

ICAR
RESEARCH COMPLEX FOR LAKSHADWEEP (CPCRI)
MINICOY

Research Accomplishments



Central Plantation Crops Research Institute
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INTRODUCTION

The ICAR Research Complex for Lakshadweep was established in 1976 under the administrative and technical control of Central Plantation Crops Research Institute, Kasaragod. The Research Complex, Lakshadweep is located in Minicoy, the southernmost island. The farm is 5.5 ha in extent and 3 m above MSL. The soil is highly calcareous with pH above 8.0.

The objectives of the Research Complex are :

- ❶ Genetic improvement of the production potential of coconut,
- ❷ Increasing the productivity and production of coconut plantations through integrated farming system and
- ❸ Undertake adaptive research in the field of animal husbandry.

I. AREAS OF INTEREST AND RESEARCH ACCOMPLISHMENTS:

1. Survey for nutrient status and composition of Lakshadweep soils

An extensive soil survey was conducted to study the composition and nutrient status of Lakshadweep soils. This study revealed that the soils of this island are structureless, formed by the disintegration of coral debris, strongly alkaline (pH 7.8 - 9.1) and contains 80 to 90 per cent calcium carbonate, less than two per cent alumina and traces of silica. Nitrogen and phosphorus contents are medium to high while potash content is low in the soils. The total and available micronutrients like iron, manganese, copper and zinc are also low. Though the top soil is rich in organic carbon, the water and nutrient holding capacity is poor. A hard pan formulation of CaCO_3 was found at a depth of 15 cm to 3 m depending on the elevation.

2. Manurial requirements of coconut

The recommended fertiliser schedule of 360 N, 0 P_2O_5 and 720 K_2O is based on the nutrient status of soil. In order to determine the nutrient requirements of the crop a manurial experiment was started in Minicoy in 1983. It has been observed from this experiment that coconut palms respond well to fertiliser application and maximum response was shown by palms which received NPK at the rate of N 500 g, P 320 and K 1200 g per tree per year.

3. Rodent control

Rat is a serious pest of coconut in Lakshadweep causing an annual loss of around 6 million nuts. In islands like Minicoy, which have a natural stand of screwpine bushes, the damage is more severe as the rats could easily hide among screwpine bushes. An integrated method of control was developed and recommended to the farmers which included :

- i. Cleaning the crown of coconuts at the time of harvest,
- ii. Mechanical trapping with wooden and metal Sherman traps,
- iii. Trunk banding with aluminium sheets,
- iv. Chemical control with Radofin or Rodofarin cakes as poison baits and
- v. Placing Celphos tablets as fumigant in burrow holes.

By adopting these control measures the rat damage could be reduced from 32 per cent to 10 per cent in many islands. An island wide programme for controlling the rodents has been launched since 1985.

4. Biological control of Rhinoceros beetle

Rhinoceros beetle is another major problem affecting coconut production in Lakshadweep. In certain islands like Androth, 90 per cent of the trees are infested with this pest. An integrated programme for control of this pest consisting of mechanical, sanitational and chemical methods was developed and implemented in this island, which helped to reduce the damage considerably. Recently a new programme of biological control has been launched in Minicoy to destroy this beetle with *Baculovirus*. Observations revealed that the introduction of this virus helped to reduce the pest population in the island as evidenced by a reduction in leaf damage from 56.6 to 20.37%, spathe damage from 31.1 to 2.26% and fresh spindle damage from 39.2 to 5.12%. It is proposed to extend this programme to other islands also.

5. Mixed cropping in coconut

Since the pressure on land is tremendous (per capita availability of land is only 0.08 ha) in the island, proper utilisation of every inch of land by developing proper multispecies cropping systems is important to give maximum income from unit area. There is good scope for introducing inter and mixed cropping in coconut gardens. It is evident from the success obtained from the vegetable and fruit crops already tried in coconut gardens. The vegetable and fruit crops already found successful as intercrops are brinjal, tomato, chillies, snake gourd, bitter gourd, radish, amaranthus, papaya, banana, guava and sapota. Recently a multispecies cropping trial has been started in the Research Complex at Minicoy to design proper cropping models, adaptable to this area. The crop combinations tried are :

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

All these crop combinations have been found to grow satisfactorily well under the island conditions. This trial has been extended to some farmer's fields also to serve as demonstration plots.

6. Hybrid production

The coconut production in the island can be stepped up by producing superior quality planting materials and distributing them to the farmers. With this objective a hybrid production programme has been initiated by this complex. As a first step in this direction a "dwarf palm plot" has been developed in this farm with 50 palms each of Laccadive dwarf orange, Laccadive dwarf yellow and Laccadive dwarf green types. Apart from this, there are 1200 high yielding Laccadive ordinary coconut palms at this centre, which are under different stages of yielding. Thus, there is a good parental stock, from which it would be possible to produce enough superior quality planting materials including hybrids for distribution among farmers.

7. Correction of nutrient deficiency diseases in vegetable and fruit crops

A major problem with vegetable and fruit crops cultivation in Lakshadweep is the development of chlorosis resulting in poor yield. The highly calcareous nature of the soil with very poor nutrient status and moisture holding capacity results in expression of nutrient deficiency symptoms in crop plants grown. Experiments conducted at this Research Complex have shown that this malady can be overcome by adopting proper management practices in the cultivation of these crops. When vegetables were grown after applying enough organic manures (cowdung, poultry waste, compost etc.) as basal dose, applying recommended doses of NPK in split doses and providing irrigation at frequent intervals during summer months, they developed very little chlorosis. So also when banana, guava, and other fruit crops were planted after breaking the 'hard pan' and filling the pits with organic wastes and top soil and applying NPK at recommended doses, they showed no chlorotic symptoms. A recent study has shown that 'Agromin' a micro nutrient compound providing iron, manganese, copper and magnesium in chelated forms is effective in markedly reducing chlorosis in vegetable and fruit crops, when applied as foliar spray at fortnightly intervals at 0.3% concentration.

II. TECHNOLOGIES TRANSFERRED

1. To achieve better performance and higher productivity of vegetable crops, the micronutrient deficiency has to be corrected by foliar application of 'Agromin' at the rate of 0.3% at fortnightly intervals which reduces the

yellowing of the leaves. Care should also be taken to break the hard pan before transplanting the vegetable seedlings. It is always desirable to apply plenty of organic matter in the planting pits before seedlings are transplanted.

2. In order to obtain maximum profit from coconut garden, under Lakshadweep conditions, acid lime, banana, papaya, sapota and colocasia may be grown as inter/mixed crops. Growing inter and mixed crops increased the per palm nut production.

3. Rhinoceros beetle can be checked by adopting the following integrated methods of control:

- i. Removing and burning all the coconut logs to reduce the breeding site.
- ii. Hooking out and destroying the beetles, and
- iii. Adopting biological control methods using *Baculovirus*.

4. For reducing the damage due to rat the following integrated method of control is recommended:

- i. Cleaning the coconut crown at the time of harvest,
- ii. Mechanical trapping of rats with wooden and metal Sherman traps,
- iii. Banding of coconut trunk with aluminium sheets,
- iv. Use of Radofin or Rodofarin cake as poison baits and
- v. Placing Celphos tablets in burrow holes as a fumigant.

III. RESEARCH PRIORITY FOR THE COMING DECADE

In the coming decade, the research efforts will be directed to evolve an integrated management programme for coconut, developing appropriate inter and mixed cropping systems, evolving suitable methods of fertiliser and micro-nutrient management for coconut, vegetables and fruit crops, biological control of rhinoceros beetle and nematode management, rodent eradication programme, introduction and developing suitable technology for management of livestock population in the island.

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