

DATE PALM (*Phoenix dactylifera*, L.)

ORIGIN

The exact origin of date palm is not known. However, it is certain that date palm was cultivated as early as 4000 BC, since it was used for construction of the temple of moon god near Ur in Mesopotamia (now southern Iraq).

P. canariensis (Canary palm) *P. dactylifera* are not an edible date, but is very good as an ornamental plant.

Botanical Description

Root system:

It is a monocot plant, thus no tap-root. Instead the plant has fibrous roots that are fasciculated. Secondary roots appear on the primary roots and develop directly from the seed.

The trunk / stem: The date palm trunk or stem or stipe is vertical, cylindrical and columnar of the same girth all the way up. The girth does not increase once the canopy has fully developed.

The leaves: Depending on variety, age of a palm and environmental conditions, leaves of a date palm are 3 to 6 m long (4 m average) and have a normal life of 3 to 7 years. An adult date palm has approximately 100 to 125 green leaves with an annual formation of 10 to 26 new leaves.

Fibre, spines and leaflets: The base of the frond is a sheath encircling the palm. This sheath consists of white connective tissue ramified by vascular bundles.

Spines, also called thorns, vary from a few cm to 24 cm in length and from a few mm to 1 cm in thickness.

Leaflets or pinnae are between 120 to 240 per frond, entirely lanceolate, folded longitudinally and obliquely attached to the petiole.

Reproductive organs: Date palm is a dioecious species with male and female flowers being produced in clusters on separate palms.

Seed: As with the fruit, seed characteristics vary according to variety, environment and growing conditions. A seed's weight could range from less than 0.5 g to about 4 g, in length from about 12 to 36 mm and in breadth from 6 to 13 mm.

GEOGRAPHICAL DISTRIBUTION OF DATE PALM

Date palm is found in both the Old World (Near East and North Africa) and the New World (American continent) where dates are grown commercially in large quantities. The date belt stretches from the Indus Valley in the east to the Atlantic Ocean in the west. In order to have a clear picture on the geographical distribution of date palm, it is worth looking at it from the following aspects:

- (i) Distribution according to latitude,
- (ii) Distribution according to altitude,
- (iii) Number of date palms in the world.

NUTRITIONAL VALUE DATE:

Dates are very nutritious, assimilative and energy producing. With the present uncertainty in the world food supply and the expected increase in demand, the date palm could be a good source of food of high nutritional value. In fact, date fruit is rich in nutrients, and due to its dietetic values it has always been held in high esteem by people. Compared to other fruits and foods (apricot: 520 calories/kg; banana: 970 calories/kg; orange: 480 calories/kg; cooked rice: 1,800 calories/kg; wheat bread: 2,295 calories/kg; meat (without fat): 2,245 calories/kg, dates give more than 3,000 calories per kilogram.

CLIMATIC REQUIREMENTS OF DATE PALM

Temperature requirements: Date palm is cultivated in arid and semi-arid regions which are characterized by long and hot summers.

Rain effect: Date palm culture has mostly been developed in areas with winter rainfall which does not cause harm to the date fruits.

Air relative humidity: In fact, the date palm eco-system is mostly of an arid nature where air relative humidity has a large influence.

Wind: Compared to other plant species, the date palm shows no damage under windy conditions.

Light: The growth of a date palm is inhibited by light rays at the violet and yellow ends of the spectrum

PROPAGATION OF DATE PALM

There are three techniques to propagate date palm:

- **Seed propagation,**
- **Offshoot propagation (traditional methods),**
- **Tissue culture techniques.**

Seed Propagation: Seed propagation, also called sexual propagation, although useful for improvement purposes, is not a proper method of date palm propagation.

Offshoot propagation: Offshoot propagation, also called asexual or vegetative propagation is a preferable technique.

Tissue culture: The application of tissue culture techniques for date palm, also called *in vitro* propagation.

Nursery operations and Management of date palm plant: Transplanting of date should be done properly with no disturbance to the root system.

LAND PREPARATION FOR DATE PLANTATION ESTABLISHMENT

When establishing a new date plantation, certain actions need to be implemented to ensure the long term success of the plantation. One of these actions involves the initial land preparation which should be done prior to transplanting of the plant material (offshoots or

tissue culture-derived plants). Critical factors to consider during this planning exercise include the followings:

- Availability and quality of irrigation water
- Field selection
- Mechanical actions to be implemented
- Chemical needs for pre-plant soil improvement

Planting operations: This is probably the most critical phase in the establishment of a new date plantation. Mistakes at this point may lead to a poor survival rate of the transplants.

Plant spacing: This varies but, examples include, 10 m × 10 m (100 palms/ha). It has, however, changed over time and a plant spacing of 9 m × 9 m (121 palms/ha) or 10 m × 8 m (125 palms/ha).

Planting time: The critical factor is to transplant the young tissue culture date palms or offshoots at that time of the year that will ensure a good survival rate and proper establishment before the beginning of a "hard" season.

Transplanting stage: The best field survival rate, as well as early plant development, is obtained when the date tissue culture plantlets are transplanted at the four (4) plus pinnae leaf stage.

Basin preparation: Immediately after transplanting, a basin is prepared around the palm to prevent run-off and to ensure a sufficient supply of water to the plant. When using a micro irrigation system, it is recommended to have a basin of approximately 3 m in diameter and 20 to 30 cm deep.

Mulching: The benefits of organic material as mulching materials are immense.

Irrigation: Immediately after transplanting, the palm should be irrigated to limit transplant stress. Once the plantation is established, a frequent irrigation schedule is to be followed to allow sufficient water supply to the young date palm.

Protection: Tissue culture-derived plants and young offshoots should be protected from harsh climatic conditions (sun and wind during the first summer and cold the following winter) and against some animals (rabbits, etc.).

Aftercare: Beside irrigation applications, the annual fertilizer application schedule, weeding and mulching, the date grower should, for at least the first 10 to 12 months, keep an eye on the plantation in order to detect and consequently correct any adverse situations.

Harvesting: Although attempts are being made to harvest the fruit by shaking the trunk of the palm in order to avoid having to climb it, it is still necessary to reach the top of the palm to harvest the fruit. Mechanical harvesting is done in Israel and elsewhere.