

Production Technology for Cultivation of Breadfruit

(*Chinnasamy C S¹, Rajangam J², Nithiya Sree S¹, Udhayakumar K¹ Sangeeth Shyam Sundar¹ and Ashtalakshmi M¹)

¹Research Scholar, Department of Fruit Science, Horticulture College and Research Institute, Periyakulam, TNAU

²Dean, Horticulture College and Research Institute, Periyakulam, TNAU

*Corresponding Author's email: chinnasami2001@gmail.com

Breadfruit, part of the Moraceae family and *Artocarpus* genus, is an unusual fruit in India, often consumed as a vegetable rather than a fruit. It thrives in tropical climates and is typically cooked, although it can be fried, baked, boiled, or roasted. In addition to its culinary use, breadfruit tree leaves are utilized as livestock feed. Despite India's favorable warm coastal climate, commercial cultivation of breadfruit is limited, with notable production in Kerala and the Southwest Konkan coast.



Scientific name: *Artocarpus altilis* (2n = 56)

Family : Moraceae

Origin: Indo Malayan

Health benefits

- Breadfruit contributes to heart health by providing protection against infections.
- It serves as a valuable energy source.
- Breadfruit aids in digestion.
- It assists in diabetes management.
- Breadfruit contains beneficial omega-3 and omega-6 fatty acids.
- It alleviates toothaches.
- Breadfruit helps prevent skin inflammation.
- It is effective in treating skin diseases.

Dietary profile

- The food contains 4.0 grams of protein, 31.9 grams of carbohydrates, and 5.4 grams of fiber.
- It provides 43.1 milligrams of phosphorus, 376.7 milligrams of potassium, 16.8 milligrams of calcium, 34.3 milligrams of magnesium, and 19.4 milligrams of sodium.
- The nutrient composition comprises 0.5 milligrams of iron, 2.4 milligrams of vitamin C, 0.9 milligrams of niacin (B3), 1.4 micrograms of vitamin A, and 96.3 micrograms of lutein.

Botany

- With the capability to reach heights of 21 meters and diameters of 2 meters, these trees boast a single trunk and a spreading, evergreen canopy. They also feature white milky latex present throughout all parts of the tree.

- The species is monoecious, with male and female flowers growing on the same tree. Male inflorescences appear before female ones, with male flowers being club-shaped. Female inflorescences consist of 1500–2000 reduced flowers attached to a spongy core.
- These flowers merge to form the edible part of the fruit. Although cross-pollination is possible, it is not essential for fruit development.
- The leaves are arranged alternately and vary in shape from broadly obovate to broadly ovate, with some showing slight to deep pinnate lobing. They have a smooth, glossy surface and are predominantly dark green with green or yellow-green veins.
- Additionally, there may be sporadic to abundant white to reddish-white hairs along the midrib and veins.
- The fruits come in various shapes, sizes, and surface textures, commonly round, oval, or oblong, with widths ranging from 9 to 20 centimeters and lengths surpassing 30 centimeters. Their weight typically varies between 0.25 to 6 kilograms.



Species

1. *Artocarpus camansi*, commonly known as breadnut or camansi, bears elongated fruits covered in sparse spines. These fruits contain minimal pulp and numerous large, light brown seeds. The tree's large leaves are deeply lobed, typically with 4–6 pairs.
2. *Artocarpus mariannensis*, also called dugdug or chebiei, produces small, dark green fruits with a cylindrical or kidney shape. These fruits have yellow flesh and dark brown seeds. The tree's leaves are small and may be either entire or shallowly lobed with 1–3 lobes.
3. The hybrid of *A. altilis* and *A. mariannensis*, known as Meinpadahk or Mejenwe, combines traits from both parent species.

Climate

Breadfruit thrives in hot, humid tropical climates with temperatures between 15 to 37 degrees Celsius and requires annual rainfall of 200 to 250 centimeters, along with high relative humidity of 70 to 80%.

Soil

It prefers deep, fertile, well-drained soils but can adapt to shallow sandy soils, favoring light to medium soil types like sands, sandy loams, loams, and sandy clay loams. Optimal soil pH ranges from 6.1 to 7.4, with good drainage being essential for growth.

Propagation

- Root cuttings
- Air layering
- Root Suckers
- Root shoots

Root cuttings

Carefully select and excavate roots just below the soil surface, avoiding surface roots. Opt for roots with diameters of 1.5 to 6 centimeters, cut them into 15 to 25 centimeter sections, and plant them horizontally or at an angle. While hormone treatment is optional, follow manufacturer recommendations if used. Rooting success ranges from 75 to 85%, with shoots emerging within 3 to 4 weeks.



Planting

Optimal planting periods for breadfruit are June and July in Karnataka and Kerala, and October to November in Tamil Nadu. Excavate pits measuring 1x1x1 cubic meters, spaced 10 to 12 meters apart, and apply 25 kilograms of organic manure per tree.

Nutrient Management

Allocate 25 kilograms of organic manure per tree. While no specific fertilizer is recommended, consider applying a 7:10:5 ratio of N:P:K fertilizer at a rate of 1 to 2 kilograms per plant, based on age.

Irrigation

Immediately irrigate after planting, adjusting the frequency as per soil moisture and weather conditions. Regular watering is crucial during hot, dry summers. Ensure effective drainage during heavy rainfall to prevent waterlogging. To combat fruit rot disease during rainy seasons, utilize a 1% Bordeaux mixture.

Flowering and Fruit Bearing

Breadfruit follows a seasonal fruiting pattern, typically yielding one or two crops per year across most varieties. The primary harvest occurs during the hot, rainy summer months, with a smaller crop following 3–4 months later. Trees grown from seeds start flowering and fruiting within 6–10 years or sooner, while those propagated vegetatively begin bearing fruit in 3–6 years.

Maturity Indicators

Indications of ripeness include the emergence of small latex droplets on the surface, a delicate aromatic aroma, soft texture upon touch, division into sections, and a transition from dark green to yellow in color.

Yield

Yield output varies significantly, ranging from fewer than 100 to over 700 fruits per tree, influenced by factors like variety, age, and tree condition. On average, trees yield between 150 and 200 fruits each. Storage at 12°C is recommended for up to 10 days.

Value Addition

- Ripe fruits can be transformed into desserts, purees, and puddings.
- Green, immature fruits are suitable for cooking applications like curries and fries.

Future Scope

The future prospects for breadfruit are promising, with potential avenues including:

- Further exploration of its nutritional benefits and culinary versatility to expand its appeal.
- Research and development efforts focused on enhancing cultivation techniques for increased yield and resilience to environmental challenges.

- Exploration of breadfruit's potential as a sustainable food source in regions facing food security issues.
- Utilization of breadfruit as a raw material in various industries, such as food processing, cosmetics, and pharmaceuticals.
- Continued efforts to raise awareness about breadfruit's benefits and promote its adoption on a broader scale.

Conclusion

In summary, the production technology of breadfruit presents exciting prospects for sustainable agriculture and food security. Through a thorough understanding of its ideal cultivation conditions, including climate, soil, and planting methods, we can optimize both yield and quality. Advancements in harvesting, post-harvest handling, and value-added processing also play a crucial role in enhancing its economic viability. With ongoing innovation and research, breadfruit stands as a versatile crop with the potential to address nutritional needs, support livelihoods, and promote environmental sustainability. Continued investment and collaboration in breadfruit production technology will further unlock its benefits for local communities and global markets.