Although coconut has been one of Goa's main cash crops from early times, the coconut gardens of Goa have suffered from neglect, ignorance and bad management.

But through adoption of scientific methods of cultivation

GOA CAN GROW MORE COCONUTS

BY K. SATYABALAN
&
R. VASUDEVAN PILLAI
Central Coconut Research Station, Kasaragod

ONE of the latest additions to the coconut producing areas of tne Indian Union is the centrally administered territory of Goa. It lies on the West Coast of India between the Mysore and Maharashtra States. Its area is about 1,500 square miles and it has a population of about 650,000.

Of the total area of Goa, only about 9 per cent is barren or uncultivated. About 29 per cent is covered by forests. Agriculture is carried on in about 35 per cent, 19 of which is under food crops and the remaining 16 is under cash crops. Roughly 24 per cent of the area is lying fallow. The land is reported to be very fertile.

Coconut has been one of the main cash crops of Goa since early times as the territory of Goa lies mainly in the coastal coconut belt of India. Most of the eleven districts of Goa lie in the coastal belt. The acreage under coconut in each district is as follows:-

	District	Acreage in hectares
1.	Pernem	1,076
2.	Bardez	2,471
3.	Bicholim	1,140
4.	Satari	398
5.	Goa	1,474
6.	Mormugao	1,256
7.	Ponda	1,671
8.	Salcete	4,590
9.	Sanguem	2,533
10.	Quepem	1,346
11.	Canacona	541
	Total	18,496

CLIMATE AND SOIL

Goa enjoys the climate which we experience in Kerala. A heavy rainfall of about 120 inches per annum is received. A major portion of it is received during the south-west monsoon. North-east monsoon is not regular and at times is a failure. Almost all soil types are met with in Goa. The eastern region is mainly hilly with laterite type of soil. On the coastal tract the soil is mainly sandy loam. In between these two major types of soil there are areas of red loam and clayey loam. Hence this small territory has got the unique advantage of having all soil types within it. Coconut is widely cultivated in all these types of soil except in the hilly tract.

CULTIVATION PRACTICES

Shallow and close planting

In spite of their antiquity, coconut plantations in Goa are in a neglected state and the acreage yield is considerably low. Coconut gardens are neither properly cultivated nor manured. Only a few growers cultivate the gardens and fewer still only manure the palms. In almost all the gardens the bole portion (root forming region) of the palms is exposed indicating that they were not deeply planted. The general practice is to plant the seedlings about a foot deep so as to cover the nut portion only. Because of this surface planting a good portion of the root producing region gets exposed. Here the planting is generally done with a spacing of about 10 feet or even less between palms. The common belief seems to be, "Many plants mean many nuts". But because of the close planting the trees have become thin and unproductive. In the struggle for existence and the competition for food and sunlight the palms bend in and grow up in different directions. In these overcrowded plantations besides coconut other trees are also found. Naturally this too has contributed to the low yield of the coconut palms.

Domestic nurseries

The cultivator raises his own nursery for seedlings for purposes of planting. He selects heavy yielding palms of almost middle age in his garden and collects nuts from them during the summer months. These nuts are kept in shade or sheds until they are sown in the nursery. The sowing is done very closely and the nuts are placed either in the vertical or the horizontal position. Generally speaking the nursery is not divided into separate beds or rows for sowing (Fig. 1). Because of the close sowing of nuts in the nursery the seedlings growing out of these nuts are very lean and lanky. Shading is generally done for the nursery. Manuring the nursery with ash or even with chemical manures seems to be the general practice here. This is done to give better growth for the seedlings especially when they are intended for sale. One year old seedlings are sold at the rate of one rupee each.

Haphazard planting

Usually one year old seedlings are planted out in the field. They are planted quite irregularly and with very little space in between. Underplanting in coconut gardens is done without any consideration of the age of the existing palms or

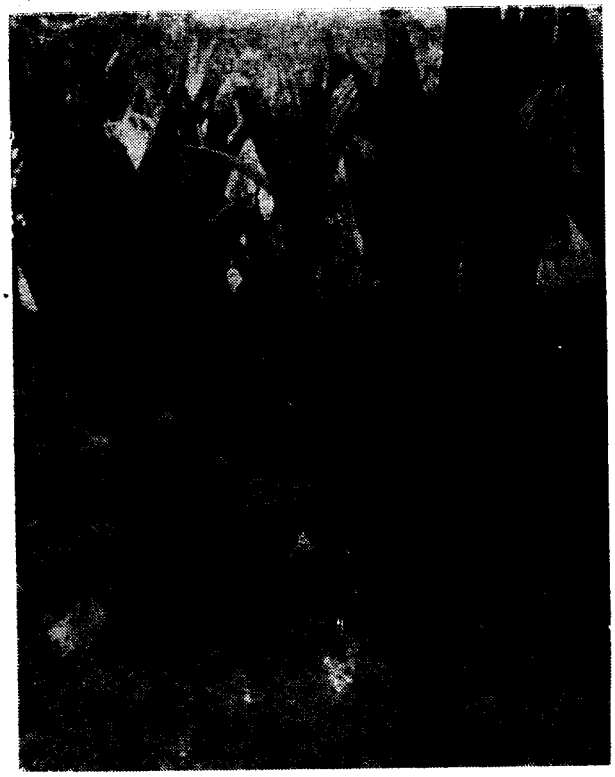

FIG. 1
A private coconut nursery in Goa

the spacing between the palms. The seedlings are planted in pits one foot deep in almost all areas except in lowlying or waterlogged ones where they are planted on mounds. Planting is done along paddy field bunds and on the sides of roads. In the coastal area small islands of coconut may be found in an ocean of paddy fields. The newly planted seedlings are watered for a period of two or three years.

Cultivation and manuring

Ploughing is the main cultural operation done in coconut gardens. But coconut gardens covering large areas are left uncultivated for many years. Very few cultivators manure their gardens systematically. Most of the gardens are not manured at all. What manuring is done, is done with the locally available organic manures. Dried fish, cowdung and compost are the common manures used. Chemical fertilisers are seldom used. Coconut gardens are not irrigated in Goa.

Harvesting

Harvesting is done once in three or four months. Climbers go up the trees

using steps cut on the stem upto a certain height and there[illegible] their feet into a rope ri[illegible] and other place[illegible] bunches are h[illegible] means that th[illegible] harvesting a fe[illegible] The nuts are [illegible] sold. The m[illegible] convert them [illegible] The copra is su[illegible] crushing or sol[illegible] The husk is [illegible] of fuel.

COCONU[illegible]

Three ma[illegible] cultivated in [illegible] portion of the[illegible] type called *Be*[illegible] called *Calangute*[illegible] in the northern [illegible]

Benaulim

This type belongs to the Tall variety and starts bearing at the age of 6 to 8 years after planting. The nuts are small in size. The husk is fairly thin. Two shades of colour occur-green and reddish green. The green type is a heavy bearer and is predominant though the other type is also a heavy bearer. *Benaulim* is reported to have wider adaptability as far as soil requirements are concerned. The oil-content of the kernel is fairly low. This type derives its name from the village of Benaulim where it is extensively cultivated. This is also known as *Banavalli* type.

Calangute and Nadora

Both these types are met with in the northern parts of Goa. They also derive their names from the villages called Calangute and Nadora where they are mainly cultivated. They reach the bearing stage by 10 to 15 years after planting. They seem to be more adapted to coastal and riverside areas. The nuts of these types are bigger in size. More nuts are obtained per palm. The kernel has greater oil content than that of the *Benaulim* type. They are reported to have a shorter life span than the latter.

These are to be seen mainly in the coastal belt and the villages from which they derive their names.

The varieties they are met with in Goa are as follows :-

	II. Calangute type	III. Nadora type
1. [illegible]	[illegible]erul	Camorlim
2. Carmona	[illegible]ndolim	Colvale
3. Orlim	[illegible]alangute	Revora
4. Varca	Saligao	Nadora
5. Benaulim	Arpora	Pirna
6. Sernabatim	Parra	Assonora
7. Betalbatim	Guirim	Mulgao
8. Colva	Anjuna	Bicholim
9. Consua	Siolim	
10. Cansaulim		

Dwarf types of coconut are not met with in Goa.

PESTS AND DISEASES

Fortunately diseases of the coconut palm are not a problem in Goa. Stray instances of stem bleeding and bud rot only are met with. But the pests do pose problems. The rhinoceros beetle attack is quite a common sight here. Because of very bad field sanitation it

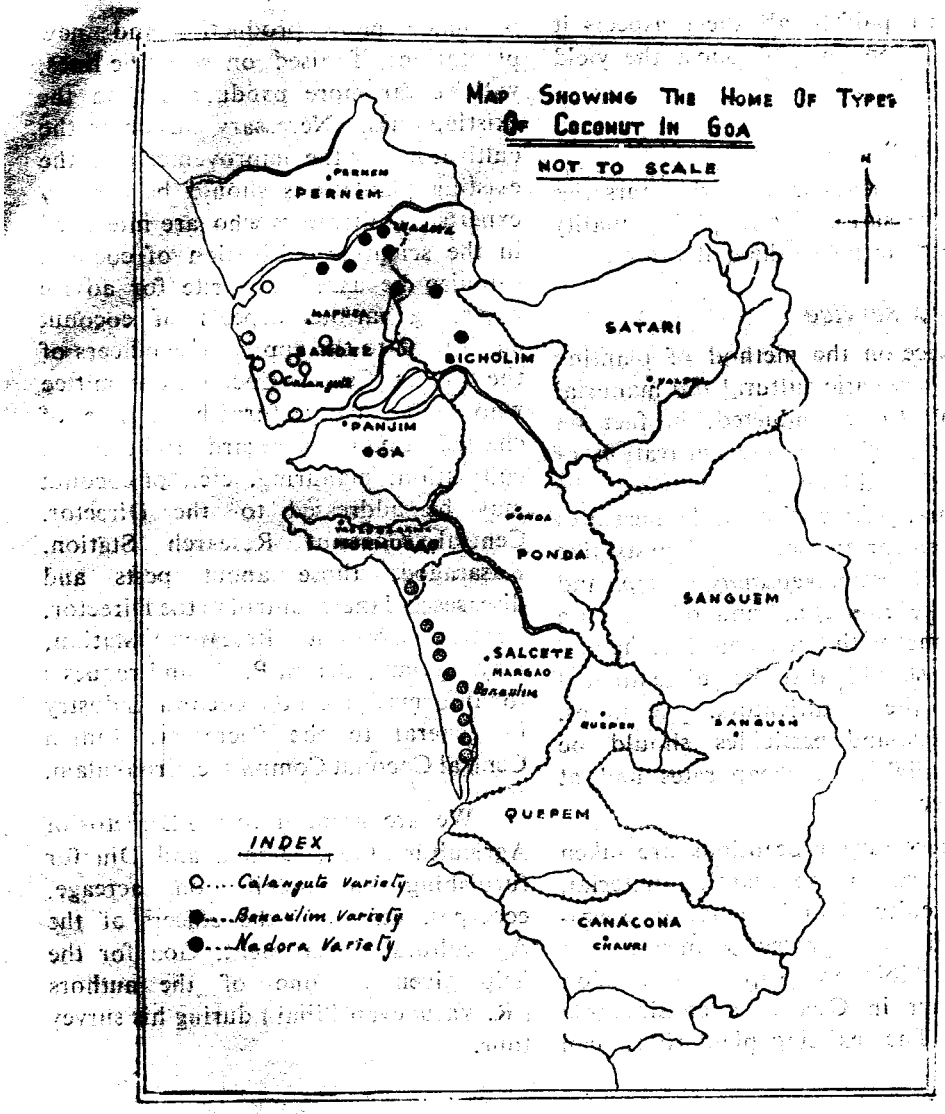

FIG. 2

has become rather a serious menace. Nephantis attack is also noticed in areas around the paddy fields and water-logged areas. But its infection is noticed only seasonally.

SUGGESTIONS FOR IMPROVEMENT

The low yield of coconut palms in most of the plantations can be mainly attributed to planting of seedlings of poor quality. Want of manuring, inadequate manuring, inadequate spacing between palms, neglect of cultural operations and failure to adopt timely measures for the control of pests and diseases affecting coconut palms have also contributed to the poor yield. If

attention is paid to all these aspects it will go a long way to boost the yield of the palms.

Government nurseries

Government - sponsored nurseries have to be started for supplying quality planting material to the cultivators.

Advisory service

Advice on the method of planting and on systematic cultural and manurial operations to be conducted, in fact on all aspects of scientific cultivation of coconut should be made available to the cultivators. Information on the measures to be taken for eradication of pests like rhinoceros beetle, *Nephantis serinopa* and others like rats etc., and of common diseases met with like stem-bleeding and bud rot should also be disseminated among the cultivators. Manures, insecticides and pesticides should be made available at cheap rates and at the proper time.

If necessary precautions are taken with regard to the planting material, spacing, cultural and manurial operations and plant protection measures, it will be possible to step up the production of coconut in Goa to a considerable extent. The existing plantations can be made more productive and new plantations, if raised on scientific lines, will be far more productive than the existing ones. Necessary advice to the cultivators for the improvement of the existing plantations should be given by experts. Cultivators who are interested in the scientific cultivation of coconut can also be asked to write for advice regarding various aspects of coconut cultivation to the appropriate officers of the Indian Central Coconut Committee who will gladly furnish it free of charge. Enquiries regarding breeding, cultivation, manuring, etc., of coconut may be addressed to the Director, Central Coconut Research Station, Kasaragod, those about pests and diseases and their control to the Director, Central Coconut Research Station, Kayangulam, Ochira P. O. and requests for information on the coconut industry in general to the Secretary, Indian Central Coconut Committee, Ernakulam.

We are grateful to the Director of Agriculture, Goa, Daman and Diu for furnishing the details on acreage, ecotypes, etc., and the officers of the Agricultural Department, Goa for the help given to one of the authors (R. Vasudevan Pillai) during his survey tour.