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Fig, a innovative nutritious fruit for Bundelkhand region

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Abstracts

Bundelkhand region is largely characterized by shallow red soils, undulating topography, extreme weather conditions, and recurrent droughts, making the agriculture in the region more difficult leading to low crop productivity, crop intensity, and higher soil loss through erosion and runoff Fig cultivation if adopted in water scarce region can prove to be an asset to small holders as well as entrepreneur farmers. The Fig is a subtropical plant belongs to the genus *Ficus* of Moraceae family. The Fig tree is native to Central Asia. Fig fruits contain at least 17 types of amino acids, among which aspartic acid and glutamine are the highest ones. Dried figs also contain relatively high amounts of crude fibers (5.8%, w/w), higher than those of all other common fruits. More than 28% of the fiber is of the soluble type, which has been shown to aid in the control of blood sugar and blood cholesterol and in weight loss. Dried figs also contain one of the highest concentrations of polyphenols among the commonly consumed fruits. The ideal temperature for the growth of the fig tree is 15.5 to 21°C. Many techniques are used for propagating Fig such as budding, hardwood cutting, air layering and grafting. However, the most commonly used methods for commercially propagating the trees is through hardwood cuttings. The Planting fig trees at 8 × 8 m or even 15 × 15 m spacing has been reported. Planting is done in early spring monsoon – during August and September.

Introduction

Fig (*Ficus carica* L. 2n = 26), is a subtropical plant belongs to the genus *Ficus* of Moraceae family. The family includes over 1400 species grouped into about 40 genera. The genus *Ficus* alone contains nearly 700 species. Fig tree is native to Central Asia. It's cultivation was started around 3000 BC in the South Arabian Peninsula. Later, it spread to Iran, Syria and Turkey and all the Mediterranean countries. Tree is hardy that is well-adopted to several types of soils and climates and can tolerate salinity and drought to a limited extent. Therefore, it is grown in many parts of the world having moderate climate. Figs are free from sodium as well as

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cholesterol and fat. Fig fruits contain at least 17 types of amino acids, among which aspartic acid and glutamine are the highest ones. Dried figs also contain relatively high amounts of crude fibers (5.8%, w/w), higher than those of all other common fruits. More than 28% of the fiber is of the soluble type, which has been shown to aid in the control of blood sugar and blood cholesterol and in weight loss. Dried figs also contain one of the highest concentrations of polyphenols among the commonly consumed fruits and beverages. Figs can be eaten fresh or dried, or processed into jam, rolls, biscuits and other types of desserts. Since ripe fruit does not transport and keep well, most commercial production is in dried and processed forms. Raw figs contain roughly 80% water and 20% carbohydrates, with negligible protein, fat and micronutrient content. They are a moderate source of dietary fiber.

The fig fruit develops as a hollow, fleshy structure called the syconium that is lined internally with numerous unisexual flowers. The tiny flowers bloom inside this cup-like structure. Although commonly called a fruit, the syconium is botanically an infructescence, a type of multiple fruit.

Climate & soil

This fig tree is a subtropical tree that can tolerate a lower temperature range of 9.5 to 12°C while in the dormant, mature stage, whereas the trees in the growing stage need protection from lower temperatures. The ideal temperature for the growth of the fig tree is 15.5 to 21°C. Fig trees growing in the mild tropical and subtropical areas exhibit certain characteristics like:

- Continuous growth during certain part of the year
- Rest during a well-marked period
- Flowering and fruiting during an indistinct period
- Dormant period with barren limbs

Region with the dry climate during fruit development and maturation is considered best for fig trees. The fig trees in regions with high humidity coupled with low temperatures generally result in cracked and low- quality fruits. The trees flourish well in regions with hot and dry winds during the April-June period.

The best type of soil required for growing fig trees is deep, non-alkaline clayey loam soil. Soil with well- draining property and good water holding capacity are ideal for the cultivation of fig, especially alluvial clay loam or medium black soils. The pH level of soil should be around 5.5-8 and approximate depth of the soil should be around 1 m.

Propagation

Many techniques are used for propagating Fig such as budding, hardwood

cutting, air layering and grafting. However, the most commonly used methods for commercially propagating the trees is through hardwood cuttings. The size of the hardwood cuttings should be about 20-30 cm long and 0.5 to 0.7 cm thick. These cuttings should be taken from 1 to 2-year-old shoots, especially in the month of July-August. These cuttings are then planted into rooting mixture within a polythene bag. The cuttings can also be rooted by immersing them in damp sawdust or other medium. It is also clearly observed that cuttings that are placed under the mist develop roots faster (say 3 to 4 weeks). Propagation of figs through the seeds is not true to type and is probably used only in breeding programs.

Health benefit

Dietary Fiber: Figs are an excellent source of dietary fiber, which aids in digestion and helps prevent constipation. The fiber content can also contribute to a feeling of fullness, which may be beneficial for weight management.

Rich in Nutrients: Figs are a good source of essential nutrients (such as vitamins A, vitamin K, vitamin B6), minerals (including potassium, magnesium, calcium, iron), and antioxidants. These nutrients play crucial roles in maintaining overall health and well-being.

Heart Health: The potassium content in figs can help regulate blood pressure and support cardiovascular health. Additionally, the fiber and antioxidants may contribute to reducing the risk of heart disease.

Blood Sugar Control: Figs have a moderate glycemic index and may help in managing blood sugar levels. The fiber in figs can slow down the absorption of sugars, potentially benefiting individuals with diabetes.

Antioxidant Properties: Figs contain various antioxidants, including phenols and flavonoids, which can help neutralize free radicals in the body. This may contribute to reducing oxidative stress and lowering the risk of chronic diseases.

Composition of nutrients

Fig is a nutritious fruit with high sugar and low acid content. The fresh fruit is rich in calcium, iron, vitamins A, and C the Composition of fig is as following this table:

Nutritional	composition
Moisture	80.8%
Carbohydrate	17%
Protein	1.3%
Fat	0.2%
Iron	30(mg/100g)
Potassium	7.1(mg/100g)
Thiamin B1	14(mg/100g)
Riboflavin B2	6.2(mg/100g)
Carotene	600(mg/100g)
Nicotinic acid	0.8(mg/100g)

Planting system

Cuttings are raised in nursery beds and are set out in the field after 12 or 15 months. They may be spaced from 6 to 25 ft (1.8-7.5 m) apart, depending on the cultivar and the fertility of the soil. Closer spacing reduced in increased yield per tree, and per unite area and early ripening of fruits. Planting fig trees at 8 × 8 m or even 15 × 15 m spacing has been reported. Planting is done in early spring monsoon – during August and September.

Training systems

Fig trees are usually fan-trained. The tree should not be allowed to become tall, as it is to harvest fruits by hand packing from low-headed trees. Pruning is also done to ensure new growth. In Pune notching of buds is done in July for inarching fruit bearing shoots by giving slant cuts over dormant buds remove a small slice of bark with wood and two buds are notched in each shoot.

The following treatments *viz.* Pruning of top bud, light pruning (removal of top 6-10 cm of all shoots), medium pruning (removal of all small and green shoots, and removal of half the bigger shoots), several pruning (pruning to about 30-45 cm) and light pruning with notching (slant cut in bark over the bud) were imposed on three-year-old trees.

Cost and Profit Analysis in Fig Farming

Bundelkhand region is largely characterized by shallow red soils, undulating topography, extreme weather conditions, and recurrent droughts, making the agriculture in the region more difficult leading to low crop productivity, crop intensity, and higher soil loss through erosion and runoff Fig cultivation if adopted in water scarce region can prove to be an asset to small holders as well as entrepreneur farmers. It is a fast return perennial fruit with high yield, as regular bearing brings steady income to the growers. Beside high initial establishment cost due to cement poles and trellis, it's becoming very much demanding amongst the farmers because of its very high return. In addition, once planted, it will grow for about 15-20 years. It starts giving return immediately one and half year after plantation through selling of pruned plant parts as planting material and from second year onwards through selling of fruits.

Profit from the farm is expected only in the second year of farming: Income – (Establishment cost in year 2 + maintenance cost (B) + material cost (C)) = (Rs 4, 07,000 – Rs 40,113) = Rs 3, 66,887. It is to be noted

that the farm may need a drip irrigation system and it would need around Rs 35,000 to Rs 50,000 for one acre of land. It is not included in the calculation. **(According to FICCI).**