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What is a Palm Tree?

3,000 Palm Species

There are more than 3,000 species of palms around the world. Palms are in the *Arecaceae* family of *perennial* plants. They are *monocots* and have more in common biologically with grasses than with *hard wood trees*.

Coachella Valley Native

California fan palms, (*Washingtonia filifera*) named after our 1st president, are the only native palms to the Coachella Valley. It is believed that the Cahuilla Indians (the first inhabitants of Indian Wells) were the first to plant and transplant palms in the Coachella Valley. The palms were important to the Cahuilla because they could use the dead fronds to thatch their houses, harvest and grind fruits into flour, and modify the spine-covered frond stems into weapons.



Indian Wells Cahuilla Indians
Traditional Home with Palm fronds

Trunk

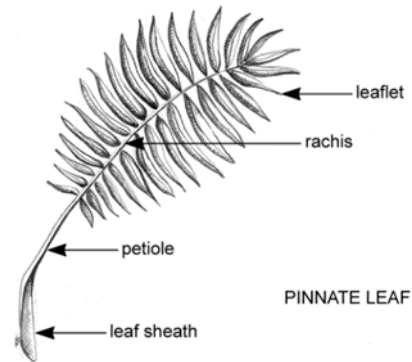
Palm stem or trunk, is the structure that holds the leafy vegetation above the ground. Palm stems have a single growing point or *apical*

Parts of the Palm

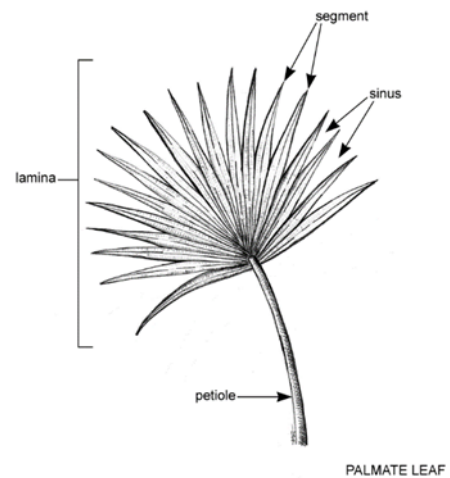
Leaves

Fronds are the leaves of the palm. Palms have the largest leaves of any trees. **Photosynthesis** takes place in the fronds, which dominate the **palm crown**. There are two classes of palm fronds:

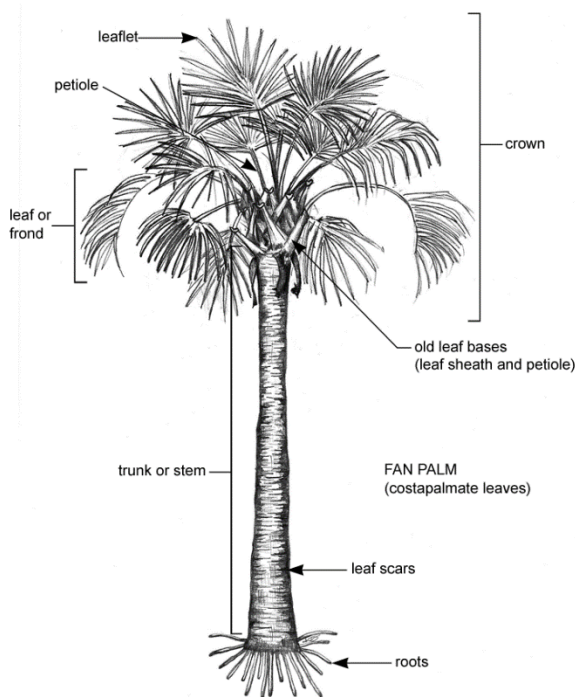
- 1) The **Pinnate** or feather leaf is long and slender. Examples of this type are the Date palm (*Phoenix dactylifera*), and the Pindo palm (*Butia capitata*).



- 2) The other is **Palmate** or fan leaves, which are circle shaped and makes near a 360-degree circle. Examples include California fan palm (*Washingtonia Robusta*) and Mexican blue palm (*Brahea armata*).



meristem. Most palms lack the capacity to generate a new apical meristem, so if damaged, the whole palm will die. The stem provides transportation and storage of water, minerals, and carbohydrates. Enabling palms to reach heights of 100 feet or more. One or a few irregular **trunk constrictions** usually represent periods of abnormal reduced growth or stress, from environmental events, such as severe cold, disease, and **culture** or **transplant shock**.

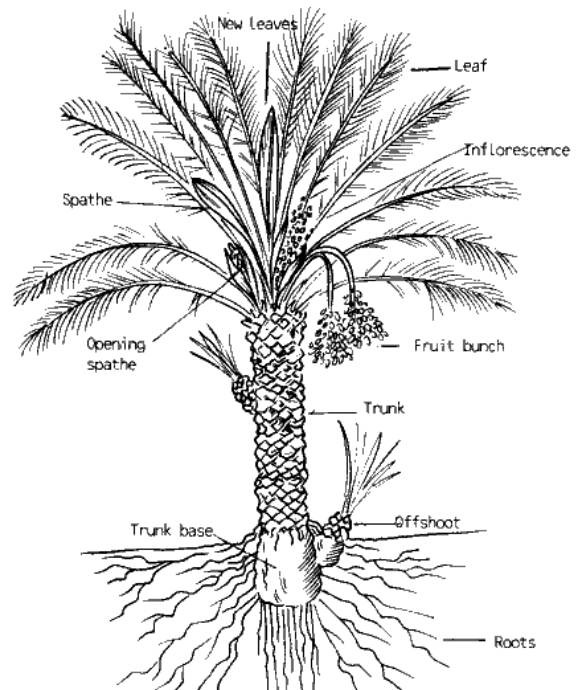


Fan palm parts

Flowers, fruits and seeds

Palm trees make flowers and produce seeds. There are both male and female flowers. Palm species where each individual plant is either male or female is called a **dioecious species**. Example is the date palm, which has to be hand pollinated in order to produce a commercial crop of

dates. Palms with flowers of both sexes on the same tree, are called **monoecious**, example is *Washingtonia robusta*. Palm fruits vary in sizes and shapes, typically fleshy, pulpy, mealy, or fibrous, and contain one or more hard seeds. There is a potential to stain concrete, so removal of the **inflorescences** prior to fruit drop, is recommended. While most palm fruit is edible, precautions should be taken, many other landscape plants fruit is poisonous.



Date palm parts

Roots

Palm roots tend to be diffuse and small in caliper. There is typically no massive **tap root** below the tree. They fan out with small to medium sized roots and have hair-like smaller roots that occupy the soil. They do not thicken like roots of hard wood trees. **Root initials** are produced throughout the life span of the plant. Making even very large specimens, able to be successfully transplanted. Palm roots are nowhere as invasive as hard wood trees.

Common palms used in the Coachella Valley.

Phoenix Dactylifera- (Date Palm)

Female date palms

- Date palms make a great landscape palm, as it is sourced locally from the many date palm groves in the eastern Coachella Valley. They are reasonable priced for their size compared to other trees. Date palms can successfully be transplanted with proper equipment and training.
- Grown in many tropical and subtropical regions worldwide for its fruit.
- Fruit, is sweet and edible, but can stain cement if not removed before fruit drop
- Leaves, pinnate, spreading to slightly drooping, to 12 feet long, leaf base to 1 foot wide, has 2 inch thorns along petiole, can be dethorned when trimmed.
- Height and growth, can reach 80 feet, grows about 1 foot per year, but starts to slow down to about ½ foot a year when reaches about 40 foot.
- Trunks, 14" to 16" diameter, if **diamond cut**, makes a nice manicured look, aerial roots up to 5 foot is natural in taller date palms, but can be manicured nicely.

Common varieties used in landscape

Deglet Noor

Hard date, fruit used mostly for **commercial use**, most common date palm used in landscape.



Deglet Noor dates-Diamond cut trunk

Medjool

Fruit soft and sweet to eat, has a little shorter and darker green fronds, making it more attractive for landscape use.



Medjool dates
Diamond cut trunk

Other Female Varieties

Zahidi

Transplants well, much shorter supply, tends to produce multiple apical meristems on the sides of the trunk, requiring annual removal.

Abbada, Barhi, Halawi, Honey, Khadrawi & Thoory

Soft fruit and good eating, do not transplant well, limited supply for landscape use.

Male (Macho)

- Macho dates are a great alternative to Canary Island date palm (*Phoenix canariensis*), transplants much better, not susceptible to ***Fusarium wilt***. Machos can be trimmed to match Canary Island date palms.
- Grown by farmers for the pollen, usually one row on end of field of female date palms.
- Fruit, pollen drops below palm and is dusty, but does not stain cement.
- Leaves, pinnate, spreading to slightly drooping, to 14 feet long, leaf base to 14 inches wide, has two inch thorns along petiole, can be dethorned when trimmed.
- Height and growth, can reach 60 feet, grows about 1/2 foot per year, but starts to slow down to about ¼ foot a year when reaches about 40 foot.
- Trunks, 16 inch to 24 inch diameter, can be diamond cut or ***flat cut*** to resemble Canary Island Date Palms, very common to have two foot to five foot of aerial roots, but can be manicured nicely
- Heads, can be ***pineapple cut*** to resemble Canary Island Date Palms



Macho dates- flat cut trunks, Similar look to Canary Island date palms.



Macho dates- natural, before harvested or cleaned

Washingtonia palms

Washingtonia filifera-California fan palm

- Native to California desert areas
- Fruit, edible, was used by the native Indians
- Leaves, palmate, to eight feet long, blade (fan part) 4 X 5 feet, one inch spines along petiole
- Height and growth, can reach 60 feet, grows about one foot per year
- Trunks, 14 inches to 24 inches after bark is peeled, can be left with dead fronds hanging down, called a *skirt*, dead fronds can be trimmed, leaving a natural look, or bark can be peeled off to give a clean, manicured look.
- Makes a great landscape tree, easy to move with proper equipment and training. Transplants well, drought tolerant after established, but will require irrigation water in the desert areas.

Washingtonia robusta-Mexican fan palm

- Native to Mexico
- Fruit, edible
- Leaves, palmate, to five feet long, blade (fan part) 3 X 3 feet, one inch spines along petiole
- Height and growth, can reach 90 feet, grows two to four feet a year
- Trunks, 9 inches to 12 inches after bark is peeled, can be left with dead fronds hanging down or called a skirt, dead fronds can be trimmed, leaving a natural look, or bark can be peeled off to give a clean manicured look.
- Makes a great landscape tree, easy to move with proper equipment and training, transplants well, the most economical landscape palm.



Washingtonia filifera- peeled



Washingtonia robusta- peeled

Washingtonia hybrid fan palm

- The hybrid is a cross between the *W. filifera* and the *W. robusta*, has characteristics of both. Sometime referred to as *filibusta* (Unofficial Scientific name).
- Fruit, edible
- Leaves, palmate, to seven feet long, blade (fan part) 3 X 4 feet, one inch spines along petiole
- Height and growth, can reach 70 feet, grows about one foot per year
- Trunks, 11 inches to 14 inches after bark is peeled, can be left with dead fronds hanging down, called a skirt, dead fronds can be trimmed, leaving a natural look, or bark can be peeled to give a clean manicured look.
- Makes a great landscape tree, easy to move with proper equipment and training. Transplants well, drought tolerant after established, but will require irrigation water in the desert areas.



Washingtonia hybrid fan palms-non peeled

Specialty palm species that are well suited for Coachella valley

***Bismarckia nobilis* (Bismarck palm)**

Beautiful whitish green large palmate fronds, does not transplant well.



Bismarck palm

***Brahea armata* (Mexican blue palm)**

Dark green palmate palm, drought tolerant after establishment



Mexican blue palm

Butia capitata (Pindo palm)

Beautiful pinnate palm, slow growing



Pindo palm

Phoenix roebelinii (Pygmy date palm)

Beautiful small pinnate palm, must source locally. There are California department of Agriculture restrictions from importing from out of Coachella Valley.



Pygmy date palm

Paurotis Palm (swamp palm)

Slender multi palmate palm, works great as center tree.



Swamp palm

Sabal palmetto (Cabbage palm)

Stocky palmate palm with long fronds



Cabbage palm

Palms NOT Suitable for Coachella Valley

Syagrus romanzoffianum (Queen palms)

They survive when less than five feet, then as they get taller the extreme hot dry days burns the meristem down in the crown, so you don't see the damage until late fall or winter.

Trachycarpus fortunei (Windmill palms)

Not recommend as Coachella Valley Summers are too hot.

Recommended practices for vitality of palms

Trimming

- The larger the canopy of green healthy fronds the better.
- Green palm fronds through photosynthesis, produce sugars for the palm to grow and keep healthy.



Washingtonia filifera
Over trimming will damage the palms

- Dead or dying fronds create extra weight and wind drag on the palm; also can be a fire hazard and a home for rodents.

- Tree spikes should never be used on any palms, damages the trunks both visually and physically, spike holes serve as entry for diseases and pests. The palm has no way to heal the damage.
- Trimming tools should be sanitized by soaking for 30 minutes in solution of 10% bleach and water between palms.

Washingtonia robusta palms

- Should be trimmed once a year early summer after inflorescences (flower/seed stalk) are fully emerged.
- Trim all dead or dying fronds close to the base, trim green fronds no more than 10:30 to 1:30, as compared to a clock face.
- Old frond bases can be peeled, as wanted, for aesthetic looks, but never closer than four foot from the crown.



Washingtonia robusta
proper "10:30 to 1:30" trimming

Washington filifera palms

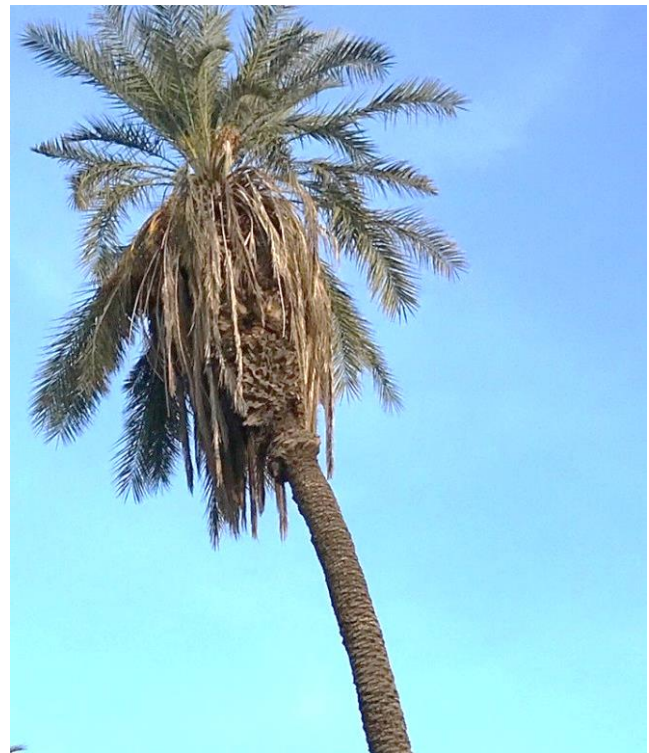
- Should be trimmed once a year early summer after inflorescences are fully emerged.
- Trim all dead or dying fronds close to the base, trim green fronds no more than 10 to 2, as compared to a clock face.
- Old frond bases can be peeled, as wanted for aesthetic looks, but never closer than five foot from the crown.

Phoenix dactylifera palms

- Should be trimmed once a year early summer after inflorescences are fully emerged.
- Trim all dead or dying fronds close to the base, trim green fronds no more than 9 to 3 as compared to a clock face.
- Trunk should be removed of old Frond bases or extended crown every five years, leave crown or pineapple about four feet long. This is to reduce weight in the head and expose any **pencil necking** or damaged trunks.



Date palm with "9 to 3" trimming



Date palm needs dead fronds and fruit removed, trunk cleaned, crown raised. This will reduce weight in top of palm (lower danger of breaking the wind), lower danger of falling tree parts; expose any "pencil necking" in the trunk.

Fertilization of palms

- A good quality “Palm Special” fertilizer is recommended
 - First application 60 days after initial transplanting,
 - One application in April
 - One application in July
- Follow manufacturer recommended quantities.

I recommend “Lesco 13-3-13 Palm and Tropical Ornamental Fertilizer” sold by “SiteOne” or “Lutz” “Maintaining Healthy Palms” Palm Tree Spikes, (Palm spikes only have to be installed once per year), found direct from Lutz, Amazon, and Home Depot.



Palm watering recommendations

Irrigation

- Should be above ground, either a drip hose with drippers, riser with a dripper or bubbler on top. A minimum of three per palm is recommended, five is better. The water transports oxygen down to the roots, water also pushes the salts in the ground down away from the roots.
- Deep water pipes are bad for the palms and never recommended, they do not transport oxygen down, and they push salts up into the roots of the palms.
- A small basin is recommended to keep water from running off before it has a chance to soak in.
- Multiple water cycles are recommended throughout the day with short run times.

Example water schedule

Weekly days “ON/OFF”

Stagnant or standing water can be an issue for palms. A short period of no irrigation is recommended for both observation and optimal root growth. If standing water is observed after the “OFF” period, water schedule should be reduced; alternatively if soil is dry after last “ON” period, irrigation should be increased.

Summer

Six days “ON”, One day “OFF” per week.

Winter

Four days “ON”, Three days “OFF” (not consecutive) per week

Recommended gallons per week

Hours/Minutes of time per station varies depending on the size and quantity of drippers per palm, so we will use gallons per week. Divide the gallons of water per week by the watering “ON” days each week, to get the gallons of water per day on.

Washingtonia palms

New palms (first two years)

- Summer 225 gallons per week
- Winter 100 gallons per week

Established palms (more than two years)

- Summer 150 gallons per week
- Winter 75 gallons per week.

Phoenix dactylifera

New date palms (first three years)

- Summer 350 gallons per week
- Winter 200 gallons per week

Established date palms (more than three years)

- Summer 225 gallons per week
- Winter 150 gallons per week

Key signs of potential palm tree failure

- Decline in growth, vigor and/or loss of green color in fronds.



Queen palm – Meristem fried from Coachella Valley extreme summer heat

- Crown or head tilting



W. robusta – damaged tilted head

- Trunk tilting, cracks developing or shrinking



W. filifera- shrinking trunk, due to lack of water uptake

- Holes in sides of trunks about the size of nickel or bigger.



W. filifera- deteriorating trunk and Palm Borer exit holes

- Center fronds falling out or fronds dying back excessively



Date palm- extreme frond die back

- Pencil neck in trunk more than 50% of girth reduction



Date palm-pencil neck

- Deteriorating trunk or roots, also excessive ant activity going up the trunk



W. Filiferia- deteriorating trunk

- NOTE: If any of these key signs appear on your palm, call an ISA (International Society of Arboriculture) certified arborist who specializes in palms. See directories on ISA-arbor.com website.

Palm tree replacement recommendations

Time of year to plant

The optimal time of year to plant a new or replacement palm is February to middle of June and September to middle of November; it is best not to plant in the hottest or coldest months.

Soil

If the soil has large amounts of clay or does not drain well, dig the hole 25% larger and deeper, install a four inch “L” shaped drain pipe with drain sock, under palm to surface with perforations only under palm (this is for aeration and observation only, not for irrigation or drainage), then back fill palm with **washed concrete sand**.

Water

Water jet in with a ¾” PVC pipe on the garden hose, as backfilling palm, be sure to remove all air pockets.

Planting depth

Plant the palm root ball at the same level it was before it was removed from the nursery or field, covering air roots is ok, but not necessary.

Conclusion

This palm tree report is for general information only. It is not meant to take the place of professional assistance from a trained ISA Certified Arborist or Certified Master Arborist, with certification in tree risk assessment and palm trees. Call the expert; See ISA-arbor.com website for list of local qualified Arborist.

GDY Consulting provides risk assessment services and tree care recommendations. Gregston D. Young is an ISA Board Certified MASTER Arborist.

Glossary

- **Apical meristem--** is the growth region in plants found within the root tips and the tips of the new shoots and leaves. In palm trees, the growing point, which is also referred to as the bud or heart.
- **Areaceae--** are a botanical family of perennial plants. Their growth form can be climbers, shrubs, tree-like and stemless plants, all commonly known as palms
- **Arborist--** Professional who possesses the technical competence gained through experience and related training to provide for or supervise the management of trees and other woody plants in residential, commercial, and public landscapes.
- **Commercial use--** is any reproduction or purpose that is marketed, promoted, or sold and incorporates a financial transaction.
- **Culture shock--** from improper transplanting or maintenance, and recovery is hindered.
- **Diamond cut or Classic cut—**when the trunk of a date palm has the petioles cut to a diamond-shaped pattern.
- **Dioecious species--** These plants produce a male plant and a female plant and not usually a single plant with both male and female parts.
- **Drip Line—**Imaginary line defined by the branch spread of the tree.
- **Flat cut—**when the trunk of a macho date palm or a Canary Island palm tree is cut smooth.
- **Fronds--** The foliage of a palm tree or leaf, where photosynthesis takes place.
- **Fusarium wilt--** Unlike most fungal diseases of palms, this disease is very host specific, with the primary host being *Phoenix canariensis* (Canary Island date palm).
- **Hard wood trees--** The most common species in North America are oaks, maple, hickory, birch, beech and cherry.
- **Inflorescences--** The complete flower head of a plant including stems, stalks, bracts, and flowers
- **Monocots--** are flowering plants, the seeds of which typically contain only one embryonic leaf, or cotyledon.
- **Monoecious--** That has male and female reproductive organs on the same individual plant (rather than on separate plants), either in different flowers or in the same flower.
- **Mulch—**Material that is spread on the soil surface to reduce weed growth, retain soil moisture, moderate temperature extremes, prevent damage from lawn-maintenance equipment, and improve aesthetic appearance of the landscape.
- **Palmate--** A compound leaf with more than three leaflets (trifoliate) radiating from the same point, resembling a hand with the fingers spread.
- **Palm crown--** An elongated circumferential leaf base formation present on some species of palms.
- **Palm stem--** is the tree trunks of palm trees.
- **Photosynthesis--** the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water.

Glossary Continued

- **Pencil necking**—in palm trees, when the trunks develop an area where it slender down to a smaller circumference, caused by lack of water, nutrients or over pruning.
- **Perennial**-- is a plant that lives more than two years
- **Pineapple cut**—usually on a macho or Canary Island palm, trim the crown to resemble a pineapple shape.
- **Pinnate**-- leaves, which are sometimes described as being feather-like, have leaflets entirely separated from each other that are attached perpendicularly to the rachis.
- **Resistograph**-- An instrument that detects decay and cavities in trees and timber.
- **Root initials**—the starting point of a root.
- **Root Zone**—Area within the soil profile where roots exist; typically the root zone of trees extends beyond the drip line.
- **Skirt**--Washingtonia palm, when the dead fronds are allowed to cover most or the entire trunk.
- **Sounding**-- Strike the tree sharply with the hammer side of a hatchet or a mallet.
- **Tap root**-- is somewhat straight and very thick, is tapering in shape, and grows directly downward
- **Tomography**—Tool used to measure the decay inside trees.
- **Transplant shock**-- from improper transplanting or maintenance, and recovery is hindered.
- **Tree Risk Evaluation**—Assessing the chances of a tree causing damage to people or property
- **Trunk constrictions**-- appear as a narrow area on the trunk and are caused by a disruption of the palm's diameter for that year. Some of the causes are nutritional deficiencies, drought, hard freezes and over-pruning. Also called pencil necking.
- **Washed Concrete Sand**-- Comprised of a washed and screened coarse sand

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