

## CROP DIVERSIFICATION IN ARECANUT GARDENS

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Arecanut is an important plantation crop grown largely in the States of Kerala, Karnataka, Assam and Meghalaya. The total area under the crop in India is estimated to be 1,93,200 hectares with an annual production of 1.66 lakhs tonnes. The present production is almost on par with the demand. The prospects for developing export markets and alternative uses are also very limited. It seems that the chewing habit is also tending to taper off with people at large. Therefore it is not advisable to devote any additional area for arecanut. Attention has now to be paid to intensive cultivation with emphasis on intercropping, of suitable crop so as to obtain higher income from the existing gardens.

Intercropping in the existing garden enables to raise the income from the land considerably. The yield of crops raised in the interspace is additional production. This increase in productivity is more than proportional to the expenses incurred in raising the crop separately and therefore the net return per unit amount of investment is considerably higher and further the intensive cropping generates more employment opportunities. With monoculture, the farmer runs the risk of poor return due to low price of the produce, incidence of pests and diseases adverse climatic conditions etc. On the contrary crop diversification is an insurance against such risk and help to keep the farmer and his family profitably employed for greater part of the year.

Growth habits and canopy size of the arecanut palm necessitate a wider spacing (2.7 m × 2.7 m) for proper growth. But more than 80% of the roots and the active root zone of the palm are within one metre radius. Therefore, fairly the large portion of the inter space in arecanut garden which remains unutilized offers sufficient scope for raising subsidiary crops. Intercropping in arecanut garden is an age old practice in almost all areca growing tracts. However, this is often done without proper care and attention to fertilization and

other management aspects, with the result that the yield of both arecanut and intercrops is very low. Studies conducted at the research stations have shown that several crops can be profitably cultivated in the interspace of arecanut palms without any adverse effect provided attention is paid to manage the individual crop adequately and separately.

While selecting inter crops several aspects have to be taken into consideration. (i) The inter-crop selected should be compatible and able to co-exist with arecanut crop under the partial shade prevailing there. (ii) It should create only minimum pest build up. (iii) It should ensure maximum production thereby maximum return per unit input. (iv) It should have a rooting pattern different from that of the main crop so that this crop can utilize the water and nutrients which are not utilized by the arecanut.

Field experiments with different crops, carried out at the research stations have shown that cash crops like pepper, cardamom, ginger, cocoa, clove, nutmeg, ginger and betelvine, food crops like banana, elephant-foot-yam, tapioca, pineapple and arrow-root and fodder crops like Guinea grass can be cultivated successfully in the arecanut garden. It is for the farmer to choose the combination of crops suitable to his region. The method of cultivation of these crops as an inter-crop in arecanut garden is discussed briefly in the following paragraphs.

(1) *Pepper*: Pepper can be cultivated as a mixed crop using arecanut palm as standard. On each palm two rooted cuttings of pepper may be planted 30 to 35 cm. away from the base, in pits of 50 cm cube filled with cattle manure, top soil and sand. While planting, southern side of the palm may be avoided to reduce damage to tender vine from sun. Cultural operations being given to arecanut will meet the requirement of pepper as well.

However, pepper vines have to be manured separately. Farm yard manure or compost at the rate of 10 Kg. per standard is to be applied before the South West Monsoon. Fertilizers to supply 100 gm. nitrogen, 40 gm. phosphorus and 140 gm. potash are to be applied in two split doses first along with the organic manure and the second in August-September. Graded dose of fertilizers may be given to young vines of below 3 years i.e.  $\frac{1}{3}$  dose in the first year,  $\frac{2}{3}$  in the second year. The manures are to be applied around the vine to a depth of 15 cm, and 30 cm. away from the base, and mixed well with soil by light forking.

2. *Cocoa*: Cocoa is a shade loving plant and therefore comes up well in the arecanut garden. Arecanut - Cocoa mix is a very compatible and highly paying crop combination. With increasing price of cocoa this crop combination is becoming popular. Cocoa can be interplanted in the arecanut gardens at a spacing of 2.7 m  $\times$  5.4 m (in alternate rows of arecanut) where arecanuts are planted at 2.7 m  $\times$  2.7 m. apart. The planting may be done in rows across the irrigation/drainage channels. 4-6 months old cocoa seedlings are planted in pits of 60 to 70 cm. cube previously filled with compost and top soil. On an average 600 cocoa seedlings can be planted in an area of 1 hectare. Irrigation and cultural practices as given to arecanut will meet the requirement of cocoa. However, manuring has to be done separately. Each cocoa plant is to be manured every year with 10kg. each of cattle manure and compost and fertilizers to supply 100 gm. nitrogen, 40 gm. phosphorus and 140 gm. potash in 2 equal doses, one in February-March and the other in September-October. Fertilizers may be applied in graded doses only in the initial stages, to provide  $\frac{1}{3}$  quantity in 1st year and  $\frac{2}{3}$  in the 2nd year, the full dose being given only from the 3rd year onwards. With a view to develop good shape and to limit the height of main stem the cocoa tree is pruned periodically.

3. *Clove and Nutmeg (Tree Spices)*: These can be conveniently planted as inter-crops in a properly spaced arecanut garden. Shade cast by the arecanut palm will provide sufficient protection to these plants from sub-scorch. In arecanut gardens raised at a spacing of 2.7 m  $\times$  2.7 m, the seedlings can be planted along every 3rd row of arecanut so that within the square formed by four seedlings there will be nine arecanut palms. Seedlings are planted in pits of 75 cm. cube filled with a mixture of farm yard manure sand and top soil. Grown up

clove and nutmeg plants are to be manured separately with cattle manure at the rate of 15 kg. per tree and fertilizers to supply 300 gm. nitrogen, 250 gm. phosphorus and 250 gm. potash for clove and 500 gm. nitrogen, 250 gm. phosphorus and 1000 gm. potash for nutmeg. For young seedlings only graded doses of fertilizers are given.

4. *Cardamom*: Cardamom can be successfully grown as a mixed crop in the arecanut garden at elevations suitable for cardamom. This is already in practice in the Sampaje region of Karnataka and Panathady region in Cannanore District of Kerala. The seedlings are planted in between rows of arecanut in pits measuring generally about 60  $\times$  60  $\times$  35 cm. filled with mixture of soil and compost/cattle manure. Spacing given depends upon the types of cardamom used for planting. Weeding is done 3 rounds per annum during May-June, August-September and December-January and collected weeds are used for mulching cardamom. At the end of monsoon rains, dig the soil lightly at a radius of 75 cm. around the plants to form soil mulch. Cardamom is fertilized at the rate of 30 kg. nitrogen, 60 kg. phosphorus and 30 kg. potash per hectare in two split doses.

5. *Ginger*: Beds of 1 m width, 15 cm. height and of convenient length are to be prepared in the interspaces of arecanut palms. Plant seed rhizome bits of 15 gm. weight in small pits at a spacing of 25 cm.  $\times$  25 cm. at the rate of 1500 kg. per ha. Apply a basal dose of 30 tonnes of cattle manure per ha. in the pits at the time of planting. Fertilizers are given to supply 50 kg. of phosphorus and 25 kg. potash just before planting. 37.5 Kg. nitrogen 60 days after planting and 37.5 Kg. nitrogen and 25 Kg. potash 120 days after planting. Immediately after planting mulching is done thickly with green leaves. Repeat mulching and weeding along with 2nd and 3rd dose of fertilizers.

6. *Banana*: Banana is also an ideal intercrop for the arecanut garden especially in the early stages. Selected suckers are planted in pits of 60 cm. cube at a spacing of 2.7 m  $\times$  5.4 m (when the spacing for arecanut is 2.7 m  $\times$  2.7 m) along the rows of arecanut in the interspaces. A basal dose of 12 kg. of farm yard manure and fertilizers to supply 200 gm. nitrogen, 200 gm. phosphorus and 400 gm. potash are given per plant in two split doses in the 2nd and 4th month after planting. Propping, desuckering etc. have to be done in time.

7. *Elephant foot yam*: The seed material of yam is planted in pits of 50cm. cube the planting is done usually in February-March and the crop can be harvested after 9 months. Two pits at a distance of 90 cm. is dug in between two palms along the rows of arecanut planted at a spacing of 2.7 m. × 2.7 m. A basal dose consisting of 5 kg. of cattle manure, 15 gm. phosphorus and 25 gm. potash may be applied per pit and mixed with soil. Nitrogen at the rate of 300 gm. per pit is given  $\frac{1}{2}$  as basal and the remaining one month after planting.

8. *Pineapple*: Pineapple is a profitable inter-crop for arecanut garden especially in the early stages. Trenches of 60 cm. width and depth and about 125 cm. length are dug in between two arecanut palms. In each trench pineapple suckers are planted. The plants are to be manured with 15-20 tonnes of cattle manure per hectare and fertilizers to supply 8 gm. nitrogen, 4 gm. phosphorus and 12 gm. potash per plant in 4 split doses in 2 years. (May-June (at planting), August-September, November-December, and May-June).

9. *Guinea grass*: Trenches of 20 cm. width and depth are prepared at about 50 cm. apart in the interspace between the rows of arecanut palm. Apply 10 kg. of farm yard manure and fertilizer to supply 0.2 kg. each of phosphorus and potash mix well and cover the trenches and form ridges of 15 cm. height for planting slips. The slips can also be planted on the edges of irrigation/drainage channels. Apply 0.5 kg. of nitrogen in two split doses, following the two crop cuttings and the second dose during north-east monsoon cutting. The fertilizers may be applied on either side of plants along the rows and earthed up.

10. *Betelvine*: Cuttings of betelvine are planted at the base of each arecanut palm 30 cm. away from the palm in pits of 45 cm. cube. The pits are well manured and three or four cuttings of 45 cm. length are planted in each pit, with their growing tip trailed towards the palm. Usually the planting is done in May. The vines are watered and manured frequently and regularly. In the monsoon season drainage facilities are provided to prevent water logging.

#### POTATO CAUSES NO OBESITY

Eat more potatoes without worrying about your weight. The popular notion that potato causes obesity and gastric disorders does not have any scientific basis, according to nutrition experts at the Central Potato Research Institute, Simla. Potato has 80 per cent water content, which may lead to a feeling of stomach-fulness when consumed, but not any trouble, they explained. It has 15 to 18 per cent of starch, two per cent protein and one per cent minerals. It has amino acids in a more balanced form, and makes it a balanced food when taken along with milk.

(Caravan—May, 1978)