Palms in the landscape, XIV
Phoenix: The date palms, Part 2

Donald R. Hodel

Pruning

Pruning in *Phoenix* includes removal of leaves, inflorescences, trunks and basal or aerial offshoots of clustered species, acanthophylls, and flared pseudobark; shaping and sculpting "pineapples" and leaf bases; and skinning and peeling trunks.

Ideally when pruning *Phoenix* remove only dead leaves and inflorescences after they have elongated fully and, if fruit is an issue, prior to fruit maturation. While infructescences can be showy and attractive, especially with the large-fruited *P. dactylifera*, they can also be messy if fruit is allowed to drop onto hardscape (**Figs. 46-48**). Also, untimely removal of infructescences, especially heavy ones like those of *P. dactylifera* and *P. canariensis*, can result in the disorder two-tiered canopy, where heavy fruit clusters rest on subtending leaves, pushing them down and distorting an otherwise symmetrical canopy (**Figs. 49-50**). Time leaf removal to coincide with inflorescence removal to keep the number of trips up the palm to a minimum (**Figs. 51-52**). More frequent pruning might be required in intensely maintained landscapes. If so, remove dead leaves and only green leaves below the horizontal. Avoid removing green leaves above the horizontal. Pruning, especially leaves, is a stress-inducing and wounding procedure. While most healthy, vigorously growing palms can sustain periodic removal of some green leaves, excessive, frequent removal reduces photosynthesis and carbohydrate production, stressing the palm and, if done carelessly, creating permanent wounds.

The *Phoenix* species of clustering habit are unusually versatile in the landscape. Judicious pruning out of trunks and basal suckers or offshoots can regulate height, width, and density of clumps, creating specimens of different habits and landscape functions (**Figs. 53-54**). When doing so, remove trunks or basal offshoots as close to the base as possible to ensure that the apical meristem is removed, otherwise that trunk or offshoot will regrow. During the removal process take care not to damage remaining, desired trunks.

Phoenix dactylifera 'Zahidi' tends to produce multiple apical meristems (aerial offshoots) (**Fig. 55**). While

The Phoenix species of clustering habit are unusually versatile in the landscape.

Figure 46. (Left) While infructescences can be showy and attractive, especially with the large-fruited *Phoenix dactylifera*, they can also be messy if fruit is allowed to drop onto hardscape (California State University, Fullerton).

Figure 47. (Center) Fruits of *Phoenix*, especially large-fruited species like *P. dactylifera*, are showy and attractive but can be a serious litter problem (California State University, Fullerton).

Figure 48. (Right) Fallen fruits of *Phoenix dactylifera* can be a nuisance, especially if they fall onto hardscape.

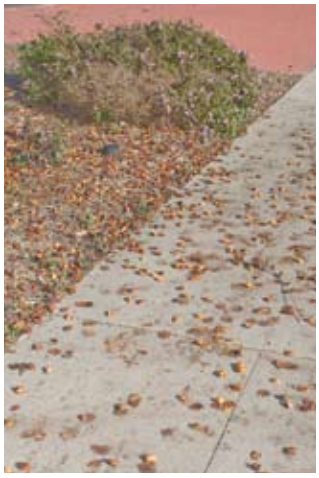


Figure 49. (Left) Untimely removal of infructescences, especially heavy ones like those of *Phoenix dactylifera*, can result in the disorder two-tiered canopy, where heavy fruit clusters rest on subtending leaves, pushing them down and distorting an otherwise symmetrical canopy.

Figure 50. (Center left) Heavy infructescences resting on and pushing down subtending leaves have caused two-tiered canopy in this *Phoenix canariensis*.

Figure 51. (Center right) Time leaf removal to coincide with inflorescence removal to keep the number of trips up the palm to a minimum.

Figure 52. (Right) Untimely leaf removal prior to emergence of inflorescences means a second trip up this *Phoenix dactylifera* is necessary.

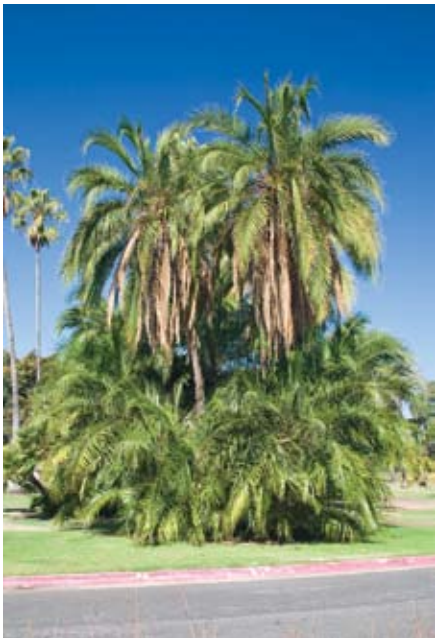
theoretically these could grow and result in an attractive if not unusual, multi-headed palm, especially if thinned, pruned, and groomed neatly, the potential for these additional apical shoots to fail and fall off once they gain sufficient size is a critical consideration. Thus, in most cases, it is prudent to remove these additional apical offshoots (**Fig. 56**). Again, as with basal offshoots, it is important to cut sufficiently low and close to the base to ensure that the meristem is removed; otherwise they will regrow (**Figs. 57-58**).

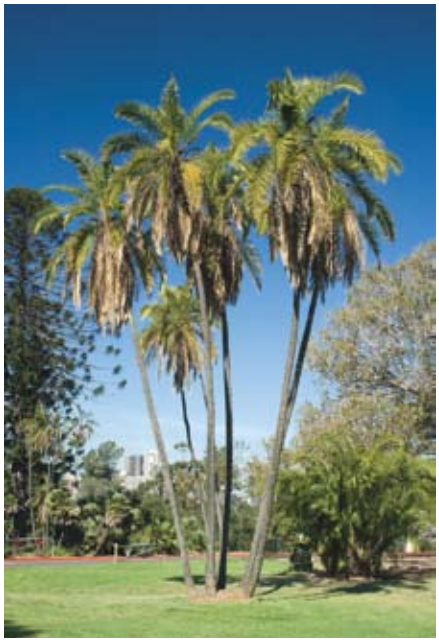
In some cases, especially with small or low-growing palms and those close to pedestrian traffic, it might be ad-

Figure 53. (Left) *Phoenix* spp. of clustering habit, such as this *P. reclinata* at Golden Hill Park in San Diego, CA, are versatile landscape subjects because height, width, and density of the clump can be managed by judicious removal of selected trunks.

Figure 54. (Center) Judicious removal of selected trunks of this *Phoenix reclinata* at Golden Hill Park in San Diego, CA has created a plant of different habit and function than that of the plant in Figure 53.

Figure 55. (Right) *Phoenix dactylifera* 'Zahidi', while one of the most handsome varieties of the date palm, has a tendency to produce multiple, apical offshoots high up in the canopy that can fail and fall off once they gain sufficient size.





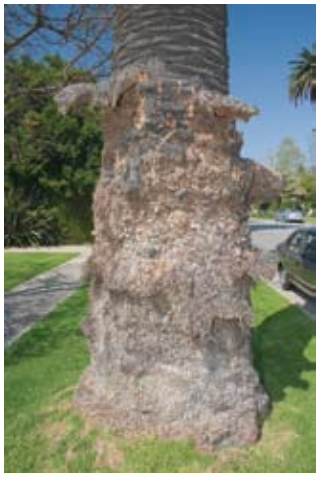


Figure 56. (Left) Because of the possibility of failure, it is prudent to remove these additional apical offshoots of *Phoenix dactylifera* 'Zahidi'.

Figure 57. (Center left) When removing apical offshoots of *Phoenix dactylifera* 'Zahidi' it is important to cut sufficiently low and close to their base, perhaps even coring out the meristem, to ensure that is completely removed.

Figure 58. (Center right) If the meristems of apical offshoots of *Phoenix dactylifera* 'Zahidi' are not completely removed, they will regrow.

Figure 59. (Right) In some *Phoenix*, especially *P. canariensis*, the emerging roots and enlarging root boss at the base of the trunk push out the pseudobark and attached cortex, flaring them out unattractively.

visable and prudent to prune off the dagger-like acanthophylls because they can be a dangerous menace to unwary passersby and children playing in the area. Arborists and others working in these palms might want to remove the acanthophylls to make their leaf and inflorescence pruning easier and safer tasks. Acanthophylls can be easily removed with a carpet knife, running the blade carefully along the pseudopetiole, stripping off the appendages at the base.

In some species, especially *Phoenix canariensis*, the emerging roots and enlarging root boss at the base of the trunk push out the pseudobark and attached cortex, flaring them out unattractively (**Fig. 59**). For esthetic reasons these can be pruned off neatly and attractively without damaging the trunk (**Fig. 60**).

A commonly held belief among arborists is that once the "ball" or "pineapple" of *Phoenix canariensis* has been shaped or sculpted, which is a typical occurrence in the landscape (**see Fig. 9 earlier**), this practice must continue or the result is that portions of the "pineapple" will tend to fall out, leaving an unsafe, ragged, and esthetically unpleasing structure. This phenomenon became evident when arborists refrained from shaping and sculpting the "pineapple" and skinning or peeling the trunk of old leaf bases, at least with chainsaws, out of concern for spreading Fusarium wilt. The result they say is that in many instances the previously shaped "pineapple" had a tendency to deteriorate and fall apart. Shaping the "pineapples" with manual or even power-reciprocating saws that can be thoroughly disinfected to prevent the spread of disease is labor intensive and tedious and not an attractive alternative. However, until a method can be devised to clean and disinfect chainsaws adequately and thoroughly, this conundrum of how

Figure 60. (Left) For esthetic reasons flared pseudobark can be pruned off neatly and attractively without damaging the trunk (*Phoenix canariensis*).

Figure 61. (Center) In the Spanish, French, and Italian Riviera, the "pineapples" of *Phoenix canariensis* are often mostly removed, leaving only a short, uniform, arch-like curve up to the lowest leaves (Villa Ormond, San Remo, Italy).

Figure 62. (Right) Also in southern Europe, especially in the Italian Riviera, individual leaf bases of *Phoenix canariensis* are sometimes artistically cut for esthetic reasons (Villa Nobel, San Remo, Italy).

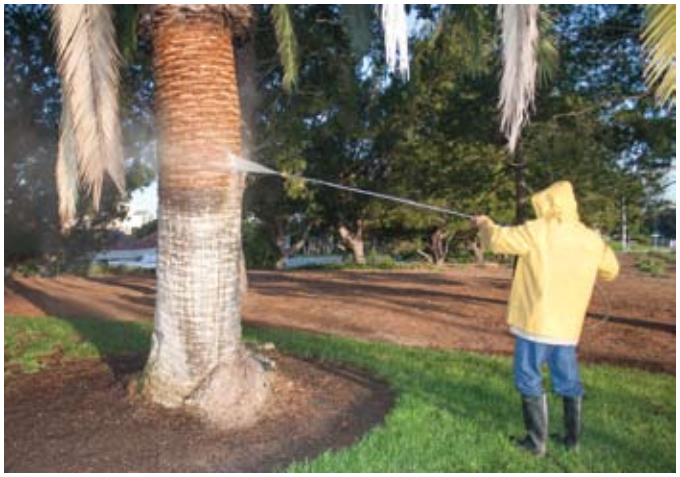


Figure 63. (Left) Persistent leaf bases on this *Phoenix dactylifera* were not cut attractively.

Figure 64. (Center) Persistent leaf bases on this *Phoenix dactylifera* were cut attractively.

Figure 65. (Above right) Trunk rejuvenation through high-pressure washing, as here on *Phoenix canariensis*, removes dirt, pollution, and otherwise darkened tissue, resulting in a fresh, brown appearance.

Figure 66. (Below left) High-pressure washing dramatically rejuvenates the trunk of this *Phoenix canariensis*.

Figure 67. (Below center) The trunk of this *Phoenix canariensis* before high-pressure washing is dark, nearly black.

Figure 68. (Below right) The trunk of this *Phoenix canariensis* after high-pressure washing is fresh, brown, and rejuvenated.

to manage "pineapples" of *P. canariensis* will continue.

In the southern part of Europe along the Mediterranean Sea where *Phoenix canariensis* is widely cultivated, for example along the Spanish, French, and Italian Rivieras, the "pineapples" are typically handled differently than in the United States. There the "pineapple" is not allowed to flare or bulge out abruptly as in the United States but is mostly removed, leaving only a short, uniform, arch-like curve up to the lowest leaves (**Fig. 61**). In many ways this method results in a more attractive structure and one that might be less prone to having portions deteriorate and fall out, simply because the sheer mass of leaf bases is lacking. Also in southern Europe, especially in the Italian Riviera, individual leaf bases are sometimes artistically cut for esthetic reasons (**Fig. 62**). Persistent leaf bases on the lower part of the trunk can be neatly and attractively pruned without peeling or skinning them off, enabling one to regulate to a certain extent the girth of the trunk and to create an esthetically and visually appealing surface (**Figs. 63-64**).

Even root bosses, if they become too large and encroach on sidewalks and other hardscape, can be carefully and neatly pruned.

When pruning *Phoenix*, always follow all safety precautions, avoid use of chainsaws, and thoroughly clean and disinfect saw blades prior to use on each palm.

Transplanting

Like all palms in non-tropical areas, *Phoenix* establish best if transplanted in late spring at the beginning of the growing season. In tropical areas they can be transplanted year round. Plant at grade and backfill small specimens with native site soil but for large specimens where additional support and anchorage are required consider backfilling with washed concrete sand, which has high bulk density and packs evenly, uniformly, and tightly. Judicious, post-plant irrigation is critical. Irrigate to maintain root ball, backfill, and surrounding site soil evenly moist. Leaf removal and tie up facilitate digging, transport, and replanting, especially of large specimens, and are likely necessary to reduce water loss when transplanting in hot, arid areas. In cooler, more humid coastal areas minimize leaf removal and untie leaves once planted.

Take care with *Phoenix canariensis* when laying down for transport and picking up for planting. Trunks are prone to break just proximal of the "pineapple" when in a horizontal position because of the excessively heavy canopy and trunk tissues that have yet to attain optimal strength. Also, constrictions or decay at this area in the upper part of the trunk further weaken it. Consider providing external support during the trans-

Figure 69. (Left) These *Phoenix canariensis* have yet to have their trunks rejuvenated through high-pressure washing. See Figure 70 to see how they looked after rejuvenation.

Figure 70. (Center) These are the same *Phoenix canariensis* in Figure 69 but after their trunks were rejuvenated.

Figure 71. (Right) The presence or absence of white ramenta (coarse hairs) on abaxial leaf surfaces is a useful character to identify various species of *Phoenix* (*P. roebelenii*).

planting process, using splints made of strong, heavy, sturdy timbers securely lashed to the upper part of the trunk proximal of the "pineapple."

Although replanting with *Phoenix canariensis* at the same site where one has died from Fusarium wilt is strongly discouraged and not recommended, there might be some instances where it is unavoidable. In such instances, consider excavating a planting hole at least 10 × 10 × 10 feet and lining all four sides of the pit with heavy, six-mm, black, polyethylene sheeting to act as a barrier against introduction of surrounding site soil that might be contaminated. While certainly not fool proof, this method might reduce the chance of early contamination of a newly planted palm. This planting technique and the above-mentioned one for supporting the trunk during transplanting will be discussed in detail in an upcoming installment of this continuing series.

Other maintenance

Trunks of many *Phoenix*, but especially *P. canariensis*, can become dark or otherwise discolored with time due to dust, air pollution, sun burn, oxidation of tissues, algae, mineral deposits from irrigation water (trunk staining, Hodel 2012a), and simple aging. Many people find these dark nearly black trunks unattractive and unappealing and long for the look of a newly planted palm with a freshly skinned or peeled, brown trunk. Infrequent, high-pressure washing with ordinary water at about 1,000 to 2,000 psi (rated output) from a flat nozzle (15-degree arc) held about 18 inches from the trunk can effectively remove dust, dirt, algae, stains, and air pollution particles as well as the thin outer layer of aged, darkened tissue, leaving a clean, fresh-looking, rejuvenated, brown trunk (Figs. **65-70**). High-pressure washing might also be considered for managing or cleaning up ragged "pineapples."

Identification

Four leaf characters and one seed character, usually alone or certainly in combination, are sufficient to distinguish *Phoenix* from all other palms. The four leaf characters are induplicate, pinnate leaves with pinnae having pointed apices; the presence of acanthophylls; the presence of the layer of tissue called "haut" on the adaxial surface of unopened leaves; and pinnae lacking a midrib. The seed with a prominent, longitudinal furrow is unique.

Some characters used to distinguish species of *Phoenix* include habit (whether solitary or clustered and overall size); size and surface of trunks without leaf bases; number, size, and color of leaves and how they are held (flat vs. tilt); presence or absence of white ramenta (coarse or scurfy hairs) on abaxial midrib and adjacent surfaces (**Fig. 71**); concolorous or discolorous pinnae surfaces; arrangement of pinnae (regular or grouped, inserted in one or several planes); size and shape of inflorescences; fruit size and color; and ruminate (intrusions of seed coat into the endosperm) or homogenous (no seed coat intrusion) endosperm. Leaf color, which is primarily due to the layer of powdery or glaucous gray wax or bloom, can be variable, and depends on climate, culture, angle of the sun, and even distance from the palm that one views it. For example, leaves of *P. dactylifera* 'Zahidi' are distinctly gray when viewed from about 150 to 300 feet but when viewed from about 30 feet they appear less gray.

Because *Phoenix* spp. hybridize readily in cultivation, many intermediate forms are present in the landscape that can make identification challenging (see below under Hybrids).

More common landscape *Phoenix*

Descriptions are from Barrow (1998), Hodel (1995, 1998), and, especially for *Phoenix dactylifera* and its varieties, Hodel and Johnson (2007).

Phoenix canariensis
Canary Island date palm

Habit: solitary, robust, massive, tree palm, moderately slow to 80 feet tall (**Fig. 72**). **Trunk:** to 3 feet DBH, brown aging black, marked with elliptic leaf scars, distally just below the canopy old leaf bases persist and these are often shaped or sculpted into a tight, compact structure referred to as a 'ball" or "pineapple." **Leaves:** ascending to spreading to

Key to Species of More Common Landscape *Phoenix*

This key identifies the more common landscape species of *Phoenix* in California, Hawai'i, southern Nevada, and western Arizona. Species found primarily in botanical gardens or private collections, such as *P. acaulis*, *P. paludosa*, and *P. theophrasti*, are not included but are discussed below under Other Species.

1. Habit clustered (multiple trunks or stems).
    2. Plants small, typically less than 15 feet tall.
        3. Pinnae soft, abaxially with white ramenta (scurfy hairs) on midrib; trunk to 4 inches DBH, with protuberant remnants of leaf bases) . . . . . ***P. roebelenii***
        3. Pinnae stiff, abaxially without white ramenta (scurfy hairs) on midrib; trunk to 10 inches DBH, not with protuberant remnants of leaf bases . . . . . ***P. loureiroi***
    2. Plants medium to large; trunk medium to large (8 inches or more DBH).
        4. Leaves dark glossy green, pinnae abaxially with white ramenta (scurfy hairs) on midrib . . . . . ***P. reclinata***
        4. Leaves variously glaucous, pinnae abaxially without white ramenta (scurfy hairs) on midrib . . . . . ***P. dactylifera***
1. Habit solitary (single trunk or stem).
    5. Plants small, typically less than 15 feet tall.
        6. Pinnae soft, abaxially with white ramenta (scurfy hairs) on midrib; trunk to 4 inches DBH, with protuberant remnants of leaf bases) . . . . . ***P. roebelenii***
        6. Pinnae stiff, abaxially without white ramenta (scurfy hairs) on midrib; trunk to 10 inches DBH, not with protuberant remnants of leaf bases . . . . . ***P. loureiroi***
    5. Plants medium to large; trunks medium to large (8 inches or more DBH).
        7. Plants large; trunk large (24-36 inches DBH) . . . . . ***P. canariensis***
        7. Plants medium; trunk medium (8-20 inches DBH).
            8. Pinnae dark glossy green, abaxially with white ramenta (scurfy hairs) on midrib, acanthophylls in one plane . . . . . ***P. rupicola***
            8. Pinnae grayish green or glaucous, abaxially without white ramenta (scurfy hairs) on midrib, acanthophylls arranged in several planes.
                9. Pseudopetiole to 20 inches long, acanthophylls closely spaced . . . . . ***P. sylvestris***
                9. Pseudopetiole more than 20 inches long, acanthophylls sparsely arranged . . . . . ***P. dactylifera***

drooping, to 18 feet long, mostly flat, infrequently tilted; leaf base to 2 feet long, deeply split opposite petiole, margins fibrous; acanthophylls to 8 inches long, pointing in several directions, green aging to yellow; other pinnae ca. 200 on each side, to 12 × 1 inches, closely and mostly regularly arranged in mostly one plane, green. **Inflorescences**: interfoliar, staminate to 3 feet long, cream-colored in flower but mostly hidden among leaves; peduncle 2 feet long; rachillae spreading to drooping; pistillate to 7 feet long, orange; peduncle to 6 feet long; rachillae spreading to drooping. **Fruit:** to 0.8 × 0.5 inch, obovoid, yellow-green to golden yellow.

Ecology and distribution: in valleys along seasonally dry streams in open, rocky situations, Canary Islands, Spain.

Landscape adaptation: higher elevation, cooler areas in Hawai'i; coastal plains and valleys and inland valleys of California; low deserts of California, southern Nevada, and western Arizona; full sun; tolerates extreme heat, aridity, wind; cold; requires regular irrigation in desert areas but established plants need little or no irrigation in coastal plains and valleys of California.

Figure 72. (Left) *Phoenix canariensis* is a massive yet regal palm (Centerpointe, La Palma, CA).

Figure 73. (Center left) *Phoenix canariensis* has few peers for stateliness (MacArthur Court, Newport Beach, CA).

Figure 74. (Center right) *Phoenix canariensis* makes an impressive statement in the landscape (MacArthur Court, Newport Beach, CA).

Figure 75. (Right) *Phoenix canariensis* is at its best here at the Newport Center in Newport Beach, CA.



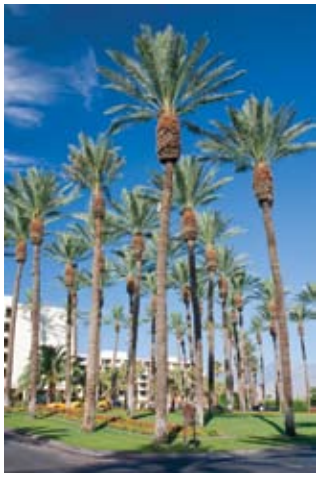



Figure 76. (Left) ***Phoenix canariensis*** **is the one of two iconic, signatures palms for California.**

Figure 77. (Center left) Canopies of ***Phoenix canariensis*** **often exhibit gender dimorphism. Canopies of pistillate plants (left) tend to be more rounded while those of staminate plants (right) tend to be more flat-topped.**

Figure 78. (Center right) Naturally ***Phoenix dactylifera*** **is a clustered palm (Hyatt Newporter, Newport Beach, CA).**

Figure 79. (Right) ***Phoenix dactylifera*** **in the landscape are typically solitary because the basal offshoots have been removed, and with age they can become rather tall (Marriott Desert Springs Resort, Palm Desert, CA).**

Notes: *Phoenix canariensis* is the most common large palm in California and the desert Southwest. With few peers for size, grandeur, and stateliness (**Figs. 73-75**), it is the one of two iconic, signatures palms for California (**Fig. 76**). Unfortunately, it is susceptible to two serious, fatal diseases, *Fusarium* wilt and sudden crown drop (which see under Cultivation and Landscape Management), and is listed officially as an invasive species in California and should be likewise for Hawai'i. It is also susceptible to magnesium and potassium deficiencies. There is a trend in this species for gender dimorphism in the shape of the canopy. Staminate plants tend to be flat-topped and the entire canopy is square or rectangle in shape while pistillate plants tend to have a rounded top and canopies are circular in shape (**Fig. 77**).

Phoenix dactylifera
date palm

Habit: variable, naturally clustered (**Fig. 78**) but usually solitary in the landscape, moderate, large-sized, tree palm, moderately slow to 70 feet tall (**Fig. 79**). **Trunk:** to 20 inches DBH, brown, marked with diamond-shaped leaf scars, often covered by persistent leaf bases distally, if clustered trunks on the periphery tend to lean outwardly in a picturesque manner. **Leaves:** ascending to spreading to slightly drooping, to 16 feet long, flat to tilted; leaf base to 1 foot long, deeply split opposite petiole, margins fibrous; pseudopetiole variable in length among varieties; acanthophylls to 8 inches long, pointing in several directions, gray-green; other pinnae to 130 on each side, to 35 × 2 inches, variously arranged and in up to 3 planes especially proximally, gray-green to gray, glaucous. **Inflorescences**: interfoliar, staminate to 3 feet long, cream-colored; peduncle to 20 inches long; rachillae spreading to drooping; pistillate to 9 feet long, peduncle to 7 feet long; rachillae spreading to drooping. **Fruit:** to 2 × 1.2 inches, variously shaped, yellow-green to orange, red, purplish brown, brown, or black.

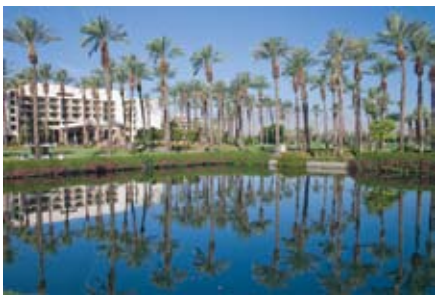
Ecology and distribution: natural distribution unknown but likely around oases, seeps, springs, and seasonal water courses in the Middle East and northern Africa.

Landscape adaptation: dry areas of Hawai'i; coastal plains and valleys and inland valleys of California; low deserts of California, southern Nevada, and western Arizona; full sun; tolerates extreme heat, aridity, wind; cold; requires regular irrigation in desert areas but established plants need little or no irrigation in coastal plains and valleys of California.

Notes: Cultivated for millennia in the Middle East, Southwest Asia, and northern Africa, *Phoenix dactylifera* is unusually variable in habit, trunk,

Figure 80. (Left) Because commercial date orchards in California's Coachella Valley have been a reliable source of uniform and relatively inexpensive palms over the last 30 years, ***Phoenix dactylifera*** **is now a common landscape subject (The Market Place, Tustin, CA).**

Figure 81. (Right) These exceptionally well grown ***Phoenix dactylifera*** **are impressive (11999 Harbor Blvd., Garden Grove, CA).**



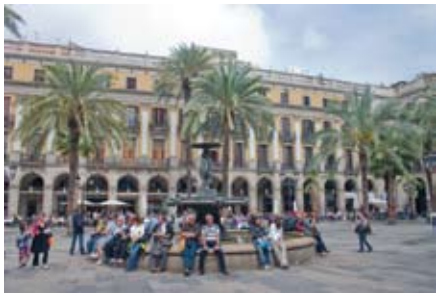


Figure 82. (Left) *Phoenix dactylifera* are natural subjects for hot, arid deserts and around water (Marriott Desert Springs Resort, Palm Desert, CA).

Figure 83. (Center) *Phoenix dactylifera* is used extensively in the Mediterranean climate of southern Europe (Mirado de Colon, Barcelona, Spain).

Figure 84. (Right) Phoenix *dactylifera beautifies* the Plaça Reial, Barcelona, Spain.

leaf, and fruit (Barrow 1998, Hodel and Johnson 2007). It is especially common in landscapes in California and the desert Southwest. The commercial date orchards of primarily the Coachella Valley in California have served as a reliable source of uniform and relatively inexpensive palms for the landscape industry over the last 30 years in California (**Fig. 80-81**), the desert Southwest (**Fig. 82**), and even as far away as Texas and Florida. It is also a popular landscape palm along the Spanish, French, and Italian Rivieras in southern Europe (**Figs. 83-84**) Date growers realized that they could grow these palms for 25 years or so and make money from date fruit production and then, when the palms attained a sufficient height, sell them into the landscape trade. Indeed, nearly all the impressive plantings in California, especially those in Orange County around Tustin, Irvine, and Newport Beach, where established during this period.

Because the landscape date palms mostly originate from fruit-producing orchards, nearly all specimens in cultivation are pistillate and there are few, if any, staminate plants of this species in the landscape to provide pollen. However, *Phoenix* is a promiscuous genus and the species are easily wind-pollinated; thus, nearly all the cultivated pistillate palms set fruits (which can be messy) (**Fig. 85**), their flowers pollinated by the chance staminate palm in the vicinity or other nearby species, like *P. canariensis*, *P. reclinata*, and *P. roebelenii*. Also, nearly all plants in the landscape lack basal trunk suckers or offshoots because they were removed to make new orchard plantings. Typically, plants produce a set number of offshoots, which varies by variety (see below), and once they are removed the plant produces no more.

If clumping, judiciously remove trunks to control clump height, width, and density. The date palm appears susceptible to magnesium and boron deficiencies. It does not appear susceptible to *Fusarium* wilt; consider replacing *Phoenix canariensis* infected with *Fusarium* wilt with *P. dactylifera*, especially staminate plants because

Figure 85. (Left) Despite being dioecious, nearly all the pistillate plants of *Phoenix dactylifera* in the landscape set fruits, which, while attractive, can be messy, their flowers pollinated by the chance staminate palm in the vicinity or other nearby species of *Phoenix* (California State University, Fullerton).

Figure 86. (Right) Staminate plants of *Phoenix dactylifera* are more robust and have larger canopies than their pistillate counterparts, making them a suitable substitute for *P. canariensis*, especially where Fusarium wilt is a problem (The Plantation, Indio, CA)

Table 1. Characteristics of the Most Common Pistillate Varieties of *Phoenix dactylifera* in the Landscape (Hodel and Johnson 2007).

Character	Barhee	Deglet Noor	Halawy	Honey	Khadrawy	Medjool	Zahidi
Habit	robust	medium	medium	medium	short	medium	medium
Trunk	robust	slender	slender	medium	medium	medium	medium
Leaves	to 14.5 feet long, slight to moderate curvature, light elm-green with heavy glaucous bloom.	to 16.4 feet long, slight curvature, olive-green with light glaucous bloom.	to 13.1 feet long, slight to moderate curvature, hellebore-green with moderate glaucous bloom.	to 14 feet or longer, slight curvature, olive-green with light glaucous bloom.	to 12.5 feet long, moderate curvature, jade-green with only light glaucous bloom.	to 12 feet long, slight curvature, olive-green with light glaucous bloom.	to 13.8 feet long, little or no curvature, hellebore-green with very heavy glaucous bloom.
Pseudo-petiole	1/5 of blade	¼-1/3 of blade	¼-1/3 of blade	¼ of blade	1/7-¼ of blade	¼ of blade	1/7-¼ of blade
Acantho-phylls	28-36	40-60	18-33	36	15-25	30-39	25-30
Pinnae (inches)	to 28 × 2	to 35 × 1.5	to 24 × 1.9	to 31.5 × 2	to 24.8 × 1.7	to 32.5 × 2	to 30 × 1.7
Apical divergence angle°z	80-95	65-85	___	85	___	55-75	60-80
Fruit stalks (length in feet)	9.5	6.5	5	6	5	5	5
Fruit (inches)	0.85-1.45 × 0.8-1.2, broadly ovate to rounded, amber.	1.6-1.95 × 0.8-1, oblong-ovate, brownish.	1.4-1.8 × 0.7-0.8, oblong, golden brown.	1.6-1.9 × 0.8-0.9, oblong-oval, reddish brown	1.3-1.6 × 0.8-0.9, oblong, reddish brown to nearly black.	1.5-1.9 × 1-1.25, broadly oblong-oval, reddish brown.	1.2-1.6 ×0.9-1, obovate, reddish brown and yellow.
Offshoots	6-8	3-12	10-15	6-12	15-20	15-20	15-20
Notes	Moderately open canopy; graceful, grayish green leaves; delicious fruit.	Very open, airy canopy; graceful grayish-green leaves.	Very open, airy canopy; graceful, bluish green leaves.	Similar to 'Deglet Noor'; open, airy canopy; graceful grayish-green leaves.	Short palms; moderately curved leaves with flat blades; apical pair of pinnae long and wide spread.	Rather dense canopy with stiff, ruffled leaves; delicious, large fruit.	Very dense, formal canopy with stiff, straight, gray leaves; often produces multiple apical meristem and then offshoots or branches in the canopy.

[z]Apical divergence angle is a measurement of the angle formed by opposite ranks of pinnae with the distal extension of the rachis 12 inches below the apex on the abaxial surface. It is indicative of how forward-pointing are the pinnae: the smaller the angle the more forward-pointing.

they have a more robust trunk and look more like *P. canariensis* than do pistillate plants (**Fig. 86**) (which see below under staminate varieties of *P. dactylifera*).

About 3,000 varieties of *Phoenix dactylifera* are documented (Hodel and Johnson 2007). Most are pistillate varieties and, because they are vegetatively propagated from offshoots, each variety is a clone where all individuals of the same name are genetically identical. Nearly all pistillate or fruiting varieties originated in the Middle East or northern Africa and were imported into the United States in the early 1900s. Some American varieties have been developed, usually from chance seedlings from established pistillate varieties but some from formal breeding programs, yet they account for just a miniscule fraction of the fruit production and palms available for the landscape. The three most common pistillate varieties in the landscape, from most to least common, are 'Deglet Noor', 'Medjool', and 'Zahidi', all imported varieties. 'Medjool' and 'Zahidi' are considered more attractive landscape subjects but 'Zahidi' has a tendency to produce multiple apical meristems and offshoots and subsequent aerial branches, which might have to be removed due to safety and esthetic concerns (which see above under Pruning and below under 'Zahidi'). **Table 1** summarizes characteristics of these three varieties and four others, 'Barhee', 'Halawy', 'Honey', and 'Khadrawy', which might also appear in the landscape but only rarely.

Figure 87. (Left) *Phoenix dactylifera* 'Barhee' has a robust habit, thick trunk, and long, stout, slightly to moderately curved leaves (U. S. D. A. Germplasm Collection, Thermal, CA).

Figure 88. (Right) Leaves of *Phoenix dactylifera* 'Barhee' have a pronounced whitish bloom (U. S. D. A. Germplasm Collection, Thermal, CA).

Distinguishing varieties of *Phoenix dactylifera* can be challenging. 'Medjool' and 'Zahidi' are the most distinctive and can usually be easily identified, which means most everything else must be 'Deglet Noor'. However, while this scenario is mostly the case, cultivation and environment appear to affect leaf length and color of 'Deglet Noor', and a few rare varieties similar to 'Deglet Noor', like 'Halawy', 'Khadrawy', and perhaps 'Honey', and chance seedlings of intervarietal hybrids might infrequently appear in the landscape, adding to the confusion and making identification sometimes difficult and perplexing.

'Barhee'

'Barhee' has a robust habit, thick trunk, and long, stout, slightly to moderately curved leaves with unusually wide, slightly drooping pinnae (**Fig. 87**). The leaves have a pronounced whitish bloom (**Fig. 88**). The distinctive fruits are broadly ovate to rounded, and amber-colored, and are among the highest quality of all date varieties. It produces few offshoots, only about six to eight, over its life.

'Deglet Noor'

'Deglet Noor', the most common variety in the landscape, has an open, airy canopy, slender trunk and habit, and unusually long, moderately curved, olive-gray-green leaves (**Figs. 89-90**). The unusually long pseudopetiole bears numerous acanthophylls and gives an open, airy appearance to the canopy. The narrow pinnae arise from the blade in many planes. It produces few offshoots over its life, only about 3 to 12, and all within three feet of the ground. An impres-

Key to Most Common Pistillate Varieties of *Phoenix dactylifera* in the Landscape

Trunk short; distal pair of pinnae longer than immediately proximal ones . . . . . **'Khadrawy'**
Trunk tall; distal pair of pinnae shorter than immediately proximal ones.
  Pseudopetiole long, ¼-⅓ of blade length.
    Acanthophylls 40-60 . . . . . **'Deglet Noor'**
    Acanthophylls 18-36.
      Leaves mostly to 13 feet long with moderate glaucous bloom . . . . . **'Halawy'**
      Leaves to 14 feet or longer with light glaucous bloom . . . . . **'Honey'**
  Pseudopetiole short to medium, ⅐-¼ of blade length.
    Leaves conspicuously curved . . . . . **'Barhee'**
    Leaves mostly straight with little or no curvature.
      Pinnae with heavy glaucous-gray bloom, appearing grayish . . . . . **'Zahidi'**
      Pinnae with only light glaucous bloom, appearing mostly olive-green . . . . . **'Medjool'**

sive planting of 'Deglet Noor' is in the Anaheim Entertainment District along Katella Avenue near Disneyland and the Anaheim Convention Center (**Fig. 89**).

'Halawy'

A combination of characters distinguishes 'Halawy', including the open, airy canopy, somewhat glaucous-green, medium-long leaves with moderate curvature, and broad, stiff pinnae (**Fig. 91**). It produces 10 to 15 offshoots over its life. These have relatively small connections to the mother palm and are easily removed and root readily.

'Honey'

An American variety , 'Honey' is a seedling of 'Deglet Noor' that E. K. Duvall selected and planted on his property in the Coachella Valley in 1916 or 1917 (Hodel and Johnson 2007). Not surprisingly, it is similar to 'Deglet Noor' in its leaves and long, greenish yellow fruit stalks but differs in its wider pinnae (**Fig. 92**).

Figure 89. (left) *Phoenix dactylifera* 'Deglet Noor' is the most common variety of date palm in the landscape (Katella Ave. east of Harbor Blvd., Anaheim, CA).

Figure 90. (Right) *Phoenix dactylifera* 'Deglet Noor' has an open, airy canopy of long, curved leaves (17900 Von Karman Ave., Irvine, CA).

'Khadrawy'

One of the more distinctive of all date varieties, 'Khadrawy' grows slowly and old palms are conspicuously shorter than those of other varieties (**Fig. 93**). The moderately arched leaves, relatively few in number, have more or less flattened blades with short, rather stiff, closely and evenly set pinnae. The distal pair of pinnae are distinctive because they are longer than the immediately proximal pinnae, giving a "fishtail' appearance to the end of the blade (**Fig. 94**).

'Medjool'

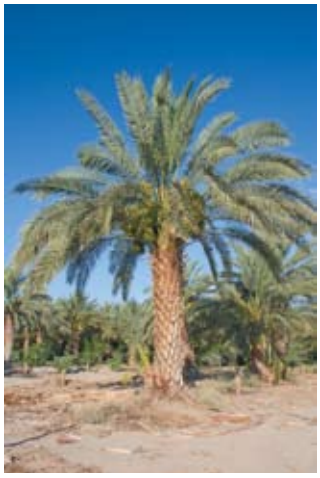
'Medjool', considered by many one of the most handsome of the date varieties for ornamental landscape use, has a medium trunk and habit and a relatively small and dense canopy (**Fig. 95**). The short to medium, olive-green leaves with little glaucous bloom have slight if any curvature and densely set, conspicuously forward-pointing pinnae in several planes (**Fig. 96**), giving the leaf an especially plumose or ruffled appearance. The small to

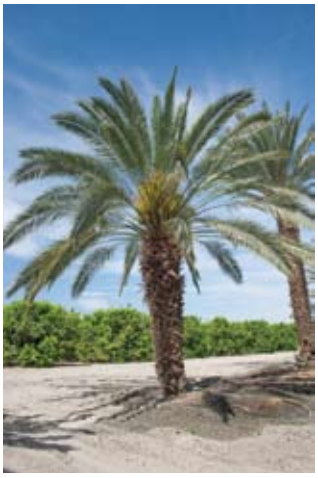
Figure 91. (Left) Much like *Phoenix dactylifera* 'Deglet Noor', P. dactylifera 'Halawy' has an open, airy canopy but leaves are shorter and have broader pinnae (U. S. D. A. Germplasm Collection, Thermal, CA).

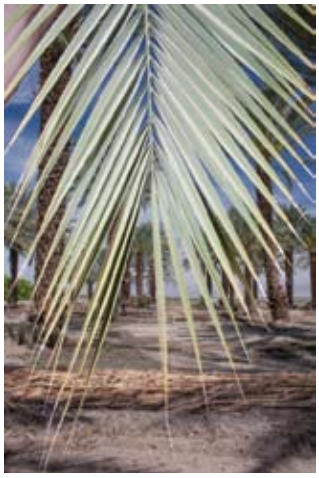
Figure 92. (Center left) The American variety *Phoenix dactylifera* 'Honey' is a also similar to *P. dactylifera* 'Deglet Noor' but has wider pinnae (Indio, CA).

Figure 93. (Center right) *Phoenix dactylifera* **'Khadrawy' grows slowly and old palms are conspicuously shorter than those of other varieties (U. S. D. A. Germplasm Collection, Thermal, CA).**

Figure 94. (Right) The distal pair of pinnae of *Phoenix dactylifera* 'Khadrawy' are distinctive because they are longer than the immediately proximal pinnae, giving a "fishtail' appearance to the end of the blade (U. S. D. A. Germplasm Collection, Thermal, CA).







medium but bright orange peduncles of the infructescences are especially conspicuous. It is a prolific producer of offshoots. 'Medjool' is reputed to be one of the best varieties for use near the coast.

The most impressive planting of 'Medjool' in California is at 20-40 Pacifica in Irvine (**Fig. 97**). Another nice planting is nearby at the WATG Building at 8001 Irvine Center Drive (**Fig. 98**). Other noteworthy plantings of 'Medjool' in Irvine are at Lakeshore Towers on Von Karman Avenue (**Fig. 99**) and at 1920 Main Street (**Fig. 95**). Other plantings of 'Medjool' are at Chapman University in Orange, The Palm Court on Slover Avenue in Fontana, the Huntington Beach Sports Complex on Goldenwest Street in Huntington Beach (**Fig. 100**), and at 500 E. Harbor Drive in San Diego (**Fig. 101**).

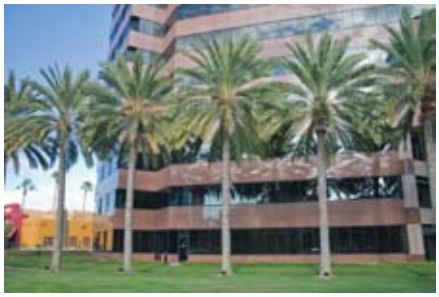


Figure 95. (Left) Considered by many one of the most handsome of the date varieties for ornamental landscape use, *Phoenix dactylifera* 'Medjool' has a medium trunk and habit and a relatively small and dense canopy (1920 Main St., Irvine, CA).

Figure 96. (Right) Pinnae of *Phoenix dactylifera* 'Medjool' are densely set and conspicuously forward-pointing pinnae in several planes.

'Zahidi'

'Zahidi', perhaps the most handsome of the date varieties for ornamental landscape use, is distinctive on several counts. Although the trunk and habit are medium, the leaves have a dense, especially heavy glaucous bloom, making them appear unusually gray (**Fig. 102**). Stiff, somewhat upswept, straight leaves with little or no curvature (**Fig. 103**) and a short pseudopetiole give the canopy a dense, compact, and formal appearance (**Fig. 104**). Also distinctive are dead, straw-colored leaf tips and/or scattered pinnae that mark the blade here and there (**Fig. 105**). The infructescences are unusually short with densely crowded fruits.

'Zahidi'produces up to 20 off-

Figure 97. (Left) An impressive planting of *Phoenix dactylifera* 'Medjool' is at 20-40 Pacifica, Irvine, CA.

Figure 98. (Above center left) Another impressive planting of *Phoenix dactylifera* 'Medjool' is at 8001 Irvine Center Dr., Irvine, CA.

Figure 99. (Below center left) ***Phoenix dactylifera* 'Medjool' grace a building at 18191 Von Karman Ave., Irvine, CA.**

Figure 100. (Above center right) The Huntington Beach Sports Complex on Goldenwest Street in Huntington Beach is home to *Phoenix dactylifera* 'Medjool'.

Figure 101. (Below center right) *Phoenix dactylifera* 'Medjool' are better adapted for use along the immediate coast than most date varieties (500 E. Harbor Dr., San Diego, CA).

Figure 102. (Right) Perhaps the most handsome of the date varieties for ornamental landscape use, leaves of *Phoenix dactylifera* 'Zahidi' have a dense, especially heavy glaucous bloom, making them appear unusually gray (1221 Placentia Ave., Anaheim, CA).

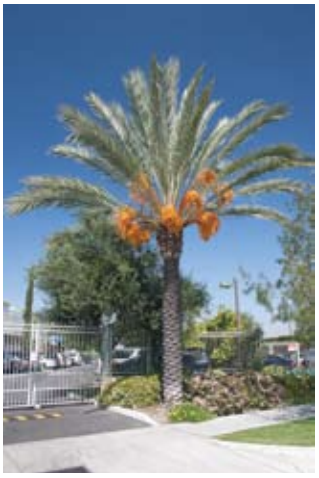


Figure 103. ***Phoenix dactylifera*** **'Zahidi' typically has a dense, formal canopy composed of stiff, somewhat upswept leaves. Note the telltale scars about mid trunk where apical offshoots have been removed (7777 Milliken Ave., Rancho Cucamonga, CA).**

shoots over its life, some as much as 20 feet or more above the ground. Indeed, the ability of "Zahidi' to produce these offshoots (multiple apical meristems and vegetative branches) up in the canopy (**Fig. 106**), while often characteristic of this variety, is one of the few drawbacks for landscape use. These aerial offshoots, which genetics and/or boron deficiency might cause, typically are removed because they detract esthetically from the formal appearance of the canopy and might fail and fall out, causing damage to people and property below. Such palms have the telltale rounded to oval, naval-like scars where offshoots were once attached high up on the trunk or among the leaf bases (**Fig. 107**). When removing these aerial offshoots, ensure that they are cut sufficiently proximal (below) or behind their apical meristem otherwise they will resprout and grow again.

The most impressive plantings 'Zahidi' can be seen in California at The Citadel, along Interstate-5 in the city of Commerce, southeast of Los Angeles; at Seacliff Shopping Center on Goldenwest Street in Huntington Beach (**Fig. 108**); at Irvine Towers on Van Karman Ave., Irvine; and the south parking lot of the South Coast Plaza bordering Interstate 405 near Bear Street in Costa Mesa. Several other plantings, while not so impressive, have many palms with multiple aerial offshoots. These plantings are near the Long Beach Aquarium in Long Beach; at the 183rd Street and Artesia Boulevard interchanges on the 91 Freeway in Cerritos (**Fig. 109**); and on Gridley Road just north of South Street in the Cerritos Mall, also in Cerritos (**Fig. 106**).

Staminate Varieties of *Phoenix dactylifera*

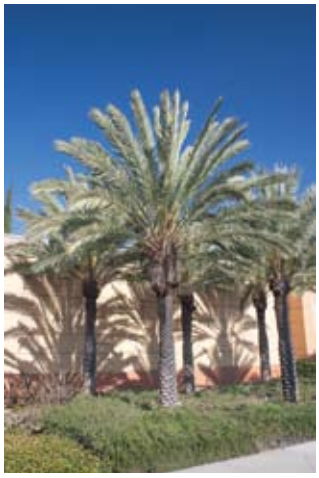
Staminate plants of *Phoenix dactylifera* generally have a significantly larger and more robust habit and have larger canopies and more leaves than their pistillate counterparts (**Figs. 86, 110-111**). Retaining longer but still neatly pruned leaf bases on staminate plants increases the diameter of the trunk even more, making these staminate palms appear even more like *P. canariensis* than *P. dactylifera* (**Fig. 112**). The larger, more robust habit, trunks, and canopies coupled with their resistance to Fusarium wilt make staminate plants an appropriate choice for replanting where *P. canariensis* have died from this disease if one wishes to retain the *P. canariensis* motif. Unfortunately, staminate plants comprise only about two percent of *P. dactylifera* (typically planted in the date orchard one staminate per 50 pistillate plants per acre) so they are more scarce and more expensive. Named staminate varieties include 'Crane' and 'Jarvis' (**Fig. 113**) although in the landscape trade they typically are referred to

Figure 104. (Left) ***Phoenix dactylifera*** **'Zahidi' has a dense, formal canopy of stiff, gray leaves (The Citadel, Commerce, CA).**

Figure 105. (Center left) Another distinguishing character of ***Phoenix dactylifera*** **'Zahidi' is that a few necrotic pinnae typically mar the leaf here and there (center).**

Figure 106. (Center right) Perhaps the most distinctive character ***of Phoenix dactylifera*** **'Zahidi' is its tendency to form multiple apical meristems and offshoots (1800 Gridley Ave., Cerritos, CA).**

Figure 107. (Right) Even when apical offshoots of ***Phoenix dactylifera*** **'Zahidi' are removed, the rounded, naval-like scars they leave are a telltale sign of this variety (1245 S. McClellan Dr., Los Angeles, CA).**



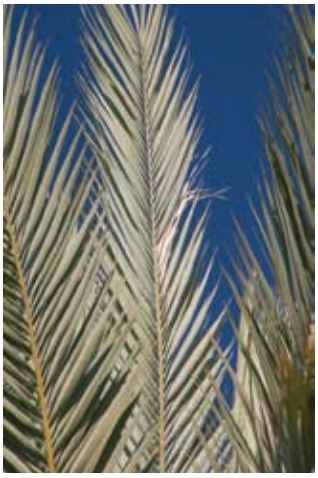





Figure 108. (Left) Seacliff Village Shopping Center in Huntington Beach, CA has an impressive planting of *Phoenix dactylifera* 'Zahidi'. Note the telltale scars in the 'pineapple" just below the leaves where apical offshoots have been removed.

Figure 109. (Center left) Careful inspection of these tall *Phoenix dactylifera* 'Zahidi' show a dense center canopy crowded with apical offshoots (12800 Artesia Blvd. at the 91 Freeway, Cerritos, CA).

Figure 110. (Center right) Staminate plants of *Phoenix dactylifera* generally have a significantly larger and more robust habit and have larger canopies and more leaves than their pistillate counterparts, making them look more like *P. canariensis* (12062 Valley View St., Garden Grove, CA).

Figure 111. (Right) A grove of robust staminate plants of *Phoenix dactylifera* is at The Plantation, Indio, CA.

only by the generic term "macho" (meaning male). Their larger, more robust habit and canopy and short inflorescences that do not set fruit are sufficient to identify staminate *P. dactylifera* (**Fig. 114**). In the spring when they flower the panicle at the end of the staminate inflorescence is more compact with shorter, whitish flowering strands or rachillae (**Fig. 115**) while pistillate inflorescences have larger, more expansive panicles with longer, yellowish rachillae.

Donald R. Hodel is the Environmental and Landscape Horticulture Advisor for the University of California Cooperative Extension in Los Angeles, a position he has held for nearly 30 years. Don develops and implements educational and applied research programs for the professional tree and landscape management industries. He specializes in the selection and management of trees and palms. <drhodel@ucanr.edu>.

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Figure 112. (Left) Retaining long er but still neatly pruned leaf bases on staminate plants of *Phoenix dactylifera* increases the diameter of the trunk even more, making them appear more like *P. canariensis* (11300 Birch St., Bloomington, CA).

Figure 113. (Center left) *Phoenix dactylifera* 'Jarvis' is one of the few named, staminate varieties (U. S. D. A. Germplasm Collection, Thermal, CA).

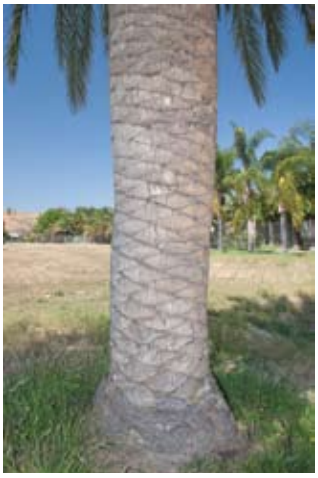
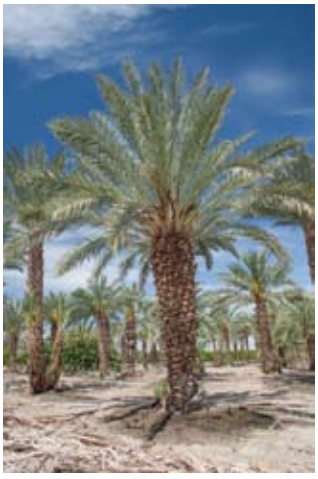

Figure 114. (Center right) Besides their more robust habit and larger canopies, the short, whitish inflorescences distinguish staminate varieties of *Phoenix dactylifera* (U. S. D. A. Germplasm Collection, Thermal, CA).

Figure 115. (Right) Staminate inflorescences of *Phoenix dactylifera* have short, compact, white to cream-colored flower-bearing rachillae (U. S. D. A. Germplasm Collection, Thermal, CA).