

# INDIAN BAEI



## GENERAL INFORMATION

Bael, is known for its nutritional and medicinal values. Bael is a domestic fruit tree of India having religious importance. It is also known as Bengal quince, Indian quince, golden apple, holy fruit, stone apple. It is known from the pre-historic times. Drugs prepared from bael used to cure diarrhoea, dysentery, peptic ulcer, respiratory infections and relieving constipation. It is a deciduous tree with 6-8 meters in height with greenish white and sweet scented flowers. Fruits are oblong and pyriform in shape. Because of the Important medicinal properties of bael such as antidiabetic, antimicrobial, anti-inflammatory, antipyretic, analgesic, cardioprotective, antispermatogenic, anticancer and radioprotective it is considered to be medicinal plant. Bael is found growing along foothills of Himalayas, Uttar Pradesh, Bihar, Chattisgarh, Uttaranchal, Jharkhand, Madhya Pradesh, The Deccan Plateau and along the East Coast.

## CLIMATE

### Temperature

35-50°C

### Rainfall

174-200cm

### Sowing Temperature

**35-45°C**

### **Harvesting Temperature**

**10-12°C**

### **SOIL**

Good sandy loam soil, sunny condition, warm humid climate are suitable for cultivation of this plant. It requires pH ranging from 5 to 8. Use warm soil i.e. 75- 90F.

### **POPULAR VARIETIES WITH THEIR YIELD**

Narendra bael varieties are developed by Narendra Dev University of Agriculture and Technology, Faizabad, Uttar Pradesh

**Narendra Bael (NB) 1 and Narendra Bael (NB) 2** are most useful and good yielding variety.

**Narendra Bael (NB)-5:** - Fruit size is medium having weight of about 1kg. The surface is smooth with round shape, having low mucilage and soft flesh with excellent taste.

**Narendra Bael (NB)-6:** - Fruit size is medium with about 600g of weight. The surface is round smooth having soft flesh with low mucilage content. They are mild acidic and good in taste.

**Narendra Bael (NB)-7:-** Fruit size is very large, flattened round greenish grey in color.

**Narendra Bael (NB)-9:** - Fruits of this variety are large in size, having oblong shape with low fibre and seed content.

**Narendra Bael (NB)-16:-** Prolific bearing, fruits are elliptical round in size having yellow pulp with low fibre content.

**Narendra Bael (NB)-17:-** Prolific bearer, fruits are average in size with low fibre content;

CISH varieties are developed by Central Institute of Sub-tropical Horticulture, Lucknow, Uttar Pradesh.

**CISH B-1:** - It is a mid-season variety which matures in April-May. The fruits of this variety are oval-oblong in shape. The fruits are average in size having weight of 1.0kg and are the pulp is dark yellow in color with good flavoring taste. When tree matures it has 50-80kg of weight.

**CISH B-2:** - It is a dwarf variety and moderately spread. The fruits are oblong-oval in shape and are average in size having 1.80-2.70kg of weight. The pulp is orange yellow in color with good taste. They have low fiber and seed content. The tree at maturity bears upto 60-90kg weight.

**Goma Yashi:-** Developed by Central Horticultural Experiment Station, Godhra, Gujarat. Trees are dwarf, spineless, prolific bearer and have early maturity. Fruits are bigger in size and yellowish green in color.

**Pant Aparna, Pant Shivani, Pant Sujata, Pant Urvashi are developed by G.B. Pant university of Agriculture and Technology, Pantnagar, uttarakhand.**

**Pant Aparna:** - Its trees are dwarf with drooping flowers, almost thornless, precocious and heavy bearer. The leaves are large, dark green and pear shaped. Fruits are globose in shape with average weight 1.0 kg.

**Pant Shivani:** - Found in early mid-season. Trees are tall, vigorous, dense, upright growth, precocious and heavy bearer. The weight of fruit ranges from 2 to 2.5 kg

**Pant Sujata:** - Trees are medium dwarf with drooping and spreading foliage, dense, precocious and heavy bearer. Fruit weight varied from 1 to 1.5 kg

**Pusa Urvashi:** - It is mid-season variety. Trees are tall, vigorous, dense, upright growth, precocious and heavy bearer. Fruits are ovoid, oblong. The fruit weight ranges from 1.5 to 2.5 kg.

## **LAND PREPARATION**

For Bael plantation, it required well cleared sandy or loamy soil. To bring the soil to fine tilth pits are dug of size 90cm x 90cm x 90cm and the blend of garden soil and 25kg FYM, 1kg of Neem oil cake and 1kg of bone dust is filled in the dug. Irrigation should be done to settle the soil.

## **SOWING**

### **Time of sowing**

February to March or July to August is the right time for sowing the seedlings.

### **Spacing**

For good plant growth budded plant should be planted at a distance of 8m x 8m and seedlings should be planted at a distance of 10m x 10m.

### **Method of sowing**

Seedlings is transplanted in main fields.

## **SEED**

### **Propagation**

Patch budding and ring budding is an ideal way of reproduction. The success rate is higher in this method.

### **Seed treatment**

Firstly the seeds are soaked in water for about 12-14 hours and then they are air dried. Then they are used for sowing. Seeds are sown in polybags or prepared raised beds.

## **NURSERY MANAGEMENT AND TRANSPLANTING**

Before sowing do mulching with dry leaves to retain moisture in soil. Seeds are sown on well prepared nursery bed. Seeds germinate in about 2-3 weeks and are ready for transplanting.

The seedlings germinated from seed will differ largely. Due to the limitation, vegetative propagation is done to overcome from these problems. Patch budding is done with mother plant and root cutting is also done. Both are successful processes.

Pruning is done. 4-6 well shaped branches are develop further. They are sensitive to water logging conditions so care must be taken.

When plant is one year old application of 10kg of farmyard manure, 50gm nitrogen, 25gm phosphorus and 50gm of potassium is given to cure from disease and pest. Quantity of dose should be increased every year as per the growth rate. After application of fertilizer irrigation must be done.

## **FERTILIZER**

### **Fertilizer Requirement (kg/acre)**

<b>NITROGEN</b>	<b>PHOSPHORUS</b>	<b>POTASSIUM</b>
500	250	500

At the time of land preparation, apply 25kg FYM, 1kg of Neem oil cake and 1kg of bone dust and mix well in soil. After transplantation application of 10kg of farmyard manure, 500gm nitrogen, 250gm phosphorus and 500gm of potassium per plant is done. After harvesting artificial storage of fruits is done by giving application of 1,000 to 15,000 ppm ethrel (2-chloroethane phosphonic acid) and stored it at 86° F (30° C).

## **WEED CONTROL**

Too much weeding is not required in this crop. First weeding is done in initial stage of seedling growth and then next weeding is done when the plant is 2 years old.

## **IRRIGATION**

Young plants need to be watered regularly in summer and one month interval in winter for their rapid vegetative growth and establishment. In bearing trees irrigation is not required in dry summer, as it sheds leaves and resists hot dry summers. Irrigation can be applied at the time of new leaf emergence.

## **PLANT PROTECTION**



- **Pest and their control:**

**Lemon butterfly:** It is caused by *Papilio demoleus*. It can be cured by the spray of Spinosad@60ml at the interval of 8 days in nursery seedlings.



**Bael butterfly:** It is caused by *Bactrocera zonata*.



**Leaf eating caterpillars:** It causes major problems when new leaves arise and it is cured by application of Thiodan @ 0.1%.



- **Disease and their control:**

**Fruit canker:** The disease is caused by *Xanthomonas bilvae*. Disease spread spot on parts of tree, leaves and fruits.

To get rid from this disease prune twigs, branches and burn them or can give application of streptomycin sulphate( 20g/100Ltr water)+ Copper oxychloride (0.3%) at the interval of 10-15 days.



**Fruit cracking and fruit drop** are two important physiological disorders found in bael. They can be cured by application of borax @ 0.1% twice at full bloom and after fruit set.



**Sooty mould:** It is also seen in bael which can be managed by spraying wettable Sulphur + chlorpyrifos /methyl parathion+ gum acacia (0.2 + 0.1 + 0.3%).

### **HARVESTING**

Plants start giving fruits in 6 to 7 years after transplantation. Harvesting is done in the month of January when fruits start giving yellowish-green appearance. The yellowish-green fruit is kept for 8 days so they lose its green tint. Handle with care so that the fruits will not fall otherwise minor cracks occur in the shell. For processing, fully ripe fruits with soft flesh are used.

### **POST-HARVEST**

After harvesting, grading is done. Then fruits are packed in gunny bags or airtight bags to transport for long distances. It is stored for 15 days. Artificial treatment is also given to store the bael for longer time. From ripen Bael several products like juices, squash, jam, toffees and powders are made after processing.

### **REFERENCES**

- 1.Punjab Agricultural University Ludhiana
- 2.Department of Agriculture
- 3.Indian Agricultural Research Institute, New Delhi
- 4.Indian Institute of Wheat and Barley Research
- 5.Ministry of Agriculture & Farmers Welfare