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An Inventory of Palms in Hawaii

RAYMOND F. BAKER

*Harold L. Lyon Arboretum, 3860 Manoa Road,
Honolulu, Hawaii 96822*

The Biennial Meeting in June 1980 is almost here. The staffs of the various botanic gardens and private collectors in Hawaii have been hard at work inventorying their palms, and our inventory¹ is printed here to let you know what we have (and don't have) so you can better prepare yourselves for the trip.

In the inventory, a code follows the species name. The capital letters designate the garden, the small letters the growth status of the palm. An "f" means the palm has set fruit, an "m" that it is mature (has flowered) but for some reason has not set fruit, an "i" that it is planted in the ground but immature, and an "n" that it is still in the nursery. Many rare and exciting species are still found only in the nursery. Take this with a grain of salt. These could be ready to plant in the ground, or they could be seed several

years old, with little hope of germinating. The status used is for the most developed palm of that species in each collection. Thus, if one is fruiting, but ten are in the nursery, "f" is used.

This inventory is a conservative listing of our collections. Excluded are all undetermined species, plants identified only to genus, those under invalid names, and those whose identification is questioned. In a few instances, when transfers have not been made to the appropriate genus or where taxonomic problems may be involved, a valid name is included parenthetically, as in *Pinanga* and *Mauritia*. Of those on the list, I would hope our identifications are 95% correct. There are many more palms in our collections yet to be identified. Who knows what discoveries lie in store.

Oahu

The Honolulu Botanic Garden System includes seven gardens on Oahu administered by the Department of Parks and Recreation of the City and County of Honolulu. Foster Botanic Garden is the parent institution which handles the accession data for all the gardens and distributes the plants to them according to the theme of each garden and the proper environment. Three of the gardens have substantial palm collections—Foster, Wahiawa, and Koko Crater. Paul Weissich has directed the system since 1957.

Foster Botanic Garden lies on ap-

¹ This inventory results from the efforts of many people. I would like to thank the following for their sustained cooperation: Paul Weissich and Godfrey Chun of Foster Garden, Gilbert Yamada of Wahiawa Botanic Garden, Wesley Teraoka, Douglas Okamoto, and David Silva of Lyon Arboretum, Keith Woolliams of Waimea Arboretum, Hiram Fong of the Senator Fong Plantation Garden, Dr. William Theobald and Scott Lucas of Pacific Tropical Botanical Garden, Donn Carlsmith, Tom Kunichika, Jean Herbst, and Toshio Imoto of Onomea, Howard Horiuchi of the Hilo Nursery Arboretum, Don Hodel of the Kona Botanic Garden for information on collections, and Dr. H. E. Moore, Jr. of the L. H. Bailey Hortorium for checking the taxonomy and nomenclature of the list. Any errors are my own.

proximately 15 acres at 50 N. Vineyard Boulevard in downtown Honolulu. It was the estate of Dr. William Hillebrand, author of *The Flora of the Hawaiian Islands*, from 1853 to 1871, during which time he introduced many new species to Hawaii and planted them on the grounds. In 1880, Thomas R. and Mary Foster bought the land and added to the earlier plantings. The Hawaiian Sugar Planters Association (HSPA) in 1918 set up a plant introduction nursery adjacent to the property, and under the direction of Dr. Harold L. Lyon many of these introductions were planted in the Fosters' yard. In 1930, the land was deeded to the City and County of Honolulu. Due partly to Dr. Joseph Rock's interest in palms, a palm garden was established in 1933, now filled with many mature specimens. Other major collections include orchids, bromeliads, cycads, aroids, and economic plants. The garden also maintains an important botanic library.

Wahiawa Botanic Garden is at about 1000 ft elevation on the Schofield Plateau of Oahu. It receives 100 in of rain a year and is considerably cooler than Honolulu. The 27-acre garden is situated in the large gulch of an intermittent stream, and was originally another test site for plantings by HSPA. The New Caledonian palms thrive there. Other collections include gingers, heliconias, ferns, aroids, and native Hawaiian plants.

Koko Crater receives less than 25 in of rain a year. The 208-acre site is contained entirely within an old volcanic cone east of Diamond Head and houses a collection of cactus, succulents, and desert palms.

The Harold L. Lyon Arboretum is located in the back of Manoa Valley, where it receives 160 in of rain a year on steep topography at 450 to 1300 ft elevation. Sunbathers at Waikiki

Beach, 4½ miles away, may often find their view of the valley head blocked by rain and framed by a rainbow. Originally named the Manoa Arboretum, it was started in 1918 by HSPA as a reforestation test site. Thus Foster Garden, Wahiawa Botanic Garden, and Lyon Arboretum shared a long period of plant introduction under Dr. Lyon. In 1953, the University of Hawaii assumed control of this 124-acre rain forest which is now concerned mainly with research and instruction. A research library and herbarium support this work. Other collections include aroids, Marantaceae, heliconias, gingers, ferns, *Eucalyptus*, *Ficus*, bromeliads, native Hawaiian plants, economic plants, Hawaiian ethnobotanic plants, and ornamental ti (*Cordyline terminalis*).

Waimea Arboretum, on Oahu's north shore, is part of a private tourist attraction, Waimea Falls Park. The arboretum is only six years old but progress has been impressive. Most of the palms are not yet mature, but a major palm planting is just getting under way. The park includes 1800 acres, but so far the arboretum is restricted to the wind-protected, steep-sided valley of Waimea Stream. The arboretum runs the length of the stream from Waimea Falls, where rainfall is 75 in per year, to the estuary and sandy beach at the ocean, with a rainfall of 20 in per year. The park includes a restaurant and shuttle bus service and there is an entrance fee. Emphasis is on Hawaiian plants, plants of the Ogasawara Islands, *Hibiscus*, peperomias, aroids, heliconias, gingers, Liliaceae, Commelinaceae, and Acanthaceae. Some Hawaiian archeological sites are also being restored.

At the urging of Dr. Joseph Rock, parts of the University of Hawaii campus at Manoa at one time were designated a botanic garden and planted

with many rare trees and palms. Unfortunately, this practice has been discontinued. A good collection of mature palms remains and is worth the visit, especially for seed collecting.

The Senator Fong Plantation Garden is still in the development stage on Oahu's windward side. Two small valleys of this 150-acre garden have been devoted to palms and with time this should become a collection worth seeing. Former Senator Hiram Fong intends to build a restaurant and a political library, and to have tours of the plantings of fruit trees and colorful ornamentals. Also planned are a bamboo garden and various ethnic gardens—Japanese, Chinese, Filipino, Hawaiian, and European.

Kauai

The Pacific Tropical Botanical Garden occupies 186 acres of Lawai Valley on the southern coast of Kauai. Adjacent lands are available to it in the future and it oversees two other gardens and three preserves on Kauai, Maui, and Hawaii. The congressionally chartered garden is privately funded and emphasizes research and education. A collection of coconuts and Hawaiian *Pritchardia* is being developed at Kahanu Gardens on Maui. Other collections at PTBG include economic plants, erythras, and gingers. Rainfall at Lawai is about 44 in per year with relatively dry summers and wet winters.

Hawaii

Donn Carlsmith, the present president of The Palm Society, has been collecting palms at Onomea, just north of Hilo, for 14 years. Through the seed bank and other friends, he has gathered together an important collection. The 31 acres of land was mostly used

for sugar cane plantings in earlier years. It has good soil with 120 in of rain per year. Those palms preferring a cooler climate go to Keolahou at 6000 ft elevation.

The Hilo Nursery Arboretum was started in 1920 on 19.4 acres of land in Hilo. Most of its palms are mature specimens, isolated enough for good photographs, and many are fruiting. The arboretum also contains a large number of fruit and timber trees.

Don Hodel's collection is included here since he has travelled widely, collecting many of his rarer species himself. He has also generously distributed his palms to other botanic gardens, filling important gaps in their collections. Most of Don's palms are still in pots, wellgrown, and he hopes eventually to be able to start a permanent collection in the ground. He manages the Ho'olau Nursery in Kealahou, Hawaii.

The diversity of soil types and microclimates in Hawaii offers good growing conditions for practically every type of palm. Of the roughly 2500 types of palms known, about 650 are presently being tried in a collection somewhere in Hawaii. However, a mere 30 kinds of palms may be said to be commonly used in landscaping or available in the nurseries.

List of Palms Cultivated in Hawaii

Explanation of abbreviations: f, fruiting; i, planted but immature; m, mature; n, nursery; C, Donn Carlsmith's collection at Onomea (Hawaii); DH, Don Hodel's collection at Kealahou (Hawaii); F, Foster Botanic Garden (Oahu); H, Hilo Nursery Arboretum (Hawaii); HF, Senator Fong Plantation Garden (Oahu); K, Koko Crater Botanic Garden (Oahu); L, Harold L. Lyon Arboretum (Oahu); P, Pacific Tropical Botanical Garden (Kauai); U, University of Hawaii, Manoa Campus (Oahu); W, Wahiawa Botanic Garden (Oahu); WA, Waimea Arboretum (Oahu).

- Acanthophoenix rubra* (A. crinita), F-n, C-n, DH-n
Acoelorrhaphe wrightii, F-f, W-i, L-f, WA-i, U-f, HF-i, P-i, H-f
Acrocomia aculeata, P-n
ierensis, U-f
media, F-f
mokayayba, F-n, C-n
totali, F-n
vinifera, F-n
spp., F, L, C
Actinokentia divaricata, F-n, W-m, L-i, WA-n, C-n, DH-n
Actinorhynchus calapparia, F-n, L-i, P-i, DH-n
sp. (New Guinea), W-i, L-i, C-i
Aiphanes acanthophylla, F-i, W-i, L-f, WA-n, P-i
caryotifolia, W-i, L-f, HF-i, P-i, C-n, H-f, DH-n
corallina, F-f, L-i, U-f
erosa, L-i, WA-n, P-i
lindeniana, F-f, L-f, P-n, C-i, H-f, DH-n
simplex, F-n
sp., W, WA, C
Allagoptera arenaria, C-n, DH-n
Alloschmidia glabrata, F-n, W-i, L-n, C-n, DH-n
Ammandra decasperma, L-n, P-n, C-i
Archontophoenix alexandrae, F-f, L-f, HF-i, P-f, C-f, DH-n
alexandrae var. *beatricae*, WA-n
alexandrae (weeping), C-i
cunninghamiana, F-f, L-f, C-f
sp. (purple crownshaft), F-i, W-f, L-n, WA-n, P-n, C-i, DH-n
Areca alicaeae, F-f, L-i, C-f, H-f, DH-n
catechu, F-f, L-f, WA-n, HF-f, P-f, C-f, H-f, DH-i
catechu (white fruit, Tikopia Island), L-i
concinna, F-f, L-f, WA-n, C-f, DH-n
glandiformis, F-i, W-i, L-f, P-n, DH-n
guppyana, L-f, WA-n, C-i, DH-n
hutchinsoniana, L-n, WA-n, DH-n
ipota, F-n, L-n, WA-n, C-n, DH-n
macrocalyx, F-n, L-n, WA-n, P-n, C-n, DH-n
macrocarpa, WA-n, DH-n
triandra, F-f, L-f, P-n, C-n, DH-n
vestiaria, F-f, W-f, L-f, HF-i, P-i, C-f, DH-n
whitfordii, L-n, DH-n
spp., F, W, L, WA, C, DH
Arecastrum romanzoffianum, F-f, L-f, U-f, HF-i, P-i, C-f, H-f
Arenga ambong, W-i, L-i
australasica, F-n, W-i, WA-n, HF-i, P-n, C-i, DH-n
caudata, F-n, W-m, L-i, WA-n, HF-i, P-i
engleri, F-m, L-f, WA-n, P-i, C-f
microcarpa, F-i, L-i, C-i
obtusifolia, F-f, L-i, U-f, P-i, C-i
pinnata, F-f, L-f, WA-n, P-n, C-n, H-i, DH-n
porphyrocarpa, F-f, W-i, L-f, P-i, C-f
tremula, F-i, L-i, WA-n
undulatifolia, F-m, L-m, P-n, C-i
westerhoutii, F-i, L-i
wightii, F-i, C-n
spp., F, L, WA, C
Arikuryroba schizophylla, F-f, L-f, HF-i, P-n, C-n, DH-n
Asterogyne martiana, F-n, DH-n
Astrocaryum aculeatum, L-n
confertum, L-i
malybo, L-n
murumuru, F-i
standleyanum, F-n, L-i, P-n, C-i, H-f, DH-n
standleyanum var. *calimense*, F-n, L-n, DH-n
tucuma, F-i
vulgare, L-n
spp., F, L, WA, C
Attalea allenii, F-n
Bactris baileyana, F-n
balanoidea, F-n, W-m
cruegerana, L-n
gasipaes, F-i, W-i, L-i, P-n, H-f
guineensis, L-i
longiseta, L-n
major, F-n, L-n, P-n
setosa, F-n
setulosa, P-n
spp., F, L, P, C, H
Balaka longirostris, F-n, W-f, L-f, WA-n, C-n, DH-n
microcarpa, F-n, C-n, DH-n
rechingerana, F-n, C-n
seemannii, L-m, P-i, C-n, DH-n
siliensis, F-n, W-m, C-n, DH-n
tuasivica, L-i
spp., F, L, WA, C, DH
Barbosa pseudococos, F-n
Basselinia eriostachys, F-n, W-i, L-n, C-n, DH-n
pancheri, F-n, C-n, DH-n
tomentosa, F-n, W-i, C-n, DH-n
spp., F, C, DH
Bentinckia condapanna, F-n, P-n, C-n, DH-n
nicobarica, F-f, L-f, P-i, C-i, DH-n
Bismarckia nobilis, F-n, L-i
Borassodendron machadonis, F-i, L-n
Borassus aethiopicum, K-i
flabellifer, F-m
Brahea aculeata, F-n, K-i
armata, F-n, K-i, L-n, U-f, C-n
bella, K-i, L-n, C-i, DH-n
berlandieri, K-i
brandegeei, F-n, K-i, L-i, U-f, P-i, C-n
edulis, W-m, L-i
elegans, K-i

- armata × *B. brandegeei*, C-n
 sp. (B. "calcareo"), K-i
 spp., F, K
- Brassiophoenix drymophloeoides*, L-i, WA-i, P-i, C-i, DH-n
- Brongniartikentia vaginata*, F-n, C-n
- Burretiokentia hapala*, L-n, WA-n, P-n, DH-n
- vieillardii*, F-n, W-i, L-i, P-n, C-i, DH-n
- Butia capitata*, F-f, L-f, P-i, C-n
- eriospatha*, L-i, C-n
- paraguayensis*, P-n
- yatay*, L-i
- Calamus australis*, F-n, L-n, WA-n, P-n, C-n, DH-n
- blancoi*, L-n, WA-n, DH-n
- caryotoides*, F-n, WA-n, DH-n
- discolor*, F-n, L-n, WA-n, P-n, C-n, DH-n
- heteroideus*, P-n
- maximus*, F-n, L-n, DH-n
- mindorensis*, F-n, L-n, WA-n, DH-n
- moti*, L-n, P-n, C-i
- ornatus*, F-n, L-n, WA-n, P-n, C-n, DH-n
- reinwardtii*, F-n, P-n, C-i
- retrophyllus*, F-n, W-i, C-i
- reyesianus*, F-n, L-n, WA-n, DH-n
- vitiensis*, F-n, C-n
- spp., F, W, L, WA, P, C, DH
- Calypstrocalyx hollrungii*, F-n, L-n, C-n
- spicatus*, F-m, W-m, L-f, WA-i, C-m, DH-n
- spp., F, W, L, WA, C, DH
- Calypstrogyne ghiesbreghtiana*, F-m, P-n, C-n, DH-n
- Calyptronoma dulcus*, F-i, W-i, L-f, C-n, H-f, DH-n
- occidentalis*, C-n
- rivalis*, F-n, L-n, P-n, C-i, DH-n
- Campecarpus fulcitus*, F-n, W-i, C-n
- Carpentaria acuminata*, F-f, W-m, L-m, WA-n, HF-i, P-i, C-i, DH-n
- Caryota cumingii*, F-f, W-i, L-f, WA-i, P-i, C-i, DH-n
- maxima*, C-i
- mitis*, F-f, W-f, L-f, WA-i, HF-i, C-f, H-f, DH-n
- no*, L-i, C-i
- ochlandra*, P-n
- rumphiana*, F-n, W-i, L-f, WA-i, P-n, C-i
- rumphiana* var. *albertii*, F-n, P-i
- rumphiana* var. *philippinensis*, WA-n, P-i, DH-n
- urens*, F-f, W-i, L-f, WA-n, C-f, DH-n
- spp., F, L, HF, P, C
- Catoblastus praemorsus*, F-n, W-i, C-n, DH-n
- pubescens*, C-n
- Ceroxylon alpinum*, F-n, W-n, P-n, DH-n
- hexandrum*, W-n, L-n, DH-n
- spp., F, L, C
- Chamaedorea alternans*, W-m
- amabilis*, F-n
- arenbergiana*, W-i, L-n, DH-n
- atrovirens*, DH-n
- brachypoda*, F-m, W-m, C-n, DH-n
- cataractarum* (*C. martiana*), F-n, W-m, P-i, C-i, DH-n
- costaricana*, F-m, L-m, P-n, DH-n
- elator*, C-i
- elegans*, F-m, W-i, L-m, WA-n, HF-i, C-m, DH-n
- ernesti-augusti*, F-m, L-n, WA-n, C-i, DH-n
- erumpens*, F-m, W-f, WA-n, P-f
- erumpens* cv. 'Fairchild', W-i
- falcifera*, F-n, W-i, L-n, WA-n, P-n, DH-n
- fragrans*, F-n, L-n, WA-n, P-n, C-m
- geomorphiformis*, F-n, L-m, P-n, C-i, DH-n
- glaucifolia*, L-f, WA-n, HF-f, P-f, C-n, DH-n
- klotzchiana*, F-m, DH-n
- lepidota*, C-i
- metallica*, F-m, L-m, C-f, DH-n
- microspadix*, F-m, L-f, WA-n, HF-f, P-m, C-f, DH-n
- neurochlamys*, F-n, L-n
- oblongata*, F-m
- pacaya*, L-i
- pinnatifrons*, F-n, W-m, L-i, WA-n, HF-i, P-m, C-i, DH-n
- radicalis*, F-f, L-f, HF-f, DH-n
- sartorii*, L-m
- schippii*, F-m, WA-n
- seifrizii*, F-m, W-f, L-m, WA-n, P-m, C-i, DH-n
- tepejilote*, F-f, W-f, L-f, WA-n, HF-f, P-m, C-m, DH-n
- tuerckheimii*, F-n, C-m
- wedeliana*, F-n
- woodsoniana*, F-n, W-i, C-i, DH-n
- spp., F, W, L, WA, HF, P, C, H, DH
- Chamaerops humilis*, F-m, W-i, L-i, HF-i, C-i
- humilis* var. *arborescens*, F-i
- humilis* var. *elator*, F-i
- humilis* cv. 'Nana', F-i
- Chambeyronia lepidota*, F-n, C-n, DH-n
- macrocarpa* (*C. hookeri*), F-m, W-f, L-i, WA-n, P-n, C-n, DH-n
- spp., W-m
- Chrysalidocarpus auriculatus*, C-i
- cabadae*, F-f, W-i, L-n, WA-n, P-n, C-i, DH-n
- decipiens*, F-n, L-n, C-n
- fibrosus*, P-n
- lutescens*, F-f, W-f, L-f, WA-i, U-f, HF-i, H-f
- madagascariensis*, F-m, W-i, L-m, C-n
- madagascariensis* var. *lucubensis*, F-f, L-m, WA-n, U-f, HF-i, P-i, C-i, H-f, DH-n
- Clinosperma bracteale*, F-n, C-n
- Clinostigma carolinense*, P-n
- exorrhizum* (*C. smithii*), F-n, L-n, WA-n, C-i, DH-n
- haerestigma*, F-n, L-i, C-n
- harlandii*, F-n, L-n, C-n, DH-n

- onchorhynchum*, F-n, L-i, WA-n, P-n, C-i,
 DH-n
ponapense, F-i, L-f, WA-n, C-n, DH-n
samoense, F-n, L-i, WA-n, C-n, DH-n
savaiiense, F-n, W-i, L-n
savoryanum, W-i, WA-i
 spp., F, W, L, C
Coccolthrinax argentata, F-i, L-n, C-i
argentea, F-m, U-f, C-i
crinita, F-i, L-i, C-i
dussiana, L-f, WA-n, C-i
ekmanii, F-m, WA-n, P-n
fragrans, F-m, L-n, WA-i
martii, C-i
miraguama, F-f, L-f, WA-n, C-n, DH-n
 spp., F, L, WA, HF, C, H, DH
Cocos nucifera, F-f, L-f, WA-f, U-f, HF-f, P-f,
 C-f
Colpothrinax cookii, F-n, C-n
wrightii, K-i
Copernicia alba, K-i, WA-i, P-i, DH-n
berteroana, K-i, P-i
cowellii, L-n, P-i
glabrescens, K-i, L-i, P-i
hospita, F-i, K-i
macroglossa, F-i, K-i, L-i
prunifera, F-f, L-i, P-n, H-f, DH-n
Corypha elata, F-n, L-n, P-i, DH-n
lecomtei, F-n, L-i, C-n
umbraculifera, F-i, W-i, L-n, C-i, DH-n
Cryosophila albidia, C-i
argentea, F-i, C-n, H-f, DH-n
warszewiczii, L-f, WA-n, HF-i, P-m, H-f,
 DH-n
Cyphokentia macrostachya, F-n, C-n
Cyphophoenix elegans, F-n, W-i, P-n, C-n,
 DH-n
nucele, F-n, DH-n
Cyphosperma balansae, F-n, C-i, DH-n
tanga, F-n, L-i
Cyrtostachys lakka, F-i, L-m, HF-i, P-i, C-i,
 DH-n
renda, F-i, W-i, L-n, C-i, DH-n
 spp., F, L, C
Daemonorops angustifolia, W-i
hystrix, W-i, C-i
longipes, W-i, C-n
mollis, F-i, WA-n, DH-n
periacantha, F-n
 spp., F, L, HF, P, C
Deckenia nobilis, F-n, L-i, P-n, C-i, DH-n
Desmoncus orthacanthos, F-n, L-i, P-n, C-i
polyacanthos, F-n WA-n
 sp., DH
Dictyocaryum fuscum, F-n
Dictyosperma album, F-f, W-i, L-i, WA-n, U-f,
 HF-i, P-i, C-i, H-f, DH-n
album var. aureum, F-m, W-i, L-f, WA-n, C-i
Drymophloeus beguinii, F-f, P-i, C-f, DH-n
oliviformis, F-n, L-f, WA-n, P-i, C-i, DH-n
oninensis, C-i
pachycladus, F-n, L-n, WA-n, DH-n
samoensis, F-n, C-n, DH-n
subdistichus, F-n, L-n, DH-n
Dypsis gracilis, F-n
 sp., F, L, C
Elaeis guineensis, F-m, L-f, WA-n, HF-i, P-i,
 C-f, H-i
oleifera, F-m, L-i, P-n, H-f
Euterpe controversa, F-n, P-n, C-n
edulis, L-i, P-n, C-i
microcarpa, F-n, P-n, DH-n
oleracea, F-n, L-n, WA-n, C-i
precatória, F-n, P-n, C-n, DH-n
 spp., F, L, WA, P, C, H, DH
Gaussia attenuata, F-f, L-i, H-f, DH-n
princeps, F-m, L-f, C-i, H-i
Geonoma aspidiifolia, C-n
interrupta, C-i
oxycarpa, F-n, P-n
pinnatifrons, C-n, DH-n
schottiana, F-n
sodiroid, F-n, C-n
 spp., F, W, L, C
Gronophyllum microcarpum, L-n
ramsayi, F-n, C-n
Gulubia costata, F-n, DH-n
macrospadix, F-n, W-i, C-n, DH-n
palauensis, F-n, L-n, P-n, C-n, DH-n
 spp., L, WA, C
Hedyscepe canterburyana, W-i, DH-n
Heterospatha elata, F-f, W-i, L-f, WA-i, U-f,
 HF-i, P-i, C-i, DH-n
minor, F-m, L-n, P-n, C-n, DH-n
negrosensis, L-n, DH-n
salomonensis, L-n
sensis ?, F-n, DH-n
woodfordiana, F-m, L-n, C-f, DH-n
 spp., F, W, L, WA, P, C, DH
Howea belmoreana, F-m, W-f, L-m, WA-n
forsterana, F-m, L-i, WA-n, C-i, DH-n
Hydriastele beccariana, L-n, P-n, C-n
kasesa, L-i
microspadix, L-n
wendlandiana (H. douglasiana), F-n, L-i, C-n,
 DH-n
 spp., F, L, WA, HF, P, C, DH
Hyophorbe indica, W-i
lagenicaulis, F-f, L-m, U-f, HF-i, C-i, H-i,
 DH-n
verschaffeltii, F-f, L-f, U-m, HF-i, P-i, C-i,
 DH-n
lagenicaulis × H. *verschaffeltii*, F-m, L-m
 sp., WA
Hyospathe lehmannii, F-n, C-n, DH-n

- Hyphaene coriacea*, P-n
crinita, F-m, P-n, DH-n
schatan, K-i
thebaica, F-f, C-i
thebaica × *H. crinita*, HF-i
- Iriartea gigantea*, F-n, L-n, WA-n, DH-n
Iriartella setigera, C-n
- Jessenia bataua* (*J. polycarpa*), F-n
 spp., F, L, WA, P, C, DH
Johannesteijsmannia altifrons, F-n, WA-n
Juania australis, F-n, C-n
Jubaea chilensis, L-i, C-n
Jubaeopsis caffra, F-i, L-i
- Kentiopsis oliviformis*, F-n, W-i, L-n, WA-n, P-i, C-n, DH-n
Korthalsia rubiginosa, F-n, C-n
- Laccospadix australasica*, F-n, W-i, L-n, WA-n, P-n, C-i, DH-n
Latania loddigesii, F-m, L-m, WA-i, U-f, P-i, C-i, H-m, DH-n
lontaroides, F-f, L-n, C-i, DH-n
verschaffeltii, F-f, L-m, C-n, DH-n
verschaffeltii × *L. loddigesii*, U-f, HF-i, H-m, DH-n
Leopoldinia piassaba, C-n
Lepidocaryum spp., C
Licuala ferruginea, F-i, C-i
flabellum, W-m
glabra, F-n
glabra var. *selangorensis*, L-i, C-n
grandis, F-f, L-m, WA-i, HF-i, P-i, C-m, H-f, DH-n
lauterbachii, F-m, W-i
paludosa, P-i, C-n, DH-n
peltata, L-i, C-i
petiolulata, F-n
ramsayi, F-n, L-i, WA-n, P-n, C-i, DH-n
rumphii, L-n
spinosa, F-f, W-i, L-i, HF-i, P-i, C-i, H-i, DH-n
 "elegans" (of W. Sumawong), W-i, L-i, C-i, DH-n
 spp., F, L, WA, P, C
Linospadix minor, C-n, DH-n
monostachya, L-m, HF-i
palmerana, L-n, DH-n
 spp., F, L, C, DH
Livistona alfredii, F-n, P-n
australis, F-n
benthamii, F-n, P-n, C-n
chinensis, F-f, L-i, WA-i, U-f, HF-i, P-m, C-i
chinensis var. *boninensis*, WA-i
chinensis var. *subglobosa*, P-i, H-i
decipiens, P-n
drudei, F-n, L-i, WA-n, DH-n
eastonii, F-n, L-n, P-n, DH-n
- humilis*, F-n, P-n, C-n, DH-n
inermis, F-n, L-n, DH-n
loriphylla, F-n, P-n, C-n
mariae, F-m, WA-n, P-n
muelleri, F-n, L-i, WA-n, P-n, C-n, DH-n
robinsoniana, L-n, WA-i, H-f, DH-n
rotundifolia, L-i, WA-n, U-f, HF-i, P-m, C-i, H-f, DH-n
rotundifolia var. *luzonensis*, F-f, L-n, WA-n, DH-n
saribus, F-f, L-i, WA-i, HF-i, P-m, C-i, DH-n
speciosa, F-n, WA-n
woodfordii, F-n, P-n, C-i, DH-n
 spp. F, W, L, WA, HF, P, C, DH
Lodoicea maldivica, F-m, C-i
Loxococcus rupicola, F-n, L-n, P-n, DH-n
- Mackeeea magnifica*, F-n, L-n, C-n, DH-n
Manicaria saccifera, F-n, C-n
Mauritia aculeata?, F-n
armata, F-n, DH-n
flexuosa, F-n, C-n
 sp. (*Mauritiella pacifica*), F-n
 sp., F, C
Maximiliana maripa, C
Metasocratea hecatonandra, F-n, C-i, DH-n
Metroxylon amicarum, F-f, L-i, C-i, H-f
sagu, L-i
salomonense, F-n
upolense, F-n, L-n, WA-n, P-n, C-i, DH-n
vitiense, F-i, C-i
warburgii, F-n, L-n, WA-n, P-i, C-n, DH-n
Microcoelum insigne, L-n
weddellianum, W-f, L-f, HF-i, P-n, C-f, DH-n
Myrialepis scortechinii, F-n
- Nannorrhops ritchiana*, F-n, L-n, WA-n, P-i, C-n
Nenga pumila, C-n
Nengella spp., F, L, P, C, DH
Neodypsis baronii, F-n, L-n
decaryi, F-f, L-i, WA-n, P-i, C-i, DH-n
lastelliana, F-n, L-n, P-n, C-n, DH-n
 spp., F, L, P, C
Neonicholsonia watsonii, F-n, P-n, C-n, DH-n
Neophloga spp., F
Neoveitchia storckii, F-n, L-n, WA-n, P-n, C-i, DH-n
Nephrosperma vanhoutteanum, F-m, W-i, L-n, WA-n, P-i, C-m, DH-n
Normanbya normanbyi, F-f, W-i, L-i, WA-n, P-n, C-i, H-i, DH-n
Nypa fruticans, F-n, WA-i, P-n
- Oenocarpus bacaba*, C-i
distichus, F-n
dryanderæ, F-n

- huebneri, G-n
 multicaulis, C-n
 panamanus, F-n, L-m, P-n
 spp., F, L, P, C, DH
Oncosperma fasciculatum, F-n, W-i
 horridum, W-i, L-n, DH-n
 tigillarum, F-f, W-i, L-i, C-i, DH-n
Opsiandra maya, F-i, L-f, C-n, DH-n
Orania appendiculata, F-n, P-n, C-n, DH-n
 archboldiana, P-n
 decipiens var. montana, L-n, DH-n
 disticha, P-i, C-n
 lauterbachiana, F-n, L-n, C-n, DH-n
 palindan, F-i, L-i, WA-n, P-i, DH-n
 sylvicola, F-n, W-i, L-n
 spp., W, C, DH
Orbignya cohune, F-f, L-i, P-n, C-i, DH-n
 cuatrecasana, F-n
 guacuyule, W-i
 lydiae, L-n
 martiana, F-i
 spectabilis, F-i
 sp., F

Palandra aequatorialis, WA-n, C-i
Parajubaea cocoides, W-i, L-n, P-n
 sp., WA, C
Parascheelea sp., F, P, DH
Pelagodoxa henryana, F-f, W-i, L-i, WA-n, P-i,
 C-i, DH-n
Phloga nodifera, F-n, L-n, C-n, DH-n
 sp., F, P, C
Phoenicophorium borsigianum, F-f, W-i, L-i,
 HF-i, C-i, DH-n
Phoenix acaulis, F-f, P-i, C-n, DH-n
 canariensis, L-n, WA-i, P-n, C-i
 dactylifera, F-i, K-i
 loureirii, F-n, W-m, L-m, DH-n
 pusilla, F-m, L-n, C-i
 reclinata, F-i, K-i, L-i, WA-n, P-n, C-i, H-f,
 DH-n
 roebelenii, F-f, L-f, WA-i, U-m, HF-i, P-i, C-
 f, H-f, DH-n
 rupicola, W-m, L-i, U-i, C-n, DH-n
 sylvestris, F-m, DH-n
 spp., F, L, U, HF, P, C
Pholidocarpus macrocarpus, L-n
 majadum, F-n, WA-n, P-n, C-n, DH-n
Physokentia dennisii, F-n, L-i, P-n, C-n, DH-n
 insolita, L-i, C-n
 rosea, F-n, P-n, C-n
 thurstonii, F-n
Phytelephas macrocarpa, DH-n
Pigafetta filaris, F-n, W-i, L-i, WA-i, HF-i, P-n,
 C-i
Pinanga barnesii, DH-n
 copelandii, L-n, WA-n, DH-n
 coronata, L-f
 dallasensis, F-n, C-n
 densiflora, W-i
 elmerii, DH-n
 geomiformis, F-n, L-n, WA-n, C-n, DH-n
 grandis, F-i
 insignis, F-f, L-f, WA-n, C-n, DH-n
 isabelensis, DH-n
 javana, W-i, WA-i, C-n
 kuhlii, F-f, L-f, WA-i, HF-i, C-f, H-f, DH-n
 latisecta, C-i
 limosa, F-n
 maculata, F-n, W-i, L-n, DH-n
 malaiana, F-n, L-i, WA-n, DH-n
 modesta, DH-n
 noxa, DH-n
 patula, L-n, C-i, DH-n
 punicea, C-n
 scortechinii, F-m
 speciosa, L-n, DH-n
 sp. (*Pseudopinanga aristata*), C-n
 sp. (*Pseudopinanga pilosa*), F-n, C-n
 spp., F, W, L, WA, U, HF, P, C, DH
Podococcus barteri, F-n
Polyandrococos caudescens, F-f, W-i, L-f, WA-
 n, P-n, C-n, DH-n
Prestoea acuminata, F-n
 montana, F-n, L-n, WA-n, C-f
 pubigera, F-i, L-f, C-n, DH-n
 spp., F, L, C
Pritchardia affinis, F-i, W-i, L-n, WA-n, P-n, C-
 i, DH-n
 affinis var. gracilis, F-n, W-i, L-i, WA-n, P-n,
 C-n, DH-n
 affinis var. halophila, WA-n, DH-n
 affinis var. rhopalocarpa, F-i, L-i
 arecina, F-f, L-i
 aylmer-robinsonii, F-n, WA-n, P-i, DH-n
 beccariana, F-i, W-i, L-n, WA-n, C-i, DH-n
 beccariana var. giffardiana, F-i, W-i, L-i,
 WA-n, C-n, DH-n
 brevicalyx, F-n, W-i, DH-n
 donata, WA-n
 eriophora, F-i, P-n, DH-n
 eriostachya, F-n, W-i, L-i, WA-n, U-f, C-i,
 DH-n
 forbesiana, W-i, L-i, WA-n, C-n, DH-n
 gaudichaudii, F-f, W-i, L-i, WA-n, DH-n
 hardyi, W-i, L-n, WA-n, P-i, DH-n
 hillebrandii, F-f, L-f, WA-n, U-f, HF-i, P-n,
 DH-n
 insignis, F-i
 kaalae, F-f, W-i, L-n, WA-n, P-n, DH-n
 kaalae var. minima, F-n, W-i, WA-n, P-n
 kahukuensis, F-i, W-i, L-i
 kamapuaana, F-i, W-i
 lanaiensis, F-i, P-n
 lanigera, F-m, U-i
 lowreyana, F-i, WA-n, U-f, HF-i, C-i
 macdanielsii, F-n, W-i
 macrocarpa, F-f, W-i, L-i, WA-n
 (aff.) maideniana, L-n, WA-n, DH-n
 martii, F-i, W-i, L-f, DH-n

- martioides, F-n, W-i, L-f
 minor, F-n, W-i, WA-n, P-n, DH-n
 munroii, F-n, L-n, WA-i, P-i, DH-n
 pacifica, F-f, L-i, WA-i, C-i, DH-n
 remota, F-i, W-i, K-i, L-f, WA-i, P-i, DH-n
 rockiana, DH-n
 thurstonii, F-f, L-n, WA-n, U-f, HF-i, P-i, C-i, DH-n
 viscosa, F-i, L-i
 vuykstekeana, F-i
 weissichiana, F-n, W-f, P-n, DH-n
 spp., F, W, L, WA, U, HF, P, C, H, DH
Pseudophoenix sargentii, L-n, P-i
 sargentii ssp. saonae, F-i
 vinifera, F-n, WA-n, P-n, C-n
Ptychococcus lepidotus, C-i
 paradoxus, F-m
 spp., F, W, L, C, DH
Ptychosperma ambiguum, W-i, L-n, DH-n
 burretianum, F-n, L-n, P-n, C-n, DH-n
 elegans, F-f, L-f, WA-n, U-f, P-i, C-f, DH-n
 hosinoi, F-n, C-i, DH-n, L-f
 lauterbachii (P. hollrungii), L-i
 ledermannianum, F-i, L-n, C-i, DH-n
 macarthurii, F-f, W-f, L-f, WA-i, U-f, HF-i, P-i, C-f, H-f, DH-n
 microcarpum, F-n, W-m, L-i, WA-n, HF-i, P-i, C-i, DH-n
 propinquum, F-f, L-f, WA-i, C-n
 salomonense, F-f, W-m, L-i, DH-n
 sanderanum, F-f, L-n, U-f, C-f, DH-n
 schefferi, DH-n
 vestitum, P-n
 waitianum, P-n, C-n
 spp., F, W, L, WA, HF, P, C, H, DH

Raphia farinifera, F-i, L-f, HF-i, C-i
 hookeri, F-n
 monbottorum, F-n
 vinifera, L-i
 spp., F, W, DH
Ravenea glauca, F-n, P-n, C-n, DH-n
 latisecta?, F-n
 madagascariensis var. monticola, F-n, DH-n
 robustior, F-n, L-n, HF-i, P-n, C-n, DH-n
 spp., F, P
Reinhardtia gracilis, W-f, L-n, WA-n, P-m, C-i, DH-n
 gracilis var. gracilior, F-m, W-i
 gracilis var. rostrata, F-n
 koschnyana, P-n
 simplex, F-m, L-f, HF-f, P-n, C-n
Rhapidophyllum hystrix, L-i, C-n
Rhapis excelsa, F-m, L-m, WA-i, U-f, HF-i, DH-n
 excelsa "dwarf", F-i, L-n, WA-n
 humilis, F-i, L-i, WA-i, P-m
 "dwarf Japanese", F-i, W-i, P-i
 sp. (Thai, from W. Sumawong), W-i, L-m, WA-n, P-m, C-n, DH-n
 sp. (variegated), F-n, L-n

Rhopaloblaste augusta, F-f, L-i, P-n, C-i, DH-n
 ceramica, F-i, L-i, WA-i, P-i, C-i
 elegans, F-n, WA-n, C-n, DH-n
 singaporensis, HF-i
 spp., L, P, C
Rhopalostylis baueri, L-i, C-n, DH-n
 cheesemanii, W-i
 sapida, W-m, L-n, HF-i, C-n, DH-n
Rhyticocos amara, F-f, HF-i, P-n, C-i, H-f, DH-n
Roscheria melanochaetes, F-n, L-i, C-i
Roystonea borinquena, F-i, W-i, L-i
 elata, L-i, P-i, C-i, DH-n
 hispaniolana, F-n
 oleracea, F-f, L-f, U-f, P-i, C-i, DH-n
 regia, F-f, L-i, WA-n, U-f, HF-i, P-i, C-i, DH-n
 venezuelana, F-i
 oleracea × *R. regia*, U-f
 spp., F, L, C

Sabal bermudana, L-i, WA-n
 causerum, F-f, L-i, WA-i, P-i
 etonia, L-n, WA-i, P-n
 mauritiformis, F-f, L-i, WA-i, U-f, C-i, DH-n
 mexicana, F-f, L-i, WA-i, P-i, H-f
 minor, F-f, L-f, WA-i, P-i, C-i
 morrisiana, F-n
 palmetto, F-f, L-i, WA-i, HF-i, C-n
 parviflora, F-f, L-n, U-f, C-i
 princeps (S. beccariana), F-i, L-n, P-i
 uresana, F-n
 "Riverside", L-n, C-n
 spp., F, L, WA, HF, P, C, H, DH
Salacca conferta, F-n
 edulis, W-i, L-m, WA-i, HF-i, C-n
 wallichiana, W-i
 spp., F, L
Satakentia liukuiensis, F-i, W-i, L-i, HF-i, C-i, DH-n
Scheelea butyracea, F-f, L-n, P-n
 gomphococca, L-i
 macrolepis, P-n
 phalerata, F-n
 rostrata, L-n
 zonensis, L-i
 spp., L, C
Serenoa repens, F-f, L-i, HF-i, P-i, C-n
Siphokentia beguinii, F-f, L-m, P-i, C-n, DH-n
Socratea durissima, F-n, L-n, WA-n, C-n, DH-n
 exorrhiza, F-n
 spp., F, C
Syagrus coronata, F-f, W-i, L-n, DH-n
 flexuosa, F-f, P-n, C-i, DH-n
 inajai, P-n, C-n
 orinocensis, DH-n
 sancona, W-i, P-i
 spp., F, C, DH
Synechanthus fibrosus, F-n, W-f, L-f, P-n, C-i, DH-n
 warscewiczianus, F-n, W-i, P-i, DH-n

- Thrinax morrisii*, F-f, C-n, H-f
radiata, F-f, L-f, WA-i, U-f, P-m, C-i, H-f,
 DH-n
 spp., F, L, P, C, DH
Trachycarpus fortunei, L-i, WA-i, C-n
takil, W-i, L-i
wagneranus, W-m, L-n
 spp., F, W, L, HF
Trithrinax acanthocoma, WA-i
biflabellata, P-n, C-n

Veillononia alba, F-n, C-n, DH-n
Veitchia arecina, F-i, L-f
joannis, F-f, L-f, WA-i, U-f, HF-i, P-i, C-i,
 DH-n
maddanielsii, F-i, L-f, WA-n, C-n, DH-n
merrillii, F-f, L-f, WA-i, U-f, HF-i, P-f, C-i,
 H-i, DH-n
montgomeryana, F-f, W-i, L-f, WA-n, HF-i,
 P-f, C-f, H-f, DH-n
pedionoma, WA-n
petiolata, F-n
sessilifolia, F-f, W-m, L-m, U-i, HF-i, P-m,
 C-n, DH-n

simulans, F-i, W-i, L-i
spiralis, F-n, L-n, C-n, DH-n
vitiensis, F-n, L-n, C-n, DH-n
vitiensis var. *parhamiorum*, W-m, L-i
winin, F-n, L-n, WA-n, P-m, C-i, DH-n
 spp., F, L, HF, P, C, DH
Verschaffeltia splendida, F-i, L-f, WA-n, P-i, C-
 i, DH-n
Vonitza fibrosa, F-i

Wallichia disticha, F-n, L-i, WA-n, P-n, DH-n
 spp., F, HF, C
Washingtonia filifera, K-i, L-n, WA-n, U-f, HF-
 i, P-i, H-m
robusta, F-f, L-i, WA-i, U-f, HF-i, P-i
 spp., F, C
Welfia georgii, F-n, L-n, WA-n, C-n, DH-n
Wendlandiella polyclada, F-n, DH-n
Wettinia quinaria, F-n
Wissmannia carinensis, F-n, L-i, WA-i, HF-i,
 P-i

Zombia antillarum, F-i, WA-i

PALM QUESTIONS AND ANSWERS

- Q. Have more palms been added to the list of susceptible species to lethal yellowing?
 A. Yes. *Ravenia hildebrandti* and *Veitchia montgomeryana* have been added to the list. The revised host list now consists of the 26 species listed below.
1. *Allagoptera arenaria* (Gomes) Kuntze
 2. *Arenga engleri* Becc.
 3. *Arikuryroba schizophylla* (Mart.) L. H. Bailey (Arikury palm)
 4. *Borassus flabellifer* L. (Palmyra palm)
 5. *Caryota mitis* Lour. (Cluster fish-tail palm)
 6. *Chrysalidocarpus cabadae* H. E. Moore (Cabada palm)
 7. *Cocos nucifera* L. (Coconut palm)—all varieties, including Malayan dwarf
 8. *Corypha elata* Roxb. (Buri palm, gebang palm)
 9. *Dictyosperma album* (Bory) H. Wendl. & Drude (Hurricane or princess palm)
 10. *Gaussia attenuata* (O. F. Cook) Becc. (Puerto Rican gaussia)
 11. *Howea belmoreana* (C. Moore & F. Muell.) Becc. (Sentry palm)
 12. *Latania* (all species)
 13. *Livistona chinensis* (Jacq.) R. Br. ex Mart. (Chinese fan palm)
 14. *Hyophorbe verschaffeltii* H. Wendl. (Spindle palm)
 15. *Nannorrhops ritchiana* (W. Griff.) J. E. T. Aitch. (Mazari palm)
 16. *Phoenix canariensis* Hort. ex Chab. (Canary Island date palm)
 17. *Phoenix dactylifera* L. (Date palm)
 18. *Phoenix reclinata* Jacq. (Senegal date palm)
 19. *Phoenix sylvestris* (L.) Roxb. (Wild date palm)
 20. *Pritchardia affinis* Becc. (Kona palm)
 21. *Pritchardia pacifica* Seem. & H. Wendl. (Fiji Island fan palm)
 22. *Pritchardia thurstonii* F. Muell. & Drude

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