



Jack fruit

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Introduction

- Botanical name : *Artocarpus heterophyllus*
- Family : Moraceae
- Origin : India
- chromosome no 2n : 56 (X=14)
- Fruit type : Sorosis
- Edible Part : Bracts or Perianth
- Poor man's food.
- National fruit of Bangladesh.
- It is also called kathhal (hindi and urdu), pala (tamil), halasina hannu (kannada), panasa pandu (telugu) and phanos (marathi and Konkani).

Growth and Development characteristic

- ❖ Evergreen tree
- ❖ 30-70 feet (9-21m) tall
- ❖ Monoecious tree
- ❖ All parts contain silky white latex.
- ❖ Flower bearing habit : Terminal bearing habit
(Current season growth)
- ❖ Fruit Bearing habit : Cauliflorous bearing habit
- ❖ Type of Inflorescence : Catkin (Racemose)
- ❖ Type of Pollination : Cross Pollination
- ❖ Mode of Pollination : Anemophilous (Wind Pollination)
- ❖ Fruit shape: Oblong, ellipsoid, triangular, spheroid, claviform, round



Cultivation Area

- ✓ The jackfruit tree is widely cultivated in tropical regions of India, Bangladesh, Nepal, Sri Lanka, Vietnam, Thailand, Malaysia, Indonesia and the Philippines etc.
- ✓ In India, Kerala, Tamil Nadu, Karnataka, Goa, coastal Maharashtra, Assam, Bihar, Tripura, Uttar Pradesh and foothills of Himalayas.
- ✓ In india the area & production of juck fruit is 0.156Mha & 1.826 MT respectively.
- ✓ In Rajasthan. It is cultivated in kota, Udaipur and near by area.

Composition

- Ripe fruit flakes (bulb) contain
 - carbohydrates (16-20%),
 - total soluble solids (25-29 brix),
 - β -carotene (500-580 IU),
 - thiamin (30g), aa
 - pectin (1.5-6%)
 - phosphorus (30-40mg) and
 - calcium (20-30mg)/100gm of edible portion.
- It is rich in vitamin B and C, potassium, calcium, iron, proteins and high level of carbohydrates, affordable and readily available supplement to our staple food.
- Its seeds are rich in proteins and can be relished as a nutritious nut.

Nutritive value of jackfruit (100 g)

Constituent	Average value
Moisture (%)	76.20
Energy (cal)	88.00
Protein (g)	1.90
Fat (g)	0.10
Fibre (g)	1.10
Carbohydrates (g)	19.80
Potassium (mg)	107.00
Calcium (mg)	20.00
Phosporous (mg)	41.00
Iron (mg)	0.56
β Carotene (mg)	175.00
Thiamine (mg)	0.03
Riboflavin (mg)	0.13
Niacin (mg)	0.40
Vitamin C (mg)	7.00



Uses

- ▶ Immature fruit is used as a vegetable
- ▶ Ripe fruits are canned, used for preparation of jam, nectar, preserves, squash and candy.
- ▶ From mature but unripe fruits, products like chips and papads can be prepared.
- ▶ It is used for curing inflammations, constipation, and wound healing and skin diseases.
- ▶ **Lectine**, a natural protein from fruit is used in cancer treatment.
- ▶ An extract of jackfruit called '**jacaline**' inhibited the growth of HIV infection invitro.

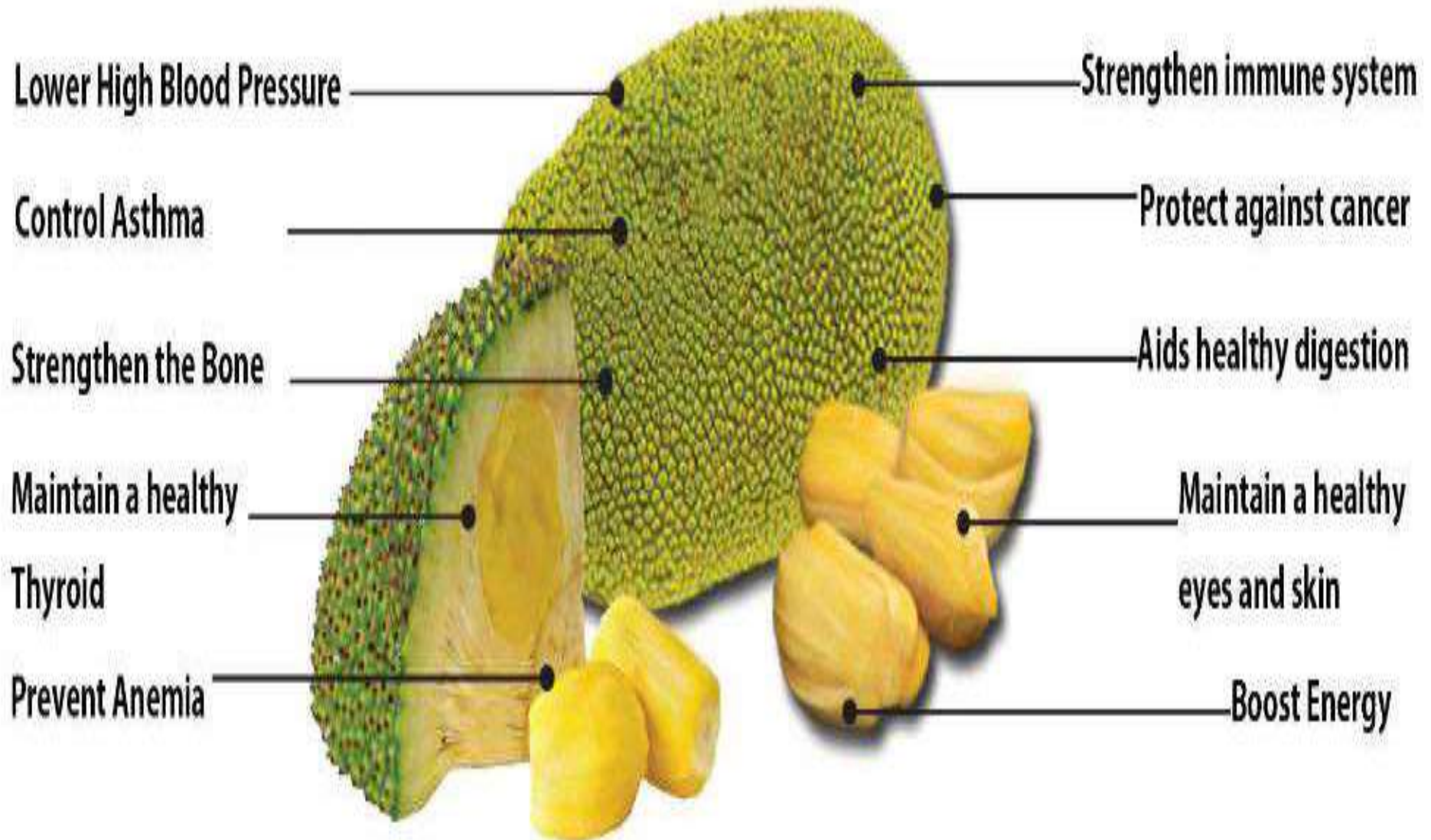


JAM

PICKLES

PAPAD

Health benefit of jackfruit



Climate

- Jack fruit adapt well to humid tropical and subtropical climates.
- Warm humid plains are very much suitable for its growth and fruiting.
- Jack fruit also performs well in semi arid and warmer plains as well as coastal climate of southern India.
- It grows in the arid region and up to an elevation of 1500m, but the quality gets affected at higher elevations.
- The tree can not tolerate frost and cold conditions.

Soil

- ✓ The fruit crop can be grown in a wide variety of soils but it performs well in deep, rich, alluvial soils with enough drainage facilities.
- ✓ Tree is grown in laterite or open textured soils also, but sufficient nutrients should be provided.

Varieties

- Singapore or Ceylon jack : Introduced from Ceylon, highly precocious type, produces fruits within 2.5 to 3 years time, and produces off-season crops also.
- Rudrakshi : Produces small round fruits having smooth rind with fewer wines, quality inferior.
- Muttam varikka: Locally named variety, produces medium size fruits with Sweet flesh.
- Gulabi (rose-scented), Champa (flavour like that of champak) and Hazari (bearing large number of fruits).
- Jackfruit NJT1, NJT2, NJT3 and NJT4 collections from Faizabad have large fruits with excellent quality, low fiber content and suitable for table purpose.
- NJC1, NJC2, NJC3 and NJC4 have small to medium sized fruits with thin rind, soft flesh and suitable for culinary purpose.

- Through selection, Burliar-1, Palur-1 (PLR-1) and Pechiparai-1 (PPI-1) were released from TNAU, Coimbatore.
- **PLR-1** is an off season high yielding variety suitable for high density planting.



Propagation

- Propagation is usually by seeds which can be kept no longer than a month before planting because seeds lose viability with a short period.
- Soaking seeds in NAA (25 ppm) for 24 hrs enhances percentage of germination and seedling growth.
- Budding method like patch, chip and forket are successful in jackfruit.
- Air layering is the best method under west Bengal condition which gave 100% rooting with IBA treatment.



Jackfruit Seed



Seedlings

Cultivation

Planting: -

- System of planting adopted is square method while hexagonal system can be followed in less fertile soil.
- Planting either with seedlings or vegetative propagules is done during onset of monsoon period soon after planting, staking has to be done.
- In situ planting of 3-4 seeds / pit gave strong plant.
- Soaking one-month-old seedlings in a gibberellic acid solution (25-200 ppm) enhances shoot growth.
- Gibberellic acid spray and paste increase root growth.

Manures and Fertilizer

Nutrient g/tree	Age of tree (Years)		
	1-3	4-7	>7
N	200	400	600
P	120	240	300
K	60	120	240

Training and Pruning

- No regular training and pruning is given to trees.
- But it is desirable to maintain a single stem up to a certain height.
- In aged trees light to medium pruning can be given to remove over crowded branches without affecting yield. (Muthulakshmi,2003)

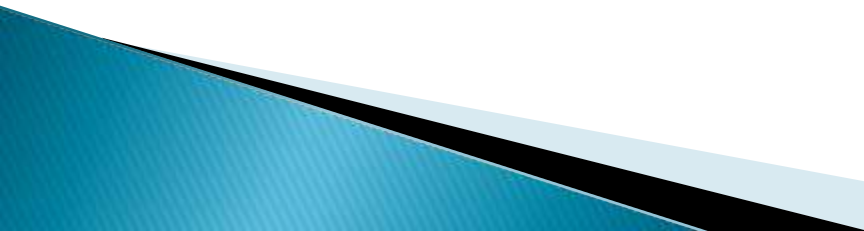
Irrigation

- Tree does not need regular irrigation.
- Young trees can be watered during summer.
- Frequency of irrigation depends upon soil and climatic factors

Intercropping

- Jackfruit intercropped with vegetable crops like chilies, bhindi, brinjal, and pulses till trees reach bearing stage.

Flowering

- Trees start bearing from 6-8 years after planting.
 - According to locality and plant type, Flowering seasons starts from November and extends upto march.
 - Very rarely , off season flowering during September is noticed.
 - Female spikes are borne on footstalks from main branches while, male spikes appear both on central and peripheral region.
 - Sex of spike can be easily identify.
 - Female spike are large and surface gritty while, male ones are small with smooth surface.
 - A single male flower consists of stamen covered by perianth.
- 



Jackfruit Flowers



Male flower



Female flower

Fruit development

- Pollination and fertilization of spike are completed within 3-6 days after pollination.
- fleshy perianth is the edible portion, which develops the flake.
- Fruit consists of four parts, viz i) bulb (37-40% } ii) perigons (18-20%) iii) rind (20-22%) iv) seeds (20-23%).
- After fruit set it takes about 120-140 days to reach maturity.
- Flattening of spines on the rind and thickening of latex are the maturity of indices.

Season

- In Asia, jackfruits ripen principally from March to June, April to September, or June to August, depending on the climatic region, with some off-season crops from September to December, or a few fruits at other times of the year.

Harvesting

- Fruit maturity indications include hollow sounding when tapped, spines become flattened and wider, colour of fruit becomes pale, develops a strong aroma and matures 3 to 8 months after flowering.
- Harvesting season starts from February and extends to June.
- Fruits mature 3 to 8 months from flowering.
- Fruits are harvested along with their footstalks.
- Yield varies from a few fruits during first year of bearing and it may be as high as 250 fruits after 15 years of age.
- Individual fruit weight varies from 3-15kg. " -On an average about 50-30 tons of fruits per hectare.

Post Harvest Management

Storage :-

- jack fruit is climatic in it's nature of ripening.
- Usually ripening takes place within 3 to 5 days after harvest.
- These fruit is not normally stored in low temp, but ripe flakes (bulbs).
- can be stored at low temp for 2 - 3 weeks by dipping then in sugar syrup containing potassium meta bisulphate and packing in 100 gauge.
- polypropylene cover without affecting the quality.

CROP PROTECTION

Pest:-

1. Shoot borer (*Diaphania caesalis*)

- It is reported from Karnataka, Maharashtra and Assam. The caterpillars bore into shoot, flower bud or fruit causing wilting of shoot, drying of flower buds and rotting of fruits. The pest can be controlled by spraying phosphamidon (0.03%).



2. Bark borers (*Indarbela tetraonis* and *Batocera* spp.):-

➤ These are mostly polyphagous pest and in case of jackfruit, *Indarbela tetraonis* and *Batocera* spp. are important. To control borers, clean affected portion of bark on main stem and insert a wick of cotton wool soaked in kerosene oil or carbon bisulphate into holes and seal holes with mud.

3. Bud weevil (*Ochyromera artocarpi*) :-

- It is found all over India. Buds and fruits fall prematurely by attack of this weevil. This can be controlled by spraying carbaryl (0.2%) and also by destroying fallen fruits and buds.
- Other pests affecting jackfruit are leaf webbers (*Perinna mida*), scale insect (*Simalaspilus artocarpi*), aphids (*Greentdia artocarpi*), mealy bugs, white flies and red ants.

Disease:-

1. Fruit rot/soft rot (*Rhizopus artocarpus*):-

➤ it is a serious disease and affected fruits fall off early. This can be controlled by application of captan (0.2%) or Bordeaux mixture (1%).



2. Dieback (*Botryodiplodia theobromae*):-

➤ Twigs or branches shrivel, die and fall off. There may be gum exudation from affected branches. Management of dieback includes pruning of affected twigs followed by spraying carbendazim (0.1%) or chlorothalonil (0.2%). The minor diseases are leaf spot (*Phyllosticta artocarpina*), rust (*Uredo artocarpus*), Pink disease (*Botryobasidium salmonicolor*) and seed rot.