



## Studies on Growth, Development and Establishment of Different Bael (*Aegle Marmelos*) Varieties under Prayagraj Agro Climatic Conditions

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### Abstract

The objective of the experiment was to work out the " Studies on Growth, Development and Establishment of Different Bael (*Aegle Marmelos*) Varieties Under Prayagraj Agro Climatic Conditions. So, a field experiment was conducted during session 2023-2024 at, Department of Horticulture, Sam Higginbottom University Agriculture, Technology and Sciences, (SHUATS), Prayagraj (U.P); under the guidance of Dr. Devi Singh, Associate Professor, Department of Horticulture. The experiment was conducted in Randomized Block Design with 7 Variety (treatment) replicated thrice. The treatments were V1 Narendra Bael -2, V2 Narendra Bael -5, V3 Narendra Bael -6, V4 Pant Shivani, Vs Pant Aparna, Vo Narendra Bael -9, V, Etawah super. V6 was found to be superior in the term of Survival Percentage (100.00) Plant height (74.29 cm), Number of leaves plant' (81.52), Number of branches plant" (8.76), Stem girth (7.27 cm), Plant spread 60.06 cm (E-W) and 61.92 cm(N-S), Leaf area (17.99 cm') Chlorophyll content 68.17. The research conduct will help the farmers to select superior variety of Bael under Prayagraj agro-climatic condition.

**Keywords:** varieties, growth, survival (%), Bael (*Aegle marmelos*), Plant Height

### Introduction

Bael (*Aegle marmelos* L.) is an indigenous fruit of India belongs to family Rutaceae and commonly known as Bengal quince, Bilva, Indian quince, Golden apple, Holy fruit, Bel, Sripthal, Stone apple and Maredo in India. It has great religious significance. The Bael tree has been originated from Eastern Ghats and Central India. It is also found growing along foothills of Himalayas, Uttarakhand, Jharkhand, Madhya Pradesh and the Deccan Plateau and along the east coast (Sharma *et al.*, 2007).

The production of bael in India is million tonnes. In Uttar Pradesh, total production is million tonnes with million ha area and productivity is million per ha (Anonymous, 202).

It is an ecosystem friendly tree species as it can be grown on wide range of soil *viz.* sandy, clay, acidic, saline, alkaline and pH range of 5-10. Well drained sandy loam soil is best suited for its cultivation along with sunny and warm humid climatic conditons.

It is a slow-growing, medium sized tree, 25 to 30 feet tall. The stem is short, thick, soft, flaking bark, and spreading, sometimes spiny branches, the lower one's drooping. Young suckers bear many stiff, straight spines. The leaflets are oval or lancet shaped, 4-10 cm long, 2-5 cm wide. Leaves composed of 3 to 5 leaflets in it. The lateral leaflets are without petiole and the terminal one has a long one. The petiole is 1 to 2.5 inch long. Mature leaves emit a peculiar fragrance when bruised. Flowers occurs in clusters of 4 to 7 along the

young branchlets, have 4 recurved, fleshy petals. The flowers are greenish white in color with a peculiar fragrant. Flowering occurs during the month of May and June.

Fruit is spherical or oval in shape with a diameter of 2 to 4 inch. Shell is thin, hard and woody in nature. It is greenish when unripe and upon ripening it turns into yellowish colour. The pulp of the fruit has 8 to 15 segments. The pulp is yellow, soft, pasty, sweet, resinous and fragrant. Fruition occurs in the month of May and June. The seeds are embedded in the pulp. The seeds are small (nearly 1 cm in length), hard, flattened-oblong, bearing woolly hairs and each enclosed in a sac of adhesive (Lambole et al., 2010). It is cross pollinated and poly embryonic in nature.

Bael fruit is globe with grey or yellowish hard woody shell. It is one of the most nutritious fruits and used for the preparation of number of products like beverages, candy, toffee, pulp, powder etc.

The Bael contains 61.59% water, 0.6% fat, 1.7% minerals and 6.20% fiber. It is the richest source of Riboflavin. Beta-carotene content is 5.2mg/100g also higher than most of the reputed fruits like apple, guava and mango. Dehydration as drying is the most widely used methods of food preservation. During dehydration of Bael fruit pulp, carbohydrate & crude fat content increased while protein content decreased. On dehydration as nutrients becomes concentrated, the proximate composition as fiber, ash, total carbohydrates, protein & fat were 6.20%, 4.61%, 81.12%, 2.90% and 0.65%, respectively.

Bael tree is highly valued in *Ayurvedic* medicines. All the parts of the tree, whether it is stem, bark, root, leaf, flower, seed oil, or fruits of any stage of maturity and ripening, are used in various Ayurvedic medicines. The ripe fruit is used as a restorative, laxative and thus used as a good tonic for brain and heart health. It is also effective in chronic diseases. The leaf extract is effective in restoring blood glucose and body weight to normal levels. Green bael fruits are used for preparing murabba which is generally taken for stomach ailments.

Bael powder can be stored for long time, if harvested at 4-8 months after fruit set. It is useful in the treatment of diabetic patients due to high contents of mucilage and secondary metabolites as coumarin and marmelosin, later one is the therapeutically active principle of bael. It is also effective against cancer, cardiovascular diseases and ulcer.

Bael fruits have immense potential for processing into products such as squash, jam, candy and syrups for internal and foreign market. A firm jelly is made from the pulp alone or better still combined with guava to modify the astringent flavour. The pulp is also pickled. A confection bael toffee is prepared by combining the pulp with sugar, glucose, skim milk powder and hydrogenated fat.

Some of the bael varieties are NB-4 NB-5, NB-7, NB-9, NB17, Pant Sujata, Pant Shivani, CISH B-1, CISH B-2, Goma Yashi, Thar Divya, Thar Neelkanth, Thar Srishti

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