



The Coconut¹

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- **Scientific Name:** *Cocos nucifera* Linn.
- **Family:** Palmaceae

ORIGIN

Comparatively little is known about the origin and early distribution of the coconut palm, probably because it was so widely spread throughout the tropical areas of the world so many years ago. It has variously been thought to be native to the Malay Archipelago, the South Pacific and tropical America.

DISTRIBUTION

The coconut is widespread throughout the tropics, typically being found along sandy shorelines. It has been spread largely by man but also by natural means. The fruit can float for long distance and still germinate to form new trees after being washed ashore. Commercial plantings are confined to the tropical lowlands, but it will also fruit in a few warmer subtropical areas. In Florida it is successfully grown from Stuart on the east coast and Punta Gorda on the west coast, south to Key West.

IMPORTANCE

The coconut is the most extensively grown and used nut in the world and the most important palm. It is an important commercial crop in many tropical countries, contributing significantly to their

economies. The chief product is copra, the source of coconut oil used for making soap, cooking oils and margarine. Much of the fruit is consumed locally for food. The coconut palm more than any other plant, gives a tropical effect to the Florida landscape. It is highly valued as an ornamental but its fruit is of limited commercial importance in Florida.

DESCRIPTION

Tree. Palm tree with a smooth, columnar, light grayish brown trunk, and topped with a terminal crown of leaves. Tall selections may attain a height of 80 to 100 feet while dwarf selections are shorter in stature. The trunk is slender and slightly swollen at the base. It is usually erect but may be leaning or curved.

Leaves. The pinnate leaves are feather-shaped, up to 18 feet long and 6 feet wide. The leaf stalks are 3 to 5 feet in length and thornless.

Flowers. Flowers are small, light yellow, and in clusters which emerge from canoe-shaped sheaths among the leaves. The coconut palm flowers approximately after the sixth year.

Fruit. Roughly ovoid, up to 15 inches long and 12 inches wide, composed of a thick, fibrous husk surrounding a somewhat spherical nut with a hard, brittle hairy shell. The nut is 6 to 8 inches in diameter and 10 to 12 inches long. Three sunken

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holes of softer tissue called "eyes" are at one end of the nut. Inside the shell is a thin, white, fleshy layer, about ½ inch thick at maturity, known as the "meat". The interior of the nut is hollow but partially filled with a watery liquid called "coconut milk". The meat is soft and jelly-like when immature but it becomes firm at maturity. The coconut milk is abundant in unripe fruits but it is gradually absorbed as ripening proceeds. The fruits are green at first turning brownish as they mature. Yellow varieties go from yellow to brown.

PRODUCTION

The coconut palm starts fruiting 6 to 10 years after the seed germinates and reaches full production at 15 to 20 years of age. It continues to fruit until it is about 80 years old with an annual production of 50 to 200 fruits per tree. The fruits require about a year to develop and are generally produced regularly throughout the year.

CULTIVARS

The only cultivars that should be planted in Florida are the 'Malayan Dwarf' selections and the 'Maypan' hybrid when it is available. These are highly resistant to lethal yellowing which has been progressively killing the common 'Jamaican Tall' and other varieties. There are three 'Malayan Dwarf' forms -- green, yellow and golden, recognized by the color of the petiole and the fruit. The golden and yellow forms have a golden cast to the foliage and bright yellow, highly ornamental fruit. The green form has bright green leaves and nuts, making it an outstanding ornamental. The 'Malayan Dwarf' is actually a semi-dwarf which grows more slowly and reaches a height of 40 to 60 feet. The trunk is straighter and smaller in diameter, there is less swelling at the base and the leaves are shorter and more numerous. They begin flowering and fruiting at 4 or 5 years of age with nuts that are smaller and closer to the ground.

PROPAGATION

Propagation is entirely from seed. Large, well-matured nuts are collected from selected trees placed on their sides and buried to about one-half their thickness. They may be planted in closely spaced rows in well-drained semi-shaded seedbeds or they may be planted directly into pots. Upon germination, the shoot and root emerge through one of the three "eyes". Young palms, about 6 months old, can be

transplanted directly into the field or be grown in pots in the nursery for a few more years.

CLIMATE AND SOILS

The coconut palm is typically found along tropical, sandy shorelines since it can tolerate brackish soils and salt spray. However, salt is not required for the growth of healthy plants and they can be successfully grown well inland. Coconut palms grow well in a wide range of soil types, provided they are well-drained, and a wide pH range, from 5.0 to 8.0. Successful growth requires a minimum average temperature of 72°F and an annual rainfall of 40 to 60 inches or more, fairly evenly distributed throughout the year. The trees may be injured by cold when the temperature falls below 32°F (0°C). They require full sunlight and are tolerant to wind and flooding.

Coconut palms may be planted at any time of the year but the warm, rainy summer months are best. The trees can be successfully transplanted at any period in their growth, provided they are properly handled. A large hole, about 3 feet in diameter and 3 feet deep, should be dug to receive the new tree. The tree should be set at the same depth at which it was growing in the container. Organic amendments such as peat should be mixed with the soil removed from the hole before its replacement to provide more water and nutrient retention. The new tree should be watered immediately after planting and frequently thereafter until it is well established. A mulch applied to the soil surface around the tree will help retain soil moisture and restrict weed growth. Commercially, the trees are planted at spacings of about 25 x 25 feet to 30 x 30 feet, resulting in about 48 to 70 trees per acre. In home gardens, they should be planted where they will receive full sun and not be crowded. At least 1 inch of water should be supplied weekly by rainfall or by irrigation.

FERTILIZATION

Adequate fertilization during the early years encourages vigorous growth, early bearing and high initial yields. Container grown palms can be fertilized immediately after planting. Nitrogen is particularly important for young palms since it promotes leaf development and early flowering. 'Malayan Dwarf' palms require more care than the common tall palms for healthy, vigorous growth. Fertilizer requirements vary with the size of the palm. Young palms with no visible trunk should receive 3 or 4 applications of 2 to

8 ounces of 6-6-6 or similar analysis fertilizer annually. Older palms require 1 pound of 6-6-6 per inch of trunk diameter 3 or 4 times a year. Minor elements should be applied at least once a year. These may be contained in the regular fertilizer.

DISEASES

Lethal yellowing is the most important disease of coconut in Florida. Since it was discovered in Key West over 200 years ago, it has crept northward, killing hundreds of thousands of palm trees and endangering virtually all of the tall coconut palms in Florida. It is suspected to be caused by a tiny mycoplasma-like organism, visible only with the aid of an electron microscope. Early symptoms are premature dropping of coconuts and blackening of flower stalks. The leaves then turn yellow, beginning with the lower ones and progressing to the crown which dies and eventually topples from the tree. The tree usually dies within 6 months after exhibiting the first symptoms. An injection of an antibiotic (oxytetracycline) may result in remission of symptoms within 4 weeks but additional applications at 4 month intervals are required to keep the tree alive. Roguing and destruction of the infected palms and replacement with the resistant 'Malayan Dwarf' coconut palm is recommended.

Bud rot, caused by the fungus *Phytophthora palmivora* Butler, is found in all areas where the coconut palm is grown. Early symptoms, found on young developing leaves, are brown sunken spots, yellowing and/or withering. The leaves turn a light grayish brown, becoming darker brown as they collapse at the base. The infection spreads inward to the bud and outward to surrounding leaves which turn yellow and fall. Young nuts fail to develop and fall but those well-formed before infection continue to mature. A very disagreeable odor emanates from the decaying bud. Disease development most commonly occurs after periods of heavy rains. Early detection is essential for successful control. Application of a Bordeaux paste to the buds in early stages may result in recovery if the apical meristem is not infected. Removal of fronds showing early symptoms is recommended. Palms showing advanced symptoms should be removed and destroyed since they may serve as a source of inoculum.

PESTS

A number of pests including several kinds of scale, palm aphid, spider mites, mealybugs, palm weevils and caterpillars are occasionally found but usually do not require control measures. Coconut scale occasionally may cause extensive damage and heavy infestations should be controlled by appropriate measures. Current recommendations may be obtained from your local County Agent.

HARVESTING

Harvesting is done throughout the year. The time from fruit set to full maturity is about 12 months. The fruit should be harvested fully ripe for copra and dehydrated coconut. Drinking nuts should be picked earlier, at about 7 months. The nuts may be harvested by skilled climbers or may be cut from the ground, using a knife attached to a long pole.

USES

There are literally hundreds of uses for coconuts and their products. The meat of immature coconuts can be eaten with a spoon or be scooped out and made into ice cream. Coconut milk, abundant in unripe nuts, is a refreshing and nutritious drink. The meat in mature coconuts is firm and can be eaten fresh or may be used for making shredded coconut. The most important economic product is obtained by drying the meat into copra which is pressed to produce coconut oil, primarily used in making soap. Coconut oil is also used for cooking and making margarine. The husk fiber is combed out and sold as coir, a material for making rope and coconut matting. The trunks may be used for building timbers and the leaves used for house thatching. The coconut palm has little commercial importance in Florida but is highly valued as an ornamental. It gives a tropical effect to the Florida landscape and provides fruit for home use.