



Information Booklet

Cayman Islands
Department of
Agriculture
Box 459
KY1-1106
Cayman Islands

P: 345-947-3090
F: 345-947-6501
ciagriculture@gov.ky
www.doa.gov.ky

All About coconuts



Introduction

The coconut palm, *Cocos nucifera* is the only accepted species in the genus Cocos. The term coconut refers to; the entire palm, the seed or the fruit (not a biological fruit, but a drupe). There are two natural sub-groups, simply referred to as "Tall" and "Dwarf" cultivars. Each producing region has its own selection e.g. 'Panama Tall' or 'Jamaican Tall'. The tall cultivars are grown commercially because they live longer and are higher yielding than the dwarf cultivars. The coconut is a very versatile crop, which requires little care. It is often referred to as the 'Tree of Life' and has many uses – food, fibre, fuel, water and shelter. Agro-forestry uses include coastal stabilization and windbreaks. The palms also contribute to attractive landscapes and home beautification for both tourists and locals.



Origin

Despite the fact that very little is known about the origin and early distribution of the coconut palm, probably because it was so widespread throughout the tropical areas of the world so many years ago, it is however believed to be native to the Malay Archipelago or the South Pacific.

Distribution

The coconut is widespread throughout the tropics, growing along sandy shorelines and inland farms. Even though man has contributed significantly to its geographical distribution, natural means has also played a part, as the fruits can float for long distances and still germinate to form new trees after being washed ashore. The majority of commercial plantings are confined to tropical lowlands; however the trees will also fruit in a few warmer subtropical areas. The coconut palm is widely distributed throughout Asia, Africa, Latin America, the Caribbean and the Pacific region. It is however not grown commercially in Europe and Australia.

Importance

The coconut was once the most extensively grown and used palm in the world; however, over the past few years the oil palm has displaced it. Coconuts are commercially produced in 95 countries worldwide on approximately 12.38 million hectares of land while oil palms are produced on approximately 17 million hectares of land. The coconut is however still considered to be an important commercial crop in many tropical countries, where it contributes significantly to their economies. Copra is the chief product of the coconut and is the source of coconut oil, which is used for making soap, shampoo, cosmetics, cooking oils and margarine. Also during the past few years other industries such as; coir which is used in mattresses, floor mats, door-mats, brushes and as a substrate in ornamental and greenhouse agriculture and bottled/tinned coconut water industries have emerged.

Description

This tree is a large, single-trunked plant having a smooth columnar trunk with a light grayish-brown color, with the top of the plant ending in a terminal crown of leaves. Tall varieties may attain a height of 50 - 100 feet (15 - 31 m) while dwarf varieties may reach up to 60 feet. The trunk is slender and often swollen at the base. The trunk is typically curved or leaning, but is often erect in some varieties/cultivars.

Climate and Soils

The coconut palm is typically found along tropical, sandy shorelines since it is very tolerant to saline soils and salt sprays. However, salt is not required for the growth of healthy coconut palms, as it can be successfully grown inland on normal soils. Coconut palms grow well in a wide range of soil types and in a wide pH range, from 5.0 - 8.0 provided that the soils are well drained. Successful growth requires a minimum average temperature of 72°F and an annual rainfall greater than 30 inches. Coconut palms are not suitable for areas that regularly experience freezing temperatures. Plants require full sunlight and are tolerant to windy, waterlogged or flooded soil conditions for a few days. However, trees may decline and die when exposed to prolonged flooding or waterlogged soils.

Pests

Lethal yellowing (LY) is the most important pest of coconut worldwide. Since the discovery of LY more than 200 years ago, this disease has killed hundreds of thousands of palm trees and endangering virtually all of the tall coconut varieties. Lethal yellowing is caused by a tiny organism called a phytoplasma, which is visible only with the aid of an electron microscope. The disease is transmitted by a plant hopper. Early symptoms of LY are premature dropping of coconuts and blackening of flower stalks. The palm leaves then turn yellow, beginning with the lower leaves and progressing to the crown, which dies and eventually topples from the tree. The tree usually dies within six months after exhibiting the first symptoms of LY. Coconut is also affected by Bud rot, Red Palm mites and scale insects

Common Coconut Varieties/ Cultivars

Several varieties/cultivars of coconut palms are found within the Caribbean. These varieties differ in their petiole and fruit colour, straightness (or crookedness) of the trunk, leaflet and leaf width, growth rates, presence or absence of a swollen trunk base or bole, adaptability to soil conditions, and resistance to lethal yellowing disease (LY). Some that are commonly found in the Cayman Islands are:

Varieties/Cultivar	Type	Lethal Yellowing Resistance	Petiole and Immature Fruit Colour
Jamaica Tall	Tall	Very low	Green or bronze
Panama Tall	Tall	Low	Green or bronze
Malayan Dwarf	Semi-Dwarf	Low	Green, golden, or yellow
Maypan hybrid	Tall	Low	Green or bronze
Fiji Dwarf	Dwarf	High	Green or bronze

Jamaican Tall

The Jamaican Tall which is also known as the Atlantic Tall, is a fast-growing variety that has a swollen trunk base and often show signs of curving as the tree increases in height. This variety is often observed to grow to a height of 85 - 100 feet. This type of coconut palm usually bears fruit within 5 years after planting. A mature Jamaican Tall palm can produce up to 300 coconuts each year. Development of coconuts from flowering buds to the seedlings stage takes approximately one year. Jamaican tall coconut palms have however being found to be extremely susceptible to the disease known as lethal yellowing which to date has actually wiped out most of the Jamaican Tall variety that were planted in large acreages. This coconut palm can withstand high winds because of its root structure and is drought resistance.



Jamaica Tall

Panama Tall

The Panama Tall variety is also known as Pacific Tall. It grows rapidly and may attain a height of almost 100 feet. This variety is largely recognized by its large-diameter trunk, along with the green or bronze colours of its immature fruits. The popularity of Panama tall peaked in the 1980s, when studies conducted in Jamaica concluded that, along with their hybrids, they were among the varieties with greatest tolerance to the disease lethal yellowing. The plant begins flowering approximately seven years after planting, producing fruits that are large and spherical. The nuts have very thick shells and are almost round, being flatter at the base and contains a thick kernel. Harvesting often commenced within the eight year after planting and annual fruit yields can reach a peak of 150 nuts. This cultivar is well known for its prolific copra yield in India.



Panama Tall and fruits of the Panama Tall .

Malayan Dwarf

The Malayan dwarf coconut palm is widely planted because it is resistant to many destructive diseases, such as lethal yellowing. This coconut palm is smaller than the Jamaican tall and has a narrow, straight trunk. The trunk has no bulging at the base like the Jamaican Tall. The height of this palm range from 30 - 50 feet. Immature fruits of the Malayan dwarf coconut palm are often green, red or yellow. Trees often bear fruits within 3 years of planting with the nuts containing little meat but sweet water. Malayan Dwarfs grow in most well drained soil types, but the cultivar is also tolerant to waterlogging, saline soil, salt sprays and drought.



Malayan Green



Malayan Yellow Dwarf



Malayan Red Dwarf

Maypan

The Maypan is a hybrid that was developed in Jamaica in 1974 by crossing Malayan Yellow and Red Dwarf varieties, as the female parent, with Panama Tall variety imported into the island at the beginning of the twentieth century. The name ‘Maypan’ is derived by combining “May” from Malayan and “pan” from Panama Tall, or part of the names of both parents. It was originally developed as a commercial solution for the copra business after the Jamaican Tall and the Panama Tall varieties were ravaged by lethal yellowing disease. It produces lots of large nuts at an early stage of development and does not grow as tall as taller varieties. Early researchers found it to be approximately 85% resistant to lethal yellowing and this was one of the major reasons why this hybrid was used for replanting disease ravaged areas. The Maypan hybrid starts bearing approximately five years after planting and can produce 200 fruits annually before the 7th year.



Maypan (not yet fruiting) & Malayan Yellow Dwarf (Fruiting) - at 2.5 years old



Maypan (Yellow) Cultivar



Maypan (Green) Cultivar



Fiji Dwarf

Fiji Dwarf is a slow-growing palm that ultimately may reach 60 feet tall with a thick trunk. It is reported to have good resistance to lethal yellowing. 'Fiji Dwarf' coconut is also sometimes called 'Niu Leka'. The fruit colours are either bronze or green, however they are sometimes found with off-colours.



Fiji Dwarf

Production

The coconut palm starts fruiting within 6 - 10 years after the seed germinates and will reach full production at 15 - 20 years of age. The tree continues to fruit until it is about 80 years old, yielding an annual production of 50 - 300 fruits per tree, depending on varieties and climate. The fruits require about a year to develop and are generally produced regularly throughout the year. Planting space varies from 25 – 30 feet, depending on varieties

Production is often estimated using reported copra production, area planted or administrative estimates, since by the very nature of coconut production, it is virtually impossible to do an accurate count of the number of coconuts. Therefore, it is reasonable to assume that the production data underestimates actual production. Also, there is usually a gap between production and harvesting, influenced by the price. If this price is too low the farmer has little incentive to harvest.

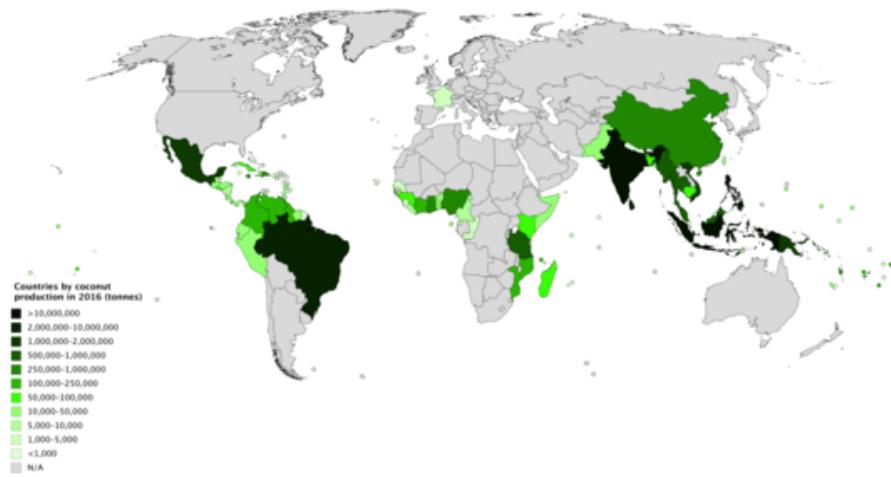
World Production

Coconuts are produced in 95 countries worldwide on about 12.38 million hectares land. World production has been estimated at 61.7 million tons (FAO, 2018). The top ten producing countries are listed in table 1 below. The top three countries producing coconuts over the past 10 years remain-Indonesia, Philippines and India. In 2018 the Islands of the Caribbean contributed to the total amount by producing 796,018 million tons of coconut. The Cayman Islands was ranked at number 95 producing 19 tons.

Table 1: Top ten coconut producing countries in the world—2016-2018

Rank	Country/Region	2018	2017	2016
1	Indonesia	18,555,371	18,747,003	17,979,533
2	Philippines	14,726,165	14,049,131	13,825,080
3	India	11,706,343	11,166,772	11,344,306
4	Sri Lanka	2,623,000	2,445,000	3,011,000
5	Brazil	2,346,750	2,210,139	2,634,396
6	Vietnam	1,571,709	1,499,228	1,469,960
7	Papua New Guinea	1,221,080	1,203,796	1,186,513
8	Mexico	1,158,471	1,157,614	1,156,757
9	Thailand	885,751	895,000	900,000
10	Myanmar	557,240	545,994	531,653

Countries by Coconut Production—2016



Source :Wikipedia

Products & Uses

Every part of the coconut palm is used and many value added products are derived from it. The kernel or flesh (Endosperm) is eaten fresh, green or dry and used for making value added products (copra, oil, cake, milk). The water is obtained from immature nuts and provides a nutritious, refreshing drink. The Husk (Mesocarp) which is fibrous and dry at maturity is used for fuel, mulch, coir and peat. The hard shell enclosing the seed (Endocarp) is used for making handicraft, charcoal, flour and activated charcoal. The leaves and trunk are used for making brooms, furnishing and for decorations.

Kernel

- Fresh green and dry nuts
- Copra (the dried ‘meat’ or endosperm, from which oil is expelled. In ripe nuts the endosperm contains about 50% water and 35- 40% oil.)
- Coconut oil – used for cooking and in the oleo-chemical industry for making margarine and soaps, it has potential for energy generation as a bio fuel – either mixed with diesel or as a substitute for diesel
- Coconut water - a refreshing , nutritious drink
- Coconut juice with/ without pulp
- Coconut milk & cream – raw copra is grated and squeezed
- Coconut jam
- Coconut yogurt
- Vinegar
- Desiccated coconut - dried to 2-5% moisture and shredded for use in cakes & confectionary products.



Copra



Coconut shell craft



Coconut shell charcoal

Shells

- Charcoal
- Handicrafts
- Activated carbon



Drying husk for fuel



Cocopeat

Husks

- Fuel
- Mulch
- Coir and peat (processed coir, rubberized coir for mattresses, car seats)

Food Value

Water of the matured nuts is considered as a refreshing and nutritious drink, making the fruit suitable for commercial exploitation of the tender nuts. Oil is extracted from the dried copra which is used in food preparation and other industries.

Nutrient Content of Coconut Copra per 100 gram (3.5 oz.)

Constituent	Proximate value	Constituent	Proximate value
Water	47%	Calcium	14.0 mg
Calories	354 kcal	Iron	2.43 mg
Protein	3.3 g	Magnesium	32.0 mg
Fat	33.5 g	Phosphorus	113.0 mg
Cholesterol	0 mg	Potassium	356.0 mg
Carbohydrate	15		
Total dietary fiber	9.0 g	Vitamin C	3.3 mg

Nutrient value of coconut water [100 g (3.5 oz.)]

Constituent	Proximate value	Constituent	Proximate value
Water content	95%	Calcium	24.0 mg
Calories	19 kcal	Iron	0.3 mg
Protein	0.7 g	Magnesium	25.0 mg
Fat	0.2 g	Phosphorus	20.0 mg
Cholesterol	0 mg	Potassium	250.0 mg
Carbohydrate	3.7 g	Sodium	105.0 mg
Total dietary fiber	1.1 g	Vitamin C	2.4 mg