GROWING PALMS

Horticultural and practical advice for the enthusiast

Edited by Randal J. Moore

Contents

Management of Falling Fronds

Palms with crownshafts are widely admired for their stately appearance and also for their self-cleaning habit. These palms shed their senescent leaves cleanly in one piece, including the blade, petiole and leaf base.

Most of these self-cleaning palms belong to genera that require tropical or sub-tropical climates. A few will grow well in my warm-temperate climate in San Francisco, California. I grow *Archontophoenix*, *Rhopalostylis* and *Dypsis*. My garden is tiny, only seven meters wide. I have several *Rhopalostylis* palms, some with four meters of trunk below the crownshaft. They present a problem when their leaves fall. *Rhopalostylis* leaves are quite large and heavy, and falling leaves can easily damage smaller plants growing beneath the palms. Also, in my urban garden the leaves can fall over the property line, causing damage to my neighbor's garden.

1. A dead leaf of a *Rhopalostylis sapida* is held in place by an elastic cord. The leaf can then be carefully removed without unfastening the cord so that the cord remains in place.

I have devised a technique to prevent the uncontrolled descent of falling leaves. I use elastic cord to encircle and bind the leaves (Fig. 1). This cord, commonly called "bungee cord," is about 1 cm in diameter and is available at home improvement stores. I loop the cord around the top of the crownshaft, just at the point where the petioles begin (Fig. 2). The length of cord can be secured into a loop by a small metal clamp, called a "hose clamp." The proper amount of tension in the elastic cord should allow a person's closed fist to pass beneath the looped cord.

When the oldest leaf has completely abcissed from the trunk, the leafblade will sag downward, maintaining close contact between the leaf-base and crownshaft. At this time, I use an extension ladder to remove the leaf manually. Standing on

2. Close-up of the elastic cord tied around the crownshaft of a *Rhopalostylis sapida*.

the ladder, I assist the leaf downward toward the ground at a controlled rate. It is not necessary to remove the elastic cord loop. Indeed, it is the loop's support that allows the leaf to move down slowly, rather than falling freely.

One must be very careful in the use of extension ladders. Falls from ladders are a leading cause of injury in the home environment. Do not attempt to this technique unless you are quite comfortable using ladders. Also, this technique will become more difficult as the palms grow taller and the gardener grows older! – *Darold Petty, San Francisco, California USA*

Palm Horticulture in the Rose Hills Foundation Conservatory for Botanical Science, Part II

Light

The Conservatory's light-transmitting structural material is comprised of a laminate sandwiched between two panes of glass. This laminate blocks about 50% of available light and, taking into account a layer of dirt and smog that is present most of the year, yields an interior light level of 4500-4800 footcandles in the most open areas during November. This light level has been generally satisfactory for most species. Exceptions are certain woody plants, especially those trees that thrive in full sun in the tropics.

Among a variety of factors that contributes to outdoor plants being physically stronger and more resilient, the blocking of UV radiation should be given careful consideration for any conservatory project. For this purpose, clear glass is probably the best option. It was rejected in our case due to concerns about cooling capacity during our hot summers. A wide range of glass, polycarbonates and films are available that address both light levels and filtering of non-visible solar radiation.

Air

Presently most air movement in the Conservatory is by convection force and limited ventilation during moderate ambient conditions. When the weather is colder or hotter, ventilation cooling and heating create appreciable drafts and air flow in some areas. However, the air in the middle portion of the Rotunda remains still most of the time. Paddle fans were installed to help move this air.

There is a debate over the need for significant air movement in interior growing spaces. In our building there is no practical way to control micro-environments that may harbor pathogenic fungi and bacteria. One of the major reasons for brisk air movement in production greenhouses is a non-issue for us. Several additional arguments for generating regular air turbulence or air circulation remain, however. One of these is to disrupt the stratification of air by "air mixing." This helps cool or heat air-spaces more efficiently, with the proviso that plants in some areas may be better managed under relatively cool, still air.

A challenge for us is the establishment of taller foundation plantings with strongly anchored root systems. This may be due to a lack of robust air movement (at least periodically) combined

with a loose soil-less medium. Lack of wind resistance encourages top growth that may appear healthy and vigorous but with a corresponding root system that is loose and eventually troublesome. Enough air movement to gently ruffle leaves and small branches during the day is sufficient. This is usually achieved with HAF (horizontal air flow) fans. Night-time air movement may be reduced to approximate the cycles in nature.

Pests and Diseases

A variety of pests common to greenhouse-cultivated palms are found in the Rose Hills Foundation Conservatory. They include several species of scale, spider mites and mealybugs. Many of these pests have not yet been identified to genus or species.

Some of these pests arrived from out-of-state on nursery stock, and they are new threats to our collections. For example, the coconut mealybug (*Nipaecoccus nipae*) is common in Hawai'i and feeds on palms and other tropical plants. It is now established in the Conservatory. From another source came trees infested with several species of scale, also new to our collections. Due to resource and schedule constraints, the staff was not able to quarantine any of these plants before they were introduced into the Conservatory. Obviously, the nursery certificates, export/import licenses and apparent health and cleanliness of these plants were not totally effective as protection against imported pest problems.

To date, our primary method of controlling insect pests has been rigorous spraying with a generic insecticidal soap and an emulsifier/surfactant oil mixture. Both ingredients are used at the highest recommended rates on the label and sprayed at high pressure. The forceful spray works in concert with the soap/oil to penetrate the mechanical defenses of insects like scale and mealybugs. It also washes dust and other insect habitat from leaf surfaces.

A program of intense spraying several times per year gives good control, provided that each application is attentive and thorough. Each spray session consists of an initial application followed by second application seven days later and finally a third spraying two weeks after the second. We use a portable electric sprayer, an adjustable spray-pattern nozzle and JMS Stylet™ Oil. Initially, we tried several brands of ceramic hollow-cone nozzles at 28 kgf/cm2 (400 psi) but changed to an adjustable nozzle (TeeJet 5500-series) at 11 kgf/cm2 (150 psi). The coarser spray from this nozzle does not coat surfaces as efficiently but can be adjusted while spraying to reach the taller plants and trees.

Staffing and Volunteers

Current staffing for the Conservatory consists of three full-time positions. A Botanical Technician is responsible for mechanical and systems services. A Conservatory Gardener provides technical horticulture along with the author.

A dedicated team of approximately ten regular volunteers helps make our workload manageable and more enjoyable. This same group of Huntington employees and volunteers also cares for an even larger, more complex collection of plants housed in two large greenhouses. These operations are all under the aegis of the Botanical Division, while a somewhat larger group of Education staff and volunteers works to maintain and develop Conservatory exhibits and signage

The Palms

The following list represents the palms currently planted in the Conservatory. They are arranged into practical groups, with notes on our experiences and impressions of their performance under the conditions described above. In the near term it is likely that there will be small changes to the collection, either by the addition or deletion of species or specimens.

Solitary Feather Palms – *Areca ipot, Asterogyne martiana, Attalea oleifera* (as *A. burretiana*), *Balaka seemannii, Beccariophoenix* sp., *Calyptrocalyx albertisianus, Chamaedorea metallica, Chamaedorea sullivaniorum, Cocos nucifera, Dypsis pusilla, Geonoma* sp. 79327, *Ravenea julietiae, Socratea exorrhiza* – Most of these palms could be described as slow growing under our conditions. All are growing in the Rotunda except the coconut, which is in the laboratory (10°C minimum in winter), and *C. sullivaniorum* (in the Cloud Forest, 11°C minimum in winter). Our young *Cocos nucifera* continues to grow well in a small, raised bed and produces leaves about 2 m long. *Chamaedorea*

sullivaniorum is in a moist, secluded location and is perhaps too shaded or too cool, as it has only produced one or two leaves per year. It is a male plant (we would like to know about any locally productive females to try to generate a crop of seedlings). One of three *A. ipot* died recently, and the remaining two no longer initiate new stilt roots at the bases of the trunks. Nevertheless, they continue to generate healthy new leaves. In a trio of *A. martiana*, only the youngest, with only 1 m of trunk, continues to grow well. The other two boast trunks over 2 m tall but suffer badly from some form of tip die-back, possibly caused by an attack of anthracnose. Any palm labeled "*Attalea*" probably needs its own conservatory, but this rather obscure species (*A. oleifera*) is among the still-intimidating, mid-sized species. Compensating for its ultimate proportions is the fact that it produces handsome *Cocos*-like leaves and has a slow growth rate. *Dypsis pusilla* is represented by a group planting of four beautiful young specimens in part shade with trunks starting to form. *Ravenea julietiae* has grown well and will be majestic once it develops a trunk; in the meantime, it is very slow growing. By contrast, *S. exorrhiza* grows quickly, though not quite fast enough to outgrow some browning of the leaf tips that is probably the result of salts and high pH water. To help combat this condition we have added a thick layer of long-lived, fibrous peat around the base of the plant, including its impressive stilt roots.

1. *Verschaffeltia splendida* (right) and *Aiphanes horrida* (left) growing in the Rose Hills Foundation Conservatory at the Huntington Botanical Gardens.

Finally, a pair of *Beccariophoenix*, supposedly representing a second undescribed taxon, were planted along the upper walkway where they will doubtless outgrow their space in a few years. Shortly after

they were planted, acute chlorosis set in until the foliage of one plant was almost entirely yellow. Repeated applications of about 100 ml per plant of Micro-Max™ by hand yielded no results over approximately 6 months. A visiting palm enthusiast from Florida recommended Trachelene™, a specially formulated iron chelate supplement. A similar dose of roughly 100 ml of Trachelene per plant resulted in a near-miraculous and complete return to healthy green leaves on both specimens in 2 or 3 months. However, it is difficult to obtain a supply of Trachelene in small amounts. It would be worth trial experimentation to observe the efficacy of this product on various chlorosis-prone palms and other plants.

Solitary Fan Palms – *Coccothrinax proctorii, Johannesteijsmannia altifrons, Kerriodoxa elegans, Licuala ramsayi, Sabal minor* – Except for the *Kerriodoxa* and *Sabal*, these are adult flowering and fruiting specimens that were purchased as mature foundation plantings. *Coccothrinax proctorii*, with a graceful trunk 5 m tall, produces heavy clusters of near-black fruits. After *Ptychosperma macarthurii*, it is the tallest palm in the Conservatory. The *Johannesteijsmannia* is naturally one of the main attractions in the Rotunda. All of our purchased specimen palms experienced a stressful pre-planting period of high temperatures, high light and low humidity. Underfeeding and under-watering are other probable causes of this stressed growth. Both during and after this period, the least temperamental species in this group was *J. altifrons*. It never produced halting growth or stunted leaves or significant tip die-back. In contrast, *L. ramsayi* has grown well but with subsequently smaller leaf blades and less robust petioles. It will likely exhibit a section of smaller diameter trunk that reflects this transition period. One of the most beautiful of all fan palms, *Kerriodoxa* deserves prominent placement in any collection. It has been a very slow grower for us and this growth rate seems to correlate with its "diving rhizome" seedling morphology, in common with some species of *Ravenea*. *Sabal minor* is a small plant in the upland part of the Carnivorous Plant Bog room.

Clustering Palms – *Basselinia gracilis, Chamaedorea fragrans, Cyrtostachys renda, Geonoma schottiana, Phytelephas* sp. Peru, *Ptychosperma macarthurii, Reinhardtia gracilis, Serenoa repens, Wendlandiella gracilis* – *Cyrtostachys renda* and *P. macarthurii*, were large specimen plants when planted in 2005. The latter is a multi-trunked specimen and, at about 10 m tall, is the tallest plant in the Conservatory. It has grown well but would probably appreciate warmer nights. The same is probably true for *C. renda*, which has suffered from attacks by spider mites and possibly from insufficient humidity. We quickly realized that this eye-catching palm apparently cannot be over-watered, and so it gets more irrigation than other plants in the building. It has been slow to produce healthier and more vigorous new leaves possibly due to insufficient watering and fertilizing and cool nights. Poor water quality is also a factor. *Chamaedorea fragrans* and the rare, *Chamaedorea*-like *Wendlandiella gracilis* are both bushy specimens about 2 m tall. Also met with only infrequently in collections, the ivory nut palms (*Phytelephas*) are represented in the Conservatory by a collection made in Peru. It is a beautiful feather palm with long, upright, graceful leaves suggesting the archetypal rainforest understory. The other species listed here are small specimens.

Rattans – *Calamus caryotoides, C.* sp. (as *C. latifolius*), *C.* sp. Thailand, *Korthalsia laciniosa, Plectocomia elongata* – In spite of the caution required around these formidable palms, we felt that the Rotunda's tall structural columns provide an opportunity to allow the public to see these famous economic plants at close range. The hazard posed by each of these rattans is very real. The rows of curved prickles are sharper and tougher than any cat's claw. But the real hazard lies in the long "whip" or cirrus that is formed as an extension of the leaf tip or the flagellum, formed as a separate maxillary structure. These efficient climbing devices are similarly armed with reinforced, retrorse barbs. For all of this potential horror they are beautiful palms. Our *Korthalsia*, donated by Mr. Donald Hodel, is arguably the most striking palm in the Conservatory. Some of these climbers will likely wear out their welcome sooner than later, as there is probably not enough room for one let alone three rattans in the Rotunda. In the future we hope to somehow add one of our seedlings of the rare *Oncocalamus tuleyi* to the conservatory plantings.

Other Armed Palms – *Aiphanes horrida* (as *A. caryotifolia*), *Cryosophila albida, Salacca magnifica, Verschaffeltia splendida* – Two of these, *Cryosophila* and *Verschaffeltia*, are dedicated to an exhibit showcasing special root adaptations (trunk-borne root spines and stilt roots, respectively). The

largest of the three *Verschaffeltia* is over 6 m tall and regularly sets fruit (Fig. 1). The single specimen of *C. albida*, with root spines along its near-white trunk as well as numerous, spoke-like stilt roots near the base of the trunk, is about 4 m tall. In addition to its remarkable trunk and roots, this under-rated palm's broad leaves have a distinct matte cast but are nearly white below. Also heavily armed, *A. caryotifolia* and *S. magnifica* are sited well off the path. Both attract attention with their bold foliage and have not presented any difficulties in their cultivation. We hope to find a suitable location in the Rotunda for a small specimen of the more elegant *Aiphanes lindeniana*.

Although the Conservatory is not large enough to house an extensive or representative collection of palms, we hope to eventually have on display a significant number of rare species of known wild origin in addition to important well-known species. Where resources are scarce and space and time are limited, it is not only efficient but appropriate to focus on collections that have value on multiple levels—education, horticulture, research and conservation.

In a botanical garden, both depth and breadth are required to transmit this message to the widest possible audience. Most visitors, while they may not arrive steeped in botanical or horticultural knowledge, appreciate learning about or just observing new and different plants. They recognize that we are the stewards of something special. These considerations acknowledge the value that a varied and dynamic collection of plants has for future generations. – *Dylan P. Hannon, Curator of Conservatory and Tropical Collections, Huntington Botanical Gardens, San Marino, California, USA*

Editor's Note: Part I of Dylan Hannon's account of the Rose Hills Foundation Conservatory for Botanical Sciene appeared in PALMS *51: 7–10. 2007.*