Re-Print, Indian Coconut Journal January 1986, Vol. XVI. No. 9

RP 624

624 624

COCONUT CULTIVATION IN LAKSHADWEEP - PROBLEMS AND PROSPECTS

CHACKO MATHEW

Scientist-in-charge, ICAR Research Complex for Lakshadweep, CPCRI, Minicoy

Lakshadweep, the smallest Union Territory of India, is comprised of 10 inhabited and 12 uninhabited coral islands. These islands lies scattered in the Arabian sea about 200 to 300 km off the Kerala coast between 8° and 12° north latitude and between 71° and 74° east longitude. Except Andrott all the other islands lie generally from north to south and have shallow and saucer shaped lagoons on their western side. The islands are encircled by a coral reef and storm beach on the eastern side. The area of Lakshadweep is only 32 sq. km., and population about 40,000. The weather and other climatic conditions are more or less the same as those prevailing on the west coast of the country. The islands experience both south west and north east monsoons and get an average rainfall of 1600 mm a year. Major portion of the rain is received during May - September. The temperature in these islands varies from 24°C to 31°C. Humidity ranges from 60 to 75 per cent.

Coconut is the major crop of the islands covering almost the entire 2233 ha. cultivable area. It is so thickly planted that in some areas the palm density is 600 per hectare. The main cultivars are Laccadive ordinary, Laccadive small and Laccadive micro. The average yield is 58 nuts per palm per year. Though the performance of these varieties is comparatively good, the yield potential is not yet fully exploited. With a view to giving support to coconut growers in Lakshadweep by way of supplying hybrids and superior planting materials,helping to adopt recommended package of practices including plant protection measures so that the yield of coconut as well as the over all productivity of the land is increased, a Research Complex was established in Minicoy by the Indian Council of Agricultural Research in 1976 under the administrative control of Central Plantation Crops Research Institute, Kasaragod. This centre has undertaken a number of research programmes which have helped to improve coconut cultivation in the islands.

SOIL SURVEY

An extensive soil survey was conducted by the scientists of this Complex and important information has been collected regarding the composition and nutrient status of the soil. The soils of these islands are structureless, formed by the disintegration of coral debris. In these soils there is

CPCRI Contribution No. 480

practically no sand, silt or clay. Soils of this area dissolve in acid baring no residue. These soils contain about 80 to 90 per cent calcium carbonate, less than two per cent alumina and traces of silica. Nutrient and water holding capacity is very low. Most of the surface soil contain more than one per cent organic carbon Because of the fact that these soils do not contain any clay, organic matter is the main reservoir of nutrients for plants in the soil. The pH of the soils ranges from 7.6 to 9.0 with very little inter island variation. A 'hard pan' with 12 cm to 15 cm. thickness is a characteristic feature of the soil profile. This is found at a depth of 15 cm to 3 metres depending on the elevation and water-table.

Regarding the nutrient status of the soils, potash content is very low while organic carbon, nitrogen and phosphorus appeared to be medium to high. Leaf anaiysis also indicated that potassium content in majority of the palms is below critical level. The soils are also found to be poor in the available micronutrients like iron, manganese, copper and zinc.

MANURIAL REQUIREMENT OF COCONUTS

No systematic work has been carried out to find out the manurial needs of coconut palm in the sland. The present recommendation of manuring with 12-0-24 mixture of NPK at the rate of 3 kg. per palm per year is only arbitrary and needs to be revised based on suitable manurial trials. For this, a statistically laid out manurial experiment was started in 1983 in the Research Farm of ICAR Research Complex, Minicoy with six combinations of NPK. The data on the growth characters of the experimental seedlings (3-5 years old) recorded after 18 months of treatment, indicated positive response to all the manurial treatments. Maximum response was shown by the seedlings which received N-500, P-320 and K-1200 per palm per year. It would be possible to give a specific recommendation on the manurial requirement of the coconut palms growing in the islands on conclusion of this experiment.

PLANT PROTECTION

Rodent Control - Rat is a serious pest of coconut in Lakshadweep, causing an annual loss of around 6 million nuts. Nuts at all stages of development are destroyed by rats and the maximum attack was observed in tender nuts 3/4 months old. It is a common sight in the island to see tender nuts with circular pear shaped holes of various dimensions, lying scattered under the trees. These are nuts damaged by rats. Four species of rats, house rat (*Rattus rattus*), house mouse (*Mus musculus*), house shrew (*Suncus morinus*) and bandicoot rat (*Bandicota bangalensis*) are generally present in the plantations. In islands like Minicoy which have a natural stand of pandanus, the damage due to rats is more severe as the rodents could hide among screwpine bushes during day time. An integrated method of control was developed and recommended to the farmers which included cleaning the crown of palms at the time of harvest, mechanical trapping with wooden and metal Sherman traps, trunk banding with aluminium sheets and chemical control using warfarin blocks. By adopting these control measures the rat damage could be reduced from 32 per cent to 10 per cent in many of the islands.

Recent studies conducted at this centre has revealed that the application of Warfarin' (0.025%) blocks was reduced rodent popu-

A view of the high density multispecies cropping model laid out at Minicoy

lation by about 68% in the Minicoy Island whereas two new generation single dose anticoagulant rodenticides, *BROMODIALONE* and *BRODIFACOUM* could reduce the rodent population by 79 and 75 per cent respectively. These chemicals are not freely available now in India and attempts are underway to procure and popularise these chemicals among the farmers. Rat hunts and rat control compaigns are periodically arranged with the co-operation of the Agricultural Demonstration units functioning in the islands to minimise the damage caused by rats.

Beetle Problem : Rhinoceros beetle is another major problem, affecting coconut production in Lakshadweep. In certain islands like Andrott 90per cent of the trees were found infested with this pest. Earlier, a project was taken up to reduce the damage caused by this beetle in coconut plantations in Andrott, by adopting an integrated control measure involving mechanical (extraction of beetles), chemical (prophylactic filling of innermost 2 or 3 axils of leaves using 5% BHC dust and equal volume of sand thrice a year and treatment of all breeding places with BHC 0.1%) and sanitational methods. This had helped to reduce the damage considerably. Recently a new programme has been launched in Minicoy to control rhinoceros beetle using *Baculovirus* based on the past experience with this virus in many of the South Pacific islands, where this pest has been successfully controlled using the virus. Initial observations indicated that the pest population and past attack have been reduced significantly in Minicoy after the introduction of this virus. It is proposed to extend this programme to other islands also especially Andrott, where beetle problem is compratively more severe.

PROSPECTS OF MIXED CROPPING

The characteristic feature of agriculture in Lakshadweep is one of pure coconut culture. Since the pressure on land is very high (*per capita* availability of land is only 0.08 ha) all efforts should be directed towards proper utilisation of every inch of land available for developing a multispecies cropping system. This can only be achieved by intensive inter and mixed cropping in coconut gardens. There is good scope for introducing inter and mixed cropping in the island, provided the coconuts are cultivated with proper spacing. One of the factors affecting coconut production in Lakshadweep is the high density of the crop. So, before attempting any inter or mixed cropping, the farmers should be prepared to reduce the density of their coconut gardens and weed out the unproductive senile palms. Many vegetables, pulses and fruit crops have been successfully grown as intercrops in the research farm of this Complex and also in the agricultural demonstration units in the different islands. These included brinjal tomato, chillies, snake gourd, bittergourd, cucurbita, maize, sorghum, papaya, banana, guava and sapota. Recently a multispecies cropping trial has been started in this Research Complex to design proper cropping models suitable to this area. The important crop combinations tried are:-

1. Coconut + Acid lime + Papaya + Colocasia
2. Coconut + Guava + Banana
3. Coconut + Sapota + Banana
4. Coconut + Acid lime + Banana

Most of these crop combinations have been found to grow satisfactorily well under the island conditions (Fig. 1). Based on this trial a few demonstration trials have been laid out in farmers' gardens.

HYBRID PRODUCTION PROGRAMME

The coconut production in the island can be stepped up by introducing superior quality planting materials. With this objective a hybrid production programme has been initiated in this Research Complex. As a first step in this direction, a dwarf palm plot is being developed with 50 dwarf green, 50 dwarf orange and 50 dwarf yellow (all local) coconut seedlings. Planting of these seedlings was made in 1983 and some of the plants have already started flowering. About 1500 high yielding Laccadive Ordinary palms have already been planted in the Research Farm, since its establishment in 1976 and these palms are under different stages of production. Thus, there is a good parental source from which it would be possible to produce enough quality planting materials including hybrids for distribution among farmers.

It may thus be seen that the research programmes envisaged for implementation by this Complex will help solve many of the problems confronting coconut production in the islands. With the co-operation of the farmers, there is ample scope for increasing further the yield of coconut and other food crops and thereby improve the overall economy of the land.