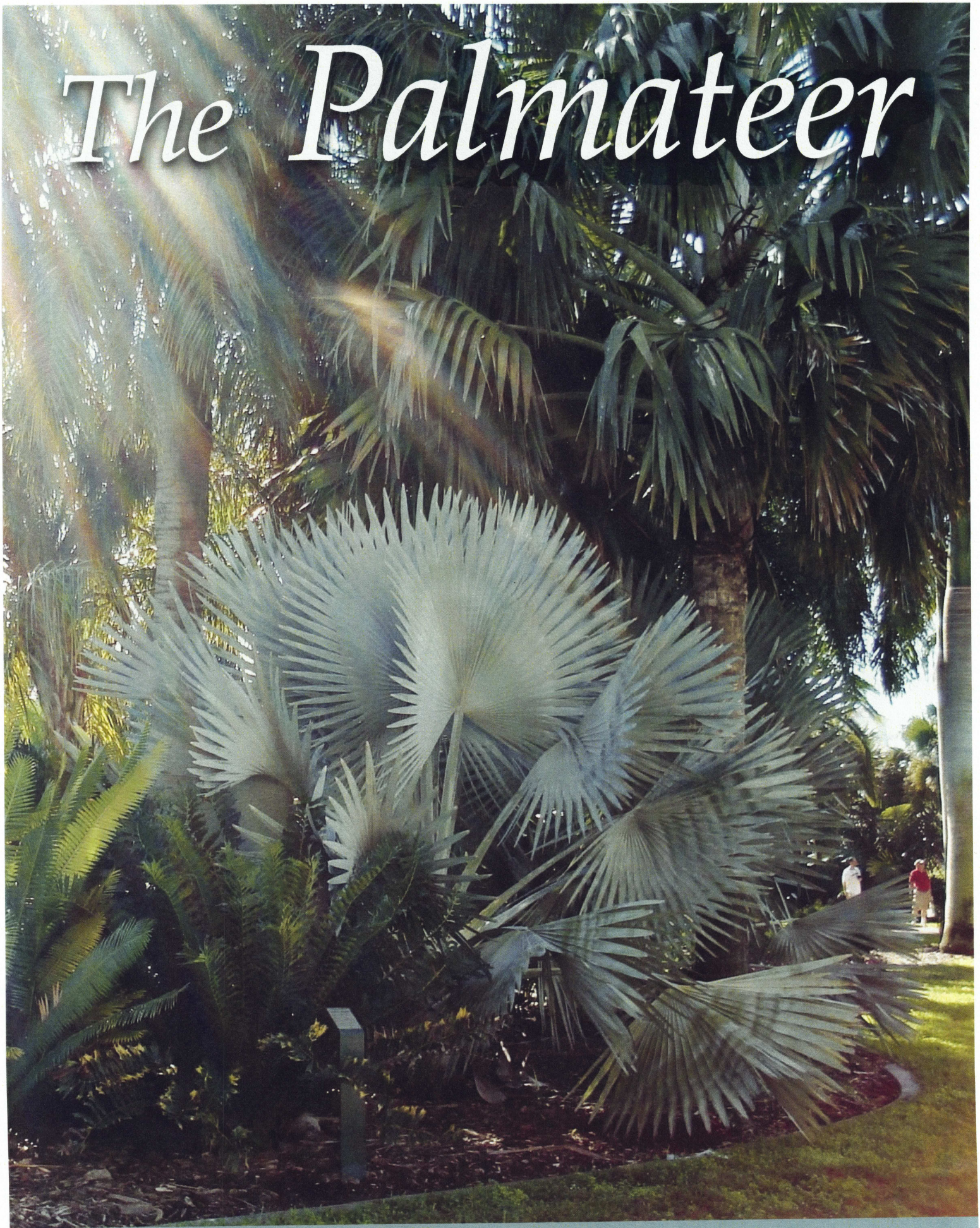
# The Palmateer



*Central Florida Palm & Cycad Society* • Summer/Fall, 2011 • Volume 31, Number 2

# Name That Palm!

Neil Yorio, host of the first stop of our December 10th meeting, standing next to one of his prize palms.

Can you

***Name That Palm?***

E-mail your best guess to CFPACS president

Dave Reid:

damy5@juno.com

Answer will be revealed at the CFPACS December meeting.

# The Palmateer

**Central Florida Palm & Cycad Society**

**Summer/Fall, 2011 • Volume 31, Number 2**

## Contents



**Front cover:** *Bismarckia nobilis and other palms at the Gizella Kopsick Palm Arboretum in St. Petersburg, Florida (photo by Bob Johnson).*

**Back cover:** *Group of Cocos nucifera reflecting off lake at Fairchild Tropical Botanical Garden, Coral Gables, Florida (photo by Bob Johnson).*

***Below:*** *A portion of Neil Yorio's garden, one of the stops for the CFPACS December 10th Holiday Meeting (photo by David Reid).*

***The Palmateer* Editorial Team**

**Editor:** Bob Johnson

**Contributors:** William Black, Chuck Grieneisen, David Reid, Eric Rosenfeld, Eric Schmidt, Dave Witt

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www.cfpacs.org

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The **Central Florida Palm & Cycad Society** is an affiliate of the **International Palm Society** and **The Cycad Society**. CFPACS is a nonprofit, nonpartisan organization dedicated to scientific and educational projects related to the study of palms and cycads, their propagation, culture, conservation, care, and development. We assist in the preservation of palms and cycads for future generations as well as promote and maintain public interest in palms and cycads.

CFPACS serves the following counties: *Alachua, Brevard, Citrus, DeSoto, Flagler, Hardee, Hernando, Highlands, Hillsborough, Indian River, Lake, Levy, Manatee, Marion, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Putnam, Sarasota, Seminole, St. Lucie, Sumter and Volusia.* We also welcome palm and cycad enthusiasts from beyond Central Florida to become members.

### CFPACS Membership Dues for 2011:

US Members (1-year): $15

US Members (3-years): $40

Foreign Members (1-year): $20

**Please send dues to:**

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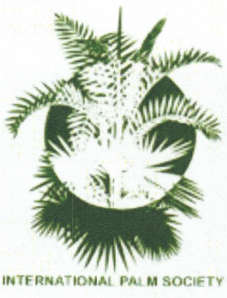
CFPACS Membership Chair
5942 Ehren Cutoff
Land O Lakes, FL 34639

You may also pay by credit card at www.PayPal.com (please indicate "payments@cfpacs.org" in the "to" field).

**Advertising:** Please contact CFPACS treasurer, Catherine Johnson (e-mail treasurer@cfpacs.org) for advertising rates.




**About the International Palm Society:** IPS membership dues are $45 a year. Membership includes a subscription to *Palms*, the quarterly journal of the IPS. For further information on the IPS, please visit their web site: www.palms.org


**About The Cycad Society:** TCS membership dues are $35 a year. Membership includes a subscription to *The Cycad Newsletter*, the quarterly journal of TCS, and access to The Cycad Society seed bank. For further information on the TCS, please visit their web site: www.cycad.org

# CFPACS News

## President's Message

For the December 10th meeting I would like to discuss with everyone the future of CFPACS and how to make the club stronger for the year 2012. I took the reins in July 2011 and have struggled like everyone else to be motivated in keeping CFPACS on its feet. I feel I've done an inadequate job to this point but am looking to greatly improve for 2012. Please come out to the meeting and express your opinion on how to improve CFPACS. There are many opportunities to help. I can always be reached by e-mail if you cannot make the meeting.

*Dave Reid*
*CFPACS President*

## Correct contact info for Dave Reid

The contact info for Dave Reid on the CFPACS web site is incorrect. Please call Dave at (321) 454-4771 or e-mail him at: damy5@juno.com

## The CFPACS web site is in transition

Until this changes you can get the most up to date information on CFPACS from our Facebook page (see below). If you are interested in helpoing with the CFPACS web site, please contact president Dave Reid.

**The Palmateer** continues to be published intermittently but will catch up soon. Look for the Winter issue to arrive around Thanksgiving. Articles on Archontophoenix, *Chambeyronia macrocarpa* (photo, upper right) and *Zamia floridana* are planned for future issues. Your submissions are welcome and much needed!

Find us on Facebook
www.facebook.com/pages/Central-Florida-Palm-Cycad-Society/145851341806

follow us on twitter
www.twitter.com/centralflapalms

**Last Issue's Name That Palm was**
***Syagrus schizophylla.***
No one guessed correctly.
See the new "Name That Palm" on page 2.

# CFPACS Holiday Meeting

## December 10th • Indian Harbour Beach & Merritt Island

*Article and photos by Dave Reid*

Our next meeting will be Saturday, Dec. 10th. From 10 to noon we will meet at Neil Yorio's exquisite palm and cycad garden in Indian Harbor Beach. Then, after a lunch break we will meet at my house at 1 pm. Neil is a former CFPACS president and his garden is well matured. He has towering palm species that only recently have become more popular, thus proving that Neil was way ahead of the curve in collecting rare palms and cycads. It will be an interesting stop for many palm and cycad enthusiast as many of the rare plants tower over his house *(photos this and facing page)*. Cycad collectors will be charmed on his many rare species.

The suggested lunch spot is Double Hoagies in Indian Harbor Beach. It is very close to Neil's and is on the road to South Tropical Trail. Very close with a cheap and varied menu.

The path from Neil's beach side home to mine allows a drive up the beautiful South Tropical Trail on Merritt Island. As many as you know, the Southern tip of Merritt Island is a unique micro-climate. Scattered amongst the rows of expensive mansions grow many tropical plants, it is a scenic drive. Too bad it won't be mango season as there are many roadside fruit stands when they are in season.

I live two miles North of Pineda Causeway off of South Tropical Trail. Another bonus is that the Pineda Causeway extension just opened a few months ago so there is easy travel off of I-95 to South Tropical Trail and to beach side A1A. Neil's and my addresses are listed below so use your favorite map or GPS to chart your course to the December 10th CFPACS meeting.

My yard is less mature than Neil's, but I feel I've been obsessed enough in planting palms for the past decade to offer a few surprises. I've done a lot of experimenting with odd palms and you can see what has survived ( I can only talk about the failures). I hosted a CFPACS meeting back in 2005 and the garden has grown in nicely since then.

### Holiday Meeting Schedule

**10 am - noon:** Yorio garden open for viewing

**Noon:** Lunch *(on your own)*
Double Hoagies,
1896 S. Patrick Dr.
Indian Harbour Beach, FL 32937

**1 pm:** Reid garden open for viewing, followed by auction and plant sale.

*Please bring a plant to donate to the auction! All CFPACS vendors are invited to sell plants, new vendors are welcome. Please contact CFPACS treasurer Catherine Johnson (contact info on page 4) for vendor information.*

### Directions to the Yorio's

- Take I-95 to exit 183
- Take exit 183 toward Melbourne 0.3 mi
- Merge onto W Eau Gallie Blvd 4.7 mi
- Continue onto Montreal Ave 0.5 mi
- Continue onto Eau Gallie Causeway 1.6 mi
- Turn left onto S Patrick Dr 0.9 mi
- Turn right onto Banana River Dr 0.3 mi
- Take the 1st left onto Wimico Dr 0.3 mi
  *The Yorio's will be on the right*

Neil & Karen Yorio
211 Wimico Dr.
Indian Harbour Beach FL 32937
321-779-4347

### Directions from the Yorio's to the Reid's

- Head south on Wimico Dr 0.3 mi
- Turn right onto Banana River Dr 0.6 mi
- Continue onto Co Rd 3 / Mathers Bridge
  Continue to follow Co Rd 3 6.7 mi
- Turn left onto Hillard Ln
  *The Reid's will be on the left* 0.2 mi

Dave & Amy Reid
100 Hilliard Ln.
Merrit Island FL 32952
321-454-4771

# What's Wrong With that Cycad Leaf?

*Article & photos by Chuck Grieneisen*
*Oviedo Florida*
*chuckfg@bellsouth.net*

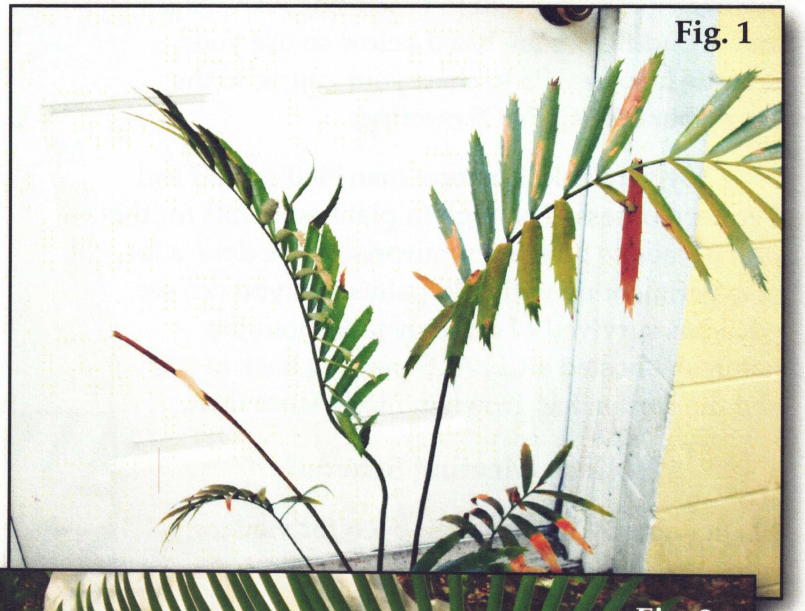


Fig. 1


Fig. 2


Fig. 3

In the accompanying photos it is not a pest or disease that has caused the leaf problem! All that has happened is that as the new leaves were emerging something happened to disturb them. When new cycad leaves emerge they are soft and rubbery, or at least pliable. As they reach there full size the leaves "harden off" to their final size and texture. When the leaves are emerging they grow very quickly. In some of the larger species, a 12 foot leaf can be produced in two months. If something gets in the way of the emerging leaves they can get bent or twisted as they go around an obstruction. When they "harden off" they do so permanently bent or twisted.

When the leaves look like that, they are healthy, although misshapen. This is most common in container grown plants. It can happen from something as simple as just moving your plant into a new location as the new leaves are emerging (Fig. 1). This seems almost always to happen when you move a plant while the leaves are emerging. It often has to do with the leaves orienting themselves to the sun. It will also happen if the plant's new location is different in the vertical plane (if it was straight up and down and it's new location has a slight angle to it and vice-versa).

Leaf disfigurement can also happen if the plants are grown too close together, or next to a fence with the leaf hitting the fence and continuing to grow. It can really be bad if the plant is knocked over while the leaves are emerging (Fig. 2). It can also happen to plants grown in the ground. On one of my cycads, a lizard would sit on an emerging leaf every day. The weight of the lizard caused the leaf to harden off bent (Fig. 3). So if you see some cycad leaves (especially on a container plant) that look a little bent or misshapen, but otherwise healthy, it is likely due to one of these reasons.

# The Cyclanthacea: Another group of Palm-like Plants

*Article & photos by Eric Schmidt*
*Leu Gardens*
*Orlando, Florida*
*eric.schmidt@cityoforlando.net*

The Cyclanthaceae is a family of herbaceous shrubs, climbers, and epiphytes. Many of them resemble small and shrubby palms. Twelve genera comprise this monocot family with around 230 different species. They are native to tropical regions of Central and South America where they grow in moist forest habitat.

Many of the cyclanths have bifid or palmate leaves and look like palms. A few have entire leaves. These leaves have an open sheath. The petioles of the leaves are rounded, unlike those of palms which are usually flattened on top. The flowers often resemble those of aroids. They consist of a spadix with spirally arranged flowers and a spathe.

Cyclanths date back at least to the Eocene Period (34-56 million years ago). They are believed to possibly go back as far as 77 million years ago. Cyclanths are only distantly related to palms. Their closest relatives are members of the Pandanaceae (pandans). The Cyclanthaceae Family belongs to the Order Pandales which also includes the families Pandanaceae, Stemonaceae, Triuridaceae and Velloziaceae. The palm family, Arecaceae (Palmae), belongs to the Order Arecales and is the only family placed in this order. The genera found in Cyclanthaceae include *Asplundia, Carludovica, Chorigyne, Cyclanthus, Dianthoveus, Dicranopygium, Evodianthus, Ludovia, Schultesiophytum, Spaeradenia, Stelestylis,* and *Thoracocarpus.*

Only a few species of cyclanths are commonly cultivated. Generally, cyclanths like a shady location. They also like moist soil and should not be allowed to get very dry. Many seem to be tender to cold, suitable only in the warmer areas of southern Florida. We have tried several here at Leu Gardens but all have died when temperatures dipped below 35F. They do make great container plants and can be placed in a greenhouse or brought indoors during cold periods.

The most common cyclanth grown is *Carludovica palmata*, the Panama Hat Plant. It does not form a trunk but has leaves with long petioles that can reach 8-10 feet tall. The leaves are dark green and palmately compound. Fiber is obtained from the petioles and used to make panama hats. It is native from southern Mexico to Bolivia. Panama Hat Plant seems to be a hardier cyclanth as it is occasionally seen in southern Florida. We have yet to try it here at Leu Gardens.

*Top: Dicranopygium wallisii*

*Middle: Carludovica palmata at Lincoln Park Conservatory, Chicago, Illinois. This plant is called "Panama Hat Plant" in the nursery trade.*

*Right: Carludovica rodundifolia*

*Two cyclants growing at Fairchild Tropical Botanical Garden in Coral Gables, Florida*

*Left: Asplundia rigida, sometimes called "Jungle Drum" in the nursery trade.*

*Below:. Cyclanthus bipartitus*

*Asplundia rigida* is native to Hispaniola and the Lesser Antilles. This may be the plant that is being sold in the nursery trade as "Jungle Drum". It has dark green, bifid leaves. It is trunkless and grows 3-4 feet tall. This cyclanth has never survived for us at Leu Gardens as it quickly declines below 40F.

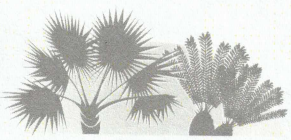
*Cyclanthus bipartitus* is also trunkless, growing 5-7 feet tall. It has rounded bifid leaves that are light green and glossy. It is native from southern Mexico to Brazil and Peru. We planted a small specimen of this out at Leu Gardens in summer 2009. Unfortunately the winter of 2009-2010 was colder than normal. With long periods of cool and cold temperatures the plant perished. I plan on planting another specimen out in 2011 to try again.

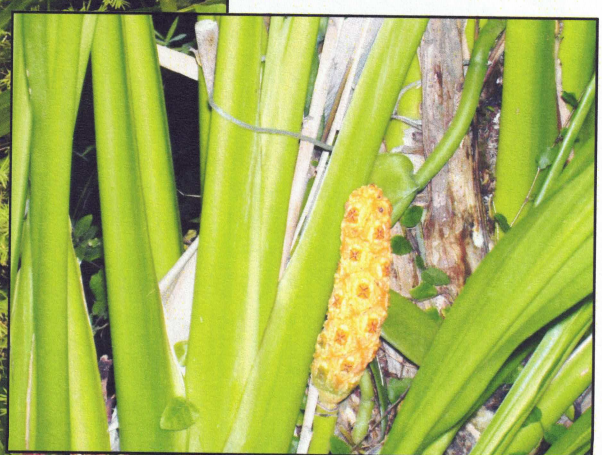
*Above: Chorigyne ensiformis*

*Left: Carludovica rodundifolia*

*Below: Ludovia lancifolia*

*Below right: Ludovia lancifolia inflorescence*



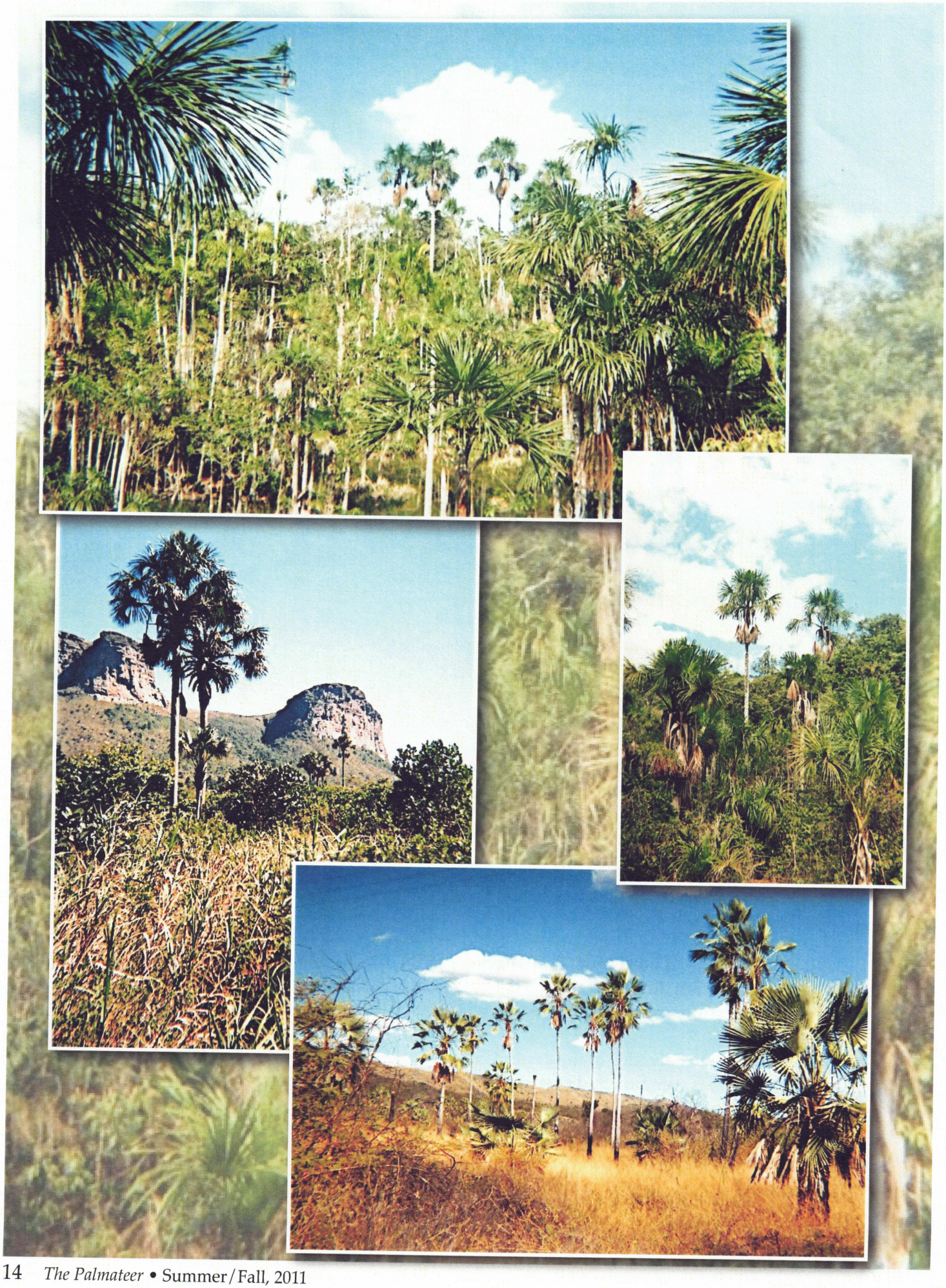


# Bill in Brazil

*Article & photos by William Black*
*St. Cloud, Florida*

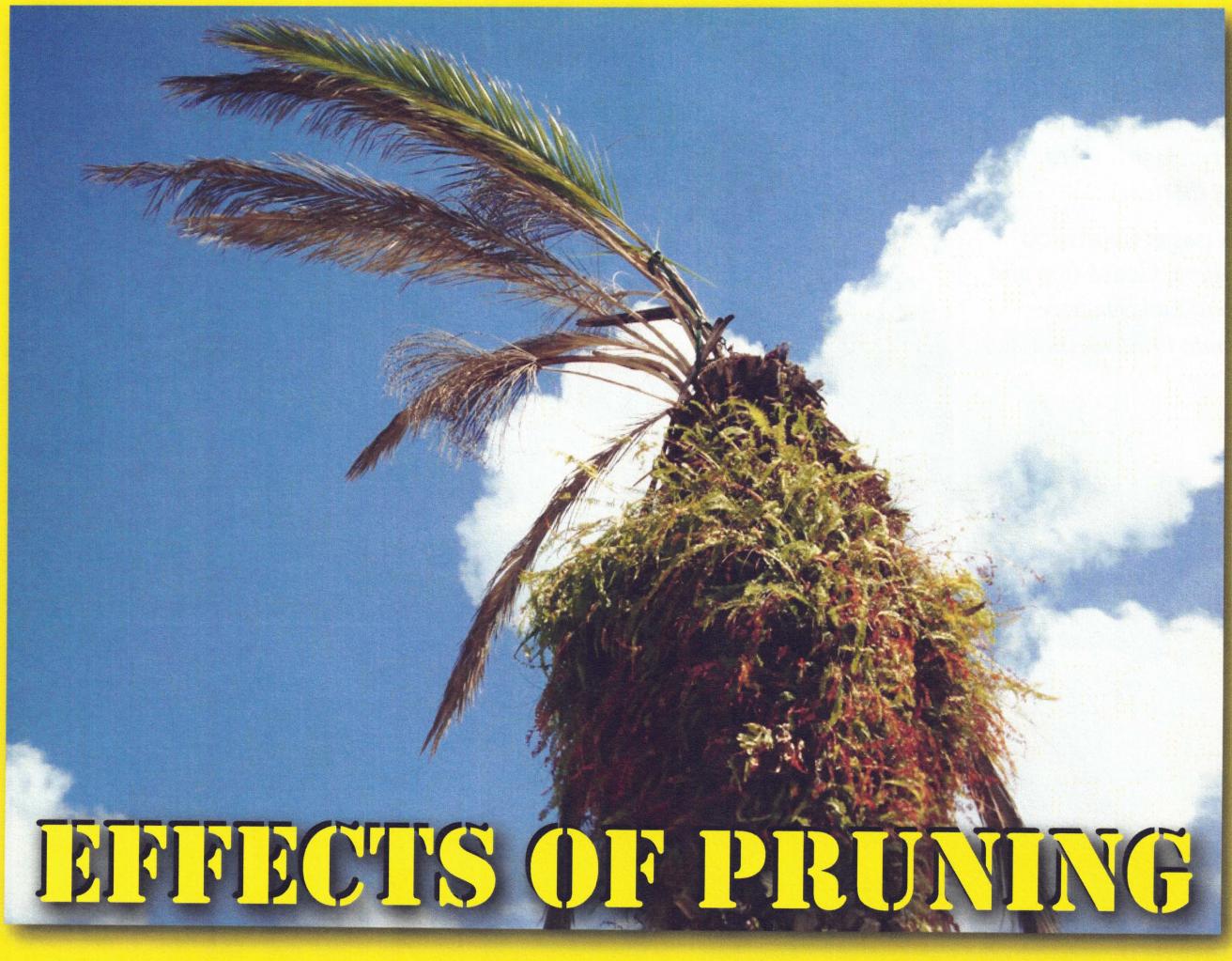
I overcame a long established fear of Portuguese and made three trips to Brazil n 2010. Each time I arrived at an airport, rented a vehicle and took off looking for adventure and wild palms. The road north from Manaus passes into the green hell of Amazonas where *Mauritia flexuosa* is a dominant presence. My next destination was the state of Ceará in the northeast where *Copernicia prunifera* is abundant along streams and in other wet areas.

In the fall I flew to Salvador in the eastern coastal state of Bahia and headed inland. *Syagrus coronata* is common and scattered groups of *Mauritia flexuosa* and *Copernicia prunifera* are also present. As an aside, I've had *Copernicia prunifera* in the ground in Osceola county for about 5 years. They grow faster than *Copernicia alba* and seem to be equally impervious to cold.



**Facing page:** *Mauritia flexuosa, Amazonas, Brazil (top and middle right), in Bahia (middle left) and Copernicia prunifera, Bahia (bottom).*

**This page:** *Copernicia prunifera,* Ceará *(top and bottom) and Syagrus coronata in Bahia (middle).*



# EFFECTS OF PRUNING ON THE HEALTH OF PALMS

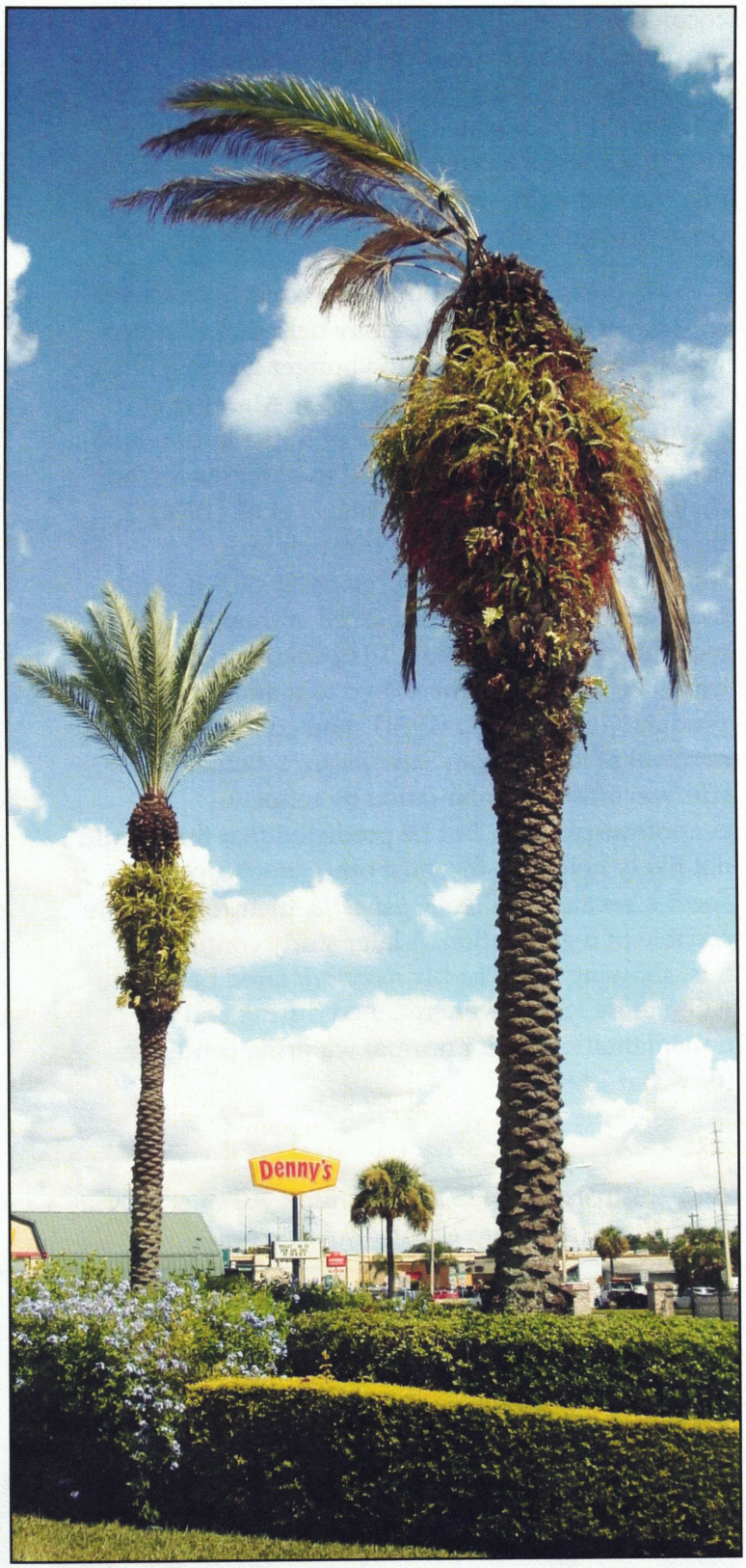
*by Eric Rosenfeld*
ericworking1@gmail.com

**Abstract.** This literature review gathers the findings of studies of the effects of pruning on palms in an attempt to answer questions about proper maintenance of ornamental specimens. Several species displayed reduction in size of new leaves after pruning. Pruning was found to worsen the health of palms deficient in mobile nutrients, but healthy palms showed only small changes in leaf nutrient composition. Two studies on oil palm (*Elaeis guineensis*) recorded higher incidence of weather-induced crown fracture occurring among heavily-pruned specimens. Coconut fruit yield did not change in the first year of experimentation, but significant declines often occurred in subsequent years with continued treatment. Up to ten lowest leaves could be removed from a full-crowned coconut palm without negative effect on fruit yield. Research was lacking on the question of whether leaf pruning leads to reduction of stem diameter in palms. Research tailored more specifically to the concerns of arborists and landscapers working with palms as ornamentals is needed.

**Key Words.** Coconut; *Cocos*; frond; leaf; palm; pruning; trimming.

Pruning of ornamental palms has been a subject of debate among arborists and landscapers, but opinions are often based on individual experience and casual observation rather than experimental data. The purpose of this article is to gather the results of diverse studies on the effects of leaf ("frond") pruning on palms and to present these data in a way that may be useful for professionals in urban forestry and landscaping. For the sake of biological accuracy, palm "fronds" are referred to hereafter as "leaves".

Despite their importance as sense-of-place ornamentals, palms are also a source of concern for property owners in regions where their heavy leaves and fruit are viewed as a liability. In Hawaii, professional tree climbers are routinely hired to remove developing bunches and inflorescences from coconut palms, as well as a portion of the lower green leaves, at considerable monetary cost to the owner. While cutting of fruit clusters is not considered detrimental-and may actually be beneficial-to palm health, leaf pruning is widely discouraged by horticulturists who theorize that it weakens the plant by reducing photosynthetic area (Broschat and Meerow 2000; Pfalzgraf 2000). On some properties, coconut palms are trimmed as frequently as 3 or 4 times per year, never being given the opportunity to re-grow a typical crown. Other species in other states are usually pruned less frequently but more severely, being stripped of all but a few of their topmost leaves. Many tree care professionals claim that heavily-pruned palms exhibit structural weaknesses (shorter, less turgid leaves; reduced crown density; stem tapering) not generally visible on untrimmed or infrequently-trimmed trees in the same vicinities. Some hold that such symptoms are due to other stress factors and not to pruning. Many feel that pruning is acceptable as long as it is done on a limited scale, but opinions vary as to what that means. There is obvious need for solid experimental data to serve as the basis for palm pruning guidelines.




*It should be a crime! These Phoenix dactyliferas gave a sense of majesty to the entrance of a church on Semoran Blvd. in Orlando. Not any more! They are now an example of over pruning at its worst. The palm on the right has likely been killed by severe pruning. Even at todays prices, a replacement palm will cost around $4,000.00 wholesale. The palm on the left will survice, but is still over pruned. All fronds above 9 and 3 o'clock should have been left on the palm.*

*(Photo by Bob Johnson)*

## BENEFICIAL EFFECTS

Some researchers believe that limited pruning of palms could have beneficial effects. Several articles have cited Dolar (1961) as asserting that the 10 to 12 oldest leaves of a mature

coconut palm could be removed in order to make nutrients and moisture available to more physiologically-active parts of the tree. In fact, this is not what Dolar stated; he merely cited Sampson (1923), who had written that the 6 to 8 lowest leaves of a coconut palm were past their prime and of little use to the tree.

In areas where drought is a concern, removal of some of the older leaves may help make limited water resources available to younger leaves (Heichel and Turner 1985; Magat et al. 1994). Marar et al. (1970) mentioned that the rate of transpiration had been reported to be more rapid in older leaves, but they did not cite references. Magat et al. (1994) theorized that loss of water through leaf transpiration could be reduced by 25-50% if some older green leaves were removed, although they recommended that at least 18 opened and functional leaves be retained in the crown to maintain productivity. Broschat (1991) showed that complete removal of leaves from *Sabal palmetto* helped survival after transplantation by reducing evapotranspiration, but he predicted that this would not likely hold true for most other landscape palm species because, unlike *S. palmetto*, their root tips are capable of regeneration. A later study confirmed this, showing that *Phoenix roebelenii* fared better when more leaves were retained during and after transplantation under normal watering conditions (Broschat 1994a).

## EFFECTS ON SIZE AND PRODICTION RATE OF NEW LEAVES

Aldaba (1931) concluded that removal of 7 to 16 of the oldest leaves did not hamper the production of new leaves of coconut palm, *Cocos nucifera*, but pruning was applied on only one occasion and not maintained. Bailey et al. (1977) recorded significant decline in new leaf production from *Cocos nucifera* after 9 months of treatment at 70% defoliation. Their method, however, differed considerably from the practices of landscape arborists in that they cut various set percentages of pinnae (leaflets) from all leaves in the crown rather than starting from the bottom of the crown and removing whole leaves.

Calvez (1976) observed that single-occasion pruning of oil palm, *Elaeis guineensis*, to retain 17 youngest leaves significantly reduced the length of new leaves produced in the ensuing months. Plants treated thus took two years to fully recover normal leaf size. Tajudin and Yeoh (1987) measured the length, area, and weight of leaves during experimental pruning treatments of oil palm carried out over 4 years and recorded no changes, except in the third year of the most severe treatment (retaining 24 leaves), in which case new leaves came out significantly shorter in length. Treatment consisted of selectively removing a certain number of leaves from each whorl of the crown.

Mendoza et al. (1987) tried one-time pruning of the forest understory palm *Astrocaryum*

*A row of Washingtonia robusta at a Bradenton, Florida shopping center in the process of being pruned from a full crown down to one or two fronds. (photo from www.hurricanecut.com)*

*mexicanum* at three levels (1/3, 2/3, and 3/3 defoliation) and measured subsequent new leaf production and plant survival. Completely-defoliated juvenile and immature palms produced fewer new leaves than controls. Mature specimens experienced a 30% increase in leaf production after treatments removing 1/3 and 2/3 of the oldest leaves. Defoliation was also found to decrease abscission of retained and newly-produced leaves in all age categories except seedlings. Abscission generally decreased proportionately to increased amounts of pruning, especially where older rather than younger leaves were removed.

Oyama and Mendoza (1990) examined the effects of pruning on *Chamaedorea tepejilote*, an understory palm of neotropical forests. Leaflets were removed at 25, 50, and 100 percent levels on one occasion only. For a 6-month period following treatment, the rate of new leaf production nearly doubled for male palms defoliated at 25% and 50% and nearly tripled for those defoliated 100%. Size of new leaves was not measured.

Endress et al. (2004) studied the effects of leaf harvesting on the small forest palm, *Chamaedorea radicalis*, and found that pruned palms produced leaves at a slightly faster rate but that the leaves were shorter in length. After two years of treatment, new leaves were so much shorter that 48%, 54%, and 68% reductions in overall foliar yield were recorded for treatments consisting of removal of all marketable leaves once, twice, and four times per year, respectively.

Jimenez (2004) found that pruning of pygmy date palm (*Phoenix roebelenii*) increased production rate but also decreased the length of new leaves. Pruning of all but the 5 topmost mature leaves was maintained for 9 months. Pruned specimens produced an average of 8.3 new leaves per month compared to 5.4 leaves for those left unpruned. Average length of new leaves was 60.9 cm for pruned plants and 76.7 cm for controls. Leaf length averages were reported differently in the abstract than in the data charts.

## EFFECTS ON LEAF NUTRIENT COMPOSITION

Canja et al. (2003) carried out pruning of coconut palm from leaf #19 (maintaining 18 youngest leaves in the crown) on fertilized specimens over several years and measured changes in foliar nutrient concentrations. Differences between pruned and unpruned palms were insignificant, although percentages of N, P, K, Cl, S, and B were slightly higher in pruned palms while percentages of Ca, Mg, and Na were slightly lower. Tajudin and Yeoh (1987) found that leaf nutrient concentrations of N and K increased with leaf pruning of oil palm, while Mg concentrations decreased. They pointed out that the higher N and K concentrations in more heavily-pruned palms may have resulted from these elements becoming more readily available due to decreases in fruit bunch production that also resulted from treatments. Pruning methods consisted of selective leaf removal at all levels of the crown.

Palms recycle mobile nutrients such as potassium (K) from old, dying leaves to new, developing ones. In cases where palms are deficient in K or other mobile nutrients, removal of old leaves has been shown to increase deficiency symptoms

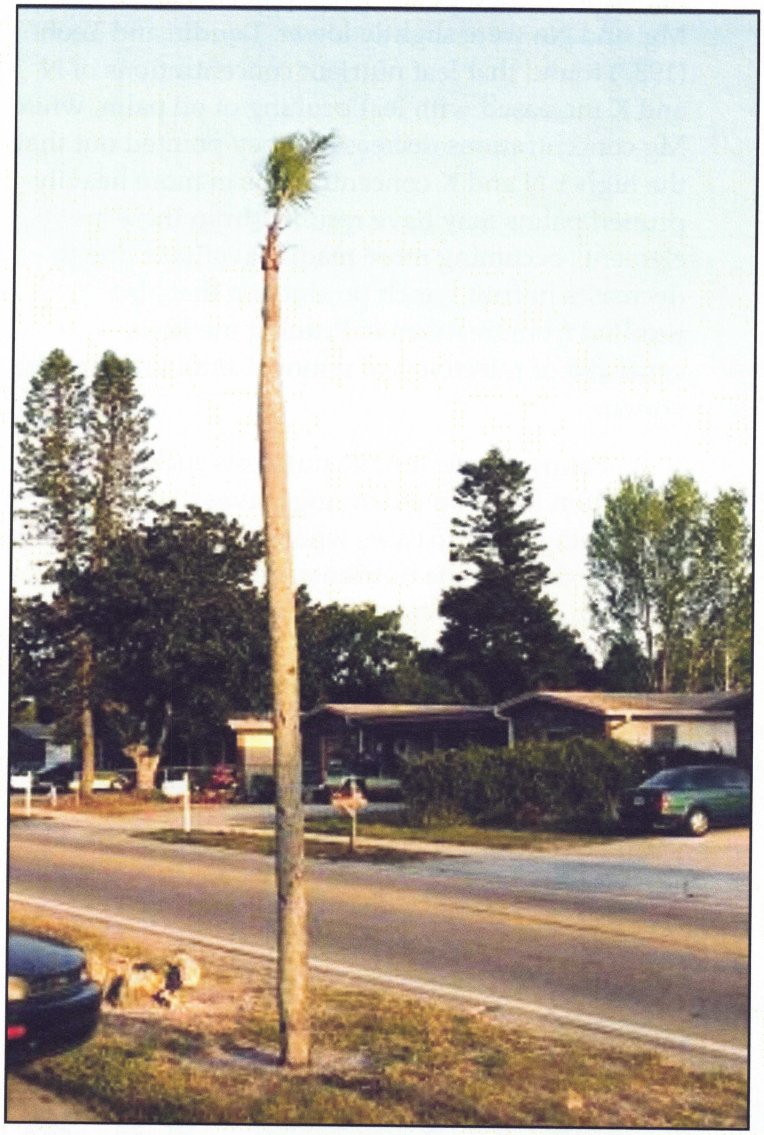
*Sabal palmetto before and after over pruning. (photo from www.hurricanecut.com)*

and accelerate decline of the plant (Hartley 1988; Broschat 1994b).

## EFFECTS ON STRUCTURAL INTEGRITY OF PLANT

Pfalzgraf (2000) wrote, "Research tells us the following: juvenile leaves are dependent on mature leaves for structural support (Tomlinson 1990)...The individual leaves work well in unison...In removing large portions of mature crown mass, we promote wind failure of juvenile leaves via exposure." James et al. (2006) demonstrated that the canopy of leaves of the palm *Washingtonia robusta* provided some damping of the harmonic sway effect that can potentially lead to stem failure in strong winds. Chan and Duckett (1978) wrote that lower leaves of oil palm gave structural support to the crown through a "bracing effect" in strong winds. They recorded that crown fracture from strong winds only occurred among trees with leaves missing and not among those with a full crown. Calvez (1976) found the highest incidence of weather-induced crown fracture to occur among oil palm specimens with the highest level of pruning.

Many arborists and horticulturists believe that reduction of stem/trunk diameter results from too much pruning of palm leaves (Bailey 2002; Bezona 2004; Gabel 2004). Broschat and Meerow (2000, p. 220) wrote, "Overtrimming reduces the food-manufacturing efficiency of the living palm and may result in suboptimum caliper development at the point in the crown where diameter increase is currently taking place." Although casual observations of this effect are widely reported, no controlled studies could be found to have formally tested the theory.



*This poor little Sabal palmetto eventually succumbed to yearly abuse. It is now dead and gone. (photo from www.hurricanecut.com)*

## EFFECTS ON FRUIT PRODUCTION AND YIELD

Since pruning reduces the photosynthetic capacity of plants, reduction in fruit yield may be an indication that a palm is being forced to cope with a dwindling supply of carbohydrates by "cutting back" on production. Farmers have been interested in coconut leaf pruning (CLP) for the purposes of increasing light transmission to undercrops and for harvesting of leaves for thatching and other uses. CLP studies have also been carried out to simulate the effects of leaf-feeding insects on fruit yield.

Marar and Padmanabhan (1970) measured the effects of CLP for a period of 4 years. In one treatment, palms were kept trimmed of their oldest leaves whose accompanying coconut bunches had already been harvested. In the other group, all opened leaves on one side of the tree were removed additionally. No significant change in fruit production was recorded with the first group, but the second group showed a significant decline in average production (45.6 coconuts per year compared to 68.6 before treatment). Another study that observed no change in yield after removal of the bottom-most leaves of *Cocos nucifera* was conducted by Sudhakara et al. (1989), in which 3 to 10 of the oldest leaves were removed during the 5-month dry season of each year over a period of 5 years.

Bailey et al. (1977) recorded major declines in coconut yield due to increased premature fruit shedding following pruning treatments and concluded that defoliation above 40% has long-term effects on the health of *Cocos nucifera*. Their method, however, differed from the practices of arborists in that Bailey et al. cut various percentages of pinnae (leaflets) from all leaves in the crown, rather than starting from the bottom of the crown and removing whole leaves.

Magat and colleagues have been carrying out studies on CLP at the Davao Research Center in the Philippines for a number of years. Initially, they pruned palms to retain 23, 18, or 13 youngest leaves out of 31 total and found no significant decrease in yield after one year of experimentation for all 3 treatments (Magat and Habana 1991). Later, Magat, et al. (1994) tried maintaining CLP for a longer period of time and got different results: Although there was once again no decrease in yield during the first year, trees retaining 13 youngest leaves showed a 29% loss in production of nuts in the second year followed by a further 20% reduction in the third year (a nearly 50% decline in nut production after 3 years). Treatments retaining 18 youngest leaves caused no significant decline and even showed an improved yield in the third year. Thus, it was concluded that maintaining 18 functional leaves in the crown was sufficient to provide optimum yield in *Cocos nucifera*.

Contrarily, an experiment conducted at the Davao center between 1993 and 2001 recorded a 20% to 25% decline in the yield of palms pruned to retain 18 youngest leaves, except where coffee was used as an intercrop. It was suggested that the lack of significant results in the case of coconut + coffee may have been due to coffee's high concentration of nutrients in leaf litter (Secretaria et al. 2003).
The 1991 and 1994 reports by Magat and colleagues are not the only studies to have found *Cocos nucifera* unresponsive to pruning during the first year of treatment. Aterrado and Abad (1998) pointed out that no changes in yield occurred within the initial year of pruning. After that, palms deprived of 25% or more of their foliage exhibited decreased fruit set. Eroy et al. (2001) reported that CLP did not significantly affect yield in the first year, but nut yield was reduced by an average of 21% per tree after two years. The method and amount of pruning were not mentioned.

Extensive research has also been carried out on the effects of pruning on fruit yield in oil palm because older leaves of that species are customarily removed to facilitate the fruit harvesting process. Oil palm is similar to coconut palm in form, although it has more leaves (as many as 64) in the crown (Tajudin and Yeoh 1987; Meerow 1992). Calvez (1976) reported that pruning oil palm to retain 17 youngest leaves on just one occasion, allowing the crown to recover immediately afterwards, caused significant fruit abortion. A summary of the results of several oil palm studies was provided by Henson (2002). He concluded that fruit yield was maximized under maximum retention of leaves, that pruning of older/lower leaves was less damaging to fruit yield than pruning of younger/higher leaves, that the effects of pruning did not show up until after 8 to 10 months, and that younger specimens recovered from pruning effects more quickly than did older trees.

*Queen palm (Syagrus romanzoffiana) before and after abusive pruning. (photo from www.hurricanecut.com)*

## EFFECTS ON SUSCEPTIBILITY TO PESTS, DISEASE, AND COLD

It has been suggested that the interweaving of leaf bases surrounding the stem at the crown acts as a buffer in palms to protect the meristem (palm heart) from cool temperatures, so leaf pruning may leave palms more vulnerable to cold (Bailey 2002). Broschat and Meerow (2000 p. 221) wrote, "In the severe 1989 freeze that struck Florida and other areas of the United States, specimens of *Sabal palmetto* that were over-trimmed in north-central Florida suffered damage, while those left with a normal canopy and full complement of leaf bases were unscathed."

When palm leaves are lopped off at the petiole base, as is standard practice among arborists, plant tissue becomes exposed that is said to be highly-susceptible to infection from diseases such as *Phytophthora*, which threatens coconut palm in Hawaii (Uchida et al. 1992). *Fusarium oxysporum* has spread among ornamental palms in the U.S. partly by means of improperly cleaned pruning saws coming into contact with this sensitive tissue (Pfalzgraf 2002). Calvez (1976) did not find a higher incidence of disease or insect attack in oil palm subjected to pruning treatments, although pruning was applied only once and not maintained.


*Wrong Way! The sign tells the story. Over pruned Sabal palmetto at Orange Lake City Park, New Port Richey. (photo from www.hurricanecut.com)*

## SUMMARY OF MAJOR POINTS

- Pruning increased the rate of production of new leaves, but size of new leaves decreased as a result of higher levels of pruning in all experiments in which it was measured.
- Nutrient concentrations in retained leaves were not much affected by leaf pruning in healthy palms, but nutrient-deficient palms experienced a worsening of deficiency symptoms when older leaves were removed.
- Studies with oil palm found that heavily-pruned palms were more susceptible to crown fracture under the force of strong winds than those left unpruned.
- Coconut leaf pruning was shown to have significant negative effects on fruit production when fewer than 18 youngest leaves were retained.
- Pruning of younger/higher leaves has shown a stronger negative impact on fruit yield than has pruning of older/lower leaves for both coconut and oil palm.
- For all studies, there was an 8 to 12 month delay before maintained leaf pruning began to show its effects on fruit yield for coconut palm and oil palm.
- Scientific research is lacking on the question of
- whether or not leaf pruning causes reduction of trunk diameter (stem tapering) in palms.
- Uncontrolled observation of *Sabal palmetto* following the 1989 freeze in Florida lends some support to the hypothesis that leaf pruning renders palms more susceptible to cold temperatures.

## DISCUSSION

The information gathered in this literature review lends some support to the hypothesis that routine green leaf pruning structurally weakens and reduces the size of the crown of palm trees over time and compromises their productive capacity, but research tailored to ornamental palms is still needed.

Palms that are regularly pruned often exhibit leaves that appear shorter and less turgid than those of unmaintained specimens, so studies of the effects of pruning on leaf size are of interest. The experimental data summarized above generally show that pruning causes an increase in new leaf production coupled with a decrease in length of new leaves, particularly under more severe pruning treatments. Even though Jimenez (2004) was the only study to apply pruning in a way that compares to practices in the ornamental environment, results were still similar in studies using other pruning methods. It appears that palms try to compensate for lost photosynthetic surface area by producing new leaves more quickly, but fewer carbohydrates are invested or available to make these leaves as large as they would otherwise be. Trials employing methods identical to those currently used on ornamental palms would be useful, especially if both size and strength of new leaves could somehow be examined, because structurally-weakened leaves are a public safety concern.

Broschat and Meerow's (2000) explanation of how removal of green leaves in palms may lead to reduction of stem/trunk diameter makes logical scientific sense, but experimental data are lacking. Trials must be carried out to show a conclusive link between pruning and stem tapering. Meanwhile, it is clearly observable throughout the island of Oahu that mature coconut palms frequently experience severe stem tapering following transplantation, but this could be due to a number of possible stress factors among which severe leaf pruning is only but one.

Both Calvez (1976) and Chan and Duckett (1978) observed that severe palm pruning weakens the structural integrity of the crown under the force of storm winds and increases the likelihood of crown fracture. Research and modeling show that trees' canopies limit the sway and potential failure of their trunks by counterbalancing and dispersing the forces of wind. Although palms have a small relative canopy size, the leaves still function to dampen sway (Tomlinson 1990; James et al. 2006). Ironically, commercial properties and hotels that keep their palms severely pruned often do so at least in part because they are concerned about leaves breaking off in windy conditions, despite the casual observations of numerous palm experts and certified arborists that such pruning tends to result in a higher rate of wind-related leaf failure.

Many studies have looked at how coconut leaf pruning affects fruit production and yield. Insofar as fruit production and yield can be seen as indicative of overall health, these studies indicate that routine leaf removal is potentially harmful to the plant. Research in the Philippines suggested that it is necessary to retain at least 18 youngest leaves in order to maintain the productivity of coconut palm. Palms in tourist areas and commercial properties in Hawaii and Florida are often not allowed to retain that many leaves. On the other hand, removal of inflorescences and fruit bunches should free up more resources for the plant and may thereby offset the negative consequences of leaf pruning, at least to some extent. Studies that are more specifically addressed to ornamental palms must be undertaken.

Sudhakara et al.'s (1989) results support Sampson's (1923) claim that the bottom 6 to 8 leaves are past their prime and of little value to the coconut palm. Workers servicing coconut palms on a bi-annual or more-frequent basis may be able to remove this number of the very lowest green leaves from a full-headed palm and accomplish the goal of preventing leaf senescence before the next trimming cycle without compromising tree health. One complicating factor here is that removal of lower leaves could conceivably result in an accelerated rate of descent and senescence for retained leaves, even though Mendoza et al. (1987) suggests otherwise. Testing this hypothesis would be both simple and worthwhile.

Many palm species are planted in areas close to the edge of their range for cold tolerance. *Cocos nucifera* is native to the deep tropics, and overnight temperatures during the cool season in both Hawaii and southern Florida can be lower than ideal for the species (Sampson 1923). Considering this, and in light of Broschat and Meerow's (2000) observation of *Sabal palmetto* after freezing temperatures in Florida, it may be wise to avoid pruning of *Cocos* and other

tropical species between November and March in these states.

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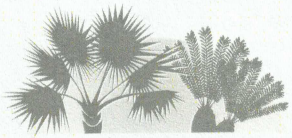


## Palm Pruning Simplified

- **Best practice: *If it's Green it Stays***
  Prune only brown fronds and (if desired) the fruit stalks.

- **Acceptable Practice: *9 and 3***
  Looking at the leaf crown of the palm like a clock, prune only those fronds below 9 and 3 o'clock. Keep all fronds above 9 and 3 o'clock.

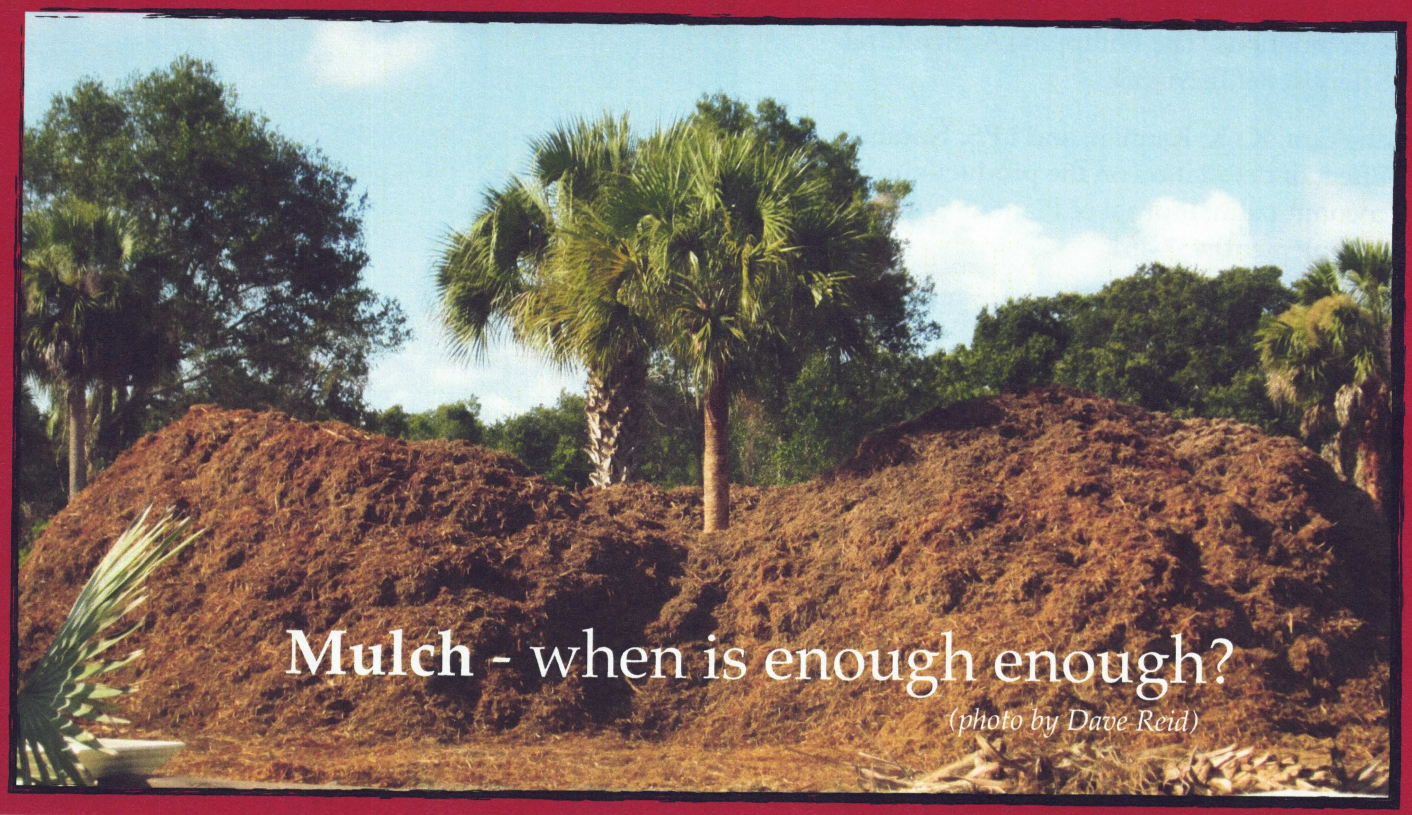
- **Unacceptable: *"Hurricane Cut"***
  This should **never** be done to an established palm.* It is detrimental to the health of the palm and an eyesore to all of us who have to look at it. If you like the look of "Hurricane Cut" palms, just stick a few telephone poles in your yard or business and be done with it.

*So-called "Hurricane Pruning" is only done to transplanted Sabals so the palm can focus it's energy on growing new roots. Once a Sabal is established, it should not be "Hurricane Pruned" again. *(The Editor)*

# PALMY'S SIDESHOW

## Epiphitic Phoenix

This epiphitic Phoenix was spotted growing on an oak tree in an office park west of South Orange Blosom Trail in Orlando. *Phoenix reclinata, P. roebellini* and *P. parens ignotus* are all in close proximity, so this unusually placed specimen may be a hybrid. It is not known whether a bird or squirrel planted the seed. *(contributed by Bob Johnson)*



**Mulch** - when is enough enough?

*(photo by Dave Reid)*

# Amazing Allagoptera and it's branching fronds


Several times over the course of it's adulthood this *Allagoptera arenaria* palm produces a branched frond. The appearance of these fronds is always a precursor to the splitting (branching) of the below ground meristem that frond originates from. Perhaps these leaves form just at the point in time the bud splits? *(contributed by Dave Witt)*

# Premature fruiting in *Caryota mitis*

This mature *Caryota mitis* has multiple flowering stems, on the surface nothing odd about it as this is all a part of it's hapaxanthic nature. Each stem grows to maturity, usually taking 10-12 years from seed for this; then flowers from top to bottom spending approximately two years to finish it's death sentence. Well not entirely true as new stems emerge to replace the older ones. However a closer inspection reveals flowering stems barely one to two years in age! This odd event no doubt a result of last winter's prolonged cold event. Severe stress (cold, drought, even transplanting) has been known to send old specimens of Caryota, and close relatives Wallichia and Arenga into a feverishly flowering frenzied finale! *(contributed by Dave Witt)*

# *Copernicia baileyana*

*Article & photos by Bob Johnson*
*Orlando, Florida*
*tropicalbob@earthlink.net*

I can still remember the first time I saw the grove of mature *Copernicia baileyana* in the lowlands at Fairchild. There was a presence to that group of palms that gave me a sense of awe and wonder that I have experienced few times in nature. The stately, massive trunk and the full crown of paddle-shaped leaves give the Bailey palm a majestic profile unique in the palm world (except for it's relatives, *C. fallaensis* and *C. gigas*). Native to Cuba, it grows in open forests and savannas. It can attain 60 feet in habitat, but only grows to about 40 feet in cultivation. A mature specimen can have a trunk diameter of two feet and a leaf crown spread of 20 feet.

*Copernicia baileyana* is recommended for growing only in zone 10 and above (minimum temp. 30F) [1] although it has survived lower temperatures. It should be safe down to 28F, perhaps with some leaf burn. Lenny Goldstein reports a specimen surviving 26F in Broward county with 40 percent leaf burn and recovering. [2] Locally, Dave Witt reports specimens surviving down to 25F in central Florida with slight to moderate foliage burn. [3] With our recent spat of cold winters, it might be a gamble to grow it in the cooler parts of central Florida. The specimens pictured on the following pages have survived those cold winters. If you live on the coasts, you do have a chance of growing it to some size. Inland, it is growing at Leu Gardens in Orlando. For what its worth, in my Orlando garden I have had both foxtails *(Wodyetia bifurcata)* and royals *(Roystonea regia)* killed by the recent freezes. My *Copernicia baileyana,* although small (just now 6 feet OA), has prevailed through the recent winters with no damage. Your results may vary - microclimate, amount of frost, health of palm going into the winter and other variables all play a factor. Be warned, it is a slow grower. Plant in a well drained location in full sun. Once established it is drought tolerant, but it will grow faster and look better with adequate irrigation. If you live on the coast, grow one. If you live inland and can start with a smaller one, it is worth a try.

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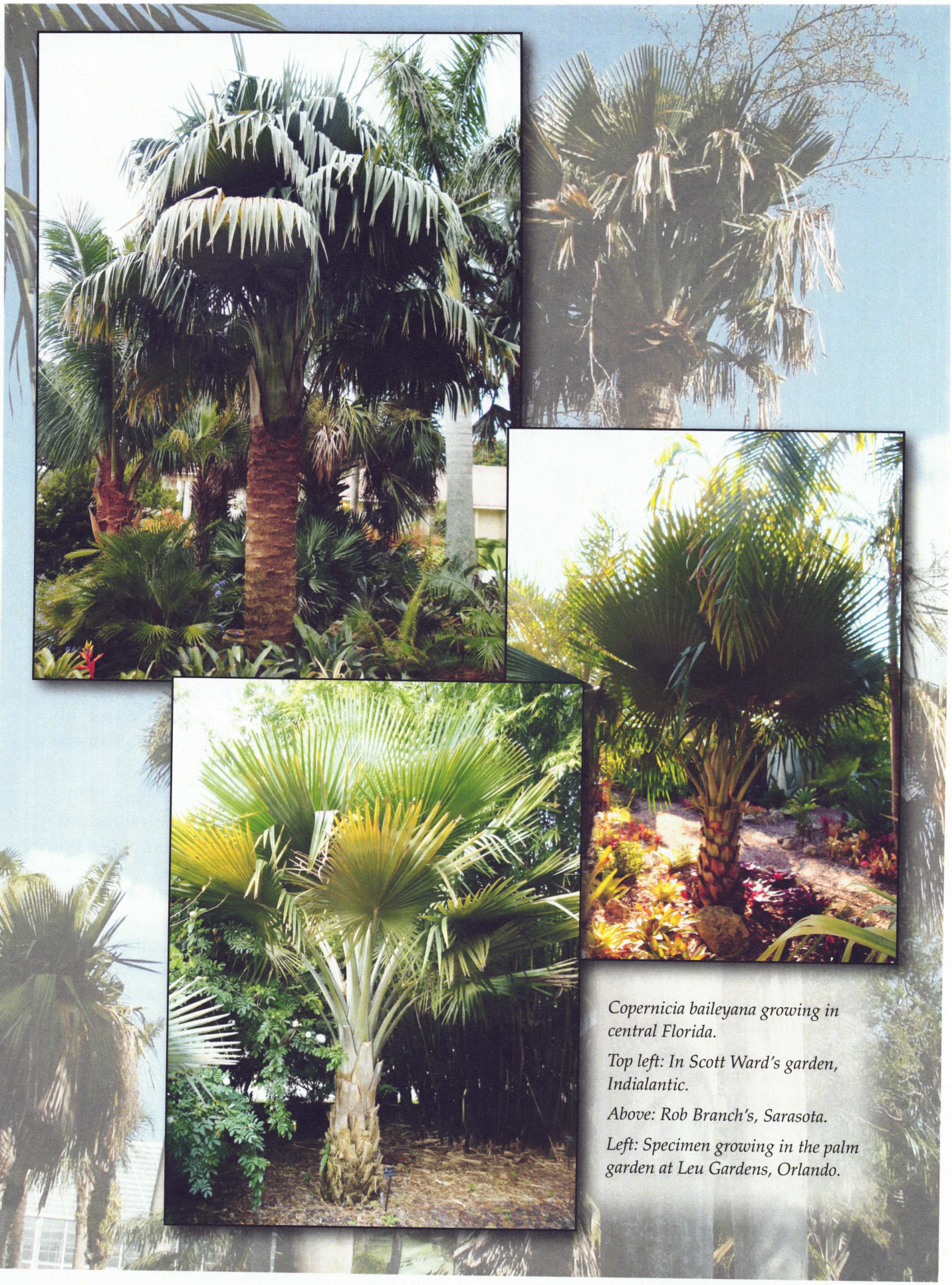
*Facing page: A cathedral of palms - grove of Copernicia baileyana at Fairchild Tropical Botanical Garden in Coral Gables, Florida. This page: Copernica baileyana growing in the "Palmetum" at Fairchild.*



*Copernicia baileyana growing in central Florida.*

*Top left: In Scott Ward's garden, Indialantic.*

*Above: Rob Branch's, Sarasota.*

*Left: Specimen growing in the palm garden at Leu Gardens, Orlando.*

*Left: Copernicia baileyana at the Gizella Kopsick Palm Arboretum in St. Petersburg.*

*Below: Multiple planting of Copernicia baileyana in the garden of Dr. Byron and Libby Besse, Sarasots - perhaps the most mature specimens in central Florida?*