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National Agricultural Research Institute

## **Mangosteen** **(*Garcinia mangostana*)**



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## THE INSTITUTE

**The National Agricultural Research Institute (NARI)** was established by an Act of National Parliament of Papua New Guinea in July 1996 as a publicly funded, statutory research organisation, to conduct applied and development oriented research on food crops, alternative food and cash crops, livestock and resource management issues. Besides applied and adaptive research, NARI is responsible for providing authoritative technical, analytical and diagnostic services and up-to-date information to the entire agriculture sector in PNG. The major targets are the smallholder semi-commercial farmers in the country.

The mission of NARI is to contribute, through applied research and technical services, to the development of the agriculture sector and realization of the national goals by identifying, adapting and transferring agricultural technologies and information, so as to:

- Enhance the productivity, efficiency and sustainability of the smallholder agriculture, and
- Improve farmer income, food security and welfare of Papua New Guineans and the Nation.

The material presented in this bulletin is based on the best information available at the time of printing (December 2001)

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The fruits are harvested by hand when the fruit skin turn soft and dark purple in color. The state at which they are harvested will depend upon whether they are exported or sold in local markets or supermarkets. Usually fruits for export are harvested before they are fully ripe. Only fully ripe fruits should be harvested, as immature fruits will expel yellow sticky latex when lightly rubbed or scratched. Brushing sometime stains the creamy white color of the edible portion of the fruit.

## Pests and Diseases

Very few pests and diseases on mangosteen have been report in PNG. We do not know what the situation will be if they are grown more widely on large scale in PNG.



Fully ripe fruit ready for harvesting. Usually takes up to four months from flowering in the warm lowlands and about six months in cooler or higher elevations



Fruit showing the delicious creamy white segments . A fruit usually has four to eight segments . Some times a segment would contain one or two brown seeds inside.

### *Vegetative propagation*

Mangosteen can be successfully reproduced vegetatively but there is no real benefits to these methods as tree breed true to type from seeds. Grafted seedling may take up to two years in the nursery and reports show that although grafted seedlings produce earlier the fruits are usually small and are often weak. Vegetative propagation of mangosteen may be used for other reason such as dwarfing of trees or to overcome environmental problems such as pest and disease, wet and dry conditions and producing planting material when fruit (seed) is out of season.

### *Field Preparation and Planting*

Field preparation for planting should be done in the same way as for planting cocoa. Because mangosteen is slow growing, it is often planted under fully established shade which is then gradually thinned out over about four years. The trees should be planted at least five metres apart.

### *Management*

Little or no pruning is necessary, however because of it's slow growth, weeding during the juvenile phase of the tree must be done regularly. No fertilizer is recommended at this stage in fertile soils.

### **Harvest**

## **Mangosteen**

Scientific name: *Garcinia mangostana*

Other names: mangosteen (English), mangostanier (France), mangkhut (Thai), Manggis (Malaysian), manggustan (Phillippines).

### **Introduction**

Mangosteen is native to tropical jungles of Malaysia and Sumatra and often referred to as the “Queen of tropical fruits” because of its sweet and delicious taste. The mangosteen is a small, slow-growing, broad-leafed evergreen tree that grows to a height of 12 –20m with a dense canopy that often develops into a pyramid shape. The tree has a straight trunk and symmetrical branching. The trees are dioecious meaning that the male and female flowers appear on separate plants but for mangosteen male trees are non existent and female trees produce apomictic seeds i.e. produce seed without pollination when grown without male trees.

Trees start to fruit at 8 -10 years. Flowers are borne on the terminals or tips of mature shoots or branch lets inside the canopy. The fruit is ready for harvest at 4 to 6 months after

flowering. It takes longer at higher elevations or in cooler regions than in the warm lowlands. The fruit is round, green and turns purple-black when ripe. It has a thick woody purple skin, which contains yellowish latex and a purple-staining juice, which is very bitter and which successfully repels most insects. Fruit contains 4 to 8 creamy white segments with one or two brown seeds in them. The edible part is the creamy white aril, which has a sweet, melting, delicate and exquisite flavour.

At LAES Keravat mangosteen produce fruits once a year and this is usually around January to March. They can sometimes produce fruits twice a year in areas where there are distinct short dry periods.

## **Uses**

Mangosteens are normally eaten fresh because of their superb flavour but they can also be used in fruit salads.

## **Climate**

Mangosteens grow best in lowland tropical climates, having temperatures ranging from 21 to 34°C and constant high humidity. Temperatures below 20°C will slow growth and eventually kill the plant at below 5°C. Temperatures

above 35°C will produce sunburns of both leaves and fruit. The trees require a short dry period for inducing flowering.

## **Soil**

The trees grow in a wide range of soils provided that there is a satisfactory soil moisture level. Good growth is obtained when grown in well drained soils, rich in organic matter and slightly acidic clay. They will not grow well in fast draining soils such as sandy or limestone soils.

## **Varieties**

At this stage, there are no distinct clones or varieties due to the fact that very little or no crossing or pollination takes place. The seeds in this manner are true to type. The current PNG mangosteen is believed to be a cross between two wild species of mangosteen.

## **Cultivation**

### *Propagation*

Mangosteen trees are often grown from seeds, which are very much true to type. The seeds are extracted from good healthy fruits and should be planted into poly bags immediately as they will not store for more than three days. They are very slow growing and may take up to one year before they are ready to plant in the field.