The development of a large garden and recreational complex whose prime function is display, often does not allow time for research. In fact, even the word research is not permitted in many display gardens! This certainly was the case at Callaway Gardens. While the opportunity for research was ever present, the development of the Gardens took precedence. However the nature of the horticulture work on such a large scale calls for trial, evaluation and testing of plant materials, equipment, supplies, fertilizers and pesticides.

Native plants

The basic concept of using native plants within the 2500 acres of the Gardens was a challenge in itself. Native plants were not readily available, so methods of collecting, propagation and establishment of wild plants had to be devised. One major group of species we started with were native azaleas. Six species of native deciduous rhododendrons could be found within 15 miles of the Gardens, including the rare Rhododendron prunifolium. Although the number of plants added to the Gardens was never kept, I estimate that over 200,000 plants have been added, of these, about 50,000 were rhododendrons, mostly native azaleas.

Due to our large demand for native azaleas, we grow them from seed and collected plants in the wild. We were able to move many species from the 8,000 acres of the Ida Cason Callaway Foundation property. Additional plants were obtained by permission from areas that were cleared and from private timber and power company land. Native plants and especially azaleas were known to be notoriously difficult to transplant. We readily found this to be true due to the sparse root system. We devised a procedure of cutting plants back 6—8 inches from the ground and keeping the plants very close together in a rich mixture of ground pine bark and compost, for 1 or 2 years before moving plants to a permanent site. The cut back azalea plants during the healing period developed a new fibrous root system and adventitious shoots. This has resulted in nearly a 100% survival. It is an important technique when several thousand plants must be moved each year.

We later observed that woodland sites, where a large number of azaleas had been moved, were soon literally alive with numerous young azaleas that arose from the old roots left after the original digging. We pursued this and developed techniques to propagate native azaleas from root cuttings. Three to 4 inch root pieces 1/8 to 1/2 inch in diameter are laid horizontal in grounded sphagnum or a mixture of sphagnum and perlite in flats and covered with the same media. New adventitious roots and vegetative shoots develop from the short root pieces. This method of propagation has been successful from root cuttings collected in early spring up through mid summer. Root cuttings have also proven successful with other woody plants such as Aesculus paviflora and deep rooted perennials such as Asclepias tuberosa.

A breeding project with native azaleas was proposed in 1954 to determine the

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2Curator.
Rhododendron prunifolium (plum leaf azalea). A rare deciduous azalea from moist woodlands located only within 100 miles of Callaway Gardens. The bright red flowers are borne in July and August.

The Gardens has also introduced plants into the nursery industry. A yellow fruited Ilex cornuta similar to ‘Burford’ holly has been given the name ‘D’Or’ and is available in the trade. Another plant that has been very popular is the ‘Harbour Dwarf’ nandina, which was originally obtained from a defunct nursery in North Carolina. The major production at present comes from a California nursery.

The unique ornamental and native plants on display within the Gardens have become popular in recent years. The native azaleas are now grown by many nurseries throughout the Southeast.

Other popular species include Danae racemosa, Alexandrian laurel; Rohdea japonica, Nippon lily; and Leucothoe populifolia.

Rare plant preservation

Since its inception the Gardens promoted the preservation of the rare plants of the Southeast and at present work with the Georgia Rare and Endangered Plant Division, Department of Natural Resources. Over 15 rare and endangered plants in Georgia are established in the Gardens including Elliottia racemosa, Rhododendron prunifolium, Shorta galacifolia, Silene polypetala, Torreya taxifolia, and Trillium persistens.

Some of these such as Silene polypetala and Rhododendron prunifolium have been introduced to specialty nurseries and growers throughout the country. Another interesting plant, a selection of Asarum shuttleworthii now given the name ‘Callaway’, has proven to be a very vigorous stoloniferous ground cover for shady locations. Work is now being conducted by a leading nurseryman to determine the feasibility of producing this cultivar through tissue culture. The ‘Callaway’ crabapple, a seedling of Malus prunifolium from the Gardens was named by two nurserymen in Tennessee.

Franklina alatamaha, the rare and now extinct plant of Georgia, has proven to be very difficult to establish at the Gardens. We worked even 25 years ago

Stream near wild flower trail, Callaway Gardens.
Pinckneya pubens (Georgia bark or fever tree). A rare small tree found along the marshy stream banks in the southern Coastal Plains. The attractive blossoms in mid June are composed of large leaf like white to bright pink calyx lobes surrounding the tubular flowers. On growing this plant from seed and cuttings. It is easy to do, but we found that in wet periods during the summer, the young plant would succumb to root rot, later identified as *Phytophthora cinnamomoni*. We were the first to announce that this may have been the reason for its extinction in Georgia. Cotton is a very susceptible plant of the same disease and *F. alatamaha* was lost some time after cotton was introduced to the state of Georgia.

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Zephyranthes atamasco atamasco (Rain lily). A beautiful bulbous herb found in rich woodlands and moist sites. The delicate flowers, borne in early April are often pink in bud opening to white. An attractive plant for the woodland garden but uncommon commercially. The fall flowering *Z. candida* of S. America is often sold for the atamasco lily.

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Silene polypetala. A rare low herbaceous perennial of Georgia and north Florida. The showy rose pink fringed flowers are borne in late April. The plant has good potential for the shady rock garden.

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Equipment

In the early development stages of the Gardens, specialized equipment was not readily available. Augers for tractors were seldom used for digging planting holes. Working with major equipment companies, we obtained augers up to 24 inches in diameter to be used with special removable cutting blades. The heavy piedmont soils were very abrasive to the cutting blades. We encouraged the manufacturer to develop high carbon steel edges for the wearing surface and upon their advice, we added high carbon steel edges, in our own shop, for the wearing surface. Large vacuum machines were unavailable 25 years ago, so a unit was made using a 4 cylinder motor and an industrial suction fan. Two units were completely worn out before a commercial one was obtained a few years ago.

Two special intermediate size mist blowers were designed for use on the various trails. The present unit still being used today is a modification of a mist blower from Holland and is powered by a VW engine and on a trailer mount. It can be pulled by a Cushman vehicle and operated by the driver. Large heavy duty compost grinders were not available in the 1950s so a PTO tractor driven unit was made. The unit was very durable with large replaceable hammer knives. Unfortunately, over the years the unit was not large enough to handle the grinding of the large volume of leaves and other material.

Today a large commercial grinder powered by a 96 horsepower tractor is used to grind leaves and regrind wood chips to increase decomposition. Four large tilt-up concrete bunker silos were built in the early 1960s for compost bins. Each unit is 5 feet high, 20 feet wide and 40 feet long and each has a capacity of about 100 tons of organic material.

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A homemade leaf suction machine made in the mid 1950s capable of picking up golf balls and rocks 2–3 inches in diameter.

A PTO driven hammer mill made in the late 1950s to shred leaves and other organic material.

Upright concrete silo compost bins built in the early 1960s are still used today.
Naturalized planting of *Rhododendron canescens* along one of the 12 manmade lakes.

Fertilizers and pesticides.

Fortunately, we were able to work with many of the manufacturers of fertilizers, pesticides, and herbicides and tested and evaluated their materials on a large scale prior to their release. We had first hand experience on Orthene, Bayleton, Roundup and other materials before they were commercially available. Bayleton is effective for control of azalea petal blight and we assisted the manufacturer in testing and evaluation of their material on a large scale.

Working with fertilizer companies we used and adapted formulations to meet the needs of the Gardens that proved beneficial. In the 1950s, 10-6-4 (oxide) formulations were unavailable in the South. We started with a 12-6-6 material later changing to 10-6-4 to a 10-5-7. The basic formulation used now on the woody plants is a slow release 20-5-10 formulation.

Test gardens

The Gardens 2500 acres includes recreational facilities of 63 holes of golf. One of the 13 lakes is for a swimming and picnicking area, over 15 miles of drive throughout the area, with 5 miles of walking trails. Greenhouses which were initially used for growing only plants for the Gardens have developed into the largest display greenhouses in the Southeast. The greenhouse outdoor area has large displays of summer annuals and perennials and a very large display of chrysanthemums in the fall.

A 7.5 acre vegetable garden serves as a demonstration plot for both new and old cultivars. Increased interest in vegetable gardening has made this garden a popular success. Many unusual species are grown along with the more common vegetables and herbs. The Gardens test All-American selections of both vegetables and annual flowers.

While the Gardens has not been designated as a research facility, it has had the opportunity to test, evaluate and report on many plants that have proven a success in the garden in both trade and popular magazines and in the Southern Nurserymen's research reports. In addition, the garden staff has worked actively with the U.S. nursery industry, particularly in the southeast.