

LAB TO LAND PROGRAMMES IN KERALA

MESSAGES



KERALA AGRICULTURAL UNIVERSITY

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LAB TO LAND PROGRAMMES IN KERALA

MESSAGES



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KERALA AGRICULTURAL UNIVERSITY
Mannuthy

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KAU/LA

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LAB TO LAND PROGRAMME

KERALA INSTITUTES

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(From)

ICAR Institutions

- 1 Central Plantation Crops Research Institute, Kasaragod
- 2 Central Marine Fisheries Research Institute, Narakkal
- 3 Central Institute of Fisheries Technology, Cochin-682 629
- 4 Central Plantation Crops Research Institute, Kayamkulam-690 533
- 5 Central Tuber Crops Research Institute, Trivandrum

Voluntary agency

- 6 Krishi Vigyan Kendra, Mitraniketan, Trivandrum

Kerala Agricultural University Centres

- 7 Krishi Vigyan Kendra, Manjeswaram
- 8 K. A. U. Project Centre for SC/ST, Nilambur
- 9 Communication Centre, Mannuthy
- 10 Agronomic Research Station, Chalakudy
- 11 Fisheries Instructional Farm, Puduveypu—Vypeen
- 12 Tribal Area Research Centre, (Amboori) College of Agriculture, Vellayani
- 13 College of Agriculture, Vellayani

Preface

The programme of transfer of proven and viable technologies from laboratories to farmers field, popularly known as the Lab-to-Land programme was launched in the country in June 1979 as a part of the ICAR golden jubilee celebrations. The programme is at its fourth phase now. The first phase covered a period of three years from 1979-'82, the second and third phases were for two years each from 1982-'84 and 1984-'86 respectively. The fourth phase started in 1986-'87 is also for two years. Following institutions in Kerala participate in the programme. A number of technologies in Crop production, Live stock production, Fish farming, Fishery technology, Home practices etc. were transferred through the various centres under the Lab-to-Land programme.

In the zonal meeting of the Lab-to-Land programme held at the K. V. K. Mitraniketan on 30.5.1986, the Kerala Agricultural University was requested to compile and publish the most important "Messages" in respect of various enterprises transferred to the adopted farmers through different transfer of technology centres operated by various organisations/agencies in Kerala for the use of beneficiaries. This publication contains a compilation of such "Messages" transferred from various Lab-to-Land centres implemented in Kerala State.

It is hoped that this publication would serve as a reference material of various viable technologies transferred under LLP in Kerala.

The co-operation extended by the Heads of Institutions and Implementing officers concerned in this regard is gratefully acknowledged.

Suggestions to improve the publications are solicited.

Dr. A. G. G. MENON
Director of Extension
Kerala Agricultural University
Mannuthy

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MESSAGES FROM

INDIAN COUNCIL OF AGRICULTURAL

RESEARCH INSTITUTIONS

(UNDER LAB-TO-LAND PROGRAMME)

Central Plantation Crops Research Institute, Kasaragod-670 124

MESSAGES

- 1 Inter and mixed cropping in coconut garden can bring in an increased profit to the cultivator by utilising the available space in his holding.
- 2 The recommended fertiliser application of 500:320:1200 gm of NPK with 30 kg of organic manure can increase the production of coconut from the average of 30 nuts to 60 nuts per palm.
- 3 Irrigation in coconut with 200 litres of water once in 4 days during summer can double the yield.
- 4 Leaf axil filling of coconut with BHC-sand mixture can control the damage from Rhinoceros beetle.
- 5 For controlling red palm weevil in coconut use of injection of Pyrocone E @ 10 ml in one litre water is effective. All the holes in the affected stem may be closed before injecting the insecticide. Keeping split trunks smeared with toddy and BHC can trap the beetle.
- 6 Regular spraying of Bordeaux mixture as pre and post monsoon can control budrot disease of coconut.
- 7 Stem bleeding of coconut can effectively be controlled by chiselling the affected portion and applying hot coal tar.
- 8 Leaf rot of coconut can be controlled effectively by sequential spraying of Bordeaux mixture, Dithane M 45 and Fytolan.
- 9 The improved varieties viz., Mangala, VTL 11 & VTL 17 have a number of desirable characters such as earliness in bearing, higher and quicker stabilisation of yield etc.
- 10 Annual application of 100:40:140 gm of NPK and 12 kg of green leaf or compost will increase the yield of arecanut.
- 11 Inter and mixed cropping with banana and cocoa/pepper in arecanut garden can increase the income of the cultivator from a unit area without affecting the yield of arecanut.
- 12 Three spraying of 1% BM, starting from premonsoon at 40 days interval is able to control Mahali disease effectively.
- 13 By spraying Endosulphan against the tea mosquito and application of recommended doze of fertiliser a yield increase of 150 kg of raw nuts/ha/year can be obtained.

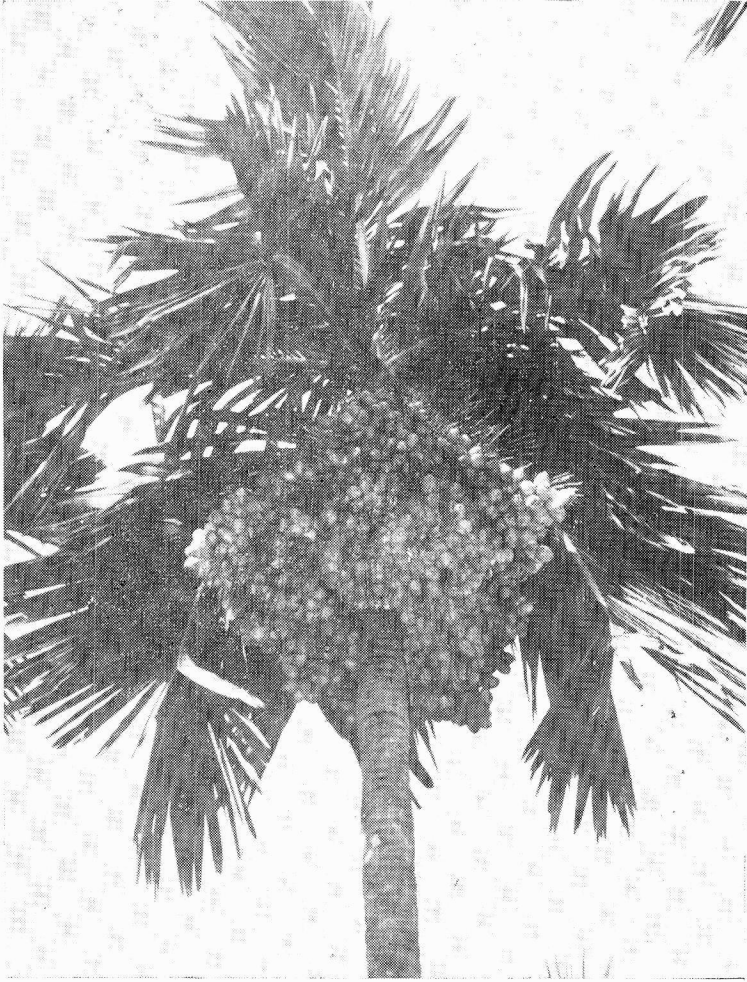
- 14 Quick wilt disease of pepper can be controlled effectively by application of Bordeaux paste on the collar region upto 50 cm on the vine, spraying the leaves and drenching the basins with 1% Bordeaux mixture.
- 15 By growing improved varieties of fish fingerlings like Catla, Rchu and Mrigal in the ponds, 3500 kg of fish per ha can be produced.
- 16 Adoption of paddy cum fish culture can give an additional income of Rs. 3000-5000 without affecting the yield of paddy.
- 17 Limited small size of holding limits the adoption of inter and mixed cropping. This can be compensated by adoption of poultry keeping and goat rearing.

List of Implementing Officers

Shri M. K. Muliya, Head, Division of Extension CPCRI, Kasaragod-670 124.	—	Co-ordinator for the Institute.
Shri B. M. Bopaiah, Scientist S-2 CPCRI, Regional Station, Vittal—574 243, D. K.	—	Programme Leader for the Centre.
Shri Thomas Joseph, Scientist S-2 CPCRI, Regional Station, Kayamkulam—690 533.	—	"
Shri A. K. Sadanandan, Scientist S-2 NRC for Spices Marikunnu P. O. Calicut—673 012.	—	"
Shri K. Venugopal, Joint Director, ICAR Research Complex for Goa, OLD GOA—403 402.	—	"



Hybrid coconut —Proper management gives increased yield



Mangala—High yielding variety



Inter and mixed cropping gives more return

**Central Marine Fisheries Research Institute, Krishi Vigyan Kendra,
Narakkal 682 505**

MESSAGES ON SCIENTIFIC PRAWN FARMING

The technology of scientific prawn farming involves the exclusive stocking of seeds of commercially important species of prawns such as the Indian White Prawn, *Penaeus indicus* and the Jumbo Tiger Prawn, *Penaeus monodon*, proportionate to the area and productivity of the fields and growing them for definite periods to achieve good quality and maximum quantity of prawns for more profitability than the conventional prawn filtration system.

MESSAGES

Adopt scientific method of prawn farming to achieve good quality and maximum quantity of prawns for more profitability than the conventional prawn filtration system.

The problem of predation in the culture field may be averted by eradicating the predators in the field, prior to stocking, by draining and drying the pond bottom, application of mahua oil cake @ 200 ppm, or anhydrous ammonia @ 10 ppm. Tidal flow in and out of the culture field may be allowed across a close-meshed nylon screen attached to the sluice gate.

Seeds of *P. indicus* or *P. monodon* may be collected either from the surf in the sea or from shallow brackish water areas or may be procured from hatcheries or seed banks.

Acclimatise the seeds before stocking by equalising the temperature and salinity of the transport water and the water at the culture site.

Before releasing into grow-out ponds, rear the small seeds in nursery ponds till they reach above 25 mm in length.

Stocking may be done when the water temperature is low (before 9 am or after 9 pm) on sunny days, at any time during a rainy day and when fresh tidal water is entering the field.

Avoid overstocking or understocking of fields by following the stocking rate of 50,000 nos. of seeds per hectare in grow-out ponds, in the case of *P. indicus*, the species suitable for growing in Kerala.

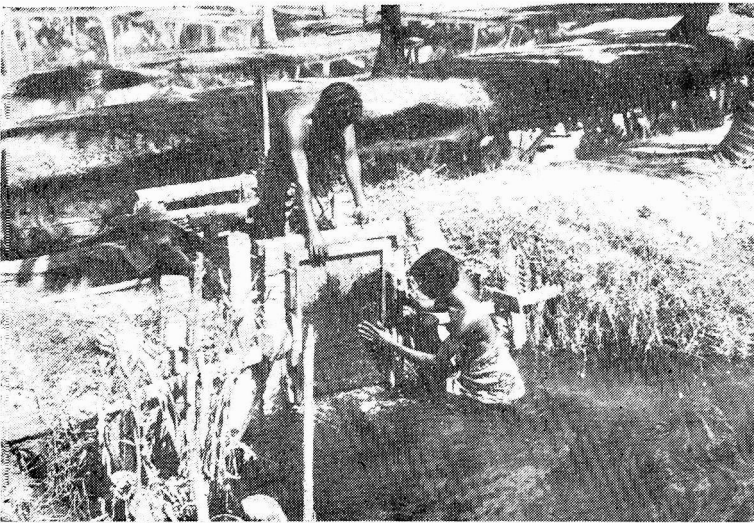
Best results are obtained with the optimum depth of 0.75 m water temperature between 25 and 30°C, dissolved Oxygen level above 3.5 ml/l, salinity between 10 and 35 ppt and pH between 7.5 and 8.5.

Allow daily flushing of water for keeping up the quality. Observe the growth and survival rate by regular sampling.

Grow the prawn for about 3 months or till they attain a length above 120 mm whichever is earlier.

Plan the cultural operations in such a way as to take two crops during the summer season. Nov.—May.

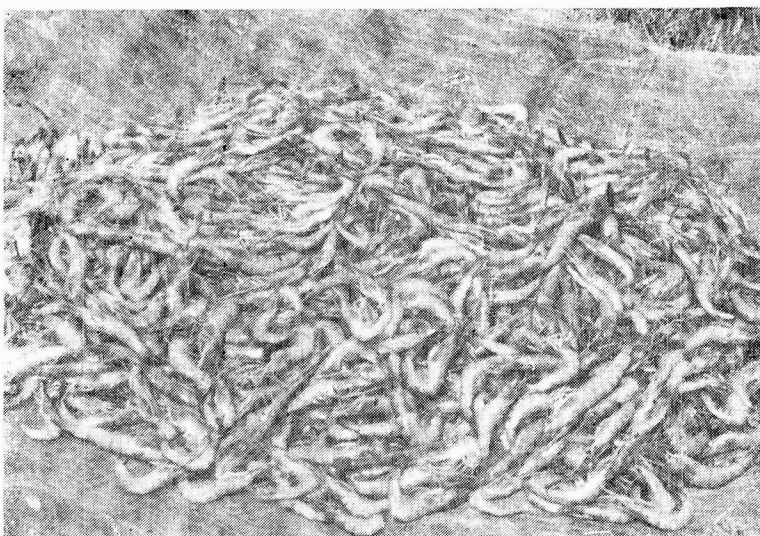
- 1 Name of Programme : Dr. M. M. Thomas,
Co-ordinator Sr. Scientist & Officer in Charge
- 2 Name of Team Leaders :
 - i. Shri P. Karunakaran Nair
Sr. Training Assistant (T6)
(Area-I 22 families)
 - ii. Shri K. Asokakumaran Unnithan
Sr. Training Assistant (T6)
(Area-II 42 families)
 - iii. Dr. P. K. Martin Thompson
Sr. Training Assistant (T6)
(Area-III 11 families)
 - iv. Shri K. N. R. Kartha,
Sr. Training Assistant (T6)
(Area-IV 10 families)
- 3 Name of Associates :
 - i. Shri A. N. Mohanan,
Training Assistant (T5)
 - ii. Shri P. Radhakrishnan,
Training Assistant (T5)
 - iii. Shri K. Purushothaman Kani
Training Assistant (T4)



Cleaning the nylon screen of the sluice gate
to prevent clogging



Sampling of prawns stocked in coconut grove canals, for growth and survival studies



Cultured Indian white prawn, *Penaeus indicus*

Central Institute of Fisheries Technology, Cochin 682629

The technology transferred under LLP phasewise is given below:

PHASE I

- A. Fabrication of modern trawl nets
- B. Processing of clam pickle
- C. Processing of mussel meat

PHASE II

- D. Preservation of traditional fishing crafts

PHASE III

- E. Fabrication of high opening trawls
- F. Handling and processing of clam meat
- G. Lobster fishing with modern traps

PHASE I

A. Fabrication of modern trawl nets

Training was imparted to selected fishermen in reading of different designs of modern trawl nets, fabrication of webbing with different mesh sizes, tailoring and mounting of the net.

B. Processing of clam pickle

Clam meat is a food rich in protein and mineral.

MESSAGE

1. Depuration—the live animals are allowed to starve overnight by keeping them in water collected from their natural habitat, followed by a treatment with chlorine.
2. They are then steamed and the meat is “shucked” out.
3. The meat is then given a further blanching in brine.

4. Take the following ingredients

- | | | |
|---|---|--------|
| a) Clam meat | — | 1 Kg. |
| b) Refined ground nut oil | — | 200 g |
| c) Powdered salt | — | 60 g |
| d) Chilli powder | — | 50 g |
| e) Turmeric powder | — | 3 g |
| f) Green chillies cut into small pieces | — | 50 g |
| g) Ginger cut into small pieces | — | 150 g |
| h) Asfoetida (powdered) | — | 5 g |
| i) Vinegar | — | 400 ml |

- 5 Fry the clam meat in minimum quantity of oil and set apart
- 6 Fry the other ingredients viz. garlic, green chilly and ginger in remaining quantity of oil until a pale brown colour is obtained.
- 7 Add chilly powder, turmeric powder and asfoetida and mix well.
- 8 Remove from the fire and add fried clam meat and salt and mix thoroughly well. When cool, add vinegar stirring well for thorough mixing.
- 9 Allow to stand for 2 days in a closed container. Pack in clean dry wide mouthed bottles.

C. Processing of Mussel meat

Mussels are available in plenty in Malabar area especially in Kozhikode district.

MESSAGES

Process Mussel meat by pickling, drying, smoking and canning. The animal has to be starved overnight by keeping them in water collected from their natural habitat followed by chlorination. This will remove the sand and other dirt in the gut of the mussel. They are then steamed and the meat is "shucked" out. The meat is then given a further blanching in brine.

a. *Pickling*

For pickling take the following ingredients:

- | | | | |
|---|---------------------|---|-------------|
| 1) Blanched mussel meat with the gut contents removed | and cut into pieces | — | 1 kg |
| 2) Green chillies split | | — | 100 g |
| 3) Ginger, skinned and cut into small pieces | | — | 100 g |
| 4) Garlic | | — | 100 g |
| 5) Curry leaves | | — | about 10 g |
| 6) Chilly powder | | — | 150 g |
| 7) Turmeric powder | | — | 5 g |
| 8) Mustard, crushed | | — | 25 g |
| 9) Pure gingelly oil or refined groundnut oil | | — | 300ml |
| 10) Vinegar (Acetic acid content 4%) | | — | about 400ml |
| 11) Salt (refined) to taste | | — | about 100 g |

For every kilogram of mussel meat dissolve 50 g of refined salt in 750 ml water and boil. Add the meat to the boiling brine and allow 5 mts of boiling. Drain the brime, remove the gut contents and cut the meat into small pieces. Small sized mussel meat can be kept as such after removal of gut contents. Wash the pieces thoroughly in potable water and drain.

Fry the meat prepared as above in oil to a golden brown colour and keep aside Fry the ingredients, first the green chillies, ginger, garlic etc and then the other spices in oil. Finally, mix all the constituents, including the fried meat. Add the salt and allow to cool. Add sufficient quantity of vinegar and fill in bottles.

b. *Smoking and drying*

1. The traditional methods of smoking and drying are unscientific and will reduce the keeping quality and general hygiene of the products.
2. Adopt scientific methods of smoking and drying developed by CIFT which would reduce the drying time and produce market preferred dried and smoked fish which fetch better market price.

c. *Canning*

1. Select fresh and good quality raw material for canning.
2. Fill the blanched/pre-cooked mussel in the can without air pockets and with good hygiene.
3. Avoid over filling which may lead to seam strains during retorting and bulging at ends.
4. Exhaust the cans by heating, mechanical vacuumisation or by steam injection to the head space. In heat exhausting, heat the contents immediately before filling in cans and quickly seal or pass to a steam box so that temperature at the centre of the can is 70°C. Seam the cans immediately before it cools.
5. After seaming wash the cans in a tank containing hot detergent, generally 1-1.5% solution of sodium phosphate followed by rinsing with hot water to remove the detergent residue which may cause can corrosion.
6. Can the mussel in oil
7. Heat process the can to the predetermined time and immediately cool down to below 37°C to prevent over cooking and to avoid the growth of any thermophilic bacteria that might have survived.
8. Take care to avoid under processing, inadequate cooling, leakage through seams, pre-process spoilage under exhausting, over filling, panelling etc.
9. Keep the warehouse clean, cool and dry. Water condensing on can surface, high humidity or temperature, corrosive fumes etc. leads to rusting of the can surface.
10. Use Aluminium can with "Lift tab" or "pull tab" lid since it is easy to open the can and is popularly available.

PHASE—II

D. *Preservation of traditional fishing crafts*

MESSAGES

1. The traditional methods of preservation of the fishing crafts using fish oil and cashew nut shell liquid etc. are not effective and economical.
2. Use Copper creosote/Arsenical creosate as the first coat and creoscor as the second coat.
3. Apply these preservatives by painting with brush or by coir brush.
4. Allow the craft to dry for a day before operation.

PHASE—III

MESSAGES

E. *Fabrication of High opening trawls*

1. High opening trawls are improved types of fishing nets designed and developed by CIFT.

2. Catch of fish is comparatively more in high opening trawls than in ordinary trawl nets.
3. Training was given in design reading, fabrication of webbing with different mesh size, tailoring and mounting of high opening trawl nets.

F. Handling and Processing of Clam meat

1. Construct modern hearth for heating fresh clams
2. Adopt starvation method for purification of clam meat
3. Hygienically handle fresh clam meat, cook in modern hearth, separate the meat wash in 10 ppm chlorinated water and pack in polythene bags.

G. Lobster Fishing with modern traps

1. The traditional trap used for Lobster fishing, made up of palmyra leaf stalk fibres or date palm leaf stalks are very crude, inefficient and not durable.
2. The modern traps are durable, more effective and easy to operate. The details of fabrication of the new trap were also taught.

LIST OF OFFICERS ASSOCIATED WITH THE IMPLEMENTATION OF
LAB-TO-LAD PROGRAMMES AT CIFT

- 1 Shri M. R. Nair, Director
- 2 Shri M. K. Kandoran, Scientist S3, (Coordinator, LLP)
- 3 Shri H. Krishna Iyer, Scientist S3, Head of Division, Extn, Information & Statistics
- 4 Shri P. V. Prabhu, Scientist S3
- 5 Shri P. A. Panicker, Scientist S3 HOD (Fishing Gear)
- 6 Shri K. K. Balachandran, Scientist S3
- 7 Shri V. C. George, Scientist S3
- 8 Shri S Ayyappan Pillai, Scientist S3
- 9 Dr. K. Ravindran, Scientist S3, HOD (Fishing Craft)
- 10 Shri T. S. Unnikrishnan Nair, Scientist S3
- 11 Shri P. A. Perigreen, Scientist S2
- 12 Shri A. K. Kesavan Nair, Scientist S2
- 13 Smt. Mary Thomas, Scientist S2
- 14 Shri Jose Joseph, Scientist S2
- 15 Shri P. K. Vijayan, Scientist S2
- 16 Shri K. N. Kartha, Scientist S2
- 17 Shri K. K. Kunjipalu, Scientist S2
- 18 Dr. N. Unnikrishnan Nair, Scientist S2
- 19 Dr. A. G. Gopalakrishnapillai, Scientist S2
- 20 Kum. B. Meenakumari, Scientist S2
- 21 Shri George Mathai, Scientist S2
- 22 Shri K. C. Purushothaman, T7
- 23 Shri N. A. George, T6
- 24 Shri T. M. Sivan, T6



Fisher women with fishing nets fabricated by them under the Lab-to-Land programme on 'Fabrication of modern trawl nets'



Clams being boiled in modern hearth developed at CIFT for Lab-to-Land programme on 'Handling and processing of clam meat'

Central Plantation Crop Research Institute

KAYAMKULAM REGIONAL RESEARCH STATION, KRISHNAPURAM-690 533

MESSAGES

Management of Root (wilt) Disease Items under transfer of technology.

- 1 Removal of Palms (a) Palm in the advanced stage of the disease (b) Palms which are senile and uneconomic and (c) disease affected palms in the pre-bearing age.
- 2 Planting with quality coconut seedling preferably hybrids.
- 3 Restructuring of the garden and shade regulations.
- 4 Balanced fertilizer application, addition of organic matter and raising green manure crops in the basins.
- 5 Cultural operations like weed control.
- 6 Plant Protection
 - a) Control of leaf rot and other fungal diseases
 - b) Insecticidal spraying to suppress the insect population.
 - c) Control of insect pests and rodents.
- 7 Other enterprises wherever applicable
 - a) Vegetable cultivation, inter and mixed cropping.
 - b) Live stock maintenance (Poultry birds, duck, genetic improvement of animals etc.)
 - c) Apiculture
- 8 Training of farmers on:
 - a) Crop maintenance
 - b) Pests and disease management
 - c) Live stock maintenance
 - d) Apiculture
- 9 Distribution of extension pamphlets
- 10 Farmers' group discussions
- 11 Conduct of Kisan Mela

List of Implementing officers

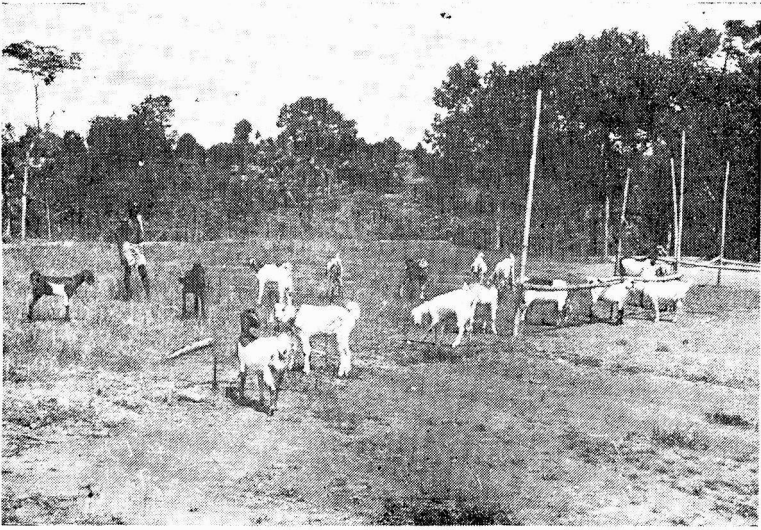
- 1 Mr. Thomas Joseph, Scientist S-2 (Path)—Leader
- 2 Shri T. S. S. Rawther, Scientist S-3 (Path)—Associate
- 3 Shri Chacko Mathew, Scientist S-2 (Phy)—Associate
- 4 Dr. K. V Joseph, Scientist S-2 (Biochem)—Associate
- 5 Dr. V. A. Abraham, Scientist S-2 (Ent.)—Associate
- 6 Shri P. M. Jacob, Scientist S-1 (Genet.)—Associate
- 7 Shri M. Gopalakrishnan Nair, Scientist S-1 (Agron)—Associate.



Fertilising Coconut Trees



Goat rearing



Goat rearing

Central Tuber Crops Research Institute

SREEKARIYAM, TRIVANDRUM-695 017

MESSAGES ON CASSAVA

- 1 Hybrid cassava varieties
- 2 Improved cultivation practices/
Technologies transferred:
- 3 Intercropping with cassava

1 Hybrid cassava varieties

a) *H. 1687 (Sree Vishakam)*

- Duration : 9-10 months
Yield : 35 t/ha (Farm condition)
30 t/ha (Village level)
Features : Contains 27% starch, 466 IU of carotene
(Not a common constituent of cassava)
field tolerant to mosaic disease

b) *H. 2304 (Sree Sahya)*

- Duration : 11 months
Yield : 40 t/ha (Farm condition)
35 t/ha (Village level)
Features : contains 29% starch, field tolerant to
mosaic disease and drought

2 Improved cultivation practices

a) *Method of planting*

- i) Mound method in level lands with poor drainage
- ii) Ridge method in slopy areas
- iii) Flat method in level lands with good drainage

b) *Sett length and spacing*

Sett length is 20 cm obtained from 8-10 months old disease free plants.

Spacing is 90 x 90 cm.

c) *Fertilizers*

100 Kg each of N, P per ha. Half N and K and P as basal dress and remaining as top dress at 45-60 days of planting.

d) *Plant protection*

Plant mosaic disease free stems. Roguing of infected plants during first month and marking diseased plants at 6-8th month and discarding the stems after harvest.

REMARKS

Hybrid cassava with recommended practices would give an additional net income of Rs. 3000/ha over and above local varieties (1985-86 season).

3 Intercropping with cassava

a) *Intercropping & varieties*

- i) Groundnut—Bunchy varieties like TMV-2, TMV-7 etc.
- ii) Cowpea—B61 (Vegetable)

b) *Seed rate and planting*

40–45 Kg (Groundnut), 10 Kg (cowpea) per ha. Two rows of intercrop in between two rows of cassava with spacing of 30x20 cm.

c) *Fertilizer*

10:10:20 Kg NPK/ha for groundnut and 10:15:10 Kg NPK/ha for cowpea to be applied one month after sowing as band application.

d) *Yield and income*

	<i>Yield</i>	<i>Income</i>
i) Groundnut	1000—1200 Kg/ha	Rs. 2000—2500
ii) Cowpea	2000—2500 Kg/ha	Rs. 2000—3000

MESSAGES FROM

A VOLUNTARY AGENCY

(UNDER LAB-TO-LAND PROGRAMME)

Krishi Vigyan Kendra

(Sponsored by ICAR)

Mitraniketan, Vellanad, Trivandrum, 695 543

MESSAGES

ENTERPRISE I: CROP PRODUCTION

High yielding varieties of tapioca

- 1) Sree Visakhm and Sree Sahya, the two high yielding varieties of tapioca have better yield potential and diseases—pest tolerance.
- 2) These varieties if cultivated under recommended package of cultivation practices would yield 6 to 10 kg per plant at 7-10 months maturity.

Inter cropping in tapioca

- 1) Bunch variety groundnut and bushy vegetable type of cowpea variety are suitable intercrops in tapioca based farming system.
- 2) TMV-7 is a better substitute for planting in April/May because of its better dormancy.
- 3) TMV-2, in spite of its good performances in most of the homesteads are unsuitable for rainy season planting. Under most conditions seeds of this variety tend to germinate in mature pod leading to heavy losses.
- 4) Cowpea (61-B) is a promising intercrop in tapioca generating a net increase of over Rs. 500/ha.

ENTERPRISE II: LIVESTOCK PRODUCTION

Goatry

- 1) Cross-breeds of desi-goats with Sannen and Alpine exotic breeds increase their productivity by more than 30 percent.
- 2) Milk production in cross-breeds which are maintained at a daily ration of 400g of feed concentrate is within the range of 1.5 to 2 l per day.

Poultry

- 1) Austrowhite is a hardy and productivity stock for backyard management in small holdings.
- 2) Egg production per bird with a daily supplement of 50 g of feed concentrate per bird will yield between 4 to 5 eggs per week.

ENTERPRISE III: HOME APPLIANCES

- 1) Priyagni Wood Store of NRDC New Delhi could save fuel and time. It is hardy and convenient to use also.
- 2) Water candle filters of NRDC is a cheap and hardy devise to ensure good drinking water for those who depend on unprotected water sources for the purpose.

Name and designation of implementing officers

Shri. V. K. Karthikeyan, Training Organizer, Dr. M. S. Sivasubramoniam, Training Associate (A. S.), Dr. T. G. Ramachandran, Training Assistant (A. S.), Smt. P. Girija, Training Assistant (H. S-), Smt. G. S. Sreeletha Nair, Training Assistant (Extn.) Shri. S. Muralikrishnan, Training Asst (Agronomy)

Training Organizer was co-ordinating the activities and Smt. G. S. Sreeletha Nair was in charge of maintenance of registers, supply of critical inputs ect. under the programme.

MESSAGES FROM
KERALA AGRICULTURAL UNIVERSITY
CENTRES

(UNDER LAB-TO-LAND PROGRAMME)

Krishi Vigyan Kendra

P. O. Vorkady 670 347, Manjeswar

MESSAGES

CROP: COCONUT

Location	: Thimmangur
Soil Type	: Gravelly laterite with low water table
Type of Land	: Garden land
Period	: May-June

Preparation of pit and planting

Messages given in the month of May/June.

I Preparation and planting

- 1 Dig pits of 1M³ at 7.6 M spacing
- 2 Fill it with fertile top soil to a height of 60 cm below the ground level
- 3 In the pits apply BHC 10% dust and mix with the soil where there is any incidence of white ants.
- 4 Fix the seedling firmly in the soil. Do not cover the collar region of the seedling with soil. The soil must be well pressed and heaped in such a way not to accumulate water at the collar region of the seedling.
- 5 Need not apply organic manure or fertilizer at the time of planting
- 6 Provide support to the seedling to protect from the wind.
- 7 Provide a circular bund around the pit to prevent inflow of rain water from the surrounding areas into the pit.

II After care

A August-September

Apply 1/10th of the total fertilizer recommended for an adult palm and slightly incorporate in the soil without damaging the root system.

November

- 1 Provide partial shade. Fix the shade in the South West direction of the pit.
- 2 Keep the soil loose and free of muds around the pit.
- 3 Irrigate the seedling according to necessity i. e., @ 45 litres of water per seedling once in four days or keep a half baked, porous mud pot of 3 to 4 litres capacity with narrow neck, in the pit and fill it with water once in 4 to 5 days.

B December

Irrigation to be continued (Filling the mud pot with water)

C January to March

As mentioned irrigation to be continued (Filling the mud pots with water)

Adult Palms (Rainfed condition)

A May-June

- 1 After the receipt of 3 to 4 soaking rains apply $\frac{1}{3}$ of the total quantity of fertilizers recommended and incorporate in the basin.
- 2 Dig the plot to facilitate maximum infiltration of rain water in the soil.

B July-August

- 1 Open the basin at 1.8 m radius from the basin and 25 cm deep at the periphery.
- 2 Apply 25 to 50 kg of green leaves or cattle manure according to availability and cover it partially with soil.

C September—October

- 1 Apply the balance quantity i. e., $\frac{2}{3}$ of the recommended quantity of fertilizer and cover the basin
- 2 Fill the uppermost 3 leaf axils around the spindle with a mixture of 10% BHC and sand, i. e., 1:2 proportion by volume against the attack of Rhinoceros beetle.

D November–December

- 1 Dig the interspaces of coconut palms and keep free of weeds to provide a dust mulch and proper soil aeration.
- 2 Provide mulch with stubless or dried leaves in the basins to reduce the loss of moisture by evaporation and prevent heat.

E January-February

The same message given to be continued.

Adult Palms (Irrigated condition)

A May-June: Apply $\frac{1}{4}$ of the recommended quantity of fertilizer in the basin and incorporate.

B July-August: Open the basin and apply 25 to 50 kg of organic manure and partially cover it.

C August-September: Apply $\frac{1}{4}$ th of the recommended quantity of fertilizer and incorporate.

Irrigate the palms once in 4 to 5 days so as to get an average of 50 litres of water per day (200 to 250 litres of water/irrigation).

D January: Continue irrigation

E February: Apply $\frac{1}{4}$ th the recommended quantity of fertilizer and incorporate. Continue irrigation.

RICE VARIETY—TRIVENI

A August-September: Preparation of nursery bed (wet nursery)

Selection of site

- 1 Select fertile soil without any shade, and with ample drainage facilities.
- 2 Plough thoroughly and apply well decomposed organic manure, i. e., @ 1 Kg/m² mix well and level.
- 3 The nursery bed should be 1 to 1.5 m width with convenient length and 5 to 10 cm height with drainage channels between the beds.
- 4 Use good seeds with 80% germination @ 60 to 85 kg/ha.

IMPACT POINT

Preparation of land and application of adequate quantity of organic manure are the most important two points for the production of quality seedlings. Egg masses of stem borer if noticed in the nursery must be collected and destroyed.

B. September-October: Preparation of mainfield and transplanting.

- 1 Transplant the seedlings at 5th leaf stage at a spacing of 15 x 10 cm (67 hills per m²). Plant 2 to 3 seedlings per hill at a depth of 3 to 4 cm. Maintain the water level at about 1.5 m cm during transplanting. Leave a wider row of 30 cm after every 3 m to facilitate spraying and other cultural operations.
- 2 Plough the field 3 to 4 times providing sufficient time for decomposing the stubbles and other organic matters.
- 3 Apply organic manure @ 5 tonnes/hectare and incorporate into the soil along with ploughing.
- 4 Apply the recommended quantity of fertilizers in the following quantities

Short duration (High yielding)

N	P	K
70	35	35

Half 'N' full 'P' and 'K' (As basal dose)

In some plots from given message was

Half of 'N' at tillering stage and the rest at P I Stage.

- 5 Keep the Rice field free of weeds upto 45 days.

C. October–November: Apply the balance quantity of fertilizers at active tillering stage or 5 days prior to P I stage.

PLANT PROTECTION: STEM BORER

Insecticides are to be applied if the percentage of deadheart is 5% at mid tillering stage and Adult moth 1/M² at P I to booting stage

Use any of the following insecticides.

Fenthion, Phosphamidon, Monocrotophos, Carbofuran

D. November-December

Drain of excess water 13 days prior to harvest.

Mark out the plot for seed collection.

Roguing is to be done. Dry the seeds till the moisture percentage reaches 14% and store well.

BANANA

A. August-September

- 1 Select 3 to 4 months old healthy sword suckers
- 2 Dig pits of 50 cm³ at 2m x 2m spacing
- 3 Plant the suckers at the centre of the pit with 5 cm of pseudostem remaining above the soil level
- 4 Apply wood ash @ 2kg/pit, mix well and press the soil around the sucker to avoid hollow air spaces.

B. September-October

- 1 Apply compost, cattle manure or green manure @ 10 kg/pit one month after planting and cover it partially with soil.
- 2 Apply half of the following fertilizers (2 months after planting) and cover it.

N	P	K
190	115	300
- 3 Dig the interspaces and keep free of weeds.
- 4 Sow any one of the following green manure seeds @ 50 kg/ra.
 - a) Sunhemp
 - b) Daincha
 - c) Cowpea

C. October-November

Open the basin and pull out the green manure crop 40 days after sowing and apply in the basin.

D. November-December

Apply the balance quantity of fertilizer in the basin and cover.

Apply the fertilizers when there is sufficient quantity of moisture or irrigate. Subsequent irrigation is to be given once in 3 to 4 days so as to get 15 l of water per day.

E. December-January

Keep the interspaces free of weeds. Do not dig deeply and disturb the root system. Continue irrigation.

F. January-February

Continue irrigation. Destroy the suckers till 7th month of planting (or till flowering)

G. February-March

Continue irrigation. Retain only 2 to 3 suckers and destroy the rest

Destruction of unwanted suckers

Cut back the suckers at ground level and apply one teaspoonful of kerosene oil at the cut end.

MANGO

VARIETIES— 1. ALPHONSO 2. NEELAM 3. KALAPADY

Method of planting

A. August—September

- 1 Prepare pits of size of 1 x 1 x 1m at spacing of 9m one month before planting and allow to weather. Fill with trashes and burn thoroughly.
- 2 Refill the pit with mixture of top soil and 10 kg of compost or Farm Yard Manure per pit to a level higher than the adjoining ground. Plant the graft at the same depth as they were in the containers preferably in the late evening. Ensure the graft joint is above the soil level. Tie the plants to stakes to prevent snapping at the graft joints.

B. October : Keep the basin free of weeds

C. November : Nil

D. December : Irrigate twice a week

E. January : Continue irrigation

F. February : Continue irrigation

KAU Project Centre for SC/ST Chunkathara, Nilambur Malappuram Dist.

The KAU Project Centre has been extending its activities to the Appankappu Tribal Colony near Munderi in Edakkara Panchayat since 1983 under the Lab to Land Programme.

The Appankappu Tribal Resettlement Colony is fully occupied by 25 Kattunaickan families and is situated on the fringes of Munderi Forest in Chungathara Reserved Forest Range. The inhabitants of the colony were traditionally nomadic in their life style but now they have been housed in common rural designed houses built with government grant. Most of the houses are presently in a dilapidated condition. Their chief occupation had been collection of minor forest produce like gum, honey, ginger, wild cardamom etc. and they also seasonally find employment in bamboo felling. Though the soil is rich alluvial forest no attempt has been made in settled agriculture.

The activities of the KAU Project Centre, Nilambur started since May 1983 and has since been involved with the transfer of technologies in various fields. The following messages were transferred to the beneficiaries through the centre.

MESSAGES

I. VEGETABLE CULTIVATION

- 1 Kitchen gardening is necessary for correction of faulty food habits.
- 2 Vegetables play a very important role in the daily diet.
- 3 The iron deficiency diseases among the beneficiaries can be prevented through the inclusion of vegetables like amaranthus, muringa and bitter-gourd in their daily diet. (Medical reports revealed a high percentage of iron deficiency diseases).
- 4 Proper care and attention is necessary for successful yield of the kitchen garden.
- 5 An ideal kitchen gardening can be observed through the demonstration plot.

II COCONUT CULTIVATION

- 6 Take pits of size 0.50 x 0.50 x 0.50 m as the land is shallow and is located near the stream.
- 7 Pits should be filled with top soil
- 8 Pits should be fenced properly against stray animals
- 9 Low cost irrigation pots may be used for irrigating the seedlings in the upper fields.
- 10 The pots should be filled with water once a week.

III RUBBER CULTIVATION

- 11 Clear-felled higher mountain slopes can be used for rubber cultivation
- 12 Rubber buds should be used for cultivation
- 13 RR11 105 variety of rubber is the most popular and high yielding variety.

IV. GINGER CULTIVATION

- 14 Ginger can be raised as a field crop in the area to get rid of elephant menace.
- 15 'Maran' variety of ginger produces excellent yield.
- 16 Construct beds of convenient length 1 m wide 25 cm high with 40 cm spacing between the buds.
- 17 Plant rhizome bits of 15 gm weight in small pits on the bed.
- 18 Mulch the beds immediately after planting with green leaves which are available in plenty.
- 19 Two more mulching of the beds with green leaves first fifty and second hundred days after planting.
- 20 Earth up the beds during mulching.
- 21 Scientific curing of the rhizomes enhances the quality of the product.
- 22 Ginger cultivation is a profitable income generating activity.

V. BANANA CULTIVATION

- 23 Banana cultivation not only provides a good source of income but also provides necessary nutrients for growing children.
- 24 Prepare the field by ploughing or digging and dig pits for planting.
- 25 Pit size 50 x 50 x 50 cm is recommended (select 3-4 months old disease free sword suckers from healthy clumps).
- 26 Apply green leaves at the rate of 10 kg per plant at the time of planting.
- 27 Avoid deep digging when weeding.
- 28 Mulching the base with green leaves will considerably improve the bunch yield.
- 29 Cucumber and amaranthus can be cultivated profitably as an intercrop.

VI. FRUIT CROPS

- 30 The importance of cultivating fruit crops in the backyard is that it provides easy access to them.
- 31 Seedlings of jack fruit, mango, lime, gooseberry, sapota, bilimbi and ramapazham should be grown around the house.
- 32 This will help to provide the necessary nutrients to ensure healthy body growth of all members of the household especially children.

VII. SESAMUM CULTIVATION

- 33 Oilseeds are good sources of nutrients—proteins and fats.

VIII. TUBER CROPS

- 34 Tubers can be grown successfully in the backyard
- 35 Tuber crops of tapioca, amorphophallus, dioscorea, colacasia were recommended.

- 36 To prevent menace of wild pigs and rats, the local variety of Tapioca—"Pathinettu" is feasible.
- 37 Cultivation of 'Thamirakannan'—colacasia variety during February—March, will ensure food for monsoon season.

IX GOAT REARING

- 38 Goat rearing is a profitable subsidiary occupation.
- 39 Goat's milk can be used for human consumption. It can be added to black tea to enhance taste and also to increase nutritive content.
- 40 Separate shelter should be provided to the goats.

X. POULTRY KEEPING

- 41 Poultry keeping is a profitable subsidiary occupation.
- 42 By providing a warm and comfortable earthenware pot in a suitable place in the house; the birds can be prevented from laying eggs elsewhere.
- 43 To eradicate fowl lice, dipping the fowls in 0.1% of Malathion solution is recommended.
- 44 Proper care and attention should be given to the fowls regularly.

XI. APIARY

- 45 Honey bees can be kept in hives maintained around the house.
- 46 For bee keeping, in addition to bamboo poles earthen pots and modern bee hives can also be used.
- 47 Queen cases can be used to keep the queen.
- 48 Scientific extraction of honey using honey extractor can improve the quantity and quality of honey.
- 49 Scientific extraction of honey helps to preserve the honey combs.
- 50 Honey collected from the forest must be filtered through a muslin cloth.
- 51 While collecting wild honey, smokers can be used instead of destroying it by fire.
- 52 During lean season artificial feeding should be given to the bees in the bee hives.

XII HEALTH HYGIENE & NUTRITION

- 53 Bathing regularly, twice a day will help in promoting health. Personal hygiene is essential for health. Using the ESP latrines, supplied by the Block, will prevent spread of diseases.
- 54 It is a healthy habit to rise early in the morning.
- 55 Eat plenty of fresh fruits and vegetables daily.
- 56 Playing immediately after meals weakens digestion.
- 57 Sound sleep is essential for good health.
- 58 Balanced diet is the necessity of life to keep our body healthy. Lack of vitamins result in eye troubles, skin troubles, rickets and sterility.

Shri. I. P. Sreedharan Nambiar, Professor of Agronomy, K. V. K. Majneshwer, was the implementing officer.

Communication Centre
Lab-to-Land Centre, Kompazha, Trichur Dist.

MESSAGES

ENTERPRISE I—MANAGEMENT OF DAIRY ANIMALS

- 1 Feed colostrum at the rate of one tenth of the body weight.
- 2 Adopt feeding of concentrates to calves at the age of one month.
- 3 Completely remove milk from the diet of calves at 3 months of age.
- 4 Deworm the calves at one month age and every subsequent month upto the age of six months.
- 5 At six months age vaccinate the animal against Anthrax, Bloch quarter, Haemorrhagic septicaemia, Rinderpest and Foot & Mouth disease.
- 6 Feed the animal according to the weight, production and pregnancy.
 - a) Maintenance ration—1.5 kg concentrates per day upto body weight of 250 kg with 20% protein.
 - b) Production ration—1 kg concentrates for every 3 kg of milk production.
 - c) Pregnancy ration—1.5 kg concentrates after six months of pregnancy.
- 7 Feed the cows with atleast 5 kg of green grass per day.

ENTERPRISE II—POULTRY REARING

- 1 Rear Austrowhite to increase the egg production.
- 2 Adopt exotic male birds to increase the egg production.
- 3 Vaccinate the birds at 2 months of age against Ranikhet disease and Fowlpox disease.
- 4 Feed with feed having 24% of protein.

ENTERPRISE III—FODDER CULTIVATION

- 1 Cultivate legume fodders to feed cows.
- 2 Cultivate cowpea, groundnut and sesamum for feeding cow to get better milk production.
- 3 Adopt goat rearing and pig rearing to increase the daily income of the farmer.

ENTERPRISE IV — BANANA CULTIVATION

A. *Prior Planting* (August/September & April/May)

Control of Rhizome weevil

- 1 Prepare insecticide solution as follows :
Take 4 g of BHC (50% WP) and dissolve in 1 litre water. Make enough quantity of the solution.

- 2 Immerse the selected suckers in the solution for about 30 minutes.
- 3 Take out the suckers and dry them in shade.

B. *At the time of planting*

- 4 Take pit size of $\frac{1}{2}$ m³ at a distance of 2m \times 2m

Control of Bunchy top

- 5 Apply 25 g of phorate (10%) in pits.
 - 6 Apply phorate 25 g each again on 75th day and 165th day after planting.
- or
- Apply 12.5 g each in leaf axils on 75th day and 165th day of planting.

Fertilizer management

- 7 Apply 10 kg of organic manure (cow dung, compost, green leaves)
- 8 Apply N, P, K at the rate of 190 g, 110 g, 300 g per plant in two equal splits at 2 months and 4 months after planting.

Control of Cigatoka disease

- a) Collect and destroy by burning all the dry leaves.
- b) Prepare 1% Bordeaux mixture and spray on all the leaves of the plants in the garden.
- c) Repeat at 15 day interval until the disease is completely checked.

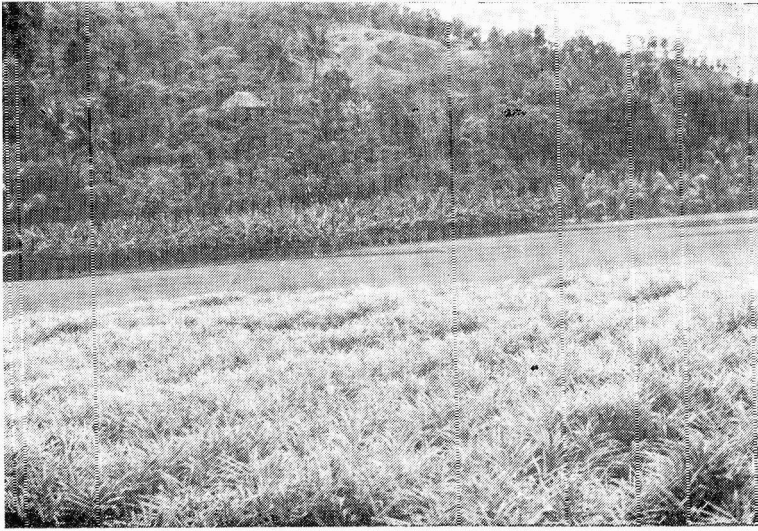
ENTERPRISE V — RAISING ROOTED CUTTINGS OF PEPPER

Time—February/March

- 1 Select high yielding mother plants during November/December.
- 2 Select the runner shoots from the selected plants and keep them coiled in wooden pegs.
- 3 Reject the terminal 1/3 and the bottom 1/3 of the runner shoots.
- 4 Select the middle 1/3 portion.
- 5 Cut it into pieces of 2–3 node length.
- 6 Make a slanting cut about 1 cm below the lower node.
- 7 Clip off the leaf blades from the cutting.
- 8 Dip the lower cut ends in Ceradix B2.
- 9 Plant the cuttings in the polythene bags filled with potting mixture or in nursery beds.
- 10 Provide adequate shade and irrigate regularly.
- 11 Cuttings will be ready for planting by June/July.

List of implementing officers

- 1 Dr. U. T. Francis,
Professor of Animal Husbandry,
Farm Advisory Service,
Kerala Agricultural University,
Mannuthy.
- 2 Sri. N. R. Nair,
Associate Professor.



Area development—Through diversified crops



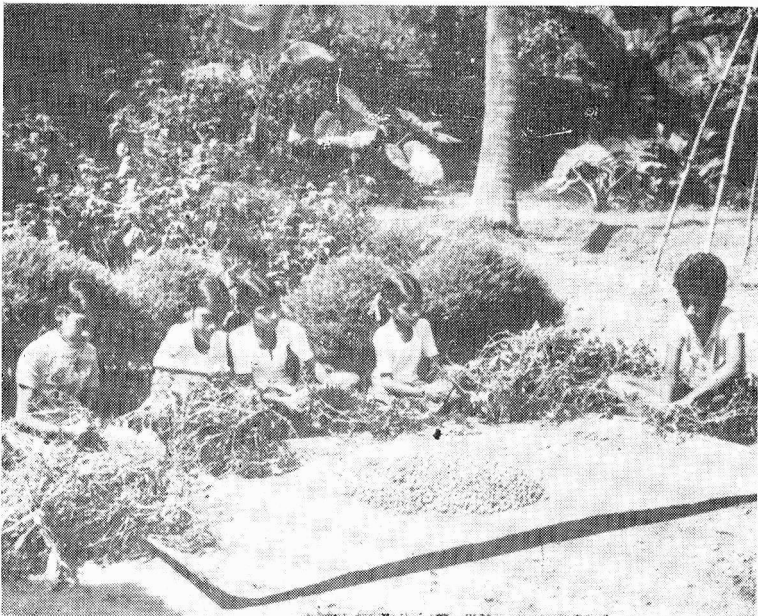
Area development — Through diversified crops



Increased yield—The farmer is happy



Groundnut as an intercrop with tapioca



Harvest of groundnuts

Agronomic Research Station, Chalakudy

Under the Lab to Land programme of this centre an area development programme is being implemented in a compact area of about 25 ha at Thuravur near Angamaly.

Problems identified

The problems limiting the agricultural production in the area and factors responsible for wastage of previous irrigation water were identified from the bench mark survey.

1) The cultivators were not following a scientifically planned cropping pattern suitable to the area, season and irrigation water availability. This led to crop failures due to water scarcity especially during summer months.

2) In the absence of well laid out field channels, farmers resort to field to field method of irrigation resulting in the heavy loss of irrigation water and nutrients. Inadequate drainage facilities and unscientific water management have resulted in the occurrence of iron toxicity in the area particularly during second and third crop seasons due to the prolonged reduction in the soil which is rich in native iron.

3) Staggered planting and usage of multitude of varieties, mostly low yielding local varieties causes serious problems for allocation of water by the irrigation authorities to varying growth stages of the crop.

MESSAGES

To combat the various problems identified in the bench mark survey the following improved technologies were recommended and tested in the study area.

1) Adopted a suitable cropping pattern involving varieties of appropriate duration and high yield in the area. Package of practices recommended by Kerala Agricultural University was also followed.

2) Shallow continuous submergence (5 ± 2 cm) of water was strictly maintained.

3) Changed the existing practices of field to field irrigation to channel to field irrigation.

4) Provided drainage facilities in the ill drained areas.

Names of officers who were actually implementing the Lab to land programme.

Sl.

No. Names of Officers

1 Dr. G. R. Pillai

2 Smt. G. Santha Kumari

3 Sri. Kuruvilla Varghese

4 Sri. A. A. Abdulla

5 Sri. P. K. Reghu

Designation

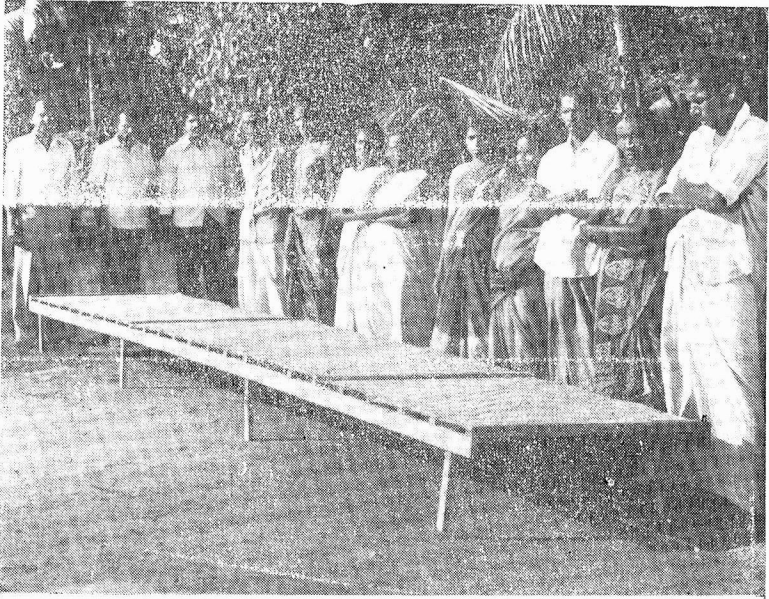
Professor of Agronomy

Associate Professor

Assistant Professor

Farm Assistant Gr. II

Farm Assistant Gr. II



Wooden raised flat

**Fisheries Station, Puduveypu
Cochin 682508**

1 Fresh water fish culture

The method of composite culture enables to utilize all the available niches of the water body with fishes of different habitat. Scientific fish culture helps to harvest 2000–3000 kg fish compared to 300 kg of the traditional fish culture.

MESSAGES

- 1 Adopt scientific culture to utilize all the layers of water in the pond
- 2 Slightly alkaline fresh water ponds with at least 1 m depth and strong bunds are ideal for fish culture.
- 3 Apply lime if water is acidic.
- 4 Marshy lands and paddy fields which are not ideal for economic cultivation can be used for fish culture.
- 5 In ponds with 50 cents and more, fish culture could be done profitably.
- 6 To start with, clean the ponds by drying or eradicating unwanted and predatory fishes by using mahua oil cake (200-250 ppm) or the powdered seeds of *Croton tiglium* (Neervalam) @ 3-5 ppm or *Euphorbia* Sp. (Kallichedi) @ 5-10 ppm or Ammonia or bleaching powder (25-30 ppm).
- 7 Initially apply 5-6 Kg cowdung/cent and repeat this manuring at an interval of 2 months. Apply 200 g urea/cent and 400 g super phosphate/cent along with the first dose of cowdung.
- 8 After one month introduce fast growing, compatible species of fish seeds @ 5000/ha.
- 9 Introduce Catla, rohu, mrigal in the ratio 4:3:3 or Catla, rohu, mrigal, cyprinus, silver carp, grass carp in the ratio 10:15:15:20:15:5.
- 10 Introduce grass carp in ponds with good quantity algae only.
- 11 Give supplementary feeding (if necessary) with a mixture of rice bran and ground nut oil cake (1:1) once in the morning or twice in the morning and evening.
Start harvesting from the 8th month onwards (if necessary)

II Supply of Raised wooden platforms for fish drying

- 1 Adopted raised wooden platform for drying fish.
- 2 Fish dried in beach sand are poor in quality and fetch low price only.

III Scientific Prawn farming

Period—November–May

- 1 Adopt scientific prawn farming with high quality better priced prawns like *P. indicus* and *P. monodon* for getting maximum profit.

- 2 Eradicate the predatory and unwanted fishes/prawn and check their further entry by using Velon screen in the sluices.
- 3 Use hatchery produced seeds of *P. indicus* @ 50,000/ha or—*P. monodon* @ 30,000/ha for stocking.
- 4 The hatchery produced seeds are to be raised in the specially prepared nurseries for 20 days before releasing to the farm.
- 5 Allow daily water exchange in the tides through the Velon screen in the sluices.
- 6 Grow the prawn for 3 months in the case of *P. indicus* and for 4 months th case of *P. monodon*.

Shri. K. S. Purushan, Associate Professor and Shri. P. K. Kumaran, Farm Assistant were the implementing officers of the lab to land programme during 1986-87.

Tribal Area Research Centre, Amboori, Trivandrum District

100 Nos. of Goats were supplied to the tribals and the usual package of practices were advised.

COLLEGE OF AGRICULTURE

VELLAYANI-TRIVANDRUM

ENTERPRISE I—SCIENTIFIC AND ECONOMIC MANAGEMENT OF BANANA

MESSAGES

- 1 Select 3-4 month old disease free sword suckers
- 2 Apply compost or cattle manure at the time of planting
- 3 Apply fertilizer 60-70 cm around the plant in two equal split doses (2nd month & 4th month)
- 4 For Nendran six split doses.
- 5 Mulching the basin with dry leaves to improve water use efficiency & bunch yield.
- 6 Raise vegetables like Bhindi, Amaranthus, Gourds, Cucumber, Cowpea.

ENTERPRISE II—HOMESTEAD MANAGEMENT OF BETEL VINE.

- 1 Raise Thulasi & Cheelanthi Karpuram
- 2 Apply well rotten farm yard manure and leaves and incorporate with the top soil of the furrows.
- 3 Apply wood ash
- 4 Apply small quantity of urea for initial development.
- 5 Mulch the furrows
- 6 Place leaves (Dry Banana leaves, Glyricidia) as mulch in the furrow.
- 7 Spray 1% Bordeaux mixture against Bacterial leaf blight.

ENTERPRISE III—SCIENTIFIC CULTIVATION OF PULSES

- 1 Recommended the variety like Kuruthola payar PTB. 1.
- 2 Spacing 25 x 15 cm is recommended
- 3 For vegetable type spacing 45 x 15 cm is recommended.
- 4 Apply $\frac{1}{2}$ quantity of N and full P & K as basal.
- 5 Foliar spraying of Dimecron + urea for initial protection and quick growth.

ENTERPRISE IV—SCIENTIFIC CULTIVATION OF OIL SEEDS (SESAMUM)

- 1 ACV-2 (Surya) suggested for upland between August—December.
- 2 Apply 75% N as basal
- 3 Recommended thinning for good growth and vigour,
- 4 2% concentration N sa foliar spray 25 days after sowing

ENTERPRISE V—SCIENTIFIC CULTIVATION OF VEGETABLES

a). **Bhindi**

- 1 Recommended Pusa sawani and Vellayani local
- 2 Recommended closer spacing for summer (60 x 30 cm)
- 3 FYM as basal
- 4 Apply NPK in the form of Factomphos and MOP,
- 5 To control borer, spray Carbaryl 0.15% at an interval of 15-20 days.

b) **Amaranthus**

- 1 Recommended Kannara local
- 2 Transplant 20-25 days seedlings
- 3 Apply FYM (50 tons/ha) as basal
- 4 Tobacco decoction against aphids and other soft bodied insects.

c) **Bitter gourd**

- 1 Recommended the spacing of 2 x 2 m
- 2 Recommended the variety PRIYA (VK-1)
- 3 Recommended the application of 20-25 tons of FYM as basal with half dose of N (35 kg) and full dose of (25 kg) and K (25 kg) per ha.
- 4 Split application of N (35 kg) in two equal doses.

Shri. S. Mothilal Nehru, Assistant Professor was the implementing officer of the Lab-to-Land Programme, Vellayani Centre from 1986-87.





How useful this sprayer supplied under Lab-to-Land Programme?
—Farmer in action



An informal chat between Lab-to-Land beneficiaries and
Implementing officer, regarding field problems



Irrigating banana using water pan provided under
Lab-to-Land Programme



Sri. K. V. Surendranath, M.L.A., and Member, General Council of Kerala Agricultural University distributing the critical inputs to the beneficiaries

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