

Betelvine cultivation: Importance in Indian perspective

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In India betelvine is known as 'Paan'. It is grown as an important cash crop. India has a long ancient history of betelvine culture as mentioned in Atharva Veda. The betel leaf occupies a significant place in everyday life of Indian people as it is used in rituals and in Indian system of medicine as cure for many diseases and disorders. It is the most important commercial crop and also most profitable amongst all cultivated crops which plays a vital role in the overall livelihood security of farm families. It offers perennial employment and income to small and marginal farming community because of its capital and labour intensive characteristics. Betelvine cultivation is highly intensive and particularly suited to small holding may be 5 to 10 decimal land.

Area of cultivation : In India, betelvine is grown as an important cash crop in southern parts, mainly in the states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Betel is also cultivated in Assam, Bihar, Madhya Pradesh, Maharashtra, Orissa, Meghalaya, Tripura, Uttar Pradesh and West Bengal. The probable places of origin of betelvine are India, Sri Lanka, Malaysia and Indonesia. In India, it is an important commercial crop of Andhra Pradesh, occupying about 3600 hectares. Betelvine is cultivated over an area of 50000 hectares in India. In West Bengal prominent districts are –South 24 Paraganas, Midnapore, Howrah, Hooghly and Nadia. The betel plant is currently extensively cultivated in India, Bangladesh and Sri Lanka.

Botany : Botanical name of betelvine is *Piper betel*. Betelvine belongs to the family Piperaceae. Betelvine is a perennial, dioecious (male and female plants are different), shade loving, aromatic, evergreen root climber with glossy heart-shaped leaves and white catkin. Other botanical characteristics are:-(1) woody climber with adventitious roots at swollen nodes (b) leaf simple, alternate, cordate, 8-12 cm wide, 12-16 cm long, with description odor and spicy taste (3) inflorescence in auxiliary spike; flowers unisexual, white

(4) fruit globose berry.

Varieties : Based on shape, size, brittleness and taste of leaf blade, betelvine is classified into pungent and non-pungent varieties. Important betelvine varieties cultivated in- (a) Andhra Pradesh- Karapaku, Chennor, Tellaku, Bangla and Kalli patti (b) Assam- Assam patti, Awani pan, Bangla and Khasi pan (c) Bihar- Desi pan, Calcutta, Paton, Maghai and Bangla (d) Karnataka:- Kariyale,

Mysoreale and Amdadiale (e) Kerala-

Nadan, Kalkodi and Puthukodi (f)

Madhya Pradesh- Desi Bangla,

Calcutta and Deswari (g)

Maharashtra- Kallipatti,

Kapoori and Bangla(Ramtek)

(g) Orissa-Godi Bangla, Nova

Cuttak, Sanchi and Birkoli

(i)Tamil Nadu- Pachai kodi and

Vellaikodi (j) Uttar Pradesh-

Deswari, Kapoori, Maghai and

Bangla (k) West Bengal- Bangla,

Sanchi, Mitha, Kali Bangla and Simurali

Bangla

Cultivation :

Climate : Tropical climate, high rainfall and a shady place are best for its vigorous growth. An annual rainfall ranging from 200 to 450 cm is ideal. The crop tolerates a minimum temperature of 10°C and a maximum of 40°C.

Soil : Well drained fertile clay loams are suitable. It does not tolerate saline and alkaline conditions.

Season : November to December and January to February are optimum for cultivation.

Cultivation practices : Two types of cultivation is practiced in India; open system of cultivation using support plants and closed system of cultivation using artificial rectangular structures called borojas.

Raising of support plants for natural support and shade : Plants of *Sesbania grandiflora*, *S. sesban*, *Erythrina variegata* and *Moringa oleifera* are raised to provide support and shade. They are sown in 45-60 cm rows at least 45 days before planting the cuttings of betelvine.

Construction of Boroja (rectangular structures) for artificial support and shade: Borojas are normally made on slightly sloppy land, near to a source of irrigation at a higher level than the adjoining area. There must be a slope in all directions for a quick drainage of excess water. Borojas are nothing but rectangular structures made up of bamboo or jute sticks which are normally having a height of 2-2.5 meters. These rectangular structures are covered with thatching using coconut leaves or straw or other such materials.

Establishment of betelvine yard (Boroj): Betelvine is cultivated in a hut like structure called Boroj which is made of either square or rectangular in shape. Usually a path of about one meter width is left all around the garden on the inner side of the enclosure to serve as walking space. Afterwards, beds of 100-125cm wide and as long as the entire length of side are prepared, leaving about 30 cm walking path between two adjoining beds. The side wall is strengthened and supported by bamboo poles inside the Boroj. The distance from one horizontal pole to another is about 20-25cms. The roof, side walls are generally covered with sticks, paddy straw and coconut leaves etc. The following materials are required to construct a boroj of 5 decimal areas that may cost around ten thousand rupees. The height of boroj may be 7 to 8 feet.

Materials are required to construct a boroj		
Sr. No.	Materials	Quantity
1.	Bamboo	16 pieces
2.	Iron wire	28-30kg
3.	Coconut rope	8-10kg
4.	Paddy straw	480 bundles
5.	Jute stick	10000 pieces
6.	Bamboo pole	1000 pieces

For assured water supply to the betelvine yard at least 10 decimal pond is sufficient for 5 decimal Boroj. The pond soil may be utilized for raising the Boroj site. The pond bund may also be used for vegetable cultivation and pond water for aquaculture.

Propagation : Stem cuttings having 3-5 nodes are used for propagation and these are planted in such a manner that 2-3 nodes buried in the soil. A single node cutting with a mother leaf is also planted. The vines are propagated by terminal stem cutting or setts about 30-45cm long. Setts obtained from the top portions of the vines are easy to root and hence best for planting. On an average 100000 setts are required for planting one hectare. Generally 40000-75000 cuttings are used for a hectare under open

system of cultivation whereas 100000-120000 cuttings / ha are sufficient in boroja (closed) system of cultivation.

Irrigation : Irrigate the field immediately after planting and afterwards once in a week.

Manuring : Apply 150 kg N/ha/year through neem cake (75kg N) and urea (75kg N). Out of total, 37.5 kg N apply as basal dressing and remaining 112.5 kg N apply in three split doses (top dressing); first at 15 days after lifting the vines and second and third dose at 40-45 days intervals. Apply 100 kg P₂O₅/ha/year through super phosphate and 30 kg/ha/year muriate of potash as basal dressing.

Training of vines : Training is done by fixing the vine at intervals of 15 to 20 cm along the standards loosely with the help of banana fibre. Training is done at every 15-20 days interval depending upon the growth of vines.

Lowering : Under normal condition, the vines grow to height of 3 m in one year period. When they reach this height their vigour to produce normal size leaf are reduced and they need rejuvenation by lowering during March-April. After the vine is lowered, the tillers spring up from the nodes at the bends of the coiled vines at the ground level and produce many primary vines. Irrigation should be given after each lowering.

Harvesting : It depends upon the growth of the vines and market condition. Once harvesting starts it continues almost everyday.

Yield : About 75 to 100 lakh leaves/ha/year can be obtained.

Post harvest management : Harvested leaves are washed, cleaned and graded according to their size, colour, texture and maturity. Then they are packed after cutting a portion of the petiole and rejecting the damaged leaves. For packing mostly bamboo baskets are used and in many places straw, fresh or dried banana leaves, wet cloth etc. are used for inner lining.

Curing : Usually, betel leaves are used for chewing as fresh unprocessed. But in certain areas, leaves are subjected to processing known as bleaching or curing. There is a good demand for such leaves which fetch higher prices in the markets. Bleaching is done by successive heat treatments at 60° -70°C for 6-8 hours.

Uses of betel leaves :

- Offering betel morsels (pan-supari) to guests in the Indian sub-continent is a common courtesy.
- Many traditional ceremonies governing the lives of Hindus use betel leaves and areca nuts.
- In India, betel is used for deworming.
- According to traditional ayurvedic medicine, chewing areca nut and betel leaf is a good remedy against bad

breath.

- Betel leaf has aphrodisiac properties.
- Betel leaf juice is credited with diuretic properties.
- Betel leaves are beneficial in the treatment of nervous disorders.
- The betel leaf has analgesic and cooling properties. It can be applied to relieve intense headaches.
- Betel leaves are useful in pulmonary afflictions suffered in childhood and old age.
- In the case of constipation in children, a suppository made of the stalk of betel leaf dipped in castor oil can be introduced in the rectum. This instantly relieves constipation.
- Local application of the leaves is effective in treating sore throat.
- Betel leaves can be used to heal wounds.
- The herb is also an effective remedy for boils.
- The application of leaves smeared with oil is said to promote the secretion of milk when applied on the breasts during lactation.
- Betel leaf is a popular spice in South-East Asian cooking with the leaves being used in their raw and cooked form.
- Leaves are so attractive; they are often used as a base for decorating platters, with food arranged on top of them.
- The white flower spikes of the betel plant develop into seeds/fruits that look a little like a green /brown mulberry when ripe and can be eaten; it is a tasty morsel of sweet jelly-like pulp.
- The edible portion is green leaf, used as masticatory along with areca nut, lime and catechu.
- Chewing of pan leaf is an ancient habit having existed for more than 2000 years.
- The pan leaf contains vit. B and C and also beneficial in accelerating the process of digestion.
- It also possesses antimicrobial activity due to peroxidase, nitric and secretory antibodies which offer protection against microbial proliferation in mouth so that tooth and gum decay is kept under check.
- The betel leaf is also used as cosmetic purposes now.
- Extract of betel leaves has antioxidant property due to presence of chevibetol (CHV), allylpyrocatechol (APC) etc.
- Betel leaves have anti-carcinogenic properties due to presence of hydroxyl-chevicol.
- Betel vine is grown as an important cash crop.
- Betel chewing is considered as a good and cheap source of dietary calcium.

- Betel leaves oil has several medicinal uses.
- Betel leaf consumption reduces gastric pain.
- Betel leaf consumption increases hunger.
- A hot poultice of betel leaves help to reduce joint pain in arthritis.
- Betel leaves can be used by people who are on weight loss programme.
- It cures erectile dysfunction in men.
- Betel leaf treats ear infections.
- Betel leaf even treats insect-bites.
- Red betel leaf is said to control blood sugar levels in diabetic patients.
- Betel leaf juice can be applied externally on the skin to treat skin diseases like psoriasis and eczema. Betel leaves can work effectively to treat any type of skin infections caused due to bacteria and fungus.
- When mixed with a little amount of honey, betel leaf extract is a good remedy to treat cough.
- Betel leaf treats gastric ulcers.
- Betel leaf is used for treatment of warts.
- In some area of Indonesia, betel leaf chewing is a well-established tradition.
- Eliminates body odour.
- Stop the bleeding nose.
- Brightens up the complexion.
- The betel leaf when chewed produces a sense of well-being. Taken particularly after dinner it produces a pleasant effect, refreshing the mind, giving vital power and removing bad odour from the mouth.
- A poultice of the leaves or their juice mixed with some bland oil such as refined coconut oil can be applied to the loins with beneficial results in lumbago.
- Betel leaves are known for their ability to remove toxins from the body.

The role of betel leaves in the national economy :

The vast economic potential of the crop can be adequately established by the fact that about 15-20 million people consume betel leaves in India on a regular basis, besides those in other countries of the world, which may add upto over two billion consumers. The betel farming activities can generate employment opportunities for agricultural workers throughout the year, helping them to support their families. Further, as far as national employment generation is concerned, about 20 million people derive their livelihoods directly or indirectly by producing, processing, handling, transporting and marketing betel leaves in India. The Indian betel leaves are in great demand in several other countries of the world where demand far exceeds the local supply. Consequently, leaves worth about Rs.

30-40 million are exported to European countries. This clearly indicates the profitability of the crop which can be further exploited in the interest of the nation.

Promotional measures :

– As there is no betel leaf research institute in India, diseases that afflict the plant have serious consequences and farmers are unable to contain their spread even after applying pesticides and germicides.

– Healthy plants are important to achieve good yields and quality betel leaves. There is a need to select good-quality material and use new planting techniques.

– Scientific management and trained labour are the main causes of higher yield of the betel leaf.

– Betel leaf exports earn a significant portion of foreign exchange for the country. Yet, there is a need for proper research on export systems and gathering of market intelligence besides a continual modulation of export policy decisions to boost exports.

– The central and state governments should jointly take appropriate steps to improve pest management in betel farms, and establish a Betel Research and Development Board, to enhance export oriented activities with regard to global standards, reduce intermediaries in marketing; stabilize the betel prices; increase the area under betel farm cultivation and raise awareness among betel growers. These initiatives will enable India's betel leaf crop to contribute a significant portion to India's foreign trade in the near future.

Conclusion : Many years before, majority of people of our country depended on cultivation for their survival, livelihood and progress. That time, there were lot of limitations in cultivation even in many cases, there were no scientific technologies to cultivate the crops. Nowadays, lot of scientific technologies is there, production has increased manifold for most of the crops, lot of agricultural implements are coming in market to facilitate various

agricultural operations, high demand of many commercial crops, though youth generations of our country are leaving agriculture and chasing a white colour job or simply a petty job in industry where maintaining self-respect is a matter of question and it is the breeding ground of nuclear family where depth of happiness is very confined. Therefore, time has come to call the youths to back in agriculture. If our young generations think deeply and try to find a job in agriculture, obviously they will find it because agriculture provides variety of job opportunities. Due to liberalization, privatization and globalization, farmers have a golden opportunity to sell their products from village market to global market according to their quality and it provides an opportunity to earn more. Moreover, mobile, internet and other mass media have opened a wide door for market information and market intelligence. Due to pressure of population in our country, there is pressing need of agricultural produces to meet the domestic consumption as well as export to other countries. In this respect, crop diversification, use of seed of high yielding varieties, integrated nutrient management (INM), integrated weed management (IWM), integrated pest management (IPM), integrated disease management (IDM), adoption of drip irrigation, proper storing, overall value addition and market intelligence will be conducive for upliftment of economic condition of the farmers. It is equally true in case of betelvine cultivation also, because this crop is the most profitable amongst all cultivated crops. Betelvine cultivation is highly intensive and particularly suited to small holding (may be 5 to 10 decimal land). Therefore, small and marginal farmers also have an opportunity to engulf this technique of cultivation. Therefore, public and private extension agencies who are working at grass-root levels must aware the farmers about the importance of betelvine cultivation through various extension teaching methods.

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