

IV. INTERCROPPING IN ARECANUT GARDENS

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Raising other crops in the interspace of arecanut stands has been a common practice. The diversity of the inter and associated crops in arecanut gardens was reported by Bavappa (1951). The long pre-bearing age, low returns during the initial bearing stage, unexpected loss due to pests and diseases and natural calamities, remoteness from markets and lack of transport facilities were reported to be some of the reasons that might have induced the farmers to grow intercrops in arecanut gardens (Abraham, 1956; Bhat, 1974; Khader and Antony, 1968; Nagaraj, 1974; Naidu, 1959). According to Bhat (1974), the main objective of intercropping in arecanut gardens in the earlier days was not intensive land use, but compelling social and economic situations. The selection of the intercrops and the management practices adopted were not based on sound agronomic principles. Reduction in the productivity of the main-crop of arecanut as well as that of the intercrop, resulting from the inadequate management practices and incompatibility of the crops chosen were to a great extent overlooked. Hence, a number of field experiments were initiated in early sixties at the CPCRI Regional Station, Vittal, and the Research Centres to assess the adverse effect, if any, on the productivity of the main crop of arecanut due to intercropping with commonly cultivated tuber crops, fruit crops like banana and pineapple, and spice crops like ginger and turmeric, and to find out the productivity of these crops

grown as intercrops and to determine the profitability of the practice.

Tubers

Among the tropical tubers, elephant yam (*Amorphophallus companulatus*) and tapioca (*Manihot utilissima*) are more popular, as these edible tubers partially meet the food requirements, especially in years of scarcity for the staple cereal—rice. Further, some of the tubers like elephant yam, yams and colocasia are capable of giving satisfactory yields under the partially shaded condition prevailing in arecanut gardens and can tolerate the dripping of rain water from arecanut leaves. The other tuber crops tried were sweet potato (*Ipomoea batatas*) and arrow root (*Maranta arundinacea*).

Reporting the results of the experiment on intercropping with tapioca, elephant yam, yam and sweet potato, in a rainfed adult bearing arecanut garden at Palode, Abraham (1974) stated that no perceptible deleterious effect on the yield and condition of arecanut palms could be noticed. Sadanandan (1974), on the basis of an intercropping experiment in a bearing irrigated arecanut garden, observed that there was no adverse effect on the yield of arecanut palms due to intercropping with elephant yam. The results of an intercropping experiment at Hirehalli, which was continued for nine years, showed that tapioca had no adverse effect on the yield of arecanut palm (Anonymous, 1977).

Table 17. Productivity and profit of intercropping with tubers in areca garden

Intercrop	Location	Yield (kg/ha)	Net profit (Rs/ha)	Source of information
Elephant yam	Vittal	12,000	1,550	Bhat (1974)
Elephant yam	Palode	6,496	1,700	Abraham (1974)
Elephant yam	Kannara	4,245	1,398	Sadanandan (1974)
Tapioca	Palode	10,246	1,851	Anonymous (1977)
Dioscorea	Palode	6,744	1,824	Abraham (1974)
Sweet potato	Palode	712	61	Abraham (1974)
Arrow root	Vittal	4,000	1100	Bhat (1974)

The yield in terms of quantity of harvested produce and the net income were reported for some of the tuber crops tried at various places. The available information in this regard is summarised in Table 17.

Due to the variations in the agroclimatic conditions under which these studies were undertaken, the yield and profitability of individual crop showed wide differences from place to place. However, elephant yam had shown consistently good performance in all the three places i.e., Vittal, Palode and Kannara.

Fruit crops

Among the fruit crops grown in association with arecanut, banana is the most popular. The practice of growing banana as an intercrop in arecanut has been reported by Bavappa (1951), Bhat (1974), Brahma (1973) and Sundaramurthy (1950).

Roy (1974) reported that the yield of arecanut grown in the alluvial soils of north eastern India was not significantly influenced by intercropping with banana. Similar results were observed by Nagaraj (1974) and Bhandary (1974) in *Maidan* area of Karnataka and coastal Karnataka.

An experiment to study the long term effect of intercropping with banana in arecanut garden is in progress since 1963 at the CPCRI Regional Station, Vittal. The spacing adopted for arecanut was 2.7×2.7 m. The following were the treatments: (1) no banana throughout the period of experiment (i.e. sole crop of arecanut), (2) banana intercrop throughout the period of experiment at full level, (3) banana at full level for three years and no banana thereafter, (4) banana at full level for three years and at reduced level for the rest of the period, (5) banana at full level for three years and at reduced level for next three years, (6) banana at full level for six years and no banana thereafter, (7) banana at full level for six years and at reduced level for the rest of the period, and (8) banana at full level for six years, reduced level for next four years and no banana thereafter.

The cumulative yield data of arecanut for six years after the fifth year of plantation life showed no significant difference between treatments. Bhat (1978) based on the results obtained thus far found that growing banana as intercrop had no adverse effect on the performance of areca palms.

The yield of banana from one hectare of arecanut garden and the net profit obtained from the same at different places are provided in Table 18. The per hectare yield of banana and the profitability showed considerable variation due to the difference in the variety tried and the management practices adopted at the different locations.

Table 18. *Yield of banana and profitability*

Location	Yield (kg/ha)	Net profit (Rs/ha)	Source of information
Vittal	4,000	1,650	Bhat (1974)
Kahikuchi	12,200	728	Roy (1974)
Hirehalli	—	1,000	Nagaraj (1974)
Mohitnagar	—	850	Brahma(1973)

Pineapple

The production and consumption of fruits, which are considered protective foods, is very low in this country, when compared to the developed nations. Further, crops like pineapple can generate additional employment opportunities in the post harvest operations, viz., canning and marketing. The practice of raising pineapple as an intercrop was reported by Bavappa (1951). No adverse effect on the yield of arecanut was observed due to intercropping with pineapple in arecanut gardens (Abraham, 1974; Sadanandan, 1974). The yield of pineapple and the net profit obtained at different locations are given in Table 19.

The wide variation in yield recorded at different places, is probably due to the variation in management practices and the difference in the agroclimatic conditions.

Spice crops

Ginger (*Zingiber officinale*) and turmeric (*Curcuma longa*) are some of the spice crops

Table 19. *Yield of pineapple and profitability*

Location	Yield (kg/ha)	Net profit (Rs/ha)	Source of information
Vittal	8000	850	Bhat (1974)
Kannara	1953	703	Sadanandan (1974)
Palode	3942	847	Abraham (1974)
Hirehalli	—	500	Nagaraj (1974)
Kahikuchi	15,700	2379	Roy (1974)

commonly intercropped in arecanut gardens. Satisfactory yield in the partially shaded condition existing in the areca gardens, fair market demand, easy processing, and long storage life after processing are some of the factors that favour growing these intercrops.

An experiment on intercropping carried out at CPCRI Research Centre, Kannara, in an adult arecanut garden receiving summer irrigation, showed that the yield of arecanut palms were not affected by raising ginger in the interspace (Sadanandan, 1974). Similar results were reported from Kahikuchi (Assam) also (Roy, 1974).

The yield of ginger in the above places and the net profit from one hectare by intercropping with ginger are provided in Table 20.

Studies on intercropping with turmeric in arecanut garden are in progress at CPCRI Research Centre, Hirehalli.

Table 20. *Yield and net profit by intercropping with ginger*

Location	Yield (kg/ha)	Net profit (Rs/ha)	Source of information
Kannara	2650	905	Sadanandan (1974)
Kahikuchi	9800	998	Roy (1974)

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