

# GROWING PALMS

Horticultural and practical advice for the enthusiast

Edited by Randy Moore

## Contents

- ☞ More on Leaning Crown Syndrome – *Dave Romney*
- ☞ Abnormal Branching in Palms – *Mike Marika & Randal J. Moore*



## More on Leaning Crown Syndrome

I have had experience with Leaning Palm Syndrome (LCS) in Jamaica. I believe that one of the causes of LCS that we identified in coconuts may apply to certain forms of LCS in other palms.

In two papers published in agronomic journals (Romney, D.H. 1964. Observations on the effects of herbicides on young coconuts. *Weed Res.* 4: 24–30. and Romney, D.H. 1965. Further experiments with herbicides on young coconuts. *Trop. Agric.* 42:177–181.), I identified the cause of LCS in coconuts as phenoxyacetic acids, such as 2,4-D or 2,4,5-T, particularly if in a volatile form. These hormone-like chemicals are used as herbicides for killing broadleaf (dicot) weeds among grasses. Since grasses and other monocots, with their protected growing points, are much more resistant to these chemicals than dicots, my colleagues and I wanted to determine whether palms (in this case coconuts) had any resistance. If resistance should occur, we would have a useful tool for selective weed control around young coconut palms.

We found that coconuts are not resistant to these chemicals. On the contrary, they are sensitive to much smaller doses of 2,4-D, 2,4,5-T and MCPB than are needed to kill weeds (Romney 1964), a finding borne out by the fact that injury caused by 2,4-D or 2,4,5-T is frequently seen on bearing coconuts in Jamaica. The injury consists of excessive fruit-setting by female flowers, the set often being increased from the normal 25% up to as much as 100%. The nuts within the fruit are mostly reduced in size or absent, so that the fruits become distorted to a tri-lobed shape. Such damage could usually be traced to the use of volatile ester formulations on pastures under palms or to spraying nearby weeds under windy conditions.

The trials with young coconut palms showed that elongation of the youngest most actively growing leaf slowed or ceased less than a week after spraying with 2,4-D or 2,4,5-T. The leaflets eventually separated, but the petiole did not lengthen to free itself from sheaths of the older leaves, resulting in a bunched appearance. Palm crowns leaned 5–10° from vertical. In other trials using amine 2,4-D (Romney 1965), I found that young palms leaned 5° from the vertical four weeks after spraying, and the angle increased to 30° by ten weeks. I also noted that the palm usually leaned towards the leaf that, growing more vigorously at the time of spraying, was most retarded by the hormone.

Many of the instances of LCS occur in countries where hormone-based herbicides are commonly used, so herbicide injury may be a possible cause of some kinds of LCS. Volatile formulations of phenoxyacetic herbicides should not be used under or near palms, and spraying should not

be done in windy conditions. I believe that some “weed-and-feed” mixtures intended for lawns should also be used cautiously near palms. – *Dave Romney, Homestead, Florida, USA* 🌴

## Abnormal Branching in Palms

Dichotomous branching, in which the growing point forks into two equal branches, occurs normally in several species of palm, as does axillary branching. This natural branching is well understood and documented. Dichotomous branching is most commonly seen in species of *Hyphaene* (Fig. 1). Some species of Calamoideae in the genera *Eugeissona*, *Korthalsia* and *Calamus* also produce branches. *Dypsis utilis* and *Nypa fruticans* are other examples of a trait that is rare in palms. Very rarely, one finds branched specimens of palms that are normally unbranched during their growth and development. This branching is abnormal branching.

### Abnormal Branching

Our investigation attempted to determine the possible causes of abnormal palm branching at Balboa Park in the City of San Diego, California. Balboa Park is an international tourist destination that includes the city’s museums and zoo. Unusual palm branching in the park is disfiguring some palms and distorting their leaves. Some palms have had to be severely pruned and face future removal.

Two species of palm within Balboa Park are affected. A *Phoenix roebelenii* is making many small branched stems from multiple locations near the top of the main stem. In this species, branching appears to occur later when the palm stem has attained approximately one meter in height (Fig. 2). In addition, many leaves near the branching exhibit distortion, including whorled pinnae.

Abnormal branching is also common in *Livistona chinensis* found in the southeast corner of Park Boulevard and Inspiration Point Place. There are five separate palms located near one another that are all showing similar problems. In addition to branching, there are many small, deformed leaves coming out of the top of the palms. Margins of the leaves are brown and necrotic.

Some petioles have become brown, thickened and rough. This condition has spread to other palms in the same planter that previously did not exhibit these symptoms. Herbicide exposure and automobile exhaust are possible causes at this location.



1. Dichotomous branching occurs normally in *Hyphaene* species, as shown in this specimen of *H. thebaica* at Fairchild Tropical Botanic Garden in Miami, Florida.



2. A multi-branched *Phoenix roebelenii* named "the menorah palm" because of its candelabra appearance. This palm was grown by Jerry Hunter at Rancho Soledad Nursery in Rancho Santa Fe, California.

### Collection of Samples

Samples of *Phoenix roebelenii* were taken from the planter adjacent to the Mingei International Museum located at the corner of El Prado and the Plaza de Panama southwest of the fountain in Balboa Park. Permission was obtained from the Department of Park and Recreation to dissect two palms located within the park and to use the city's horticultural equipment for this purpose. A hand pruning saw was used to dissect the apical stem at the point of branching (Fig. 3).

In another area of the park near the Veterans Museum and Memorial Center housed in the Old Navy Chapel are branching specimens of *Livistona chinensis*. This planter is surrounded by an asphalt parking lot and boulevard. The park's maintenance staff observed that the branching began in younger palms and spread to older palms. Removal of the larger stem for analysis required use of a chain saw (Fig. 4).

### Dissection of the Samples

The collected specimens of *Phoenix roebelenii* and *Livistona chinensis* (Fig. 5) were wrapped in plastic bags and stored in a refrigerator for several days. They were subsequently examined under a dissecting microscope at the Kate Sessions Plant Nursery in Balboa Park. The purpose of the examination was to provide a possible entomological diagnosis of the observed abnormal palm branching. The samples were carefully teased apart using dissecting probes.

Eriophyid mites are known to cause deformation of leaves and fruit in a variety of plants and are difficult if not impossible to see with the naked eye. They are minute (less than 200 microns), elongated, cigar-shaped mites with only two pairs of legs. We were looking for evidence of live mites or signs of their cast exoskeletons. It is possible that these mites can cause branching by disrupting the growth process at the meristem and causing it to become askew. However, live mites or their traces could not be found in either sample.

Our samples were taken in late January. This is the season when mites normally overwinter as eggs. At a later date we plan to obtain a fresh sample and to reinvestigate when and if mites are active and present in the warmer months of the year.



3. Removing an abnormal branch of *Phoenix roebelenii* in Balboa Park, San Diego for inspection in the laboratory.

### Laboratory Diagnosis

The specimens of *Phoenix roebelenii* and *Livistona chinensis* were submitted to a plant pathologist at the Department of Agriculture in the County of San Diego. The purpose of the laboratory analysis was to provide a possible diagnosis based on plant pathology for the abnormal palm branching. The pathologist confirmed that Eriophyid mites were not present in the samples.

No primary plant pathogens were recovered from either sample. The fungi *Penicillium* sp., *Verticillium* sp., *Cladosporium* sp. and *Fusarium* sp. were recovered in the sample of *Phoenix*



4. A chainsaw was required to remove a section the thick stem of *Livistona chinensis* in a group of these palms where abnormal branching is spreading throughout the population.

*roebelenii*. However, they were considered secondary invaders in this case. This sample also had some red scale present but not enough to cause the branching symptoms.

Herbicide exposure is another possible cause for the leaf distortion in the samples. Automobile exhaust driven by prevailing winds into the planter could produce similar damage. The next most likely cause is nutrient deficiency, especially manganese or boron deficiency often associated with “frizzle top.” Cold soil, wet soil, or alkaline soil can inhibit the ability of the plant to take



5. The excised section of *Livistona chinensis* to be dissected in the laboratory. In addition to abnormal branching, the palm's leaves are deformed and necrotic.

up nutrients. The pathologist could not determine which of these possibilities is causing the problems observed in Balboa Park.

### Other Abnormal Branching

There are several instances of abnormal branching that were reported but were not analyzed as a part of our study. A group of *Phoenix dactylifera* growing along Interstate 15 in Escondido, California are all exhibiting aerial branching. We hypothesize that this branching may be due to another cause not documented above. The branching appears to be occurring from axillary buds on these *P. dactylifera*. Normally these buds stay dormant. Is it due to the increased humidity the palms are experiencing or are they relatively young plants still with a propensity to form offsets? Some unknown factor may trigger them to grow and produce aerial branches. It is interesting to note that this phenomenon appears to be very rare in the nearby date palm groves of the Coachella Valley.

A well-known and very attractive specimen of *Hyophorbe lagenicaulis* growing in the collection of the Montgomery Botanical Center in Miami, Florida has branches (Fig. 6). We have also heard reports of branching in *Roystonea* and *Sabal* species in Florida.

There are also reports of induced branching. This is accomplished through intentional mechanical damage of the palm meristem. The method involves driving a wedge into the stem. This type of abnormal branching is intended to modify the appearance of the palm to create an oddity.



6. An unusual and attractive branching *Hyophorbe lagenicaulis* growing at the Montgomery Botanical Center in Miami, Florida. (Photo courtesy of Montgomery Botanical Center)

There are several possible causes of abnormal branching in palms, but making an exact diagnosis of the cause in a particular instance is still quite difficult. – *Mike Marika, Park Arborist, City of San Diego, California and Randal J. Moore, Poway, California USA.* 🌴