

Palmyrah palm for nutritional security of tribal people

Palmyrah palm (*Borassus flabellifer* L.) belongs to family Arecaceae and is native of tropical Africa. In India, it is grown naturally throughout the country. It is monocotyledonous, dioecious plant. Almost all parts viz. root, leaves, seed and fruit of the palm is used in different ways. It is underutilized palm and grown naturally in forest and barren lands. The importance of the palm is not still recognized by the people. The basic cultivation practices of palmyrah palm are summarized in this article.

PALMYRAH Palm (*Borassus flabellifer* L) is also known as toddy palm, tal, tar, panai, etc. It is third important palm next to coconut and date palm. The centre of origin of Palmyrah Palm is Tropical Africa and distributed from India through South-East Asia to New Guinea. According to literature, it is believed that *B. flabellifer* is a selection from the more diverse *Borassus aethiopum* Mart. of Africa. Globally, it is grown in Sri Lanka, India, Myanmar, Cambodia, Indonesia, etc. In India, it is found naturally in forest and community land of Tamil Nadu, Andhra Pradesh, Odisha, West Bengal, Bihar, Karnataka, Gujarat and Maharashtra. It is a large tree up to 30 m high and the trunk may have a circumference of 1.7 m at the base. It is also recognized as the state tree of Tamil Nadu in 1978. It is multipurpose, evergreen plant. All the plant parts of this palm are useful for the welfare of human in different ways. It is good source of nutrition especially tribal peoples. It also provides good opportunity for employment and source of income for resource poor people of panchmahal tribes. Recently, it is grown in orchard form as sole, mixed with fruit crops, boundary plantation and multistory cropping systems.

Uses

Economically, it is very useful palm especially for rural people. Its leaves are used for the making of mats, baskets, fans, hats, umbrellas and also as writing material, trunk for the construction of buildings and bridges and fruit stalks in making of fences. The most important use of this palm is production of jaggery and sugar from sap obtained by tapping from the inflorescence. The sap is dried and used as vegetable in off season by tribals. Tender nut kernels are relished during hot summer. The sap is called neera, which contains sucrose 12.0%. The nutritional value of different plant parts are given in table -1. Toddy is fermented product of palm water or neera. Neera is sold at ₹10/glass (200 ml) during summer in Gujarat.

Agro-climatic requirement

It is a tropical palm. It is also found growing in subtropical and semi-arid environments. The palm can grow at elevation up to 80 m above mean sea level. It requires low sunlight for growth and development. An annual rainfall of 300-750 mm is found sufficient for growth and development. It can be grown in all types



Removal of kernels



Kernels ready for sale



Neera selling

Table 1. Composition of different palmyrah palm parts on dry basis (%)

Plant part	Crude protein	Crude fibre	Ash	Ether extract	Nitrogen free extract	Ca	P
Leaves	13.30	38.0	7.40	4.60	74.70	0.22	0.24
Fruit	6.50	16.10	4.80	0.80	87.90	0.17	0.18
Immature Seed	5.10	7.90	1.70	0.60	92.70	0.6	0.46
Shoot	8.90	7.20	3.30	0.70	87.20	-	-
Fruit	3.10	-	3.10	0.90	93.40	-	-
Seed	8.10	-	3.50	1.40	85.10	-	-

of soil. The deep sandy and loam soil are found better. It has adapted exceptionally well to arid marginal soils unsuitable for most other fruit crops. The fruit yield is higher under fertile soils of river basins.

Varieties

There is limited research work was carried out on variety development of Palmyrah palm. The most of the planting is done from location specific elite type palms.

SVPR-1: It was developed through selection during 1992 from Srivilliputhur local. It is semi tall in height and tapping duration is up to 95 days. It is suitable for growing in entire Tamil Nadu. It yields 298 liters of padaneer/tree/year. The Jaggery recovery is higher (144 g jaggery /litre of padaneer).

Local fruits are identified as Black skinned and Red skinned palm. The black skinned fruits have comparatively less red pigment on their skin whereas red skinned fruits have variable amounts of black pigments along with very liberal distribution of red in their skin.

Propagation

It is propagated through seed. The best period of sowing is monsoon. The ripe fruits collected from mother palm should be mid in age group (30-40 years), dwarf, stout with compact leaves are preferred. Sowing can be done directly *in situ* or by raising the seedlings in nursery. In *in situ* 2-3 fruits are planted in a pit. The pits were covered with dried leaves. On other hand the fruits are

heaped under shade for 3-4 weeks. The seeds are loosened from the flesh and soaked in carbendazim (0.1%) for 24 h to reduce incidence of disease (apocolon rot) and increase germination per cent. The seeds are removed from the fruits and sowing is done in nursery bed, prepared with bricks having 3.0 m length, 1.0 m broad and 60 cm height and at 10 cm spacing. The beds should be covered with dry leaves. The soaking of seeds in water for three hours prior to sowing gave 100% germination. Seeds are germinated within 2-3 weeks of sowing. After 10-12 months, the seedlings are transferred in polythene bags and transplanted in the main field after sowing. It is dioecious plant. The identification of male and female plant is a complex situation. According to literature the seeds of single nut give female palm, double nuts give one female and one male and trinuts two male and one female. It is better to collect 10 to 15% of double nuts palm to maintain male and female ratio.

Plantation

Planting of palm is done during monsoon (July-September). Traditionally, most the farmers are growing it as boundary. In scientific manner, it is planted at 3 m × 3 m distance and accommodate 1,110 palms/ha. The pits of 60×60×60 cm is dug during April-May and filled with pit soil and well rotten Farm Yard Manure (FYM) in equal proportion. At the time of planting carbendazim (50-60 g/ plant) should be applied to prevent infestation.



Naturally grown seedlings at beneath of palm



Boundary plantation of palmyrah palm



Pruning of palmyrah palm



Fruit ready for harvesting

Manure and fertilizers

Nutrients play important role in growth, development and yield of palm. It is better to apply fertilizers as per nutrient status of soil. There is recommendation of 10 kg FYM/pit before planting and it may be increased for every two years till reaching 60 kg FYM/tree/year. The manures are applied before monsoon. According to recommendation highest sap yield, the longest possible tapping period (136 days) and highest number of palms available for tapping (8 out of 10) were obtained when 60 kg FYM was applied before onset of northeast monsoon. Similarly, when 25 year old palms were supplied with organic and inorganic fertilizers, the sap yield was the highest with 50 kg FYM.

Pruning

The basin must be widened to 2 m for full grown palm. The young leaves should not be removed from juvenile palms. When the palm attains a height of 2.0 m, one or two leaves may be removed. In adult palms 30-50% leaves should be removed. It is also advisable that minimum 16-22 leaves are retained on the crown. During summer, the leaves are removed and cleaned before tapping and the stem should not be injured while cleaning.

Inter-cropping

Generally, it is grown as mixed crop with ber, custard apple, moringa, etc. It is a slow growing palm so that the groundnut, cowpea, green gram and vegetables can be grown as intercrops to generate additional income.

Irrigation

After planting during monsoon, need based irrigation should be applied. During winter, plants are irrigated at 15-20 days interval. Under semi arid rainfed conditions the plants are not irrigated after establishment. If the plants are irrigated twice a month during tapping season it significantly increased sap and fruit yield. The young seedlings are covered with dried leaves to protect from high temperature and desiccating wind.

Flowering and fruiting

Palmyrah palm is a dioecious plant where male and female flower are borne on different plant. It is a single, unbranched, stout and erect palm. The gestation period of the palm is very long (12-20 years). The identification of



Harvested fruits

palmyrah palm is either male or female takes place during flowering. The inflorescence is spadix. Flowering takes place throughout the year but the peak period is April-May. The anthesis takes place between 8:00 and 11:00 AM After opening of spathe, 16-25 days is required to open the flowers. It is pollinated by insects and wind. The palm takes 120-130 days from fruit set to harvesting. The fruits are

round to spherical in shape, fleshy, 15-20 cm in diameter and having weight 1-3 kg. The fruit colour turn from green to dark purple or black when ripe.

Harvesting and yield

It is cultivated for sap (Neera/ Padaneer) and fruits. At the age of 25-30 years, tapping can be done. The sap (Neera/ Padaneer) is harvested just before the inflorescences open. The leaves are removed at

the time of tapping so that tapper can easily reach the inflorescence. After removing the flower buds in male palms, inflorescences (generally about 12) are tied together. Usually 3-4 days after cutting the tops of the stalks of the inflorescences, bucket is hanged which is supported by a basket. Individual inflorescences are handled in female palm where flowers are broken off and bent towards the bucket to increase the sap flow. This is carried out early in the morning. To prevent fermentation, some slaked lime is added in the sap but this also affects the flavor. Yield of the sap depend on the skill and technique used by the tapper. During harvesting of fruit, the harvester climbed on the palm and cut the inflorescence. The individual fruits are separated from spadix and sold in market either whole or after removing endosperm. A mature plant can give 110-130 litres sap (neera) and 200- 300 fruits per palm annually.

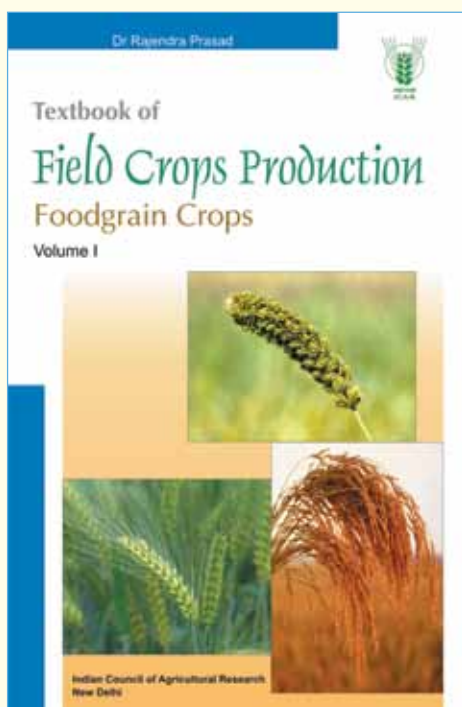
Pest and Diseases

Palmyrah palm is affected by so many diseases and pests but its severity depends on the weather, location etc. The bud rot of palmyrah palm is caused by *Phytophthora palmivora* fungi. It is most serious disease of palm which destroys the tree. It can be managed by application of trichoderma and drenching with ridomil MZ. The common pests found in palmyrah palm are rhinoceros beetle, red palm weevil and black headed caterpillar.

For further interaction, please write to:

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TECHNICAL SPECIFICATIONS

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