

“Amla Farming – A profitable cultivation approach for removing poverty among rural Indian farmers”

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Abstract

Indian gooseberry, **Amla** or Aonla (*Emblica officinalis* Gaertn. or *Phyllanthus emblica*) is a traditional indigenous fruit to the Indian subcontinent with high medicinal value. Owing to hardy nature, suitability to various waste lands, high productivity, nutritive and therapeutic value, Amla is becoming more and more commercially important with every passing year. Aonla is the **second highest** among all the cultivated fruits. This fruit is highly valued among indigenous medicines. It has good demand from the industries for the preparation of various health care products also like shampoo, hair oil, dye, face creams and tooth powder. It is widely cultivated across the India especially Uttar Pradesh, Himachal Pradesh, Rajasthan, Tamilnadu, Karnataka, Madhya Pradesh etc. Unfortunately, Our Indian farmers are facing different type of natural calamities in every year. Due to these unwanted calamities, our traditional cropping system is badly affected and farmers have not got their right cost due to low yield and poor productivity. Due to all this, Farmers are facing huge financial crisis and they are onto the verge of worst poverty. Sometimes, due to low productivity with least income, farmers got frustrations and committed to suicide.

To overcome this problem, Now-a-days **Amla Farming** is a beneficial cultivation approach among rural farmers. Farmers are using their abandoned land area for the cultivation of Amla as a crop and got high productivity/unit area (15-20tons/hectare) with a net income of Rs 10,000 to 20,000 per acre.

So overall, at present scenario Amla farming is a best profitable cultivation approach besides traditional farming and this could be a remarkable approach for the removal of poverty among our rural Indian farmers.

Keywords- Amla Farming, cultivation, calamities, poverty, medicinal values.

Introduction

“Investments in agriculture are the best weapons against hunger and poverty, and they have made life better for billions of people”

- Bill and Melinda Gates foundation

Indian gooseberry, **Amla** or Aonla or Nelli (*Emblica officinalis* Gaertn. or *Phyllanthus emblica*) is a traditional indigenous fruit to the Indian subcontinent with high medicinal value. The Aonla or Indian gooseberry is known for its therapeutic properties and holds a reputed position in the Ayurvedic and Unani system of medicine in the country as well as whole world. Owing to hardy nature, suitability to various waste lands, high productivity/unit area (15-20tons/hectare), nutritive and therapeutic value, Amla is becoming more and more commercially important with every passing year.

Indian gooseberry or Amla fruits are a very rich source of vitamin C having an ascorbic acid (700 mg per 100 g of fruits) content varying from 0.9 to 1.3 per cent. Aonla is the **second highest** among all the cultivated fruits. This fruit is highly valued among indigenous medicines. It is acrid, cooling, refrigerant, diuretic and laxative. Dried Amla fruits have been reported to be useful in diarrhea, haemorrhages, diarrhea, dysentery, anemia, jaundice, dyspepsia and cough. Due to their strong antioxidant and biological properties, *Emblica officinalis* prevents innumerable health disorder related to oxidative stress, cardiovascular diseases, neurodegenerative diseases and cancer. Chyawanprash and Triphala are well known indigenous medicines in

Ayurvedic system using Amla fruits. It has good demand from the industries for the preparation of various health care products also like shampoo, hair oil, dye, face creams and tooth powder. Murabba (preserve) is prepared from Aonla fruits which are a very popular preparation in India and hundreds of tons are sold every year. Besides Amla fruits, leaves, bark and even seeds are being used for various purposes.

Its cultivation is common in India, particularly in Pratapgarh, Rai Bareilly, Varanasi, Jaunpur, Sultanpur, Kanpur, Agra and Mathura districts of Uttar Pradesh. Its intensive plantation is being done in the salt affected areas of the state of Uttar Pradesh, including ravenous areas in Mathura, Agra, Etawah, Fatehpur and semiarid tract of Bundelkhand. Aonla cultivation is also spreading rapidly in the semiarid regions of Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, Karnataka, Tamil Nadu, Aravali ranges in Haryana and Kandi area in Punjab and Himachal Pradesh. Vindhyan region of Madhya Pradesh is so rich in wild types of Amla species. "Panna" A district at Vindhyan region, is popularly known as "Aonla Zila" of Madhya Pradesh.



Fig.1-Foliage and fruits of Amla

Soil Requirement and Climate

Aonla is very hardy and can be grown in different agro-climatic conditions. Aonla is a subtropical plant and prefers dry subtropical climate. Annual rainfall of 630-800 mm is ideal for its growth. Though it can bear temperature up to 46°C during summer months, but the temperature should not be high at the time of flowering. Significant humidity is essential for initiation of fruit growth of dormant fruitlets during July –August. It can be grown in variable soil conditions ranging from pH 6.5 to 8.5. Heavy soils or high water table areas are not suited for cultivation.

Amla Varieties

There were traditional three main varieties of Amla namely Banarasi, Francis, Chakaiya. These varieties had their own merits and demerits. Considering limitations of these varieties, following varieties were identified at NDUAT, Faizabad (U.P.) and released for commercial cultivation: - Kanchan, Krishna, Narendra Aonla-6, Narendra Aonla -7 and Narendra Aonla – 10.

Banarsi : This is an early fruiting variety. Fruits are oval with white and greenish marks. Fruits are large, and mainly used for making 'murabba'.

Francis (Hathijhool): A vigorous, mid-maturing variety. Fruits are yellowish in colour. Affected by internal necrosis.

Chakaiya : A late maturing variety. Production is high. Also used as polliniser for other varieties.

Kanchan (NA-4): This variety of Amla is selected from seedling of Chakaiya. It is a heavy and regular bearer. Fruits are of medium size with high fibre content, so mainly preferred for pulp and manufacturing various products.

Krishna (NA-5): This variety of Amla is selected from Banarsi. The fruits are large, triangular, and conical: skin is smooth, whitish green to apricot yellow with red spot on exposed portion. Fruit Flesh is pinkish green, less fibrous and highly astringent. Pulp is fibreless. Production more than Banarsi.

Narendra Aonla-6 (NA-6): This variety of Amla is selected from Chakaiya. Fruits are medium to large sized, attractive and shining with low fibre content. Trees are heavy fruit bearers and fruits are suitable for making candy, preserve, sweets, jam and sauce.

Narendra Aonla-7 (NA-7): This variety of Amla is selected from Francis. Fruits mature in mid season, are medium to large, with conical apex and free from necrosis. Fibre content is a little higher than in NA-6. A precocious and prolific bearer. Ideal for making chyawanprash, chutney, pickle, jam and squash.

Narendra Aonla-9 (NA-9): An early variety with medium spreading habit. Vit-C content is high in comparison to other varieties. Fruits mature from mid October to early November.

Narendra Aonla-10 (NA-10): This variety of Amla is selected from Banarsi. Fruits are early maturing, large-sized and flattened. Fruit skin is rough, yellowish green with pink tinge. Flesh is whitish green, Fiber content is higher. Heavy bearer and suitable for pickling and dehydration.

Besides above all varieties, Anand 1, Anand 2 and Anand 3 have been selected as promising strains at the Gujarat Agricultural University.



Fig.2. Fruits of Banarasi Amla



Fig.3. Fruits of Amla Krishna (NA-5)

Wild Himalayan Amla: There also exists a quite distinct strain of Aonla, which grows wild in the mid-hill regions of the Western Himalayas. This Amla bears smaller fruits and is a very heavy cropper. A very good quality of this Amla strain is that it is much cold hardy in comparison to the commercial Amla. The wild Himalayan Amla can therefore be successfully used to extend Amla cultivation to colder areas.

Propagation and rootstocks (Mother seedling)

Aonla has are raised through seeds as well as inarching. However, there is prolonged juvenility and wide variability in seedlings. On the other hand only limited number of scion shoots is available for inarching owing to upright tree habit. Amla can also be propagated through patch/ modified ring budding in north India during mid May to September with 60-100% success. Besides, Veneer grafting also has successfully been attempted. Considering the efficiency and requirement of single bud, budding is an ideal method of propagation.

Six months to one year-old seedlings obtained from ordinary seedlings Amla trees are being used as rootstock. Mature Amla fruits are collected during January-February and their seeds are extracted after drying. Seeds are sown in raised beds April onwards and these are transplanted in separate bed for subsequent budding.

Amla Cultivation

Planting

Budded or grafted Aonla plants are planted 7-10 m apart during July–August or February. Pits of 1-1.25 m size are dug 2 months prior to planting. In each pit 3-4 baskets of well rotten farmyard manure and 1 kg neem cake or 500 g bone meal are mixed with soil and filled. In sodic soils, 5-8 kg gypsum along with 20kg sand is incorporated. Filled pits are irrigated thoroughly if there is no rain. Hedge row planting is also being tried keeping line-to-line distance of 8m, while 3plant-to-plant distance is reduced to 4-5m. Under adverse soil conditions, it is advisable to grow the seedlings directly in the field pits or raise these in suitable containers and transplant at permanent site, and perform budding (in situ) subsequently. Amla scion shoots can be safely stored for 5-7 days with ample success.



Amla is a heavy bearer tree

Since self incompatibility appears to be a problem with amla varieties, 2 varieties in alternate rows need to be planted.

Irrigation

Young Amla plants require watering during summer months at 15-20 days interval till they are fully established. In general, Established Aonla orchards do not require irrigation particularly in normal soils. No irrigation is required during rainy and winter season. In the bearing plantation, first irrigation should be given just after manure and fertilizer application (January or February). Irrigation should be avoided during flowering (Mid-March- April) period. Irrigation at 10-15 days intervals should be given particularly in the salt affected soils.

Basin system of irrigation is well suited for Amla. The initial information obtained with drip irrigation has shown promising response. Alternate drip irrigation with 60 CPE is appropriate with water saving of 40-45%. In water scarcity areas, pitcher irrigation can also be successfully utilized.

Manuring and fertilization

The dose of manures and fertilizers depends upon soil fertility, age of plant and production. A dose of 10 kg farmyard manure, 100 g N, 50 g P and 100 g K should be given to one years old plants of amla. This dose should be increased yearly up to 10 years and thereafter a constant dose should be given. Full dose of farmyard manure and P and half of N and K should be given in tree basin during January- February. The remaining half should be applied in August. In sodic soils, 100-500 g of B and zinc sulphate should also be incorporated along with fertilizers as per tree age and vigour.

Training and pruning

Amla plant should be encouraged to develop a medium headed tree. The main branches should be allowed to appear at a height of 0.75-1m above the ground level. Plants should be trained to modified central leader system. Two to four branches with wide crotch angle, appearing in the opposite directions should be encouraged in early years. The unwanted branches in are pinched off during March-April. In the subsequent years, 4-6 branches should be allowed to develop. Regular pruning of a bearing aonla tree is not required. As per growth habit, shedding of all determinate shoots encourages new growth in coming season. However, dead, infested, broken, weak or overlapping branches should be removed regularly.

Manuring and fertilization

The dose of manures and fertilizers depends upon soil fertility, age of plant and production. A dose of 10 kg farmyard manure, 100 g N, 50 g P and 100 g K should be given to one years old plants of Amla. This dose should be increased yearly up to 10 years and thereafter a constant dose should be given. Full dose of farmyard manure and P and half of N and K should be given in tree basin during January- February. The remaining half should be applied in August. In sodic soils, 100-500 g of B and zinc sulphate should also be incorporated along with fertilizers as per tree age and vigour.

Irrigation

Established amla orchards in general do not require irrigation particularly in normal soils. No irrigation is required during rainy and winter season. However, irrigation at 15-20 days interval is desirable in dry summer particularly during early years of orchard establishment under wasteland conditions. Brackish water should not be used for irrigation. In the bearing plantation, first irrigation should be given just after manure and fertilizer application (January/ February). Irrigation should be avoided during flowering (mid-March-mid April) period. Irrigation at 10-15 days intervals should be given particularly in the salt affected soils.

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Mulching

Mulching with organic wastes is very effective tool for establishment of Amla orchards in sodic and ravenous areas. Paddy straw, sugarcane trash and farmyard manure have shown better response. Mulching with organic wastes over a number of years shall be helpful in improving the organic matter content, infiltration rate, and restricting the upward movement of soluble salts and thus escaping their toxicity menace in salt-affected soils.

Intercropping

Amla being a deep rooted, deciduous tree with sparse foliage, is an ideal plant amicable for 2 or 3 tier cropping system. Fruits, vegetables, flowers and a few medicinal and aromatic plants are well suited for intercropping in amla orchards

Harvesting and Post harvest management

Change in seed colour from creamy white to brown is an indication of fruit maturity. Fully developed fruits are harvested. Delay in harvesting results in heavy dropping of fruits particularly in Banarasi and Francis. It also adversely affects the following years bearing. Individual fruits are plucked by climbing on the tree with the help of pegged bamboo or ladder. Harvesting should be done in early or in the late hours of the day.

A budded/grafted Amla tree starts bearing third year onwards after planting, whereas a seedling tree may take 6-8 years. Vegetatively propagated plants attain full bearing within 10-12 years and may continue to bear for 60-75 years of age under well managed conditions. An Amla tree may bear 1-300 kg tree, giving 15-20 tons/ha.

Amla fruits are graded into 3 grades. Large sized, sound fruits are mostly utilized for preserve and candy; small sized for chyavanprash and trifala and blemished fruits for powder and shampoo making. Amla fruits can be stored for 6-9 days at ambient temperature. However, with a salt solution it can be stored up to 75 days.

Physiological disorder

Necrosis, a physiological disorder, has been observed in Amla fruits. Francis variety is highly susceptible followed by Banarasi incidence initiates with browning of mesocarp which extends towards the epicarp resulting into brownish black appearance of flesh.

Chyavanprash and other products

It is an ages old Ayurvedic preparation made from Amla fruits. It is prescribed as a restorative tonic which also develops resistance in body against various diseases.



Chyawanprash and Hair oil of Amla product

This tonic has become very popular not in India, but outside India too. Therefore the demand for Amla fruits has now outgrown its production. So Amla cultivation is becoming very profitable.

Some Health Benefits of Amla

- Boosts Immunity due to presence of vitamin 'C'.
- Good for eye health.
- Good for hair.
- Good for digestion and prevents from constipation.
- Prevents from certain type of cancers.
- Good for brain health.
- Improve skin health.
- It has anti-aging properties.
- Excellent for diabetic patients.
- Gooseberry is rich in antioxidants, iron, calcium, anthocyanin, flavonoids, and potassium, hence good for heart.

Economic benefits

A mature Amla tree of about 10 years will yield 50-80 kg of fruit. The average weight of the fruit is 60-75grams and 1 kg contains about 15-19 fruits. So, around 12 to 15 quintals of fruits can be obtained per acre, giving a net income of Rs 15,000 to 35,000 per acre, which varies and depends on the current trends and prices of market. A well maintained orchard yields up to an age of 60-70 years.

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