

FRUIT PRODUCTION: JACKFRUIT



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INDEX

1. Jackfruit: An Introduction	1
2. Indian Names of Jackfruit	1
3. Interesting Facts	2
4. Plant Description	2
5. Fruit Description	3
6. Food Uses of Young/Unripe Jackfruit	3
7. Food Uses of Ripe Jackfruit	3
8. Food Uses of Jackfruit Seeds	4
9. Jackfruit Preparation 1	4
10. Jackfruit Preparation 2	4
11. Jackfruit Preparation 3	5
12. Jackfruit Cultivars	5
13. Growing Jackfruit	6
14. Disease Management	7
15. Harvesting	7

Jackfruit: An Introduction

Scientific name of jack fruit is *Artocarpus heterophyllus* and it belongs to the family Moraceae, the Mulberry Family. Jack fruits are believed to be originated in South India (its natural habitat is the rain-forests of the Western Ghats). Common names of this plant are Jack tree, jack, and jackfruit tree.

Taxonomy

Kingdom	Plantae
Order	Rosales
Family	Moraceae
Genus	<i>Artocarpus</i>
Species	<i>A. heterophyllus</i>
Binomial name	<i>Artocarpus heterophyllus</i>

Jackfruit: Indian Names

- Hindi: Katahal, Kathal
- Manipuri: Theibong
- Marathi: Phanas
- Tamil: Palaa
- Malayalam: Chakka
- Telugu: Panas
- Kannada: Halasina hannu
- Bengali: Kathal
- Oriya: Panas
- Sanskrit: Panasam

Some Interesting Facts

It is the national fruit of Bangladesh and Sri Lanka and the state fruit of the Indian states of Kerala and Tamil Nadu. Major producers of jackfruits are India, Bangladesh, Thailand, and Indonesia. Jackfruit is widely cultivated throughout Southeast Asia and Brazil. In Brazil, Jackfruit trees are considered as an invasive species. Jackfruit tree produces large fruits directly from its trunk and from its interior branches; fruit is oblong to cylindrical in shape. Fruit of the Jackfruit tree is the largest tree-borne fruit, reaching as much as 50-60 kg in weight, up to 1 meter in length, and 50 cm in diameter.

Plant Description

Jackfruit tree is a large perennial tree that reaches up to a height of 10 to 25 m and a canopy diameter of 4-7 m at its full maturity; that is when the tree is 5 years old. Leaves are simple, evergreen, alternate, thick textures, glossy and leathery; it is oval to oblong in shape; petioles (leaf stalks) are stout and about 2 cm long; leaf blades have entire margins on mature plants but they are deeply lobed on young plants. All parts of the plants contain a sticky, white latex which are rich in a number of resinous compounds. Flowering stems appear from the trunk and large interior branches, or sometimes, from base and roots of the mature trees; since Jackfruit is monoecious both male and female flowers appear on the same tree but in separate flower clusters. Male flowers are borne in oblong clusters and female flowers are borne in rounded clusters; flowers are small and green-coloured.

Flowering and Pollination

Regarding flowering, jackfruit tree is polycarpic and its inflorescence is a spike. Flowers are open-pollinated by winds and insects. Stingless bees (e.g. *Tetragonula iridipennis*) are important jackfruit pollinators and therefore it is important to keep a healthy population of bees in a jackfruit plantation. Since jackfruit is an open/cross-pollinated crop, it is difficult to get true-to-type seedlings.

Fruit Description

Jackfruit is a multiple fruit and is formed by the fusion of multiple flowers in an inflorescence. Mature fruit has a green-coloured, hard, outer covering or rind. The rind of jackfruit is formed by the fusion of tops of all fertile and sterile flowers. On the rind, the polygonal, areola-like part with a short spine represents stigmatic heads of the flowers. Inside the jackfruit, individual bulbs are present and they represent individual fruits. Fruit flesh is slightly acidic, sweet, and banana-flavored; it surrounds each seed. In other words, one seed is present in each bulb; there are as many as 500 seeds are present in a whole jackfruit; the loose, leathery bag around each seed is actually a transformed ovary wall. The fleshy and juicy pulp of the jackfruit bulb is the modified perianth and the ribbon-like white structures between the bulbs are actually modified sterile flowers. The heavy fruit is held together by a massive club-like structure at the centre of the jackfruit; it is the thickened peduncle of the inflorescence. The fruit has a sticky, white-coloured latex which contains resins.

Food Uses of Young/Unripe Jackfruits

Young, immature jackfruits are mildly-flavoured and has a meat-like texture; hence it can be prepared like meat by adding spices and herbs to make delicious curry dishes. Boiled young jackfruits can be used in salads or as a vegetable ingredient in mixed vegetable preparations or as filling in cutlets. Young jackfruit slices can be deep-fried in oil to make crispy, jackfruit chips. Young jackfruit slices can be canned to preserve it for a long time and these canned jackfruit may be used as a vegetable. In South India, young jackfruits are used as a staple food especially in times of food scarcity; jackfruit can be considered as a food security crop.

Food Uses of Ripe Jackfruits

Fresh, ripe jackfruit can be eaten fresh and it is a naturally sweet, mild-flavoured, delicious fruit. Jackfruit juice can be extracted from ripe, juicy jackfruit bulbs. Jackfruit can be preserved as a dried fruit, candied fruit, or as jackfruit jam. Dried fruit is made by air-drying or sun-drying fresh fruit slices. Concentrated jackfruit juice is used for making jackfruit candies. Fresh fruit slices can be preserved for a long time by canning in a sugary syrup. Fresh fruit can be frozen in food-grade polybags for later uses. Jackfruit flesh may be used in the preparation of custards, cakes, and ice creams.

Food Uses of Jackfruit Seeds

Jackfruit seeds may be roasted and eaten like any other nuts. Powdered, roasted seeds are a good addition to baking flour. Boiled seeds can be consumed with salt as a vegetable as it is rich in edible starch. In South India, seeds are dried and preserved in soil or in covered earthenware to be used later; here seeds are used to make several vegetable preparations and most famous among them is, ‘aviyal,’ a mixed vegetable preparation.

Jackfruit Preparation 1:

Curry Preparation from Young Jackfruits

Tender, young, unripe jackfruits are selected for curry preparations. Jackfruit bulbs should be so tender that seeds should be just at the formation stage only. Selected jackfruits are cleaned and the skin of the jackfruit is peeled off. Remaining part is chopped into small chunks and boiled in water for removing stickiness. Boiled jackfruit portions are used just like meat pieces to prepare a delicious curry. Preparation is similar to that of any meat preparation; i.e. by adding lots of spices and herbs.

Jackfruit Preparation 2: Jackfruit Jam

Firm, ripe, soft and juicy jackfruit bulbs are selected for preparing jackfruit jam. Then, jackfruit flesh is chopped into small pieces. Simultaneously, fresh and clean jaggery is taken in a deep, large pan and heated to make a sweet syrup. When syrup is ready, it is mixed with jackfruit pieces and stirred in low flame until desired consistency and texture for jam is obtained. This jackfruit can be preserved and used for several months. In South India, jackfruit jam is locally known as “Chakka varatti.”

Jackfruit Preparation 3: Jackfruit Chips

Unripe fruit bulbs are used for making jackfruit chips. Firm, unripe jackfruit bulbs are separated from the fruit and all attached fibers and seeds are removed. Bulbs are cut into thin, long slices and then mixed with a pinch of salt; sometimes turmeric powder is also used to smear jackfruit slices. Take a large, deep frying pan and pour cooking oil into it. Boil the oil and when oil is ready, put jackfruit slices into it and deep fry until slices turn golden brown colour. Take the chips out of the oil and cool at room temperature before packing it in air-tight containers. Chips can be stored at room temperature for several months under cool, dry, hygienic conditions.

Jackfruit Trees: Timber, Fodder and Other Uses

Jackfruit wood is highly durable, and its timber (hardwood) is termite-proof and is extensively used for building furniture, and for constructing doors and windows for houses and other types of buildings. Its softwood is good for manufacturing musical instruments, especially veena, a South Indian musical instrument. Leaves of jackfruit trees can be used as a food for goats and other animals. A yellow/saffron dye can be extracted from its hardwood, which is used for dyeing clothes of the Buddhist monks.

Jackfruit Trees as Garden Plants

Dwarf varieties of Jackfruit trees can be grown for ornamental purposes as the tree has attractive, elegant, evergreen foliage. Jackfruit is a popular fruit plant in tropical kitchen gardens. Jackfruit trees can be grown for screening and shade purposes also. In coffee plantations, jackfruit can be grown as a shade-tree. Jackfruit trees can also be grown as a support for black pepper vines.

Jackfruit Cultivars

There are mainly two types of jackfruit trees based on the characteristics of fruit flesh. These are, hard-flesh varieties and soft-flesh varieties. In South India, hard-flesh varieties are known as “Varikka” and soft-flesh varieties are known as “Koozha”. Flesh of “Hard/Varikka” jackfruit is crunchy, fleshy or thick, and dry with moderate sweetness. Flesh of “Soft/Koozha” jackfruit is soft, fibrous, moist, and too sweet.

Growing Jackfruit

Climate: The jackfruit tree is well suited to tropical lowlands where humid and warm climate is prevalent. They thrive well in equatorial to subtropical climate at an elevation up to 1600 meters. Jackfruit trees require an average rainfall of 100 to 240 centimeters for healthy growth and fruit production.

Soil: Well-drained, rich and fertile loamy soils or lateritic soils are the most suitable soils for jackfruit trees. Water-logged soils and poorly aerated soils are detrimental for plant growth.

Propagation and Planting: Propagation can be done by seeds; however seed propagation gives highly variable seedlings. Commercial propagation is by grafting and air-layering. One-year old grafts can be planted in well-prepared pits at the onset of monsoons. Pits of size 50x50x50 cm may be prepared well in advance to weather in the sun. At the time of planting, pits may be filled with a good soil mixture prepared by mixing top soils and organic manures such as farmyard manure and compost. Soon after planting, plants are watered.

Manuring and Watering: Organic growing practices are preferred for jackfruit cultivation. Established jackfruit trees require very less care. Every now and then, large quantities of farmyard manure or compost or leaf manures may be added and mixed with the top soils to replenish soil fertility. Watering is done depending upon the requirements of the plants, wetness of the soil, and prevailing climate.

Pruning: Growing plants do not require pruning. Mature plants require minimal pruning such as removal of dead and diseased branches. After every harvest, fruit-bearing stems need to be cut down to the trunk to induce new growth. Pruning can be done every year or at the interval of 3-4 years. Pruning increases productivity of the plants.

Insect-Pest and Disease Management

Shoot borer caterpillars (*Margaronia ceasalis*), Mealy bugs and Jack scales are the major insects of the jackfruit tree. They can be controlled by hand-picking or by spraying pyrethrum-based organic pesticides. Common diseases are: Pink disease, Stem rot, Fruit rot and Male inflorescence rot. They can be controlled by the application of 1% Bordeaux mixture.

Harvesting

Fruiting season is mainly from March to September. Individual fruits are harvested by cutting the fruit from its base by a sharp, big knife. A mature jackfruit tree produces about 100 to 250 fruits per annum. On an average, a fruit weighs about 3-5 kg. Researches reveal that jackfruits as big as 55kg have been obtained elsewhere.



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