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# Brinjal: Nutritional Benefits Overview

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Brinjal is rich source of essential nutrients and antioxidants, such as vitamins C and B6 and various phytochemicals. Its mild flavor allows it to be a versatile ingredient in both delicious and sweet dishes. It has a wider diversity in fruit colour, shape and especially consumer preference in the regions of our country. The fruits have small in size, greenish purple colour with spine type are mostly liked in Rajasthan, green fruits with vertical strips are popular in Bihar, white type in Odisha and some part of U.P, purple and medium size is very much popular in Delhi. Brinjal fruit is consumed by different cooking styles i.e., grilling, roasting, frying and stewing. It is a key component in many traditional dishes from various cultures, such as Ratatouille, Baba Ganoush and Moussaka. In addition to its culinary uses, brinjal has been associated with several health benefits specially in diabetic, cardiovascular, ulcer, cancer, stroke etc. The antioxidants present in brinjal may help to protect cells from oxidative stress and white type brinjal helps in curing diabetes. However, it's important to note that some individuals may be sensitive to certain compounds in brinjal, and it is also advisable to consult with a healthcare professional if any adverse reactions occur. Overall, brinjal is a versatile and nutritious vegetable that adds depth and flavor to a wide array of dishes and make it a popular choice in global cuisines.

## Introduction

Brinjal (*Solanum melongena* L.) is a popular and versatile vegetable that is widely cultivated in India as well as around the world. It is also known as various names such as eggplant in the United States, aubergine in Europe and brinjal in South Asia, this vegetable is prized for its rich, creamy texture and earthy flavor. In India, it was cultivated in 0.67 million hectare area with a production of 12.96 million tonnes and productivity of 16.7 tonnes per hectare. Fruits of brinjal are available in various shape, size and color. It is a favorite among home gardeners and commercial farmers alike. Brinjal cultivation also plays a role in supporting a sustainable and nourishing food supply. The common brinjal bearing large, round or egg-shaped fruits grouped under *var. esculentum*. The long and slender fruit bearing types are included under *var. serpentinum* and the dwarf brinjal plants are put under *var. depressum*.

## Morphology

The plant typically grows as a bushy, erect perennial, bearing large, glossy and different shaped fruits with a wide range of colors, including shades of purple, green and white, depending on the variety. The skin is often smooth, although some types may have a slightly ribbed or bumpy appearance. Its flowers can be huge, single or in clusters of two or more, with a violet colour. Generally, flowers consist of 5 calyx united with persistent; 5 corolla united and usually cup shaped; 5 stamens present alternate with corolla; carpels are united with superior ovary. The most of the varieties

has perfect flowers borne singly and opposite the leaves. In brinjal, heterostyly is a common feature. Long style flowers also have more potential of cross-pollinating. Varietal characteristics include the proportion of long and medium-styled flowers. Long-styled flowers have varying percentages of fruit setting (70.7–86.7%) depending on the variety. Fruit set varies from 12.5% to 55.6% in medium-styled flowers.

## Nutritional importance

Unripe brinjal fruit is mostly eaten cooked in a variety of ways, and in rural regions, the dried shoots are used as fuel. Fruits contains water with trace amounts of protein, fiber and carbohydrates. Fruits has low calories and fat. Among other nutrients, it is rich in amide proteins, free reducing sugars, total water and soluble sugars. Brinjal fruit has medicinal benefits because it is utilised as an appetiser, aphrodisiac, cardiotonic and to balance the vata and kaph doshas in Ayurveda. The Unani medical system brinjal fruit and roots used as a laxative, muturant, cardiotonic, cancer, high blood pressure and inflammation treatment.
It is also a strong source of vitamins and minerals.

**Table1: Different nutritional values in brinjal per 100g**

| Nutrients | Value |
|---|---|
| Calories | 25 kcal/100g |
| Carbohydrates | 6.4 g/100g |
| Fibre | 2.4 g/100g |
| Protein | 1.3 g/100g |
| Vitamin C | 2.2 mg/100g |
| Vitamin $B_6$ | 0.1 mg/100g |
| Iron | 1% |
| Water content | 91.5 % |

## Cultivation

The brinjal needs a long and warm growing season. It is very susceptible to frost. It is not desirable to transplant the plants into the field until the daily temperature reaches between 18.3 to 21.1$^0$C. The ideal daily temperature range is between 23 to 27 $^0$C. The short summer days and cool nights are harmful for the crop. It can grow well up to an altitude of 2000 m above mean sea level. All types of soils from sandy loam to heavy clay are good for brinjal, however heavy loam soils work best. The soil pH ranges between 5.5 - 6.0. It can be successfully grown in well-draining soil with incorporate organic matter, such as compost or well-rotted manure to improve soil fertility and structure. Prepare raised beds or rows to ensure good drainage, as brinjal plants are susceptible to waterlogged roots.

## Nursery

The seeds are sown in well prepared nursery beds. Nursery beds are to be prepared 15-20 cm high with finely prepared soil mixed with well decomposed farmyard manure. 150-200 g seeds for hybrid and 300 g per hectare for open pollinated. Seeds should be treated with carbendazim 1.5g or thiram 2.0 g per kg of seeds before sown the seeds. The seedlings about 15 cm height are ready for transplanting in 5-6 weeks. Usually, 45 x 45 cm, 45 x 60 cm, 60 x 60 cm, 60 x 75 cm and 90 x 90 cm kept distance between plant and row for vigorous growth.
The first step in brinjal cultivation is to be select the right variety and local consumer choice. The choice of variety should depend on your local climate, soil type and demand of market. Some popular brinjal varieties are *viz*., Thar Rachita, Pusa Purple Long, Arka Nidhi, Pant Smart, Arka Neelkanth, Arka Shrish, GNRB-1 each with unique characteristics and growth requirements.

## Nutrient Management

The fertilizer requirement of brinjal depends upon soil type, crop rotation, season, genotype and the region of growing. About 25 tonnes perha farmyard manure is required. For open pollinated varieties a fertilizer dose of 120 kg N, 80 kg P, 50 kg K per ha is recommended. 60

kg N and entire quantity of P and K fertilizers are applied as basal dose and the remaining 60 kg N is applied as top dressing 30 days after transplanting. For $F_1$ hybrids a fertilizer dose of 180 kg N, 150 kg P and 120 kg K per ha is recommended.

**Table 2: Different brinjal varieties**

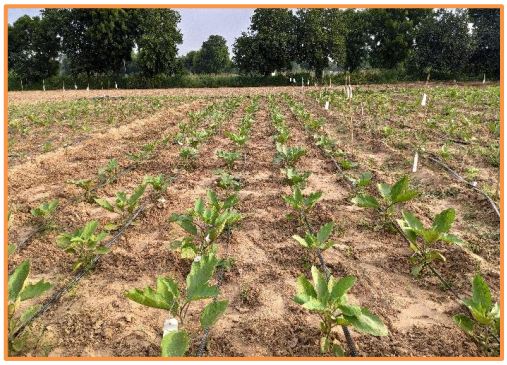
| Fruit type | Varieties |
|---|---|
| Long Shaped | Arka Unnathi, Arka Harshita, Pusa Purple Cluster, Kashi Taru, Narender Brinjal-1, Azad B-3, Narendra Suyog |
| Round Shaped | Thar Rachita, Arka Neelanchal Shyama, Pant Raj, Kashi Uttam, Azad B-4, Safed Bangan-1, Pusa Uttam, GNRB-1 |
| Oblong Shaped | Pusa Kranti, Arka Sheel, Panjab Neelum, Arka Nidhi |

## Aftercare

High yield of brinjal is obtained under optimum moisture condition. It is recommended to irrigate at an interval of 3-4 days during summer and at 10-12 days interval during winter. Further, drip irrigation makes it feasible to save water and fertilizers. Crops and weeds fight for resources like water, nutrients, and space. consequently, the weed free condition in the brinjal crop must be ensured. Depending on the requirement and level of weed infestation, hoeing and weeding should be done. Two to three weeding should be done at interval of 25-30 and 40-45 days after transplanting. Brinjal plants blooms different types of flowers but long style or medium style flowers gives maximum fruit set.

## Plant Protection

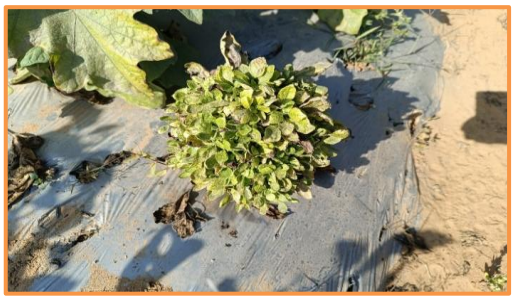
One of the biggest things preventing brinjal from reaching its full yield potential is the invasion of insects. The crop is susceptible to damage from a variety of insects however the extent of their infestation varies drastically. Some of the important insects are fruit and shoot borer, jassids, mites, etc. Numerous diseases like Damping-off, Phomopsis blight, Alternaria leaf spot, cercospora leaf spot, little leaf and bacterial wilt can infect the roots, leaves, stems, and fruits of the brinjal plant. The season and the area in which the crop is growing determine how severe a given diseases is? A few diseases are common in many locations each year and cause different kinds of damage, but many diseases have only caused harm in exceptional years. In the case of shoot and fruit borer infestation can be reduced with the spray of chlorentraniliprole 18.5% EC 0.5ml per litre of water or acephate 75 SP @ 1kg per ha in 500-600 litre water. Resistant varieties like Pusa Purpal Long, B-544, Arka Kusumkar, IHR-191, H165 are recommended to overcome the problem of shoot and fruit borer.



**Irrigation in Brinjal**

**Shoot and fruit borer in Brinjal**

The infected plants were removed in the early stages, and a biweekly spray of imidacloprid (0.4 ml/litre) or thiomethoxam 25 WP (0.3 ml/litre) was used to eliminate the little leaf of brinjal.



**Little leaf**

**Phomopsis blight:** Phomopsis blight can be mitigated by the use of seeds obtained from disease free and treating them with captan 50 WP (0.2%). After fruit formation the crop may be sprayed with

zineb 75 WP (0.2%). The spray can be repeated every 10 to 12 days. Incorporating a sticker with the spray is recommended for improved efficacy.

**Field View of Brinjal crop**

| | | |
|---|---|---|
|  |  |  |
| **Long purple Brinjal** | **White oblong Brinjal** | **Green Brinjal** |

## Harvesting and Yield

Brinjals are ready to harvest when their skin is glossy, firm, and vibrant in color. Use a sharp knife or pruning shears to cut the fruit from the plant to avoid damaging the stem. On an average brinjal can produce 300 to 400 q/ha (Open pollinated varieties) and 650 to 750 q/ha (Hybrid varieties) fruit yield.

## Conclusion

Brinjal, a widely cultivated vegetable globally, is valued for its rich taste and nutritional benefits. Its cultivation, extending across various climates and soil types, offers a productive experience to farmers. With diverse varieties and easy cultivation methods, it contributes significantly to sustainable food production. Brinjal's nutritional profile, coupled with its medicinal uses indicates its importance in promoting health. However, successful cultivation requires attention to factors like temperature, soil and pest management. Overall, brinjal stands as a versatile and nutritious addition to agricultural practices, offering both culinary delight and health benefits to consumers worldwide.