# THE MONTGOMERY NEWS

Newsletter of Montgomery Botanical Center

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# A Botanical Garden Built for Science

Terrence Walters, Ph.D.
MBC Executive Director

This population of *Caryota gigas* in the MBC collection not only provides an attractive visual presentation of shapes and textures, but, along with its associated data, is far more valuable to researchers than if just one or two representatives of the species were available.

During each MBC garden tour, when introducing our scientifically valuable population-based collection, I'm frequently asked to explain, first, just what that long phrase means—followed immediately with, "How are Montgomery Botanical Center's collections different from those in the familiar botanical display garden?" It is a common confusion even among informed botanical enthusiasts.

Historically, botanical gardens develop their important collections by obtaining a few specimens of each species within a group of interest, whether they are oaks, roses, orchids, or palms. In many cases, the specimens lacked any associated provenance data and were obtained from a single (and not necessarily representative) population of the species. Gardens developed these types of collections for the typical garden viewer interested in seeing the diversity among species within a specific plant family.

Montgomery Botanical Center has a very different mission than most botanical gardens, as set forth by its founder, Nell


Montgomery Jennings. MBC is an institution that directs its resources toward the scientific and educational usage of our collections by researchers, educators, and students.

Researchers have very specific needs that differ greatly from casual garden visitors. They require samples from wild material. If it isn't feasible to access plants in their natural habitat (*in situ*), a very close alternative is to use their offspring grown from seeds collected in the wild in an *ex-situ* botanical collection. But a study based on just a few representative samples is not enough. For research to be valid, the provenance of the seeds must be established by having comprehensive visual and written field data collected along with the seeds, and have that information readily available in a database. Samples obtained from multiple populations—groups of individuals spatially isolated from other groupings of the same species—provide even more information to the scientist.

A plant species can consist of one to hundreds of populations; each population can consist of one to literally thousands of individuals. A genetically distinct individual within a population grows, develops, reproduces, and dies; however, it does not evolve. Evolution, as we understand it today, occurs in the genetic variation among the individuals within a population through many generations.

One of the evolutionary changes that can occur in a population is speciation, the development of a new species. For example, a particularly isolated and distant population might be subjected to extreme environmental changes not experienced by other conspecific (same-species) populations. Although many plants and their offspring fail to thrive under the new environmental pressures, some individuals will breed with other genetically distinct individuals to produce progeny with genetic coding for physical and physiological traits necessary to survive more successfully in the new environment. This process of adaptation causes the population to diverge genetically from other conspecific populations and sometimes marks the beginning of a new species.

A sampling of only one or a few specimens from a population does not represent the genetic diversity within the population, let alone the diversity within the entire species. To uncover, or just to understand the diversity and evolution of plant life, research must be undertaken at the population level.

In 1994 the MBC team identified the type of collections needed by researchers and made the long-term decision to develop the highest quality, scientifically useful, population-based palm and cycad collections in the world. This focus meant we needed to enhance the existing collections by obtaining wild documented seeds from multiple populations of each species.

Since 1995 MBC has been mounting three to five expeditions per year to tropical regions of the world to obtain the required propagules for our collections. In 1996, the MBC team planted our first population-based assemblage. We have continued to add approximately 50 population samples annually, typically consisting of 12–15 individuals each, to systematically increase the number and diversity of accessions required for study by researchers.

Also of scientific importance is where populations are collected within the geographic range. In the wild, populations at the extremes of a species' distribution are often under different sets of environmental pressures, and therefore are likely to possess unique, genetically-based, adaptive qualities.

If the conspecific populations are too numerous to feasibly collect, we strive to sample those populations at the geographic extremes of the species' range as well as at least one sample from deep within the range. In this way, we endeavor to represent as much of the genetic diversity within a species as possible—genetic diversity that is vital for evolutionary research, teaching, and species conservation.

Today, with hundreds of wild-collected, extensively-documented population samples of palms and cycads growing at MBC, the significance, value, and importance of these collections to the international botanical community are becoming clear. Dr. John Donaldson, Research Director of South Africa's Kirstenbosch Botanic Gardens, recently observed that "Montgomery Botanical Center has been at the forefront of efforts to build up off-site collections of cycad species."

Researchers from around the globe recognize MBC as a primary source for experimental plant material. We are able to provide them with quality material their research demands. Educators interested in demonstrating conservation-quality off-site collections, characteristics of population biology, and techniques for taxonomic studies have been enthusiastically accessing MBC's population-based collections.

Even the public, who has learned of our unique collections, is clamoring for more on-site tours. It is heartening to know that MBC offers something for all those who want to see and use the type of conservation and research collections that will improve our ability to understand and preserve the earth's diversity. ■

# In Search of Lilliputian Palms

Larry Noblick, Ph.D.
MBC Collections Development Manager and Palm Biologist

Mbaracayú Reserve guide, Eligio Fariña, examines *Butia campicola* hidden in the grass that it mimics. The inset above shows the developing palm fruits growing from what otherwise looks like a grass spike.

Jonathan Swift's *Gulliver's Travels* was always one of my favorite books, especially the tale of Lilliputia, that miniature kingdom of tiny people, undersized buildings, and small forest trees (though I can't recall any mention of little palms). Apparently Gulliver never made it to South America, because I've found in my own travels some of the planet's smallest palms hidden in the grasslands of Brazil and Paraguay.

Not known to be native to other parts of the world, most of these diminutive and fascinating palms share similar characteristics: a short subterranean trunk with some leaves often spreading out horizontally near the ground. Other long, narrow leaflets stand erect, mimicking patches of the native grasses among which they grow. Even the inflorescence that often extends upright beyond the low woody bract looks very grasslike—until the spiky flowering cluster yields its very recognizable, grape-sized palm fruits. There is at least one evolutionary advantage of this subterranean grasslike habit. Because the tender growing bud is so well protected below ground level, the plant easily survives fast-burning ground fires or extended periods of drought. But their low grasslike habit doesn't make them easy to locate; some species have gone almost a century between collections.

*Syagrus lilliputiana* (note the name) and *Butia campicola* were both collected in Paraguay by Swiss botanist Emile Hassler in the Sierra de Mbaracayú between 1898-1899. It was next collected 97 years later by Belen Jiménez during his exploration of one of Paraguay's newest reserves, the Mbaracayú Natural Forest Reserve. Similarly, *Butia leptospatha* was first—and last—collected in 1936 in the Mato Grosso do Sul grasslands of Brazil, not far from Paraguay.

Nine years ago, I discovered a new grasslike species in a national park in Goias, Brazil. Two years later, I hiked across a Paraguayan *cerrado* with a botanist who showed me a then unnamed *Butia* hidden among the grasses. Recently, I collected yet another new species of similar habit growing on the Paraguay/Brazil border. All were small, visually camouflaged, and rare.

I've spent the better part of 12 years conducting research on Cocosoid palms and came to a point when I needed some of these small species to complete a matrix of characters for analysis. So while preparing for my 2002 Paraguay expedition, I pursued, with determination, a collecting permit for the Mbaracayú Reserve to follow in the footsteps of the researcher, Jiménez.

Working with my good friend and expedition partner, Tomas (Pilu) Rios, out of the Museum of Natural History of Paraguay, we finally got permission to collect in the reserve after weeks of paperwork, phone calls, and several trips to the permitting office. What we thought would be a short, wrap-up visit to pick up our papers turned into two long days of bureaucratic back and forth. But frustration quickly turned into a sense of good fortune.

While impatiently waiting for the permits, heavy rains had turned the roads into an impassible quagmire of clay. If we had left when first planned, we would have ended up worming our vehicle through a seemingly giant bowl of chocolate pudding. By the time we hit the roads they were dry enough so we negotiated easily around large trucks still deeply buried up to their axles—although, admittedly, we drove with the four-wheel drive engaged for most of the 300 kilometers to the Reserve's overnight accommodations. We made good progress, arriving at dusk in time to meet the resident biologist, Rosalia Fariña, and our guide, Eligio, and get settled in for the night.

The next day we headed out to Aguara Ñu, the largest *cerrado* region in the 155,000-acre reserve, to search for those elusive small palms. We easily located groups of the taller palms: the common *Syagrus romanzoffiana* at the edge of the moist forest, some of the most massive stands of *Butia paraguayensis* I have ever seen, and several populations of *Allagoptera leucocalyx*, but none of the knee-high *B. campicola* or *S. lilliputiana.*

Although I had the first collector's exact coordinates for the species, they turned out to be completely erroneous (bad GPS readings or U.S. scrambled satellite data). With all our high-tech devices, it was sheer luck and perhaps a bit of divine intervention that finally came through. While looking for species of *Allagoptera*, we chanced upon populations of *S. lilliputiana*, along with the diminutive *Acrocomia hassleri*.

Thrilling as the discovery was, we still had yet to locate *B. campicola*. As Pilu and I were returning to the reserve complex toward the end of the day, thinking our bit of luck had run its course, we happened to spot some ripe *Allagoptera leucocalyx* fruit. Amazingly, we parked right in front of some very suspicious looking grass that, yes, turned out to be a population of our elusive *Butia campicola*.

A few days later we left the Mbaracayú Reserve to head north towards Ypé Yhú on the Brazilian border. The road was so

bad, gas tankers were unable to reach this region of Paraguay, leaving every service station dry. To get a fill-up, we had to go to Brazil, crossing a border defined by a rutted dirt lane in Paraguay abruptly changing into a smooth two-lane asphalted road with gleaming white concrete curbs in Brazil. It was more like passing through a time barrier than an international border.

Our journey continued from Ypé Yhú to Capitão Bado, encountering the challenging sandy roads along the top of the Sierra de Amambay at an elevation of about 420 meters. After driving for little more than 40 kilometers, things really began to get interesting. The region opened up into grandiose, uninhabited, nearly treeless and shrubless plains—a natural *campos*, with deep sandy soils, and no visible surface water. There is marvelous and most interesting flora in this area rich in ankle- to knee-high *Allagoptera campestris*, native grasses, sedges, and flowering trees. Camouflaged among the grass and other small, interesting plant life was hidden yet another unique species of *Butia* new to science, again Lilliputian in size, resembling its other grasslike relatives.

I came away from the expedition with some questions answered, but new questions yet to tackle. I learned that small does not mean unimportant or inconsequential in botany, and certainly not in my current research. The *Butia* species continue to cluster together in all of my computer analyses, but the most fascinating thing is the sequence in which they group. Analysis after analysis indicates that the entire genus may have originated from Lilliputian, grasslike ancestors that are closely related to all of my Brazilian/Paraguayan Lilliputian palm acquaintances: *Butia campicola*, *Butia leptospatha*, and the three other newly discovered species in that genus. In a real sense these small, hard-to-see species have been key in understanding *Butia* and understanding where and how the genus may have originated. ■

# The Amazing Tree Dioons of Honduras

Jody Haynes,
MBC Cycad Biologist

The "tree Dioons" represent a unique and intriguing assemblage of three related New World cycad species. Their nickname comes from their resemblance to a stereotypical palm tree—well-developed trunks, impressive proportions, and long arching leaves.

The largest is *Dioon spinulosum*, native to southeastern Mexico. It is the tallest of the New World cycads and the second tallest cycad species in the world, with some specimens soaring to more than 50 feet.

The second tree Dioon is *D. rzedowskii,* which grows in the same general area of Mexico but in a dramatically different habitat. Specimens have been reported to grow to 16 feet in habitat.

I recently had the exciting opportunity to get up close and personal with the third tree Dioon, *D. mejiae*, during MBC's 2003 Honduran Cycad Expedition.

*Dioon mejiae* is the only Central American representative of an otherwise Mexican genus. A native of Honduras, it was described in 1950 from an immature cultivated plant. Its formal description—and all subsequent published reports on this species—states that *D. mejiae* occurs in a single dry, rocky canyon near Olanchito, Honduras; that its trunk grows to only three feet; and that it is rare in habitat. One of the primary goals of our expedition was to prove that the published information on *D. mejiae* is grossly inaccurate—and we succeeded in doing so beyond our wildest expectations.

Author Jody Haynes is dwarfed by a 36-foot *Dioon mejiae* in the wilds of Honduras. The photo was captured by colleague, Mark Bonta, with a digital camera purchased through a generous grant from the Central Florida Palm & Cycad Society.

During the 30-day expedition, my colleague, Dr. Mark Bonta, and I visited more than 20 populations of *D. mejiae* in the provinces of Olancho and Yoro in east-central Honduras. Our first surprise was the sheer number of plants in the wild. We conservatively estimated over 600,000 wild plants—including two "super-populations" containing more than 100,000 plants each. Our discovery makes *D. mejiae* the most numerous of any cycad species growing in the wild—though none-the-less worthy of diligent preservation. Our second surprise was encountering spectacularly large specimens—many reaching at least 36 feet tall!

Estimating their age took some interesting extrapolation. Prior to this expedition, MBC had a total of 39 plants of *D. mejiae* in the Grounds Cycad Collection, representing only two accessions—one collected as seed in 1976 and the other donated to MBC as small plants in 1993. The largest of the plants from the older accession currently has about two feet of exposed trunk. Doing the math yields a growth rate of approximately seven feet per century under careful cultivation. Conversely, plants in dooryard gardens in Juticalpa, Honduras, grow at a rate of only 2.3 feet per century.

Using the latter growth rate to estimate age for plants growing in habitat, the awesome tree Dioons growing at Teocintalito, Honduras, might have been young seedlings in 600 A.D., just about the time the Roman Empire was coming to a close.

Standing in the shadows of this ancient giant was a truly amazing experience. And isn't it great to know that it will only take about 450 years for these plants to reach that height here at MBC! ■

# New Large-Capacity Sprayer Gives Boost to Palm Program

In just eight years, Montgomery Botanical Center has more than doubled the number of plants in the ground. Current totals exceed 10,600 accessioned plants in three major collections across 120 acres.

One of the largest and fastest developing programs is MBC's palm collection, accounting for more than half of all MBC plants. The Palm team has grown in tandem to include a palm scientist, three full-time palm horticulturists, two volunteers, and the support of the rest of the MBC team.

With plans underway to add an average of 600 palms annually over the next five years, MBC especially welcomed a grant from The South Florida Palm Society to purchase a 300-gallon sprayer dedicated to the Palm Program.

In the shade of the taller *Thrinax radiata*, Assistant Horticulturist Vickie Murphy delivers micronutrients to several populations of *Chamadorea* palms with MBC's new large-capacity sprayer purchased with a grant from The South Florida Palm Society.

A multipurpose piece of equipment, the sprayer is needed for micronutrient foliar feedings as well as protective drench applications. MBC Palm Horticulturist Laurie Danielson was especially enthusiastic when the sprayer was delivered. "With a full-time sprayer available for palms, we can now respond immediately to everything from freezing and drought to targeted pest control."

It didn't take long for the palm team to get the sprayer into action. Within a week, the team not only had it out doing its job but came up with creative modifications to make the sprayer even more useful. ■

# Quick Takes

### MBC for NYBG

Darrin Duling, Curator of Glasshouse Collections, New York Botanical Gardens, toured the grounds and reviewed our database, mapping, and labeling protocols, as well as visited with staff to learn about MBC's collections management and horticultural practices. He anticipates applying some of what he has learned when NYBG completes their new propagation facilities that will allow them to increase their palm and cycad collections under enhanced growing conditions.

### Fakahatchee Redux

Dr. Larry Noblick collected native seeds in the Fakahatchee Strand Preserve in 2001 for MBC's collection. Now as healthy, mature palms, four groups of *Roystonea regia* and two groups of *Acoelorraphe wrightii* have been returned to the park as part of their native plant restoration project. Because MBC had detailed data about their parentage and horticultural data, the park biologists could be confident that the palms were authentically native to the area.

### Operation Cycad Photo

It may be horrid if you can't get a photo of a "*horridus*" but when the Los Angeles Zoo & Botanical Gardens were running the story "Operation Cycad" about their acquisition of confiscated plants, their staff were hard pressed to find a good image of the *Encephalartos horridus*. But after a search on the internet, they found MBC. The picture was sent, the news item ran, and the story had a happy ending.

## Institutions and Organizations Benefiting from MBC

Whether it was participation in our Seedbank Program, scientific research, educational opportunities, or community projects, MBC is proud to have benefited the following institutions and organizations during 2003.

Arnold Arboretum, MA
Bogor Botanic Garden, Indonesia
Botanic Gardens of Adelaide, Australia
Brazil Botanical Garden
Center for Natural Product Research, University of Mississippi
Central Florida Palm and Cycad Society
Charles University, Prague
City of Coral Gables, FL
City University of New York
Coastal Research and Extension Center, Mississippi State University
Colorado State University
Columbia University, NY
Coral Gables Fire Department, FL
Cornell University, NY
Deering Estate, Miami-Dade Park and Recreation, FL
Delta State University, MS
Department of Environmental Resources Management (DERM), FL
DERM: Adopt-a-Tree Program
Dolmetsch Arboretum, Colombia
Eden Project, United Kingdom
Everglades National Park, FL
Fairchild Tropical Botanic Garden, FL
Fakahatchee Strand Preserve State Park, FL
Flamingo Gardens, FL
Florida Engineering Society
Florida International University
Florida Nurserymen & Growers Association
Ganna Walska Lotusland, CA

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### WE'LL HELP YOU HELP US

*If you want to know how you can join Montgomery Botanical Center's commitment to the scientific investigation and education in tropical botany through much needed financial support, goods, or services, contact Mary Andrews, Manager of Development & Communications, at 305-667-3800 x112 or maryandrews @bellsouth.net.*

# Sinkholes, Sand, and the Silver Bluff

## UM Student Digs Deep into MBC's Geological History

In a collaboration between the University of Miami, MBC, and one very bright science student, everyone wins. Katie Maier, a student of Dr. Harold Wanless, professor of Geology at UM, earned college credit for undertaking a research project on the geological history of MBC's property.

Her report begins, "As each plant and building at Montgomery Botanical Center has a unique history, so the underlying rocks have a story to tell." In what serves as a field guide, Katie takes us back more than 125,000 years as sea levels rose and fell along an ancient sandy shoal that eventually formed the Silver Bluff Ridge. A spectacular geological feature, the limestone escarpment's highest point drops sharply near the Walter Haynes Overlook along the upper perimeter of the Lowland Palmetum, as it stretches north to Georgia and south to Homestead in a formation known as the Atlantic Coastal Ridge.

Her report describes the special type of sand that makes up the bulk of the bluff. Called ooids, this sand was created by growing larger rather than by being ground down from larger material. It forms by gradually accreting more material in concentric layers as strong currents moved tiny particles around the sea floor. When fused into the solid mass of sedimentary rock, it is known as oolite.

Other features of the property indicate environmental shifts over time. Katie points out deposits of marine fossil skeletons embedded in the limestone indicating the violence of storm surge events. Nearby, sea anemone burrows can be seen in the side of the limestone wall, revealing a paleoenvironment during relatively long calm periods.

Another interesting feature of the property is a dry sinkhole containing unique isolated sculptural spikes known by their German name as *spitzkarren*. These formations were left as acidic rainwater slowly eroded the softer rock around them.

For anyone interested in Katie's study, a copy of the report with a CD of charts and images can be reviewed in the Montgomery Archive. ■

**Dr. John Donaldson**, Director of South Africa's Kirstenbosch Research Centre, annotated MBC's cycad collections. While on site, he met with the MBC representatives of the IUCN Cycad Specialist Group which he chairs. After discussing the Cycad Action Plan with Dr. Terrence Walters and Jody Haynes, Dr. Donaldson reviewed the healthy African cycads grown from seeds he had collected on previous expeditions. He was later sent a comprehensive sample of leaflets he selected for his molecular research on *Encephalartos*.

## Research Notes

Co-authors and palm experts, **Dr. John Dransfield**, Kew Gardens, and **Dr.Natalie Uhl**, Cornell University, were having a learned debate over the characters of certain palm species, when Dr. Dransfield noted that, with many plants developing into the reproductive stage, the scientific value of MBC's collections have become extremely valuable to researchers. The two scientists found this to be especially true as they examined fruit and flower during their annual on-site stay early this year. They were able to resolve many issues for their revised edition of *Genera Palmarum* due to their publishers in 2005.

**Dr. Harvey Ottley**, director of Wildlife North Australia, reviewed MBC's cycad collection to learn about *ex-situ* conservation efforts in the U.S.

MBC staff sent **Dr. C. Liu**, professor of plant anatomy and paleobotany at the University of Wisconsin, leaflet samples from 60 species of *Cycas* to assist in identifying fossil pinnae of *Cycas* from the Eocene period of northeastern China.

On-site guest, **Dr. Juan C. Moreno**, Universidad Autonomea de Madrid, Spain, collected leaf samples from 112 MBC accessions of *Phoenix* for DNA extraction as part of his research on phylogeny and biogeography of palms.

**Dr. Charles Brandt**, professor at the University of Mississippi, visited MBC to obtain diverse morphological samples and images of four Rutaceae species for his research and lectures.

**Dr. J.-C. Pintaud**, IRD, Quito, Equador, obtained leaflets from two accessions of palms for his molecular phylogenetic studies.

**Argelia Cuenca**, a graduate student at the Royal Veterinary and Agricultural University in Denmark, collected palm leaflets. Her project focuses on the phylogenetic relationship of the tribe Hyophorbeae based on molecular and morphological markers.

**Sophie Nadot and Beatrice Albert** from the Laboratore Ecologie, France, collected flower buds from 36 palm accessions for their study on the development of pollen from an evolutionary point of view.

**Dr. Catharine Mannion**, professor at the University of Florida, accesses MBC regularly for her entomological research. She is currently working on the lobate lac scale and the Asian cycad scale.

Also working on the Asian cycad scale problem are **Roger Coe**, (USDA-APHIS,FL) and **Lizandra Nieves**, of the USDA-Chapman Field, FL station. They access MBC to conduct studies on biological control of scale with wasps.

# The Cut Above:
## Trimming Tropical Trees

Scott Massey
MBC Dicot Horticulturist

As MBC's dicot horticulturist and an International Society of Arboriculture (ISA) certified arborist, I am frequently asked questions regarding tree care. One of the most common is: "How should I prune my trees?"

### Call the Experts

I always like to qualify any advice on pruning with the recommendation that, while a small amount of trim on small, lower branches can be done by an informed homeowner, a reputable professional—optimally a certified arborist—should first make an evaluation regarding the species, age, health, and condition of the tree as well as handle, at least, any major pruning project.

Why a certified arborist? Certification is awarded by the International Society of Arboriculture, an 80-year-old organization whose core mission is the care and preservation of trees. The ISA Certified Arborist Program requires passing a rigorous examination demonstrating tree knowledge in 10 domains including pruning, safety, pest control, regional tree identification, climbing, and fertilization. An applicant must have a minimum of three years experience to take the examination, pass each domain to gain certified status, and take 30 continuing education units every three years to maintain certification. Hiring a certified arborist assures a high level of expertise.

### Identify Your Objective

Once an evaluation of your tree is completed, you need to establish your primary objective. You may want to increase sunlight in areas under or near the tree, provide a better view through a tree, clear the tree of unsound or objectionable branches, or make the tree canopy smaller.

Using one or a combination of four basic types of pruning can usually accomplish most objectives: raising, cleaning, and thinning the canopy and crown reduction.

**Raising the canopy** or crown is most often performed on young to medium-aged trees to prevent low branches from growing to a large diameter. This technique shortens low branches on a regular basis, forcing more growth to occur in the upper branches. The lower, shorter branches are later removed to provide clearance around the tree.

Large diameter branches on older trees should only be shortened, not removed all the way back to the main trunk. Complete removal may introduce decay that can cause the tree to decline to the point of having to be removed.

**Cleaning the canopy** is commonly needed for mature trees to maintain safety, appearance, and health. Focusing mostly on the interior near the trunk, this method removes dead, dying, damaged, broken, rubbing, and structurally unsound branches as well as thins water sprouts. It should be noted that if too many water sprouts are removed, there may not be enough foliage left in the interior of the tree. This removal not only looks bad, it weakens the branches and reduces photosynthesis.

**Thinning the canopy** reduces the density of live branches on the tree if it is still too thick after cleaning. As opposed to cleaning the canopy, thinning is performed mostly on the outer portions of the canopy by removing small branches or portions of the outer edge of branches.

Thinning should not be confused with shaping or hedging the tree—cutting all branch tips back to a pre-determined length. Though often done by tree-service companies, it is not recommended because it causes the cut tips to flush out in many smaller branches. This forced growth stresses the tree by using up stored energy reserves. Maintaining the rigid shape also requires more frequent pruning (which may account for the reason why some companies use this pruning method.)

Another common concern voiced is, "My tree is too big." Topping a tree—indiscriminately removing a major portion of the crown—should never be an option. Besides ruining the tree's natural form, the loss of leaves cuts off much of the tree's food source and exposes the bark of the upper branches to harmful rays of the sun. The wounds from this drastic cutting may never heal, leaving the tree vulnerable to disease and decay.

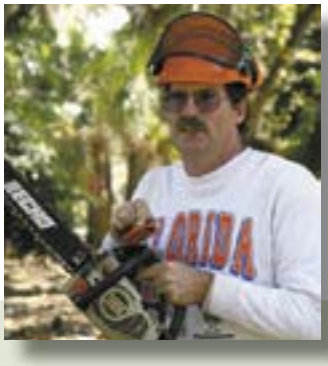
If your tree is healthy and you feel that it's too big, careful **crown reduction** pruning can help. In this type of pruning, the longest portion of main branches are cut back to existing smaller lateral branches. The lateral branch should be one third to one half (preferred) the diameter of the removed branch. Making these kind of cuts around the entire tree reduces its size and maintains its original shape. When properly executed, a 20% reduction in size of canopy can be expected.

Although many arborists consider crown reduction a milder form of topping, the decision should be based on the ability of the species to handle multiple cuts. There is a lot of variability in the ability of tree species to heal itself by compartmentalizing (sealing off an affected area). For example, *Quercus* (oaks) and *Bucida* (black olives) compartmentalize very well, while others such as *Delonix* (poincianas) compartmentalize poorly and decay easily and rapidly.

### Health and Safety First

There are a lot of things to consider before revving up your chain saw. It is vital to understand and employ the proper technique that will accomplish your objective while protecting your own safety as well as the health of your plant.

So begin by learning all about your tree and how to care for it from the library or internet. Then find a certified arborist for a professional evaluation, advice, safety information, time of year for pruning your particular species, and to take care of most, if not all, your tree care. ■

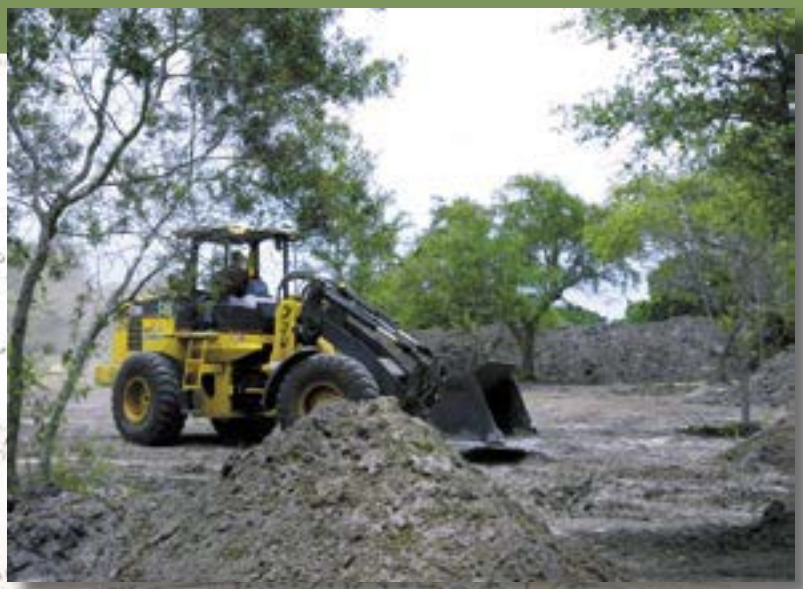


### Scott's Recommended Resources

- www.na.fs.fed.us/spfo
- www.floridaisa.org
- *Tree Pruning*, Alex L. Shigo
- www.isa-arbor.com
- www.hort.ifas.ufl.edu/woody/pruning
- *Illustrated Guide to Pruning*, E.F. Gilman

# Planning, Propagating, Plowing...

## MBC Team Focuses on Three Research Collections Featuring Endangered Species



When Nell Montgomery first envisioned a place where researchers and students could investigate tropical botany "outside the public glare," she would never have dreamed the collections would become so important to international conservation efforts. But with all cycads considered endangered and the diversity of palm species disintegrating at an accelerating rate, MBC's collections with associated scientific data play an increasingly important role in international conservation strategies.

With landscaping planned, plants growing in the nursery, ground clearing underway, and expeditions in the offing, three focused projects are making significant headway at MBC: the Caribbean Basin Conservation Collection, the Native Florida Collection, and the Cycad Ecologic Collection.

Listed as a critical hotspot, the Caribbean Basin was targeted by MBC's Board in 2001 as a priority for collecting expeditions. Seeds from the Bahamas, Puerto Rico, and Honduras are growing in the nursery as plans are being made for expeditions to Mexico, Cuba, and (yes) Florida.

"Many gardens fail to highlight what is in their own backyard," says Executive Director Terrence Walters. "But not only are this state's native populations of palms and cycads endangered or threatened, they are often requested to be seen by our international visitors. When completed, the Native Florida Collection will be the only one of its kind in the state."

Building an environment for populations from the Caribbean Basin is relatively easy given MBC's location, but creating a habitat for desert-loving cycads provides more of a challenge. It takes a mix of astute input from a landscape designer, soil scientist, irrigation experts, geologist, horticulturists, cycad biologists, and a hardworking team behind a lot of heavy equipment to make it happen. When developed, the Cycad Savannah Area will be the centerpiece for the new seven-acre Cycad Ecologic Collection that will also include tropical forest and oak woodland habitats.

"The creation of specialized habitats for taxa with particular horticultural requirements will help ensure the healthy growth of the endangered cycads and, ultimately, preservation of their germplasm," explains Jody Haynes, MBC Cycad Biologist. "And not only will there be additional research and educational opportunities, the Cycad Ecologic Collection will demonstrate the beauty and variety of color and form for landscaping possibilities."

And as with every experimental project at MBC, the process is being thoroughly documented for future reports that should be of special interest to researchers and conservationists as well as cycad enthusiasts who share our subtropical climate. ■

## MBC BY NUMBERS

### 2003 Collection Inventory

| | Planted in the Ground | Growing in Our Nursery | Total in Collection[3] |
|---|---|---|---|
| **PALMS** | | | |
| Taxa[1] | 377 | 198 | 472 |
| Accessions[2] | 1,725 | 557 | 2,225 |
| Plants | 5,626 | 4,244 | 9,870 |
| **CYCADS** | | | |
| Taxa[1] | 197 | 160 | 251 |
| Accessions[2] | 1,011 | 641 | 1,576 |
| Plants | 2,798 | 2,661 | 5,459 |
| **OTHER** | | | |
| Taxa[1] | 419 | 24 | 429 |
| Accessions[2] | 2,046 | 59 | 2,099 |
| Plants | 2,435 | 87 | 2,522 |

For detailed information on MBC's taxa and accessions, contact Collections Development, ext. 103

[1] Species, subspecies, varieties, etc. [2] A collection of seeds from one source or locality
[3] A taxon or accession may be represented in both the ground and nursery

## Two Join MBC As One of Our Own Accepts Promotion

Laura Vasquez

Last September, **Laura Vasquez** became part of the Collections Development team in the new position of Field Specialist. She brings a wealth of experience from projects ranging from conducting field research experiments, sampling, and testing to developing educational programs and presentations.

Christine Emshousen is flanked by two other members of the Cycad Program team, Cycad Biologist Jody Haynes (right) and Assistant Cycad Horticulturist Stella Cuestas (left).

As the new Cycad Horticulturist at MBC, **Christine Emshousen** brings energy and commitment to the Cycad Program. What does she envision for the Program? "I will first address the current challenge of growing cycads from all over the world in one locale to optimize the health of the collection. I especially look forward to taking part in developing the new seven-acre ecologic collection." Jody Haynes, MBC Cycad Biologist, values his new collaboration with Christine. "Her knowledge and skills already have proved to be a valuable asset to the entire Cycad Program."

Charles Bauduy

**Charles Bauduy** was selected as an MBC Assistant Palm Horticulturist, enthusiastically filling the position opened by Christine Emshousen's promotion to Cycad Horticulturist. With a life-long interest in subtropical horticulture, Charles has been a quick study under the guidance of Palm Horticulturist Laurie Danielson and veteran Assistant Palm Horticulturist Vickie Murphy.

# Remembering Mayna

## 1925 - 2004

Excerpt from a tribute presented by Dr. Terrence Walters at the memorial service held at Montgomery Botanical Center for MBC Volunteer Mayna Adams Hutchinson, February 1, 2004

I cannot think of a better place for family and friends to celebrate Mayna's life than here at the Nell Montgomery Home. Mayna spent countless hours here every week during the past 10 years bringing warmth, charm, and beauty to the first floor of this historic residence with her inspired botanical arrangements. She considered this home a canvas on which to paint with the plant collections found on the property. Each week, with clippers in hand and her straw hat on her head, Mayna would explore the 120 acres of Montgomery Botanical Center looking for just the right leaf, branch, flower, and seed with which to fill her palette.

Mayna created hundreds of magnificent palm and cycad arrangements for the numerous events, tours, and receptions held each year at Montgomery. In her ikebana arrangements, she captured the windswept beauty of the large fan- and feather-shaped palm and cycad leaves, the primeval majesty of cycad cones, and the distinctive personalities of fruits and seeds from a wide diversity of plant species. Most visitors and guests, when reflecting on their visit to Montgomery, mention Mayna's stunning works of botanical artistry as a memorable part of their visit.

In 1994, Mayna's fascination with botany and her love of history, especially the history of Coral Gables, led her to volunteer in the new Montgomery Archive. Mayna's knowledge of South Florida history and attention to detail made her a natural archivist. Along with her two dear friends, Katherine Bryholdt and Jackie Biggane, the three women developed a truly outstanding archive program for Montgomery Botanical Center.

During my 10 years as MBC's Executive Director, Mayna watched over me, as does a caring parent. She supported me, as a close friend, in all of my endeavors, and provided guidance, as a mentor, when I was floundering or moving in the wrong direction. Mayna has strongly influenced me and has had an exceptionally positive impact on my life, my work, and Montgomery Botanical Center. She is and will always be considered part of the Montgomery family. All of us at Montgomery will miss our friendship with her—however, Mayna's love and commitment, and the impact she had in our lives, will be with us each and every day. ■

THE MONTGOMERY
ARCHIVE

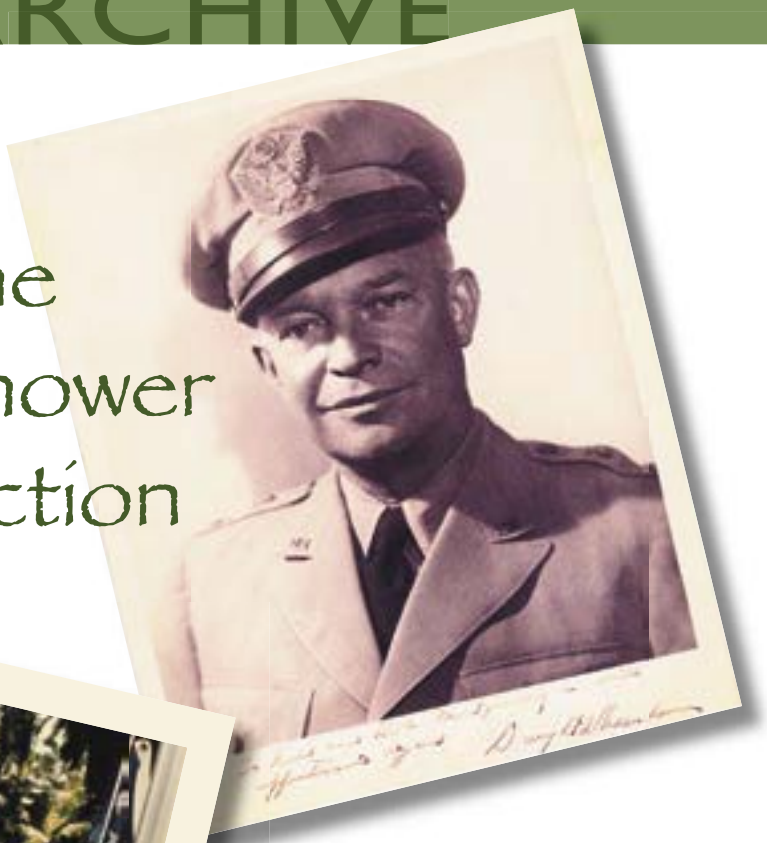
## IN THIS ISSUE...



**About the Cover:** The stately *Roystonea regia*, featured in MBC's Florida Native Collection, displays its showy inflorescence referred to locally as "Florida snow."
Photography by Mary Andrews



# The Eisenhower Collection



While Robert Montgomery was serving as executive secretary of the War Policies Commission in the early 1930s, he came to know one of the commission's major players, Major Dwight D. Eisenhower. From a bond of mutual respect and common understanding, they created a strong friendship lasting the rest of their lives.

Among photographs of the Eisenhowers' visits, news clippings, and memorabilia, the Montgomery Archive holds decades of correspondence between the two notable men as well as between their dynamic wives, Mamie and Nell.

The letters, beginning in 1933, include special insights into personal and political events including the Colonel's active support of General Eisenhower for the Presidency in 1952. After the deaths of Robert and Ike, correspondence between Mamie and Nell continued. Mamie shared her concerns during the Watergate scandal of the Nixon administration, the difficulties of widowhood, and her decline in health. Mamie's last letter to Nell was in 1979, the year of her death.

Among the special events documented in the collection is Mamie Eisenhower's 1970 flag dedication ceremony in front of Nell's House to honor the memory of her husband. Mamie inscribed the flag picture for Nell (shown above), but apologized for the ink smearing on the glossy surface.