

BETEL VINE (GACHH PAN)-A SUITABLE MIXED CROP OF ARECANUT IN SUB HIMALAYAN TERAJ REGION

Arun Kumar Sit and Sandip Shil*

Betel vine (*Piper betel*) is an important perennial vine crop whose leaf is mainly used as Pan along with betel nut (*Areca catchu* L). It belongs to the family Piperaceae. The leaf is widely used in social, cultural and religious events for hospitality and has also medicinal value. Besides its use as a Pan, it is also used as a treatise in Ayurvedic medicine. In Susruta (600 AD) betel leaf was recommended as a digestant, deodorant, mouth wash, antiseptic poultice for boils and in treatment of bronchitis, cough, cold, chills, dyspepsia and anorexia. Fruit of this crop along with honey is being used as a remedy of cough in Konkan region of India. It is also reported that in some parts of Odisha, the roots has also been used to prevent child birth. Warm juice is good as a febrifuse. The alkaloid, arkene, is used to increase the flow of saliva, reduced tachycardia and had a purgative effect. It is also reported that the essential oil extracted from leaf contains chavicol and hydroxi-chavicol, which have shown anti carcinogenic properties. The betel oil contains a mixture of several important organic compounds (such as terpenes, phenols, esters etc.) and has shown excellent promise in use as flavours and essences in confectionary, pan liquar.

Based on the cultivation, Betel vine can be divided in to two groups, the plain land betel-leaf (Boroj pan) and tree -betel-leaf (Gachh Pan). Gachh pan is widely chewed with raw or

fermented (Moza) betel nut in rural area of Northern parts of West Bengal and North Eastern states. The gachh pan is mainly cultivated along with arecanut as a mixed crop in this region. The demand of this pan is very high in this region and some farmers are also dependent on this crop for their livelihood. Hence, information on cultivation aspects, demand, economic return and problems faced by the growers of this crop has been collected through questionnaire of 25 betel vine growers and documented.

Arecanut palm is predominantly existed in each and every household of the rural area of this region. Farming community mainly uses the arecanut palm as a standard or support plant for trailing of this vine crop. Farmers plant arecanut at a distance of 7-8 feet plant to plant and row to row. Close spacing of arecanut is adopted to provide more shade to the betel vine and which otherwise turns to yellow upon exposer of leaf to the sun light. With this spacing about 1700-2200 arecanut palm can be accommodated in one hectare of land. Accordingly, 1700-2200 betel vines may also be planted in one hectare of land.

Land preparation

The betel vine is usually planted in arecanut basin about 1-1.5 feet away from the trunk. The basin is cleaned and soil is dug to

¹ ICAR-Central Plantation Crops Research Institute, Research Centre, Mohitnagar-735102, West Bengal.

make the soil loose at northern side of the arecanut trunk. Well rotten cowdung 1-2 kg is mixed with the soil.

Planting

Two to three feet long (with 2-3 branches) shoot growing upward along with standard trunk locally called as Mathi Poya (shoots grow upward) is used as a planting material. A pit is made 1-1.5 feet away of the trunk. The base of the vine coiled and placed on the loose soil of the pit and covered with soil-cow dung mixtures and watered. The vine is tied with the standard so that roots emerged from the node can hold the trunk and can spread upward further. An other way of planting, 2-3 nodes are placed under the pit and rest of the vine is tied with the trunk of the arecanut. In this way of planting 100% establishment was noticed by the growers. The planting is done during onset of monsoon for better establishment and less mortality.

Manuring

The betel vine of this region is mainly cultivated organically. Mostly arecanut leaf and FYM is used. About 30 kg (one jhuri/bucket) is applied to the root region then covered with arecanut leaf. Arecanut leaf first is used as mulch material. Subsequently, it serves organic materials while decomposed at the basin. The application of FYM and arecanut leaf mulching is mainly due to not to disturb the root system of the betel vine. It is believed that if the root is damaged then vine will die. Earthing up of base of the vine is the annual routine work. Sometimes, growers apply raw cowdung at the middle of the four arecanut palm during onset of monsoon and at the end of monsoon. During

monsoon, rainwater helps to wash out the cowdung slowly and it reached the root zone of the vine. After rain, growers used to apply irrigation to the crops. And cow dung in this case also slowly reached to the root zone of the betel vine. Care is only taken to the betel vine not to the arecanut standard.

Other intercultural operation

Weeding is done regularly to the field. Vine is irrigated during dry period at regular interval. Dry/yellow leaves are removed regularly to facilitate new leaf emergence. Hanged branches are tied with the standard frequently. Otherwise poor quality leaf is produced from the hanged branches. It is told that the shoot growing upward along with standard or horizontal expansion can produce good quality leaf.

Problems of betel vine cultivation

The major problem associated with this crop is quick wilt, yellowing of leaf during winter period and death of standard crop (arecanut).

Quick wilt

The disease is caused by *Phytophthora capsici*, a soil borne fungus. Infection to the crop increased during rainy season or post rainy season. Feeding root is damaged by the fungus and gradually moved upward to the collar region. As a result, leaf yellowing, shading of leaf and sudden death of the vine is observed. However, farmers do not have any idea about the disease. The fungus can be controlled in an integrated way. Proper drainage and clean cultivation can reduce the incidence of this disease. As the leaf is for consumption and

farmers do the cultivation organically, chemical control measures are not advised. It is better to control the pathogen organically. Application of neem based *Trichoderma viride* @ 2-3 kg/vine at the basin of the betel vine can minimize the disease.

Yellowing of Leaf

The leaf yellowing mainly occurs during winter season. The market price of betel leaf is very high during winter months. Some farmers keep the leaf in the vine for winter month. Due to low temperature and maturity of leaf, it becomes yellow. Sometimes if shade is less, then also leaf becomes yellow. To reduce the leaf yellowing regular harvesting of leaf at appropriate maturity stage is advised. Regular irrigation during winter month can reduce the low temperature effect. More sunlight penetration can be minimized by planting tree at south western side of the garden.

Death of standard (Arecanut)

Arecanut is used as a standard only because of more number of vines can be grown in a particular area and required shade will be available for quality betel leaf production. Arecanut is planted in a closer spacing, drainage facility is very poor and it is not manured properly, plants become weak. As a result, *Ganoderma lucidium* infection was noticed maximum in this locality. Within few weeks, plant dies. Dead arecanut palm can be kept maximum one year in the garden. After that it will not serve as a standard for betel vine. As a result betel vine is lost with the death of the arecanut standard. Plant health management organically by providing good drainage facility, weeding, application of more organic materials

in the form of FYM or vermicompost, application of neem cake based *Trichoderma viride* can save the arecanut palm as well as betel vine by reducing the *Ganoderma* infection.

Yield

As per information collected from the growers, once the vine is planted it can survive up to 100 years. But the longevity depends on the life span of the standard in which it is grown as a mixed crop. Leaves can be harvested from second year. The number of leaves in second year is very less. Number of leaves to be harvested depends on the vertical growth of the vine. Vine growth is allowed upto 20-25 feet to facilitate the harvesting by using special ladder made up of bamboo. Betel leaf is harvested at an interval of 15 days during summer and in winter month mainly November to February, leaf harvesting is done at 30-45 days interval. During summer, growers can harvest 150-200 leaves/vine/harvest. The number of harvested leaves reduced 50 to 100 during winter months. On an average one can harvest maximum one bishi (the local unit used for sale of betel leaf) leaves from a vine grown in arecanut. One bishi equals to 1680 number of leaves. The rate of the leaf depends on the supply and demand of the leaf in the local market and as well as neighboring state Assam and neighbouring country Bhutan where this type of betel leaf is used along with dry or fresh betel nut. As the production of the leaf is more during summer and rainy season, the rate of one bishi is Rs. 200-250/- and the same is sold at Rs. 2000/- per bishi during winter month. As per the growers, they can earn an amount of Rs. 700-800/- per vine per year. This can be increased if there is more demand from the neighbouring state and

country.

Betel vine cultivation is a profitable mixed crop with arecanut in this region. As the rural people are habituated with the betel nut along with gachh pan (betel leaf), so the demand will persist always. They can grow this crop along with arecanut or other crops for their better livelihood. It is a perishable crop and cannot be stored for more than 2 days and also

cannot be kept for long time in vine, so the farmers face uncertainty of return during less demand and more production period. However, black pepper is another one important mixed crops of arecanut for this region and the processed black pepper can be stored for long time and growers can sell the produce at peak market rate. If the growers grow betel vine and black pepper as mixed crops together, then the uncertainty of market price can be reduced.
