resources, strengthening collections through combined collaborative activities. As a Nationally Accredited Plant Collection™, Jenkins now serves as a reference site for plant identification and cultivar registration. We must also make germplasm available for taxonomic studies, evaluation, breeding, and other research. Other botanical

Fig. 12. *Kalmia latifolia* 'Heart's Desire'.

Fig. 13. Volunteers working on de-leafing azaleas.

Fig. 14. Using the Total Station to map plants in the field.

institutions with significant rhododendron collections are welcome to contact us about acquiring plants, cuttings, seeds, and/or pollen.

Though it is overshadowed by the rhododendrons, it should be noted that Jenkins also maintains a second accredited collection with the genus *Kalmia*. Mountain laurels (*Kalmia latifolia*) are among the plants that grow wild on the site and there are many old, gnarly specimens dotting the landscape, especially on the rocky slopes of our natural areas. During a good year, these plants put on a floral show that rivals even the best of the azaleas (Fig. 12). Due to the breeding efforts of Richard Jaynes at Broken Arrow Nursery and others, dozens of beautiful varieties have been developed and distributed. Unlike the common white blossoms of the straight species, we now have maroons such as 'Heart's Desire', reds such as 'Ostbo Red', and pinks such as 'Nathan Hale'. There are also split-petaled selections like 'Shooting Star' and 'Galaxy', dwarf selections like 'Elf' and 'Minuet', strap-petaled selections like 'Willowcrest' and its southern counterpart 'Willowood', and even the very unusual variety called 'Stoplight' which has bright red buds that never open into flowers. In total, Jenkins main-tains a collection of nearly 300 accessioned *Kalmias* of 44 different taxa, which includes *K. angustifolia* (sheep laurel) and the hybrid of *K. latifolia* × *K. hirsuta* (hairy laurel). Adding to the *Kalmia* collection is a bit more challenging because of limit-ed availability and climate restrictions. Though there are seven species of *Kalmia* in the United States, only three (*K. latifolia, K. angustifolia*, and *K. polifolia*) grow in Pennsylvania. Unfort-unately, *K. polifolia* and *K. angustifolia* tend to grow best in the colder, damper regions of the state.

Collections Management

Maintaining any living collection is a neverending endeavor. There are a couple of different ways to think about collection management: a horti-cultural perspective and a curatorial perspec-tive. The horticultural maintenance is the same for all of us; it is the constant challenge of keeping our plants happy, healthy, and looking their best. This, of course, involves pruning to remove dead wood, separating cultivars, shaping the plants, fertilizing as need-ed, watering, weeding, and managing pests. In recent years, managing pests, specifically the maple mealybug (*Phenacoccus aceris*), has been particularly challenging in southeastern Pennsylvania. Several years of increasing mealybug populations, despite annual treatments of horticultural oil and foliar insecticide sprays, took its toll on our aging collection, and we lost several mature specimens, leading to more drastic pest management measures. In 2014, after the blooming period was over, every azalea in Jenkins' collection was treated with a soil injection of systemic insecticide. It didn't work. Since then, we have become much more diligent in our scouting and treatments, which now include treating secondary hosts such as maple leaf viburnum (*Viburnum acerifolium*) and spicebush (*Lindera benzoin*), both of which grow in abundance at the Arboretum, and removing those plants where they have grown too close to azaleas. Horticultural oil is our preferred pesticide, with heavily infested specimens also getting a bark application of systemic insecticide – always after blooming has finished. We have also become more diligent in "de-leafing" our plants, that is, pulling the deciduous tree leaves out of the azalea branches, and especially out of the bases of the azaleas in the oak-dominated forest (Fig. 13). We discovered that oak leaves protect the mealybugs and, in some cases, there were so many mealybugs hiding under the leaf litter that flipping over the packed leaves exposed what appeared to be snow! Diligent spraying of those colonies with

Type	# of Taxa	# of Accessions	# of Individuals	% of Individuals Native*
Trees	181	1,081	1,578	95%
Shrubs	1,741	2,697	7,689	52%
Vines	19	24	37	84%

Table 2. The 9000 plants that were reassessed and mapped. * We use the term “native” for plants that are indigenous to the eastern United States.

horticultural oil has significantly reduced this pest pressure and our collection has rebounded nicely. Of course though, some damage had been done and many of our plants were left looking stressed and disheveled, leading to their overhaul. So, in 2016, we began rejuvenating most of our collection. Plants that were underperforming, unhealthy, or overgrown were cut back to about six inches (15 cm) from the ground, and a balanced, slow-release fertilizer was applied to what remained. Now, just three years later, the results have been amazing, and our collection looks as good today as it ever has.

Though horticultural management is not necessarily an easy task, it is at least pretty straightforward. The curatorial management, however, requires a bit more planning, preparation, and aesthetic consideration. Decisions about what to plant, and where, require knowledge and understanding about each plant’s bloom time, bloom color, light requirements, moisture requirements, ultimate dimensions and so on, but there’s more. There are so many questions to ask ourselves—“do we keep hybrid groups together? Can we mix large leaf rhododendrons with evergreen azaleas? Do we keep color groups separated? Do we even *need* to plant “those” plants? Will “those” plants thrive? Are they hardy? How do we decide what is best for the collection?” and so on. It can take months, or even years, to make some of these decisions at a place like Jenkins, where space is so limited and the collection so diverse.

Records and Information Management

In the Arboretum’s early years, the plant records database consisted of hand-written ledgers. Later, in the 2000s, these records were entered into a File Maker Pro database, which was a huge improvement, but as the Arboretum’s collections grew, proved to have limited usefulness. A map of the Arboretum, which had been broken into a 50’x50’ (about a 15 m x 15 m) grid, had always been maintained on paper, and the mapping of new plants was done with measuring tapes and approximation. This all changed in 2015 with the installation of BG-Map mapping software and BG-Base database software. These programs allow us to much more efficiently maintain our records and easily locate plants in the field. It was not an easy transition though; it required a professional survey of the Arboretum to re-locate the corners of each of the original 50’x50’ quadrants. It also required a change in how our plants were accessioned as we needed to assign qualifiers to each accession number. It required purchasing professional survey equipment, including a total station, handheld data collector, and all of the accessories (and training) that go along with them. It required that every single tree, shrub, and vine in the garden, all 9000 of them (see Table 2 above), be re-accessioned and re-mapped (Fig. 14). Perhaps most importantly though,

Fig. 15. Aluminum accession labels.

Fig. 16. Sorting and organizing herbaceous plant labels.

it required adding Curatorial Assistant, Nancy Cosmos, to the team. Nancy, a highly detail-oriented former civil engineer, was the perfect fit, and she has played a huge role in completing all of these curatorial tasks.

The modernization of our database and the new mapping procedures required significant changes, but "achieving a high standard of excellence in collections management" as directed by our accreditation, required even more. It is difficult to say that one task was more important than another, but to quote Harold Sweetman, "if you want to successfully enjoy collecting and sharing rhododendrons and azaleas, you need to label, label, label," and label we did!

The 9000 plants that needed to be re-accessioned and re-mapped also needed to be re-labeled. This step required upgrading an old rotary engraver to a more efficient laser engraver that would be able to produce the new labels, in-house, in a fraction of the time. Now every woody plant in the collection can be identified with its own 1½ by 3-inch (38 x 76 mm) anodized aluminum accession tag that contains important technical information, including its scientific name, common name, family name, hybrid group, accession number, nativity, and location in the garden (alphanumerical code) (Fig. 15).

However, the labeling doesn't stop there. Though we are primarily an arboretum with scientific collections of woody plants, we also maintain tens of thousands of companion plants—various wildflowers, ferns, grasses, and sedges that help round out the "complete plant association" that Mr. Patton suggested nearly 50 years ago. The herbaceous collection is not currently accessioned and managed in the same way as the woody collection, but plants are recorded in a separate database and hundreds of specimens throughout the garden are marked with a larger, staked label (Fig. 16).

The Future is Bright

Jenkins Arboretum & Gardens is blessed to exist in an area with a very long history of botany and horticulture going back to the 1700s when John and William Bartram were exploring America's southern wildlands and starting America's first botanical garden, right here in Philadelphia. Though the Bartrams were pioneers in the field, this appreciation for plants and enthusiasm for gardening became common in the region and as a result, several world-class gardens are now dotted across southeastern Pennsylvania and northern Delaware.

Without this history and appreciation for the natural world, Mr. Jenkins might not have thought to preserve the property as he did. Of course, we are happy he did and today, Jenkins Arboretum & Gardens continues to provide a tranquil escape from the bustling Philadelphia suburbs, being open every day of the year with free admission. Perhaps more importantly, Jenkins has become one of the region's great horticultural and environmental assets, now preserving a total of 48 acres (19.4 ha) of natural woodland and utilizing native plants in the landscape.

The gardens continue to expand and the rhododendron and azalea collections continue to grow. Currently, Jenkins is working on preservation and collections expansion to include some of the best new cultivars of hybrid rhododendrons from east coast hybridizers. Though we do have some, the gorgeous creations developed by Pete Vines (Holly Springs) and Joe Klimavicz are among the evergreen azaleas we hope to add to the collection. The large leaf hybrids developed by Tom Ahern, Joe Minahan, Perc Moser, John Doppel and others, are welcome recent additions, and collections on which we will continue to expand. Personally, my greatest fascination lies with the native azaleas and their various selections. In 2018 alone, we added more than 200 native azaleas (about 1/3 of the total number of deciduous azaleas currently in our collection), with more to come. The future is bright at Jenkins Arboretum & Gardens, and we hope you will be able to visit us this May at the 2019 ARS Spring Convention.

Steven A. Wright is the Director of Horticulture/ Curator of Plant Collections at the Jenkins Arboretum & Gardens in Devon, Pennsylvania, and is a director of the Valley Forge chapter.