

Irrigation Management at the Montgomery Botanical Center

By Lee Anderson, Superintendent

Within a radius of about 5 miles are five venerable (for Miami, at least) botanic institutions, all sharing certain commonalities, but each with a disparate focus.

- Kampong of National Botanical Garden c. 1918
- Montgomery Botanical Center (MBC) c. 1932
- Pinecrest Gardens c. 1937 (Originally Parrot Jungle)
- Fairchild Tropical Garden c. 1938
- University of Miami Gifford Arboretum c. 1947

Each institution has a particular focus, which dictates the irrigation management strategies. The irrigation schedule at Pinecrest Gardens, for example, a labor-intensive manual system, needs to reflect the hours of park operation. Heaven forbid that an errant zone is still running when patrons arrive a few minutes early and get spritzed on their way to the water park. It's the same with the Gifford Arboretum—students taking a shortcut through the Arboretum after parking their Lamborghinis nearby certainly don't want to show up in class soaked from errant overspray.

The Kampong irrigation system was beset early on in the 1930s by saltwater intrusion, so their challenge is managing domestic, potable water supply and the associated budgetary and regulatory restrictions.

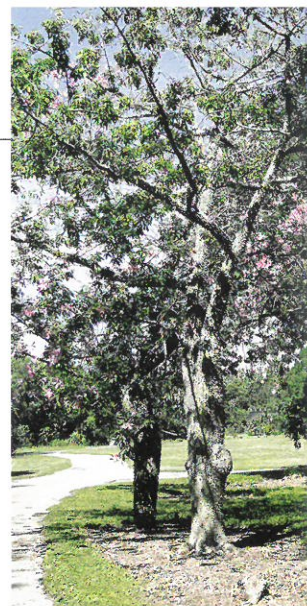


These date and royal palms, above, at one of the lakes required a dedicated irrigation zone for several years before establishing themselves. The zone can be seen on the master map in the upper right corner, paralleling the lakes.

Fairchild Tropical Botanical Gardens also fell victim to saltwater intrusion in the late 1930s, and although the garden has access to reasonably fresh water from adjacent county property, this water still needs to be run through a reverse osmosis (RO) treatment before being used in sensitive collections such as the butterfly garden. (Although based upon my experience with the potential corrosiveness in our greenhouse complex, I don't know just how appropriate RO water is for the fragile lepidoptera!)

At MBC, the focus is on research and conservation, so the irrigation system management needs to be tailored with these objectives in mind.

Palms from the tropical rainforests of South America have completely different requirements than palms from the arid regions of North Africa, for example. The two essential elements of the irrigation management program are the central system controller and weather station supplemented by an array of Rain Bird RainWatch field stations scattered across the 120-acre site and an in-depth mapping program that has become more technologically advanced over the years with increasing sophistication and accuracy of survey equipment. The master map of the entire property is broken down into 154, 200' x 200' quadrants. Each of the "quad maps" displays every known horticultural and infra-





The central irrigation controller and weather station mounted on the main greenhouse, left, is augmented by a half-dozen remote field stations.

These Kapok trees (far left) from Central America, planted in the early 1980s, have thrived since then with no supplemental irrigation.

irrigation lines at the bottom of the map reflect the original agricultural rowcrop plots, primarily tropical fruit such as mango, avocado and citrus.

Although the details of the equipment inventory will not be addressed in this article, the irrigation management program has evolved over the years with the acquisition of increasingly sophisticated equipment within the confines of the modest budget of this not-for-profit institution. An excellent example is a recent upgrade from basic direct-reading rain gauges to data-logging, tipping-bucket gauges. The direct-reading gauges had a capacity of 6 inches, so if a curator sees a reading of 6 inches after a night of steady rain, he or she doesn't really know if exactly 6 inches fell, or if it could have been 7 or 8 inches or more. The tipping-bucket gauge can record up to 160 inches, which, at least for South Florida, would be around three years' worth of data. Additionally the data-logging feature tracks the intensity of the rainfall. Let's say 3 inches of rain were recorded after an application of granular fertilizer. Three inches over the course of several hours would



The master irrigation map is divided into 200' x 200' quadrants that show in detail all items of infrastructural and botanical significance.

be perfect. Three inches in one hour would be a true washout, a waste of time and money as well as negative environmental impacts on nearby waterways.

At the MBC, irrigation management means organizing whatever resources are available to provide the most effective and scientifically documentable applications within budget and water supply constraints. 🌱

structural detail available: utility and irrigation lines, hardscapes and every accessioned plant: palms, dicots, shrubs of botanical significance. Since we plant around 500 new specimens a year, it is essential to know exactly where these plants can be installed without damaging existing utilities while still following an exemplary landscape design plan.

The master map also provides a visual account of the evolution of the irrigation system over the years. For example, the irregular circular loop at the top of the map depicts the original layout from the fifties and sixties while the symmetrical rows of

Extensive wall-to-wall palm fairway irrigation, right, is required to maintain turf with sufficient vigor to withstand the foot and vehicle traffic of various tour groups that come through the garden.

