SEED LEAFLET

No. 45 October 2000

Tamarindus indica L.

Taxonomy and nomenclature

Family: Fabaceae

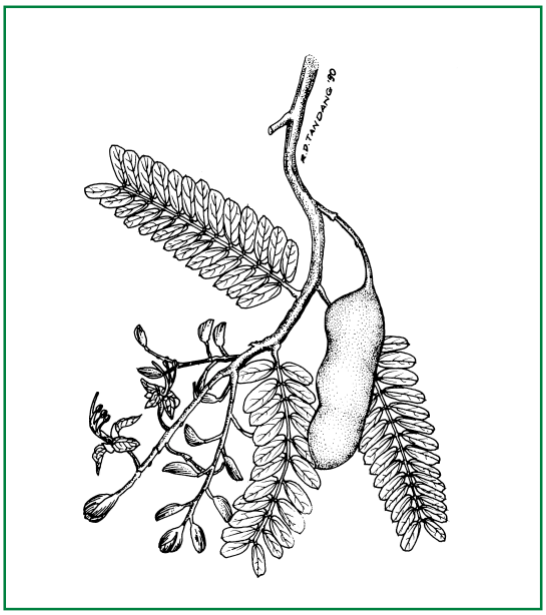
Synonyms: *Tamarindus occidentalis* Gaertn. *T. Hook., T. umbrosa* Salisb.

Vernacular/common names: tamarind, Indian tamarind, Indian date (Eng.); tamarinier (Fr.); imli (Ind.).

Distribution and habitat

The origin of *T. indica* is uncertain but it is probably indigenous to the dry savannahs of tropical Africa. Long ago it was introduced to Asia where is has become naturalised, and in recent times also to the tropics in the western hemisphere.

It performs well in both semi-arid and humid monsoon climates and can grow on a wide range of soil types. Essentially a tree of the tropics, it tolerates temperatures up to 47°C but is very sensitive to frost. It is mainly grown in areas with 500-1500 mm rain/year but tolerates down to 350 mm if irrigated at the time of establishment. In the wet tropics with over 4000 mm rain, flowering and fruitsetting is significantly reduced and in India it is not grown in areas receiving more than 1900 mm rain/year. Regardless of total annual rainfall, it produces more fruit when subjected to a fairly long dry period.



Flowers, foliage and fruit. From: Plant Resources of South-East Asia. No. 2.

Uses

Tamarind is mainly grown for the fruits but is also a valuable timber species. The fruit pulp has a high content of vitamin B and is eaten fresh or made into jam, chutney, juice or sweets. Flowers, leaves and seeds are also edible and used in a variety of dishes.

The wood is hard and very heavy with purple-brown heartwood that is used for furniture. It provides good firewood and is excellent for making charcoal. The leaves have a high forage value but as lopping reduces fruit yield, tamarind is rarely used for fodder. The deep roots make it very resistant to storms and suitable for windbreaks. It has been tested as an agroforestry species in India but although the reduction in crop yield is less that e.g. with teak, the spreading crown makes it little compatible with other species. The dense shade makes it more suitable for firebreaks as no grass will grow under the trees.

Although a legume, tamarind is not nitrogen-fixing.

Botanical description

Evergreen tree, up to 30 m tall with dense, spreading crown and short trunk. The leaves are up to 15 cm long, alternate and compound with 8-18 pairs of leaflets, each 1-3.5 cm long. Flowers small, yellow streaked with pink, 5-10 together in 3-5 cm long inflorescences.

Fruit and seed description

Fruit: indehiscent pod, brittle, 5-15 cm long, more or less curved and constricted between the seeds. There are 1-10 seeds per pod, embedded in the sticky pulp.

Seed: up to 18 mm long, irregular, reddish, dark brown or shiny black, with hard and smooth testa. There are 1800-2600 seeds/kg.

Flowering and fruiting habit

Although evergreen, the tree may remain leafless for short periods. Flowering normally occurs synchronous with new leaf growth, which in most areas happens during spring and summer but some trees may flower much later. The flowers are probably pollinated by insects. The fruits develop during the rainy season and are ripe about 6 months later. The trees begin to produce fruits when they are 8-12 years old and may continue for 200 years.

Harvest

When the pods begin to show cracks on the surface and rattle when shaken and the first pods fall to the ground, the seeds are ripe and collection can begin. Collection can be done from the tree or from the ground after shaking the branches but it is suspected that weevil infection is more prevalent in pods collected from the ground.

Processing and handling

If the pods are dry when collected, it is not necessary to dry them in the sun before processing. The pods are indehiscent and must be opened manually. There are various methods of extraction. One method where the pods are broken, e.g. with a hammer, soaked in water for 12 hours and then macerated by hand. Pods, pulp and dead and empty seeds will float on the water while full seeds sink. When separated, the seeds are dried in the sun. Another method is to pour the pods into a cement mixer with gravel in a weight proportion of 2:1 (seed:gravel) together with as much water as possible. After the treatment the mixture is floated and seeds that sink are recovered.

Regardless of extraction method the seeds are dried in the sun before storage. After drying the seeds can be cleaned by winnowing or in a seed cleaner to remove fibres.

5 kg of fruits yield about 1 kg seed.

Storage and viability

The seeds are orthodox and should be stored at low moisture content. If stored at 5-10°C the seeds can retain a high viability for several years. Infestation by insects can be a problem and it may be necessary to store the seeds with CO_2.

Dormancy and pretreatment

Reports on the necessity of pretreatment are contradictory. Some say the seeds have no dormancy and need no pretreatment, others use scarification as for other legume seeds. For bulk treatment boiling water or seedgun can be used, for seed testing in the laboratory hot wire scarification is recommended.

Sowing and germination

The seeds can be sown in seed beds or in medium to large size polytubes. Containers are recommended if seedlings remain in the nursery for more than four months. After that, the deep tap root will make transplanting difficult. Germination is epigeal. It starts 7-10 days after sowing and normally takes at least a month to complete. During germination, the seedlings should be protected from the sun.

When the seedlings have reached a height of 30 cm they are ready for planting in the field. If growth is poor, the seedlings can be retained in the nursery for another year but then they will normally require root pruning and should be treated with care during transport. Vegetative propagation by branch cuttings, budding and grafting is possible.

Phytosanitary problems

Insect attack during storage can be a major problem.

Selected readings

Dalla Rosa, K.R., 1993. *Tamarindus indica – a widely adapted, multipurpose fruit tree*. Agroforestry for the Pacific Technologies no 2. NFTA.

von Maydell, H-J., 1986. *Trees and Shrubs of the Sahel.* Eschborn.

Prins, H. & Maghembe, J.A., 1994. *Germination studies on seed of fruit trees indigenous to Malawi*. Forest Ecology and Management 64: 111-125.

Sankaranarayanan, R., Vijayakumar, M., Rangasamy, P., 1994. *Cow urine for ideal seed germination in tamarind*. Indian Horticulture, 38(4):15.

Troup, R.S., Joshi, H.B., 1983. *The Silviculture of Indian Trees*. Vol IV. Leguminosae. Delhi, India

Verheij, E.W.M., Coronel, R.E., eds, 1991. *Plant Resources of South-East Asia. No. 2. Edible fruits and nuts.* PROSEA Foundation. Wageningen, Netherlands: Pudoc.

Mature fruit bearing tree. Photo by H.P.M. Gunasena.

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