FAIRCHILD TROPICAL BOTANIC GARDEN

Exploring, Explaining and Conserving the World of Tropical Plants

A Rare Gem
The Twenty-Year Evolution of a Tropical Botanical Garden

"It's hard to say what plant in Dr. Jeff Block's collection is most beautiful, because each plant is riveting."
-Georgia Tasker, Miami Herald 1999

All photos are of Block Botanical Gardens

So began a featured newspaper story from November 14, 1999 about an extraordinary ten year-old private garden in Miami. It went on to describe Dr. Jeff Block's background in science as a medical doctor and nurturing caretaker. His growing tips referenced in that article are still referenced by local garden enthusiasts today. The careful plant selections and artistic grooming of several hundred handsome specimens were described as being grown to horticultural perfection far surpassing those same plants when found in the wilds of nature.

Fast-forward another ten years and we can now see the anticipated results of Block's planning and labor. In addition to the garden's high horticultural merit, at twenty years old we can now see the benefits of his original landscape design. This garden has been transformed from a collector's garden into a masterful botanical garden offering balanced vistas among artistic vignettes of plantings. Nearby pathways enable plant specimens to be observed from optimal vantage points, and allow accessibility for maintenance. Unlike most collector gardens that tend to group plant families together, Block's designs mix the colors and textures of evolving sizes together with foresight planned two decades ago. With thousands of different plants to choose from, he has carefully researched and selected exotic materials not commonly seen in typical Florida gardens. Prize-winning orchids, bromeliads, begonias, ferns festoon live oaks, lignum vitae, and rock walls resembling rainforest cliffs. Two particularly well-grown tree specimens have recently been measured, designated and registered as Florida State Division of Forestry *Champion* trees and represent the finest of their kind anywhere in our country. A dozen different tropical fruit trees and shrubs provide a backyard source for culinary delights, while several native gems continue to flourish in their home soils. Then there are the palms and cycads! Representing over a hundred species, experts had warned that several carry reputations as being too challenging to grow, but Block has managed to coax most through their susceptible infancies into full-grown healthy adult specimens. Dr. Block is a certified Master Gardener through the University of Florida's agricultural extension program, and is well known as a prize-winning horticulturist in multiple plant society sponsored judged competitions. He is an active Fellow member of Fairchild Tropical Botanical Garden, and his garden is an institutional member of the American Botanical Gardens Association. Insights into his success with landscape design and subtropical gardening are shared through this article.

Regarding twenty years involved with the passionate nurturing of his garden, Block points out that in many other parts of the world, families remain with their homes and gardens for generations, while in contrast here in he United States the typical homeowner stays in their home for only seven years on average. When considering our particularly transient South Florida community, this time frame may be even shorter. *"Taking time to smell the roses"*, describes the peaceful satisfaction one experiences by sufficiently interacting with the wonders of their surroundings. Opportunities abound with dynamic gardens that grow quickly in the subtropics. An appreciation of just how quickly nature paces herself here helps make our observations more readily apparent when compared with non-tropical climates.

“The summer hurricanes and winter freezes are historically the greatest threats to our sub-tropical landscapes”, says Block. “They’re nature’s cleansing mechanisms and are consistently inconsistent! While we can’t stop the forces of nature, we can use intelligent design to help defend our landscaped garden spaces, because a healthy plant will be better able to tolerate these extremes of South Florida’s weather conditions. Regardless of how wonderful a landscape design may be, without a basic knowledge of how to grow plants, most landscapes will eventually succumb to nature’s tendency to regularly breakdown and rebuild our earth’s surfaces.” After these twenty years his garden has seen two major and a two minor hurricanes, as well as yearly threats of sub-freezing temperatures that occasionally leave their scars.

“A garden design built to withstand wind and cold requires a working local knowledge of seasonal weather conditions concerning water, air circulation and light. Yes, we really do have different seasons here!” explains Block. “All South Florida boaters know that our normal or *prevailing* breezes arrive here from the southeast by sweeping warm, moist tropical air in from the gulfstream. Of course the most severe winds associated with our hurricanes are unique due to their circulating winds that can impact from any direction. Experienced gardeners understand that the primary reason we have such wonderful growing conditions here compared to elsewhere in the continental United States is largely because of our seasonally plentiful water and warm air temperatures, and the not-too-cold temperatures found in our winter months. This allows us to select from a huge bounty of tropical plant choices. Our yearly winter ‘arctic’ threats in December through February originate from the *dry northwest*. Agricultural crop farmers know that dry, cold winds will threaten crops by desiccating plants, so if a cold front is not preceded by rain, they will irrigate well before a cold snap arrives. Water should be regarded as the most essential temperature regulator for plants. During the summer’s heat it serves to protect a plant’s tissues from the stress of evaporative heat and water losses. In dry, cold conditions, adequate hydration can help protect the threat of desiccation and keep a plant from lethal cold damage. Additionally, in contrast to air temperatures, soil temperatures in South Florida will seldom fall below freezing, such that moist soils with thick mulch covers act as a heat reservoirs in which a plant’s roots can be considered as being plugged into the earth for a source for warmth. Because the cooler winter months occur during our dry season, adequate hydration is particularly important during these times, and concerns for water conservation techniques such as mulching are particularly beneficial from November through May.

Having covered water and air circulation, let's take a closer look at sunlight in South Florida. Adequate light promotes compact and structurally stronger growth in plants. We all know that the number of hours of daylight versus nighttime varies depending on seasons. Plant photosynthesis uses sunlight as its fuel source for the energy that produces vigorous growth during the longer sunlit days of our summer's most active growing season. In South Florida we live at latitude 26° N and what many people don't appreciate is that during winter's shorter days, our sunlight comes from lower in southern sky, casting longer shadows to the north of objects. For this reason, plants that have high light requirements such as most flowering trees and many orchids may need to be positioned away from the shade created by obstructions. Furthermore, many plants flower in response to the stresses of cool temperatures and less daylight hours that occur in our winter dormancy season. Experienced growers know how to capture adequate light during these frugal winter months by avoiding placing flowering plants close to the north sides of dense plantings or buildings. The north sides of most South Florida properties may be best suited for cold tolerant plantings such as live oak trees which are capable of withstanding winter's cold winds and also can serve to protect less cold tolerant plantings from unobstructed northwest winds.

January of 2010 set new records for a remarkably long cold snap that saw consecutive nights near 30F, and many daytime high temperatures that remained only near 50F. In this situation, during the shorter winter days, the sun's radiant heat was insufficient to raise ground temperatures at our plant's root zones. Just as "cold feet" describes an uncomfortable and unhealthy condition for human beings, many plants suffered as well. Symptoms included an initial widespread dormancy followed by early defoliation in wind chill susceptible plants, as well as later signs due to root zone damage such as delayed defoliation and a general failure to thrive. Block explains that sometimes a delayed defoliation may actually indicate a healthy plant attempting to hold onto its leaves, and that those plants often may recover more efficiently. His methods used to help cold damaged plants to recover include a pre-cold feeding using extra magnesium to give a plant's cells the extra ability to make chlorophyll; a plant's life blood enabling photosynthesis and re-growth. "Chlorophyll closely resembles the human blood molecule which uses iron as its central building block. Plants need magnesium to re-energize chlorophyll, and grow out of the dormancy." After the cold, prudent pruning helps to remove decaying leaves and avoids necrotic tissue from spreading. Keeping plants clean by spraying with agents such as peroxides can also help limit this potential disease spread. Fallen leaves should be removed as they can smother lower level plants including turf grasses by blocking ventilation and light. Selective pruning also allows light to reach newly emerging leaves. "Minimal initial pruning and restrained initial feeding can help avoid having new leaves from being exposed to another late-season cold event, but it's usually OK to prune more aggressively and resume optimal feeding once our warmer weather appears by early March", says Block. As the sunlight and heat increase with the arrival of spring, extra water can be helpful until our summer rainy season arrives in June.
So which aspects of a good design can help protect against these threats of nature in our environment? "A little research about where a given plant normally thrives is very helpful," says Block. "Epiphytes for instance (which include orchids, bromeliads and many ferns) live on the branches of trees which are exposed to wonderful air circulation, and generally capture bright filtered light. In tropical rain forests however, very large trees may host many different varieties of plants. These plants often evolve to prefer either a tree's lower branch levels that provide more shade and moisture, or the canopy tops that may be brighter and relatively dry. Such is the habit of nature's fine-tuning for survival. Observation and research assist good growers to recognize these differences and use this information to help their plants to thrive."

When considering a new landscape design, Block strongly prefers to first start with tree plantings. Sometimes even years in advance because trees will generally take longer to establish, and will define where understory plantings will later perform best. He is careful not to overcrowd, and allows open spaces as essential design elements that help us perceive visual depth. Open areas are inviting, and allow space for us to observe and access our plantings. "A so-called jungles look for home landscapes is greatly overrated", says Block, "Overcrowding readily leads to poor air circulation and creates maintenance access difficulties. In contrast, look for minor elevations and depressions in your yard space. Even small grading can have profound effects on water flow and drainage, that may have unique usefulness during either our wet or dry seasons." These elevations and obstructions are often subtle but are key elements that identify microclimates (areas with unique growing conditions) even on the most modestly sized landscapes. Knowing where these areas exist on your property, and which plants prefer one spot compared to another may allow you to successfully grow more varieties of plants than you ever thought possible.

When asked about his plant's nutritional needs, Block states that over the past decade, his ideas concerning what, when and how to feed tropical plants have evolved. He explains that because our native soils are extremely nutrient poor, he recognizes the need for supplemental fertilization to potentiate the fast pace of tropical plant's growth rates. He does not ascribe to the widely recommended practice of blending in our native soils with the store bought prepared bagged potting soils for new plantings. Block understands that over time, the excellent drainage properties of most ground soils will eventually incorporate these better balanced potting soils, and will essentially expand the size of the original planting hole's nutrients encouraging deeper roots. Other problems with a one-size-fits-all approach are many. To begin with, because there are so many different tropical plant families, many may have different optimal nutritional needs. His next consideration is that some plant food components called micronutrients are better absorbed by sprayed fertilizers applied by a sprayer to a plant's leafs, while others are better taken into the plant through their root systems by granular fertilizers. Originally he used several different granular preparations for different plant types, but after many years of observing if this extra care made observable differences, he now has settled on the widely available Palm Special fertilizers (for all of his plants, and turf grass). He offers one final point regarding how water quality effects plant nutrition; "There is plenty of research to show that plants generally prefer slightly acidic water. pH is a number between 0 and 14 indicating how acidic or basic liquids are measured to be. A pH of 7.0 is considered as neutral, but at slightly lower acidic levels of 5.5 to 6.5, micronutrients are actually better able to get absorbed into plants. Difficulties with plant nutrition occur due to the chemical composition of our ground 'well' water versus municipal, or 'city' water. Because of our calcium-rich limestone coral rock foundation, the ground water here is considerably alkaline or what we regard as 'basic' with pH levels measuring over 8.0. Municipal waters often have even higher pH values making this water an expensive and relatively poor quality product for plants, but reasonably healthy for human consumption due to its cleanliness, higher pH and added fluoride for teeth. Unfortunately, our municipal water contains understandably high levels of chlorine due to the threat of bacterial contaminants that grow quickly in our tropical environment. Chlorine is in fact bleach, and high levels are not generally well tolerated by many plants." Abiding by twice-weekly water restriction guidelines, Block mulches liberally and uses his well's water source through a zoned primary sprinkler system to irrigate his property.

Nearly eighteen years ago, Block invested in a relatively new technology to help purify water using a filtration technique called reverse osmosis. Small units are widely used today for 'under-the-sink' applications that make optimally clean home cooking and drinking water. He has designed a considerably larger water purification system that not only waters his commercial greenhouse plants, but also mists thousands of the epiphytes living on his trees. Because reverse osmosis purification removes all calcium, the pH of the resulting product approaches an ideal acidic range preferred by plants to enable optimal nutrient absorption. Another added benefit of removing this calcium is that the unsightly salt stains calcium deposits on plant leaves after overhead irrigation are not seen, creating a cleaner, healthier plant. Block then adds a very dilute soluble fertilizer to his pure water and the results are spectacular. Orchids, bromeliads and ferns thrive in year-round show-quality abundance and appear as jewels adorning nearly all trees, including his palms trees.

Research starts at home by looking at your immediate surroundings. Observations should make notes of buildings that obstruct airflow and light from reaching plants. Also look at where you spend time in your home, and realize that the best direction to look though windows and see ideal natural light is when we face north. When looking to the north, we view the southern exposed sides of landscapes that receive optimal sunlight year round, and also receive our most consistent airflows originating from the southeast. Try to take full advantage of this northern side of your landscape's design, as it will reward you with the best natural environment for viewing your healthy South Florida garden.

Dr. Block offers us these preventative care prescriptions for healthy gardens in South Florida:

- Allow airflow from the warm, moist prevailing breezes that come from the southeast.
- Protect against winter winds coming from the northwest (Dec. through Feb.).
- Considering our nutrient poor soil's needs, water quality can make a difference.
- Provide efficient water and mulch during the dry season (November through May).
- During the winter months, be aware that sunlight comes from lower in the southern sky.
- Use the right plant in the right place (this teaching is his Master Gardener mantra).
- The most expensive plant you'll ever buy is the one you kill. Find out what went wrong.
- Spend some time *"smelling the roses'.* Observe things and always consider changes.