

Spices as Intercrops in Coconut and Arecanut Gardens

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HOW pepper, the big dollar earner, can be grown in coconut and arecanut gardens under suitable conditions, and cardamom in areca gardens down to an elevation of 1,500 feet is described here by an expert on spices.

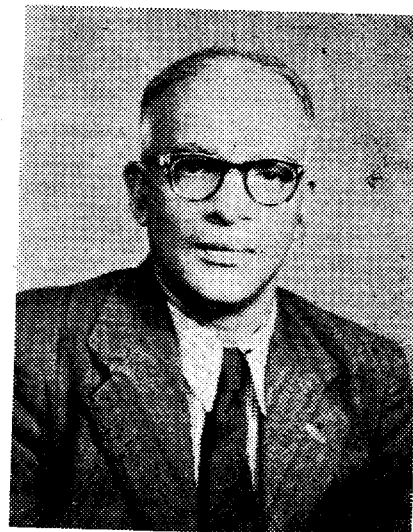
OF the numerous intercrops grown in coconut and arecanut gardens, spices are among the most important. Most of the intercrops in the palm gardens are annual crops raised with the aid of the monsoon rains from May to October. Although mango, jack and other useful trees are grown along with the coconut and arecanut trees in mixed household gardens no perennial crops are usually

grown in pure coconut and arecanut plantations. However, pepper and cardamom, the great spices, can be grown as intercrops of coconut and arecanut, pepper in both coconut and arecanut gardens and cardamom in arecanut gardens.

Pepper as an Intercrop

In parts of North Travancore besides pure pepper plantations, mixed cropping is also adopted. Pepper forms an intercrop trained on *Erythrina indica* and other standards in coconut plantations both being planted at the same time. Under this condition pepper is kept on the plantation for 12 to 15 years by which time the coconut trees come into full bearing and the vines deteriorate or perish.

The arecanut tree has been commonly used as a standard for pepper vines from time immemorial. In North Kanara and Mysore, the arecanut tree is



The author the standard very largely used for pepper vines not only in household gardens but also in arecanut plantations where cardamom and banana are other subsidiary crops. The arecanut gardens are situated on the lower slopes of valleys. As natural drainage is defective in such situations, elaborate arrangements are made for drainage. The area of individual gardens varies from 2 to 10 acres. The arecanut trees receive manuring regularly. The gardens receive clean cultivation, the weeds being removed and a digging given. In alternate years heavy application of green leaf mulch to a depth of 2 to 3 feet is given. Cattle manure at the rate of one basket full (25 to 30 lb) is applied to each tree in the next season. Pepper vines receive the benefit of the attention bestowed on the arecanut palms on which they are trained. No special cultural operations are done to the pepper except the tying of the vines



Pepper vines trained on arecanut trees

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to the standards to assist climbing. This operation is carried out regularly either in May just before the monsoon sets in or during the break of the monsoon in September. The leaf sheaths of arecanut palms are torn into strips and are used for tying the vines. As the arecanut palm does not offer a good hold for the aerial climbing roots of pepper an elaborate system of tying of growing shoots of pepper is adopted; about 20 strings being tied to a full grown vine. The vegetative runner shoots arising from the base of the vines are "layered" and trained on to the standards. This method of pepper cultivation is worth copying in other pepper and arecanut growing areas. A substantial additional income is obtained from pepper in these arecanut gardens.

Coconut Palms as Standards

Years ago good pepper vines grown on coconut trees could be seen only here and there on the West Coast. Growing pepper

vines on coconut trees was generally considered detrimental to the proper development and productivity of the trees and a hindrance to climbing the trees. These objections are, however, not so serious as they seemed to be. In recent years with the increase in the price of pepper the popularity of coconut trees as a standard for pepper vines has vastly increased and excellent pepper vines on coconut trees could now be seen in homestead gardens throughout the West Coast. Even if the growth and productivity of the coconut tree is affected to some extent by the vines trained on to it, the gain from the vines should more than compensate it and give an additional profit.

Palm trees in general are found to be excellent standards for pepper vines. They thrive well also on palmyra palm, bastard sago palm and wild date palm. Of all these palms the coconut palm seems most kindly to the pepper vine and there seems to be a very good mutual

adjustment between this palm and the vine in respect of their demand for nutrition and moisture from the soil. The manuring done to the coconut tree is taken advantage of by the pepper vine also. The best development of pepper vines seems to depend on this sort of adjustment of the vine with the standard tree.

It is a well known fact that the coconut tree develops normally and gives satisfactory yields only where the soil moisture conditions are favourable especially in the dry season. Only in areas where these conditions are satisfied can pepper vines also be grown successfully in association with the coconut tree. There are innumerable such homestead and other coconut gardens where these conditions exist and excellent pepper vines can be grown on coconut trees in such gardens. The coconut trees provide just the shade required by the pepper vine in the hot season, provided the trees are spaced at about 25' x 25'. If the trees are planted much closer than this, the shade will be too heavy for the normal development and productivity of the pepper vines grown on them.

Favourable Soil Moisture Conditions

A distinction has to be made between pepper vines interplanted with coconut trees on other standards and those trained on the trees. It has been mentioned earlier that where pepper vines are interplanted with coconut trees on Murikku (*Brythrina indica*) or other standards even at the time of planting the coconuts, the pepper vines are productive only during



Healthy and vigorous pepper vines on coconut palms

the prebearing period of the coconut trees and that the vines die out when the coconut trees begin bearing. This does not happen to pepper vines planted near to coconut trees, using the tree as a standard. They develop normally and give good yield. It should not, however, be forgotten that interplanting of coconut with pepper is usually done on hillslopes which dry up to a considerable extent during the dry season. Under such



Pepper vines trained on coconut palms and teakwood posts in a Central Travancore coconut garden. Note the stretch of water two to three feet below ground level. Such sites are ideal for mixed coconut and pepper cultivation.

conditions the young coconut trees in their pre-bearing period may not compete with the vines in-between them for soil moisture and nutrition, but will do so when they come to full bearing and their roots permeate the entire area. It would, therefore, appear that the life of interplanted pepper vines depends on the availability of moisture. In valleys and low-lying areas where soil moisture conditions in the dry season are favourable for both coconut and pepper, when planted separately or as a mixed crop, the life of interplanted pepper could be as long and as useful as in pure pepper plantations. It therefore, follows that pepper should be planted in association with coconut only in situations where the soil moisture conditions are favourable for the mixed crop throughout the year. In this connection, it should also be borne in mind that ill-drained soils and waterlogged conditions

are inimical to the normal development of pepper vines but may be tolerated by the coconut tree. These are important points to be remembered while choosing the type of land where pepper could be grown in association with coconut. All types of land where coconut could be grown may not be suitable for pepper also.

Trials of Pilicode

The Madras Agricultural Department has been conducting trials of training pepper vines on coconut trees in their Coconut Research Stations, especially Pilicode. The results of these trials were discussed in these columns (vide "Pepper in Coconut Gardens" By Koyama & Albuquerque, Vol IX No: 7 February 1956). The fertility of the soil and the soil moisture conditions at this Station do not seem to be very favourable for growing pepper on the coconut trees at the Station. The little success achieved seems to have

been on account of pot-watering and irrigation.

In mixed gardens of coconut and pepper where the pepper vines could be productive only during the pre-bearing period of the coconut tree, quick bearing and short-lived varieties of pepper such as *Narayakodi* and *Karimunda* only should be planted. In situations where the moisture condition are favourable throughout the year for mixed growing of pepper and coconut, long lived and productive varieties of pepper such as *Kalluvally*, *Kottavally*, *Kaniakadan*, *Chola*, *Kothanadan* etc. should be chosen.

Cardamom

It has been mentioned previously that in North Kanara and Mysore, a variety of cardamom is grown as a subsidiary crop in arecanut gardens. This is a form of the smaller cardamom with creeping panicles and small pale green roundish fruits. This seems to be a locally evolved form of cardamom which is

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productive even down to an elevation of about 1500 feet which is about the lowest elevation at which any cardamom could be productive. These arecanut gardens are situated at elevations ranging from 2400 ft. down to about 1500ft. Cardamom seedlings are planted in the arecanut gardens with a spacing of 6ft. x 6 ft. The cardamom plants take advantage of the heavy green leaf mulch given to the arecanut trees. Arecanut husks are also spread in the garden and forms an excellent additional mulch and conditioner of soil most favourable to cardamom also. They grow luxuriantly under the shade of the arecanut trees and produce a sizeable crop of 15 to 20 lb. of dry cardamom per acre. This

brings a substantial additional income from the pepper vines grown on the arecanut trees. This remarkable and highly profitable kind of mixed cropping is found only in the Sirsi and Siddapur Taluks of North Kanara and the adjoining areas in North Mysore.

Ginger and Turmeric

Ginger and turmeric are two other spices grown extensively as intercrops in coconut and arecanut gardens. They are, as mentioned previously, annual crops grown with the aid of the monsoon rains and do not affect the moisture requirements of the coconut or arecanut trees in any way. These crops are planted on raised beds in-between the palm trees im-

mediately after the receipt of a few very heavy rains in the month of May. Green leaves and cattle manure are repeatedly applied to these crops and these treatments increase both the fertility and the texture of the soil. These treatments as well as the frequent weedings vastly help the growth and productivity of the coconut and arecanut trees also among which the crops are raised.

Mixed cropping is of fundamental importance in the economy of farming in India. Mixed cropping of spices with other crops especially perennial trees like the coconut and arecanut should vastly help in the development and extension of cultivation of the spices of India.