

Post-Harvest Management Protocols

BRINJAL

Brinjal or Eggplant is an important crop of sub tropics and tropics. The name brinjal is popular in Indian subcontinents and is derived from Arabic and Sanskrit whereas the name eggplant has been derived from the shape of the fruit of some varieties, which are white and resemble in shape to chicken eggs. The brinjal is of much importance in the warm areas of Far East, being grown extensively in India, Bangladesh, Pakistan, China and the Philippines. **Total production for the year 2017-18 in India was 12800.77 ('000MT)** and major producing states are West Bengal, Odisha, Gujarat, Bihar and Madhya Pradesh.



Main brinjal hybrid varieties cultivated in India

- Pusa Purple Long
- Pusa Purple Cluster
- Pusa Kranti
- Pusa Barsati
- Manjri Gota
- Vaishali
- Arka Navneet
- Arka Sheel
- Arka Kusmukar
- Arka Nidhi (BWR – 12)
- Arka Keshav (BWR – 21)
- Arka Neelkanth (BWR – 54)
- Pusa Ankur

MATURITY INDICES

Brinjals are immature fruit. If left on the plant too long the seeds harden and darken, and the flesh becomes spongy.

Fruit is generally harvested at immature stage before seeds begin to enlarge and harden. Firmness and external glossiness are also indicators of optimum maturity and when they become greenish yellow or bronze and their flesh turns dry and tough. Pressing the thumb against the side of the fruit can indicate the maturity of the fruit. If the pressed portion springs back to its original shape, the fruit is too immature. Brinjal is harvested by cutting and not by pulling off the plant.

The fruits will attain optimum maturity after about 15 days from flowering and 120 – 130 days of seed sowing depending on variety. Fruits become dull, pithy, seedy, fibrous and bitter when they reach over- mature stage.

The fruits should be harvested once or twice per week, depending on the variety. They are harvested by gentle twisting rather than by tearing or using secateurs leaving 1 to 2" stalk attached to the fruits. Avoid use of sacks or bags for handling and transportation purpose as it results

in mechanical damage and heat build-up. Use ventilated shallow field crates and avoid overfilling. Harvesting of brinjal during rainy or wet conditions should be avoided and keep the harvested produce in the shade. The fruits can be wiped with a clean damp cloth to remove soil and residues.

Some portion of the calyx and the stem-end is retained on the fruit during harvesting. Since all the fruits do not mature at the same time, the fruits are harvested at an interval of 8-10 days.

POST-HARVEST HANDLING

GRADING

Brinjals vary widely in colour, shape and size. They need to be sorted according to their size and colour.

All the fruits showing signs of over-maturity (yellowing of the skin), decay, sunscald, insect damage, mechanical damage, badly misshapen or immature, are to be rejected in the field. Quality brinjal should have characteristics like

- Uniform size and shape
- Freedom from growth or handling defects
- Freedom from decay
- Fresh green calyx.
- Firm, glossy in appearance and no shrivelling

All Brinjals have a smooth, glossy skin with no stomata or lenticels. This makes them relatively resistant to water loss. However, if the skin is damaged or broken, eggplants will deteriorate quickly. Moreover, even small amounts of moisture loss cause noticeable softening.

In India, below is the seven varieties commonly available for consumption:

Brinjal green round

Fresh, tender with shine, Calyx and stalk should be green in color with 40 to 70mm in diameter.

Brinjal long green

Green colored, fresh, straight, tender with shine, calyx and stalk should be green in color with 110 to 200mm in length, 20 to 30mm in diameter.

Brinjal long violet

Fresh, violet colored, tender with shine, calyx and stalk should be green in color with 150 to 200mm in length, 20 to 30mm in diameter.

Brinjal Nagpur

Fresh, violet colored, tender with shine, calyx and stalk should be green in color with 40 to 60 mm in diameter.

Brinjal Bottle

Fresh, violet colored, tender with shine, calyx and stalk should be green in color with 300g to 700g in weight.

Brinjal stripped

Fresh, tender with shine, calyx and stalk should be green in color with 30 to 60 mm in diameter.

Brinjal round white

Fresh, white colored, tender with shine, calyx and stalk should be green in color with 40 to 60 mm in diameter.

PACKAGING

The fruits are packed loosely in full or half-telescopic two-piece fiber board cartons with net weight of 4.5 to 9 kg. Packaging also takes place in bamboo baskets and plastic crates with butter paper at the top and bottom. Where staples are used in carton construction, care should be taken to prevent fruit damage by closing the staples properly.

STORAGE

Brinjals can be stored for 1-2 days in summer and 3-4 days in winter season provided they are kept in shade under ambient temperature conditions. When stored in a cold storage, forced air or room cooling should be used to cool harvested eggplants below 20°C as soon as possible, then to around 12°C, 85 -95% RH within 24 hours of harvest, to preserve freshness. Under appropriate conditions, brinjal can be stored for 7-10 days. Six hours at 25°C can result in softening and quality loss.

CHILLING INJURY

Brinjals are chilling sensitive. Symptoms of chilling injury include the appearance of light brown, scalded patches on the fruit skin, development of sunken pits which are susceptible to disease, and bleaching of the calyx tissue.

Internal quality is also reduced due to flesh darkening, which is most severe around the developing seeds. Susceptibility to chilling injury can be reduced by delayed cooling, short hot water treatments, and plastic film packaging. The storage life of brinjal is extended to 10 days at 10°C without any chilling injury by packing in non-perforated polyethylene bags of 100-gauge thickness as compared to 7 days at 7°C and 3 days at ambient temperature. Rapid cooling, primarily to reduce water loss, soon after harvest is helpful for optimal post-harvest keeping quality and forced-air cooling is the most effective method.



STORAGE PARAMETERS

Recommended Temperature
(in degree Celcius)

7-12



Recommended Relative
Humidity (in %)

90-95



Shelf Life

7 to 10 days



Product Loading Density (in Pound/cu.ft)	-
Initial Freezing Point (in degree Celsius)	-0.8
Specific Heat Above Freezing Point in (kJ/Kg.K)	3.95
Specific Heat Below Freezing Point (in kJ/Kg.K)	2
Latent Heat of Fusion (in kJ/Kg)	310

Thermal properties of Brinjal

Initial Freezing Point (in degree Celsius)	-1.1
Specific Heat Above Freezing Point in (kJ/Kg.K)	3.65
Specific Heat Below Freezing Point (in kJ/Kg.K)	1.89
Latent Heat of Fusion (in kJ/Kg)	278