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# **ANNUAL REPORT**

## **1995 - '96**



**KERALA  
AGRICULTURAL  
UNIVERSITY**

English

**ANNUAL REPORT**

**1995-'96**

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KERALA  
AGRICULTURAL  
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# General Report

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The Executive Committee of Kerala Agricultural University presents to the General Council its Annual Administration report for the year 1995-96 (1.4.1995 to 31.3.1996).

The Report pertains to the General Administration, Education, Research, Extension, Works, Students Welfare, Estate, Finance and Accounts. The list of members of the Statutory authorities, Sub Committees, staff at the Headquarters and in various campuses, Publications, Projects financed by outside agencies, statute amendments, details of Works executed etc. are appended.

## Officers of the University

1	Vice-Chancellor	Dr. A. M. Michael	Throughout the period
2	Registrar	Sri. E. K. Majhi, IAS	upto 1-4-95AN
		Dr. T.G. Rajagopalan Professor	1-4-95 AN to 12-7-95 FN
		Registrar i/c	
		Sri. B. Srinivas, IAS	12-7-95 FN 30-12-95
3	Comptroller	Sri. Anirudkumar Dharni I.F.S.	30-12-95 onwards
		Smt. Elizabeth John	8-3-93 to 7-4-95AN
		Sri. C.N. Muraleedharan Nair, PS to VC i/c of Comptroller	7-4-95 AN to 4-12-95 AN
		Dr. N. Mohanakumaran Director of Research i/c	4-12-95 AN to 13-12-95 FN
		Sri. B. Srinivas, IAS, Registrar i/c of Comptroller	13-12-95 FN to 30-12-95 AN
		Dr. N. Mohanakumaran D. R. i/c of Comptroller	30-12-95 AN 22-2-96 FN
		Smt. V.S. Bhanumathy Ammal	22-2-96 FN onwards

4	Director of Research	Dr. N. Mohanakumaran, ADR i/c of D. R. Dr. N. Mohanakumaran, D R.	7-9-94 to 30-9-95 30-9-95 onwards
5	Director of Extension	Dr. E. Tajuddin Professor i/c of D. E. Dr. E. Tajuddin, Director of Extension	27-6-94 to 12-12-95 12-12-95 onwards
6	Director of Physical Plant	Sri. P. O. Thomas	Through out the period
7	Dean, Agriculture	Dr. C Sreedharan, Professor i/c of Dean Dr. C. Sreedharan, Dean	5-1-94 to 30-9-95 30-9-95 onwards
8	Dean, Veterinary	Dr. A. Rajan	Throughout the period upto 30-9-95
9	Dean, Agril. Engineering	Dr. K. John Thomas Professor i/c of Dean	
10	Dean, Fisheries	Dr. M. J. Sebastian, Professor i/c of Dean Dr. D. Manikantan Thampi Professor i/c. of Dean	upto 23-1-96 23-1-96 onwards
11	Director of Students Welfare	Dr. T.G. Rajagopalan Professor i/c. of D.S.W.	Throughout the period
12	Assoc. Dean (Hort.)	Dr.C.C. Abraham,ADR i/c. of Assoc. Dean Dr. A. I. Jose, Assoc. Dean	upto 12.12.95 12-12-95 onwards
13	Assoc. Dean, C&B	Dr. M. Mohan Das Assoc. Professor i/c of Assoc. Dean	Through out the period
14	Assoc. Dean, College of Forestry	Dr, P. Abdul Wahid Professor i/c of Assoc. Dean Dr. A. I. Jose, Assoc. Dean College of Horticulture i/c of Forestry	16-11-94 to 17-4-95 17-4-95 onwards
15	Assoc. Dean, College of Agri. Nileswar	Dr. U. Mohammedkundu Director (Acad PGS) i/c of Assoc. Dean Dr. P. Abdul Wahid, ADR (NR) i/c of Assoc. Dean	11-7-94 to 17-4-95 to 17-4-95 to 12-12-95
16	Librarian	Dr. P. Abdul Wahid, Assoc. Dean Sri. R. Raman Nair	12-12-95 12-12-95 onwards 16-5-95 onwards

## EDUCATION

The following eight educational institutions functioned under the university during the period. Various courses offered in these institutions are given below.

Name of college	Courses offered
College of Agriculture, Vellayani	B. Sc. (Ag), M.Sc. (Ag), M.Sc. (Hort) and Ph. D., M.Sc. (Home Science) (FS & N).
College of Horticulture Vellanikkara	B.Sc. (Ag), M.Sc. (Ag), M.Sc. (Hort) and Ph. D., M.Sc. (Home Science) (FS & N)., M.Sc. (Ag. Stat).
College of Agriculture, Nileswar	B. Sc. (Ag)
College of Veterinary & Animal Sciences, Mannuthy	B. V. Sc. & A.H., M.V.Sc. & Ph.D
College of Fisheries Panangad	B.F.Sc. & M.F.Sc.
Kelappaji College of Agrl. Engineering & Technology, Tavanur	B. Tech. (Agrl. Engg) & M. Tech (Agrl. Engg)
College of Cooperation, Banking and Management, Mannuthy	B. Sc. (C&B), M.Sc. (C&B)
College of Forestry, Vellanikkara	B.Sc. (Forestry) & M.Sc. (Forestry)

### Admission

Students are admitted to the UG courses of the university on the basis of ranks obtained by them in the common entrance examination conducted by the Govt. of Kerala. For PG courses selections were made by the Selection Committee constituted for the purpose. Semester system of instruction continued in all the colleges.

The number of students admitted for the different courses and the number passed out from the university during the period under report are furnished in the next page.



Degree	No. admitted	No. passed out
B. Sc. (Ag)	171	164
B V Sc. & A.H.	102	110
B.F.Sc.	40	13
B.Sc. (C&B)	29	18
B Sc. (Forestry)	17	13
B. Tech (Agrl. Engg)	21	15
B Sc. (D.Sc. & Tech)	18	—
M Sc. (Ag)	45	79
M.Sc. (Hort)	21	14
M Sc. (Ag.Stat)	—	4
M Sc. (Forestry)	5	7
M.Sc. (C&B)	2	3
M.Sc. Home Science (FS & N)	7	15
M Tech (Agrl. Engg)	8	4
M.V.Sc.	36	40
M.F.Sc.	8	4
Ph. D. Agriculture	28	10
Ph. D. (Vety)	3	4
Ph. D. (Home Science)	2	—
<b>Total</b>	<b>563</b>	<b>517</b>

The number of students on the rolls of the University at the end of the year was as follows:

Courses	Total No. of students
<i>a) UG Courses</i>	
B Sc. (Ag)	970
B.V.Sc. & A.H.	698
B F.Sc.	154
B.Sc. (C&B)	106
B.Sc (Forestry)	82
B. Tech (Agrl. Engg)	103
B.Sc. (D.Sc. & Tech)	60
<i>b) PG Courses</i>	
M.Sc. (Ag)	170
M.Sc. (Hort.)	50
M.Sc. (Ag. Stat)	6
M.Sc. (C&B)	3
M.Sc. (Forestry)	5
M.Sc. Home Science (FS & N)	16
M. Tech (Agrl. Engg)	21
M.V.Sc.	51
M.F.Sc.	14
Ph.D. (Agriculture)	126
Ph.D. (Vety & Ani. Sciences)	30
Ph. D. Home Science	6

In addition to the above 12 candidates 'admitted to Diploma in Natural Rubber Production are continuing their course during the year under report.

Extra curricular activities of the students and co-curricular activities were coordinated by the Director of Students Welfare through physical education teachers and other teachers of various colleges. The Directorate of Students Welfare organised intercollegiate tournaments for various games and sports during the year.

The Kerala Agril. University continued to be a member of the Association of Indian Universities and Indian Agril. Universities Association.

### Research

The research programmes of the University have been drawn out with emphasis on solving location specific, field oriented problems faced by the farmers of the state. In addition to the State funds, the University also received assistance from ICAR, World Bank, Department of Electronics, FERRO, USDA, Hindustan Cocoa Products Ltd., Coffee Board, Department of Biotechnology, Department of Agriculture and Co-operation, Department of Science and Technology, Department of Soil Conservation, Department of Atomic Energy, Directorate of Cocoa, Arecanut and Spices Development, EEC, FACT, FAO, ICSSR and various other agencies.

Under the Kerala Agricultural University five Regional Agricultural Research Stations continued to function at Vellayani (Southern Region), Kumarakom (Special region of Problem areas), Pattambi (Central Region), Pilicode (Northern Region) and Ambalavayal (High Range Region). The technical and administrative control of these stations were vested with the respective Associate Directors under the overall control of the Director of Research.

The project co-ordination groups in all the faculties were re-constituted during the year 1995-96 based on the thrust areas of research in various fields identified. There were 22 project co-ordination groups in the Faculty of Agriculture, eight in the Faculty of Veterinary and Animal Sciences and one each in the Faculties of Agricultural Engineering and Fisheries. The Faculty Research Committee of Agriculture met four times during the year and 194 projects/experiments were cleared for implementation. The Faculty Research Committee of Veterinary and Animal Sciences met once and

approved 23 projects/experiments. The Faculty Research Committee of Fisheries met once and cleared 7 projects/experiments for implementation. The FRC on Agricultural Engineering met once and approved 11 projects/experiments.

Dr. N. Mohanakumaran, Director of Research attended important meetings/workshops which included (1) KHDP Steering Committee; (2) Faculty Research Committee (Agri); (3) Subject Committee of Kerala Legislature; (4) Faculty Research Committee (Veterinary and Animal Sciences); (5) Academic Council, (6) Governing Board of the Centre for Management Development; (7) Officers' meeting; (8) COCOTECH Conference at Ernakulam; (9) General Council; (10) Labour Norms Committee meeting; (11) Faculty Research Committee meeting (Agrl. Engg.) (12) Board of Studies (Faculty of Agriculture) (13) Plan discussions at State Planning Board (14) The Planning and Development Committee (15) Workshop on Arid Legumes (16) National Symposium on Technological Advancement in Rice and (17) Summer Institute on Rice Genetics and Breeding towards 21st Century.

## Research achievements

### *Pulses and Oilseeds*

Genetic analysis of germplasms of rice bean (*Vigna umbellata*), has indicated the possibility of identifying suitable types adapted to Southern Zone conditions.

Fourteen grain cowpea varieties were selected for CYT. The Variety COVK-869 recorded the highest mean seed yield of 1041 kg/ha followed by Culture-9 with 819 kg/ha and V-38 with 811 kg/ha. Eight cultures from six different parental combinations were selected for IET. Culture No. 602-2-42 recorded the highest grain yield of 687 kg/ha.

### *Vegetable crops*

The water melon varieties Sugar Baby and Arka Jyothi were found promising for summer cultivation in southern parts of Kerala.

Source of resistance to yellow vein mosaic virus of bhindi was located in the species viz. *Abelmoschus tetraphyllus*, *A. manihot* sp. *tetraphyllus*, *A. ficulneus*, *A. moschatus* and *Hibiscus hungelli*. Low level resistance or tolerance has also been located in cultivated varieties namely Arka Anamika and Parbhani Kranti.

## Plant protection

The integration of nursery treatment and mainfield treatment like ploughing and covering the soil with polythene sheet was found effective in controlling the root-knot infestation in brinjal. Integrated control of root-knot nematode in brinjal revealed that the treatment involving carbofuran 1 kg ai/ha basal - neem cake (1 t/ha) at 45 DAP significantly reduced the nematode population in soil and root. This effect was directly reflected on improvement in the yield of ginger.

Seventy isolates of *Phytophthora* from foot rot infected pepper, twenty six isolates from bud rot affected coconut and three from orchids were brought into pure culture and their characters studied. Mating studies, cross inoculation studies and isolation of antagonists progressed.

A detailed study of the host range of already identified fungal pathogens of water hyacinth [viz. *Colletotrichum gloeosporioides*, *Fusarium equiseti* and *F. pallidoroseum* on common weeds and cultivated plants was done. *Fusarium* sp. cause infection on *Boerhaavia diffusa*, *Phyllanthus niruri*, *Echinochloa colonum*, *Justicia prostrata*, *J. diffusa*, *Commelina bengalensis*, *C. jacobii*, *Oldenlandia umbellata*, *Calotropis gigantea*, *Cassia occidentalis*, *Axonopus* sp. etc. *Colletotrichum gloeosporioides* was found to be pathogenic to *Euphorbia hirta* and *Phyllanthus niruri*.

Monitoring of pesticide residues in 15 samples of human breast milk collected from Thiruvananthapuram Taluk Hospital revealed the presence of HCH residues. The mean level of total HCH was 0.0028 ppm with a range of 0.0008 to 0.062 ppm. The total DDT level ranged from non-detectable to 0.35 ppm with a mean of 0.062 ppm.

Among the four vegetable samples collected from farm gates 33.33% of bittergourd, 25% of snakegourd, 20.83% of cowpea and 8.33% of cucumber fruits contained organo-phosphate residues above maximum residue limits. Methyl parathion was the most frequently used insecticide (48% of vegetable growers). Of the 96 samples examined during the second season also, none of the vegetable sample was free from P residues.

Residues of quinalphos, lindane, chlorpyrifos and mancozeb present in rice grain, straw, husk and bran following application of the recommended and double the recommended dose at 30 DAT and 45 DAT were analysed and the results indicated that none of the harvested produce contain residues

of these insecticides. Methyl parathion and monocrotophos were the main contaminants and the residues exceeded maximum residue limits in the farm gate sample of vegetables.

Experiments were conducted to study the dissipation of lindane (0.05 and 0.1%) and mancozeb (0.2 to 0.4%) in chillies following application at 60 and 75 days after planting. Fresh and dry chillies were analysed at intervals of 0, 1, 3, 5, 7, 10 and 15 days after the second application. The initial deposit of lindane in fresh samples was 3.96 and 5.04 ppm for the doses of 0.05 and 0.1% respectively. The corresponding levels of the dry chilli were 4.83 and 6.36 ppm. Removal of residues due to washing ranged from 57.14 to 65.66%. The residues dissipated to non-detectable levels by the 10th day when applied at 0.05% and by the 15th day when applied at 0.1%.

In the case of mancozeb the initial deposit was 4.32 and 6.00 ppm in fresh and dry chilli respectively when applied at the dose of 0.2%. No detectable residue was found in the fresh samples 10 days after treatment whereas 0.86 ppm was found in the dry chilli. In dry chilli the residues dissipated to non-detectable levels by the 15th day after treatments. 20.55 to 51.33% reduction in residue could be obtained due to washing.

Waiting periods of quinalphos and monocrotophos for cardamom were fixed as 23 days and 22 days, dimethoate and quinalphos for pepper as five days and 12 days, respectively and quinalphos in brinjal as 11 days.

#### *Forage crops*

Guinea grass varieties (45) were maintained in the germplasm. They are being catalogued with the help of a descriptor. Fresh planting of the germplasm is being done during kharif 1995. Fifteen varieties of *Stylosanthes* were maintained in the germplasm. Seed collection and germination tests progressed.

The guinea grass variety PGG-489 recorded maximum green fodder yield in the advanced varietal trial of guinea grass.

Biofertilizers had no significant influence on the fodder production of grasses. Increase in the level of nitrogen increased the fodder yield of grasses.

Comparative fodder production of guinea grass and gamba grass under coconut garden, revealed the superiority of guinea grass over gamba grass.

Different levels of irrigation significantly influenced the green fodder yield of grasses. Irrigation at 30 & 40 mm CPE was found good for grasses.

The fodder trees *Glyricidia* sp. and *Flemingia congesta* were found promising.

The fodder variety of amaranthus APGA-3 recorded the maximum green fodder yield of 45.55 t/ha followed by APGA-6 (42.22 t/ha).

## **Beneficial microorganisms and productive insects**

### *Honey bee*

The wild tree "Maruthu" (*Terminalia paniculata*) was found to be a good source of nectar for migratory bee keeping after the rubber honey flow season.

Performance of the introduced Italian bees has been satisfactory so far.

The etiology of the bee disease in southern zone of Kerala has been completed. In colonies of *A. mellifera*, the brood mite, *Tropilaelaps claseae* was found to be major pest, but it could be controlled by periodic dusting of sulphur at 200 mg per frame. The other pests noticed were the yellow banded wasp *Vespa orientalis* and the bee eater bird *Merops orientalis*. No disease has been observed in these bees so far.

In *Apis cerana indica* the wax moth *Galleria melonella* has been observed as a serious pest.

### *Sericulture*

In rainy season, silk worms could be reared successfully at a spacing of 830 larvae/m<sup>2</sup>.

The mulberry varieties S<sub>1</sub> and MR<sub>2</sub> were identified for intercropping.

### *VA mycorrhiza*

Two native VAM cultures were developed for improving the growth and tolerance to foot rot disease of pepper. A coir pith based mass production technique for VAM was standardised.

### *Nitrogen fixing bacteria*

#### **Rhizobium**

Development of efficient strains of *Rhizobium* suitable for acid soil conditions, and isolation of acid tolerant cultures of *Bradyrhizobium* sp. suitable for cowpea, black gram and green gram has been completed.

### **Azotobacter and Azospirillum**

Two new acid tolerant cultures of N-fixing bacteria, *Azotobacter* and *Azospirillum* were isolated for the first time in Kerala. These cultures with pH tolerance upto 6.0 are being handed over to the Kerala Agro Industries Corporation for the mass production of *Azotobacter* and *Azospirillum* biofertilizers in the state.

### **VETERINARY AND ANIMAL SCIENCES**

Immuno absorption of antibuffalo serum was found to be more beneficial. Rabbit antibuffalo serum absorbed with goat freeze dried antigen is capable of identifying both beef and buffalo beef which is not possible with any other absorbed antisera.

Filter paper was found to be a good medium for carrying meat antigen to be used later with unabsorbed antiserum.

Anaesthesia using Acepromazine thiopental was found to be satisfactory for resection and reconstruction of trachea in dogs.

Premedication with atropin and xylazine followed by Tiletamine-Zolazepam was found to be satisfactory in dogs as it produced quick and smooth induction of anaesthesia.

Studies carried out to elucidate seasonal variation in semen characteristic in goats revealed that there was significant difference in semen characteristic between seasons.

Semen extension with milk antibiotic extender and on storage under refrigeration was found to deteriorate, rendering it unsuitable in 24 hours.

On comparative study of aflatoxicosis in the duck and fish with special reference to the immune system showed immunosuppressive effect in Aflatoxin. It severely affected the immune system in both the species.

Results of studies carried out to evaluate different feeds for their microbial degradability rates indicated that among the oilcakes, coconut cake and cotton seed cake are the better source of bypass protein for ruminants.

Results of studies to find out the effect of dried spleen as a bio-stimulator in the ration of cross-bred calves at a rate of 0.1% in the ration did not bring about any significant beneficial effects on growth, feed efficiency and nutrient digestibility in calves gaining at an average rate of 600 gm day.

Experiments conducted on laying hens to assess the influence of feed enzymes in the ration of laying hens revealed that incorporation of exogenous enzymes viz., cellulase and or protease exerted positive influence on feed efficiency, egg production, feed intake and nutrient availability in laying hens.

Duck plague virus isolated from Kuttanad areas are being passaged in ducks embryo fibroblasts so as to evolve a cell culture adapted duck vaccine.

*Acuria spiralis* and *Strongyloides avium* were reported for the first time in India.

The life cycle of *Ornithostrongylus quadriradiatus* was worked out.

## FISHERIES

The Angel fish, *Pterophyllum scalare* could be bred repeatedly upto 11 times during the year, within a period of nine months. 35% of the breeders could be bred during the second year also. The number of eggs in one breedings ranged between 150 and 750 with an average of 424. The survival from eggs to fry is found to be 33%, with a maximum of 638 numbers in one breeding.

Dietary phosphorus level did not show any significant influence on the survival of the juveniles of *Macrobrachium rosenbergii*. However, excess phosphorus in the diet (above 3.3%) developed inhibitory effect on growth and feed efficiency in the prawn.

## AGRICULTURAL ENGINEERING

A coconut dehusking tool was developed by the Department of FPME and its technology was transferred to M/s. Raidco Kerala Ltd. for commercial production and distribution.

## EXTENSION

The Directorate of Extension is responsible for the extension education activities of the Kerala Agricultural University. The Communication Centre, the Farm Advisory Service, the Central Training Institute and the Information cum Sales Centre which form the main constituents of the Directorate of Extension spearhead the first line extension activities of the University and implement by themselves and through constituent research stations and educational Institutions under KAU.



The Krishi Vigyan Kendras (KVK) sponsored by the ICAR and the Village Adoption Programme are other Transfer of Technology programme implemented by KAU.

Information Communication through various media is the major activity of Communication Centre which comprises the Farm Advisory Service, the Information Unit, Exhibition and Graphic service and the Publication unit.

The Farm Advisory Service Unit participated in 48 Agricultural Seminars organised at Thrissur, Palakkad, Kozhikode, Idukki, Alappuzha and Thiruvananthapuram districts in which 5000 farmers were benefitted. Six hundred and nineteen farmers were given advice in person in various problems confronted by them in the field of agriculture, animal husbandry and fish culture. Replies were also sent to 420 letters seeking information on agriculture and allied subjects through mail. Besides, several diagnostic field visits were also conducted in Thrissur, Palakkad and Ernakulam districts during the period under report.

The Publication unit brought out several technical publications which included books, two training modules and one leaflet, Kalpadhenu-the quarterly Malayalam magazine from the centre.

The Exhibition and Graphic service unit conducted four exhibitions in and around Thrissur District. Colour transparencies, photographs and blow-ups were also prepared by the unit. Besides, five scripts on mushroom cultivation, reproduction in cattle, mycotoxicosis in animals, diseases of ducks and rabbits were under preparation.

## WORKS

The provision for the Engineering works for the year 1995-96 was Rs. 350 lakhs under plan and Rs. 55 lakhs under Non-plan. The total expenditure incurred during the period under report was Rs. 206.32 lakhs.

## KAU ESTATE

Out of the total area of 391.44 hectares of the Estate, 233.30 ha were allotted to other schemes. A total quantity of 23677 kg latex was produced during the year. The total receipt and expenditure during the year were Rs. 2293669 and Rs. 3842746 respectively.

## KAU SCHOOL

A total number of 839 students were in the roll during the period. The strength of teaching staff was 18 and that of the non teaching staff 6. The school won the 1st prize and bagged the ever rolling Trophy for the Science and Maths Exhibition at the Thrissur Educational District during the school year 95-96.

## FINANCE

The University had adopted a budget of Rs. 6763 lakhs for operation for 95-96 anticipating a grant in aid of Rs. 4600 lakhs (Rs. 3250 lakhs under Non-Plan and Rs. 1350 lakhs under Plan). From the Govt., ICAR Assistance of Rs. 499 lakhs, Rs. 208 lakhs from other agencies (DBT, DST, EEC etc.) and internal resources of Rs. 440 lakhs were also anticipated. The expenditure during the period under report for various functions of the University was Rs. 5274.26 lakhs against actual receipts of Rs. 5384.27 lakhs.

## CHAPTER I

# General Administration

---

The Kerala Agricultural University came into existence on 24th February, 1971 under the KAU Act 1971 (Act 33 of 1971).

The Main Campus of the University at Vellanikkara is 13 km east of Thrissur town on the Thrissur-Palakkad highway (NH 47). The College of Horticulture and College of Forestry are located at the Main Campus. The University has six other teaching campuses, viz. College of Veterinary and Animal Sciences, Mannuthy; College of Co-operation, Banking and Management Mannuthy; College of Fisheries, Panangad; College of Agriculture Vellayani; Kelappaji College of Agricultural Engineering and Technology, Tavanur and College of Agriculture, Pilicode. In addition to this the University has 28 major research stations distributed through out the state. Some of the stations are also recognised as centres for PG research of the University. When the NARP was implemented in the University five of these stations were recognised as Regional Agricultural Research Stations. They are located at Pilicode, Ambalavayal, Pattambi, Kumarakom and Vellayani.

The University received financial assistance mainly from the State Government and ICAR. Finance assistance was also received from outside agencies like the NARP, the Department of Science and Technology, The Department of Environment, Government of India, Department of Electronics, Government of India, FERRO USDA, Coffee Board, ICSSR, Hindustan Cocoa limited etc.

### Officers of University and Administrative set up

The Officers of the University are the Chancellor of the University (Governor of Kerala), the Pro-Chancellor (Minister of Agriculture) and the Vice-Chancellor who is the Chief Executive and Academic Officer of the University.

The Vice-Chancellor is also the ex-officio Chairman of the General Council, Executive Committee and Academic Council. The Vice-Chancellor is a full time officer of the University and has the immediate overall control of the University. The other

officers of the University are the Deans of Faculty, the Director of Research, Director of Extension, the Director of Physical Plant, the Registrar, the Comptroller and the Director of Students Welfare.

The general administrative control is vested with the Registrar, while the Comptroller is responsible for budgeting, finance, statements of accounts and audit. The co-ordination, direction and administration of research activities in the University are vested with the Director of Research. The Director of Extension is responsible for extension education and public relations. The Deans and Associate Deans of the various colleges are in charge of resident teaching and instruction in the respective colleges. The Director of Physical Plant is in charge of the construction and maintenance of buildings, roads, vehicles and machinery.

#### **Authorities of the University**

The statutory authorities of the University are the General Council, The Executive Committee, The Academic Council, the Faculties and the Board of Studies of each faculty. The lists of members of these bodies are appended.

#### **General Council**

The supreme authority of the University is the General Council. The Council is reconstituted every three years. The term of the General Council constituted on 31.1.1992 with 68 members was terminated on 30.1.95 and the Council was reconstituted w.e.f. 31.1.95.

Ordinarily the Council meets once in four months. The General Council met three times during the period under report.

#### **The Executive Committee**

The Executive Committee is the Chief Executive authority of the University. The Committee consists of thirteen members with Vice-Chancellor as the Chairman. The other members include 3 ex-officio members (Secretaries to Government, Department of Agriculture, Rural Development and Finance), one ICAR representative in the General Council and of which one from among the women members, one from among the Scheduled Caste/Scheduled Tribe members, one student representative, one from among the teachers, one from among the Deans and three other non-official members (list of members appended).

During the report period, the executive committee met 11 times.

## Academic Council

The Academic Council is responsible for the maintenance of standards of teaching in different faculties of the University. The Academic Council shall exercise such other powers and perform such other functions as may be conferred or imposed upon it by Statutes. During the year 1995-96 three meetings (68-70) were held. (The list of Academic Council members appended).

Important decisions taken by the Academic Council were the following:

68th meeting of Academic Council held on 1.7.1995.

- Approved 17 Ph. D. research projects.

69th meeting of Academic Council held on 30.11.95 and 1.12.95.

- The rules for work experience training for B. Sc. (D. Sc. & Tech) were approved.
- Recommended to institute "Potash and Phosphate Institute of Canada-India Scholarship for M. Sc. (Ag) course on Potassium in Soils".
- Revised UG, PG and B.V.Sc. & A.H. regulations.
- The proposal for All India Competitive Examination by ICAR for UG programme and reservation of seats for PG programmes were approved in principle, subject to the condition that the ICAR nominations will be limited 15% for UG courses and 25% for PG and no more candidates would be admitted from ICAR quota.
- Approved five Ph. D. research projects.

70th meeting of Academic Council held on 29.3.96.

- Amendments were made in the case of Rule 3.17, 20.3 and 23(2) (c) of UG Regulations 1995.
- Decided to retain one post of Professor (RC) in each faculty.
- Approved the syllabus of Ph. D. programme in Fish Processing Technology.
- Recognised the B. V. Sc. & A. H., M. V. Sc. and Ph. D. Degrees of Tamil Nadu Veterinary & Animal Sciences, University on reciprocal basis.
- Approved the detailed guidelines for examination, evaluation and grading, conducting comprehensive and final examinations of various courses based on the new regulations.

- Decided to start M.F.Sc. programme in Fishery Hydrography and approved its syllabus.
- The syllabi for the B. Sc. (Ag), B. Sc. (C&B) and B. Sc. (Forestry) were revised.
- The intake capacities of B. Sc. (D.Sc. & Tech) and B.F.Sc. were increased to 31 and 50 respectively.

#### Sub Committees

The Chairman and Convenor of various Sub Committees of General Council and Executive Committees are given below. Names of the members of the Committees are appended.

#### Sub Committees of General Council

- i) Assurance Committee
 

Chairman	Sri. K Gopalan
Convenor	Registrar
- ii) Accounts Committee
 

Chairman	Sri. D. Vijayakumar
Convenor	Comptroller
- iii) Statute Sub Committee
 

Chairman	Sri. M. V. Kurien
Convenor	Registrar

#### Sub Committees of Executive Committees

- i) Establishment Committee
 

Chairperson	Smt. Saraswathy Kunjukrishnan
Convenor	Registrar
- ii) Research Review Committee
 

Chairman	Sri. K. M. Soopy M. L. A.
Convenor	Director of Research
- iii) Finance Committee
 

Chairman	Vice-Chancellor
Convenor	Comptroller
- iv) Planning and Development Committee
 

Chairman	Sri. Johny Nelloor M. L. A.
Convenor	Director of Research
- v) Student's Welfare Committee
 

Chairman	Sri. Johny Nelloor M. L. A.
Convenor	Director of Student's Welfare
- vi) Works Committee
 

Chairman	Sri. M. P. Thami M. L. A.
Convenor	Director of Physical Plant

### **Research Council**

The Research Council (Research Advisory Committee) reconstituted as per the decision of the Executive Committee held on 16-5-90 is continuing. The list of the members of the Research Council is appended. The main responsibility of the Research Advisory Committee is to advise the University on formulation of the research programmes.

### **Extension Advisory Committee**

The Extension Advisory Committee renders advice in extension education activities which are organised through the Directorate of Extension. List of members appended.

### **Faculty Research Committee**

The main duties of the Faculty Research Committees are to scrutinise the research proposals received from the different co-ordinators and to review the progress of research in Kerala Agricultural University periodically. The list of different Faculty Research Committee members of the University are appended.

### **Co-ordination Groups**

The various Project Co-ordination groups organised are authorised to critically examine the research proposal received from Project Leaders Principal Investigators and to review the progress in the concerned group. The list of members of the different Project Co-ordination Groups are appended.

### **Faculty Improvement**

The members of the academic staff were provided with opportunities to acquire higher qualifications by granting deputation, study leave or leave for study purposes. They were also sent for short term training courses, summer institutes etc, in different specialised centres and for participating in seminars, symposia, workshops etc., organised by different scientific agencies/ICAR institute or other Universities.

### **Students' Admission**

Admission for undergraduate courses in the University was made on the basis of a common entrance examination conducted by the Government of Kerala. Admission to the various post-graduate courses was given on the basis of marks obtained in the qualifying examination, experience, number of research papers published and the performance at the interview. Few seats were reserved for ICAR nominees and SC/ST candidates.

## Labour

Farm labourers constitute a major category of personnel in the University. Two categories of workers - Casual and Permanent - exist in the farms and research stations under the Kerala Agricultural University. In respect of service conditions and wages, generally, the University follows Government orders applicable to the labourers of the Departments of Agriculture and Animal Husbandry.

## Important Engagements of Vice Chancellor, Kerala Agricultural University during 1995-1996.

Dr. A. M. Michael continued as Vice-Chancellor of the University during the period of report.

The Vice-Chancellor chaired the meetings of different committees of the University including General Council, Executive Committee, Finance Committee, Academic Council, Extension Advisory Committee, Research Council, Research Review Committee, Officers Meeting, P. G. Committee, Faculty Research Committees, KHDP Review meeting. He also chaired the Selection Committee meetings.

The other important meetings and functions attended by the Vice-Chancellor are the following:

He attended the Vice-Chancellors Conference held at I.C.A.R., New Delhi during the period 17-4-'95, 18-4-'95 and 26-9-'95. Attended as Chief Guest in the Nurses Day Celebrations of the Amala Cancer Hospital, Trichur on 25-4-'95. He participated in the valedictory function of National workshop on Nuclear Hydrology at CWRDM, Kozhikode on 27-4-'95. Vice-Chancellor attended the inaugural function of the KAU Pavilion at the Thrissur Pooram Exhibition on 21-4-'95. He attended the recording of Radio talk on Agricultural Development Programme of Kerala Agricultural University at AIR, Ramavarmapuram on 4-5-'95. Vice-Chancellor inaugurated the Krishi Mela organized by 'Mathrubhumi' at Kattappana on 6-5-'95. He attended the National Conference on Informatics for Sustainable Agricultural Development 1995 at New Delhi on 24.5-'95. Dr. Michael participated in the function on National Refresher Course in Banking Management, Mannuthy on 5-6-'95. He attended the inauguration of the Third National meeting of Seeds at College of Horticulture Vellanikkara, on 6-6-'95. Participated in the inaugural function of the University Union at Veterinary College, Mannuthy on 13-6-'95. Dr. Michael participated as Chief Guest in the meeting of the Lions Club of Trichur East on 22-6-'95. Participated



in the Policy Planning Committee of ICAR Governing Body meeting on 26-6-'95 at New Delhi as a member. Dr. Michael participated in the meeting as External Expert for presenting major areas of R & D programmes of Central Soil and Water Conservation Research and Training Institute, Dehra Dun on 5-7-'95. Attended the inaugural function of the Students Union of ICAET, Tavanur on 16-7-'95. Participated in the inaugural function of the Cashew Grafting Training at Cashew Research Station, Madakkathara on 1-8-'95. Attended the recording of the inaugural address of the Farm School on the AIR programme of Thrissur on Cashew at Ramavarmapuram, Thrissur on 24-8-'95. The Vice-Chancellor participated in the XLIX National Workshop on Poultry Management conducted at College of Veterinary and Animal Sciences, Mannuthy, on 29-8-'95. He also attended the Scientists Meet of the Projects Scientists of National Projects on Cattle at College of Veterinary & Animal Sciences, Mannuthy, on 29-8-'95. Vice-Chancellor attended the inaugural function of the Onam Bazaar at the Information and Sales Centre, Mannuthy on 29-8-'95. He chaired the Research Review Committee Meeting of the Programmes of the Central Agricultural Research Institute, Andaman and Nicobar Islands on 31.8.'95. Dr. Michael received the award "Engineer of the year" presented in a function at Palakkad by the Palakkad Branch of the Institution of Engineers India on 15.9.'95. He participated in the meeting of the National Agricultural Technological Programme discussion held at ICAR on 2.11.'95. Attended the Plan Discussion Meeting at State Planning Board on 7.11.'95. Attended the 70th Annual General Body Meeting of the Association of Indian Universities at Manipal Academy of Higher Education, Mangalore on 9.11.'95. Participated as Chief Guest in the valedictory function of Inter University Volley Ball Tournament hosted by KAU at Mannuthy on 15.11.'95. Attended the Seminar on Orchid Cultivation conducted at Casino Hotel, Thrissur on 15.11.,95. Attended the meeting of the Chairmen of Research Advisory Committees regarding NATP at ICAR, New Delhi on 26.11.'95. Also attended the Review meeting of the guidelines of Summer Institutes at ICAR, New Delhi on 27.11.'95. Attended and participated in the inaugural function of the foundation stone laying ceremony of the Sales Centre at AMPRS, Odakkali on 23.12.'95 by the Hon'ble Minister for Agriculture. Participated in the inaugural function of the new buildings of the College of Fisheries by the Hon'ble Chief Minister of Kerala on 23.12.'95 at Panangad, Kochi. Attended the inaugural function of the Meat Technology Unit of the Veterinary College, Mannuthy, by Dr. R. S. Paroda,

Director General, ICAR on 27.12.'95 and also the inaugural function of the Centre of Excellence in Horticultural Crops at College of Horticulture, Vellanikkara by the Director General, ICAR, on 27.12.'95. The Vice-Chancellor participated in the Indian Society of Agricultural Engineers Annual Convention at Kerala Agricultural University Headquarters, Vellanikkara on 28.12.'95, 29.12.'95 and 30.12.'95. He attended the Planning Commission Working Group Meeting on Command Area Development Programme (CAD) for the Ninth Five Year Plan as Chairman of the Group at New Delhi on 9.1.'96. He also participated in the meeting of the Standing Policy Planning Committee of the Governing Body of ICAR, New Delhi on 10.1.'96. Attended the State Level Workshop on Package of Practices Recommendations 1996 at KAU Headquarters, Vellanikkara, on 15.1.'96. Participated in the Karshika Mela at Thodupuzha and addressed the farmers on 17.1.'96. Attended the State Committee Meeting of Karshikasree Award of the State Government on 19.1.'96. Addressed the Trainees of the Canara Bank on Agriculture conducted at Central Training Institute, Mannuthy on 24.1.'96. Inaugurated the Karshika Mela at Pineapple Research Station, Vazhakkulam on 25.1.'96. Participated in the Republic Day Parade at College of Veterinary and Animal Sciences Grounds. Attended the meeting of the Committee for fixation of Grands chaired by the Chief Secretary at Thiruvananthapuram on 5.2.'96.

Vice-Chancellor attended the Planning Committee meeting on Command Area Development at New Delhi on 15.2.'96. Attended the Planning Steering Committee meeting at Planning Board, New Delhi on 26.2.'96 and 27.2.'96. Participated in the inaugural function of College of Agriculture by the Hon'ble Chief Minister at Neeleswar on 2.3.'96. Participated in the discussions held at Ministerial level on starting of new Veterinary College at Wynad on 18.3.'96. Attended the Parasitology Seminar conducted by the Veterinary College for the farmers on 20.3.'96.

The Vice-Chancellor served as a member of the Governing Body of ICAR, New Delhi., Kerala Forest Research Institute, Peechi, Centre for Water Resources and Management, Kozhikode, Science & Technology and Environment Committee, Thiruvananthapuram, Tropical Botanical Garden and Research Institute, Palode, Thiruvananthapuram and State Institute of Languages, Thiruvananthapuram.

The Vice-Chancellor visited the Indian Council of Agricultural Research, New Delhi, in connection with University

work on 17.4.'95, 3.7.'95, 19.9.'95, 26.2.'95, 2.11.'95, 26.11.'95, 9-1-'96, 11.1.'96, 15.2.'96 and 27.2.'96.

The Vice-Chancellor visited College of Fisheries, Mangalore, University of Agricultural Sciences, Bangalore, Manipal Academy of Higher Education, Mangalore, Tamil Nadu Vety. & Animal Sciences University, Madras, Tamil Nadu Agricultural University, Coimbatore, Central Plantation Crops Research Institute Kasaragode, Centre for Water Resources Development and Management, Kozhikode, Cardamom Research Institute Myladumpara, of Spices Board, Central Plantation Crops Research Institute, Regional Station at Kayamkulam during the period under report.

Dr. A. M. Michael, Vice-Chancellor, served as member of the Selection Committee for higher posts constituted by the Agricultural Scientists Recruitment Board, New Delhi. He had also served as member of the Selection Committee constituted for selection of higher posts by the University of Agricultural Sciences, Bangalore during the period.

The Vice-Chancellor visited the Krishi Vigyan Kendra, Manjeswar, Regional Agricultural Research Stations at Pilicode, Pattambi, Ambalavayal., College of Agriculture, Pilicode-Neeleswar, Pepper Research Station, Panniyur, Kelappaji College of Agricultural Engineering & Technology, Tavanur, College of Vety. & Animal Sciences, Mannuthy, College of Co-operation Banking and Management, Mannuthy, College of Horticulture, Vellanikkara, College of Forestry, Vellanikkara, Central Training Institute, Mannuthy, Directorate of Extension, Mannuthy, College of Fisheries, Panangad, Agronomic Research Station, Chalakudy, Pineapple Research Station, Vazhakkulam, Aromatic and Medicinal Plants Research Station, Odakali, Rice Research Station, Kayamkulam, College of Agriculture, Vellayani. He also visited the Livestock Research Station, Thiruvazhamkunnu, Fisheries Research Station, Puduveypu, University Foultry Farm, University Pig Breeding Farm, University Livestock Farm, Buffalow Farm, and Goat Farm. He also visited the Information and Sales Centre, Mannuthy, Banana Research Station, Kannara, Assistant Comptroller's Office, Calicut, Cattle Infertility Centre at Calicut.

Vice-Chancellor met and discussions were held on University matters with the Hon'ble Chancellor and Hon'ble Chief Minister and Hon'ble Minister for Agriculture, during the period under report.

## CHAPTER II

# Education and Research

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### 1. FACULTY OF AGRICULTURE

#### 1.1. COLLEGE OF AGRICULTURE, VELLAYANI

College of Agriculture was established in the year 1955 at Vellayani, about 12 km. south of Government Secretariat Thiruvananthapuram on the banks of Vellayani lake. College campus has a total area of 243 hectares including 163 hectares of 'kayal' land.

Dr. C. Sreedharan continued as Dean of the Faculty of Agriculture and Head of the Institution.

Dr. K. M. Rajan, Professor has continued as the Research Co-ordinator of F. R. C.

The College functioned with following 14 departments carrying out teaching, research and extension activities.

Department of Agronomy

.. Plant Physiology

(Department of Agrl. Botany has been merged in the Department of Plant Breeding)

Department of Plant Breeding & Genetics)

.. Horticulture

.. Soil Science and Agrl. Chemistry

.. Plant Pathology

.. Agrl. Entomology

.. Agrl. Extension

.. Home Science

.. Agrl. Economics

.. Agrl. Statistics

.. Animal Husbandry

.. Agrl. Engineering

.. Physical Education

## Staff

Department wise staff details are furnished separately in Annexure-1.

## Major changes in staff position

Dr. M. Subramonia Iyer, Assoc. Professor was transferred to Regional Agrl. Res. Station, Kumarakom

Smt. P. Geetha, Asst. Professor was transferred to Department of Home Science.

Dr. John Kurian, Professor and Head retired from service Dr. P.A. Rajan Asari has been transferred to College of Agriculture, Pilicode. Dr. Vijaya Raghava Kumar, Asst. Professor transferred to CSRC, Karamana.

Dr. M. C. Nair retired from service. Smt. K. J. Alice has been transferred to RARS, Pattambi.

Smt. Rari John has been transferred to KVK, Sadanandapuram.

Dr. Abdul Wahab. M. has joined this institution

Smt. Bini Sam has joined in the Agrl. Engineering Department.

Dr. G. T. Nair retired from service

Sri. S. Venugopalan, Professor and Head retired from service and Dr. E. R. Narayanan Nair took charge

Dr. M. Oomen has been transferred to KVK, Sadanandapuram and Dr. K. Harikrishnan Nair took charge.

## Faculty Improvement

Sri. Nandakumar, Associate Professor (NC) has been under going Ph. D. programme at Kerala Agrl. University.

Dr. R. Vijayan has undergone Ph. D. (Vety.) programme at College of Vety. and Animal Sciences.

Smt. Meenakumari has been undergoing Ph. D. programme at Kerala Agrl. University.

Smt. Usha Mathew has been under going Ph. D. programme in Kerala Agrl. University.

Seminars/Symposia/Training programmes attended by staff:

Name and designation	Seminars/Workshop/ Training, Symposia Summer Institute	Venue	Period from To
1	2	3	4
Dr. R. Gopimony Prof. & Head	Seminar on World Environment Day	Trivandrum	5-6-'95
"	Farmers Seminar	Thiruvalla	10-6-'95
"	National Seminar on India and New Technology order	MG University	18-8-'95
"	Development Seminar on Kerala	Trivandrum	2-11-'95
"	State Level Workshop on Package of Practices and chaired session on Vegetables	Vellanikkara	15-1-96 to 16-1-96
"	Eighth Kerala Science Congress and pres- ented a paper 'Early impacting organic farming on crop productivity'	Ernakulam	27-1-96 to 29-1-96
Dr.P.Manikantan Nair, Professor	Karshakamela	Peroorkada	1-8-95
"	Zonal workshop of NARP (SR)	Vellayani	15-3-96
Dr. S. T. Mercy Professor	National Seminar in Floriculture Karshakamela	Kanakakunnu Peroorkada	19-5-95 4-8-95 to 6-8-95
Sri. N. Rama- chandran Nair Assoc. Prof.	Agricultural Seminar and farm clinic XVIII Zonal workshop of NARP (SR)	Andoorkonam Vellayani	10-8-95 15-3-96
Dr. S. G. Sree- kumar Assoc. Professor	Workshop for the resource persons organised by KHDP	Trichur	25-8-95

1	2	3	4
Dr. P. Manju, Assoc Prof. (NC)	Training programme 'Hybrid technologies for rice, millets, pulses, oil seeds and forage crops	TNAU Coimbatore	7-2-96 to 28-2-96
..	XVIII Zonal workshop of NARP (SR)	Vellayani	15-3-96
Dr.D.I. Suma Bai Assoc. Prof.	XVIII Zonal workshop of NARP (SR)	Vellayani	15-3-95
Dr. D. Wilson Asst. Professor	Summer Institute on 'Recent advances in basic and applied genetic research in crops'	TNAU Coimbatore	10-5-95 to 29-5-95
..	Special awareness programme on drug addiction and alcoholism	Fisheries College, Panangad	10-10-95
Smt. Lakha Rani Asst. Professor	XVIII Workshop and the National Sympo- sium on Forage production systems for sustainable agrl. development	IGFRI Jhansi	20-12-95 to 23-12-95
..	XVIII Zonal workshop of NARP (SR)	Vellayani	15-3-96

Dr. R. Gopimony, Prof. & Head, Dept. of Plant Breeding prepared the script and participated in the DoorDarshan Programme on bio-fertilizer videographed in the Campus on 3-11-95.

Dr. P. Manikantan Nair, Prof. conducted a class on Bhindi cultivation to the farmers (KHDP) trainees on 27-10-95 at Vellayani and another class at RATTC, Kazhakuttam. He continued as Resource Person for T & V programme.

Dr. S. T. Mercy, Professor conducted lectures on the following:

- Orchid and Anthurium cultivation on 5-12-95 at Pazhaya-kulam.
- Anthurium varieties, Botany, cultivation, management and breeding on 4-12-95 at Vellayani.

c) Anthurium cultivation and management on 16-12-95 in the Karshakamela and Workshop organised by the Canara Bank at Kayamkulam.

Orchid varieties, cultivation management and breeding in the Karshakamela at Chengannoor.

Dr. Rajendran and Dr. Pushkala attended the Winter School on "remote sensing" at I. A. R. I. New Delhi.

Dr. Prabhakumari and Dr. Ushakumari attended the seminar on waste management organised by Kurkiliya Colony association and took classes on vermicomposting.

Dr. Prabhakumari attended the National Workshop on "Tropical organic farming" and presented a paper on household vermi-composting.

Dr. Prabhakumari, Dr. Pushkala, Dr. Rajendran and Dr. Ushakumari attended the 8th Kerala Science Congress and presented research papers.

Dr. P. Prabhakumari presented a paper on vermicomposting at the Seminar on 'Problems of Solid waste Management' organised by I. M. G.

Dr. Prabhakumari presented a paper on 'Technical aspects of vermicompost production' at the Seminar on Vermiculture and bio-gas production organised by NABARD.

Dr. Ushakumari and Dr. P. B. Usha, attended the Summer Institute on 'Physical properties of soils in relation to Sustainable agriculture'.

Dr. P. Prabhakumari, presented a paper on vermicotechnology at the seminar organised by Mushroom grower's association.

Dr. Prabhakumari participated in the National Workshop on 'radio chemistry and radio tracer techniques in agriculture'.

Dr. Padmaja, Dr. Alice Abraham, Prof. Abdul Hameed; Dr. Venugopal, Dr. Rajendran Dr. Prabhakumari, Dr. P. B. Usha and Dr. Ushakumari took classes in the training programme on 'Soil testing' for Agricultural Officers and Junior Scientific Assistants.

Smt. M. Rajani, Assistant Professor was deputed for participation in the course on Management Development Programme for Women Extension functionaries held at MANAGE, Hyderabad (16-10-95 to 21-10-95).



Smt. N. K. Vimalakumari, Associate Professor had participated in the National Seminar on Environmental hygiene and promotional initiatives organised by International Union for Health Promotion Education Kerala Chapter on 19th and 20th December 1995.

Dr. S. Chellammal, Assistant Professor had participated in the International Symposium on Cassava in Co-Bank Tower, Trivandrum on February '96.

Smt. B. Prasannakumari, Smt. Subaida Beevi, Assistant Professors were deputed to attend National Seminar organised All India Women's Conference held in Trivandrum on March 96.

Dr. S. Shylaja attended 'Management development programme for women' in MANAGE, Hyderabad from October 16 to 21, 1995.

Dr. N. Kishorekumar attended training course on extension activities in DARI, New Delhi from 27-10-95 to 10-11-95.

Dr. T. Nalinakumari handled IPM classes at Thiruvalla (15-7-95), Venganoor (21-10-95), Alappuzha (31-10-95), Chengal (21-11-95), Kulathoor (30-11-95) and Nedumangad (23-12-95).

Dr. T. Nalinakumari, took classes on Storage pests and their management to FACT dealers in a training programme organised at the College of Agriculture, Vellayani on 11-1-96.

Dr. S. Nazeema Beevi handled a class on pesticide residues in food commodities to the officers of the Department of Agriculture at the Training Centre, Parottukonam on 13-12-96.

An one day training on IPM in rice was conducted to selected Scientists at the College of Agriculture, Vellayani on 22-8-'95. Dr. T. Nalinakumari took classes on different aspects of the subjects.

Dr. T. Nalinakumari conducted a Farmer field school training programme on IPM in rice to 25 selected farmers of Kuttanad from 28-10-95 to 31-1-96 with the financial assistance from FAO.

Dr. K. Saradamma took classes in the In-service Training for Agriculture Officers on pests of Mulberry.

Dr. K. Sasidharan Pillai handled a class on 'A Scientific way of handling Mulberry on a seminar organised by Thiruvananthapuram Taluk Sericulture Co-operative Society on 19-1-96.

Dr. T. Nalinakumari attended the FAO India Session IPM training programme in rice from 24-4-95 to 4-5-95 at IJAETC VC Farm Madhya Karnataka and handled a class on 'my experience at IRRI Philippines to the IPM trainees.

Dr. T. Nalinakumari attended the State level orientation cum action plan IPM meeting convened by the Director of Agriculture on 26-6-95 at Vikas Bhavan, Trivandrum.

Dr. D. Dale and Dr. K. Saradamma attended the National Seminar on 'Insect bio-chemistry and molecular biology' held at Thiruvananthapuram from 10-10-95 to 12-10-95.

Dr. A. Visalakshi attended the all India Symposium and 16th Annual Session of AEB at Andhra Pradesh Agricultural University, Hyderabad from 19-11-95 to 27-11-95.

Sri. R. Krishnakumar and Dr. K. Sasidharan Pillai attended one day seminar on Sericulture at Thiruvananthapuram on 19-1-96.

#### Academic programme

Strength of students under each course during 1995-96 is as follows

<i>U. G. programme</i>		<i>No. of students</i>
1992	—	61
1993	—	47
1994	—	59
1995	—	56
		223

#### *P. G. programme M. Sc.*

1994	—	35
1995	—	28

#### *Ph. D.*

1993	—	10
1994	—	6
1995	—	8
		87

## **Sports and games**

### *Inter-class*

Competitions were conducted in various games. Annual inter-class Athletic championship was conducted on 5th and 6th November, 1996.

### *Inter-collegiate tournaments*

College team participated in Inter-Collegiate tournaments in various games. College of Agriculture hosted the KAU Inter-Collegiate Shuttle Badminton and Table Tennis tournament in June, 1996.

Practice matches were conducted in various games.

## **Hostels**

Dr. C. Sreedharan, Dean and Head of the Institution continued as the Warden of the three Hostels in the campus.

The following staff members functioned as Assistant Wardens of the Hostels.

- |                  |   |   |
|------------------|---|---|
| 1. U.G. Men's    | — | Dr. Kishorekumar,<br>Associate Professor, Extension |
| 2. P.G. Men's    | — | Dr. Abdul Wahab,<br>Assoc. Professor, Horticulture  |
| 3. Ladies Hostel | — | Dr. Nandini,<br>Asst. Professor, Home Science       |

The strength of inmates in the Hostels were as follows.

U. G. Men	—	47
P. G. Men	—	20
L. H.	—	120

## **College Library**

In the College Library there were 23971 books at the end of the year. 56 Indian journals and 25 Foreign journals were subscribed during the year.

## **Instructional Farm**

The Instructional Farm has 78 hectares of garden land and 165 hectares of "kayal" land. The farm provides all physical facilities needed for imparting practical training and instructions to the students on modern techniques in crop production.

As a part of the Farm Development Programme with the ultimate goal of increasing production and farm revenue, irrigation facilities extended to all the blocks were made more effective.

Vegetable seeds, planting materials coconut seedlings of various varieties produced in the farm were sold to both Government agencies and farmers.

#### Livestock Farm

The Department of Animal Husbandry is maintaining a Dairy Unit with a Poultry Unit in the campus. During the year 34398 litres of milk was obtained from the Dairy and 67077 numbers of eggs obtained from the Poultry Unit.

In the Veterinary Hospital attached to the College under Animal Husbandry Department 1103 cases were treated and 157 pregnancy test and 24 artificial inseminations were also done.

#### Research

Research activities by FRC were undertaken in the major disciplines of the College on various aspects in the identified thrust areas.

The salient research findings are summarised and given below.

In a study on the management practices for the southern zone of Kerala, the varieties 'Vinks Glory' and 'Oscar' were found to perform well in southern parts of Kerala.

Evaluation of Bhindi varieties resistant to yellow vein mosaic.

Most wild species of *Abelmoschus* and some cultivated varieties were found to be tolerant.

In an evolution of watermelon varieties for southern region of Kerala. 'Sugar Baby' and 'Arka Jyothi' were the varieties found to be promising in Thiruvananthapuram area.

#### *Micro propagation of tree spices of Kerala*

Media explant and culture conditions for nutmeg and clove were standardised.

A survey was conducted in the silent valley and 12 genera of mushrooms were collected. Their morphology and other characters are being studied. Two native strains of *Pleurotus* were isolated and brought into pure culture.

A new variety of mushroom namely, 'Ananthan' has been accepted by Kerala State Seed Committee and has been sent to Central Government for notification.

For amaranteus there was 25% reduction in the need of nitrogenous fertilizer application by the use of *Azotobacter* or

Azospirillum. For brinjal also there was 25% reduction in the need of nitrogenous fertilizers by using either Azospirillum or Azotobacter in combination with FYM. In chilli there was no saving of nitrogen either with application of Azotobacter or Azospirillum.

#### Dept of Plant Breeding

The cowpea variety Covu 869 recorded the highest mean grain yield of 1041 kg/ha followed by culture 9 (819 kg/ha) V38 (811 kg/ha) on evaluation of 14 cowpea types. Cowpea culture No. 602-2-4-2 recorded 687 kg grain yield/ha followed by culture No. 502-2-2-2 (500 kg/ha) among the superior cultures evaluated in kharif upland.

In the IVT on guinea grass, PGG 519 recorded the maximum green and dry fodder yield (63.0 and 22.2 t/ha respectively). In the AVT the maximum green and dry fodder yields were recorded by PGG-101 (66.0 and 23.2 t/ha respectively).

In the AVT on rice bean, the variety BC-18 recorded the highest green fodder yield (26.22 t/ha) which was on par with BC-11 (24.17 t/ha), BC 15 (24.17 t/ha) and BC-17 (23.33 t/ha), BC 15 (24.17 t/ha) and BC-17 (23.33 t/ha). Dry fodder yield also showed the same trend with BC-18 recording 15.33 t/ha.

In the IVT on multicut bajra, the variety LSGP-1995 recorded the maximum leaf stem ratio (0.94) green and dry fodder yields (43.3 kg and 11.2 kg/plot respectively) and leaf number/plant (10.1). In the AVT on multicut bajra, the variety HTGPK-1993 recorded the maximum green and dry fodder yields (47.0 and 12.8 kg/plot respectively).

Combining ability estimation of six parents in bhindi resulted in the identification of NBPGR/TCR 864 as the best general combiner for yield and related traits. Among the hybrids NBPGR/TCR 893 x NBPGR/TCR 881 x NBPGR/TCR 893 exhibited significant heterosis for yield and related characters when compared to mid parent, better parent and the standard check and it also exhibited tolerance to shoot and fruit borer.

Estimation of combining ability in cowpea revealed that V317 x Co-4 had significant gca for seed yield per plant, number of pods per plant and 100 seed weight. Additive gene action was predominant in days to flowering, days to maturity, number of branches/plant and non-additive gene action was predominant in days to flowering, days to maturity, no. of pods/plant, number of seeds/pod, 100 seed weight, seed yield per plant and aphid borne mosaic resistance.

Evaluation of thirty blackgram varieties in summer rice fallows and estimation of selection index resulted in the identification of six high yielding genotypes viz. CoBg 309, CoBg-9, B-3-8-8-1, WBG 67, CoBg 303 and T3.

The groundnut type VGE 55-1 (3377 kg/ha) and the early segregant F11-15 (3173 kg/ha) recorded the maximum dry pod yield in the CYT.

A trial with teosinte varieties revealed that TL 42 (33.7 and 11.8 t/ha respectively) gave maximum green and dry fodder yields.

A trial with fodder amaranthus varieties revealed that maximum green fodder yield of 45.55 t/ha was recorded by APGA3. The dry fodder yield was maximum in APGA-1 (10.62 t/ha).

Analysis of seedling characters from nuts harvested at a different harvests revealed that there is no significant difference between seedlings raised from conventional and of seasons, thereby indicating that superior seedling production in coconut can be enhanced by collecting seednuts throughout the year.

#### Research achievements

Maximum loss of applied N by leaching and run off taken place in the case of Onattukara soil, because of its high sand content, low organic matter, C. E. C., clay, W. H. C. and bulk density. Kayal soil showed the lowest leaching loss and Karappadom the lowest run off loss, because of their high clay content, organic matter, C. E. C., B. D., W. H. C. and low sand content as compared to that of Onattukara soil. Vermicompost along with half inorganic fertilizers was found to give comparable yield as P. D. P. recommendations in cucumber.

In a study conducted on interrelationships of humus with fertility components of wet land soils, it was observed that the pattern of relationship of each soil property with soil organic matter same as that with its fraction and hence the estimation of soil organic matter alone is sufficient to bring out the interaction between SOM and components of soil fertility.

Vermicompost as an organic source along with the recommended dose of inorganic fertilizers gave the highest yield in tomato.

In banana and cucumber, highest yield was recorded by plants receiving vermicompost as the organic source along with half inorganic fertilizers.

In a study conducted on the effect of vermiwaste in vegetable, 10% dilution was found to be the most effective.

Acidity parameters and acidity generating factors in the major wet land rice soil have been identified and evaluated. Based on the severity of potential acidity of the surface samples, the soil can be rated on Kari Pokkali Kayal Karapadom Kole Pattambi Kattampally Vellayani Kaipad Wyanad. Exchangeable Al was found to be the best parameter for measuring soil acidity.

Cowpea followed by green gram were found to be the most commonly consumed legumes of Kerala.

Critical assessment of physical, cooking and nutritional characteristics of five varieties each of green gram and cowpea to evaluate their quality revealed that Kanakamony among cowpea and Pusa 8793, M3 and Mg 161 among green gram were better than other varieties tested.

Protein quality evaluation studies conducted on animals revealed that cowpea had higher PER, BV and DC (Protein efficiency ratio, Biological value and Digestibility coefficient) than green gram.

Cowpea and greengram varieties tested had a protein efficiency ratio ranging from 1.6 to 2.83.

Organoleptically acceptable jackfruit products having a shelf life of more than four months can be prepared using osmotic dehydration techniques utilising both soft flaked and firm flaked varieties. Best products were obtained by a pre-treatment comprising of immersing the bulbs in a sugar solution of 60° Brix containing 0.4 per cent KMS and 20% of glycerol for 60 minutes at 70°C.

Diversified and acceptable products such as RTC, Jelly, wine can be prepared with passion fruit and its pulp. The pulp can be combined efficiently to prepare blended pulp based products.

Incorporation of Kanakamony (Cowpea) which was found to have and arginine, lipine ratio of 1 in high fat, high cholesterol diet decreased the lipid level of liver and blood of experimental animals indicating its hypocholesterolic efficiency.

It is possible to formulate convenience foods of high nutritional quality, good shelf life using sweet potato and cassava by extrusion method.

Waiting periods of quinalphos for cardamom were fixed as 23 days; and 22 days; dimethoate and quinalphos for pepper as 5 days; and 12 days' respectively. It was 11 days for brinjal.

The wild tree 'Maruth' (*Terminalia paniculata*) has been found to be a good source of nectar for migratory bee keeping after the rubber honey flow season is over.

The performance of the introduced Italian bees has been so far satisfactory.

Integrated control of root-knot nematode in ginger revealed that treatment involving carbofuran 1 kg. ai/ha basal + neemcake (1 t/ha) at 45 DAP and neemcake basal (1 t/ha) basal + carbofuran (1 kg/ha) at 45 DAP significantly reduced the nematode population in soil. This effect was directly reflected in improving the yield of ginger.

Mulberry varieties S<sub>11</sub>, S<sub>16</sub> and MR<sub>2</sub> were found to yield more cocoons than the traditional K<sub>2</sub> variety under rainfed irrigated conditions.

Pruning of mulberry by adopting schedules of either three bottom pruning and bud clipping or two bottom pruning and two middle prunings was found to produce more cocoon of good quality.

Mulberry leaves harvested commencing from one month after pruning was found to be good for silkworm rearing

In the farm trials conducted, 16 cm x 16 cm spacing was found to produce 17,493 kg. of mulberry leaves per ha per year compared to 11,417 kg. under present recommendation in irrigated crop.

Under field testing the silkworm CB PM x NB 18 yielded 10 per cent more than the recommended CBPM x NB<sub>1</sub>D<sub>1</sub>.

Many pests were found causing damage to medicinal spp on Adhathoda and red spidermite on adhathoda, mealy bug *Ferrisia virgata* on *Indigofera*, white fly *Ateurodicus dispersus* on *ocimum* were some of them.



The laboratory experiment on the management of the semilooper *Aichromia orcsia* on vallippala revealed that the water extract of clerodendron and neem leaves could inhibit the feeding activity of the pest effectively.

Dissipation of triazophos and lindane was studied by applying triazophos MOEC and lindane 20 EC at 350 g ai/ha and 700 g ai/ha 3 and 6 weeks after sowing. The results showed that an initial deposit of triazophos 6.8 mg/kg was recorded at the lower dose while 16.59 mg/kg. at the higher dose. At the recommended dose of 350 g. ai/ha of lindane, the initial deposit of 2.52 mg/kg was reduced to 0.03 mg/kg on the tenth day after application. At the double dose the corresponding values were 5.61 and 0.64.

Similar studies were conducted in brinjal. The initial deposits at both 350 and 700 g ai/ha were far below the MRH of 3 mg/kg.

In a study on sweet potato, it was noticed that 50 per cent of potassium can be substituted by sodium chloride, without any adverse effect on yield and quality.

For getting quality seeds in bhinai, the seed collection should be started after two harvest of immature fruits as vegetables. It was also noticed that vermicompost was better than FYM in bhindi.

For a chilli cultivar 'Jwalasakhi', drip irrigation at the rate of 2 litres per plant per day, with 100:40:33.3 kgs. of NP and K per hectare gave the highest yield and net profit.

For augmenting the yield of sesamum a fertilizer application schedule of 75 per cent of nitrogen and potassium as basal dressing and the remaining 25 per cent as foliar application at the time of branching was significantly better than full basal or other combination of N and K application.

#### Important visitors

Dr. A. Seetharaman, Project Co-ordinator (small millets) UAS Bangalore visited the department of Soil Science and Agri. Chemistry in connection with the final viva voce of students.

Dr. A. Amirta Devarathinam, Professor and Head Agri, College of Research Institute, Madurai visited the college.

Dr. S. Purushothaman, Dean, Agri. College and Research, Institute, Madurai and Dr. S.P. Palani Appan, Chief Agronomist Nagarjuna Fertilisers visited the campus.

## 1.2 COLLEGE OF HORTICULTURE, VELLANIEKARA

### 1. Staff position

#### a. Scientific staff

Dept./Scheme/Designation	No. of posts		
	Sanctioned	In position	Vacant
Associate Dean	1	1	—
Agronomy			1
Professor & Head	1	—	—
Professor	1	1	—
Assistant Professor	5	3	2
AICRP on weed control			—
Associate Professor	1	1	—
Asst. Professor	2	2	—
Agrometeorology			—
Professor & Head	1	1	—
Asst. Professor	2	1	1
AICRP on Agrometeorology			—
Asst. Professor	1	1	—
Agri. Extension			—
Associate Professor	1	1	—
Asst. Professor	3	2	1
Agri. Economics			—
Professor & Head	1	1	—
Assoc. Professor	1	1	—
Asst. Professor	5	1	4
Agri. Engineering			—
Professor & Head	1	—	1
Asst. Professor	3	2	1
Agri. Entomology			—
Professor & Head	1	1	—
Professor (Nem.)	1	—	1
Assoc. Professor	1	1	—
Asst. Professor	3	2	1
AICRP on BCGP&W			—
Assoc. Professor	1	1	—
Asst. Professor	1	1	—
Agri. Statistics			—
Professor & Head	1	1	—
Assoc. Professor	1	1	—
Asst. Professor	6	1	—
Home Science			3
Asst. Professor	4	3	1

	1	2	3	4
<b>Plantation Crops &amp; Spices</b>				
Professor & Head	1		1	—
Asst. Professor	7		7	—
<b>PG Dip NRP</b>				
Asst. Professor	1		1	—
<b>Manpower Devpt. Scheme on Coffee</b>				
Asst. Professor	1		1	—
<b>Plant Pathology</b>				
Professor & Head	1		1	—
Assoc. Professor	4		1	3
Asst. Professor	6		2	4
<b>Pomology &amp; Floriculture</b>				
Professor & Head	1		—	1
Asst. Professor	7		7	—
<b>AICFIP</b>				
Assoc. Professor	1		1	—
Asst. Professor	2		2	—
<b>Processing Technology</b>				
Professor & Head	1		1	—
Asst. Professor	3		2	1
<b>Plant Breeding &amp; Genetics</b>				
Professor & Head	1		—	1
Asst. Professor	5		2	3
<b>Physical Education</b>				
Asst. Professor	1		1	—
<b>Olericulture</b>				
Professor & Head	1		1	—
Assoc. Professor	1		1	—
Asst. Professor	6		4	2
<b>Vegetable Seed Production Complex</b>				
Asst. Professor	1		1	—
<b>AICVIP</b>				
Asst. Professor	3		3	—
<b>Soil Science &amp; Agrl. Chemistry</b>				
Professor & Head	1		—	1
Assoc. Professor	4		4	—
Asst. Professor	5		5	—
<b>Coconut Nutrition &amp; Physiological Disorders</b>				
Asst. Professor	1		1	—
Asst. Engineer	1		1	—

	1	2	3	4
<b>Instrumentation</b>				
Assoc. Professor		1	1	—
<b>Radiotracer Laboratory</b>				
Professor		1	—	1
Assoc. Prof. (Safety Officer)		1	1	—
Assoc. Professor		1	1	—
Asst. Professor		2	2	—
<b>AICRP on Medicinal &amp; Aromatic plants</b>				
Assoc. Professor		1	1	—
Asst. Professor		2	2	—
<b>Cadbury's Cocoa research project</b>				
Professor		1	1	—
Assoc. Professor		1	1	—
Asst. Professor		1	1	—
<b>AICRP on Ornithology</b>				
Asst. Professor		1	1	—
<b>b. Technical staff</b>				
Technical Asst		1	—	—
Junior Programmer		1	—	1
Proc. Tec. Asst.		1	1	—
Technician Sr. Gr.		1	1	—
Technician Gr. I		1	1	—
Technician Gr. II		1	—	1
Farm Supervisor Gr. I		4	4	—
Farm Supervisor Gr. II		5	5	—
Farm Asst. Gr. I		1	1	—
Duplicator Operator		2	2	—
Lab. Asst. Gr. I		1	1	—
Lab. Asst. Gr. II		14	14	—
Lab. Asst. Gr. III		4	4	—
Pump Operator		1	—	—
<b>c. Administrative &amp; supporting staff</b>				
Administrative Officer		1	1	—
Section Officer		6	5	—
Asst. Sel. Gr.		2	1	1
Asst. Sr. Gr.		6	6	—
Asst. Gr. I		7	7	—
Asst. Gr. II		1	1	—
Sr. Office Superintendent		2	2	—

	1	2	3	4
Office Superintendent		1	1	
Typist Sel. Gr.		1	1	
Typist Gr. I		2	2	
Typist Grade II		3	3	
Peon (Hr. Gr.)		1	1	
Peon		8	8	
Driver (LDV)		3	3	
Driver (HDV)		1	1	
Matron		1	1	
Hostel Manager		1	1	
Clerical Asst.		1	1	
Asst. Librarian		1	1	
Ref. Asst.		1	1	
<i>Technical &amp; Administrative staff attached to schemes</i>				
AICRP on weed control				
Farm Asst. Gr. I		2	2	
Driver (LDV)		1	1	
Class IV		1	1	
AICRP on BCCP & W				
Sr. Tech. Asst.		1	1	
Technical Asst.		1	1	
Farm Asst.		2	2	
AICRP on Medicinal & Aromatic plants				
Farm Asst. Gr. I		2	2	
Field Man		1	1	
Lab. Asst.		1	1	
Class IV		1	1	
Clerk-cum-Typist		1	—	1
AICVIP				
Farm Assistant Gr. I		2	2	
PG Dip NRP				
Farm Supervisor Gr. I		1	1	
Coconut nutrition & physiological disorders				
Lab. Asst. Gr. II		1	1	
Lab. Asst. Gr. II		2	2	
Driver		1	1	
Vegetable Seed Production Complex				
Farm Supervisor		1	1	
Farm Asst.		3	1	2

### Faculty improvement programme

#### New posts sanctioned/created/shifted

Post	Discipline	Place to which shifted
Asst. Professor	Horticulture	College of Agriculture, Vellayani
Asst. Professor	Agri. Extension	College of Agriculture, Pilicode
Asst. Professor	Agri. Economics	College of Agriculture, Pilicode
Asst. Professor	Agri. Entomology	College of Agriculture, Pilicode

#### Scholarships awarded to staff/deputation of staff for higher studies

Name of staff	Course	Institute	Period
Sri. VK Raju	PhD	TNAU	1-7-95 to 30-6-98
Smt. K Krishnakumari	PhD	KAU	
Smt. Anitha Cherian	PhD	UAS	
Smt. A Sobhana	PhD	KAU	from 8-3-95
Sri. K Satheesh Babu	PhD	IARI	4-9-95 to 3-9-98
Smt. T Girija	PhD	TNAU	2-7-95 to 1-7-98
Dr. Pathummal Beevi	CWASF	University of Wales, USA	9-1-95 to 8-11-95

#### Details of Summer institutes/seminars/symposia/training attended by staff

##### Summer Institutes

Name of Scientist	Topic	Venue	Period
Dr. KT Prasanna Kumari	Recent advances in basic and applied genetical research	TNAU	19-5-95 to 29-5-95
Sri. AS Anilkumar	Weather forecasting in agriculture	CRIDA, Hyderabad	15-5-9 to 25-5-95
Dr. Sajan Kurien	Sustainable agriculture for hill regions	NEH, Barampani, Tripura	11-7-95 to 30-7-95
Dr. KV Suresh Babu	Modelling technologies for controlled atmospheric storage of fruits and vegetables	GB Pant University	22-7-95 to 11-8-95

### Workshops

Name of Scientist	Topic	Venue	Period
Dr. AVR Kesava Rao	V Workshop on AICRP on Agrometeorology	Ranichuri, UP	12-6-95 to 14-6-95
Dr. AVR Kesava Rao	Conference on informatics for sustainable agricultural development	Vigyan Bhavan New Delhi	24-5-95 to 25-5-96
Dr. PK Rajeevan	National workshop on commercialisation of tissue culture and green house	Bangalore	5-5-95 to 6-5-95
Dr. S Rajan	Third group meeting on seeds	KAU	6-6-95 to 7-6-95
Dr. P Jacob John	Technology Clinic	District Industries Centre, Thiruvalla	5-12-95 to 6-12-95
Dr. PA Nazeem and Dr. AVR Kesava Rao	Online information access and retrieval	Madhurai Kamaraj University	26-3-96 to 27-3-96
Dr. S Rajan Dr. Salikutty Joseph Dr. P Indira Smt. KP Prasanna Smt. Baby Lissy Markose	Workshop for resource persons of KHDP training programme	Thrissur	25-8-95
Dr. C Bhaskaran	National workshop on Post-Graduate training in Social Science	NCAP, New Delhi	13-3-96 to 14-3-96
<i>Seminars/Symposia</i>			
Dr. PB Pillai	Medium range weather forecasting	IARI, New Delhi	10-4-95 to 12-4-95
Dr. Al Jose Dr. KA Mariam and Dr. PK Sushama	National symposium on use of phosphate rock for sustainable agriculture	UAS, Bangalore	24-4-95 to 25-4-95

1	2	3	4
Smt. KB Sheela	National symposium on post harvest technology	UAS, Bangalore	7-8-95 to 9-1-95
Sri. VK Raju	National seminar on policies for agricultural business management		20-5-95 to 30-5-95
Dr. PA Nazeem	International symposium on medicinal and aromatic plants	University of Massachusetts, USA	28-8-95 to 30-8-95
Dr. PA Nazeem	40th Annual Congress on Canadian Society for Hort. Science	Montreal, USA	30-7-95 to 3-8-95
Dr. V Usha and Smt. Norma Xavier	National seminar on women's education	Hyderabad	15-7-95 to 17-7-95
Dr. NP Kumari Sushama Smt. Norma Xavier and Dr. V Usha	International Seminar on women and development	Cochin University	25-8-95 to 27-8-95
Dr. V Indira Dr. PA Valsala Dr. R Kesavachandran Dr. CK Geetha Dr. NN Potty Dr. EV Nybe Dr. Sara T George Dr. TP Murali Smt. Norma Xavier	8th Kerala Science Congress	Cochin University	27-1-96 to 29-1-96
Dr. V Indira Dr. V Usha and Smt. Norma Xavier	National Seminar on cassava	Co-operative Bank	10-2-96 to 11-2-96
Dr. R Kesavachandran	All India Symposium on recent advances in biotechnological application of plant cell and tissue culture	CFTRI, Mysore	22-6-95 to 24-6-95
Dr. K Lyla Mathew and Dr. Sara T George	National seminar on plant bioregulators in Horticulture		



## Trainings

1	2	3	4
Dr. AVK Kesava Rao	Training on E-Mail	CETI, New Delhi	26-12-95 to 29-12-95
Dr. A Augustine	UTA training	Social Science College, Kalamassery	18-10-95 to 21-10-95
Dr. TP Murali	Production Technology of flowers commercial interest	IARI, New Delhi	June, 95
Dr. PA Nazeem	FAO training on plant biotechnology	Univ. of Massachussets	1-6-95-5-9-95
Dr. R Kesava-chandran	Transformation Technologies for higher plants	MCL, Poona	21-8-95-9-9-95
Dr. NP Kumari Sushama	Management development programme for women extention functionaries	MANAGE, Hyberabad	16-10-95-22-5-95
Dr. N Saifudeen	Soil resources inventory for land evaluation	NBSS & LUP Bangalore	22-5-95-20-6-95
Smt. Norma Xavier	Faculty Devpt. Prog. in education technology	Madras Vet. Univ.	11-3-96-20-3-96
Dr. Jim Thomas and Smt. KP Prasanna	Vermiculture	TNAU	12-2-96-19-2-96
Dr. VK Mallika and Dr. Achamma Oommen	Tree tissue culture	NCL, Poona	22-4-96-29-4-96

## Academic programmes

All the courses due for the various programmes were offered. At the end of the year, there were 145 men and 127 women UG students. During the year, 28 men and 32 women students completed their BSc. (Ag) programmes. The number of PG students were 42 men and 117 women, out of which 8 men and 7 women completed the PG programmes.

## Research

### Major research achievements

#### *Rice and rice based cropping system*

Butachlor and Anilophos applied as home made granular preparations or as spray alone or in combination with fertilizers was safe to rice crop and it produced higher yields and higher return per rupee invested.

The possibility of using *Azospirillum* or *Azotobacter* either alone or in combination with inorganic fertilizer is less due to natural occurrence of these organisms in the soil.

#### Vegetable crops

The chilli variety 'Ujwala' brinjal variety 'Swetha' winged bean variety 'Revathy' were recommended for release by the KAU Variety release committee.

The bittergourd variety 'Preethy' and brinjal variety 'Swetha' were recommended for release as national varieties by the 15th AICVIP workshop held at Varanasi.

The pumpkin culture CM 349 was recommended for promoting as variety by the 18th ZREAC meeting at Pattambi.

LE 415, a tomato culture resistant to bacterial wilt was distributed for MLT at national level.

The pumpkin cultures CM 346 and CM 350 were recommended for advanced trials.

Okra varieties Arka Abhay, Arka Anamika P-7, HRB 9-2 and Okra No 6 were completely free from yellow vein mosaic disease. Among the F1 hybrids of watermelon, MHW 6 and among varieties, Sugar Baby were high yielding.

The experiment on sub surface pad irrigation system for tomato (SSPI) showed that the crop receiving SSPI consumed lesser amounts of water at all the frequencies of irrigation compared to surface irrigation.

#### Fruits and floriculture

The vegetative propagation technique in Baduvapuli (*Citrus pennivessiculata*) was standardised. Cuttings from hard wood and soft wood leafy shoots, layers from hard wood shoots with coconut fibre or saw dust as media and soft wood grafting on Rangpur lime rootstock gave best results with respect to percentage of success, rooting efficiency and qualitative aspects of rooting.

Breeding studies in Palayankodan banana revealed that all hybrids recorded a very low incidence of leaf spot disease. The cross combinations involving male parents Pisang lilin, Matti and hybrid No. 6,7 and 12 were compatible and produced seeds.

Studies on standardisation of agrotechniques in foliage plants indicated that among the different growth media tried, vermiculite was found to have maximum water holding capacity (81.33). Growth of foliage plants sprayed with different chemicals was superior over control plants.

Floral biology studies of ten hybrids of *Dendrobium* revealed that anthesis occurred during day time and stigma receptivity was maximum between four to six days after anthesis. Pollen grains were seen in agglutinated masses known as pollinia. Wide variation was noticed for pollen fertility (4.42 to 73.98%) and pollen size (27.91 to 48.52 $\mu$ ) among the hybrids. In general, *Dendrobiums* are highly self incompatible though some hybrids like New Pink and Ema are found to be self compatible.

The growth of *Anthurium* variety 'Hawaiian Red' was better under 80% shade. The plants responded better to application of a solution of 17:17:17 complex fertilizer. BA increased branching and suckering of plants.

The growth of *Philodendron* 'Wendlandii' was better under 50% shade.

### Spices

Two high yielding turmeric types with high yield Sobha (VK 82) high curcumin content (VK 47) were recommended for release as new varieties by KAU.

A spacing of 25 cm x 25 cm in raised beds of 3m x 1m was found to be most suited and economic for turmeric cultivation.

Two autotetraploids of ginger with  $2n = 44$  were recovered from the varieties Rio-de-Janeiro and Himachal Pradesh by colchicine treatment.

Isozyme analysis for esterase and peroxidase in ginger and *Curcuma* were standardised.

Isozyme variation studies conducted in eleven *Piper* Spp showed that there exists wide variation in varieties of

*P. nigrum* at isozyme level. Three groups could be identified in the genus *Piper*. The first group consisted of *P. nigrum*, *P. pseudonigrum*, *P. bababudani* and *P. galeatum*. The second group included *P. argyrophyllum* and *P. attenuatum* where as *P. chaba*, *P. hapinum* and *P. colubrinum* formed the third group.

The seasonal variation was highly significant in respect of leaf oil in cinnamon. The leaf oil recovery ranged from 0.55% to 2.4%. The highest oil yield was recorded during January-March (0.88%).

The procedure for mitotic chromosome analysis was standardised in *P. nigrum*.

The causative agent of little leaf disease in pepper is a mycoplasma-like-organism. The variety Karimunda was found to be most susceptible to the disease. The disease could be transmitted by sap insects. The variety Panniyur-1 was found to be comparatively tolerant to the disease.

Seed inoculation of *Aspergillus niger* in combination with either copper oxy chloride 0.3% or mencozeb 0.3% was found to be most effective for checking the incidence and severity of rhizome rot of ginger.

#### Medicinal and Aromatic plants

Multilocational testing of patchouli revealed that malaysia was superior to other entries in shoot yield and leaf yield. Johore, though was having high oil content showed poor performance.

*Azotobacter* was found to be a good substitute for chemical fertilizer.

Among the Kacholam entries, 'Echippara' was found to be having high rhizome yield, dry matter and oil content.

Exploratory trials on weed control revealed that Oxy-fluorfen @ 0.2 kg ai was effective in checking weed growth.

In Adakodian (*Holostenima annulare*) seedlings were identified as the best planting material for getting maximum yield of fresh and dry roots. Harvesting at 18 MAP was the best for yield and quality. The cost benefit analysis suggested that adakodian is a profitable crop, which can be grown as a commercial crop in Kerala.

In palmarosa *Azotobacter* or *Azospirillum*+PSB could substitute 20 kg N and P per hectare.

The leaf extracts of *Azadiracta indica* and *Glycosmis pentaphylla* were highly nematocidal to *Radopholus similis*. Higher dilutions of 1:20 and 1:40 of *G. pentaphylla* and *Kalenchue pinnata* exhibited nematostatic effects. Leaf extracts of *Moringa ocifera*, *Mentha piperita*, fruit extracts of *Melia azadiracta*, *Cleome viscosa*, rhizome extracts of *Cyperus rotundus* were also found to be nematocidal.

The active principles of the rhizome extracts of *Acorus calamus* showed considerable repellent effect against the melon fly *Bactrocera cucurbitae* in the laboratory.

*Colletotrichum gloeosporioides* was isolated from the tea mosquito feeding lesions of the die-back affected cashew shoots and this was found to be the predominant fungus responsible for the aggravation of die-back disease on young cashew trees. Bordeaux mixture (1%) was found to be effective in reducing the intensity and spread of shoot die-back. Neem oil and Pongamia oil at 2% was deterrent to tea mosquito feeding.

#### Soils and Agronomy

The soils of BRS Kannara belong to three orders viz; Entisol, Alfisol and Inceptisol. A soil fertility map of the station was prepared-

Continuous application of urea for a period of nine years in the root zone of cocoa increased soil acidity and availability of P, S Fe, and N. Long term application of super phosphate resulted in the build up of available and total P in the soil. Muriate of potash increased the available and total K content. Regular irrigation over a period of five years resulted in reducing the availability of P, Ca, Mn, and Cu. Provision of shade for a period of 13 years resulted in the build up of organic carbon and available P.

Based on the morphological and physio-chemical characteristics of soils, the fertility map of the RARS Pattambi was prepared. Based on the profile soil sample analysis, classification of the soils under Soil Taxonomy was done upto the sub group level.

An investigation was made to evaluate the morphological, physical and chemical characteristics of seven soil series identified in the Kole areas of Trichur. Classification under Taxonomy showed that Ayyanthole and Kattoor soils come under Alfisols and all the other soils under Inceptisols. The

fertility capability classification demands proper management of phosphorus. The quantity of fertilizer to be added, sources and methods of application are to be decided based on site specific characteristics and soil test data.

Studies on the efficiency of slow release nitrogen fertilizers on the yield of rice showed that maximum grain yield was recorded by the treatment monoammonium phosphate. Uptake of N, P and K were also influenced significantly with MAP registering the highest yield.

Studies conducted during the first and second crop seasons of 1992 in the existing two permanent manurial trials at RARS Pattambi showed that in the grain, significantly higher content of N, K and mg were recorded in the second season. There was not much difference in the P content between the seasons. Similar trend was noticed in the nutrient content for both tall and dwarf indica varieties, except for Ca. In the case of Ca no uniform trend was shown in both the experiments.

### Biotechnology

Black pepper and Kacholam tissue culture plants were distributed to the selected farmers in various districts.

Calli clones (213) of different cultivars of black pepper derived both from screened and unscreened calli against toxic metabolite (s) of *Phytophthora capsicii* were field planted.

The single seed obtained by *in vitro* pollination of ginger was germinated and multiplied *in vitro* and 100 plants were planted out.

Regeneration of multiple shoots was obtained from leaf bits of *Tylophthora indica*.

In gladiolus *in vitro* techniques for rapid multiplication from corm axillary buds and cormal tips were standardised. Direct organogenesis were obtained from immature inflorescence segments and callus mediated organogenesis from root segments, corm axillary buds and immature inflorescence segments. *In vitro* corm production was also made possible in elongated shoots of gladiolus.

### Post Harvest Technology

The experiment on standardisation of dehydration techniques revealed that the best pretreatment was 4% brine+0.5%

KMS at 85°C followed by 1% citric acid at 85°C and 4% brine at 35°C. Microwave dehydration was superior to dehydration in cabinet dryer and sundrying. Dehydrated anachunda black night shade and lotus stolon with an initial moisture content of  $7 \pm 1\%$  could be stored upto 6 months in polyethylene or polypropylene bags without significant deterioration in colour, texture and consumer acceptability.

Among the mango harvesters designed and fabricated, KAU mango harvester III was superior to the traditional harvester. Handling of mangoes in rectangular plastic crates was the best. Dipping the fruits in warm water containing carben-dazim 0.05% showed minimum PLW, less spoilage and disease incidence.

Among the cashew varieties tested for suitability to processing Priyanka was found to be the best. Madakathara II and Kanaka were more acidic.

#### *Transfer of technology, rural development and Agricultural Economics*

An analysis of the impact of irrigation in the small household plots of Thrissur district indicated that irrigation as an input had positive impact on cropping pattern and cropping intensity, farm income and employment in households. It was found that farmers adopting irrigation tended to use modern technologies to a comparatively higher extent. Irrigation had a positive effect on productivity of major crops and benefit cost ratio of irrigated gardens were significantly superior to that of unirrigated farms. The results clearly indicated the potential of irrigated farming to create employment opportunities and increasing family labour income.

#### *Basic research*

The major rice soils viz; alluvial and brown hydromorphic are having S deficiency to the extent of 56 and 83% respectively. In alluvial soils, extraction of Available S using monocalcium phosphate (500 ppm) is most suitable method to delineate S deficiency. In brown hydromorphic soil, Monocalcium phosphate + Acetic acid is the best method. Rice responded to S fertilizer and the economic optimum level of Ammonium sulphate & APS were 27 & 25 kg S per hectare.

**Farm Revenue**

Item	Receipts in lakhs
Mushroom spawn (9314 pkts. of 250 (kg)	0.9314
Fresh mushroom (1538 pkts of 200 g)	0.1588
Medicinal plants	2.19
Spice plants	0.40
Farm produce	0.86
Vegetable seeds	7.24
Fruits & flower crops	1.33
<b>Total</b>	<b>13.1102</b>

**1.3. COLLEGE OF AGRICULTURE, NILESHWAR****Faculty Improvement Programme****New post sanctioned/created/shifted**

Faculty position as on 1.4.95 was two posts of Assistant Professor, 3 posts of Associate Professor and 7 posts of Assistant Professor were shifted to the college.

**Scholarship/deputation of staff awarded to staff for higher studies:**

Nil

**Details of Seminars/Symposium/Training attended by staff:**

Name & Designation	Seminars, Workshop, Training, Symposium etc.	Venue	Period
Sri. Jacob Thomas M. Assistant Professor	UGC Refresher Course in Statistics conducted by Indian Statistical Institute	ISI Calcutta	30.10.95 to 20.11.95
Dr. K. J. Joseph, Associate Professor (N. C)	8th Kerala Science Congress	Cochin	27.1.96 to 19.1.96

**Research**

Major Research Achievements: Nil

**Farm Revenue**

Year	Receipts (in lakhs) Rs.	Expenditure (in lakhs) Rs.
1995-96	3,80,994	47,35,840

No separate Instructional Farm was established.

**Publication by staff—Nil**

**Important Visitor—Nil**



**Staff Position****a) Scientific Staff**

Designation	No. of posts		
	Sanct- ioned	In position	Vacant
Associat Dean	1	1	Nil
Professor	—	1*	Nil
Associate Professor	3	2	1
Assistant Professor	12	9	3
	16	13	4

**b) Technical Staff**

Library Assistant	2	2	—
Farm Supervisor/	4	4	—
Farm Assistant			
Lab Assistant	—	—	—
Driver	2	1	1
	8	7	1

**c) Administrative & Supporting Staff**

Administrative Officer	1	1	—
Section Officer	2	2	—
Assistant	5	2	3
Typist	3	1	2
Class IV	3	3	—
	14	9	5

\* Professor is officiating against the post of Associate Professor

**1.4. COLLEGE OF FORESTRY, VELLANIKKARA**

The College of Forestry was formally inaugurated on 27th October, 1986 along with the inception of four year B. Sc. (Forestry) programme. The college is presently functioning at Vellanikkara. Sri Nagesh Prabhu took over as Special Officer on 16.8.93 and continued upto 20.4.94. Dr. S. Chinnamony was the Special Officer from 20.6.94 to 16.11.94. Dr. P. A. Wahid took over as Special Officer on 16.11.94, and continued upto 15.4.95. Dr. A. I. Jose took over as Assoc. Dean i/c on 16.4.'95 and continued for the rest of the period under report.

**Academic position as on 31-3-96**

Designation	sanc- tioned	in position	Name of incumbent
Associate Dean i/c	1	2	Dr. A. I. Jose
Assoc. Professor	2	2	Dr. Luckins C. Babu Dr. N. K. Vijayakumar
Assoc. Prof. (NC)	4	4	Dr. P. K. Asokan Dr. K. Gopikumar Dr. K. Sudhakara Dr. B. Mohankumar
Asst. Professors	7	6	Sri. K. Vidyasagaran Sri. Sonney George Sri. T. Premkumar Sri. E. V. Anoop Sri. P. O. Nameer

**Paratechnical/Administrative/Ministerial position as on 31-3-96**

Admn. Officer	1	1	Sri. P. K. Nataraja Pillai.
Section Officer	1	1	Smt. Merly Sarojini
Gr. II Assistants	3	2	Sri. P. V. Xavier Smt. M. Lyla Vacant
Sr. Office Supdt.	1	1	Sri. K. G. Balakrishnan
Office Supdt. & Steno to Assoc. Dean	1	1	Smt. V. C. Mariamma

**Academic programmes**

*Student statistics (U. G. students on the rolls as on 31-3-96)*

Year of Admn.	Men	Women	Total
1992	9	—	9
1993	9	2	11
1994	10	2	12
1995	11	1	12
<b>Total</b>	<b>39</b>	<b>5</b>	<b>44</b>

**P. G. Students on roll as on 31.3.96**

Year of admission	Men	Women	Total
1994	9	—	9
1995	5	—	5
	14	—	14

## **Study**

The third year students were taken to Ooty and Mettupalayam as a part of the course Soil and Water Conservation. The second year students were taken to FIT Alwaye as a part of the course Harvesting of wood. Students/also have been over to Wild life sanctuaries and forest rangers as a part of Wildlife Courses. The field training course FMT 501 Range training was offered in collaboration with the State Forest Dept. in selected forest ranges like Alankovil, Nelliampathy, Marayoor etc. The First Aid Training and Weapon training were also offered to the final year students at Govt. Medical College, Trichur and Armed Police Training College at Ramavarmapuram respectively.

## **Details of participation of Scientists to Seminar/workshop etc.**

Dr. K. Gopikumar, Assoc. Professor attended the Kerala State Science Congress held at Cochin during the 3rd week of Jan. 1996.

## **College library**

A total of 22 foreign journals and 12 Indian Journals were subscribed during the period. The total number of titles at the end of 1996 is 2153. All these titles were properly catalogued both alphabetically and subject-wise.

## **Instructional farm**

Planting was completed in instructional farm. Block A was planted with wood lots, block B with propagated tree species and Block C with rare and endangered species. Tree planted in arboretum 1 and 2 were also being maintained. Observations were also taken on height and girth parameters of individual trees. A nursery is also maintained as a part of the farm.

## **Research project**

The following externally aided research projects were operated during the period:

Standardisation of nursery techniques of selected tropical forest tree species (State Forest Department).

Rainwater Conservation in coconut based agroforestry systems by water harvesting techniques (ICAR).

Nutrient cycling in coconut based intensive multiple cropping systems (ICAR).

Light utilisation and canopy nitrogen use efficiency of component crops in some selected agroforestry system (USDA).

Nutrient composition and decomposition of leaf biomass of selected woody species grown under rainfed condition (ICAR).

Habitat Utilization of wild animals and their parasitic burden with special reference to elephant in Vazhachal Forest Division (State Forest Division Dept.)

Clonal propagation of rose wood (State Forest Dept.)

The All India Co-ordinated Research project on Agroforestry was implemented at Thiruvazhamkundu centre of University. The technical control of the project is to be exercised by a faculty member of this college. In addition to the above research projects, M Sc. projects were also undertaken in the college.

#### 1.5 COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT, MANNUTHY

The Co-operation and Banking programme with an intake capacity of 50 students was started on 16th November 1981, at the Radio Isotope laboratory in the Main Campus, Vellanikkara, under the control and supervision of Associate Dean, College of Horticulture. The venue was shifted to Directorate of Extension in May 1982, keeping the administrative control still with Associate Dean, College of Horticulture. The programme was delineated from the College of Horticulture and started to function as a separate college under the name 'College of Co-operation and Banking', Mannuthy from 1st April 1985 onwards. The intake capacity of the undergraduate programme was reduced to 25 from 1989 batch onwards. Now the college is offering one under-graduate programme, B. Sc. (C&B) and three post graduate programmes with specialisation in Rural Marketing Management, Rural Banking and Finance and Co-operative Management.

Sri. M. Mohandas, Assoc. Professor continued to function as the Associate Dean i/c.

A. Academic position as on 31.3.95

Department & Designation	Sanctioned	In position	Vacant
Associate Dean	1	—	1
Rural Marketing Management			
Professor	1	—	1
Assoc. Professor	2	1	1*
Asst. Professor	5	5	—
Development Economics			
Professor	1	—	1
Assoc. Professor	1	1	—
-do- (Quantitative Methods)	1	1	—
Assistant Professor	4	4	—
-do- (Ag. Stat)	1	1	—
Co-operative Management			
Professor	1	—	1
Assoc. Professor	2	1	1*
Asst. Professor	5	5	—
Rural Banking & Finance Management			
Assoc. Professor	1	—	1
Asst. Professor	5	5	—

\*Upgraded as Professor

In addition to the normal work, preparation of reports, duties of Programme officer of NSS, Asst. Warden of hostel, Academic-in-charge, Officer-in-charge of Computer, Officer in charges of Arts. Officer in-charge of Planning forum Officer in-charge of Quiz Club, Officer in-charge, of library and placement Officer etc were assigned to the Scientists.

B. Changes in Academic position during the period: Nil

C. Para-technical/Administrative/Ministerial/Support positions as on 30.9.95

Name of post	Sanctioned	In position	Vacant
Administrative Officer	1	1	—
Section Officer	2	2	—
Sr. Office Superintendent	1	1	—
Assistants	6	6	—
Typists	3	3	—
Reference Assistant	1	1	—
Duplicator Operator	1	1	—
Driver	1	1	—
Peon	2	2	—
Hostel Manager	1	1	—

## Education

### Students Statistics

#### i) U G. Programme (on rolls)

Year of Admn.	Men	Women	Foreign	Total
1991	11	6	—	17
1992	15	8	—	23
1993	18	12	—	30
1994	17	12	—	29
1995	14	14	—	28

#### ii) P. G. Programme (on table)

1992	0	1	—	1
1994	2	—	—	2
1995	1	1	—	2

#### iii) Ph. D Programme (on table)

1995	1	—	—	1
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#### vi) Students who completed the course during the period

Name of Course	Men	Women	Foreign Students	Total
B. Sc. (C&B)	6	6	—	12
M. Sc. (C&B)	—	—	—	Nil

Study tours during the period: 1. South India study tour 11th May to 20th May 1995 (1993 Batch B.Sc. C&E Students)

### Research

Besides the project work done by the under graduate/postgraduate students, the college has also undertaken a number of sponsored research projects during the reference period.

Externally funded projects	: 2
P.G. projects	: 6
Ph. D. projects	: 1

### Publications

G. Veerakumaran, (1995) Land Development Banks in Tamil Nadu (A study with reference to utilisation of loans)", Land Bank Journal, Volume XXXIII issue IV, June, 1995 pp. 21-28.

## Extension

Extent of participation of research staff in teaching and extension activities:

Five scientists of the college have been identified as course directors for the training programme conducted by the Central Training Institute. Scientists of the college are identified as resource persons for the training programmes conducted by Central Training Institute, Extension Training Centre, Kerala Institute of Local Administration, Small Industries Service Institute, District Co-operative Bank and academic programmes of the University of Calicut.

Details of Scientists participated in Seminars/Workshops/Summer Institutes:

Dr. M. Mohandas, Associate Dean i/c—Workshop on Panchayathi Raj at KILA-April 3-5, 1995.

Dr. K.P. Mani, Assistant Professor—Kerala Science Congress Palakkad-June 27 1995.

Dr. M. Mohandas, Dr. A. Sukumaran, Dr. K.P. Mani, Dr. K.A. Suresh and Sri. Philip Thomas attended the Workshop of "Master Trainer's" at KILA-10-12 July 1995.

Dr. A. Sukumaran, resource person to State Level Workshop on Local Fund Finances (jointly organised by KILA and Ministry of Finance)-Sahithya Academy Hall, Trichur-23rd Nov. 1995.

Dr. M. Mohandas—55th Annual Convention of Indian Society of Agri. Economics at Anand November 23-25, 1995.

Sri. Philip Thomas—Workshop on "Institutional Support for Marketing of Agricultural Produce—the case of Kerala.

Summer Institute/Orientation programme:

Smt. K.N. Ushadevi, Kum. Vanaja Menon and Sri. E. G. Renjith Kumar, Assistant Professors attended 18th Orientation Programme at JNU, New Delhi - 30th Oct. to 24th Nov. 1995.

Workshop conducted at College level

25 day's National training programme on banking for vocational Teachers - 5 to 30 June 95

## Important Visitors

Shri. Therambil Ramakrishnan, Hon. Speaker

Dr. K. G Nair, Sec. Cashew Export Promotion Council

Shri. Pattabhiraman, Chairman, Dhanalakshmi Bank

## SOUTHERN ZONE

### REGIONAL AGRICULTURAL RESEARCH STATION, VELLAYANI

The Regional Agricultural Research Station for the Southern Zone has been functioning at Vellayani since February 1982. Apart from continuing research activities under the NARP Phase I and Phase II (and the re-prioritised thrust areas), the Station implemented 34 externally aided research projects, comprising five All India Co-ordinated Research Projects, seven ICAR *ad hoc* schemes, nine STED projects, one Central Silk Board scheme, three DBT projects, one international project on soil reference collection and data base aided by ISRIC., Wageningen, one Potash Research Institute project, one Young Scientist's Award scheme (STED), one Pilot Project on Tissue Culture funded by Department of Agriculture, Government of Kerala, one NWDPRP project, one SEARCA project, one Employment generation programme for SC women funded by Government of Kerala, one food processing project funded by Ministry of Food Processing Industry, Government of India and one project on Continuous Training on Technical and Income Generating Activities for women funded by DST, Government of India.

The Farming Systems Research Station, Kottarakkara, the Cropping Systems Research Centre at Karamana and the Coconut Research Station at Balaramapuram continued as the three satellite stations in the zone. The ECF unit of the AICARP Centre at Karamana continued to function at the Rice Research Station, Kayamkulam.

#### Mandate

Conduct of location-specific research on the field problems relating to tuber crops as well as development of suitable technology for the farming system (s) in the different agro-ecological situations of the zone and multi-tier cropping systems suited to the different sized homesteads were the main research responsibilities, in addition to testing and verification of research results on pulses, cereals (rice), coconut, banana, pepper etc.

The mandate was re-examined and the thrust areas of research re-prioritised.

#### Lead functions

Research on crops for partial shade conditions.  
Export-oriented vegetable and cut flower production.



**Verification functions**

Rice, fruits, homestead farming, coconut, tubers, vegetables, farm machinery and garden tools.

**Staff position***a) Scientists*

Cadre	Sanctioned	In position	Vacant
<b>NARP Phase I</b>			
Associate Director	1	1	—
Assoc. Professor	3	2	1
Asst. Professor	6	5	1
<b>NARP Phase II</b>			
Asst. Professor	4	3	1
<b>AICRP (Forage Crops)</b>			
Assoc. Professor	1	1	—
Asst. Professor	4	4	—
<b>AICRP (Nematode pests)</b>			
Assoc. Professor	1	1	—
Asst. Professor	2	2	—
<b>AICRP (Pesticide residues)</b>			
Assoc. Professor	1	1	—
Asst. Professor	3	3	—
<b>AICRP (Honey bees)</b>			
Assoc. Professor	1	1	—
Techni. Assistant	1	—	1
<b>ICAR adhoc scheme on Homestead Agroforestry</b>			
Res. Associate	1	1	—
Sr. Res. Fellow	1	1	—
<b>ICAR adhoc scheme on Epidemiology of honey bee disease in Kerala &amp; its management</b>			
Res. Associate	2	2	—
Apiculture Assistant	1	1	—
<b>ICAR adhoc scheme on anthurium</b>			
Res. Associate	1	1	—
<b>ICAR adhoc scheme on Development of Soya Rice blended food recipes</b>			
Res. Associate	2	1	1
<b>Central Silk Board Scheme</b>			
Asst. Professor	2	2	—
<b>DBT Project on Rhizobium-Pulse Association</b>			
Jr. Res. Fellow	1	1	—
<b>STED Project on Recycling of Vegetable Garbage by Vermiculture Technology</b>			
Res. Associate	1	—	1

Cadre	Sanctioned	In position	Vacant	Date from which vacant
STED project on phytophthora affecting coconut and their biological control				
Research Fellow	1	1	—	
AICRP on Soil Tillage				
Assistant Physicist	1	1	—	
Total	42	36	6	

b) *Administrative/supporting/para-technical/ministerial and other positions*

Name of post	Sanctioned	In position	Vacant	Remarks
1	2	3	4	5
Lead Station, Vellayani				
NARP Phase-I				
Admn. Officer	1	1	—	
Section Officer	2	2	—	
Senior Office Supdt.	1	1	—	
Typist Gr. I (Steno)	1	1	—	OS
Typist Gr. I	2	2	—	2 Gr. II
Assistant Gr. I	2	2	—	Gr. I & Sr. Gr.
Assistant Gr. II	2	2	—	
Farm Asst.(Agri.)Gr. I	3	3	—	FS Gr. I
FS Gr. II (1 on working arrangement at IF, Vellayani)				
Lab. Asst. Gr. I	1	1	—	(Gr. II)
Driver (LDV) Gr. II	2	2	—	2 (Hr. Gr.)
Photographer	1	1	—	
Duplicator Operator	1	1	—	(Hr. Gr.)
Class IV	1	1	—	
NARP Phase II				
Assistant Gr. I	1	1	—	Asst. Gr. I & II
Asst. Gr. II	1	1	—	have been shifted to Ph. I
Other schemes				
AICRP (Nematode pests)				
Farm Asst. Gr. II	1	1	—	on WA in IF, Vellayani
Lab. Asst. Gr. III	1	—	1	
AICRP (Pesticide Residues)				
Lab. Asst. Gr. III	2	2	—	

	1	2	3	4	5
<b>AICRP (Forage Crops)</b>					
Farm Asst. Gr. I		1	1	—	Sr. Gr.
Farm Asst. Gr. II		2	2	—	F. A. Gr. I
Asst. Gr. II		1	1	—	Sr. Gr. Asst.
Typist Gr. II		1	1	—	
Lab. Asst. Gr. III		1	—	1	
Peon		1	1	—	
<b>AICRP on Honey bees</b>					
Farm Asst. Gr. I		1	1	—	Sr. Gr)
Lab Asst. Gr. II		1	1	—	
<b>Central Silk Board scheme</b>					
Farm Asst. Gr. I		2	2	—	1 Sr. Gr.
Lab. Asst. Gr. III		2	2	—	
Technical Asst.		1	—	1	
<b>Total</b>		<b>40</b>	<b>37</b>	<b>3</b>	

**Details of scientists deputed to Seminars/Workshops/  
Symposia etc.**

Name of Scientist	Seminars/Symposia/ Workshops	Period deputed & venue
Dr. S. Naseema Beevi, Assoc. Prof., Ent.	National Seminar on Eco-friendly consumer & sustainable farming	28th June, 1995 TVM.
Smt. K. S. Premila Asst. Prof. Ent. & Smt. T. Jiji Asst. Prof: Ent.	National Seminar on vermicomposting	12th & 13th May, 1995 ER and DC Keltron, TVM
Dr. M. S. Sheela Assoc Prof. and Smt. N. Anitha Asst. Prof.	Biennial workshop of AICRP (Nematode) and National Sympo- sium on Nematode control	IARI, New Delhi
Dr. Thomas Biju Mathew Asst, Prof. (Ent.)	Integrated Pest Management	1-6-95 to 12-8-95 International Plant Protection Centre, Oregon State Uty., Corvallis, USA

Name of scientist	Seminars/Symposia/ Workshops	Period deputed & Venue
Dr. M S Sheela (Assoc. Prof. Ent.) Smt. Hebsy Bai (Assoc. Prof. Ent.) Smt. N Anitha (Asst. Prof., Ent.) Dr. K R Sheela (Asst. Prof., Agron.)	Integrated Pest Management in rice	28-7-1995 College of Agri. Vellayani.
Smt. K Sudharma, Assoc. Prof. (Ent )	National Symp. on Acarology	20.9.95 to 22.9.95 UAS, Hebbal, Bangalore.
Dr. R Prakash, Assoc. Prof. (Ag. Extn.)	Motivational develop- ment in Work Organisations	27.10.95 to 10.11.95 IARI, N. Delhi
Dr. T Nalinakumari, Assoc. Prof. (Ent.)	Integrated Pest Management in rice	31.10.95 Alappuzha
Dr. M Achuthan Nair Assoc. Prof. (Agron.)	XVII Workshop & National Symposium	20-23rd of Dec. 1995 IGDRI, Jhansi
Dr. K R Sheela, Asst. Prof. (Agron.) Smt. L Girija Devi, Asst. Prof. (Agron.) Smt. C Lekha Rani, Asst. Prof. (Pl. Br.)	on Forage Produc- tion in connection with the Silver Jubilee Celebrations of All India Co-ordinated Research Project on Forage Crops	
Dr. P Manju, Assoc. Prof. (NC) Pl. Br. & Gen.	Hybrid technologies for rice, millet, pulses, oilseeds & forage crops	7.2.96 to 28.2.96 TNAU, Coimbatore
All scientists	XVIII Zonal Workshop of the Southern Region	15.3.96 RARS, Vellayani

Details of Seminars/Workshops Symposia etc. conducted at the Station

Particulars	No. of participants	Period & venue
XVIII Zonal Work- shop of the Southern Region	Scientists, DoA staff, other officials & farmers (103 Nos.)	15-3-1996, Vellayani

## Extent of participation of research staff in teaching & extension activities

### Teaching

The following courses were handled by the scientists attached to the Regional Stations

Course No.	Title	Credit hours
Agron.	102 Agricultural Meteorology	1+1
Agron.	205 Principles of weed control	1+1
Agron.	410 Crop production IV	1+1
Ag. Chem.	203 Basic Soil Science	2+1
Ag. Ent.	101 External morphology & development of insects	2+1
Ag. Ent.	304 Economic Entomology I	2+1 (RE)
Ag. Ent.	305 Economic Entomology II	2+1
Ag. Ent.	406 Non-insect pests and their control	1+1
Pl. Br.	402 Breeding of crops & seed certification	2+1
Hort. W.E.	303 Post harvest handling & processing of fruits & vegetables	0+1
Hort.	305 Vegetable crops	2+0
Hort.	306 Vegetable crops	2+1
Ag. Stat.	101 Mathematics	2+0
PG courses		
Agron.	620 Fodder crops-their production and preservation	1+0
Ag. Chem.	704 Chemistry of problem soils	1+1
Ag. Chem.	706 Soil micromorphology	1+1
Ag. Ent.	601 Insect morphology & physiology	3+1
Ag. Ent.	602 Insect taxonomy	1+1
Ag. Ent.	603 Insect ecology	1+0
PB. Gen.	608 Methods of Plant Breeding	2+1

The scientists attached to the Station also served as Major Advisors Members of the PG Students' Advisory Committees besides offering UG/PG courses.

### Other Activities

#### Zonal Workshop

The XVIII Zonal Workshop of the Southern Region was held on 15.3.1996 at Vellayani. The participants to this Workshop included 73 scientists from KAU and 19 officials from

Department of Agriculture. Delegates from Farm Information Bureau, other development departments and the ICAR institute in the Zone (CTCRI, Sreekariyam) also participated in the workshop.

The workshop reviewed the progress of research in the zone and approved the proposals for farm trials to test the research results.

### Research achievements

#### Pulses and oilseeds

Genetic analysis of germplasms of rice bean (*Vigna umbellata*) indicated the possibility of identifying suitable types adapted to southern zone conditions.

Fourteen grain cowpea varieties were selected for CYT. The variety COVK-869 recorded the highest mean seed yield of 1041 kg/ha followed by Culture-9 with 819 kg/ha & V-38 with 811 kg/ha. Eight cultures from six different parental combinations were selected for IET. Culture No. 602-2-42 recorded the highest grain yield of 687 kg/ha.

#### Vegetable crops

The water melon varieties Sugar Baby & Arka Jyothi were found promising for summer cultivation in southern parts of Kerala.

Source of resistance to yellow vein mosaic virus of bhindi was located in the species viz. *Abelmoschus tetraphyllus*, *A. manihot* sp. *tetraphyllus*, *A. ficulneus*, *A. moschatus* and *Hibiscus hugelli*. Low level resistance or tolerance has also been located in cultivated varieties namely Arka Anamika and Parbhani Karanti.

#### Plant protection

The integration of nursery treatment and mainfield treatment like ploughing and covering the soil with polythene sheet was found effective in controlling the root-knot infestation in brinjal. Integrated control of rootknot nematode in brinjal revealed that the treatment involving carbofuran 1 kg a/ha basal+neem cake (1 t/ha) at 45 DAP significantly reduced the nematode population in soil and root. This effect was directly reflected on improvement in the yield of ginger.

Seventy isolates of *Phytophthora* from foot rot infected pepper, twenty six isolates from bud rot affected coconut and three from orchids were brought into pure culture and their

characters studied. Mating studies, cross inoculation studies and isolation of antagonists progressed.

A detailed study of the host range of already identified fungal pathogens of water hyacinth viz. *Collectotrichum gloeosporioides*, *Fusarium equiseti* and *F. pallidoroseum* on common weeds and cultivated plants was done. *Fusarium* sp. cause infection on *Boerhaavia diffusa*, *Phyllanthus niruri*, *Echinochloa colonum*, *Justicia prostrata*, *J. diffusa*, *Commelina bengalensis*, *C. jacobii*, *Oldenlandia umbellata*, *Calotropis gigantea*, *Cassia oxidentalis*, *Axonopus* sp. etc. *Collectotrichum gloeosporioides* was found to be pathogenic to *Euphorbia hirta* and *Phyllanthus niruri*.

Monitoring of pesticide residues in 15 samples of human breast milk collected from Thiruvananthapuram Taluk Hospital revealed the presence of HCH residues. The mean level of total HCH was 0.0028 ppm, with a range of 0.0008 to 0.062 ppm. The total DDT level ranged from non-detectable to 0.35 ppm. with a mean of 0.062 ppm.

Among the four vegetable samples collected from farm gates, 33.33% of bittergourd samples, 25% of snakegourd samples, 20.83% of cowpea samples and 8.33% of cucumber fruits contained organo-phosphate residues above maximum residue limits. Methyl parathion was the most frequently used insecticide (48% of vegetable growers). Of the 96 samples examined during the second season also, none of the vegetable sample was free from OP residues.

Residues of quinalphos, lindane, chlorphyriphos and mancozeb present in rice grain, straw, husk and bran following application to the recommended and double the recommended dose at 30 DAT and 45 DAT were analysed and the results indicated that none of the harvest produce contain residues of these insecticides. Methyl parathion and monocrotophos were the main contaminants and the residues exceeded maximum residue limits in the farm gate sample of vegetables.

Experiments were conducted to study the dissipation of lindane (0.05 and 0.1%) and mancozeb (0.2 to 0.4%) in chillies following application at 60 and 75 days after planting. Fresh and dry chillies were analysed at intervals of 0, 1, 3, 5, 7, 10 15 days after the second application. The initial deposit of lindane in fish samples was 3.96 and 5.04 ppm for the doses of 0.05 and 0.1%, respectively. The corresponding levels in the dry chilli were 4.83 and 6.36 ppm. Removal of residues due to washing ranged from 57.14 to 68.66%. The residues

dissipated to non-detectable levels by the 10th day when applied at 0.05% and by the 15th day when applied at 0.1%.

In the case of mancozeb, the initial deposit was 4.32 and 6.00 ppm in fresh and dry chilli, respectively when applied at the dose of 0.2%. No detectable residue was found in the fresh samples 10 days after treatment whereas 0.86 ppm was found in the dry chilli. In dry chilli, the residues dissipated to non-detectable levels by the 15th day after treatments. 20.85 to 51.38% reduction in residue could be obtained due to washing.

Waiting periods of quinalphos and monocrotophos for cardamom were fixed as 23 days and 22 days, dimethoate and quinalphos for pepper as five days and 12 days respectively and quinalphos in brinjal as 11 days.

### Spices

In the case of bush pepper, the largest pot size recorded the highest number of lateral branches and there was significant difference among pot size and potting mixtures with regard to the mean number of lateral branches 12 months after planting. The potting mixture soil: sand: FYM in the ratio 1:2.2 was found superior.

### Forage crops

Guinea grass varieties (45) were maintained in the germplasm. They are being catalogued with the help of a descriptor. Fresh planting of the germplasm is being done during kharif 1995. Fifteen varieties of *Stylosanthes* were maintained in the germplasm. Seed collection and germination tests progressed.

The guinea grass variety PGG-489 recorded maximum green fodder yield in the advanced varietal trial on guinea grass.

Biofertilizers had no significant influence on the fodder production of grasses. Increasing the level of nitrogen increased the fodder yield of grasses.

Comparative fodder production of guinea grass and gamba grass under coconut garden, revealed the superiority of guinea over gamba grass.

Different levels significantly influenced the green fodder yield of grasses. Irrigation at 30 and 40 mm CPE has found good for grasses.



The fodder trees *Glyricidia* sp. and *Flemingia congesta* were found promising.

The fodder variety of amaranths APGA-3 recorded the maximum green fodder yield of 45.55t ha followed by APGA-6 (42.22t ha).

## Beneficial microorganisms and productive insects

### Honey bee

The wild tree 'Maruth' (*Terminalia paniculata*) was found to be a good source of nectar for migratory bee keeping after the rubber honey flow season.

Performance of the introduced Italian bees has been satisfactory so far.

The etiology of the bee disease in southern zone of Kerala has been completed. In colonies of *A. mellifera* the brood mite *Tropilaelaps claseae* was found to be the major pest, but it could be controlled by periodic dusting of sulphur at 200 mg per frame. The other pests noticed were the yellow banded wasp *Vespa orientalis* and the bee eater bird *Merops orientalis*. No disease has been observed in these bees so far.

In *Apis cerana indica* the wax moth *Galleria melonella* has been observed as a serious pest.

### Sericulture

In rainy season, silk worms could be reared successfully at a spacing of 830 larvae/m<sup>2</sup>.

The mulberry varieties S<sub>1</sub> and MR<sub>2</sub> were identified for intercropping.

### VAM

Two native VAM cultures were developed for improving the growth and tolerance to foot rot disease of pepper. A coir pith based mass production technique for VAM was standardised.

### Nitrogen fixing bacteria

#### Rhizobium

Development of efficient strains of *Rhizobium* suitable for acid soils conditions and isolation of acid tolerant cultures of *Bradyrhizobium* sp. suitable for cowpea, black gram and green gram has been completed.

#### Azotobacter and Azospirillum

Two new acid tolerant cultures of N-fixing bacteria, *Azotobacter* and *Azospirillum* were isolated for the first time

in Kerala. These cultures with pH tolerance upto 6.0 are being sought by the Kerala Agro Industries Corporation for the mass production of Azotobacter and Azospirillum biofertilizers in the State.

#### Vermi-compost

*Eudrillus eugineae* was identified to be the superb effective agent for the operation of vermitechnology under southern Kerala conditions.

Vermicompost as an organic source (12t ha) along with NPK (at 50-8-25 kg/ha) was found to record twice the yield in bhindi compared to cattle manure along with the same dose of NPK.

Release of earthworms *Eudrillus* sp. at the rate of 50 worms/m<sup>2</sup>, two weeks after application of basal dose of fertilizers recorded 1½ times yield as package recommendation of cattle manure and NPK in bhindi.

When the *Eudrillus* compost was inoculated with *Azospirillum* and *Phosphobactor*, a significant increase in the N, P and K was observed.

Vermi-compost along with half inorganic fertilizer was found to give comparable yield as POP recommendation in cucumber.

#### Oyster mushroom

All the available *Pleurotus* cultures were made fresh and maintained. One more strain of *Pleurotus florida* was procured from IHR, Bangalore for including in the hybridisation programme. Two native isolates were made by natural collection from Thiruvananthapuram area and their pure cultures made. The domestication progressed.

The stock cultures of *Pleurotus* sp. available and the newly procured ones have been brought into grains spawn and a trial was conducted to evaluate the efficiency of mixed spawns of inter species in beds for production of any improved strains.

#### Biotechnology

Pilot project on field evaluation of tissue culture plants of red banana, jack, orchid, anthurium progressed.

#### Red banana

Two thousand plantlets were produced and hardened. Seven sites (including the District Agricultural Farm) were selected in Thiruvananthapuram district after field visit along with the officers of the Department of Agriculture in September.

Fifty tissue culture plants are being compared with fifty conventional sucker plants as per the cultivators' practices. The list of the cultivators in Kollam district has already been collected from the Department of Agriculture. The hardened plants of red banana were supplied as per the approved programme to the selected farmers in Thiruvananthapuram and Kollam and to the District Agricultural Farms at Peringamala and Anchal.

#### *Jack*

Explants of the jack variety *Muttom Varikka*, collected from the Instructional Farm, Vellayani were established on MS basal medium with supplements. They were multiplied on a proliferation medium. The microshoots were rooted in a two phase method. The plantlets were transferred to pots containing sand and *VA mycorrhiza* and hardened for two months.

Four sites (including the District Agricultural Farm) were selected in Thiruvananthapuram district after field visit along with the Officers of the Department of Agriculture in September. The list of the cultivators in Kollam district has already been collected from the Department of Agriculture. The hardened plants of jack were supplied as per the approved programme to the selected farmers in Thiruvananthapuram and Kollam and to the District Agricultural Farms at Peringamala and Anchal. Action was taken to collect the list of farmers in Pathanamthitta district.

#### *Orchid*

The orchid, 'Annie Black' (*Aranthera*) was established through enhanced release of axillary buds. The multiple shoots were being multiplied further on a proliferation medium consisting of MS basal medium with supplements.

#### *Anthurium*

Leaf explants *Anthurium andreanum* (variety 'Dragon's Tongue') were cultured on modified MS medium for the induction of callus. Shoots could be made to regenerate from the calli.

#### *Mango*

Attempts for inducing effective maturation of somatic embryoids were in progress. Tender mango fruits of the varieties Neelum and Bangalora were collected from the Government Fruit Farm, Kanyakumari. The nucellus of the fruits were subjected to various induction treatments for somatic embryogenesis. Treatments for maturation and germination

of somatic embryoids were continued. Segments of tender leaves were subjected to treatments for inducing somatic organogenesis.

Kacholam plants received from Vellanikkara campus were planted at the District Agricultural Farm, Peringamala. Hardened plants of Nendran banana and pineapple were supplied to the selected farmers of Thiruvananthapuram and Kollam districts.

### Spices

Induction of multiple shoots from primary as well as secondary shoot tip cultures of mature tree explants of both nutmeg and clove could be achieved. In nutmeg, multiple shoots produced could be rooted *in vitro*. Callusing could be induced both in nutmeg and clove nodal explants.

### Sustainable Agriculture

Early results from the field experiments of the STED project on sustainable farming indicated that the crop yield could be brought to average level under sustainable farming practices through a period of four to five years.

### Fruits and Floriculture

#### Banana

Application of NPK 370:40:380 g/plant along with 30 kg FYM & 300g groundnut cake in three split doses increased yield in Red banana.

For the banana variety Njalipoovan intercropped in coconut garden, a fertilizer dose of 150g N, 100g P<sub>2</sub>O<sub>5</sub> and 200g K<sub>2</sub>O per plant was found to be the optimum. The package of practices recommendation for pure crop Njalipoovan is 160-200g N, 160-200g P<sub>2</sub>O<sub>5</sub> and 320-400g K<sub>2</sub>O per plant. Thus there is a saving of 50g, 100g and 200g N, P and K, respectively. When the coconut yield is taken into account, there is considerable increase in total return per unit area.

#### Anthurium

A total number of 96 anthurium plants belonging to 12 varieties were collected and maintained as germplasm in the shade house. For genetic improvement, hybridisation has been taken up. About 30 cross combinations have been attempted. The first cross to produce mature fruits was Pimpon Red x Liver Red (PR x LR). 93 fruits were obtained. Seeds were extracted and sown for germination. Evaluation of the morphological and floral characters of the parent plants progressed.

Multiplication of plants by splitting suckers has been done for the variety Liver Red, Fla King, Honeymoon Red and Kalympong Orange and nine, three, two and two new plants generated respectively.

For evaluation of variability of seedlings in *Anthurium andreanum*, 170 seedling progenies from 27 hybrid combinations have been generated involving eight anthurium varieties viz. Honeymoon Red, Chilli Red, Kalympong Red, Orange, Pink and White and Lady Jane. In five combinations, the hybrids have started flowering and they are being evaluated along with their parents. Transplanting of hybrid seedlings (13 combinations) to individual pots was completed. All mature mother plants (65) and seedling progenies (180) were maintained. Hybrids of five combinations have started flowering.

Prolonging the vase life of flowers of tissue-cultured anthurium plants using various chemicals was standardised. A combination of cobaltous chloride (10 ppm) and sucrose (2%) was found to extend vase life by 4.33 days, followed by 10 ppm  $\text{CoCl}_2$  (4 days), 25 ppm BA (3 days) and 5 ppm  $\text{CoCl}_2$  (2 days).

$\text{CoCl}_2$  10 ppm as holding solution without cutting the stalk base once in 2 days and  $\text{CoCl}_2$  10 ppm as holding solution without cutting the stalk base were on par with mean vase life of 14.67 and 14.12 days respectively in *Anthurium andreanum*.

### Gladiolus

Management practices on gladiolus for the southern zone of Kerala revealed that spike length was ideal for cut flowers in Friendship and Happy End. Oscar and Tropic Seas produced spikes with maximum number of florets and the later had the highest vase life.

### Food and nutrition

25 recipes based on soya and rice were standardised for three variations of soya (10%, 15% & 20%) and their acceptability nutritive value and cost were calculated.

A weaning food with rice and soya as basic, mix and protein rich ready to mix (RTM) food based on rice and soya blend were developed. Recipes based on rice soya extruded products were standardised.

Schedules were developed to collect information on the socio economic personal characteristics, knowledge and awareness of the trainees under the project on continuous training on technical and income generating activities for

women. Syllabus of the training and detailed course outline for each topic was prepared. One batch of the training of three months duration was conducted. As part of the course, the trainees were taught in the processing of different fruits to squash, jam, wine and pickle. They were also trained in marketing the products and in the maintenance of accounts.

Under Food Processing and Training Centre at Vellayani and Vellanikkara campuses of the Kerala Agricultural University, one on-campus and one off-campus training programme were conducted. Three batches of candidates were trained during the period in on-campus training. A total number of 25 tribal women participated in the off-campus training.

Collecting baseline information regarding old age home for conducting field level acceptance studies progressed. A questionnaire was drafted for collecting the primary data of the individuals in the old age home.

Primary data on anthropometric measurements of the pre-school children were recorded as an initial step to conduct feeding trial using the high protein beverage.

A questionnaire was prepared for survey on the utilization pattern of soya bean in Thiruvananthapuram district. Mailing addresses for sending the questionnaires pertaining to survey on the utilization pattern of soya in Thiruvananthapuram district were collected.

#### **Soils and agronomy**

Acidity parameters and acidity generating factors in the major wet land rice soils have been identified and evaluated.

Partial substitution of MoP by common salt can be done in cassava.

#### **Homestead farming**

Observations regarding sunlight intensity and disease incidence in the two selected homesteads and the homestead models laid out in FSRS, Kottarakkara were recorded.

#### **Agroforestry**

The systems inventory description survey was conducted in 20 Panchayats selected at random in Thiruvananthapuram district. From each Panchayat 20 homesteads were selected at random and a information needed was collected through personal interview with the farmers based on a questionnaire designed for the purpose. Region wise and soil type wise statistical analysis was done. Valid conclusions can be drawn only after the completion of the full term of the field experiments.

## Basic Research

### USREC Project

Processing of the soil monoliths and fixing them on the display boards progressed. Soil maps and charts have been prepared and are ready for display in the Soil museum.

Soil information as per ISRIC SOIL INFORMATION SYSTEM (ISI S3 & ISI S4) have been installed in the PC/AT 486 computer of the Soil Data Processing Centre. Software programmes like SOLGRAPH, WOFOST, SWEAP, STRESS, SOILIMS and ECOCROP have also been installed in the system.

### Maintenance of breeder seeds of released/recommended varieties

Breeder seeds/planting material of the following varieties released/recommended are being maintained.

Chillies	—	Jwalamukhi, Jwalasakhi
Rice	—	Aarathy, Remya
Cowpea	—	Charodi-I, V-26
Blackgram	—	TAU-2
Vegetable cowpea	—	Malika, Sharika
Guinea grass	—	Haritha, Marathakom
Sweet potato	—	Kanjhangad
Amaranth	—	Arun
Bhindi	—	Kiran
Sesame	—	Soma, Surya, Thilak
Groundnut	—	TG-3, TG-14, Spanish improved

### Farm Revenue

Reciepts — Rs. 77,858.00

### ii) FARMING SYSTEMS RESEARCH STATION, SADANANDAPURAM, KOTTARAKKARA

The Farming Systems Research Station, Sadanandapuram, Kottarakkara was sanctioned by the National Agricultural Research Project as per the recommendations of Review Committee of the ICAR or NARP (1979). Originally this station was named as Special Station, Sadanandapuram. The land required for establishing the station was completed during 1986 and the station started functioning in a rented building with effect from 14-5-86. Later the major items of civil works were undertaken at the newly acquired land and the station started functioning in the new building with effect from 23-4-88. During October 1993, the station was renamed as Farming Systems Research Station since the lead function of the station is research on

homestead farming. The testing and verification functions include research on tapioca and coconut based farming systems and on other tuber crops, rice. Vegetable improvement programme is also included in the testing and verification functions.

This station at Sadanandapuram is situated 5 km South East of Kottarakkara town along the main central road at Vettikkavala village, Vettikkavala Panchayat, Kottarakkara Taluk, Kollam district. The total area of the farm is 8.96 ha, comprising two plots separated by a distance of 250 M. Plot I, known as Khetrakunnu has 4.03 ha and plot II, known as Chanthapurayidom occupies an area of 4.93 ha.

#### Agroclimatic situation

The station has an elevation of 95m above MSL and is located at 76° 37' E longitude and 9° 16' N latitude. The annual rainfall ranges between 1500 and 2000 mm. The soil is laterite with pH ranging between 4.0 and 4.4. Electrical conductivity is well within safe limits for crop growth. Available N and K are low to medium while available P is low. The texture of the soil is gravelly clayloam.

#### Staff position

Category	Sanctioned	In position	Vacant
<i>Scientific Staff</i>			
<i>Associate Professor</i>			
Horticulture	1	1	Vacant from 30-3-96 onwards
Soil Science	1	1	Vacant from 1-4-95 to 27-8-95
<i>Assistant Professor</i>			
Entomology	1	—	Vacant from 1-10-94 onwards
Plant Pathology	1	1	
Agronomy	2	2	Vacant from 1-4-95 to 29-1-96
Economics	1	1	
Horticulture	1	1	Post shifted to College of Agriculture, Vellayani on 22-6-95
Soil and Water Engg.	1	1	
Veterinary	1	—	Vacant throughout the period



Assistant Professor (Ag.Engg.) is attending the duty three days a week on working arrangement

Posts	Sanctioned	In position	Vacant
1	2	3	4
<i>Paratechnical staff</i>			
Farm Assistant (Agri.) Gr.I	2	2	
Farm Assistant (Agri.) Senior Grade	1	—	Vacant from 27-3-96 onwards
Farm Assistant (Vety.) Gr.I	1	1	
Lab Assistant	1	—	Vacant throughout the period
Jeep Driver	1		Post shifted to College of Agriculture, Vellayani w. e. f. 31-10-95
Agri. Technician	1	1	
<i>Administrative staff</i>			
Administrative Assistant	1	1	
Assistant Gr. I	2	2	
Typist Gr. I	1	1	
Peon HG	1	1	
<i>Krishi Vigyan Kendra</i>			
<i>Scientific staff</i>			
Associate Professor	1	1	
Assistant Professor			
Extension	1	1	
Agronomy	1	1	
Horticulture	1	1	
Plant Protection	1	1	
Animal Science	1	1	
Home Science	1	1	
<i>Para Technical staff</i>			
Farm Assistant (Agron)	1	1	
Farm Assistant (Home Science)	1	1	
Farm Assistant (Fisheries/Sericulture)	1	1	
<i>Administrative staff</i>			
Assistant Senior Grade	1	1	
Typist Gr. II	1	1	
Assistant Gr. II	1	1	

1	2	3	4
<i>Auxiliary/supporting staff</i>			
Driver (LDV)	1	1	
Peon (HG)	1	1	
Horti Attendant (Class IV)	1	1	
Animal Attendant (Class IV)	1	1	
Watchman (Class IV)	1	—	

### Faculty Improvement Programme

**New posts sanctioned/created/shifted/abolished etc.**

One post of Assistant Professor (Horticulture) and a post of driver had been shifted to the College of Agriculture, Vellayani during the period under report.

**Scholarships awarded to staff for higher studies:** Nil

### Deputation of staff for higher studies

Smt. Darley Jose, Assistant Professor (Horticulture) has been granted study leave for 3 years for undergoing Ph.D. programme in Applied Economics at the Centre for Development Studies, Thiruvananthapuram.

### Details of seminars/symposia/training programmes attended by the staff

Name of staff	Seminars/ Symposia/ Training programmes etc.	Date	Venue	Orga- nised by
1	2	3	4	5
Dr. M. Oommen, Professor and Head	Zonal work- shop of the NARP (SR).	15.2.96	College of Agriculture, Vellayani	KAU
Dr. K. Vasantha- Kumar Assoc. Professor	Review workshop of KVK 48th FRC meeting	29.4.95 to 30.4.95 6.10.95 to 7.10.95 15.2.96	Rural Institute, Gandhigram RARS, Pattambi	ICAR  KAU
	Zonal workshop NARP (SR)	15.2.96	College of Agriculture, Vellayani	KAU

1	2	3	4	5
Dr. S. Regeena, Asst. Professor	Summer Institute on participatory rural appraisal for agricultural research Zonal workshop NARP (SR)	7.6.95 to 26.6.95  15.2.95	CARDS, TNAU  College of Agriculture, Vellayani	ICAR   KAU
Smt. Darley Jose Asst. Professor	National workshop on organic farming Kerala Vikasana Sibiram Zonal work- shop of the NARP (SR)	1.9.95 to 2.9.95  2.11.95  15.2.96	Kottayam Hotel Green Park  PTC Tower Tvpm College of Agriculture, Vellayani	UPASI   Kerala Deseya Vedi KAU
Dr. S. Chandini Assoc. Professor	Zonal work- shop NARP (SR)	15.2.96	College of Agriculture, Vellayani	KAU
Dr. S. Ravi Assst. Professor	Zonal work- shop NARP (SR)	15.2.96	College of Agriculture, Vellayani	KAU

#### Involvement of staff in academic programme

Dr. S. Chandini, Associate Professor (Agronomy) is the major advisor of an M.Sc. (Ag.) student of the Department of Agronomy, College of Agriculture, Vellayani and member of the advisory committee of one Ph.D. student in the department of Soil Science and Agricultural Chemistry, College of Agriculture, Vellayani.

Dr. S. Regeena, Assistant Professor (Economics) handled two PG courses (Ag. Econ. 608 and Ag. Econ. 616) for the PG students at College of Agriculture, Vellayani. She also served as the major advisor for one M.Sc. (Ag) Economics student.

Dr. K. Vasanthakumar served as a member of the advisory committee of one Ph.D. student in the Department of Soil Science and Agricultural Chemistry.

### Research activities/achievements

No. of research projects in progress	—	12
KAU Plan	—	3
Non Plan	—	8
ICAR	—	1

Co-ordination group	—	Integrated farming systems
		Spices
		Rice

Projects conducted during the year : Nil

Projects sanctioned during the year : Nil

### Highlights of research results

#### *Standardisation of pots and potting mixture for bush pepper*

Two years study showed that the largest pot size 45 x 30 cm was found to be superior in the production of mean number of leaves, lateral branches and yield of berries. The potting mixture 2:1:1 recorded the highest number of leaves, lateral branches and yield.

#### *Improvement of local black pepper cultivar, Karuvilanchi for the southern region of Kerala*

Survey and collection of Karuvilanchi types was done in Ummannoor Village of Kottarakkara taluk. Morphological parameters of 100 types were studied. The study revealed that spike length ranged from 8.5 to 14.5 cm and number of berries varied from 26 to 50 per spike. The weight of 100 berries varied from 8.30 to 14.02 g. Yield of green pepper recorded from vines trailing under the age group of 5 to 10 years ranged from 5.14 to 16.20 kg and the recovery of dry pepper from green pepper varied from 35.4 to 38.3%.

Twenty promising types of Karuvilanchi were collected and maintained as germplasm at the station

#### *Genetic Improvement of the popular variety Cheradi for the Mundakan season in lateritic areas*

Sixteen Cheradi types brought forward from the initial evaluation trial II (IET) was tested along with ten standard rice varieties at the state seed farm, Kottarakkara. This comparative yield trial I showed that more than 5 types from among the 17 types tested are capable of yielding more than 4 tonnes per hectare.

## Farm Revenue

### Expenditure:

	Rs.
NARP Ph. 1 (Non-plan) Plan Scheme	15,02,642
Cheradi Improvement	2,819
Pepper for homesteads	47,216
Faculty Improvement Programme	28,028
Regional cashew nursery	8,72,860
Training programme sponsored by outside agencies	
Collector, Kollam	1,62,300
Village Adoption Programme	3,000
Director of Extension	1,250
Krishi Vigyan Kendra	17,15,164
Revolving Fund	7,06,580
Grand Total	50,42,579

### Receipts:

Sale of planting materials, seeds and farm produce	28,90,025
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## Important Visitors to the Station

Name and address	Period of visit	Purpose
Sri. Prayar Gopalakrishnan, Chairman, MILMA, Thiruvananthapuram	30-3-95	Inauguration of one day seminar
Sri Punalur Madhu, MLA, Punalur	30-6-95	Felicitating the one day seminar
Sri. L. Radhakrishnan District Collector, Kollam	27-10-95	Inauguration of Training Programme for SC/ST youth
Dr. N. Mohanakumaran. Director of Research Kerala Agrl. University	27-10-95	Felicitated the Training Programme for SC/ST youth
Smt. Sulochana Pallissery Block Panchayat President	27-10-95	Felicitated the Training programme
Sri. L. Radhakrishnan, District Collector, Kollam	16-3-96	Attended the valedic- tory session of the training programme for SC/ST youths
General Council Members of KAU	19-1-96	Station visit

### iii) CROPPING SYSTEMS RESEARCH CENTRE, KARAMANA

The Cropping Systems Research Centre (CSRC) is located at Nedumcaud, Karamana, 3.0 km South East of Thiruvananthapuram Central Railway and Bus stations, easily accessible by road. The station has 7.65 ha land, of which 7.25 ha is double cropped wet land and 0.4 ha garden land.

The centre, formerly known as the Model Agronomic Research Station, was established in 1955 with the objective of conducting simple fertiliser use trials and soil fertility investigations, under the 'Fertiliser use and soil fertility project, sponsored by the Indian Council of Agricultural Research New schemes and projects were started from 1968 onwards under the All India Co-ordinated Agronomic Research Project (AICARP) of the ICAR. From October 1983 onwards, the station was upgraded as the Headquarters of the AICARP in Kerala, with a unit for conducting Experiments in Cultivators' Field (ECF).

**Mandate:** The lead function of the station is research on rice and rice-based cropping system. The testing and verification functions include multilocational trials and integrated production trials with fish/livestock, poultry, bio-energy conversion and organic recycling and water requirement of crops.

Category	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
a) AICARP			
Professor (Agronomy)	1	1	—
Asst. Professor (SC & AC)	1	1	—
Asst. Professor (Stat)	1	—	From 13-6-94
b) Non-Plan			
Professor	1	1	—
Asst. Professor (Ent)	1	—	1
Asst. Professor (Pl. Path)	1	1	—

#### *Administrative/Supporting/Paratechnical / Ministerial/Other posts*

Category	Sanctioned	In position	Vacant
a) AICARP (Plan)			
Farm Assistant	2	2	—
Typist	1	—	1
Messenger	1	—	(on long leave) 1

**Staff position**

Category	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
a) AICARP			
Professor (Agronomy)	1	1	—
Asst. Professor (SC & AC)	1	1	—
Asst. Professor (Stat)	1	1	—
b) Non-plan			
Professor	1	1	Retired on 22-12-95 (Post shifted to College of Horticulture Vellanikkara)
Asst. Professor (Pl. Path)	1	1	—

*Administrative/Supporting/Paratechnical/Ministerial/Other posts*

Name of post	Sanctioned	In position	Vacant
a) AICARP (Plan)			
Farm Assistant	2	2	—
Typist	1	1	—
Messenger	1	1	—
b) Non-plan			
Admn. Assistant	1	1	—
Office Asst.	1	1	—
Peon	1	1	Joined on 20-3-96

Faculty improvement : Nil

Participation of scientists in seminars/symposium/workshops/summer institute etc.

Name of Scientist	Participation	Period of participation
Smt. C.R. Sudharmai devi	9th Kerala Science Congress	27-1-1996 to 29-1-1996

All the scientists of this station participated in the NARP Zonal Workshop held on 15-3-1996 at College of Agriculture, Vellayani.

Research Projects in operation

- a) AICRP (Externally aided) : 6
- b) KAU Projects : 1

Evaluation of component vegetable crop or varieties in a rice based cropping system. Revealed that the treatment Rice-Rice-Bhindi is the best in terms of yield, cost-benefit ratio and influence on the succeeding crop of rice.

In the permanent plot experiment on integrated nutrient supply system pooled analysis up to the year 1993-'94 revealed that application of 80% recommended NPK through fertilizers and 50% through FYM during Kharif and 100% through fertilizers during Rabi gave significantly higher grain yields. This treatment was found to be the best in terms of economics and soil physical condition.

In long range effect of continuous cropping and manuring on soil fertility and crop productivity significant response was obtained to added N (80-120 kg/ha) and  $P_2O_5$  (40 kg/ha) both in Kharif and Rabi. Applied potash showed significant response up to 40 kg/ha during Kharif season but there was no significant response during the Rabi season.

Maximisation of rice yield/productivity using FYM, spacing and levels of fertilizers.

Significant research results generated during the period.

Application of phosphorus fertilizers can be skipped for at least one year without affecting yield of grain.

Cultivation of Bhindi as a summer vegetable after two crops of rice in Kharif and Rabi can be recommended in a humid tropical climate wherever facilities are available for raising tree crops.

#### Important visitors to the station

Name of visiting dignitary	Institutional affiliation	Date of visit
Dr. RL Yadav	Project Director (ICAR)	21.1.96
Dr. Sewaram	Project Co-ordinator	21.1.96
Sri. AK Dharni, IFS	Registrar, KAU	2.1.96

#### Civil works in the station

Construction of Waiting Shed - Completed

Infrastructural development under the equipments purchased, laboratory facilities developed etc. : Purchase of Power Reaper, Generator Furnishing A.C. Room



## Distribution of farm produce

Name of produce	Quantity (kg)
Bhindi	514
Drum stick	16
Amaranthus	227
Vegetable cowpea	89
Brinjal	133
Tomato	56
Tapioca	42
Mushroom	10.8
Coconut	2017 (Nos)
Paddy seed	2940
Bulk paddy	7085
Straw	11900
Cucumber	149
Chilli	14.6
Mango	12

## Expenditure statement for 95-96 :

	KAU Plan	Non-Plan	AICRP on Cropping pattern (Externally aided project)	Total
Allotment	1.600 lakhs*	12.770 lakhs	6.50 lakhs	20.870 lakhs
Expenditure	1,49,329	10,46,344	7,12,173	19,08,346
Receipts	: Rs. 1,14,079			

\* Rs. 4.50 lakhs allotted under KAU Plan Non-Recurring 910 – Civil works is not included in this item.

## iv) COCONUT RESEARCH STATION, BALARAMAPURAM

The Coconut Research Station, was established in January 1948 with 38.18 acres of land at Pachalloor, near the College of Agriculture, Vellayani as a scheme partly financed by the Indian Central Coconut Committee. The scheme was terminated during December 1962. Later, during the III Five Year Plan (in 1963-64), the venue was shifted to 14.13 ha plot of garden land at Kattachalkuzhy, 4.0km. South of Balaramapuram on the Balaramapuram-Vizhinjam road. The station was taken over by the Kerala Agricultural University in Feb '72. The site at Kattachalkuzhy represents the typical red loam soils of South Kerala and the area is protected by barbed wire fencing.

The main objective of the station is to conduct research on coconut in typical red loam soils of the Vellayani series under the Neyyattinkara-Vellayani soil association with particular emphasis on the agronomic and plant protection aspects.

The thrust areas of research is the manurial, agronomic and plant protection aspects relating to coconut, in red loam soils.

**Mandate:** Agrotechniques for coconut-based farming system in red loam soils and intercropping in coconut, pest/disease management in cocout.

#### Staff position

Designation/Category	No. of posts		
	Sanctioned	In position	Vacant
Asst. Professor (P. P) (Prof. of Plant Pathology and Head)	—	—	—
Assoc. Professor (Agron)	Assoc. Professor (NC) Agron. (Assi st. Professor Plant Pathology from Rice Research Station, Kayamkulam)		
Assoc. Professor (Agronomy)	1	—	—
Asst. Professor	1	—	—
<i>Technical staff</i>			
Farm Assistant (Sr. Gr.)	1	—	—
Farm Assistant (Gr. II)	1	—	—
Watchman	1	—	—
<i>Administrative and supporting staff</i>			
Administrative Assistant	1	—	—
Assistant (Senior Gr.)	2	—	—
Typist (Selection Gr.)	1	—	—
Peon (Hr. Gr.)	1	—	—

#### Involvement of staff in Academic Programmes

Two M.Sc. (Ag) students are allotted to this station for the M.Sc. Thesis work. (One student for Plant Pathology one for Agronomy).

## RESEARCH

### Major Research Achievements

Based on the results of the experiment, N.P.K. nutrients of 0.68, 0.23 and 0.90 kg/tree/year have been recommended for red loam soils of Southern Kerala.

### Farm Revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	8.400	15.000
(Plan)	Nil	0.195

### Important visitors

A group of Scientists from Tansania visited the station.

Few members of General Council visited the station on 20.1.1993.

A group of farmers from Tamil Nadu visited station on 7-3-1996.

## SPECIAL ZONE OF PROBLEM AREAS

The zone of problem areas is one of the agroclimatic zones demarkated to represent the geographical area where agriculture is risky, hazardous and exposed to the vagaries of nature. It lies in the coastal line of Kerala State, extending from Kollam district in the south to Malappuram district in the north and comprises parts of Alappuzha, Kottayam, Ernakulam, Thrissur and Malappuram districts covering an area of 5254 sq. km. The zone lies below the mean sea level and gets flooded during the south west monsoon. The whole area then forms a sheet of water dotted here and there by homesteads, coconut groves, and strips of garden lands. Connected to the sea, the area is subject to ingress of salinity. The salt water intrusion into the lands is regulated in Alappuzha and Kottayam districts by Thanneermukkom barrage, Thottappally spill way and Andhakaranazhi and in Thrissur district by the Enammakkal regulator, Kottankottu, valavu and Karanchira lock. The zone in Alappuzha district is fed by four main rivers, Pampa, Meenachil, Manimala and Achencoil which drain into the vast expanse of water called Vembanad lake before merging with the Arabian Sea. The zone is the most thickly populated area in the state. The rivers as well as the channel water are polluted by human and animal wastes and by agricultural

drainage. The pollution is responsible for the prevalence of many gastro-intestinal diseases. Some of the pollutants such as pesticides and heavy metals find their way up the food chain of the aquatic environment resulting in high concentration of toxic residues, in the body of fishes in the rivers.

Seven distinct farming situations have been identified in the zone viz., Onattukara, kayal, karappadam, kari, orumundakan and koottumundakan, pokkali and kole. There are seven research stations in the zone which cater to the research requirements of the different situations.

Name of Research Station	Situation in which located	
RARS, Kumarakom	Karappadam	Kottayam district
RRS, Moncompu	Karappadam	Alappuzha district
RRS, Kayamkulam	Onattukara	Alappuzha district
RRS, Vyttila	Pokkali	Ernakulam district
AICRP on Agricultural Drainage, Karumadi	Kari	Alappuzha district
SRS, Thiruvalla	Karappadam	Pathanamthitta dist.

The thrust areas identified for the zone are:

1. Reclamation and management of problem soils
2. Farm mechanisation
3. Integrated farming involving crop-livestock and fish
4. Root (wilt) disease management
5. Seed and nursery production
6. Resistance breeding in rice
7. Breeding of rice for salinity tolerance
8. Improvement of rice under pokkali conditions
9. Research on oil seeds, pulses and rice in Onattukara
10. Rice and fish culture
11. Sugarcane research
12. Mangrove research - conservation and management

#### i) REGIONAL AGRICULTURAL RESEARCH STATION, KUMARAKOM

The Regional Agricultural Research Station is situated at 9°3' latitude and 76°3' longitude in the Kumarakom Village of Kottayam district in the southern side of 'Kavanar', 15 kms north of Kottayam town. The history of RARS, Kumarakom dates back to the year 1947, when the station was established by the Department of Agriculture with the financial support of the then Indian Central Coconut Committee. In 1958, the station was

taken over by the State Department of Agriculture and from 1972 onwards the station is functioning under the Kerala Agricultural University. The station was upgraded as a Regional Research Station for the special zone of problem areas of Kerala in 1982. The land area of the farm, in the beginning, was 23.23 ha. During 1980, an additional area of 21.49ha of land was transferred to Kerala Agricultural University making the total area of the Station 44.72 ha. The main objective of the station was originally to conduct research on coconut and coconut based farming system with special reference to coconut diseases. However, with the implementation of NARP, the station became the lead station to conduct problem oriented location specific research on all crops in the special zone of problem areas of Kerala State. The main mandates of the station are research on coconut and coconut based farming systems, integrated farming and coconut root (wilt) disease.

Dr. R. R. Nair, Associate Director officiated as the Head of the Station during the period under report.

Category	Sancti- oned	In posi- tion	Vacant	Remarks
<i>Scientists</i>				
Associate Director	1	1	—	
Professor	—	—	—	One post of Professor redesignated as ADR
Assoc. Professor	6	6	—	
Asst. Professor	17	9	8	
<i>Administrative &amp; supporting staff</i>				
Administrative Officer	1	1	—	
Section Officer	2	2	—	
Sr. Office Supdt.	2	2	—	
Office Supdt.	1	1	—	
Sr. Gr. Assistant	2	2	—	
Sr. Gr. Typist	1	1	—	
Assistant Gr. I	1	1	—	
Typist Gr. I	1	1	—	
Assistant Gr. II	3	3	—	
Typist Gr. II	1	1	—	

	1	2	3	4	5
<b>Para-technical and supporting</b>					
Senior Farm Supervisor	1		1	—	
Farm Supervisor Grade I	1		1	—	
Farm Asst. (Agri.)	7		6	2	
Farm Asst. (Vety.)	1		1	—	
Technician Grade I	1		1	—	
Artist	1		—	1	
Driver Gr. I (HDV)	1		1	—	
Driver Gr. II (LDV)	2		2	—	
Duplicator Operator	1		1	—	
Bus Attendant	1		1	—	
Lab. Assistant Gr. I	1		1	—	
Lab. Assistant Gr. II	1		1	—	
Lab. Assistant Gr. III	4		3	1	
Pump Operator	1		1	—	
Boat Driver	1		—	1	
Sarang	1		—	1	
Tractor Driver	1		—	1	
Peon (Hr. Gr.)	3		3	—	
Watchman	3		3	—	
Sweeper-cum-Attendant	1		1	—	
Fisherman	3		—	3	

### Faculty Improvement Programme

#### a. Posts shifted/abolished/redeployed

One post of Associate Professor (Soil Science and Agrl. Chemistry) shifted from College of Agriculture, Vellayani.

#### Involvement of staff in academic programmes

Dr. R. R. Nair, Associate Director was nominated as the Chairman of the advisory committee of one Ph.D student in Agronomy.

Dr. K. G. Padmakumar, Assistant Professor was nominated as external examiner for M. Phil course in Zoology in Kerala University.

#### Research

The projects/experiments in operation in the station during the period was as follows.

ICAR	3
KAU Non-Plan	13
KAU Plan	14
<b>Total</b>	<b>30</b>

## Research Highlights

Results of a survey conducted indicated that paddy cultivators and toddy tappers were beneficiaries of the Thann-eermukkom regulator. Coconut cultivators were not benefitted by the regulator. Fishermen community, coir workers, shell collectors were all adversely affected by the regulator.

A study conducted to develop an integrated system model involving crop, livestock and fish under Kuttanad condition indicated interesting results. The interspace available under coconut garden can be utilized for growing banana, yams etc. Fodder grass can be grown on the fringes of the bunds where coconuts are grown. A single cow can be maintained at the rate of 2500 m<sup>2</sup> area of coconut garden in addition to the above crops. The cowdung obtained from this cow (5 tons) is sufficient for manuring 83 coconut palms, 200 banana and 100m<sup>2</sup> area fodder and 400 yams. The intervening channels can be efficiently utilized for fish culture. When compared to monoculture of coconut, the system resulted in an increase of 157 per cent in net profit.

## Farm Revenue

Receipt — 7.89 lakhs

## Important visitors

Name and designation	Date
Sri. Remesh Chennithala M. P.	17-6-1995
Sri. T. K. Ramakrishnan, MLA	17-6-1995 and 13-11-1995
Dr. N. Mohanakumaran, Director of Research, KAU	-do-
Dr. V. G. Thampy, Land Use Commissioner	-do-
Dr. D. T. Roy, Senior Scientist, ICAR	-do-
Dr. R. S. Ramamurthy, Zonal Co-ordinator, KVK	-do-
Dr. E. Tajudeen, Director of Extension, KAU	-do-
Sri. P. H. Kurien, IAS, District Collector, Kottayam	10-1-1996
Sri. Saji Olikkara, District Panchayat President	10-1-1996
Sri. P. O. Thomas, DPP, KAU	12-1-1996
Member, General Council of KAU	17-1-1996
Dr. Vincenzo, Cumo, Prof. of Plant Pathology, Research Department, Italy	18-3-1996

## II) RICE RESEARCH STATION, MONCOMPU

Rice Research Station, Moncompu is located at Moncompu, Thekkekkara of Champakulam Panchayat in Kuttanad Taluk of Alappuzha district. The station was started in the year 1940.

### Mandate

To take up work on the location specific research needs of rice in 'Kuttanad. The main objectives of the station are given below.

Evolving high yielding varieties with multiple resistance to pests and diseases.

Standardisation of management practices so as to increase productivity.

Formulating integrated management practices to control weeds, pests and diseases.

Evolving low cost production technology for Kuttanad.

Dr. L. Remadevi, Professor (Pl. Path.) functioned as Head of the station during the period under report.

### Staff position

Category	No. of posts		Vacant
	Sanctioned	in position	
1	2	3	4
<i>Scientific staff</i>			
Research on Rice			
Assoc. Professor (Agronomy)	1	1	—
Asst. Professor (Entomology)	1	1	—
Asst. Professor (Chemistry)	1	1	—
Asst. Professor (Botany)	1	1	—
Jr. Statistician	1	1	—
AICRIP Centre, Moncompu			
Asst. Professor (Botany)	1	1	—
Asst. Professor (Agronomy)	3	2	1
Asst. Professor (Entomology)	1	1	—
NARP			
Professor (Plant Breeding)	1	1	—
Assoc. Professor (Entomology)	1	1	—
Asst. Professor (Plant Pathology)	2	2	—
Asst. Professor (Plant Breeding)	1	—	1
Asst. Professor (Plant Physiology)	1	—	1
Asst. Professor (Ag. Chemistry)	1	1	—



1	2	3	4
<i>Paratechnical staff</i>			
Farm Supervisor (Grade I)	2	2	—
Farm Asst. (Grade II)	2	2	—
<i>Administrative and supporting staff</i>			
Administrative Assistant	1	1	—
Section Officer	1	1	—
Senior Grade Assistant	3	3	—
Assistant Grade I	1	1	—
Senior Grade Typist	1	1	—
Lab. Asst. Gr. III	1	1	—
Sweeper-cum-Attender	2	1	1
Watchman	1	1	—
Jeep Driver	1	1	—
Boat Driver	1	1	—
Lab. Asst. Gr. I	1	1	—
Lab. Assistant Grade III	3	3	—
Boat Driver	1	1	—

#### Seminars/workshops attended by the staff

Name of person	Name of seminar/ workshop	Location	Date
Smt. P. Krishnakumariamma, Junior Statistician	International seminar on women	CUSAT, Kochi	25-28 August, 1995

#### Involvement of staff in Academic programmes

Dr. P. S. John, Associate Professor functioned as Major Advisor of two M. Sc (Ag.) students, one each from College of Horticulture, Vellanikkara and College of Agriculture, Vellayani.

Dr. Sumam Susan Varghese, Associate Professor was a member of the Advisory Committee of one M.Sc (Ag.) student of College of Agriculture, Vellayani.

Smt. Reena Mathew, Assistant Professor was a member of the Advisory Committee of one M.Sc (Ag.) student of College of Agriculture, Vellayani.

## Research

The project/experiments taken up during the year under report in the station is as follows:

ICAR (AICRIP)	18
KAU Non-Plan	19
KAU Plan	2
ICAR Adhoc	1
Total	<u>40</u>

## Major research achievements

Use of Pheromone trap was observed to be an effective method for surveillance and mass trapping of yellow stem borer moths.

Anilophos applied at 6 days after transplanting rice @ 0.4 to 0.53 kg ai/ha proved to be the best chemical for weed control and grain yield.

Skipping of either N alone or both P and K for 20 seasons resulted in significant yield reduction than the normal recommended dose.

## Farm Revenue

Receipts — 2.72 lakhs

## Important visitors

Dr. Sanjoy S Kaliyar, Scientist IRRI	— 13-9-95
Dr. S Rajamany, Scientist, CRRI, Cuttack	— 13-9-95
Sri. M Balakrishnan, Secretary, Ministry of Agriculture; New Delhi	— 16-11-95

## iii) RICE RESEARCH STATION, KAYAMKULAM

Rice Research Station, Kayamkulam is located in the Kayamkulam Municipality of Alappuzha district, one km east of Kayamkulam town, on the northern side of Kayamkulam-Punalaur road.

The station was established in the year 1937 under the erstwhile University of Travancore. It was subsequently transferred to the Department of Agriculture in 1958 and continued to function under the Department of Agriculture till 31-1-1972. With the formation of Kerala Agricultural University, this station has become one of its constituent units with effect from 7-2-1972. The major objectives of the station are given below.

Evolving high yielding varieties of rice, sesamum and pulses suitable for the sandy tract of Onattukara region.

Formulating improved agricultural technologies and plant protection measures for the cultivation of rice, sesamum, pulses and vegetables.

Conducting training to the personnel of the Agriculture Department and farmers of the region to impart latest agro-techniques in the cultivation of the above crops and also mushroom.

Conducting adaptive trials and demonstrations of research findings and improved cultural practices in the cultivators' field.

Adopting nearby villages and demonstrating the improved agricultural practices and research findings developed at this centre, through Village Adoption Programme and Frontline Demonstrations.

Dr. K Sivan Pillai functioned as Professor and Head during the period.

**Staff position**

Category	No. of posts		Vacant
	Sanctioned	in position	
<i>Scientific staff</i>			
ICAR			
Assoc. Professor	1	1	—
Asst. Professor	1	1	—
ICAR-ECF			
Asst. Professor	1	1	—
KAU			
Assoc. Professor	2	2	—
Asst. Professor	3	3	—
b. <i>Administrative and supporting staff</i>			
Research on rice			
Administrative Assistant	1	1	—
Sr. Gr. Asst.	1	1	—
Asst. Gr. I	1	1	—
Typist Gr. I	1	1	—
Peon	1	1	—
Watchman	2	2	—
Driver (LDV)	1	1	—
Full-time Sweeper	1	1	—
Lab. Asst. Gr. III	2	1	1
Farm Supervisor Gr. I	1	1	—
Farm Asst. Sr. Gr.	1	1	—
Farm Asst.	2	2	—
Regular Mazdoor	2	2	—
AICRP on Oil seeds			
Lab Asst. Gr. II	1	1	—
Farm Asst. Gr. II	1	1	—
NARP Phase II			
Tractor Driver	1	1	—
Total	28	27	1

### Involvement of scientific staff in Academic programme

Dr. K Sivan Pillai served as member of the Advisory Committee of one Ph. D. student of College of Agriculture, Vellayani.

Dr. P Sushamakumari, Assistant Professor continued as the Chairman of the Advisory Committee of one M. Sc. (Ag.) student of College of Agriculture, Vellayani.

Smt. M Indira, Asst. Professor worked as the member of the Advisory Committee of one M, Sc. (Ag.) student of College of Agriculture, Vellayani.

### Details of Seminars Symposia/Training attended by staff

Name of Scientist	Details of Seminars/ workshops/symposia	Venue	Date
Dr. Syam S Kurup	Summer Institute on Production, Protection and Post harvest technology of horticultural crops	CIHNP, Lucknow	4th Oct. to 4th Nov., 1995
..	Training on Plant tissue culture	NCL, Poone	23rd Nov. to 7th Dec. 1995.

### Research

The projects experiments taken up during the period is as follows:

ICAR (AICRIP on oil seeds)	8
KAU Plan	12
KAU Non-Plan	9
Total	29

### Major Research Achievements

Cul-8781 and P-22 were identified as suitable varieties of rice for second crop season in Onattukara.

The sesame cultures 10-3-2 and 5-2 were identified as most promising for summer rice fallows of Onattukara. The average yield of these cultures are 570 and 530 kg/ha. respectively.

The ocimum trap was found effective in trapping large population of fruit flies in Mango. Effective management of fruit flies is possible by adopting a method of keeping Ocimum leaf extract with Carbofuran and a bait spray with malathion 0.1% and 2% sugar at monthly intervals.

### Farm Revenue

Receipts

— Rs. 4.5 lakhs

#### iv) RICE RESEARCH STATION, VYTTILA

The Rice Research Station, Vyttila is situated in a representative site in the centre of pokkali tract. This station started functioning during the year 1958 in a leased land in Kunnara and was changed to the present site in 1963. This station was taken over by the Kerala Agricultural University in 1974. Taking into accounts the importance of fish/prawn culture during the saline phase, a unit for fisheries research was established during 1976. Now this station has a total area of 8.91 ha. An area of 5.25 ha. of wetlands is utilised for field experiments and seed production programme of pokkali rice and 3.05 ha. for fisheries work.

In March, 1982 the station was brought as a sub centre under National Agricultural Research Project of the special zone of problem area. The main objectives of this station are:

- 1) To evolve high yielding saline tolerant rice varieties suited to the pokkali ecosystem and to find out sustainable and ecofriendly agronomic practices for the cultivation of rice in this area.
- 2) To evolve cropping system practices by which the annual income per unit area can be increased to the optimum level by adopting integrated farming of rice, fish and prawn in pokkali lands.
- 3) To evolve sustainable and ecologically viable cultural practices for fishes and prawns in brackishwater ponds.

Sri. K Chandrasekharan Nair, Assoc. Prof. (Soil Sci.) officiated as the Head of the Station during the period under report.

#### Staff

Category	Sanctioned	In position	Vacant
	1	2	3
a) <i>Scientists</i>			
Professor	2	1	1
Assoc. Professor (Agronomy)	1	1	—
Assoc. Professor (Aqua)	1	1	—
Asst Professor ( „ )	1	0	1
Asst. Professor (Pl. Br.)	1	0	1
b) <i>Para technical</i>			
Farm Supervisor Gr. I	1	1	—
„ Gr. II	1	1	—

	1	2	3	4
Farm Asst Gr. I	1	1	1	—
" Gr. II	1	1	1	—
Lab Asst. Gr. III	1	1	1	—
Driver Gr. II	1	3	2	1
Fisherman cum Watchman	1	—	—	1
Pump Operator	1	—	—	—
<b>Administrative</b>				
Administrative Asst.	1	1	1	—
Asst. Gr. I	1	1	1	—
Sr. Gr. Asst.	1	1	1	—
Typist Gr. I	2	2	—	—
Peon (Hr. Gr.)	1	—	—	1
Watchman	1	—	—	—

#### Involvement of staff in Academic programme

Three Agricultural Research Trainees from the NAARM, Hyderabad were given an intensive training from 10-10-95 to 25-12-95 on Pokkali farming system and related fields.

Details of seminars/symposia/training programme attended by the staff

Name and Designation	Details of Seminar/ Workshop	Venue	Date
Dr. CG Rajendran	National symposium on Technological advancement in fisheries	CUSAT Kochi	5th to 7th Dec, '95

#### Research

The projects/experiments in operation during the period were as follows:

ICAR (AICRIP)	1
KAU Plan	1
KAU Non-Plan	8
Total	<u>10</u>

#### Major Research achievements

The long term fertilizer trials conducted at this station revealed that the Pokkali soils are inherently fertile and hence are capable of producing yields upto 3.0-3.5 t/ha of paddy without the application of chemical fertilizers.

An evaluation of fertilizer response and production potential of promising saline tolerant cultures of rice, revealed that the Vyttila varieties/cultures have a production potential of 3-4 t/ha. Most of them especially Vyttila-2 do not require chemical fertilizers to realise these yield levels.

Studies on modifying the land preparation methods of Pokkali rice revealed that conventional land preparation method of mound formation can be dispensed with if sowing is done one or two weeks before the onset of monsoon. Instead of mound formation which is laborious and costly, ridges spaced at 60 cm apart can be formed. Formation of ridges can be done mechanically utilising ridges mounted on a power tiller.

The variety evaluation committee of the Kerala Agricultural University approved the release of Cul. 655 an induced mutant of the popular variety Mashuri for cultivation in the Pokkali tract.

In the comparative yield trial of promising lines/cultures obtained from the International Rice Saline and Alkaline Tolerant Observational nursery, the cultures 1026 and 1734 out yielded the check variety - Vyttila-4.

Two series of International Rice Saline and Alkaline Tolerant Observational nursery were evaluated during the year in which the entry Nos. 95-121, 94-120 and 94-122 were found to be very promising for the pokkali area.

The effect of tidal action on the fertility and other chemical properties of pokkali soils was worked out. It was found that the tidal flow has a significant effect on regulating the pH, accretion of organic carbon and available potassium and sodium in pokkali soils. The increase in organic carbon, available potassium and exchangeable sodium due to tidal action was found to be 16, 123 and 1881%, respectively, over a controlled water regime.

For maintaining a brooder stock of *Etroplus suratensis* in ponds, a density of 2000 nos/ha was found to be satisfactory. For collecting the seed without any injury, the seed collecting device using coconut leaf basket and rind netting was found very efficient. When cast netting is done for collecting the seed, large scale mortality occurs, when the young ones hide in the pond silt for escaping from the net operation. Hence the new device developed has a definite edge over cast netting.

#### Farm Revenue

Receipts — 1.75 lakhs

### Important visitors

Mr. S. O. Banko, Director General, Ministry of Agriculture and Rural Development, Ondo State, Nigeria visited the station on 26-2-86.

### v) SUGARCANE RESEARCH STATION, THIRUVALLA

The Sugarcane Research Station, Thiruvalla, was established during the year 1976, with the complete assistance from ICAR under the All India Co-ordinated Research Project on Sugarcane. The Kerala Agricultural University strengthened the research efforts of this station during 1979 by providing more infrastructural facilities and manpower. The research programmes were later strengthened by the funds provided by NARP Phase II from 1988 and VIII plan from 1991 onwards.

The Sugarcane Research Station, Thiruvalla is located at Kallunkal in the Nedumpuram Village, 5 kms away from Thiruvalla town. It is situated at 9.5° E longitude at an elevation of 25.14 m above the MSL on the banks of Manimala river, a tributary of Pampa river, in the Pathanamthitta district.

Smt. S. Santhakumari, Professor continued as the Head of the Station.

### Staff

Category	No. of posts		Vacant
	Sanctioned	In position	
<i>Scientific</i>			
Professor	1	1	—
Assoc. Professor	2	2	—
Asst. Professor	4	4	—
<i>Paratechnical</i>			
Farm Supervisor	1	1	—
Farm Assistant (Gr. II)	1	1	—
Farm Assistant Gr. I)	1	1	—
<i>Administrative</i>			
Administrative Assistant	1	1	—
Assistant (Gr. I)	1	1	—
Assistant (Gr. II)	1	1	—
Typist (Gr. II)	1	1	—
Driver	1	1	—
Peon	1	1	—
Watchman	2	1	1
	1	1	—



Details of seminars symposia training programmes attended by the staff

Name & Designation of Scientist	Details of symposia/workshop	Venue	Date
Dr. D. Alexander Assoc. Professor and Sri. K. Sreekumar, Asst. Professor	All India Workshop of AICRP on sugarcane	IISR, Lucknow	8-11 Nov., '95
Dr. D. Alexander Assoc. Professor	Quinquennial Review meeting of AICRP on Sugarcane Breeding Institute, Coimbatore	Sugarcane Breeding Institute, Coimbatore	15-16 Sept., '95
Dr. D. Alexander Assoc. Professor	National Seminar on BGA and Azolla	TNAU, Coimbatore	21-22 Dec., '95

### Research

The experiments/projects in operation in the station during the period under report was as follows:

ICAR	14
KAU Plan	2
KAU Non-Plan	17
Menonpara	2
Total	<u>35</u>

### Research Highlights

The Kerala Agricultural University released two high yielding sugarcane varieties from the elite clones produced in this station. Madhuri is now a popular variety among sugarcane cultivators, Madhuri is a high yielding (116 MT to 124 MT per hectare), midlate maturing variety (12 months) moderately resistant to red rot disease and is suitable for flood prone and garden land situation.

The variety Thirumadhuram is a midlate maturing high yielding variety with an average yield of 104 T and 133 T respectively in the garden land situation in South Kerala and semi arid tracts of Palakkad district.

A superior variety Madhurima (Co 1527/85) has been accepted by the Kerala Agricultural University Variety Release Committee.

Studies on the suitability of varieties for jaggery production revealed that Co 88121 and Co 88017 have got high jaggery recovery compared to other released varieties of KAU and Co varieties. These varieties are promoted for farm trials along with Madhuri as check.

Agronomic evaluation of sugarcane genotypes revealed that Madhuri and Co 88017 were the most suitable varieties for the southern districts of Kerala. A delay in planting by one month from January 15th caused 21.7% reduction in cane yield.

Soil application of Azospirillum @ 5 kg/ha along with 275 kg ha of N was found comparable with 225 kg N/ha in cane yield in Menonpara.

Use of pressmud @ 4 T/ha along with 75% of recommended N was found be on par in cane yield with that receiving 100% N dose.

Results of herbicidal trials conducted at Menonpara proved that weed growth in sugarcane can be economically controlled by application of Atrazine @ 2 kg ai/ha three days after planting as pre-emergence.

An improved genotype of snake gourd 'Kaumudi' was released. The variety gives an average yield of 50 t/ha. Its white colour with thick flesh and less fibre content has great acceptance among farmers. In bitter gourd a high yielding type 'Priyanka' has been accepted by the Kerala Agricultural University release committee which out yield Priya and MC 34. The average yield is 28 tonnes/ha.

#### vi) AICRP ON AGRICULTURAL DRAINAGE, KARUMADY

The project viz., All India Co-ordinated Research Project on Agricultural Drainage under Actual Farming Conditions on Watershed basis is being implemented in 'Kavil Thekkumpuram Padasekharam', a part of Kuttanad situated in Ambalapuzha village and taluk of Alappuzha district. The scheme has come into effect from 1-12-1981 and was sanctioned for the 6th, 7th and 8th plan period.

The objectives and thrust areas of research are given below:

- 1) To comprehend the effect of a surface and sub-surface drainage system on the movement of soil liquids.

- 2) To study the pattern of hydrological cycle occurring in the watershed areas and its importance and influence on the drainage.
- 3) To develop a feasible technology for the lay out of sub-surface drainage system suitable to peak and muck soils.
- 4) To develop criteria for design parameters of surface drainage.
- 5) To develop drainage pattern requirement for different crops.
- 6) To evaluate the feasibility of using the return flow from drainage for irrigation in relation to water quality rating.
- 7) To evaluate the socio-economic benefits acquired from the drainage projects.

Sri E. K. Mathew functioned as Head of the station during the period under report.

#### Staff position

Category	No. of posts		Vacant
	Sanctioned	In position	
<i>Scientific</i>			
Assoc. Professor (Ag. Engg.)	1	1	—
Asst. Professor (Agron.)	1	1	—
Asst. Professor (Ag. Engg.)	1	1	—
<i>Paratechnical</i>			
Farm Asst. (Sr. Grade)	1	1	—
Farm Asst. (Gr. II)	2	2	—
Overseer (Civil)	1	1	—
Draftsman	1	1	—
Lab. Asst. (Gr. II)	1	1	—
Technician (Gr. II)	2	1	1
<i>Administrative</i>			
Section Officer	1	1	—
Assistant (Gr. I)	1	1	—
Typist (Gr. II)	1	1	—
Driver (Gr. II)	1	1	—
Peon	1	—	1
Watchman	2	2	—

### Faculty Improvement programme

Scholarship/deputation of staff for higher studies:  
Sri. E. K. Mathew, Asst. Professor (Ag. Engg.) deputed for Ph. D programme at IIT. Khoragpure.

### Research

Three ICAR (AICRP) projects were in operation during the period under report.

### Research achievements

The results of the effect of sub-surface drainage on crop performance revealed that there was significant increase in grain yield due to sub-surface drainage. The results indicated that partial pumping would be sufficient for attaining significant increase in grain yield during the additional crop season when there is well distributed rainfall.

On evaluation of filter tubes it was informed that no filter material is essential for heavy soils of Kuttanad.

### Important visitors

Dr. K. R. Sharma	:	February 1996
Dr. R. K. Ghosh, Scientist, BCKVV, Kalyani, West Bengal	:	March 1996
Dr. A. K. Sinha Scientist, Water Tech. Centre, IARI, New Delhi	:	-do-
Dr. A. K. Singh, Scientist, Water Tech. Centre, IARI, New Delhi	:	-do-

### vii) E. C. F. UNIT - KAYAMKULAM

The on-farm Research Unit is the field testing unit of cropping systems research project. The ECF unit started in 1971 has functioned in different districts all over the state. This unit has been functioning in Thrissur district from 1988 onwards with its headquarters at Mannuthy. The scheme completed five years by 1993 and was shifted to Kayamkulam with effect from 2/6'93.

The project took a new turn by 1990. As against the earlier concept of same type of experiments all over the nation, now on-farm research work is done on location specific problems and the area of operation is the NARP zone. The project will help to refine and develop location specific need based technologies and will help in confirmation of advanced technologies under actual farming situation. Sri. Abraham Varghese, Assoc. Professor (Agronomy) functioned as the Head of the unit.

The main mandate of this unit is conducting onfarm trials in Onattukara, Kuttanad areas of the NARP special zone; mainly on food crops, oilseeds and pulses.

Categories	Sanctioned	In position	Vacant
a) <i>Scientific staff</i>			
Assoc. Professor	1	1	—
b) <i>Technical Staff</i>			
Farm Assistant	6	6	—
c) <i>Administrative and Supporting Staff</i>			
Typist	1	1	—
Driver	1	1	—
Watchman	1	1	—

#### *Faculty improvement programme*

- 1 New post sanctioned/created/shifted—Nil
- 2 Scholarship awarded to staff/deputation of staff for higher studies —Nil

#### *Details of Seminars/symposium/training attended by staff*

NARP Zonal Workshop at RARS, Kumarakom on 7th February 1996.

#### *Involvement of staff in Academic programmes*

Training of students final B.Sc (Ag).

#### **Major Research Achievements**

##### *Onattukara region*

Application of Vermicompost, or dual culture of cowpea and incorporation of 30 DAS or Azospirillum was able to substitute 25 per cent of N requirement in Kharif rice. In rabi also vermicompost and Azospirillum were promising.

Weed management trials recommends pre-emergence spray of oxyfluorfen 0.1 kg or butachlor 1.0 kg/ha. followed by handweeding on 30 DAS for dry sown kharif rice.

Application of cowdung or coir pith @ 5t/ha. gave maximum yield of summer sesamum and cowpea respectively in rice fallows of Onattukara.

##### *Kuttanad region*

Integrated nutrient management trials in rice proved that 25% N can be substituted by Azospirillum during kharif season, but in summer the results were not promising.

Minimum tillage technique in rice proved that ploughing gave maximum yield in karapadam, in kharif and sowing after weed removal in kari lands and in karapadam in summer.

### Farm revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	Rs. 173/-	5,10,925

### Important Visitors

Sl.No.	Name and designation	Purpose	Date of visit
1	Dr. R. L. Yadav, Project Director, PDSR, Modipuram	Visit Inspection office and field	20-1-1996
2	Dr. Seva Ram, Project Co-ordinator, PDSR, Modipuram	" "	" "

## CENTRAL ZONE

The three revenue districts located in Central Kerala viz., Palakkad, Thrissur and Ernakulam constitutes the Central zone. The high ranges (Attappady and Nelliampathy hills) of Palakkad, Kole lands of Thrissur and coastal saline areas (Pokkali) of Ernakulam are however excluded. There are 17 taluks, 44 development blocks and 274 Panchayats in the zone. The region lies between 9°47' and 11°16' north latitude and between 75°52' and 76°50' east longitude.

South West monsoon contributed nearly three-fourth of the annual precipitation in the region. The highest average rainfall was received by Ernakulam, among the other districts. Eruthiampathy and the surrounding areas in the Palakkad district is a typically dry farming area with very low annual rainfall. All the districts experiences drought of varying magnitude from December to May and the most severely affected districts is Palakkad. The mean maximum and minimum temperatures experienced in the Central Zone are 31.4°C and 21.1°C respectively. The average relative humidity is around 70 per cent. It may go as low as 40 per cent in Palakkad district during December to March due to the blowing of hot ghats air from Tamil Nadu through the Palakkad gap in the western

Majority of the soils in the zone are lateritic in nature, coastal alluvium, riverine alluvium and brown hydromorphic soils are also seen in many pockets. Hydromorphic saline soils and acid saline soils are found in the coastal tracts and black soils in the Chittoor taluk.

The following Agricultural Research Stations are located in the Central Zone.

- 1 Regional Agricultural Research Station, Pattambi
- 2 Cashew Research Station, Anakkayam
- 3 Agricultural Research Station, Mannuthy
- 4 Cashew Research Station, Madakkathara
- 5 Banana Research Station, Kannara and Pineapple Research Centre, Vellanikkara
- 6 Agronomic Research Station, Chalakudy
- 7 Aromatic and Medicinal Plants Research Station, Odakkali
- 8 Pineapple Research Station, Vazhakulam

#### I. REGIONAL AGRICULTURAL RESEARCH STATION, PATTAMBI

The station started functioning in 1927 with the name Paddy Breeding Station in an area of 33.28 ha and the then mandate was to improve the local bodies of the erstwhile Madras Presidency. With the intensification of research activities in other crops such as cotton, sugarcane, sesamum, pulses and oil seeds, the station was renamed as Agricultural Research Station, in 1930. With the acquisition of 30.36 ha of land in 1945 additionally, the research activities of the station were further intensified. With the reorganisation of 30.36 ha of land in 1945 additionally, the research activities of the station were further intensified. With the reorganisation of the rice research set up in Kerala in 1972, the station was elevated as the Central Rice Research Station for the state of Kerala. The station was inherited by the Kerala Agricultural University when it was formed on February 1, 1972. The station was elevated as the Regional Agricultural Research Station for Central Zone with the implementation of the National Agricultural Research Project (NARP) in 1981.

The total acreage of the research farm is 63.64 ha. All the major rice soils of Kerala viz., modan (rainfed upland), palliyals (single cropped rainfed lowland) and double cropped lowlands are represented in the farm.

The lead functions are rice, pulses, oil seeds and rice based farming systems.

A seed testing laboratory was established under the station in 1966 which was later nominated as the State Seed Testing Laboratory according to the provisions of the Seed Act, 1969. An A class Agricultural Meteorological Observatory started in 1948, is functioning as a part of this station.

The soil texture of the farm is predominantly sandy loam and loam. The soil pH ranges from 5.2 to 5.8. Majority of the crops in the farm are rainfed. However, supplementary irrigation is given to rice during second crop seasons after withdrawal of north east monsoon. Vegetables are raised in summer under irrigation. One block of coconut plantation was irrigated using drip system. The station receives an average rainfall of 2550 mm, of which 66%, is received from South-West monsoon (June-September), 19% from North-East monsoon (October-January) and 15% from summer rains (January-April).

The station has so far released 53 rice varieties. Of this 37 strains were evolved through pureline and mass selection and the remaining through hybridisation and selection. The two high yielding cowpea varieties released by the station are Ptb-1 (Kanakamany) and Ptb-2 (Krishnamany).

Dr. N. Krishnan Nair, Associate Director of Research functioned as the Head of the station during the report period.

Scheme		Sanctioned	In position	Vacant
1		2	3	4
Non plan A				
Assoc. Professor		2	—	2
Botany	(1)			
Chemistry	(1)			
Asst. Professor		2	1	1
Plant Pathology	(1)			
Agronomy	(1)			
Asst. Professor		4	—	4
Total		8	1	7



	1	2	3	4
<b>NARP I</b>				
Professor		2	1	1
Plant Breeding (1)				
Soil Science (1)				
Assoc. Professor		4	—	4
Agronomy (2)				
Agrl. Engineering (1)				
Agrl. Economics (1)				
Asst. Professor (10)				
Agronomy	1	—	—	1
Soil Science	2	1	1	1
Agrl. Extension	1	1	1	—
Agrl. Economics	1	—	—	1
Horticulture	1	1	1	—
Biochemistry	1	—	—	1
Entomology	1	1	1	—
Plant Breeding	1	—	—	1
Agrl. Engineering	1	—	—	1
<b>Total</b>		<b>16</b>	<b>5</b>	<b>11</b>
<b>NARP II (Non plan)</b>				
Asst. Professor (3)				
Horticulture	1	1	1	—
Agrl. Engineering	1	1	1	—
Animal Science	1	—	—	1
<b>NSP—BSP</b>				
Asst Professor	1	1	1	—
<b>AICRIP</b>				
Assoc. Professor (4)				
Plant Breeding	1	1	1	—
Agronomy	1	1	1	—
Pathology	1	1	1	—
Entomology	1	1	1	—
Asst. Professor				
Plant Breeding	2	—	—	—
Agronomy	1	1	1	—
Pathology	1	1	1	—
<b>Total</b>		<b>8</b>	<b>8</b>	
<b>AICRP ON ARID LEGUMES</b>				
Assoc. Professor		2	2	—
Agronomy (1)				
Plant Breeding (1)				
<b>Grand Total</b>		<b>37</b>	<b>18</b>	<b>19</b>

*Administrative/Supporting/Para-technical/Ministerial/Other posts*

Scheme	Sanctioned	In position	Vacant
<b>Non plan A</b>			
Section Officer	4	4	—
Assistants	9	7	2
Senior Office Supdt.	1	1	—
Typist	2	2	—
Lab. Assistant	5	3	2
Driver (HDV)	1	—	1
Peon	3	3	—
<b>Non plan B</b>			
Senior Farm Supervisor	1	1	—
Farm Supervisor	2	1	1
Farm Assistant	5	4	1
Technician	1	1	—
Tractor Driver III	1	—	1
Regular Mazdoor	6	6	—
Class IV	7	7	—
Watchman	4	4	—
<b>NARP I</b>			
Administrative Officer	1	1	—
Typist	2	2	—
Duplicator Operator	1	1	—
Lab. Asst. Gr. II	1	1	—
Driver (LDV)	1	1	—
Tractor Driver	1	—	1
<b>NARP II (Non plan)</b>			
Farm Supervisor (V)	1	1	—
Technician	1	1	—
Asst. Gr. II	1	—	1
<b>AICRIP</b>			
Farm Assistant Gr. I	4	4	—
Driver	1	1	—
Tractor cum Jeep Driver	1	—	1
<b>AICRP On Guar (Arid Legumes) Pulses</b>			
Farm Assistant (Agri) Gr. II	2	2	—
Assistant Gr. I	1	1	—
Typist Gr. II	1	1	—
Lab. Asst. Gr. II	1	1	—
Peon	1	1	—
<b>NSP—BSP</b>			
Technical Assistant	2	—	2
Field/Lab. Assistant	1	1	—
Driver	1	—	1

One post of Assistant Professor (S. Sci) shifted to College of Agriculture, Nileswar w.e.f. 28-12-95 (No. GA/C3/45962/95(ii) dt. 13-12-95)

One post of Assistant Professor (Agro.) shifted to College of Agriculture, Nileswar No. GA/C3/2309/96 dt. 19-12-96.

**Scholarships awarded to staff/deputation of staff for higher studies**

Name and designation	Details of deputation	Name of University to which deputed
C. R. Elsy Asst. Professor	Study leave for 3 years w.e.f. June 94	Ph.D. programme at TNAU, Coimbatore
Rehumath Niza T.J. Asst. Professor	Joined duty on the FN of 8-6-95	Completed the Ph.D. programme at TNAU, Coimbatore
Sreenivasan, E. Asst. Professor	Continuing Ph.D. programme in Plant Breeding and Genetics	Kerala Agricultural University on part time basis
T. K. Bridgit Asst. Professor	Study leave for Ph.D. programme w.e.f. 19-9-94	Kerala Agricultural University

**Details of seminars/symposia/training attended by staff**

Prof. V. P. S. Dev	<p>Attended the All India Annual Research Rice Group Meeting held at DRR, Rajendranagar, Hyderabad on 9-12 April, 95.</p> <p>Attended the pre-season workshop of departmental officers of Palakkad district</p> <p>Attended the Zonal Research and Advisory Committee Meeting held at RARS, Pattambi on 8-3-96 and presented the research results of Plant Pathology experiments</p> <p>Attended the Package of Practices Meeting, 1996.</p> <p>Attended the 48th F.R.C. meeting at Headquarters, Vellanikkara.</p> <p>Attended group meeting of seeds on 6-6-95.</p>
Dr. P. B. Gopinathan	<p>Attended 48th FRC meeting. Attended Malappuram T &amp; V workshop. Took class to the farmers on 'Chingam-1'. Attended T&amp;V workshop of Malappuram district.</p>

Dr. L. Nadarajan

Attended the All India Annual Research Rice Group Meeting held at DRR, Rajendranagar, Hyderabad on 9-12 April, 1995.

Participated in the karshika seminar organised on the eve of Chingam 1 (18-8-95) at Karimpuzha and given lecture on Integrated pest management in coconut and rice.

Participated in the plant protection coordination group meeting of KAU held at Agriculture College, Vellayani, Thiruvananthapuram.

Attended the National Seminar on Pheromone Technology by British Council/SPIC and presented a research paper between 29th November to 1 December '95.

Attended Zonal Research and Advisory Committee meeting and presented entomology experiments.

Attended package of practices meeting 1996 and three proposals given were approved for inclusion in the POP.

Dr. Jose Mathew

Attended the All India Annual Research Rice Group Meeting held at DRR, Rajendranagar, Hyderabad on 9-12 April, '95.

Attended the mini workshop on Package of Practices Recommendations (Crops) at Vellanikkara on 25-4-95 and presented the proposals for the station in Agronomy and Entomology.

Attended the P.C. group meeting on Agroforestry on 31-7-95 held at College of Forestry, Vellanikkara.

Attended the 48th Faculty Research Committee meeting held at RARS, Pattambi on 6-7, October '95.

Attended the district level meeting convened to discuss agricultural development plans of Palakkad dist. held at Collectorate, Palakkad on 7-12-95.

Attended the workshop on POP (Crops) held at Vellanikkara on 15-16 January, '96 and presented three recommendations on rice agronomy which were all accepted for inclusion in the revised volume on POP (Crops).

Attended the T & V workshop of Malappuram district for February, '96 on 8-2-96.

Attended the 18th ZREAC meeting of Central Zone at RARS, Pattambi on 8-3-96.

Smt. Gracy Mathew

Attended the Eighth Kerala Science Congress held in Kochi from 27-29 January, '96.

Dr. S. Leenakumary

Attended the All India Annual Research Rice Group Meeting held at DRR, Rajendranagar, Hyderabad on 9-12 April, '95.

Attended training on Hybrid Rice Seed Production Technology on 9-14 October '95.

Attended the 48th Faculty Research Committee meeting held at RARS, Pattambi on 6-7, October '95. Attended Eighth Kerala Science Congress (27-29 January '96).

Smt. Kanakamany

Attended the 48th Faculty Research Committee meeting held at RARS, Pattambi on 6-7, October '95.

Smt. Tessy Joseph

Attended the 48th Faculty Research Committee meeting held at RARS, Pattambi on 6-7, October '95.

Smt. Valarmathy, G.

Attended the 48th Faculty Research Committee meeting held at RARS, Pattambi on 6-7 October '95. Attended training on "Hybrid technologies in different crops" (7-28 February '96).

Dr. T. E. George

Attended the Eighteenth Zonal Research and Extension Advisory Committee Meeting held on 8-3-1996 and presented the results of research projects pertaining to Division of Horticulture. Two conclusive results were approved in the meeting and were recommended for Farm Trials.

Dr. P. Rajendran

Attended the district level meeting convened to discuss Agricultural development plans of Palakkad district held at Collectorate, Palakkad on 7.12.1995 as Organising Secretary

Attended the 48th Faculty Research Committee meeting held at RARS, Pattambi on 6-7, Oct. 1995.

Attended the workshop on POP (Crops) held at Vellanikkara on 15-16 Jan, 1996.

Attended the National Training on Vermiculture (held at TNAU Coimbatore from 12.2.96 to 19.2.96.

Sri. Shaji James, P.

Attended the pre-season paddy workshop held on 17.7.95 at RARS Pattambi.

Participated in the 31st Annual Convention of Indian Society of Agrl. Engineers held at Vellanikkara during 28-30 Dec. 95.

Attended the workshop on problems and prospects of Agriculture in Palakkad Dt. held at Collectorate Conference Hall, Palakkad on 7.12.95.

Participated in Kerala Science Congress held at Kochi during 27-29 January. 1996.

Participated in Zonal workshop of Central Zone held on 8th March, 1996.

### **Involvement of staff in Academic Programmes**

**Dr. T. E. George**

Chairman, Advisory Committee of two Ph.D. students, Smt. M. K. Jessy and Smt. K. B. Sheela working on research projects "Breeding for resistance to mosaic viruses in pumpkin" and "Genetic improvement of bird pepper through selection" respectively.

Member, Advisory Committee of one Ph. D. Student Mr. P. G. Sadhankumar working on the research project "Incorporation of crack resistance to be a bacterial wilt resistant genetic background in tomato"

**Dr. P Rajendran**

Handled the course No. SAC 418 Extension Education (2+1) to the final B. Tech. Student of the KCAET, Tavanur.

Chairman, Advisory Committee of one M.Sc. (Ag.) student at College of Hort., Vellanikkara.

**Sri. Shaji James, P.**

Handled the course entitled "Refrigeration and cold storage" for B. Tech. programme at KCAET, Tavanur.

Handled the course entitled 'Water lifters and pump design' for M. Tech programme at KCAET, Tavanur.

## Research - Major Research Achievements

### Crop Improvement

#### *A-1 Genetic conservation of rice germplasm, collection, maintenance and cataloguing*

Three hundred rice varieties including traditional rice varieties, improved varieties, exotic varieties, and advanced cultures were raised in the field during Kharif '93. Cataloguing of these varieties as per IBPGR-IRTI Descriptor records was carried out.

#### *A.2 Breeding high yielding, tall, Photosensitive varieties with good straw yield, specifically suited for Mundakan season of Kerala*

The experiment was started in 1980-81 with the objective of breeding high yielding tall, season bound rice varieties suited for the Mundakan season of Kerala.

Two photosensitive cultures viz., Cul:87117 and Cul-87136 of the Cross C025/H4 were found to be promising in yield trials at RARS, Pattambi as well as in Multi-locational trials. Farm trials with these two promising cultures were conducted at nine locations in different parts of Kerala during Rabi 1992 and 1994. Cul. 87117 recorded on an average 4660 kg/ha during '92-93 which was 8.9% increase over the check variety and 4260 kg/ha during 94-95 with 41.9% over the check variety respectively. These two cultures and the check varieties were also screened for their reaction to major pests and diseases. (Cul. 87117 was found to be moderately resistant to sheath blight, blast and stem borer. Quality characters of the two cultures were compared with that of Ptb 20, the ruling second crop variety of Palakkad and Ernakulam Districts, where second crop area is maximum. Results revealed that Cul. 87117 was comparable in quality to Ptb.20 the variety which fetches maximum price in Kerala because of its high quality. Cul. 87117 is red kernelled with medium bold grains, characters which are highly preferred by keralites. Considering the grain quality, high yield potential tolerance to pests and diseases and the semi tall nature, this culture was proposed or released to the University Variety Release Committee, Kerala.

#### *A.3 Evolution of high yielding rice hybrids suitable for Kerala (Net work project)*

Five experiments were conducted under this project viz., (1) Evaluation of exotic CMS lines for adaptability, stability for male sterile characters, (2) Identification of maintainers and



restorers for the stable CMS lines (3) Developing indigenous CMS lines through induced mutagenesis, substitution back crossing and wide hybridisation (4) Developing superior rice hybrids for Kerala and (5) Exploiting the high heterosis in *Indica/japonica* hybrids through developing wide compatible CMS lines/restorers. The results obtained so far is presented below:

- 1 Exotic CMS lines identified : IR 58025 A & IR 62829 A  
to be suitable for Kerala in terms of agromorphological characters, tolerance to pests & diseases, floral characters and stability for male sterility
- 2 Effective maintainers : Jyothi, Aiswarya, Mo, 4, Mo. 3, and Mo. 11  
identified and used in back crossing
- 3 Effective restorers identified : Ptb 43, Ptb 47. Mo. 6, ADT 37  
ADT 42, PMK-2 MDU-4
- 4 Superior hybrid combinations identified : 25A/Ptb 43, 29A/Ptb 43, 25A/  
Ptb 47, 29A/Ptb 47, 25A/  
PMK-2
- 5 Wide crosses exhibiting : Ptb 7/DGWG, Ptb 10/Ptb 28  
sterility

#### *A.4 Breeding nonlodging blast resistant varieties suited for dry sown conditions during virippu season*

Combination breeding programme involving PTB 23, a traditional upland variety with drought tolerance and moderately resistant to blast with M 210. non lodging mutant of PTB 10 resulted in isolation of five high yielding, non lodging and blast resistant cultures viz.,  $A_{1-3-1}$ ,  $A_{1-1-3}$ ,  $A_{1-1-2}$ ,  $A_{1-1-2}C_{3-2}$ . Initial yield trials were conducted during Kharif 93, 94 and 95. Promising cultures identified are in the comparative yield evaluation trial. Yield range of the isolated cultures is 3.8–4.3 tons/ha.

#### *A.5 Improvement of rice varieties BR-51, BR-52 and IR-36 for increased consumer acceptability*

Initial Evaluation Trials with ten advanced cultures of the Cross BR 52/Edavaka were conducted during Kharif 93, 94 and 95. Analysis of the data on yield and yield contributing characters indicated that cultures BE-1, BE-3, BE-5 and BE-8 were promising. Comparative yield trials with these cultures is been continued and culture BE-8 is found to be highly resistant to leaf folder on field greening.

#### *A.6 Evolution of semi tall / dwarf types of tall indica rice varieties*

The experiment was started in 1983-84 with the objective of evolving non-lodging dwarf/semi tall mutants of the popular tall indica varieties of Kerala.

In Rabi 1994-95 semi dwarf mutants culture of Ptb-20 were evaluated along with NILA, Cul-87117 and Cul-87136 as checks. The highest yield was recorded by mutant Cul 20-D-1 (4365 kg/ha) and significantly superior to the check variety NILA. The culture was found to mature 35 days earlier than NILA. The grain yield of NILA was recorded by the drought prevailing stage. The experiment has been repeated during Rabi 1995-96 and harvest is in progress.

In Kharif,95 ten cultures which are derivatives from crosses between M2 (Mutant of Ptb 9) and M 210 (Mutant of Ptb 10) were evaluated along with parents and Cul 210-26 i.e. 4208 kg/ha. There was no significant difference among the cultures and checks.

Based on the grain yield in Initial Evaluation Trials, 4 cultures viz. 90.92, 90-05, 210-25 were advanced to comparative yield trial. The checks included are Kairali, Kanchana, Jyothi, Matta Triveni.

#### *A.7 Breeding for varieties resistant/tolerant to sheath blight*

The four progeny rows from the cross Jyothy x 25331 (in F<sub>1</sub> generation) and F<sub>2</sub> of crosses with Jyothi x Zenith with and its reciprocal were artificially inoculated and resistant plants selected and advanced to F<sub>4</sub> generation for further Screening.

#### **AICRIP Trials**

##### *A.8 IVT-Early*

Among the forty eight entries tested the highest yield was recorded by IET No. 14810 (UPR-91-88) (500 kg/ha).

##### *A.9 IVT-Irrigation Mid Early*

Sixty four entries were tested, the treatments showed significant difference among themselves. Highest yield (4916 kg/ha) was recorded by IET No. 14782 (HKR 94-2).

##### *A. 10 Irrigated Mid Early*

Thirty three entries were tested Entry No. 101016 (IET No. 13719) was the highest yielder with 4438 kg/ha.

## **A. II IVT-Irrigated Mid**

Sixty entries were tested, the treatments showed significant difference, the highest yield was recorded by IET No. 14253 i.e. 4487 kg/ha.

### **Crop Management**

#### **Agronomy**

Three new findings on rice agronomy were accepted by the state level workshop for inclusion in Package of Practices (Crops).

#### **Intercropping of cowpea in semi-dry rice**

Cowpea may be raised as an intercrop in dry seeded lowland (semi-dry) rice by sowing 12.5 kg seed/ha along with rice to serve as a source of green manure. When the rice fields get submerged with the onset of SW monsoon, cowpea at the age of about six weeks and at active vegetable stage decays and gets self incorporated in the soil, adding substantial quantity of green manure. Such a system of concurrent growing of cowpea also reduces weed pressure in semi-dry rice

#### **A new herbicide for semi-dry rice**

Pretilachlor is recommended as a broad spectrum pre-emergent weedicide for dry sown low land (semi-dry) rice and it is to be applied at the rate of 1.0 kg a. i./ha.

#### **Increasing N use efficiency of urea**

Coating urea with neem extract (containing) about 5% neem triterpanes) at 1% rate and shade drying for 1 to 1½ hours and then applying in direct seeded puddled lowland rice increase N use efficiency of urea.

The following farm trials were laid out in the farmers' fields of Ernakulam and Thrissur district in rice during the second crop season.

- a) Studies on the efficiency of coating urea with neem extract in wet seeded rice.
- b) Evaluation of new weedicides in wet seed rice.

Studies to investigate the possibilities for bringing down the phosphorus dose in rice indicated significant variation due to varieties and methods of P application but not due to interaction. With regard to varieties, Tulasi recorded appreciably higher yield than Abhaya. Among the methods of P application the highest yield was recorded by basal application of Di-Ammonious Phosphate (DAP) and it was on par with nursery

application of DAP, soil application of PAPR (Partially Acidulated Phosphate Rock) and foliar application of DAP at mid-tillering and boot leaf stages.

From a trial on this evaluation of Partially Acidulated Phosphate Rock (PAPR), it was indicated that application of 30 and 60 kg  $P_2O_5$ /ha as single super phosphate, PAPR 30% and PAPR 50% recorded significantly increased grain yields over no P control but the yields were comparable among these treatments.

Evaluation of new herbicides in dry sown lowland rice indicated that application of anilophos @ 0.4 kg a. i./ha either alone or in conjunction with 2, 4-D application @ 0.6 kg a. i. /ha three weeks after sowing recorded comparable grain yields with that of butachlor 1.5 kg a. i./ha, pretilachlor 1.0 kg a. i./ha and hand weeding. These treatments very effectively controlled weeds in dry seeded rice.

Experiments on weed management strategies for wet sown rice brought out the efficacy of formulation containing mixtures of pretilachlor and butachlor with safener in recording comparable grain yields with that of weed free and hand weeded treatments. Highest grain yield was recorded by the application of butachlor + safener mixture @ 1.5 kg a. i. /ha.

### Soil Science and Agricultural Chemistry

Integrated nutrient management through application of organic and inorganic manures, once again proved to be the best treatment with respect to grain yield and sustaining soil fertility in permanent soil fertility experiments both under dwarf and tall indica rice series.

Continuous application of green alone equivalent to 90 kg N/ha had negative influence on phosphorus utilization by rice plants and P availability in water logged sandy loam laterite soil.

Organic carbon depletion rate from rice soils during the summer fallow period of 3 months accounts to 16.9 to 33.7% depending upon the source of manures applied.

The efficiency of applied N can be increased by reducing the quantity of basal application of N to  $\frac{1}{3}$ rd or  $\frac{1}{4}$ th of the total N requirement without affecting the yield.

## Crop Protection

### Entomology

#### *Screening Trials*

In Kharif 1995, five screening trials for insect resistance was conducted with a total of 406 entries. The split up is as follows: NSN (220 entries), IRGMN (67 entries), GMS (82 entries), GMBT (10 entries) and MRST (27 entries). The pest load was lower in this season.

Two screening trials viz. Leaf folder screening trial and Evaluation of advanced cultures against stem borers were concluded. They were started in 1989. Some of the promising entries for LF resistance are RP lines, Tnaulfer 842713, BPT lings and PTB 12. Some of the promising entries for Stem borer tolerance are RM-1, RM-25 and RM-26.

#### *Insecticide evaluation trial*

In 1995, a new set of formulations of insecticides were tested under Insecticides evaluation Trial (IET). The new products are Marshal 3 G, Chess OP25, Fipronil WG, Fipronil 53 SC, Starthene 75 SP. The new product Fipronil 5 SC was found to be effective in controlling blue beetle, Stem borer (WE) and leaf folder. Marshal 5 G was effective against stem borer and gave higher yield next to Carbofuran. Fipronil occupied third place in yield.

#### *Integrated pest management*

For the effective IPM, new projects were started for identifying some of the components.

##### i) Natural biological control in rice Ecosystem.

This new project was started in 1995 to quantify the effect of natural biological control in rice ecosystem. There were three treatments viz. Scheduled based Plant protection (SBPP), Need based plant protection (NBPP) and Natural biological control (NBCP). The results showed that though the NBC plots showed more gall midge incidence initially, it came down later and was on par with NBPP plots. There was no difference between the treatments regarding the stem borer infestation. But the leaf folder infestation was statistically more in the scheduled based insecticide applied plots. Finally there was no statistical difference in the yield between the treatments. The difference in yield between natural biocontrol plots and schedule based maximum protected plots was only to a tune of 336 kg/ha.

## ii) Sex Pheromone use in Rice pest control

The experiment was started in 1994-95 for testing the efficacy of the sex pheromone traps for yellow stem borer and rice leaf folder. The sex pheromone traps of yellow stem borer was effective. In 1996 a mating confusion experiment with mass trapping technique was conducted in rabi season. There was a 80 percent reduction in the stem borer infestation in the plots, where mass trapping technique is adopted.

## iii) Optimum pest control trial

The resistant and susceptible varieties were grown in insecticide treated and untreated conditions. Cul A 4-1-3 from RARS, Pattambi outyielded all the other entries given from DRR Hyderabad (like Bhuban). It also recorded a lower stem borer incidence, Culture A 4-4-2 was ranking next in yield. Culture A 4-1-3 also showed a lower incidence of stem borer attack.

Based on the findings from Entomology Division the following recommendations were accepted for POP recommendations.

- a) Recommendation of Triazophos @ 0.25 Kg. a. i. ha for leaf folder.
- b) Inclusion of New formulation Quinalphos Aquaflow.
- c) Adhoc recommendation to use Yellow stem borer sex pheromone traps.

## Pathology

### *Screening trials*

Screening rice varieties for blast and sheath blight were taken up under the All India Co-ordinated Rice Improvement Programme and International Rice testing Programme (IRBN 95) In sheath blight screening trial 862 entries were evaluated for resistance against sheath blight. Out of the 228 NSN-1 entries 10 entries were rated as resistant and 82 entries were rated as moderately resistant. Out of 557 NSN II entries, 28 entries were rated as resistant and 176 entries were rated as moderately resistant. In 77 DSN entries, 3 were rated as resistant and 38 entries were rated as moderately resistant.

In blast screening trial, 862 entries comprising 228 NSN-1 557 NSN-II and 77 DSN were sown and disease reaction to blast were recorded. Out of the 862 entries tested, 4 entries were rated as resistant and 102 entries as moderately as resistant to blast.

In the international Rice Blast Nursery (IRBN-95) out of 228 entries, 121 entries were rated as resistant to moderately resistant to blast. Out of these, nine IRBN entries which showed higher level of resistance to blast with good yield attributes were selected for further breeding work. Some of the promising entries in IRBN-96 which showed lower score (0-1) to blast are entry Nos. 82 (Origin-Nigeria), 101 (Origin-Indonesia) and 109 (Origin-Brazil).

#### *Chemical control trials*

Chemical control trials included evaluation of new fungicidal formulations for the control of sheath blight and blast.

##### *i) Sheath blight*

A set of new fungicidal formulations were evaluated during the years 1993-94 and 1994-95 in using Bavistin 50 WP and Validacin 3L as the check fungicides on the test variety Jyothi

Among the new fungicidal formulations, Contaf 5 EC was superior in reducing the percent infection than all other fungicides and was on par with the standard checks Bavistin 50 WP and Validacin 3L and was followed by Baycor and Spektrum. Contaf 5 EC recorded 53.44 per cent reduction in disease incidence over control. Similarly a score of 2.33 was recorded in Contaf treated plots which was comparable to the standard checks.

The yield difference were not statistically significant among the treatments.

Results of the other co-ordinating centres under All India level also showed that Contaf 5 EC is superior among the new formulations comparable to Validacin and Bavistin.

##### *i) Blast*

A set of new fungicidal formulations were evaluated during the years 1992-93 to 1994-95 on the test variety IR 50 to find its efficacy in checking blast disease.

Among the different chemicals tested Beam 75 WP is found better in controlling blast by recording a significant reduction (44.61%) in disease incidence than control. The other fungicides found effective in reducing disease incidence were in the order Baycor, Kavach and Contaf 5 EC and on par with Beam 75 WP.

## PULSES

### Agronomy

#### Externally aided projects (AICRP Arid Legumes)

##### 1. *Response of horsegram to levels of P and S*

The objective of the trial is to find out the effect of P and S levels on growth and yield of horsegram and to fix up the optimum dose of these nutrients.

The trial was started in 1994 and it has been carried out for two years. Results show that application of varying doses of P and S did not give any significant yield variation in horsegram. Various growth and yield parameters like plant height, number of fruiting branches/plant, no. of pods/plant and hundred seed weight also were seen unaffected by the differential levels of the nutrients.

This non responsiveness may be due to availability of sufficient nutrients from the soil resource. Soil and plant samples have been collected for analysis.

The trial is to be repeated for one more year for getting conclusive result.

##### 2. *Survey and preparation of status report on pulse based farming situations and production constraints in Central zone of Kerala*

The objective of the work is to gather information on important pulse crops grown in central zone of the state under different farming situations and identification of constraints in their cultivation and strategies for increasing production.

The survey revealed that cowpea accounts to more than 90% of area under pulses. Though redgram, greengram, bengalgram and blackgram are the major pulses consumed in the state, the area devoted to these crops is negligible. In Ernakulam and Trichur districts, pulses are raised mainly in summer rice fallows. In Palakkad district, due to lack of irrigation facility, summer cultivation is limited. Here it is mainly grown as upland rainfed crop during kharif and in palliyals after first crop of paddy. C 152 is the major grain type cowpea grown. For vegetable cowpea production, farmers depend on various local types. The major constraints facing pulses cultivation in the zone are lack of irrigation facility, non availability of seeds, problem of grazing by stray cattle in unprotected fields, pests and diseases, non availability of labourers and lack of marketing system.

The work was started in 1994 and it is to be continued for one more year to prepare a status report based on the survey.



### 3. *Sowing time and spatial requirement of promising cowpea genotypes*

The trial is taken up with the objective of finding out the optimum spacing and sowing time of promising cowpea genotypes during rabi season.

The trial was started in 1995. Results of first year of study showed that the crop sown on September 16 gave grain yield of 497 kg/ha which was 22 per cent higher than yield obtained from October sown crop, but the two were statistically on par. Growth and yield attributing characters like plant height, number of branches/plant, number of pods/plant, seed yield/plant and dry matter production also showed a similar trend. The various weather variables like rainfall, number of rainy days, maximum and minimum temperature experienced during the growth period of September and October crop were much similar and this might have led to statistically uniform grain yield and growth pattern.

The grain yield was influenced significantly by row spacing and genotypes. Row spacing of 25cm produced 52 per cent higher yield over 40 cm row spacing.

Varieties differed significantly for seed yield/plant, hundred seed weight and dry matter production/plant. The highest grain yield of 922 kg/ha was recorded by GC 3. The superiority of this variety in the location has been reported earlier. V 819, V 240, V 585 and V 318 produced comparable yields, but it was significantly lower than that of GC 3. The interactional effect of variety and spacing was significant GC 8932, V 318 and Kanakamony exhibited no yield difference between the two row spacings. This might be due to their spreading growth habit.

The trial is to be repeated for getting conclusive result.

### 4. *Assessment of advantages of various inputs in cowpea*

The work was started in 1995 with the objective of quantifying the contribution of various inputs in enhancing the yield of commonly cultivated and improved genotypes.

Among the varieties, GC 3 showed definite superiority over the local check, Kanakamony. It recorded an yield increase of 117 per cent. Supply of various production inputs had significant effect on yield expression. The treatment where no fertiliser, lime, weed control or plant protection were given had the lowest yield. Application of recommended fertiliser alone led to 25 per cent yield increase. Adoption of

weed control along with manuring resulted in 50 per cent yield increase over control. Plant protection had no marked influence on seed yield. This can be attributed to the very low incidence of pests and diseases during the season.

The trial is to be repeated for getting conclusive result.

#### KAU Projects

##### 1. *Performance of cowpea varieties under varying moisture stress situations in summer rice fallows*

The objective of the trial is to compare the drought tolerant ability of eight recommended cowpea varieties by evaluating their performance under varying water regimes and to assess their potential in contributing green matter for the succeeding rice crop.

The trial was laid out during summer 1994, but it was vitiated due to acute scarcity of irrigation water.

Results of the trial conducted during 1995 showed that the two irrigation schedules did not show significant variation in grain yield or fodder yield. Dry matter accumulation and relative water content under the two irrigation treatments did not show significant variation which implies that the amount of moisture available to the crop under the two irrigation treatments was on par. In case of irrigation scheduled at IW/CPE ratio of 0.4, better root development under moisture stress situation might have resulted in more absorption of water from deeper layers of soil which consequently resulted in growth and yield comparable with the more irrigated crop.

Wide variation was noticed in the performance of the varieties tested. The grain yield and fodder yield of the variety V 16 was significantly higher over the two popular varieties of rice fallows viz. C. 152 and Kanakamony. The increase in yield was to the tune of 48 per cent. The correlation values showed significant positive correlation with fodder yield, dry matter accumulation and relative water content at maturity. The variety also recorded highest water use efficiency.

The genotypes V 240, GC 3 and Cul. 9 produced comparable yields and they ranked next. Seed yield and fodder production by Krishnamony and CoVU 623 were quite low compared to V 16. This can be attributable to the retarded growth of these varieties as shown by the low relative water content and dry matter production.

The trial is to be repeated for two more seasons.

## Plant Breeding (Pulses)

In the Cowpea Initial Varietal Trial conducted during 1995 Kharif season with nine AICRP entries and PTB-1 (Kanakamany) as local check, the variety V-70 gave the highest mean yield of 743 kg/ha, followed by V-240 (719 kg/ha). Pusa Phalguni was the earliest variety which took only 69 days for harvest. TVX-944 had the maximum duration i.e., 85 days and the least yield (106 kg/ha).

In cowpea Advanced Varietal trial 17 AICRP entries and Kanakamany as local check were evaluated. GC. 3 gave the highest yield of 849.5 kg/ha, followed V 240(719.9 kg/ha). This results were in conformity with that obtained on earlier years. The local check (Kanakamony) had a mean yield of 453.7 kg/ha.

12 AICRIP entries were evaluated in Horsegram Advanced Varietal trial. Among those varieties, striking difference was observed in flowering habit. Four varieties viz. AK-21, AK-26, AK-42 and Maru Kulthi attained 50% flowering at 27 days after sowing. These could be harvested in about 65 days giving above 1000 kg of grain yield per ha. The rest of the varieties were in vegetative phase at that time. AK-21 was the highest yielder (1111.1 kg/ha), followed by Maru Kulthi (1093.8 kg/ha) and AK-26 (1069.4 kg/ha).

The other varieties showed season-bound/photo period sensitive flowering habit and attained 50% flowering in about 60 days i.e., by the middle of November, 1995. These were harvested in first week of January and their mean yield were only around 300 to 400 kg/ha.

## Horticulture

### 1. ICAR Adhoc Scheme on breeding for resistance to mosaic viruses in Chilli (*Capsicum annum* L.)

This project was started on 25-7-1994 with the main objective of developing superior chilli lines with stable and extreme resistance to viruses causing mosaic disease.

One hundred and thirty five genotypes belonging to different species of *capsicum* were collected from different parts of the country and abroad. Seven genotypes namely PTB. CA-109 (Tam Mild Jalapeno), PTB. CA 107 (Hidalgo Serrano), PTB. CA-108 (Tam mild Chile-2), PIB. CA 118 (IHR-384), PTB. CA-119 (IHR-517-1), PTB. CA-121 (Koppam Local) and PTB. CA-128 (Pusa Jwala) were found to be resistant to the chilli

mosaic virus isolates collected from different parts of Kerala. Twenty one genotypes were found to be tolerant. The performance of genotypes PTB. CA-129 (Manjari), PTB. CA-130 (Ujwala), PTB. CA-131 (Jwalamukhi), PTB. CA-132 (Jwalasakhi), PTB. CA-133 (Culture-1) and PTB CA-134 (Kt-P1-18) was found to be superior with respect to yield and other commercial attributes under the agro-climatic situations prevailing in Kerala. Hybridization between the genotypes found to be resistant to mosaic virus isolates and commercially superior but mosaic susceptible chilli varieties is in progress. Twelve mosaic virus isolates were collected from the chilli plots belonging to various parts of Kerala State. These were artificially inoculated on to the seedlings of known susceptible, 'White Khanthari' genotype of chilli for maintenance and multiplication. The symptomatology of these virus isolates were studied in detail and based on the symptom similarity, isolates were classified into two virus groups.

## 2. Identification of suitable Chinese Potato (coleus) types for Central Region

The objective of the study is to identify suitable high yield types of Chinese potato (coleus) which come up well in the Central Region. Preliminary evaluation trials were conducted during 1993-94 and 1994-95 involving thirty eight genotypes of Chinese potato collected from different parts of the state. The thirty eight genotypes differed significantly for the characters viz. mean leaf area, tuber yield, tubers per plant and individual tuber weight. There was variability with respect to the cooking quality parameters like appearance, aroma, texture taste, consistency and over all acceptability score. Based on the performance in these preliminary trials, nine promising genotypes were selected for further studies. These nine genotypes and the check variety, Sreedhara were evaluated in a comparative yield trial with 4 replications.

Statistical analysis revealed the existence of significant differences among all the genotypes studied with respect to the characters observed namely, yield per plant, tubers per plant, individual tuber weight and overall acceptability score pertaining to cooking quality. Genotype CP-79 recorded the maximum tuber yield per plant (301.8g/plant) and was on par with genotypes, CP-74 (494.1g) and CP-12 (438.4g). Individual tuber weight was maximum in CP-79 followed by CP-74 and CP-12. Maximum number of tubers was seen in genotype CP-2-P followed by Sreedhara and CP-59. The highest overall acceptability score pertaining to cooking quality was recorded by CP-3-P followed by CP-44 and Sreedhara.

These results show that the genotype CP-79 with a tuber yield of 501.8 g/plant, individual tuber weight (8.3 g) and 61 tubers per plant is the highest yielder among the genotypes tested. This has got good cooking quality also as evidenced by the overall acceptability score of 65.2. The next best genotype is CP-74 with tuber yield of 494.1 g per plant, individual tuber weight of 7.5 and 65 tubers per plant. This genotype also has good cooking quality with an overall acceptability score of 62.3. The genotypes CP-79 and CP-74 which had consistently performed well with respect to yield and related attributes in the experiments conducted need to be tested under farmers' field.

#### *Studies on quality, storage life and seed viability of cucumber and ash gourd by organic and inorganic forms of fertilizers*

The technical programme of the project envisages raising cucumber and ash gourd under six treatments involving various combinations of organic and inorganic fertilizers and studying the effect of these treatments on the storage life of fruits and seed viability. Treatments T-1, T-5 and T-6 include application of different organic manures only while the treatments T-3 and T-4 include different combinations of organic manures and inorganic fertilizers. The results obtained are as follows:

#### **Shelf life of fruits**

The percentage of fruits remained unspoilt after 4 months of storage in the ambient storage conditions ranged from 70 to 85 in case of treatments receiving organic manures alone while the range was 45 to 70 in case of treatments receiving both organic manures and chemical fertilizers. The corresponding ranges were 55 to 70 and 40 to 45 after 5 months of storage and 40 to 45 and 0 to 15 after 6 months of storage. While all the fruits got decayed within 5 to 6 months of storage in case of treatments receiving both organic manures and chemical fertilizers, it took 10 to 12 months in case of treatments receiving organic manures alone.

#### **Seed viability**

There was no much difference in the seed viability upto the 4th month of storage between the treatments receiving organic manures alone and the treatments receiving both organic manures and chemical fertilizers. However, from the 5th to 12th months, the seed viability was higher in the treatments receiving organic manures alone when compared to the treatments receiving both organic manures and chemical fertilizers. The seed viability ranged from 88 to 90 per cent at the

5th month of storage in case of treatments receiving organic manures alone while this range was 80 to 84 in case of treatments receiving both organic manures and chemical fertilizers. The corresponding ranges were 71 to 78 and 60 to 70 per cent at the 12th month of storage. Above results underscore the role of organic forms of nutrients in enhancing the shelf life of fruits and seed viability in cucumber and ash gourd.

#### *Breeding for mosaic resistant cultures of ash gourd*

Evaluation of 45 ash gourd genotypes for mosaic incidence and yield parameters was conducted in a randomized block trial. All the genotypes tested were found to be vulnerable to mosaic at some stage of crop growth starting from 15th day after sowing. However in genotypes, AG-50, AG-25, AG-54, AG-1, AG-58, AG-53, AG-22, AG-21, AG-23, AG-83 and AG-55 mosaic incidence occurred only at the lag end of the crop growth i.e., 75 days after sowing resulting in less damage with respect to crop growth and yield. Maximum yield was recorded by AG-50 (33.8 kg pit) followed by AG-25 (29.2 kg), AG-54 (27.3 kg), AG-1 (26.9 kg), AG-58 (26.0 kg) and AG-53 (25.1 kg). A comparative yield trial of best 10 genotypes along with KAU local as check is in progress.

#### *Effect of time of planting on mosaic incidence in pumpkin*

This experiment with the objective of finding out the best time of the sowing for pumpkin in order to get a mosaic free crop was conducted during the past three consecutive years and concluded in 1995-96.

Statistical analysis revealed significant differences among the monthly sowing treatments with respect to all the three characters. Mosaic incidence was found to be lowest in case of October sowing (31.4%) followed by September sowing (33.6%). Mosaic incidence was maximum (100%) in February and March sowings. Mosaic incidence was noticed only on the 83rd day in case of September sowing and on 75th day in case of October sowing. In case of March sowings, disease was noticed as early as 28th day. As regards yield per plant, maximum yield was recorded in case of October sowing (15.1 kg per plant) followed by September sowing (14.9 kg per plant). These results clearly indicate that sowing in the months of September and October is the best to get a relatively mosaic free crop of pumpkin.

## Farm Revenue

Year	Total Receipts	Total Expenditure
1995 - 1996	Rs 8,86,131.95	Rs. 1,06,29,234.58

## Important Visitors

Dr. K. K. M. Nambiar, Project Co-ordinator (LTFE) visited the station on 24-5-95 in connection with the starting of a new centre at Pattambi on long term fertilizer experiment in rice.

Dr. N. Mohanakumaran (Director of Research i/c), Dr. K. M. Rajan (Professor, Res. Co-ordination), Dr. G. R. Pillai (Associate Director of Research, AR&T) visited the station on 25-26 May, 1995 and reviewed the activities of the station.

Dr. D. S. Gupta, Deputy Commissioner (Seeds), Govt. of India visited the station with the participants of the National Group Meeting on seeds on 7.6.95.

The Project Co-ordinator (Pulses) visited the station and held discussion on the projects on pulses.

The 48th FRC meeting was conducted in RARS, Pattambi on 6th and 7th of October, 1995. All the Project Co-ordinators were taken around the farm and the research activities were explained. The Director of Research and the Registrar, KAU attended the meeting.

The newly elected General Council members of KAU visited the station on 2.1.96. A detailed programme consisting of field visits, laboratory visits, exhibition etc. was organised on the day and all the members were taken around the farm and were distributed with RARS Publications.

Teachers and students from Valluvanad Vidyabhavan, Perinthalmanna, GLP School, Valloor; GWLPS Pulassery and SNGLP School, Pattambi visited the station on 6-1-96. The day was organised as Krishi Darsan Day, the teachers and students numbering about 475 were taken around and a lecture on

Ecofriendly and sustainable Agriculture was given to them at Prof. James Harithavanam.

Final year M. Sc. (Botany) standard of Wandoor Govt. Higher Secondary School along with 10 teachers visited the station as a part of their Science Club (Agriculture) on 25-1-1996.

Sixteen farmers along with 2 learners from Social work and Research Centre, Wynad visited the station on 29-1-96.

About 110 students with teachers of Kendriya Vidyalaya, Ottapalam visited the station and spent one day in the farm.

Forty five students with 5 teachers from Paruthur High School, Pallipuram visited Station on 3-2-96.

Forty eight farmers along with Agricultural Officer, Krishi Bhavan, Maneed, Ernakulam District spent one day in the station on 9-2-1996.

Sixty students along with 10 teachers of GUP School, Puasserikkara visited the Centre on 28-3-96.

## ii CASHEW RESEARCH STATION, ANAKKAYAM

### Staff Position

Category	Sancti- oned	In posi- tion	Vacant
<i>Scientific Staff</i>			
Assoc. Professor	1	1	Nil
Asst. Professor	2	2	Nil
<i>Technical staff</i>			
Farm Supervisor Gr. I	1	1	Nil
Farm Assistant Gr. I	1	1	Nil
Lab Assistant Gr. III	1	1	Nil
<i>Administrative &amp; supporting staff</i>			
Sr. Gr. Assistant	1	1	Nil
Sr. Gr. Typist	1	1	Nil
Peon Hr. Gr.	1	1	Nil
Mali Hr. Gr.	1	1	Nil
Sweeper	1	1	Nil



## Faculty Improvement programme

New post sanctioned/created/shifted —	Nil
Scholarship awarded to staff/	P.B. Pushpalatha
deputation of staff for higher studies —	Asst. Professor on study leave from 10-3-95

## Research

### Major Research Achievements

Crop Improvement Programme conducted at this Station for the last 3 decades have given encouraging results.

Anakkayam-I the first variety in Cashew released from the Kerala Agricultural University after detailed studies conducted at this Station. This variety is a selection from among the Ninety type collections of the Station.

Two types of Cashew Viz K-10-2 and H-3-17 were accepted by the Seed Sub Committee, Govt. of Kerala during 1996. K-10-2 (*Sulabha*) was identified as a promising variety with good economic characters and high quality kernels with an average yield of 23.4 kg. This variety is a selection from the collection and maintenance of the cashew types.

H-3-17 (*Dharashree*) is a progeny of the cross between an indigenous type Tree 30 x an exotic type Brazil 18. This also is a promising cashew type with high yield and highly suited export qualities with an average yield of 15.2 kg. with potential yield of 28 kg. per tree.

A peculiar variety of cashew without nut oil is now being popularised as a special purpose variety. This is a selection from the germplasm collection.

The XVIII Zonal Research and Extension Advisory Committee held on 8th March 1996, recommended two cashew hybrids for release H-7-6 and H-8-1. These hybrids are found to be superior to all other cashew cultivars with respect to nut size, kernel count and other economic characters. The average yield of these hybrids are 16.98 and 14.99 respectively. The kernel count per lbs are 145 and 156. These hybrids are suited for export oriented plantation.

### Hybrid programme

An ambitious programme for the production of hybrid seeds for evaluation and screening of seedlings for the evolution of varieties was started during 1995-96. About 900

hybrid seeds were collected and sown and 725 seedlings obtained were planted in the main field during June 1986.

#### Farm Revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1985-86	5.88	12.44

#### Important visitors

General Council Members visited the Station on 3-1-1986.

#### iii) AGRICULTURAL RESEARCH STATION, MANNUTHY

This station started functioning during the year 1957 as Rice Research Station, Mannuthy in the then Central Farm Ollukkara, with administrative control vested with Rice Specialist. Consequent to the shifting of Head Quarters of the Rice Specialist to Pattambi in the year 1963, the station was renamed as Regional Rice Research Station. With the formation of the Kerala Agricultural University during 1972, the Rice Research Station, Mannuthy and the Agricultural Research Station were taken over from the State Department of Agriculture and brought under the control of Agricultural University. In the year 1976, Rice Research Station and Agricultural Research Station, Mannuthy were merged and Research Station and Instructional farm was formed. The administrative control of this station was vested with the Associate Dean, College of Horticulture, Vellanikkara and a part of this station functioned as Instructional Farm, Vellanikkara, in the newly acquired estate of the Kerala Agricultural University. This Research Station and Instructional Farm, Mannuthy was again renamed as Agricultural Research Station, Mannuthy since 1-9-83. Instructional Farm, Vellanikkara was delinked from Agricultural Research Station, Mannuthy with effect from 1-2-1988 and since then is functioning as an independent station.

Apart from KAU Research Projects, the station undertakes research projects in rice under 'AICRIP'. The station also extends facilities to NBPGR to conduct trials on rice. The station also participates in the academic programmes of KAU by way of providing land and labour facilities as well as guidance for post graduate thesis work and under graduate work experience programmes of College of Horticulture, Vellanikkara.

Staff position

Category	No. of posts		Vacant
	Sanctioned	in position	
<i>Scientific staff</i>			
KAU (306-31-034)			
Assoc. Professor & Head	1	1	—
Asst. Professor (Agron)	1	1	—
Asst. Professor (Hort.)	1	1	—
			(Post shifted from Central Training Institute, Mannuthy as per Order No. GA/C3 45962/95 dt. 16-3-96)
ICAR/NARP			
AICRIP Double Cropping			
Sub Centre (306-31-627)			
Asst. Professor (Pl. Br.)	1	1	—
NARP-I Central Zone (306-31-035)			
Asst. Professor (Pl. Br.)	1	1	—
<i>Technical staff</i>			
KAU (306-31-034)			
Sr. Farm Supervisor	1	1	—
Farm Asst. Sr. Gr.	1	1	—
Farm Asst. Gr. I	1	1	—
Farm Asst. Gr. II	2	2	—
Lab Assistant	1	1	—
Tractor Driver	1	—	1
NARP-I Central Zone (306-31-035)			
Technician	1	1	—
Overseer	1	1	—
			(On working arrangement since 26-3-96 from DPP Tavanur as per Order No. GA/A3/997/96 dt. 18-3-96 of the Vice-Chancellor)
KAU (306-31-034)			
Administrative Asst.	1	1	—
Sr. Gr. Asst.	1	1	—
Selection grade Asst.	1	1	—
Grade I Asst.	1	1	—
Typist	1	1	—
Peon	2	2	—
Jeep Driver	1	1	—
Watchman	2	—	2
			(One post shifted to KAU Guest House, Mannuthy as per order No. GA/J1/7730/95 dtd. 28-10-98 of the Vice-Chancellor)

## Faculty Improvement Programme

### *New posts sanctioned/created/shitted/abolished*

One post of Assistant Professor (Hort.) shifted from Central Training Institute, Mannuthy as per University Order No. GA/C3/46962/95 dtd. 16-3-96 and Dr. C. Narayanankutty, Assistant Professor (Hort.) was posted.

### *Scholarship awarded to the staff/deputation of staff*

One Asst. Professor (Agron.) was paid study leave salary for Ph. D. Programme at IARI, New Delhi upto 11-1-96.

### *Details of seminars/symposia/training programme attended*

Dr. U. Jaikumaran, Assoc. Professor (NC) Agron.

Visited as a member of the K. A. U. Team that visited major Agricultural Research Station/Universities and Agricultural Production Centres in South India from 15th May to 25th May, 1996 as a Scientists Interaction programme.

Attended training programme on 'Irrigation Water Management' from 13th November to 18th November at WTC IARI New Delhi.

Dr. V. V. Radhakrishnan, Assistant Professor (Pl. Br.)

Attended Annual National Rice workshop at Directorate of Rice Research, Hyderabad from 9th April to 13th-April, 1995.

Attended the Summer Institute on 'Recent Advances in breeding for biotic and abiotic stresses on crop plants' at PAU, Ludhiana from 4th to 13th July 1995.

### *Involvement of staff in the Academic Programme*

#### *(a) U G. Programme*

The work experience programme in paddy for B.Sc. (Ag.) students was conducted at this station by Dr. U. Jaikumaran.

Smt. Sajitharani, T. offered the course (MP121-Fodder production 2+1 course) to the B.SC. (DSC & Tech.) Students of College of Veterinary & Animal Sciences, Mannuthy; (LPM 112-Forage Production 1+1 course) to the B.V.Sc. students of College of Veterinary & Animal Sciences, Mannuthy

#### *(b) P. G. Programme*

Dr. U. Jaikumaran, Head of the Station has been nominated as the Chairman of an M.Sc. (Ag.) student in Agronomy College of Horticulture, Vellanikkara.

Dr. V. V. Radhakrishnan, Asst. Prof. has been handling course on 'Population Genetics (2+1) for the P G students, of College of Hort. Vellanikkara. He has been nominated as the major advisor for an MSc (Ag) student.

### Major Research Activities and Achievements

During the period under report there were twenty experiments at this station. Among these 20 experiments 12 were under KAU station trials and five were under AICRIP and 2 were post graduate projects and one was FACT/DSIR Project

One EAP namely "Development of Mulch Cum Drip and Sub-Surface Pad Irrigation System for Vegetables' sponsored by Ministry of water Resources, Government of India funded to the line 5.876 lakhs, was started under the Principal Investigatorship of Dr. U. Jaikumaran.

A Training was conducted for 6 months starting from 21-8-95 for 6 unemployed Women under 'TRYSEM' programme sponsored by DRDA Trichur on "Techniques of Production and Management of Fruit and Ornamental plants".

Experiments conducted under different commodity

Initial yield Trial - IME (RIC-02-01-12-MNY-9-90-ICAR Co-ord)

Initial Yield Trial-IM (RIC-0-01-13-MNY-9-90-ICAR Co-ord)

Advance Yield Trial-IM (RIC-02-01-17-MNY-9-90-ICAR Co-ord)

International Network for Genetic Evaluation of Rice—  
INGER

Advance Yield Trial-IM (Basmathi)

Evolution of high yielding rice hybrids suitable for Kerala (RIC-02-01-23/94 MON (9) KAU)

Standardisation of optimum nutrient requirements of extra short duration rice varieties/cultures for kole lands. (RIC/08-00-14-95/MNY (1) KAU)

Evaluation of short duration rice varieties/cultures for kole lands (RIG-03-03-14-MNY-9-83-NARP)

MLT of Moncompu cultures

Farmboon trial—Evaluation of farmboon as an alternate source of organic manure for rice.

**Evolving varieties of cucurbitaceous vegetable suitable to summer rice fallows**

Evaluation of varieties of bittergourd (*Momordica charantia*) for summer rice fallows (VEG-02-05-05/94 MNY (9) KAU)

Evaluation of varieties of snakegourd (*Trichosanthes anguina*) for summer rice fallows (VEG-02-05-02/94 MNY (9) KAU)

'Development of Mulch cum Drip and Sub-Surface Pad Irrigation System for Vegetables' funded by Ministry of Water Resources, Government of India,

Manurial Trial on Jack (FF-07-00-05) MNY-1-80 KAU NP

Evaluation and description of Jack germplasm (FF-07-00-06-MNY-9-90 KAU NP)

Multi locational spacing trial on Turmeric.

Irrigation management related to sub-surface moisture conservation techniques in oriental pickling melon. *Cucumis melo* variety. Conomon mak VEG/08-02-13-95/VKA (14) KAU/PG (R. Veeraputhran 94-11-62)

Improving water uses efficiency of Cowpea in summer rice fallows- (Irine. G.)

FACT/DSIR Project on slow releasing fertilisers in rice and banana.

#### **b) Achievements**

The station proposed to the release of the varieties, the Culture 10-1-1 having short duration and suitability for cultivation in kole land.

Hybrid coconut seed production programme was continued at this station to produce 'Kera Ganga' and 'Laksha Ganga' hybrid coconuts.

F<sub>1</sub> hybrid of rice is being maintained under hybrid rice production programme.

Developed 10 promising rice cultivars as hybrid derivatives from the cross Hraswa × Mahsuri, Culture 10-1-1 × Mahsuri, Matta Triveni × Mahsuri under evolution of short duration rice cultures for kole lands.

The seed and seedling production programme was stepped up many fold to augment utilization of available resources and to enhance revenue.

Mango orchad (4 ha) was cleared of its wild growth and loranthus was removed from 230 mango trees.

## Farm Revenue

Station receipts upto 31-03-96 (Rs. in lakhs)

Station	7.51
Revolving fund	6.35

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Total	13.86
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Station expenditure upto 31-03-96 (Rs. in lakhs)

Station	28.72
Plan	4.19
EAP	2.83

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Total	36.45
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## Important Visitors

Name and designation	Date of visit
Dr N. Mohanakumaran Director of Research	20-4-95, 22-4-95, 22-9-95
Dr. A. M. Micheal Vice-Chancellor	22-4-95
Associate Director of Research (Extn., Planning, AR & T)	22-4-95
Dr. A. I. Jose Associate Dean of K.A.U.	22-4-95
General Council Member of Kerala Agril. University	13-12-95
Sri A. K. Dharni, IFS Registrar of K A.U.	6-1-96
Dr. G. Raghavan Pillai Associate Director of Research (Farm)	2.3.96

### iv) CASHEW RESEARCH STATION, MADAKKATHARA

The Cashew Research Station, Madakkathara under the Kerala Agricultural University was established on 1-5-1973. Initially this station was working as one of the four research centres under the All India Co-ordinated Cashew and Spices Improvement Project of the ICAR. The World Bank aided multi-state Cashew Research Project was implemented at this station from 15-2-1982 to 3-9-1986. The All India Co-ordinated Cashew Improvement Project is on going at present. The CRS, Madakkathara is located in Madakkathara village (9 km away from Thrissur town of Thrissur taluk in Thrissur district. The station is situated at a distance of 1/2 km away from Mannuthy on the left side of Mannuthy-Chirakkakode road. The total area of the farm is 22.75 ha. (22.25 ha planted with cashew and 0.5 ha under building and roads).

### Staff

Dr. S. Pathummal Beevi was in charge of the station upto 31-1-95 and Dr. M. Abdul Salam was the Head of the Station from 1-2-95.

Details of sanctioned post, in position and vacancies are given below.

Category	Sanctioned	In position	Vacant
Associate Professor (Agron./Hort)	1	1	—
Asst. Professor (Entomology)	1	1	—
Asst. Professor (Hort.)	1	1	—
Sr. Technical Assistant	1	1	—
Jr. Technical Assistant	1	—	1
Farm Assistant Gr. II	1	1	—
Assistant Gr. I	1	1	—
Lab. Assistant	1	1	—
Class IV Mali	1	1	—
Driver	1	1	—

### Faculty Improvement programme

New post sanctioned/created/shifted Nil

Scholarship awarded to staff/

deputation of staff for higher studies Nil

### Details of seminars/symposium/training attended by staff

Dr. M. Abdul Salam, Associate Professor attended the zonal research council meeting of NRCC, Puttur on 5th and 6th of June.

Dr. M. Abdul Salam, Associate Professor attended the Research council meeting held at RARS, Pattambi.

Dr. Susannamma Kurien, Associate Professor attended the NATP meeting held at RARS, Pattambi.

### Two day State Level seminar on cashew

Two day State Level Seminar on cashew was conducted on 30th and 31st of January 1996. 100 farmers from different parts of the state participated. The Seminar was inaugurated by Sri. P. Gangadharan Pillai, Ex. Chairman, CEPCI, Cochin. Dr. E. Tajuddin, Director of Extension presided over the function. Sri. P. P. Balasubramanian, Director, Directorate of Cashewnut Development, Dr. K. G. Nair, Secretary CEPCI, Cochin, Dr. G. R. Pillai, Associate Director of Research, KAU Head Quarters, Dr. N. Krishnan Nair, Associate Director of



Research, RARS, Pattambi and Dr. R. Vikraman Nair, Professor & Head, gave felicitation address.

Dr. M. Abdul Salam, Associate Professor, Dr. Susannamma Kurien, Associate Professor and Smt. Suma B., Assistant Professor attended the Zonal workshop for the period 95-96 held at RARS, Pattambi on 8th March 1996.

#### **Involvement of staff in academic programme**

Dr. M. Abdul Salam, Associate Professor offered the following courses at College of Horticulture, Vellanikkara.

i. Agron 604	Water management	2+1
ii. Agron 704	Advances in water management	2+0
iii. Agron 703	Advances in farming systems	1+0

Dr. M. Abdul Salam continued as guide for one Doctoral student and one M. Sc. student in Agronomy.

Seven unemployed girls were given training on grafts production as requested by the Agrl. Officer, Pananchery.

#### **Training programme undertaken**

4 batches of 20 trainees each (unemployed youth) on cashew graft production. Technical advice was given to officials of developmental departments and farmers who visited the station.

#### **Radio talks Doordarshan programme**

Hybrids and varieties of cashew	By Dr. M. Abdul Salam
Date of broadcasting	28.11.95
Manuring of cashew	By Dr. M. Abdul Salam
Date of broadcasting	7-10-95
Stem bore control in cashew	By Dr. Susannamma Kurien
Date of broadcasting	11-11-95
Answers to listener's questions	By Dr. M. Abdul Salam
Date of recording	28-3-96
Pest of cashew	By Dr. Susannamma Kurien
Date of recording	26-3-96

#### **Research**

##### **Major Research Achievements**

A clonal germplasm conservation block with 120 accessions was established.

A hybrid H-1591 was released as Priyanka.

Eighteen high yielding cashew varieties evolved at six Cashew Research Centres of India are under evaluation at this centre. Of this the varieties M 26/2 and M44/3 of Vridhachalam and V5 from Vengurla are found to be promising for this State of Kerala.

Screening of vigorous and less vigorous cashew types revealed that it is possible to identify the less vigorous types in the seedling stage itself using morphological characters, phenolic content in leaves, stomatal index, bark percentage in root etc. as criteria.

A total of 176 hybrid seedlings were planted in the field during the period 1993-96.

Application of neem oil 5 percent on tree trunk and exposed roots is effective in preventing stem borer infestation for 2 months. Sevidol granules 50 g/tree, prevented infestation for three months.

The accessions, A-26-2, H-718, and H-8-8 and H-3-17 were comparatively tolerant to tea mosquito infestation than the rest of the accessions.

#### Farm Revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-1996	11.76	23.94

#### Important visitors

Dr. K. G. Nair, Secretary and Chief Executive, CEPC, Cochin on 4-11-95

Sri. P. P. Balasubramanian, Director, Cashewnut Development, Cochin on 4-11-95

Honourable Sisavath (Laos Minister for Agriculture) and his team visited the station on 16th November 1996.

Dr. Raghavan Pillai, ADR (farms) visited our station on 23rd November, 1995

A Tanzanian study tour team (under the auspicious of KJP Research Foundation) visited the station on 25th of November, 1995.

Dr. M.V. Rao, Vice-Chancellor, Andhra Pradesh Agricultural University and M. Velayudham, Deputy Director General (soils), ICAR visited the station on 27th of November.

A second Tanzanian team of Scientists and Administrators visited the station on the forenoon of 8th December.

The General Council Members visited the station on 12th December.

Dr. R.S. Paroda, Director General, ICAR, visited the station on 28th of December. He was accompanied by Director of Research and all the Associate Directors of Research from the Directorate.

Dr. N. Mohanakumaran, Director of Research visited the station on 16.2.96.

Dr. Nahar Singh, Chief Agricultural Officer, Punjab and Dr. G.S. Gill, Department of Entomology, PAU, Ludhiana visited the station on 14.3.96.

Dr. N. Krishnan Nair, Associate Director of Research, RARS, Pattambi visited the station on 25.3.96.

Mr. Nageswaran, Senior Inspecting Officer visited the station on 25.3.96.

#### v) BANANA RESEARCH STATION, KANNARA AND PINEAPPLE RESEARCH CENTRE, VELLANIKKARA

The Banana Research Station at Marakkal was established during the year 1963 in an area of 17.3 ha. as a centre of the Department of Agriculture to carry out research on Banana and Pineapple. In 1970, the station was brought under the All India Coordinated Fruit Improvement Project of the ICAR to carry out research on banana and pineapple. In 1972, when KAU was established this station was brought under it. In 1974, the venue of the Pineapple Research was shifted to KAU Main Campus, Vellanikkara in an area of 6.3 ha. suited for pineapple cultivation. During 1988, NARP Phass II was implemented for strengthening research of banana, pineapple, cashew and post harvest handling of fruits and vegetables. Presently at Banana Research Station, Kannara research is being carried out on banana and pineapple only. Sri. T.C. Radhakrishnan, Associate Professor (Pl. Path) continued as the Head of stations till 8.1.96. Sri. S. Janardhanan Pillai took over charge on 8.1.96.

#### **Mandate**

The main objectives of the station are:

Germplasm collection, maintenance, evaluation and description of banana and pineapple to recommend the popular and promising cultivars of banana and pineapple for large scale cultivation.

Developing better clones or cultivars of banana and pineapple through selection and hybridisation.

Standardisation of Agro-techniques for banana and pineapple under different cropping system.

to formulate and recommend suitable control measures for pests and diseases of banana and pineapple.

to formulate small scale post harvest processing techniques in banana and pineapple.

Staff position Designation/ Category	No. of posts		Vacant
	Sanctioned	In position	
<b>AICRP (TF)</b>			
Assoc. Professor (Hort)	1	1	—
Asst. Professor (Hort)	1	1	—
Asst. Professor (Pl Path)	1	1	—
Asst. Professor (Ent)	1	1	—
Technical Assistant	2	—	2
<b>NARP</b>			
Assoc. Professor (Pl Path)	1	1	—
Assoc. Professor (Agron)	1	1	—
Asst. Professor (Hort)	1	1	—
<b>Technical staff</b>			
<b>AICRP (TF)</b>			
Farm Assistant (Gr. I)	3	3	—
Lab Assistant (Gr. I)	1	1	—
Oil Engine Driver	1	1	—
Mali	1	1	—
<b>KAU</b>			
Farm Supervisor (Gr. II)	1	1	—
Farm Assistant Gr. I	1	1	—
<b>Administrative &amp; Supporting Staff</b>			
<b>AICRP (TF)</b>			
Typist (Gr. II)	1	1	—
Peon	1	1	—
<b>NARP</b>			
Typist (Gr. II)	1	1	—
<b>KAU</b>			
Administrative Assistant	1	1	—
Assistant Gr. II	1	1	—
Driver Gr. II	1	1	—
Pump Operator	1	1	—
Peon	1	1	—
Watchman (Security Guards)	1	1	—
	5	5	—

#### Faculty Improvement Programme

- 1 New posts sanctioned/created/shifted : Nil
- 2 Scholarship awarded to staff : Nil
- 3 Deputation of staff for higher studies: Nil

Sri. K. P. Pradeep, Assistant Professor was granted study leave for undergoing Ph.D in Agronomy

## Details of Seminars Symposia Training attended by staff

Name and designation of Scientist	Seminar/Symposia/ Training attended	Period
Dr. D. Geetha, Asst. Professor (PI Path)	Symposium on 'Mushroom cultivation and post harvest Technology' at TBGRI, Palode	28.6.95
Sri. T. C. Radhakrishnan, Assoc Professor (PI Path)	Biennial workshop under AICRP (TF) held at Punjab Agricultural University, Ludhiana	27-11-95 to 30-11-95
Dr. Rema Menon, Asst Professor (Hort)		
Dr. P. K. Sudhadevi, Asst Professor (Hort)		
Dr S. J. Pillai, Assoc Prof & Head	One day Zonal workshop at Regional Agrl. Research Station, Pattambi	8-3-96
Dr. P. K. Sudhadevi, Asst Professor		

### Involvement of staff in Academic Programme

Dr. JSK Charles, Associate Professor is the major advisor of an M. Sc. (Ent) Student of the Department of Entomology, College of Horticulture, Vellanikkara.

Dr. Rema Menon, Assistant Professor is the major advisor of an M.Sc. (Hort) student of the Department of Plantation Crops and Spices, College of Horticulture, Vellanikkara.

### Research

#### Major Research Achievements

#### Crop Improvement

##### Banana

The banana germplasm consisting of 212 accessions were described employing the INIBAP banana descriptor. The synonyms and distinct clones could be distinguished. Based on the varietal studies, the clones Chinali (AAB), Dudhsagar (AAB) Mysore Ethan (AAB), Sugandhi (AAB) and Highgate (AAA) were found to be superior in yield.

In the clone Padalimoongil (AB) characterised by a few hands and fruits and the absence of a male inflorescence axis, a natural variant with a male phase and more number of hands and fruits was identified.

### Crop management

Considering the yield, net returns and quality of fruit, a spacing of 1.2 m × 1.5 m × 2.0 m (4762 plants/ha) with a per hectare yield of 45 tonnes and fetching a net profit of Rs. 55,718 was found optimum in Palayankodan banana.

Performance studies on tissue culture plants of banana varieties Robusta and Dwarf Cavendish in comparison to suckers revealed the superiority of tissue culture plants in growth and yield.

Fertigation studies in banana var. Nendran revealed the possibility of reducing N requirement by 25% of the total requirement (200 g N) when applied through drip irrigation.

### Crop protection

Field susceptibility of banana accessions to *Pseudostem borer*—*Odoiporus longicolis* Oliver revealed that out of the 212 accessions screened, 6 varieties viz., Nendran (AAB), Attu Nendran (AAB), Redjasire (AAB), Poovazha (AAB), Chinia (ABB) and Madavazha (ABB) were severely infested; 3 varieties viz. Madhuraga (AAB), Navaral (AAB), Pevazha (AAB) were heavily infested, 4 varieties viz. Myndoli (AAB), Govaka (AAB), Sannachenkadali (AA) and Padalimoongil (AB) were moderately infested, 27 varieties viz. Zanzibar (AAB), Pisang Seribu (AAB), Sugandhi (AAB), Kali (AAB), H<sub>1</sub> (AAB), H<sub>2</sub> (AAB), H<sub>3</sub> (AAB), Pachanadan (AAB), Perumpadali (AAB), Valiyapoovan (AAB), Poovan (AAB), Palayankodan (AAB), Sawai (ABB), Hybrid Sawai (ABB), Kostha bontha (ABB), Vennethumannan (ABB), Peyan (ABB), Pisang Mas (ABB), Anakompan (ABB), Vellapalayankodan (ABB), GrosMichel (AAA), Chenkadali (AAA), Sannachenkadali (AA), Padalimoongil (AB), Valiyakunna (AB), Elavazha and Kallar (*Musa bathisiana*) were slightly infested.

The nematode population in soil was found to be least by planting unpaired suckers + dip in 0.5% monocrotophos + sunn-hemp as intercrop and pairing and prolinage of Carbofuran at 1.25 g ai plant.

Screening of banana germplasm against nematode pests revealed the varieties Chenkadali, Bodles Altaforte, Robusta Poomkalli as poor hosts of nematode *Heterodera oryzae* and as good hosts.

Analysis of samples collected around the roots of banana in Kerala revealed the presence of the nematode species. *Radopholis similis*, *Heterodera oryzicola*, *Helicotylenchus multicinctus*, *Hoplolaimus indicus*, *Meloidogyne incognita*, *Rotylenchulus reniformis* and *Pratylenchus coffeae*.

Spraying of Bavistin (0.1%) or alternated spray of Calixin (0.05%), Bavistin (0.1%) and Dithane M-45 (0.2%) or mixture of 0.05% Calixin and 0.1% Bavistin soon after the appearance of the initial symptoms of the disease was found to be effective in controlling the leaf spot disease of banana. Five to six spraying at fortnightly intervals are to be given depending upon the severity of the disease.

In an experiment to control the 'panama wilt disease' it was found that disease incidence was minimum with Bavistin injection (rhizome injection 3 ml solution) followed by Bavistin (0.2%) drenching.

## PINEAPPLE

### Crop improvement

A pineapple germplasm of 24 varieties is being maintained. Detailed descriptors for all the varieties were prepared. Based on the plant and fruit characters, varieties, Kew, Queen, Ripley Queen, Mauritius, Singapore Spanish and Valera Moranda were included in the hybridisation programme. Under clonal variation studies in pineapple, considering fruits having a combination of all the good qualities like number of functional leaves, D leaf area, total sugars, acidity, sugar/acid ratio, TSS and fruit weight, the clones 1/81, 2/81, 1/82, 3/82, 6/82, 9/82 and 14/82 were selected for large C scale multiplications. Detailed variability analysis was taken up.

Among the eight hybrids from the cross Kew × Ripley Queen, hybrids H<sub>1</sub>, H<sub>2</sub>, H<sub>3</sub>, H<sub>4</sub> and H<sub>5</sub> were selected and rigorous efforts were made for the *in vitro* multiplication of hybrids.

In pineapple, the *in vitro* multiplication technique was standardised.

### Farm Revenue

Year	Receipts (in lakhs)		Expenditure (in lakhs)
	BRS	PRC	
1985-86	6.16	0.22	36.72

### Important visitors

Name and designation	Purpose	Date of visit
Dr. H.P. Singh, Project Co-ordinator, AICRP (TF) Dr. David R. Jones, Scientific Research Co-ordinator, INIBAP, France	Visit to the station and review of ongoing experiments	15.5.95
Sri. A. M. John, Asst. Director, RATTC, Vyttila and Agricultural Assistants from RATTC, Vyttila, Ernakulam	Visit to the station and experimental plots as a part of the training programme	26.8.95
A batch of 15 trainees from KERAFED	Visit to the station and experimental plots	25.11.95
Deputy Director of Agriculture and Asst. Director of Agriculture, along with 20 farmers attached to RATTC, Kozha farm	Visit to the station and experimental plots to study the various activities undertaken by the research station	13.12.95
Dr. Raghavan Pillai, ADR (Farm) KAU	Visit to the station and review of the various farm records maintained by the station	12.1.96
Dr. S. R. Nair, Project Co-ordinator, KHDP, KAU	Visit to the station and experimental plots	15.2.96
Dr. U. Mohammed Kunju, Director of Post Graduate Studies	Visit to the station and experimental plots	6.3.96

### vi) AGRONOMIC RESEARCH STATION, CHALAKUDY

#### Introduction

The station which was established in 1962 in an area of 8.95 ha. of land has been engaged in the conduct of experiments under the All India Co-ordinated Project for Research on Water Management of ICAR, apart from the NARP Phase I



and NARP Phase II which were completed in 1988 and 1992 respectively. A Project on 'Onfarm Water Management Studies' financed by Ministry of Water Resources, Government of India and Command Area Development Authority, Government of Kerala was started functioning from 1-4-1989 and concluded. In 1994-95, onfarm water management studies were undertaken as part of ICAR Project. Apart from these projects, agronomic studies [relevant to irrigation farming have been taken up as University Projects. The station has a sub unit at Vellanikkara for conducting water management trials for tree crops

The major objectives of the station are:

- i) To develop cropping patterns ideal for varying water management and fertility situation.
- ii) To test the adaptability and performance of new crops and varieties under different moisture condition.
- iii) To estimate the water requirement of crops like rice, pulses, vegetables, tuber crops, banana, pineapple etc.
- iv) To evolve measures for increasing water use efficiency of important crops of the area and to work out the economics of cultivation.
- v) To study the ground water fluctuations, quality of ground water and recycling of drainage water for cultivation.
- vi) To find out the cheap and efficiency methods of irrigation for different crops.
- vii) To conduct on farm water management studies in the command area.

The station occupies an area of 8.95 ha. of which 7.05 ha is of wetland and 1.90 ha of upland. Out of the total rainfall of 3431 mm, 78% is contributed by South West Monsoon and 17% by North East Monsoon. The uneven distribution of rainfall during the different periods in the year causes the problems of water logging and water scarcity in the same locality and demands efficient water management practices.

The Station is located on the north side of Chalakudy-Sholayar Road, about 400 m. east of Anamalai Junction in Chalakudy town. The soil of the area is sandy loam, with low to medium in organic matter, available  $P_2O_5$  low to medium and available  $K_2O$  very low.

Staff position Category	No. of posts		Vacant
	Sanctioned	In position	
<b>ICAR</b>			
<i>Scientific staff</i>			
Professor	1	1	—
Assoc. Professor (Agrl. Chemistry.)	1	1	—
Assoc. Professor (Agronomy)	1	1	—
Assoc. Professor (Agrl. Engg.)	1	1	—
Asst. Professor (Agronomy)	1	1	—
<i>Technical staff</i>			
<i>Paratechnical</i>			
Farm Assistant	5	5	—
Lab. Assistant	1	1	—
<i>Administrative and supporting staff</i>			
Assistant	1	1	—
Driver	1	1	—
Peon	1	1	—
<b>Non-Plan</b>			
<i>Technical</i>			
Farm Supervisor	1	1	—
Pump Operator	1	1	—
Plough man	1	1	—
<i>Administrative and supporting staff</i>			
Admn. Assistant	1	1	—
Assistant	1	1	—
<b>NARP-I</b>			
<i>Scientific Staff</i>			
Assistant Professor (Agronomy)	1	1	—
(Soil Science)	1	—	1
(Agrl. Engineering)	1	—	1
<i>Technical Staff</i>			
Farm Assistant	2	—	2
Lab Assistant	1	1	—
<i>Administrative &amp; Supporting staff</i>			
Typist	1	1	—
<b>NARP II</b>			
<i>Administrative and Supporting staff</i>			
Typist	1	1	—





**Important visitors**

Name	Date of visit	Purpose
Dr. IC Mahapatra Ex. Vice-Chancellor, BAU, Ranchi & OUAT, Bhubaneswar	7-4-95	Collection of data on the Water Management Research conducted on various crops and cropping systems.
Sri. TS Narayana Swamy Asst. Exe. Engineer: WRDO, Bangalore-9	"	-do-
Sri. SN Pradhan Ex. Managing Director, Lift Irrigation Corporation Orissa, Bhubaneswar	"	-do-
Dr. Shambhu Mahapatra, Ex. Additional Director of Agriculture, Bhubaneswar, Orissa	"	-do-
Dr. RK Batta, Project Co-ordinator. Directorate of Water- Management Research, Rahuri, Maharashtra	27-5-95	Reviewing the research
Dr. Velayduham, Deputy Director General (Soils & Agronomy), ICAR, New Delhi	28-11-95	To see the activities of the station and onfarm research on water management
Dr. Koria, Ex. Dean, College of Agrl. Engg., Rajasthan	30-12-95	-do-
General Council Members, Kerala Agrl. University, Vellanikkara	15-1-96	To see the activities of the station
Dr. A. C. Pandya, Manjalpur, Vadodara, Gujrat.	29-2-96	"
Dr. Anil Kumar Singh, Principal Scientist, Water Technology Centre, IARI, New Delhi	21-3-96	To see the research activities of the station and to visit the onfarm water management area.
Dr. Man Singh, Scientist, W. T. C. IARI, New Delhi	"	-do-
Dr. DK Singh, Scientist, W. T. C., IARI, New Delhi	"	-do-
Dr. AK Singh, Principal Scientist. W. T. C., IARI, New Delhi.	"	-do-









## Staff position

Category	Sanctioned	In position	Vacant
Assistant Professor (Plant Breeding)	1	1	—

## Faculty Improvement Programme

1. New posts sanctioned : One post of Research Associate was sanctioned.
2. Scholarship/deputation of staff for higher studies : Nil  
Details of seminars/symposium Training attended by staff: Nil  
Involvement of staff in Academic Programme : Nil

## Research

The following research projects were implemented at the station in the farmers fields during the year.

1. Population density of pineapple varieties Mauritius as inter-crop in coconut and rubber plantations.
2. Improvement of Pineapple varieties Mauritius through hybridization and induced mutation.
3. Breeding for mosaic resistance in bittergourd.

The following project is implemented at AMPRS, Odakkal: monitored from this Station.

1. Improvement of oil content in lemongrass.

A laboratory with moderate facilities for the quality analysis of fruits were established at the station.

## Farm Revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96		
321-31-3 0 Pest & Disease surveillance unit	Nil	1.33543

## Important visitors

Name and designation	Purpose	Date of visit
1. Dr. A. M. Michael, Vice-Chancellor	Meeting regarding	6-1-96 "
2. Sri. Johny Nellur, M.L.A. Exe. Committee Member	Station activities	"
3. Dr. N. Mohanakumaran, Director of Research		"
4. Dr. E. Tajuddeen, Director of Extension		"
5. Sri. P. O. Thomas, Director of Physical Plant		"
6. Dr. N. Krishnan Nair, Associate Director		6-1-96 & 17-1-96

## NORTHERN ZONE

### 1) REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

Coconut Research in India started in the west coast at the first while Madras state with the establishment of four Research stations in 1916-one each at Kasaragod and Pilicode and two at Nileshtar. When the Indian Central Coconut Committee was established, the Kasaragod station was taken over by the committee in 1947 and in 1970 it became the CPCRI under ICAR. With the formation of Kerala state in 1956, the remaining three stations came under Kerala Agricultural Department. In 1972 the Kerala Agricultural University came into being. One of the stations at Nileshtar (Nileshtar II) and the station at Pilicode were transferred to Kerala Agricultural University with head quarters at Pilicode. Under NARP Scheme, this station was reorganised as the Regional Research Station for the northern regions comprising the districts of Kasaragod, Kannur, Kozhikode and Malappuram with effect from 1-6-1980. The present area at RARS, Pilicode is 57.87 ha and that of Nileshtar 17.25 ha.

Dr. U. Mohammed Kunju, Special Officer, College of Agriculture, Nileshtar was the head of the Station till 1994 and later Dr. P. A. Wahid, Assoc. Dean, College of Agriculture, Nileshtar took charge of the Station and is still continuing.

The main objective of the station are to perform a state wide lead function for research on coconut and to serve as a commodity verification testing centre for rice, pulses and oil seeds and to supervise and guide the work at Panniyur and Tavanur centres in the northern zone of Kerala. It has got close collaboration with the KVK, Manjeshwar.

#### Thrust areas of research

In the beginning the activities were centred around introduction of coconut cultivars from different parts of India and other countries, selection, hybridisation, identification of superior local and hybrid varieties and their distribution among farmers. After the implementation of NARP, apart from research on coconut and coconut based farming systems rice, pepper, vegetables, pulses and tubers etc. were also initiated. In addition to the above, Animal science was also included in NARP Phase II to strengthen research on Malabari goats.

The transfer of Technology programme of this station mainly consists of training programmes for farmers, unemployed youth, SC/ST, farm women. extension personnel of various departments and students.

An Information-cum-Sales centre, is functioning at RARS. Nileshtar. Seed and nursery programme is also in operation at RARS, Pilicode and Nileshtar.

#### Staff

Category	Sanctioned	In position	Vacant
1	2	3	4
Associate Director	1	—	1
Professor	6	4	2
Associate Professor	14	5	9
Asst. Professor	13	8	5
Others (Research Associate/JRF)	9	0	9
<b>AICRP</b>			
Assistant Prof. (Ag)	1	1	—
<b>Non—Plan</b>			
Asst. Prof. (Botony, Agron., Plant Path., Entomology)	4	—	4
<b>DST Project (AAS)</b>			
Assistant Prof./Technical Assistant	1	—	1
<b>Marico Scheme</b>			
Research Associate	3	1	2
<b>ICAR Adhoc Scheme (Meteorology)</b>			
Research Associate	2	1	1
<b>(Survey and utilization of pickling types of mango)</b>			
Research Associate	2	—	2
<b>Data base system</b>			
Junior Programmer	1	—	1
<b>AICRP on Cashew</b>			
Assistant Professor	1	1	—
<b>ICAR Adhoc scheme on Azolla</b>			
Research Associate	1	1	—
Junior Research Fellow	1	—	1
<b>Total</b>	<b>60</b>	<b>22</b>	<b>38</b>

Administrative/Supporting/Para technical/Ministerial/Others

	1	2	3	4
Administrative: NARP-II			1	—
Administrative Officer		1	1	—
Typist Sr. Grade		2	2	—
Steno		1	1	—
Typist Grade I		1	1	—
Peon		1	1	—
Non-Plan				
Section Officer		2	2	—
Sele. Gr. Assistant		2	2	—
Assistant Gr. I		3	3	—
Asst. Gr. II		1	—	1
Peon (Hr. Gr.)		3	3	—
Office Superintendent		1	1	—
LDV Driver (Hr. Gr.)		1	—	1
Selection Grade Assistant (Training Scheme)		1	1	—
<b>Total</b>		<b>20</b>	<b>18</b>	<b>2</b>
<i>Para-Technical Staff</i>				
NARP-I				
Farm Assistant Gr. II		4	3	1
Farm Supervisor Gr. I		1	1	—
Lab Assistant Gr. II		1	1	—
Lab Assistant Gr. III		4	3	1
Farm Assistant (Vety.)		2	2	—
LDV Driver		2	1	1
Mechanic		1	—	1
Non-Plan				
Farm Supervisor Gr. I		2	2	—
Farm Supervisor Gr. II		1	1	—
Farm Assistant		1	1	—
Oil Engine Driver		1	1	—
Pump Operator		2	—	2
Cook-cum-Caretaker		1	1	—
Sweeper-cum-Sanitation Worker		1	—	1
Class IV		3	3	—
Watchman		1	—	1
Regular Mazdoor		15	15	—
Farm Assistant (Vety.)		1	1	—
Farm Supervisor Gr. I (Training Scheme)		1	1	—
<b>Total</b>		<b>45</b>	<b>37</b>	<b>8</b>

## Research projects in operation

a) Externally aided projects	8
b) KAU Projects/experiments	19
c) Plan Schemes	11
d) Proposed projects	4

## Externally aided projects

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Survey, collection and conservation of bold nut types of cashew in Kasaragod and Kannur districts	AICRP on Cashew
Survey, collection, conservation and utilization of pickling type of mango suitable for Northern region of Kerala	ICAR Adhoc scheme
Agrometeorological advisory service	DST
Agrometeorology of coconut and coconut based farming systems in Kerala	DST
Influence of weather and soil factors on cashew growth and yield in East and West coast of India	ICAR Ad hoc scheme
Climate and Coconut	KAU, MARICO
Central Sector Scheme on Cashew	Directorate of Cashewnut Development
Evaluation of <i>Azolla pinnata</i> strains from Kerala.	ICAR

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## Research Schemes/Projects terminated during the period

### a) Externally aided projects

Crop weather models for cashew (ICAR)

Central sector scheme on spices (Directorate of Arecanut, Cocoa and Spices Development)

### b) KAU projects/experiments

Nil

## Major Research Achievements

### Coconut

Among the 15 cultivars planted in 1976 Kudat performs better in number of nut production in 1985 and cumulative nut production.

Preliminary observations revealed that the released hybrids are performing better than the elite cultivars planted in 1976. The hybrid Keraganga performed better than Lakshaganga, Kerasankara and Chandrasankara in cumulative out turn of copra per palm.

Kerasree recorded high copra out turn per palm and is significantly superior to Keraganga and Kerasankara.

A new disease of coconut, progressive chlorosis and crown rot was found in coconut. The disease is lethal and timely control measures were recommended.

#### **Cashew**

The hybrid H-1600 was found to be superior in cashew nut yield followed by MDK-I. The nut and kernel size were maximum in the hybrid H-1591. The apples of MDK-I were found to be superior in quality for preparation of juice.

Forty five bold nut types of cashew were identified of which 15 were selected based on the kernel weight.

#### **Mango**

Fourteen pickling types of mango were identified. Further studies are in progress.

#### **Rice**

16 varieties of medium duration and 15 varieties of short duration cultures of Pattambi and Moncompu were raised and evaluation is in progress.

In varietal trial of rice Jyothi recorded maximum grain yield followed by culture 8754.

#### **Biofertilizers**

Biochemical characteristics and N fixing efficiency of 40 isolates of Azospirillum were studied. A survey of Azospirillum cultures for rice production has been conducted and isolates from TNAU, UAS and IARI were obtained. Their characters, seedling response and survival are being studied.

#### **Vegetables**

Based on the farm trials 3 improved lines such as CS-I (melon) LA-I (Ridge gourd) and TA-2 (Snake gourd) were found superior. The lines CS-I was recommended for release.

#### **Meteorology**

CERES rice model is working well during kharif in simulating grain yield, while during Rabi, it needs revalidation.

A multiple linear regression was developed for predicting nut yield in coconut seven months ahead based on agro-meteorological indices. It is being tested.

A preliminary survey conducted on Coconut oil consumption of rural people showed that they have not shifted to any other edible oils for culinary purposes.

Providing irrigation @ 450 litres/palm/week during the summer till water is available during summer is not detrimental to coconut palms.

ii) PEPPER RESEARCH STATION, PANNIYUR

Pepper Research Station, Panniyur, started as a scheme in 1952 to improve pepper cultivation, was uplifted to the status of a research station under the Kerala Agricultural University in 1972. Since then, research on crop improvement, crop management and crop protection aspects of black pepper are carried out in this station. It is an important co-ordinating centre of the All India Co-ordinated Research Project on Spices of the ICAR. Besides research, nucleus planting materials of released varieties of black pepper, viz. Panniyur 1, Panniyur 2, Panniyur 3, Panniyur 4 and Panniyur 5 are also distributed.

**Staff position**

The staff position as on 31-3-96 is presented below:

Category	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
<b>KAU (Non-Plan)</b>			
Professor	1	—	1
Asst. Professor (Botany)	1	—	1
Asst. Professor (Agronomy)	1	—	1
Asst. Professor (Pl. Breed.)	1	—	1
<b>AICRP on Spices</b>			
Assoc. Professor (Pl. Path.)	1	1	—
Asst. Professor (Pl. Path.)	1	1	—
(Agronomy)	1	1	—
(Pl. Breed.)	1	1	—
<i>Supporting staff</i>			
<b>KAU Non-Plan</b>			
<i>Para Technical Staff</i>			
Farm Supervisor Gr. I	2	2	—
<i>Administrative Staff</i>			
Administrative Asst.	1	1	—
Sr. Gr. Asst.	2	2	—
Typist Sr. Gr.	1	1	—
Peon Hr. Gr.	2	2	—
LDV Driver Gr. II	1	1	—
Class IV	1	—	1
Class IV Hr. Gr.	1	1	—
<b>AICRP on Spices</b>			
<i>Paratechnical staff</i>			
Lab Assistant	1	—	1
Farm Assistant Gr. II	2	2	—
Peon Hr. Gr.	1	1	—
<b>Central Nursery (OEAP)</b>			
Farm Assistant Gr. II	1	1	—

### Faculty Improvement Programme

New post sanctioned/created/shifted/  
abolished

Nil

Scholarship awarded/deputation of staff  
for higher studies

Sri K. N. Satheeshan, Assistant Professor joined for Ph. D.  
course in Horticulture in the Kerala Agricultural University  
on 1-9-95.

### Details of seminars/symposia/training programmes attended by the staff

Name of Scientist	Name of Seminar/ Symposia/Training Programmes	Venue	Date
Sri. K. P. Mommooty, Assoc. Professor	13th AICRP workshop on spices	ARS, Durgapura, Jaipur	23-25 Aug. '95
Dr. A. Rajagopalan, Asst. Professor			
Sri. K. N. Satheeshan, Asst. Professor			
Sri. K. P. Mammooty, Assoc. Professor	18th NARP Zonal Research Workshop	RARS, Pilicode	31 Jan '96
Dr. A. Rajagopalan, Asst. Professor			
Dr. A. Rajagopalan, Asst. Professor	Agri. Seminar	G.H.S., Naduvil	28-1-96
-do-	-do-	Krishi Bhavan, Chapparapadavu	8-2-96
Sri. K. P. Mammooty, Assoc. Professor	NARP Zonal workshop of high range regions	RARS, Ambala- vayal	22-2-96
Sri. K. P. Mammooty, Assoc. Professor	National Semi- nar on BIOSAP	IISR, Calicut	24-25 March '96

### Involvement of staff in Academic programme

Dr. A. Rajagopalan, Asst. Professor conducted training  
for the officers of the Dept. of Agriculture at RATTTC,  
Taliparamba.



## Research

### Major research achievements

Panniyur 5 variety of black pepper was formerly released for cultivation in the state on 2nd March, 1996 by the Hon. Minister of Public Works, Sri. C. T. Ahmed Ali at the inaugural function of the College of Agriculture, Nileshwar.

In the germplasm collection of cultivated types of pepper, 71 accessions are maintained. During 1995-96, Karimunda III with a mean green berry yield of 4.4 kg/vine stood first followed by TMB IV (3.26 kg) and Sullia (3.05 kg).

Survey of germplasm was done in March, 96 and one cultivated type, locally known as Mundi was collected from Kanjirapuzha area of Palghat district.

In the evaluation of open pollinated and hybrid progenies of pepper, Cul. 5489 (Cherriakanikadan OP) recorded the maximum green berry yield of 7.14 kg/vine followed by Cul. 5403 (Karimunda OP) and Cul. 7156 (Perumkodi OP) with 4.60 kg and 3.89 kg per vine respectively.

In the multilocational trial of promising cultures, Panniyur 3 with a mean yield of 4.02 kg ranked first followed by Panniyur 5 (3.91 kg.) and Karimunda (2.69 kg).

In the MLT of promising cultivars, Kuthiravaly gave the highest yield of 3.39 kg/vine followed by Neelamundi (3.37 kg) and Arakkulam munda (3.20 kg).

In the irrigation-cum-fertiliser trial of two black pepper cultivars, irrigation at IW/CPE ratio of 0.25 was found to be the best treatment for maximum green spike yield (4.27 kg/vine) in the cv. Karimunda. Irrigation did not show any significant effect on spike yield in var. Panniyur 1.

On farm trial on the control of foot rot disease of pepper showed that spraying and drenching with 1% Bordeaux mixture + application of 2 kg neemcake and 1 kg lime/vine was effective.

Spraying and drenching with 1% Bordeaux mixture and 0.2% Akomin was found to be the best treatment for the control of nursery diseases of black pepper.

### Farm Revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	5.59162	26.34490

### Important Visitors

Name & Designation	Purpose	Date of visit
Dr. S. Edison, Project Co-ordinator (Spices), IISR, Calicut	Review of research on pepper	25-1-96

## HIGH RANGE ZONE

The high range zone is a sub-region of Western Ghats lying at an elevation of 750 metres above MSL. The region comprise of the hill districts of Wayanad, Idukki, Nelliampathy and Attappady ranges of Palghat, Thannithode and Seethathode panchayaths of Kollam, Peringammala, Aryankavu, Vithura, Amboori and Kallikadu Panchayats of Thiruvananthapuram district. The total geographical area of the zone is 1140.67 Sq. km. representing 28.67 percent of the total geographical area of the state. This zone is mainly agrarian with a predominance of high value perennial crops. The major crops are coffee, paddy, pepper, cardamom, rubber, tea, ginger, tapioca etc. The climate prevailing in the zone is by and large mild subtropical which is conducive for growing both tropical and subtropical fruits.

The NARP phase I subproject for this zone was launched in November, 1983 and was completed in November, 1988. The NARP Phase II project was in operation since April, 1988 and was completed on 19-4-1992. Under the National Agril. Research Project, the Regional Agril. Research Station at Ambalavayal functioned as the lead station with the Cardamom Research Station at Pampadumpara as its sub-station.

### REGIONAL AGRICULTURAL RESEARCH STATION AMBALAVAYAL

This station was established in 1946 as a part of the Wayanad Colonisation Scheme to provide planting materials and technical advise to the settled cultivators. With the formation of the Kerala State it was brought under the Dept. of Agriculture. It was upgraded to the status of a Central Horticultural Research Station in 1966 and later brought under the control of Kerala Agricultural University in 1972. In 1983, it was elevated to the status of a Regional Agricultural Research Station under the National Agricultural Research Project with Cardamom Research Station, Pampadumpara as its sub-station.

The Regional Agricultural Research Station, Ambalavayal is located at an elevation of 974 metres above MSL in Sulthan Bathery Taluk of Wayanad District. It is 100 km north east of Kozhikode.

Lead function : Pepper and pepper based cropping in high ranges, hill paddy, cool season vegetables, soil and water management, subtropical fruits and coffee based cropping system.

Verification function : Essential oils and medicinal plants and ginger.

- Station Head:
1. Dr. K. Kumaran, Associate Director  
(1.4.95 to 14.7.95)
  2. Mr. C. M. George, Associate Professor  
(14.7.95 to 27.9.95)
  3. D. K. C. Aipe, Associate Professor  
(28.9.95 to 31.3.96)

**Staff position**

*Scientific Staff* (As per the recommendation of peer group)

Category	No. of posts		
	Sanctioned	In position	Vacant
1	2	3	4
Associate Director	1	1	H. Q. shifted to KAU, Vellanikkara
Professor (Horticulture)	1	—	1
Associate Professor (Agronomy)	1	1	—
		(from 28.9.95)	
(Plant Pathology)	1	—	1
Asst. Professor			
Plant Breeding	1	—	1
Agri. Botany	1	—	1
Horticulture	2	—	2
Plant Pathology	1	1	—
Agri. Entomology	1	1	up to 27.9.95
Soil Science & Agri. Che.	1	—	1
AICRIP on spices			
Assoc. Professor (Plant Breeding)	1	1	Asst. Prof. in position
Administrative			
Administrative Officer	1	1	—
Section Officer	1	1	—
Assistants	5	3	2
		(2 provisional)	
Typist/Steno	3	2	1

*Supporting/Technical*

	1	2	3	4
Farm Supervisor/				
Farm Asst. (Ag.)		9	6	3
Farm Asst. (Vety.)		1	1	—
Field Supervisor		1	1	—
Lab. Assistant		3	3	—
Technician		1	1	—
Tractor Driver		1	1	—
Oil Engine Driver		1	1	—
<i>Others</i>				
Driver		1	—	1
Peon		3	3	—
Budder		1	1	—
Regular Mazdoor		4	4	—
Class IV		5	5 (3 on working arrangement)	—
Watchman		4	4	—

**Faculty Improvement programme**

New post sanctioned/created/shifted— Nil

Scholarship awarded to staff/deputation of staff for higher studies— Nil

**Details of Seminars/Symposium/Training attended by staff**

A Seminar on Land resource, conservation, development and management organised by Kerala Land Use Board and Kerala Agrl. University was conducted at the Station on 3-6-95 and all the Scientists of the Station participated in the seminar.

Smt. Susamma P. George, Assistant Professor attended a three months training programme on Hybrid Rice Research at IRRI, Manila, Philippines from 10.9.95 onwards under FAO Fellowships programme.

A three days training programme on the propagation techniques of fruit crops and ornamental plants was organised for the beneficiaries of Centre for Management in Development programme during the last week of October.

Scientists of the station attended a seminar on National Watershed Development programme conducted at KVK, Ambalavayal by the Department of Agriculture for Mitrakisan and field officers of different departments from 2/2/96 to 8/2/96 and taken classes.

The XIV Zonal Research and Extension Advisory Council meeting of the high range zone was conducted at the station on 22-2-96 and all the scientists participated in the meeting and presented their research projects.

Dr. T. P. Manomohandas, Asst. Professor and Sri. K. S. Pradeep, Research Associate attended an Agri. Seminar organised by Ambukuthi Pepper Samithi of Nenmeni Krishi Bhavan on 16-3-96.

Dr. K. C. Aipe, Associate Professor and Dr. T. P. Manomohandas, Asst Professor attended a Seminar organised by STED, Kozhikode on 26-3-96 and Dr. T. P. Manomohandas took a class on value added spice products.

Scientists of the station also participated in the T & V monthly workshops of Wayanad District.

The Staff of the station actively participated in the Wayanad carnival organised by DTPC from 28.12.95 to 30.1.96, Calicut flower show '96 organised by Calicut Agri-Horticultural society from 8.3.96 to 13.3.96 and in Agricultural Exhibition organised at Kaniyampetta as a part of National watershed development programme on 9.3.96 and 10.3.96.

#### **Involvement of staff in Academic Programmes**

A batch of 14 B.Sc. (Agri) students of College of Horticulture, Vellanikkara were given field training at this station from 4.12.95 to 16.12.95.

#### **Research**

##### **Major Research Achievements**

##### **Spices**

Among the thirty six accessions in the ginger germplasm V<sub>2</sub>E<sub>1</sub>-2 recorded the highest yield of 52.53 t/ha of green ginger.

The incidence of bacterial wilt was the least in Ernadan (1.67%) followed by 2.08% in SG-603 and 2.67% in V<sub>2</sub>E<sub>1</sub>-2.

Turmeric cultivar Amalapuram recorded the highest yield of green rhizome (42.86 t/ha) among the forty cultivars tested in the germplasm.

In the comparative yield trial with six turmeric cultivars Sugandham recorded the highest yield (41.69 t/ha) followed by Mundakkayam (36.61 t/ha).

Multilocational trial with fourteen pepper cultivars/ varieties at this station revealed that Ottaplackal recorded the highest wet weight (1.348 kg) and mean dry weight (0.401 kg) per standard.

## Rice

Among the 53 accessions maintained in the rice germplasm Kirwana recorded the highest grain yield (6445 kg/ha) followed by Puttabetta (6200/kg/ha).

Comparative evaluation of twelve scented rice varieties revealed that IET 12606 recorded the highest grain yield (3113 kg/ha) followed by Pusa busmati-I (2942 kg/ha).

The experiment on the identification of collateral hosts of causal organism of udbatta disease of rice revealed that *Panicum repens* found in the rice fields harboured the Pathogen.

## Farm Revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	35.06	70.12

## Important visitors

Name & Designation	Purpose	Date of visit
1	2	3
Dignitaries from the High Court of Kerala	To acquaint with the various station activities	29.4.1995
Mr.M.G.K. Moorthy, IAS Commissioner, SC/ST	To acquaint with the activities of the station	9.5.'95
Mr, Joseph Domenic Customs Collector, Kochi	-do-	9.5.'95
Dr. C.J. Thampi, Comissioner, Kerala Land use board	To participate in the Land use seminar held at the station	3.6.'95
Smt. Rosakutty K. C. MLA, Sulthan Bathery	Inauguration of Land use seminar	3.6.'95
Sri.Syed Mohammed Ali Shihab	To acquaint with the station activities	12.8.'95
Sri. N. Gopalan, Executive Committee Member	-do-	21.11.'96
Sri. Purushotham Mudigere, Karnataka	-do-	24.11.'95
General Council Members Mr.P.N.Premachandran Mr.P.C. Retnakaran Mr.K. Gopalan Mr. R. Vijayan Mr.K.Rajan Mr.Sureshkumar, S. Dr.P.C. Antony	To visit the station and to review the research projects and other activities of the station	4.1.'96

1	2	3
Sri.V.K. Rajan, Judicial First Class Magistrate	To acquaint with the activities of the Station	27.1.'96
Sri.Viswas Metha,IAS District Collector, Wayanad	To acquaint with the station activities	10.2.96 & 14.2.'96
Sri. S.T. Raman Joint Director (Horticulture) Ooty	-do-	12.2.'96
Dr. M.R.Sethuraj Director of Research Rubber Board Kottayam	To discuss with the Scientists of the station regarding the experiment on evaluation of rubber clones suitable for Wayanad to be conducted at the station	15.3.'96

## ii. CARDAMOM RESEARCH STATION, PAMPADUMPARA

This station was established in the year 1956, under the Department of Agriculture with a view to undertake research programmes on the various agronomical, botanical entomological and phytopathological problems of cardamom cultivation, soil and water management problems in the Idukki region, selection of promising pepper cultivars for high ranges, standardization of agro-techniques and formulation of plant protection measures, in collaboration with Pepper Res. Station Panniyur for cardomom and pepper and to serve as a centre for agricultural extension education activities in the Idukki Region.

The station has been taken over by Kerala Agricultural University in 1972. The All India ,Co-ordinated Spices and Cashew Improvement Project was started in 1972 and NARP in 1983. The station has more than 600 rose varieties and serves as a source for supply of rose buddings in polybags and pots.

Researches on tree spices had also been initiated.

### Station Head

Dr. Arthur Jacob, J. Assoc. Professor (Ent.)

**Staff position**

Cadre	Sanctioned	In Position	Vacant
Assoc. Professor (ICAR)	2	1	1
Asst. Professor (KAU Non-plan)	8	4	4
Associate Professor (NARP)	1	1	—
Assistant Professor (NARP)	1	—	1
<i>Administrative and supporting staff</i>			
<b>ICAR</b>			
Farm Assistant	1	1	—
Lab Assistant	1	1	—
Peon	1	1	—
<b>NARP</b>			
Farm Assistant	2	2	—
Typist Grade II	2	1	1
<b>KAU (Non-plan)</b>			
Administrative Assistant	3	2	1
Assistant Sr. Gr.	1	—	1
Farm Supervisor	1	1	—
Farm Assistant	1	1	—

**Details of Seminars/Symposium/Trainings attended by staff**

Dr. Arthur Jacob J., Associate Professor and Head, and M. Murugan, Assistant Professor, CRS, Pampadumpara attended XIII AICRP workshop on spices held at Regional Agricultural Station, Durgapura, Rajasthan from 22.8.95 to 25.8.95.

**Involvement of staff in Academic Programmes:**

M. Murugan Asst. Professor (Agricultural Chemistry) was a member in the advisory committee of Sri. M. V. Sudeesh, MSc, Agriculture student at COH, Vellanikkara during 1994-96. Sri. M.V. Sudeesh has successfully completed his M.Sc. Programme in time.

**Research****Major Research Achievements**

Steam volatile oil estimation has been completed partially and the oil content of analysed varieties varied from 5.6 to 8.6 percent on moisture free basis. The lowest oil content was recorded by PS-2 and the highest was recorded by PS 12 and PS5. The volatile oil content varies with types and varieties mainly depends on the size, shape, no. of capsule, thickness of skin etc. The top ten varieties (on the basis of yield of dry



capsules) have also recorded reasonably higher oil content. Soil and other environmental factors may also have some influence on the oil content of cardamom types. These information can also strengthen our breeding programme to have better cardamom types with higher oil content which is now considered one of the important characters for exporting cardamom. Among the 72 cardamom lines evaluated for yield, the highest yield was recorded by PS 31 which yielded 835 gm of cured capsules per clump followed by PS I which gave 689 gm of cured capsules. Tillering was maximum for PV-1 (66 tillers/clump). The no. of panicles per clump was maximum in PS 6 and the no. of capsules per clump was maximum in PS 31 (5459). The other high yielding clones are PS 27, PS 29, PS 24, PS 6. Among these high yielding clones PS 31, PS 4 have low capsule borer attack with less than 1%. Thrips damage was the lowest in PS 10, PS 24, PS 22, PS 1, S 1 (less than 1%).

In pepper, diseases like quick wilt and leaf spot and pests such as thrips, leaf eating caterpillars were noticed in all the types. The incidence was less in Sreekara. All varieties are susceptible for quick wilt but not for slow wilt.

Only leaf symptoms were noticed and the incidence was higher in culture 1553. Leaf spot was highest in Vellanamban (control). Thrips population was highest in Kottanadan (ACC 2426). Leaf eating catterpillars were very high in Panniyur 2.

#### **Farm Revenue**

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	504749.80	3512549.80

#### **Important visitors**

Name and designation	Purpose	Date
Dr. AM Michael Vice-Chancellor	Station visit	
Dr. SN Potty Director of Research, Spices board	Official	10-1-1996
Sri. Koshy John Director, Development Spices board	"	10-1-1996
Subratho Biswas District Collector, Idukki	"	7-3-96

# KERALA HORTICULTURE DEVELOPMENT PROGRAMME

## VELLANIKKARA

### Research and Development Project

The Research and Development (R & D) component of Kerala Horticulture Development Programme (KHDP) started functioning at the Kerala Agricultural University since February, 1994. This forms a part of the joint venture of the Kerala state Government and the European Economic Community (EEC). The R & D component of KHDP is fully financed by the KHDP. The R & D activities of KHDP at the University is functioning at two campuses of KAU, viz., College of Horticulture, Vellanikkara and the College of Agriculture, Vellayani.

Dr. S. Ramachandran Nair functioned as the General Co-ordinator of the R & D Unit of KHDP during the period under report.

### Mandate

To conduct research on fruit crops (banana, mango, and pineapple), vegetables and post harvest technology of fruits and vegetables based on farmer's problems.

To supply quality planting materials, i.e. breeder/foundation seeds of vegetables, mango grafts and tissue culture plants of banana and pineapple to KHDP.

Establishment of pest and disease surveillance units at Ernakulam and Trivandrum Pilot Project Areas of KHDP and to monitor the occurrence of pests and diseases and to give recommendations.

### Staff position

Category	Sanctioned	In position	Vacant
<i>Scientists</i>			
General Co-ordinator	1	1	—
Professor (Ag. Entomology)	2	2	—
Assoc. Professor			
Horticulture (Fruits)	1	1	—
" (Vegetables)	1	1	—
Assoc. Professor (Agronomy)	1	1	—
Asst. Professor			
Horticulture (Fruits)	1	1	—
" (Vegetables)	1	1	—
" (Seed Production)	1	1	—
" (Pl. Pathology)	2	2	—
" (Ag. Entomology)	1	1	—
" (Pl. Physiology)	1	1	—
<b>Total</b>	<b>14</b>	<b>14</b>	<b>—</b>

1	2	3	4
<i>Administrative staff</i>			
Administrative Officer	1	1	—
Asst. Sr. Gr.	1	1	—
Asst. Gr. I (D R Office)	1	1	—
Asst. Gr. II	1	1	—
Office Attendant	1	1	—
<b>Total</b>	<b>5</b>	<b>5</b>	<b>—</b>
<i>Supporting staff</i>			
Farm Asst. (Agri.)	6	6	—
Stenographer	1	1	—
Typist	1	1	—
Research Assoc.	7	7	—
<b>Total</b>	<b>15</b>	<b>15</b>	<b>—</b>

Details of scientists deputed to seminars/symposia/  
workshops etc.

Name of Scientists	Seminar/Symposia/ Workshops/Meetings/ Classes		Period and Venue
	1	2	
Dr. S. Ramachandran Nair	Attended interaction seminar at the pilot project area		
Prof. P. Reghunath	Attended farmers seminar at the pilot project areas Trivandrum		Muttacadu, Kalliyoor, Vembayam, Sreekaryam Pothencode Vamanapuram, Athiyannoor
Dr. TR Gopalakrishnan	All India Co-ordinated Workshop on vegetable Research Classes for KHDP Officers Classes for farmers		BHU, Varanasi 25 & 26-3-96  Vellanikkara dt. 22-5-95 Killimangalam H. S. Panjal, Thrissur 18-8-95

1	2	3
	Classes for Officers of the Dept. of Agriculture	COH, Vellanikkara 10-11-95
	-do-	RARS, Pattambi 29-11-95
	Students of Vimala College, Thrissur	Vimala College Thrissur 18-1-96
	Staff, Canara Bank Classes for Officers of State Dept. of Agriculture	C.T.I., KAU, Mannuthy 20-1-96
	Developmental Officers of various Depts.	C. T. I., KAU, Mannuthy 1-3-36
	Project Co-ordination Group meeting (Vegetables)	Vellanikkara dt. 30-11-95
	Package of Practices recommendations Meeting at Agrl. Minister's chamber	KAU 15, 16-1-96 22-1-96
	Meeting at the Chamber of District Collector, Idukki for intensification of Vegetable Production in Idukki District.	19.2.96
	Planning and Development Committee Meeting	20.2.96
	ZREAC Meeting - High Range Zone at RARS, Ambalavayal	3.3.96
Dr. T. Radha	Seminar on Mango	Palakkad during April, 95
	Seminar on "Mango Cultivation"	Agaly during June, '95
	Training on mango	Vellanikkara during September, 95

1	2	3
Dr. Maicykutty P. Mathew	Farmer's Seminar	Kothamangalam 29.5.95
	Class on Integrated Pest management on Mango- KHDP Officials	Vellanikkara, 15.9.95
	Class on Integrated Pest Management on Cucurbits Master farmers	Vellanikkara, 30.10.95
	Class on Integrated Pest management on Pulses	Vellanikkara, 31.10.95
	Agricultural Seminar-cum-Exhibition on Pineapple Kerala Science Congress Training for KHDP Master farmers	Vazhakkulam 25.1.96 Cochin University 27-29.1.96 Kozha, 13.3.96
Dr. Aravindakshan	Visited the following Research Institutes	Regional Research Station, Payyur Indi-American Hybrid Seeds, Bangalore, Punjab Rao Krishi Vidyapeeth, Akola Jain Irrigation, Jalgaon, ICAR Research Complex, Goa during 15.5.95 to 24.5.95
	Training for KHDP Master farmers	Vellanikkara 2.11.95
	Technical Assistants of KHDP	C.T.I., KAU, Mannuthy 7.11.95
	Master Farmers, KHDP	Chempu, 20.2.96 Kodungalloor, 24.2.96

1	2	3
	Master Farmers, KHDP	COH, Veilanikkara, 12.3.96
	Master Farmers, KHDP	Kozha, 14.3.96
	Master Farmers, KHDP	Vyttila, 21-3-95
Dr. A.K. Babylatha	Kerala Science Congress	Cochin University, 27-29.1.96
Smt. T. Sheela Paul	Classes for KHDP officers	Vellanikkara, 22.5.95
	Class on Integrated Pest management on Mango- KHDP Officials	Vellanikkara, 15.9.95
	Class on Disease Management on Cucurbits	Vellanikkara, 30.10.95
Dr. C. Gokulapalan	Attended farmers seminar	Muttacadu, Panangadu, Kalliyoor
Dr. K. Nandini	National Seminar on Role of Crop Physiology in Improving agricultural Productivity	T.N.A.U., Coimbatore 29 to 31.1.96
	Agricultural Seminar-cum- Exhibition and Agroclinic	Vazhakkulam 25 to 26.1.96
Dr. V.S. Devadas	National Seminar on Role of Crop Physiology in Improving Agricultural Productivity	T.N.A.U., Coimbatore 29 to 31.1.96
Smt. Omana Pavunny	Summer Institute of Home Science for 28 days	Avinashilingam Deemed University, Coimbatore during September 95
	Kerala Science Congress	Cochin University 27 to 29.1.96

## Involvement of staff in academic programme

Scientists of this station functioned as Major Advisor/member of Advisory committee of M.Sc./Ph.D. students.

Name of the scientist	Name of student	As major advisor member
Dr. S. Ramachandran Nair	Mrs. Sherly Kuriakose	Major Adviser
	Mr. C. Narayanankutty	"
	Mrs. Mini Balachandran	"
	Miss Jyothi M.L.	"
Dr. T.R. Gopalakrishnan	Mr. P.K. Singh	"
Dr. T. Radha	Mr. Joe Jose	"
Dr. K. Aravindakshan	Miss Deepa	"
	Jacob Mavelil	"
Dr. A.K. Babylatha	Miss Bindu	"
Dr. K. Nandini	Miss Tara	"
Dr. V.S. Devadas	Mr. Bijoy Kunnath	"
Dr. Maicykutty P. Mathew	Miss Sreekala	Member, Advisory committee

## Research Highlights

### Mango

The qualitative characters of Bangalora and Alphonso varieties grown in Palakkad were evaluated and found that these varieties were on par with the fruits of Maharashtra and A.P. with respect to fruit characters and quality.

A two year study on the control of mango hoppers showed that maximum control was obtained by two sprayings of cypermethrin at 50 ppm on the panicle at 14 days intervals. This treatment resulted in maximum no. of fruits/panicle and a fruit set of about 268% over control. Quinalphos 0.05%, endosulfan 0.05% and malathion 0.1% were also effective against the hoppers. The infestation of mango fruit fly can be managed by monthly application of malathion 0.1% containing 1% sugar starting from 2 months after fruit set. Tulazi trap attracted and killed large numbers of fruit fly (*Bactrocera dosalis*).

The pink disease of mango can be controlled by the proper removal and destruction of the infected portions and applying fungicides like B.M., calixin and carbendazim.

Identified mango varieties suited for pulp based products.

## Pineapple

In order to identify the major cultivation problems faced by pineapple farmers, a survey was conducted at Vazhakulam area (potential pineapple growing tract of Kerala). Data was collected in the interview schedule on the cultivation aspects such as distribution of area, cropping system, plant protection, cost of cultivation etc. and the major problems faced by the farmers. The important problems in pineapple cultivation as perceived by the farmers are high price fluctuation, lack of storage facilities, marketing problem, scarcity of labourers, and land and disease problems. The problems identified in the survey were wider spacing, indiscriminate use of fertilizers and use of high concentration of hormone for inducing flowering.

From the study on the comparative testing of ethephon concentration on flower induction of pineapple var. Mauritius, it was found that for inducing uniform flowering in pineapple ethephon 25 ppm+2 percent urea+0.04 percent  $\text{CaCO}_3$  is sufficient. There is no need for using higher concentration of ethephon for flowering as practised by the farmers of Vazhakulam area.

Results of the population density trial in pineapple variety Mauritius for two seasons revealed that high density planting is possible in Mauritius. Eventhough a slight decrease in individual fruit size was noticed when the plant population was increased from 22,000 to 37,000/ha. The estimated yield per hectare was significantly higher for high density planting. From the economic analysis it was found that the net profit per hectare was highest for a plant population of 34,188 plants/ha.

Investigation on "marbled fruit" disease in pineapple revealed that this disease is not a physiological disorder but is a complex disease. Different organisms like *Fusarium* sp. *Penicillium* sp. *Aspergillus* sp. and some bacteria were isolated from this. The incidence occurs during rainy season only if rainfall and RH are high and the sunshine hours are less than six per day. The quality of the fruit is reduced due to infection. In Kerala the incidence is prevalent in the variety 'Kew'.

Developed packaging technique for storing pineapple under ambient storage conditions for a period of 15 days.

## Banana

The on-farm survey revealed that 'Kokkan' disease and pseudostem weevil are the major disease and pest infesting













1	2	3	4
Dr. Lucy Sabu Asst. Professor Parasitology	Summer Institute on Recent advances on the epidemiology and control of Zoonotic diseases	Madras	19-6-95 to 8-7-'95
Dr. H. Subramanian Assoc. Professor Parasitology and Dr. V. Sathianesan, Professor	VII National Congress on Veterinary Parasitology	Madras	19-21 August '95
All teachers of Dept. of Poultry Science	Annual conference & Symposium of IPSACON-96 XIX Workshop of Project Directorate on Poultry	Trichur	11-1-96 to 13-1-96  28-29 August 95
Dr. Mammen J Abraham, Asst. Professor, Pathology	Short term course on advances in Avian Diseases	Mannuthy	16-12-'95 to 31-12-'95
Dr. Koshy Varghese	Short course on PCR techniques	WRI, Izatnagar	7-1-'96 to 18-1-'96
Dr. G. Krishnan Nair, Assoc. Professor of Microbiology	Training on application of PCR and nucleic acid hybridization for detection of animal viruses	—	—
Dr. A.D. Joy, Assoc. Professor, Pharmacology	Summer Institute in Veterinary Medicine	Bhubaneswar	May 24 to June 12 '95
Dr. K.C. George, Professor & Head Dept. of Statistics	49th Annual Conference of Indian Society of Agricultural Statistics	Lucknow	22-24th Feb. '96
Dr. N.M. Aleyas, Professor, Dept. of Clinical Medicine	Poultry Seminar organised by Department of Poultry Science	Trichur	22-8-'95



1	2	3	4
Dairy Technology Unit	Training in the preparation and storage of dairy products	11.9.'95 to 16.9.'95	6
"	Training in quality control of milk	21.8.'95 to 26.8.'95	12
"	Training in sanitary practices in Dairy plant	25.9.'95 to 26.9.'95	8
"	Training in operation and maintenance of Dairy equipments	15.7.'94 to 14.7.'95	5
Meat Technology Unit	Abattoir Management and Meat Inspection Techniques	13.11.'95 to 25.11.'95	9
"	Rabbit Meat Processing Techniques	24.11.'95 to 1.12.'95	5
"	Quality control meat inspection and abattoir management	1.12.'95 to 28.2.'96	10
"	P.G. Diploma Programme in meat processing technology	1.12.95 to 30.11.96	5
Programme officer NSS Unit Dr. MR Subhadra	Orientation training course at Rajagiri College, Kalamassery	9.7.'95 to 12.7.'95	
Department of Microbiology	Manufacture and standardization of Biological products	4.10.'95 to 31.12.'95	7
"	Advanced Microbiological Techniques including mastitis diagnosis	1.2.'95 to 30.4.'95	7
"	Advanced Microbiological Techniques including mastitis diagnosis	1.1.'96 to 31.3.'96	15
Department of Pathology	Training on post mortem Techniques	12.6.'95 to 27.6.'95	4
"	Training on aflatoxin analysis	16.10.'95 to 26.10.'95	3



1	2	3	4
Department of Pathology	Training on Diagnosis of Poultry Disease	16.10.'95 to 28.10.'95	8
"	Training on advances in Clinical Pathology	6.11.'95 to 18.11.'95	10
"	Training on advances in Disease investigation	8.12.'95 to 7.3.95	10
"	Summer Institute on advances in Mycotoxicosis	3.7.'95 to 22.7.'95	20
"	Short term course on "Advances in Avian Disease"		
Department of Preventive Medicine	Farmers Training programme at Kadmal Island Kalperi & Minicoy	18-11-95 to 27-11-95	
"	One day Farmers training seminar at Choondal	3-12-95	
"	Farmers training camp at Angamaly	20-12-95	
Department of Parasitology	Seminar on parasitic disease	20 & 21 March 96	100
Department of Poultry Science	Conducted XIX workshop of project Directorate on poultry	28 & 29 Aug. '95	
"	Conducted XVIII Annual Conference & Symposium of Indian Poultry Science Association	11-1-96 to 13-1-96	
"	Three months advanced training in Poultry production and Management for Veterinarian	1-2-96 to 30-4-96	
"	One day seminar for poultry farmers	22-3.95	100

**Academic programmes  
Student statistics**

**i) UG programme (B.V.Sc. & AH)**

Years of admission	Men	Women	Total
1983	1	—	1
1984	1	—	1
1986	6	1	7
1987	6	3	9
1988	4	3	7
1989	4	6	10
1990	59	24	83
1991	50	29	79
1992	58	27	85
1993	60	33	93
1994	57	44	101
1995	59	38	97
			<b>573</b>

**B. Sc. (DSc. & Tech.)**

1993	6	14	20
1994	14	7	21
1995	8	11	19
			<b>60</b>

**ii) PG Programme  
(M. V. Sc.)**

1994	21	4	25
1995	23	13	36
			<b>61</b>

**Ph. D.**

1994	4	1	5
1995	2	1	3
1993	2	1	3
1992	1	0	1

**Students passed out**

B. V. Sc.	69	37	106
M. V. Sc.	12	3	15
Ph. D.	1	—	1

**Library**

No. of books added	: 152
Progressive total	: 22702
No. of Indian journals subscribed	: 75
No. of Foreign Journals subscribed	: 66
Journals received on exchange/gratis	: 25

Hostels	No. of inmates	Name of Asst. Warden
Mens hostel		
Main	110	Dr. Jose John Chungath
Annex	131	Dr. P. G. Baby
P. G.	52	Dr. V. S. Balakrishnan
Ladies hostel	211	Dr. C. Girija

#### Revenue

From sale of milk & milk products

Milk — 9,50,349

Milk products — 3,52,397

Total Rs — 13,02,946

#### A. I. done & Revenue collected

	Kokalai	Mannuthy	Total
Cow	1412	2565	3977
Buffalo	60	131	191
Goat	1472	210	1682
	Rs. 20400	Rs. 40905	Rs. 61305

#### Research Highlights

Immuno absorption of antibuffalo serum was found to be more beneficial. Rabbit anti buffalo serum absorbed with goat freeze dried antigen is capable of indentifying both beef and buffalo beef which is not possible with any other absorbed antisera.

Filter paper was found to be a good medium for carrying meat antigen to be used later with unabsorbed antiserum.

Anaesthesia using Acepromazine thiopental was found to be satisfactory for resection and reconstruction of trachea in dogs.

Circumferential resection and end to end anastomosis of the trachea was found to heal with minimal complication in comparison to prosthetic reconstruction.

Xylazine diazepam combination was found satisfactory for anaesthesia in enteroanastomosis in dogs.

Premedication with Atropin and Xylazine followed by Tiletamine-Zolazepam was found to be satisfactory in dogs as it produced quick and smooth induction of anaesthesia.

Studies carried out to elucidate seasonal variation in semen characteristic in goats revealed that there was significant difference in semen characteristic between seasons.

Semen extension with milk antibiotic extender and on storage under refrigeration was found to deteriorate, rendering it unsuitable in 24 hours.

Investigations carried out to study the effect of different concentration of glycerol on post thaw motility and fertility of frozen Buck semen revealed that Tris extender with 6% of glycerol was superior to Tris extender with 4% and 5% glycerol for better post thaw motility and fertility.

A method was standardised to vaccum condense the whey solids.

Standardized a method to vaccum condense the whey solids. It was proved that cheese whey can be used in a condensed form for the preparation of yoghurt. Studies on Intra uterine infusion of homologus plasma in the treatment of Endometritis in cows revealed that homologus plasma drawn from the cow at the time of oestrus has significant bactericidal or bacteriostatic property. Infusion of plasma into the uterus hastened the clinical recovery from endometritis and better conception rates.

It was proved that cheese whey can be used in a condensed form for the preparation of yoghurt. No technological problems were observed in this.

The structure and development of the upper digestive tract in Japanese quails were studied and reported.

Experimental study undertaken to test whether Monensin, Furazolidone and sodium chloride could induce Ascites syndrome in broiler chicken revealed that sodium chloride group developed ascites within one week of administration. In furazolidone group few birds developed ascites.

Three hundred and fifty cases suspected for Rabies was examined and 14% was found to be positive for Rabies.

Among the energy feeds, yellow maize protein is found to be less degradable in the rumen as compared to jowar, rice bran and wheat bran protein.

Lactation studies revealed that in medium producing Jersey cross-bred cows on a grass based diet a UDP level (by pass protein) of 63% may be considered optimum in a concentrate mixture with 20% crude protein and 70% TDN for higher production and better economic efficiency in their early lactation. Feeding experiments in crossbred heifer calves using isoproteinic and isocaloric concentrate mixtures

including fish meals at 5 and 10% level in the place of conventional plant protein supplement revealed better growth and feed conversion efficiency in animals fed on concentrate mixture containing fish meal.

Results of studies to find out the effect of dried spleen as a bio-stimulator in the ration of cross-bred calves at a rate of 0.1% in the ration did not bring about any significant beneficial effects on growth, feed efficiency and nutrient digestibility in calves gaining at an average rate of 600 gm/day.

Experiments conducted on laying hens to assess the influence of feed enzymes in the ration of laying hens revealed that incorporation of exogenous enzymes viz., Cellulase and orprotease exerted positive influence on feed efficiency, egg production feed intake and nutrient availability in laying hens.

Investigations carried out to find out the extent of *in vitro* microbial degradation of pure mimosine and that from immature leaves, mature leaves, tender stems and seeds of *Leucaena leucocephala* using strained goat rumen liquor indicated that rumen micro organisms of cross-bred goats degraded mimosine to DHP ammonia and volatile fatty acids and that mimosine did not inhibit the microbial activity even though the possible role of *Leucaena* endogenous enzymes in partial degradation of mimosine cannot be ruled out.

Analytical studies using 42 different feed ingredients for the estimation of total condensed and hydrolysable tannins indicated that there was wide variation in the content of total tannins in different feeds. Condensed tannins were more widely distributed than hydrolysable tannin in majority of cases. Leguminous feeds and fodders were found to contain more total tannin. Addition of pure tannic acid inhibited the protein break down.

The local antibody response of ducks to the selected antigens (*Salmonella typhimurium* and R2B strain of NDV) was assessed.

Frozen semen samples randomly selected from various centres were screened for various microbes, bacteria, mycoplasma and fungi. It was seen that the semen samples in Mattupetty had the least microbial load except *E. coli* followed by Dhoni and Mannuthy. Though Mannuthy had the maximum total microbial load it was free from *E. coli* contamination.

Duck plague virus isolated from Kuttanad areas are being passaged in ducks embryo fibroblasts so as to evolve a cell culture adapted duck vaccine.

The immunoglobulin profile in the serum and the mucosa of intestine and trachea was elucidated and their functional properties studied.

Infectious bursal disease virus isolated from outbreaks in vaccinated and unvaccinated birds were subjected to detailed study and it was same that the isolated and the avirulent vaccine strain did not have any difference in their antigenic structure.

Studies on tracheal reconstruction in dogs — Two techniques of anastomosis was done viz. coaptation anastomosis and marlixmesh prosthesis and anastomosis. It was found that coaptation anastomosis produced rapid healing with very little complications. But marlix mesh prosthesis and anastomosis was accompanied by stenosis of tracheal lumen.

Comparative study of crushing and modified gambee techniques for intestinal anastomosis was conducted in dogs. It was seen that the techniques were satisfactory but crushing sutures were easy to perform and simple. However, the healing was rapid in modified Gambutechnique and luminal stenosis and adhesion were minimal.

Bacteriological quality of raw milk samples from three different source such as U.L.F. Mannuthy, Ollukkara Ksheera Vyavasaya Co-operative Society and Pananchery Milk producers Co-operative Society were compared significant difference in various bacterial counts was recorded.

*Acuria spiralis* and *strongyloides avium* were reported for the first time in India.

The life cycle of *Ornitho strongylus quadriradiatus* was worked out.

Studies on mastitis showed that yeast and yeast like fungi play a major role in mastitis especially in chronic cases.

#### Important visitors

Dr. R. Shivkumar, Scientist, SCT Institute of Medical Sciences and Technology, Thiruvananthapuram.

Dr. O. Ramakrishna, Professor and Head, Department of Surgery, College of Veterinary Science, Tirupati.

Dr. M. V. Rao (World Bank expert).

Dr. R. S. Paroda, Director General, ICAR.

Lt. Col. Radhakrishnan, DADRVS.

Dr. P. A. Shankar, Director, Instruction, UAS, Bangalore.

Hon. Minister for Agriculture, Sri. P. P. Thankachan.

Brig. Sidhir Bhanot (DDST Ainkk area).



Involvement of staff in academic programmes :

SFT 311 — UG Programme

SPS 602 — PG Programme

**Farm revenue**

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	16.55	38.369

**2.3 UNIVERSITY PIG BREEDING FARM, MANNUTHY**

It is a unit of College of the Veterinary and Animal Sciences, started in 1965 with the objective of conducting research on various aspects of swine production, to function as a demonstration unit for farmers and instructional unit for students and to produce and distribute good quality piglets to farmers. The area of the farm consists of four hectares.

Dr. Kurian Thomas was the head of the station during the period.

The details of staff sanctioned, in position and vacant are furnished below.

Designation/ Category	No. of posts		
	Sanctioned	In position	Vacant
<b>CPPR</b>			
Senior Farm Supervisor	1	1	—
Farm Supervisor Gr. I	1	1	—
Farm Assistant Gr. II	1	1	—
Pump Operator	1	1	—
<i>Administrative and Supporting staff</i>			
Admn. Assistant	1	1	—
Senior Grade Assistant	1	1	—
Assistant Gr. I	1	1	—
Peon Hr. Gr.	1	1	—
Pig Attendant	2	2	—
<b>AICRP</b>			
<i>Scientific Staff</i>			
Assoc. Professor and Head	1	1	—
Asst. Professor	1	1	—
<i>Technical Staff</i>			
Farm Assistant Gr. II	2	2	—
<i>Administrative and supporting staff</i>			
Sr. Gr. Assistant	1	—	1
Typist Gr. I	1	1	—



## Farm revenue

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96		
CPPR	5.25	7.52
AICRP	0.35	9.14

## Important visitors

Name and designation	Purpose	Date of visit
Dr. S. S. Bhatia, Project Co-ordinator, AICRP on Pigs, Izatnagar	Official	September 95
Dr. R. S. Paroda, Director General, ICAR	Official	

## 2.4 CENTRE FOR ADVANCED STUDIES IN POULTRY SCIENCE

The Centre of Advanced Studies in Poultry Science located in the College of Veterinary and Animal Sciences, Mannuthy was established in the year 1986. The Centre Co-ordinates the work of the department of Poultry Science, University Poultry and Duck Farm, All India Co-ordinated Research Project on Poultry Breeding.

Training/Symposia/Seminar/Workshop/Summer Institute etc. attended by Scientific staff

All teachers in the department of Poultry Science attended Annual Conference & Symposium of Indian Poultry Science Association (IPSACON 96) conducted from 11.1.96 to 13.1.96.

All teachers in the dept. of Poultry Science attended XIX workshop of Project Directorate on poultry conducted from 28th to 29th August 1995.

Training/Symposia/Seminar/Workshop/Summer Institute etc. conducted

Conducted XIX workshop of project Directorate on Poultry from 28-29 th August, 1995.

Conducted XXVIII Annual Conference and Symposium of Indian Poultry Science Association from 11-1-95 to 13-1-96.

Conducted three months advanced training in Poultry Production and Management for senior Veterinary Surgeons/Asst. Directors of Animal Husbandry Department from 1-2-96 to 30-4-96.

## 2.5 CENTRE FOR EXCELLENCE IN PATHOLOGY

Department of Pathology in the College of Veterinary and Animal Sciences was upgraded to the status of Centre for Excellence during 1987. Dr. A. Rajan continued to be the Director of the Centre during the period.

### Staff position

#### Scientific staff

Designation/Category	No. of posts		Vacant
	Sanctioned	in position	
Director	1	1	Nil
Professor & Head	1	1	Nil
Associate Professor	2	2	Nil
Associate Professor (NC)	—	3	Nil
Assistant Professor	—	6	Nil

#### Details of seminars/symposium/training attended by staff

Dr Koshy Varghese attended the training on Polymerase Chain Reaction at IVRI, Izatnagar, from 8th Jan. 96 to 18th Jan. 96.

#### Involvement of staff in academic programmes

UG Courses are regularly organised by the department. Now the syllabus prescribed by the Veterinary Council of India is followed.

#### a) Undergraduate Courses

Course No.	Title	Credits	Period	Course teacher	No. of students
VPP 211 (VCI syllabus)	General Vety. Pathology	2+1		K. M. Ramachandran T.V. Anilkumar B. Gangadharan	54
SPT 411 supplementary)	Clinical Pathology & Special Pathology	2+1	19-8-95 to 21-3-96	C. R. Lalitha T. Leenadevi	6
SPT 321	Systemic Pathology	3+1	19-8-95 to 21-3-96	N. Divakaran Nair	115
SPT 421	Clinics III	0+2		B. Gangadharan	
SCT 321	Clinics I	0+2	1-9-95 to 21-3-96	B. Gangadharan Mammen J. Abraham T. Leenadevi	100 1107
SPT 411	Clinical Pathology and Special Pathology	2+1	7-1-95 to 3-8-95	C. R. Lalitha T. Leenadevi	77

## Summer institutes organised by ICAR

Title	Period	Partici- pants	Period
Advances in Mycotoxicosis <i>Short course</i>	20 days	22	3-7-95 to 22-7-95
Advances in poultry diseases	2 weeks	11	16-3-96 to 30-3-96

The following training programmes for Veterinary Officers of the Animal Husbandry department were offered from this department.

Title	Period	Partici- pants	Period
Postmortem techniques	2 weeks	4	12-6-95 to 24-6-95
Aflatoxin analysis	1 week	3	16-10-95 to 21-10-95
Diagnosis of poultry diseases	2 weeks	10	16-10-95 to 28-10-95
Clinical Pathology	2 weeks	10	6-11-95 to 18-11-95
Advances in disease investigation	3 months	10	18-12-95 to 16-3-96

## Research activities

During the period 332 feed samples were analysed for aflatoxin and ochratoxin. Out of the samples examined 6.6% contained aflatoxin above 80 PP6 and 21.7% contain aflatoxin between 40 - 80 PP6.

An experiment was conducted to find out the efficacy of different bacterial starter cultures in reducing Aflatoxin M1 in milk by incubation for 24 hrs with different bacterial cultures. It was concluded that irrespective of bacterial cultures, incubation with 2% bacterial cultures for 24 h. at room temperature will reduce the AFMI level significantly.

The survey studies indicated that ascites syndrome was common among broilers. Field studies clarified that excess salt in the diet could be an aetiological factor. Ascites was also found to be associated with hydropericardium. Further studies are in progress.

The survey on milk samples using CMT revealed that in most of the organised farms sub clinical mastitis was found to be very much prevalent in many of the organised farms. Bacteriological agents associated with mastitis were identified and

their nature was characterised. Staphylococcal mastitis was found to be the most common. *E. coli* mastitis were also encountered. The antibiograms of the organisms isolated was characterised and the data are being analysed.

Dermatological disorders in cattle were subjected to detailed investigation. Hypersensitivity induced allergic dermatitis was found to be very common. Papilloma another important lesion. Dermatophilosis was recorded for the first time. Experimental studies in calves to demonstrate the epidermal and dermal response to DNCB, DHA, BCG and pesticides were carried out. The tissues response was mild and transient. The mast cell response was relatively less. DNCB was found to elicit highest tissue response. Only squamous cell carcinoma was recorded.

Various techniques like seller's stain, FA, I P., Williams stain were evaluated in diagnosing rabies. The FA was found to be superior over I P. The results were 98% accurate. A modified seller's staining procedure was developed and recommended for quick, simple and efficient method for rabies diagnosis in the field.

A cell culture system for evaluating the carcinogenicity of various carcinogens was developed using cell line of the ethmoid mucosa of cattle for the first time.

In an experimental study ochratoxin was demonstrated to cause teratogenicity in duck embryos. There was also moderate degree of lymphocytolysis in various lymphoid organs and this lead to immunosuppression. The bursa and the thymus were equally affected by OA. The spleen was relatively spared. Head and neck teratological abnormalities were more frequent. By this investigation it was demonstrated that ochratoxin, in residues carried over to the egg can cause poor hatchability, teratogenicity and embryo mortality.

## 2.6 VETERINARY COLLEGE HOSPITAL, MANNUTHY

Veterinary College Hospital, Mannuthy was established in the year 1961 with the primary objective of imparting clinical training to the students and providing clinical materials for field problem oriented research. Both in-patients and out-patients are attended category wise under supervision of specialists from four clinical departments viz. Clinical Medicine, Preventive Medicine, Surgery and Animal Reproduction.











The aim of the scheme is to conduct research on infertility and to find out the incidence, nature and magnitude of prevalence of infertility conditions among cross bred cattle of Kerala.

Under the scheme the main centre is functioning at Mannuthy with regional centre at Calicut and Kottarakkara. Under the regional centre at Calicut four ICDP Sub centres and two Veterinary Hospitals were selected for conducting the regular infertility camps and regular monthly visits, carried out for screening of cows and buffaloes for various infertility conditions. In addition to infertility camp organised by Animal Husbandry Department, Dairy Development Department and Krishi Vigyan Kendra, Ambalavayal were also attended.

Dr. P. P. Balakrishnan, Assoc. Professor continued as the Head of the Scheme.

#### 2.10 UNIVERSITY VETERINARY HOSPITAL, KOKKALAI

This University Veterinary Hospital situated in heart of Thrissur town has a campus area of 1.2 acres. This being the oldest Veterinary Hospital of the State was started as Cochin State Veterinary Hospital during August 1904, was subsequently been taken by Kerala Agricultural University during 1972.

Several problem cases of animal diseases are being referred to this hospital by field Veterinarians, Police Departments and other farmers from the entire State. This hospital is equipped with modern infrastructures for proper diagnosis of animal diseases and expert treatment are rendered to the farmers.

An *Ultra Sound Sector Scanner* was procured and is being made use of in the special clinical examination of small animals.

A *Portable Electro Cardiograph (E. C. G.)* unit is also made available for diagnosing cardiac problem in small animals.

The Clinical Laboratory attached to this hospital is fully equipped especially with *Chemistry Analyser* for examining blood samples for various diseases. The existing operation Theatre is fully air-conditioned and furnished with essential equipments and appliances to cater to the needs of modern surgery. This hospital has three speciality units viz., Medical Unit, Surgery Unit and Gynaecology Unit with Artificial Insemination Centre for Cattle, Buffaloes and Goats.

Staff Designation/ Category	No. of posts		
	Sanctioned	In position	Vacant
Professor	1	1	Nil
Asst. Professor	—	1	(on working arrangement from Vety. College, Mannuthy.)
Farm Assistant (Vety.)			
Sr. Grade	2	2	Nil
Pharmacist	1	1	Nil
Section Officer	1	1	Nil
Senior Grade Asst.	1	1	Nil
Attendant	2	2	Nil
Sweeper-Cum-Scavenger	1	—	1
Peon	1	1	Nil

• Involvement of staff in Academic programmes :

Offers Courses in the Veterinary College and conduct clinical training for U. G. and P. G. Students.

**Farm revenue**

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	Rs. 413.00	Rs. 8,19,043.10 (Rs. 8.19 lakhs)

**2.11. UNIVERSITY LIVESTOCK FARM AND FODDER RESEARCH AND DEVELOPMENT SCHEME, MANNUTHY**

The University Livestock Farm, Mannuthy, established more than 70 years back has been functioning as a Cattle Breeding Farm for the supply of superior breeding bulls for about 40 years. Since the starting of Kerala Veterinary College in 1955, the farm had the added objective of instruction to students and also undertaking research.

This farm provides learning facilities both at undergraduate and post-graduate levels and provides training facilities to farmers apart from serving the needs of farmers for their fodder seeds and slips. It undertakes problem oriented research projects on livestock farming applicable to Kerala conditions.

Now, the Livestock Farm is having a fodder section as well as a central pool of labourers. The area under the farm is 69 hectares.

### 3. FACULTY OF FISHERIES

#### 3.1 COLLEGE OF FISHERIES, PANANGAD

The College of Fisheries was started during the academic year 1979-80, with the approval of ICAR and the Govt. of Kerala. To begin with the College, started functioning at Mannuthy, but was shifted to the permanent campus at Panangad, Kochi, in the year 1981. The College is situated in a 30 ha campus by the side of Kochi-bypass (NH 47), 6 kms South of Vyttila. The College offers a 4-year degree programme leading to Degree of Bachelor of Fishery Science (B. F. Sc.) following the Semester system of teaching. The intake capacity at present is 40 per year. Post graduate programme (M. F. Sc.) is also being offered in the College in the disciplines of 'Aquaculture', 'Fishery Biology' and 'Processing Technology'.

Dr. M. J. Sebastian, Professor, Aquaculture and Head of Department officiated as Dean i.c. (Fisheries) during the period.

#### Departments

The College continued to function with the following seven departments:

1. Aquaculture
2. Fishery Biology
3. Fishery Hydrography
4. Fishing Technology
5. Fishery Engineering
6. Processing Technology
7. Management Studies

#### Staff position

Designation/ Category	No. of posts		
	Sanctioned	In position	Vacant
1	2	3	4
<i>Scientific staff</i>			
Dean	1	—	1
Professor	4	2	2
Associate Professor	10	8	2
Asst. Professor	37	20	17
<i>Technical staff</i>			
Asst. Librarian	1	—	1
Reference Assistant	1	1	—
Library Assistant	1	1	—
Lab. Assistant Gr. I	1	1	—



#### Details of seminars symposium/training attended by the staff

Dr. J. Rajasekharan Nair, Dr. K. V. Jayachandran, Dr. T. V. Anna Mercy, Sri. M. S. Raju. Smt. Alphy Korath, Asst. Professors, attended the Summer Institute on "Recent Advances In Marine Fish Stock Assessment Methods and Models", conducted under the auspices of the Indian Council of Agricultural Research at the Central Marine Fisheries Research Institute, Kochi during the period from 12-6-95 to 1-7-95.

Dr. Susheela Jose, Associate Professor, attended the workshop on "Mudcrab Farming", organised by Central Marine Fisheries Research Institute, Kochi on 4-7-95.

Dr. M. J. Sebastian, Dean i/c., gave the keynote address on "The Prospects of Freshwater Prawn Seed Production and Culture in Kerala", at the Seminar on Freshwater Prawn Farming held under the auspices of MPEDA at Ramankari on 22-11-1995.

Dr. D. Damodaran Namboodiri, Associate Professor, attended the training programme on "Value Added Products from Fish" held at Integrated Fisheries Project on 30-11-1995.

Dr. Susheela Jose, Associate Professor, attended the National Symposium on "Technological Advancements in Fisheries and its impact on Rural Development" organised by the Department of Industrial Fisheries, Cochin University of Science and Technology during the period from 5th to 7th December, 1995.

Dr. P. M. Mathew, Professor, gave a talk on "Recent Advances in Inland Fisheries", in the seminar on "Recent Advances in Industrial Fisheries Research and Development" sponsored by U.G.C. and organised by the Central Marine Fisheries Research Institute at Kochi on 23-1-1996.

Dr. Thresimma James, Assistant Professor, attended the Kerala Science Congress held at Kochi from 27th to 29th January 1996.

Dr. D. Damodaran Namboodiri, Associate Professor, Dr. Sajan George and Sri. George Mathew, Asst. Professors, attended the one day seminar on "Quality Control Measures" organised by the MPEDA at Kochi on 7-2-96.

Dr. Namboodiri also attended the seminar on "Modernisation and Technology Upgradation of Marine Food Processing Industries", organised by Small Industries Service Institute, Thrissur, on 13th March 1996 in Kochi.

## Involvement of staff in Academic programmes

Practical classes on the topics on Aquaculture and Fishery Biology were arranged in the college, during the period 24th to 30th October, 1995, for the students of Post-graduate Diploma course in Aquaculture, conducted by the Rajiv Gandhi Centre for Development of Education, Science and Technology, Thiruvananthapuram.

The 3th meeting of the Board of Studies of the Fisheries Faculty was held on 19-1-1996. The meeting approved the proposal and syllabus for the M. F. Sc. Programme in Fishery Hydrography. The meeting also decided to start post-graduate diploma programmes in the Faculty.

A lecture series in fisheries, "Aquaculture" was organised in the college by the students union. The first part of the lecture series on "Emerging Trends in Aquaculture" was conducted during the Period 23rd to 24th February, 1996 and talks on the following topics were delivered.

- 1 "Mariculture of Pearls" — by Dr. K. A. Narasimhan, Principal Scientist, CMFRI, Kochi.
- 2 "Culture of Mussels" — by Dr. P. S. Kuriakose, Scientist-in-charge, CMFRI Centre, Calicut.
- 3 "Hormonal Sex Reversal and Chromosome Manipulation in Fishes" — by Dr. (Sr) Susanna Kavumpurath, Fatima Matha National College, Kollam.
- 4 "Upcoming Trends in Reservoir Fisheries Management" Sri. Christoph Feustal, Indo-German Reservoir Fisheries Development Project, Malampuzha.

## Research

### Major research achievements

The Angel fish, *Pterophyllum scalare* could be bred repeatedly upto 11 times during the year, within a period of nine months. 36% of the breeders could be bred during the second year also. The number of eggs in one breeding ranged between 150 and 750 with an average of 424. The survival from eggs to fry is found to be 33%, with a maximum of 638 numbers in one breeding.

The safe duration of transport of the seed of *Macrobrachium rosenbergii* with 100% survival could be prolonged with the introduction of habitat material in the form of plastic straw in the packing water. At  $23 \pm 2^\circ\text{C}$  the number of seed that could be transported with 100% survival ranged from 400-800 PL/L for 4 hrs, while it was found as 100 PL/L for longer duration lasting upto 3 days.

Silkworm pupae based feed, although found suitable for the fish *Chanos chanos*, did not prove suitable for the pearlspot *Etroplus suratensis*.

Dietary phosphorus level did not show any significant influence on the survival of the juveniles of *Macrobrachium rosenbergii*. However, excess phosphorus in the diet (above 3.3%) developed inhibitory effect on growth and feed efficiency in the prawn.

Supplementation of lecithin to a level of 2.5% dry weight in the diet was found to promote growth during the first fortnight in the post larvae of *Macrobrachium rosenbergii* while no significant influence, irrespective of the levels, was noticed subsequently.

#### Farm revenue

Year	Receipts	Expenditure
1995-96	Fish sale — 65,000/- Other farm produce — 50,159/- Rs. 1,15,159/-	Instruc- tional farm (wages) Rs. 728147/ Devt of I.F. (wages and research materials) Rs. 131926/-

#### Important Visitors

Sl. No.	Name and designation	Purpose	Date of visit
1.	Vice Chancellor, Akola Agricultural University, Akola, Maharashtra.	To see the Freshwater prawn hatchery and other research activities	24-8-1995

#### 3.2. FISHERIES STATION, PUDUVEYPU

The Fisheries Station, Puduveyppu is located at a distance of about 2 km west of Murikkumpadam at the Vypeen island. It is surrounded by the Arabian sea on the west, Cochin barmouth on the south and a canal emerging from the barmouth on the east. The northern side of the station faces the main land.

The campus is mostly a saline marsh with mangroves and salt resistant varieties of grass and shrub. About 25 hectares of thick mangrove area is retained as typical preserve where in varieties of migrant birds and other rare fauna take refuge.

In selected locations part of the land is converted into pond-bund systems for aquaculture and agricultural research purposes. The rest of the land which is mostly subjected to diurnal inundation during high tide forms the site of fish and shell fish seed collection. The bunds are planted with coconut palms, about 600 numbers of which are nut bearing.

The station imparts practical training on brackish water fish culture for B.F.Sc. and M.F.Sc. students of the College of Fisheries, Panangad. The station also involves in research work to develop appropriate farming techniques for better production from unit area. In addition it is also the mandate of the station to supply commercial brackish water fish seed to the farmers and other research institutions. Training programme on brackish water aquaculture and utilization of marshlands for agricultural purposes are routinely conducted.

Station Head : Dr. K.S. Purushan, Associate Professor (Aquaculture)

#### Staff position

Designation/ Category	No. of posts		Vacant
	Sanctioned	In position	
<i>Scientific staff</i>			
Assoc. Professor	1	1	—
Asst. Professor (Aqua)	2	Asst. Prof. 1 Assoc. Prof. 1 (NC)	—
Asst. Professor (Ag.)	1	Assoc. Prof. 1 (NC)	—
<i>Technical staff</i>			
Farm Assistant (Gr. II)	1	1	—
Fieldman (F)	1	1	—
Pump Operator	1	1	—
Lab Assistant	1	1	—
Field Asst.	2	2	—
Sr. Research Fellow	2	2	—
<i>Administrative &amp; Supporting Staff</i>			
Administrative Assistant	1	1	—
Assistant Gr. I	1	1	—
Assistant Gr. II	1	1	—
Typist	1	1	—
Peon	1	1	—



### Details of seminars/symposium/training attended by staff

Dr. K. S. Purushan, Associate Professor (Aq.) & Head of Station

Date	Topic	Venue
26-10-'95	Presented the important academic research and development activities of the Fisheries Station and its significance on the Fisheries Development of Kerala.	Before the Chief Minister of Kerala at his chamber Secretariat, TVM.
17-11-'95	Offered a class on 'Methods of improving traditional shrimp farming in Kerala	Seminar on shrimp farming under the auspices of Matsyafed at SVD Auditorium, Cherai.
2-1-'96	Lecture on 'Some aspects of Scientific shrimp farming in Kerala	Trainers training under the auspices of CMFRI, Cochin.

### Involvement of staff in Academic programme

Dr. K. S. Purushan, Associate Professor (Aq.) and Head of Station attended the Academic Council meeting held on 1-7-95, 1-12-95 and 29-3-96 at KAU Headquarters, Vellanikkara.

### Research Achievements

#### *Demonstration and training model for a fishery based farming system in coastal wastelands*

Innovative and pragmatic approach coupled with application of appropriate technology could transform accreted coastal wastelands into well productive fishery based farming systems at Puduveypu.

#### *Development of brood stock and hatchery production of *Lates calcarifer**

The excessively high level of turbidity and associated environmental conditions prevailing in the grow out systems hinder the gonadal development of *Lates calcarifer*.

#### *Seed resources and production potential of carnivorous fishes in south west coast of India*

Seed resource survey carried out in the Cochin Barmouth area showed that the seed of cultivable varieties of carnivorous fishes like *Megalops sp.*, *Elops sp.* and *Therapon sp.* are available in good numbers during March-June period.

A method for mass rearing of leptocephalus larvae of Megalops has been developed for the first time. By providing a combination diet of live feed and compounded feed, leptocephalus larvae could be reared to fry stage within 25-30 days.

The above finding indicates the chances of boosting up brackish water fish production utilising the extensive larval resources.

*Agricultural cropping pattern suitable for a coconut fish farming system in an accreted wetland*

The combination of coconut-papaya-xanthosoma seemed to be the best among the crop combination tried in the experimental area.

*Intensive farming and seed production monosex tilapia (Oreochromis mossambicus) in coastal wetlands*

Feed application showed positive impact on growth and related weight increase in Tilapia during September-December period where as during January-August weight gain was independent of feed application.

#### Farm Revenue

Year	Receipts (in lakhs) Rs.	Expenditure (in lakhs) Rs.
1995-96	1.51896	19.95639

#### Important visitors

Name and Designation	Purpose	Date
1	2	3
Sri. M. K. Purushothaman, General Council Member	To see the cultural practices of the station	31-5-96
Dr. K. Sudhakara and Students of College of Forestry, Vellanikkara.	Study purpose	19-6-95
Assistant Directors of Fisheries, Vikas Bhavan, Thiruvananthapuram	To familiarise with the functioning of the station	27-6-95
Smt. Deepthy Vasudevan & Smt. K. A. Shaly, PCO, Kochi	"	10-8-95
Dr. C. G. Rajendran, Associate Professor with ARS trainees	"	20-10-95

1	2	3
Officers of the Fisheries Department of the States of India accompanied by Dr. Unnithan, KVK, CMFRI, Narakkal	To familiarise with the functioning of the Station	4-1-96
Sri. V. K. Babu, MLA Smt. Saraswathy Narayanan, Chair Person, Vypeen Block Sri. M. R. Rajan, Vice President, Elamkunnappuzha Panchayat Sri. Salam Edavanakkad, Journalist Dr. D. M. Thampi, Professor (Aq.) Dr. Mohanakumaran Nair, Assistant Professor (Aq.) Dr. D. Noble, Officer i/c., KVK, Narakkal	Inauguration of the training programme under the project sponsored by NWDB	18-1-96
Dr. E. Tajuddin, Director of Extension Dr. Manon Glaser, Socio Economist, Centre for Tropical Ecology, Bremen, Germany Dr. Werner Ekau, Fishery biologist, Centre for Tropical Ecology, Bremen, Germany	Resource person for the training To familiarise with the activities of the Station	22-1-96 26-2-96
	"	"

## FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY

### 4.1 KELAPPAJI COLLEGE OF AGRICULTURAL ENGINEERING AND TECHNOLOGY, TAVANUR

The College campus is located in Tavanur village on the Southern Bank of Bharathapuzha in Malappuram District 7 km. west of Kuttippuram. The campus is the seat of Rural Institute which was established in July, 1963. The Institute was taken over by the Kerala Agricultural University on 12th December, 1975 under section 5) of the KAU Act of 1971. The Institute was renamed as Institute of Agricultural Technology and it was functioning as one of the campuses of the University. The University subsequently opened the Faculty of Agricultural Engineering and Technology on 2nd October, 1985 and the

Institute was upgraded and renamed as 'Kelappaji College of Agricultural Engineering and Technology' after the famous Gandhian Social Worker and Sarvodaya leader Sri. K. Kelappan. The total area of the campus is 40 hectares.

Dr. K. John Thomas continued as Dean i c.

### Departments

- 1 Department of Land and Water Resources and Conservation Engineering.
- 2 Department of Irrigation and Drainage Engineering
- 3 Department of Farm Power, Machinery and Energy
- 4 Department of Supportive and Allied Courses of Study
- 5 Department of Post Harvest Technology & Processing

### Staff position

Designation/Category	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
Dean	1	1	—
Department of LWRCE			
Professor	1	—	1
Associate Professor	2	—	2
Assistant Professor	5	4	1
Department of IDE			
Professor	1	—	1
Associate Professor	2	2	—
Assistant Professor	5	4	1
Department of FPME			
Professor	2	1	1
Associate Professor	3	1	2
Assistant Professor	8	5	3
Department of PHT & AP			
Professor	1	—	1
Associate Professor	2	—	2
Assistant Professor	4	2	2
Department of SAC			
Professor	2	1	1
Associate Professor	2	2	—
Assistant Professor	10	6	4
Instructional Farm			
Assistant Professor	3	1	2

	1	2	3	4
<b>ICAR—FIM</b>				
Associate Professor		1	—	1
Assistant Professor		1	1	—
<b>Plasticulture Development Centre</b>				
Associate Professor		1	1	—
<b>AICRP on Energy Requirements in Agriculture Sector</b>				
Associate Professor		1	1	—
Assistant Professor		1	1	—
<b>Technical/Administrative and supporting staff</b>				
Sr. Admn. Officer		1	1	—
Section Officer		4	4	—
Sel. Gr. Asst.		3	3	—
Assistant Gr. I		3	3	—
Assistant Gr. II		6	2	4
Sr. Office Supdt.		1	1	—
Typist Gr. I		1	1	—
Typist Gr. II		4	2	2
Research Assistant		1	1	—
Reference Assistant		1	1	—
Library Assistant		1	1	—
Draftsman (Civil)		1	1	—
Technical Supervisor		5	5	—
Trade Assistant (Elec.)		1	1	—
Sr. Gr. Technician		2	2	—
Technician Gr. I		3	3	—
Technician Gr. II		5	—	5
Pump Operator		2	2	—
Driver (HDV)		1	1	—
Driver (LDV)		2	2	—
Bus Attendant		1	1	—
Matron		1	1	—
Hostel Manager		1	—	1
Lab. Asst. Gr. I		1	1	—
Lab. Asst, Gr. III		4	4	—
Farm Supervisor (Vety.)		1	1	—
Farm Asst. (Vety.) Gr. I		1	1	—
Farm Supervisor (Agri.)		3	3	—
Farm Asst. (Agri.) Gr. I		2	2	—
Gardener		1	1	—
Class IV		15	13	2
Workshopmate		1	1	—

## **Faculty Improvement programme**

### *New posts sanctioned/created/shifted*

Dr. K. John Thomas joined as the first Dean of the Faculty.

Miss. Josephina Paul was appointed to the post of Assistant Professor (Computer Science).

Smt. K. P. Visalakshi Asst. Professor rejoined after deputation for higher studies.

Dr. M. S. Hajilal, Asst. Professor transferred to the AICRP on Agrl. Drainage, Karumadi.

### *Scholarships/deputation awarded to staff for higher studies*

Sri. P. Rajendran, Asst. Professor (Horti.) deputed for doctoral studies.

Smt. Santhi Mary Mathew, Asst. Professor, Dept. of PHT & AP deputed for doctoral studies.

### **Details of seminars/symposium/training programmes attended by staff**

All the scientific staff of the College participated in the XXXI Annual Convention of the Indian Society of Agricultural Engineers held at Kerala Agrl. University, Vellanikkara during 28-30 December 1995.

Sri. M. Velayudhan kutty, Asst. Professor (Phy. Edn.) attended a refresher course at Lakshmibhai National Institute of Physical Education, Gwalior.

Dr. K. M. Valsamma, Asst. Professor attended a refresher course at Cochin University of Science and Technology, Cochin.

Dr. K. P. Visalakshy, Asst. Professor attended a two weeks training programme on 'Onfarm Water Management practices' at the CWRDM, Calicut.

Smt. P. Suseela, Asst. Professor attended a training programme on 'Irrigation and Water Management' at the Water Technology Centre, IARI, New Delhi.

Sri. A. P. Gopalakrishnan, Research Assistant attended the NSS refresher course held at Kalamasseri during the report period.

Dr. K. John Thomas, Prof. C. P. Muhammad. Sri. Jippu Jacob, Dr. Jobi V. Paul, Dr. M. Sivaswami, Sri. Jayan. P. R, Sri. Joby Bastian, Sri. Prince. M. V, Miss. G. Sreekala and Sri. Sureshkumar. P.K. participated in the 'Karshakamanthram—Karshikayanthram'—Farm School programme of all India radio, Thiruvananthapuram.

Press conference and demonstration of the 'Coconut Husking Tool' developed by Sri. Jippu Jacob and Sri. Joby Bastian was held during the report period in the presence of Dr. A. M. Michael, Vice-Chancellor, Dr. K. John Thomas, Dean (Ag. Engg.) and Dr. E. Tajuddin, Director of Extension.

Sri. Prince. M. V. Asst. Professor attended National Seminar on post Harvest Technology of fruits held at University of Agril. Sciences, Bangalore during August '95.

Sri. Jayan. P. R. Asst. Professor participated in the training programme on 'Advances in Agricultural Machinery Design' at Punjab Agril. University, Ludhiana.

Dr. M. Sivaswami, Asst. Professor attended seminar on 'Farm Clinic', Special empowered Committee meeting at Secretariat and conducted training on 'Paddy Mechanization Machinery' for farmers at Tavanur and 'Kole land mechanization demonstration and training to farmers in Thrissur Kole lands.

Dr. K. John Thomas and Dr. M. Sivaswami attended RAIDCO Karshikotsav 95 Seminar at Palakkad and presented papers.

Smt. Suseela P. and Dr. K. P. Visalakshi presented papers on 'Effect of stroke length and weight of waste valve on the beat frequency of hydraulic ram' and 'Effect of surging on infiltration respectively during the XXXI ISAE Annual Convention held at KAU, Vellanikkara.

#### **Involvement of staff in Academic Programmes**

All the teaching staff of the College are involved in academic programmes like teaching, guiding students, attending and evaluating student seminars etc.

#### **Research**

##### **Major Research Achievements**

A new Coconut Dehusking Tool was developed by Sri. Jippu Jacob, Associate Professor and Sri. Joby Bastian, Asst. Professor, Dept. of FPME. The technology of this tool was transferred to M/s. RAIDCO Kerala Limited for commercial production and distribution.

The performance of 'petti & para' was evaluated, based on extensive field and laboratory investigations. Soil and water properties, in representative agronomic regions were analysed. A test bench was specially designed and constructed to evaluate the performance of the high discharge low head

pumping units under controlled conditions. Functional relationships of the variables influencing the performance of the pumps were developed. The regression equations obtained were compared with standard rational relationships and their predictability ascertained based on the values of correlation coefficients. Specific recommendations on suitable range in pump speed and operating head to obtain high levels of efficiency have been derived. Field studies revealed that the efficiency of the unit was very low (19.27 to 21.85 per cent). The efficiency was slightly higher (19.10 to 23.88 per cent) when the unit was operated without the bottom 'para'.

Research work on Kole Land Project and AICRP on Energy Requirement in Agriculture Sector are progressing. Under the Kole Land Project, the use of paddy reaper and thresher at various kole lands in Thrissur district was demonstrated to farmers.

CSS Farm Machinery Training Centre : Work on aspects of mechanization of paddy cultivation is progressing.

AICRP on Farm Implements & Machinery : Research on transplanters, paddy harvesters and threshers are progressing.

INCID aided project on 'Weed Control and Moisture Conservation using LDPE' : Field experiments are going on. Observations on temperature, moisture content, solar radiation etc are being taken.

ICAR project on 'Development, Testing and Introduction of low and medium head high discharge pumps : The pump testing with different impellers at different heads and speed ranges are in progress.

Plasticulture Development Centre : Experiments on banana, cashew and arecanut are going on. Construction of green houses at KCAET, Tavanur and AMPRS, Odakkali is initiated.

#### **M. Tech. Projects**

The following M. Tech. projects are progressing well.

Development of a tiller operated paddy reaper.

Dynamics and power transmission system in tractor mounted paddy reaper.

Modification and testing of KAU arecanut dehusker.

Development and testing of a rotary type black pepper cleaner.



Development and performance evaluation of a black pepper skinner.

Development and testing of a large diameter pit digger for laterite terrain.

Design, fabrication and testing of a power operated paddy dibbler

Development and evaluation of a banana chipper.

Performance evaluation of high discharge low head pumps.

Effect of soil solarisation using LDPE mulch on moisture conservation and soil temperature variation.

Effect of different types of mulches on growth and yield of drip irrigated vegetables.

A mathematical model for sediment yield in agricultural watersheds.

#### **B. Tech. Projects**

The following B. Tech. projects are in progress.

Development and testing of a semi-mechanical ginger peeler.

Development and performance evaluation of a counter sinking tool attached to the tractor operated post-hole digger.

Development and testing of a mixing plant for pot-mixture.

Performance study of centrifugal pump using different foot valves and pipes.

#### **Farm Revenue**

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	Rs. 9.822	Rs. 22.415

#### **5. K.A.U. SCHOOL VELLANIKKARA**

Kerala Agricultural University School was started in 1981 with a view to providing School education to the wards of University employess in the Mannuthy and Vellanikkara Campuses. Former Vice-Chancellor late Dr. N. Kaleeswaran. I.A.S. took special interest in establishing the School. It became a complete high School during the Academic year of 1990-91. At present classes from I to X are functioning in this School. Pre primary and Creche are also functioning along with this. It has become an attractive institution.

## Staff

Eighteen under teaching section and six under non-teaching section had worked in this School during the period.

### Staff position

Designation	Sanctioned post	In position	Vacant
1	2	3	4
Headmaster	1	1	—
Teacher English Medium	7	5	2
UPSA Malayalam Medium	3	3	—
UPSA Hindi	1	1	—
UPSA Malayalam	1	—	1
LPSA Malayalam Medium	5	5	—
High School Assistant	7	—	7
Special Teachers			
Phy. Education	1	—	1
Drawing	1	—	1
Music	2	—	2
Nursery School Assistant	4	3	1
Ayah	4	2	2
Asst. (Gr.I)	1	1	—
Class IV	3	3	—

### Strength of pupils during '95-96'

Std.	Strength
LKG	33
UKG	36
I	67
II	61
III	77
IV	79
V	93
VI	101
VII	97
VIII	71
IX	74
X	50
Total	839

### Extra curricular activities:

A Science club and a Maths club are functioning in the School. The School had won the first prize and bagged Ever rolling Trophy for the Science and Maths exhibition at the

Thrichur Educational District competition held at S.N. High School, Kanimangalam from 29/11/95 to 1/12/95. In the case of Science exhibition this School has been the winner for the third time consecutively. The School had also won the first prize at the Childrens' Science Congress held on 16/11/95 at Thrissur Educational District level.

Master Kiran V. R. (IX English Medium) and Master Rajeev A.C. (IX English Medium) were qualified at the State Level Childrens Science Congress held at Jawahar Bala Bhawan, Kollam to compete at the National Level Children Science Congress held at Gauhati, where they had presented project report on 'Clean-up-India' which won the 'Excellence' and 'Outstanding' awards. They were among the ten students selected from our State.

Four students of this School, two boys and two girls had won the 'Rajapuraskar' award of Scout and Guides. Master Sandeep Balan had won first prize in light music and classical music at Sub District level in Balakalolsavam. Kum. Asha L. had also won the first prize in classical music and second prize in light music.

#### **Parent Teachers Association**

The Parent Teachers Association has been functioning actively. Sri. K. S. Natarajan, Section Officer, Directorate of Physical Plant Office, Vellanikkara, was the President of the Association.

An endowment named 'Dr. Kaleeswaran Memorial Award for S.S.L.C. winners of KAU School' has been instituted to honour the top rank holders. Smitha N.S., Ambily R., Smitha S. respectively were the winners of the award for 1995-96.

**Expenditure Rs. 15,74,573.**

## CHAPTER III

### Extension.

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The basic extension education role of the University is to make available useful information based on the findings of research, to the farmers and the general public through mass media and the concerned development departments.

The Directorate of Extension is responsible for the extension education activities of the Kerala Agricultural University. The Communication Centre, the Farm Advisory Service and the Central Training Institute which form the main constituents of the Directorate of Extension spearhead the frontline extension activities of the University and implement by themselves and through constituent research stations and educational institutions under KAU.

The Krishi Vigyan Kendras (KVK) sponsored by the ICAR and the Village Adoption Programme are other Transfer of Technology programme implemented by the KAU.

Dr. E. Tajuddin, Professor (Agronomy) took over as Director of Extension i/c. with effect from 27-6-94 A.N. and continued in the post for the rest of the period under report.

#### Communication Centre

Information communication through various media is the major activity of the Communication Centre which comprises the Farm Advisory Service, the Information Unit, Exhibition and Graphics service and the Publication Unit. Professor K. C. Varghese continued to be the Professor and Head of the station upto 30-4-95. Dr. P. Varadarajan Nair took over as Professor and Head w.e.f. June, '95. The major activities of the Communication Centre during the period are given below.

#### Farm Advisory Service

Consultancy service to farmers.

Advice on various problems encountered in agriculture, animal husbandry and fish culture was given to 619 farmers in person. Replies were also sent to 620 letters seeking advice

on agriculture and allied subjects through mail. Besides 33 diagnostic field visits were also conducted during the period under report.

Seven radio talks on agriculture and allied subjects were also broadcast through the AIR.

#### Seminars conducted/attended

Scientists of Communication Centre, Mannuthy served as resource personnel in the farmers seminars organised at several places in collaboration with KHDP, Department of Agriculture and several other agencies. Scientists of Communication Centre, Mannuthy attended the seminar in connection with the Village Adoption Programme of Ollukkara Panchayat on 28th of February '96. In the Village Adoption Programme farmers were given vegetable seeds and advice for organising kitchen garden.

#### Information Unit

The main function of the unit is to provide information support to technical personnel and dissemination of information to the farmers through mass media. Feature articles are published in leading Malayalam Dailies in their agricultural columns.

#### Staff Position

Designation/ Category	No. of posts		
	Sanctioned	In position	Vacant
1	2	3	4
<i>Scientific staff</i>			
Asst. Professor (Ag. Extn.)	2	1	1
<i>Publication Unit</i>			
Assoc. Professor	1	1	—
Asst. Professor (Agrl. Extn.)	1	—	1
Asst. Professor (Ani. Sci.)	1	—	1
<i>Information Unit</i>			
Assoc. Professor (Agrl. Extn.)	1	1	—
Asst. Professor (Ani. Sci.)	1	1	—
Asst. Professor	2	2	—
<i>Exhibition and Graphic Service</i>			
Asst. Professor	3	1	2
<i>Farm Advisory Service</i>			
Professor (Agronomy)	1	1	—
Professor (Pl. Protection)	1	1	—
Assoc. Professor (Agronomy)	1	1	—

1	2	3	4
Assoc. Professor (Pl. Protection)	1	1	—
Assoc. Prof. (Ani. Husbandry)	1	1	—
Assoc. Professor (Entomology)	1	1	—
Assoc. Professor (Poultry Sci.)	1	—	1
		(on working arrangement at Livestock Farm, Mannuthy)	
Assoc. Professor (Hort.)	1	1	—
Asst. Professor (Plant Path.)	1	1	—
Asst. Professor (Aqua)	1	1	—
Asst. Professor (Ag. Chem. & Soil Sci.)	1	1	—
<i>Technical Staff</i>			
Farm Supervisor	1	—	1
Technician (HG)	1	1	—
Farm Asst. Gr. I	1	1	—
Photographer	1	1	—
Malayalam Translator	1	1	—
Artist (HG)	1	1	—
Driver (LDV)	1	1	—
Language Editor	1	1	—
Dark Room Assistant	1	—	1
<i>Administrative and supporting staff</i>			
Administrative Assistant	1	1	—
Section Officer	1	1	—
Sel. Grade Asst.	1	1	—
Sr. Grade Asst.	3	2	1
Assistant Grade I	1	1	—
Assistant Grade II	1	1	—
Peon	2	2	—
Sweeper-cum-Attender	1	—	1
Typist Gr. II	1	1	—

#### **Faculty Improvement Programme**

1. New post sanctioned/created/shifted — Nil
2. Scholarship awarded to staff/deputation of staff for higher studies — Nil

Details of Seminars/Symposium/Training attended by staff

Name & Designation	Details of Seminars/ Symposium/training	Duration
1	2	3
1 All the Scientists of Communication Centre	State Level Package of Practices Workshop (Crops 96) at Vellanikkara	January 15th-16th, 1996
2 All the Scientists of Communication Centre	District Level Agril. Seminar at Palakkad	3rd Feb. 96
3 S Estelitta Asst. Professor	Eighth Kerala Science Congress at CUSAT, Cochin- Research Paper presentation	27th, 29th Jan. 96
4 Dr. Jayasree Sankar, S. Asst. Professor	National Training on Plantation Crop Production Technology at Central Training Institute, Mannuthy	27th February- 5th March 96
5 Dr. M.K. Sheela & Dr. Suma Paulose, Assoc. Professors	KHDP Workshop on module preparation	25-8-95
6 Dr. Jayasree Sankar, S. Asst. Professor	South Zonal Award contest of the Indian Society of Soil Science at Agril. College, Bapatta Research Paper Presentation	12-10-95
7 S. Estelitta Asst. Professor	ICAR, New Delhi Presentation of research project- Sero-diagnosis of infectious chlorosis disease of banana and effect of certain plant extracts on disease control	12th-19th December 95
8 Dr. M.K. Sheela, Assoc. Professor	Lakshadweep Training on IPM in Coconut	1st January- 7th January 96

1	2	3
9 Dr. A. D. Antony, Asst. Professor	National symposium on Technological advancement in Fisheries and its impact on Rural Development	5th-7th December 95
10 Dr. M. K. Sheela Assoc. Professor	State level meeting on IPM at Trivandrum	26th & 27th June 95
11 All the Scientists of Communication Centre	State Level Seminar on Cashew	29th & 30th January 96
12 Dr. S. Ramkumar	NIRD, Hyderabad Training Course	7th-17th March 96

**Involvement of staff in Academic programmes  
Teaching Activities**

The following courses were handled by the teachers of the Communication Centre.

Agriculture I	—	B.Sc. Co-operation & Banking Students
Agriculture II	—	„ „ „
Ag. 202	—	„ „ „
Extn, 301	—	„ „ „
Agri. 201	—	„ „ „
Microbiology 101	—	B.Sc. Forestry Students
Aquaculture 201	—	„ „ „
Agri. 201	—	Crop Pests & diseases –Co-operation & Banking Students.

**PG Guidance**

Dr. P. Sreedevi, Assoc. Professor (Agron) was nominated as the Chairperson for one M.Sc (Ag) student in Agronomy, College of Horticulture, Vellanikkara

**Revenue**

Year	Receipts (in lakhs)	Expenditure (in lakhs)
1995-96	2.14	32.78

**Extension activities**

Scientists of the Farm Advisory Service Unit handled classes on various subjects related to Agriculture, Fisheries and Animal Husbandry in 48 Agricultural Seminars during this period. A total no. of 5000 farmers were benefitted by these seminars.



State level Package of Practices Workshop (Crops'96) of Kerala Agricultural University was conducted by the Communication Centre, Mannuthy on 15th and 16th January 1996 at University Auditorium, Vellanikkara. Officials of Kerala Agricultural University, State Department of Agriculture, CTCRI, CPCRI IISR and other input agencies actively participated in this programme. The existing practices were critically reviewed and new proposal for addition/deletion were discussed and finalised.

Agro-clinics were conducted on all working days between 10 am to 1 pm at the Information-cum-sales centre, Mannuthy by the Scientists of Communication Centre.

Integrated Pest Management (IPM) cluster demonstrations and training programmes were successfully carried out for 10 weeks in Thrissur District. Visits were conducted at farmers plot regularly and based on the spot analysis suitable and timely recommendations were given.

News related to Kerala Agricultural University were sent to All India Radio for broadcast on every Friday at 6.35 a.m. under the weekly programme കർഷക സർവകലാശാലാ വാർത്തകൾ having a duration of 5 minutes. 14 radio talks were delivered through All India Radio by the Scientists of Communication Centre.

Scientists of Fisheries Science served as Course Director for the training programme for 5 days and 6 months for unemployed youths. About 500 numbers of various types of fishes viz., Angel fish, gold fish and sword tail were produced and are in progress.

Communication Centre organised a five day each "Onam Fair" and "Christmas Fair" at the Information-Cum Sales Centre, Mannuthy for the sale of banana bunches, coconut, vegetables, mushroom, meat, milk, their products and bye-products for the benefit of the public.

125 farmers actively attended the Karshakadinam '95 organised by the Communication Centre, on 18th August 1995.

Scientists of Communication Centre, actively participated in the exhibition conducted by Lions club at Palakkad from 17th to 22nd February at Kakkoor from 22nd to 27th Feb. '96, Flowershow at Muvattupuzha from 21st to 24th February 1996 and Thrissur Pooram Exhibition from April '95 to May '95 and KAU Pavilion bagged the best Pavilion Award.

Field visits were made to solve field problems of farmers in different parts of Thrissur, Palakkad and Ernakulam districts.

Six hundred and nineteen farmers visited the Centre and consultancy services were rendered to farmers on problems related to Agriculture, Animal Sciences, Fisheries, Sericulture and Apiculture. Replies to 620 letters received from farmers on various problems were promptly done by mailing the answers.

Scientists of Communication Centre served as resource personnel in the farmers seminars organised at several places in collaboration with KHDP, Department of Agriculture and other input agencies.

Scientists of Communication Centre attended the seminar in connection with the implementation of Village Adoption Programme of Ollukkara Panchayat on 28th February 1996.

#### **Major Reserch Achievements**

A project on "Breeding technologies for selected Indian hill-stream ornamental fishes" was submitted to the Department of Science and Technology, New Delhi.

A project on "Intensive culture of fish in running water" were presented before the scientific panel in New Delhi.

Research project on "Serio, diagnosis of infectious chlorosis disease of banana and approach to integrated Pest management to control the disease" was presented before the scientific panel on Horticulture at New Delhi and the project was revised as per the suggestion of the panel and submitted to ICAR for sonsideration.

#### **Information and Sales Centre, Mannuthy**

The Information and Sales Centre, Mannuthy was inaugurated on 16th July, 93 by Sri. K. Karunakaran, Hon. Chief Minister of Kerala.

The Information and Sales Centre is a unique extension service venture of Kerala Agricultural University through which quality planting materials, livestock products like egg, meat and meat products, fruit and vegetable products, ornamental fingerlings and KAU Publications are made available to the public through a single window. The supplies are supplemented by imparting technical advice through farm clinics and video films by the Scientists of the Farm Advisory Service of Kerala Agricultural University.

Office in charge: Dr. P. A. Joseph, Assistant Professor (Agron.) continued as the Officer in charge.

**Staff position***(Scientific)*

Category	Sanctioned	In position	Vacant
Asst. Professor	1	1	—

**Administrative/Supporting/Paratechnical/Ministerial/other posts**

Name of post	Sanctioned	In position	Vacant
A.O/A.A	—	—	—
S.O/S.O.S.	—	—	—
Assistant	—	—	—
Typist	—	—	—
F. S. Gr.I (Agri.)	—	2*	—
F. A. Gr.I (Agri. & Vety.)	—	2* (+)	—
F. A. Gr. II (Agri.)	—	1*	—
Lab. Asst.	—	—	—
Pump Operator	—	1*	—
Driver	—	—	—
Class IV	—	3*	—
Date entry trainee	—	2	—

\* On working arrangement.

(+ ) 1 each

**Faculty Improvement programme:**

News posts sanctioned : Nil

Scholarship awarded to staff : Nil

Details of seminars/symposia/training attended  
by staff: Nil**Involvement of staff in academic programme.**

Dr. P. A. Joseph, Officer in-charge offered the course "Grass land and Range Management (1 + 1)" at the College of Forestry, Vellanikkara and another course "Concepts in crop production (1+1)" at the College of Horticulture, Vellanikkara.

**Research**

Major research achievements : No. research activity is under taken at this Centre.

**Farm Revenue**

Receipts from sale : Rs. 48.78 lakhs.

Total expenditure for contingencies : Rs. 2,83,451.80

Payment to supplying centres during 1995-96 : Rs. 49.96  
lakhsPayment of Comptroller (Excess of corpus of revolving  
fund) : Rs. 3.93 lakhs.

### **Other activities at the Centre**

Farm advisory service arranged at the Centre during 1995-96 : 463

Video Cassette projection arranged during 1995-96: 125

Correspondence to enquiries from farmers. : 104

Subscription arranged for Kalpadhenu : 337

Onam bazar 1995-96 and X' mas Bazar 1995-96 were organised at the Centre.

### **Publication by staff**

Popular articles : 12

Research paper : 1

### **Important visitors at the Centre**

Sri. George Mascreeen, MLA on 5/5/1995

Dr. K. K. Surendranathan, Sr. Scientific Officer, BARC, Bombay on 8/5/95.

Sri. Sisavath Kiyoo, Brown Fan-Agri. Minister Govt. of Laos. on 16/11/95.

Sri. P. Balan, MLA on 25/11/95.

Sri. M. Velayuthan, DDG, ICAR on 27/11/95.

Vice-Chancellor, A. P. Agric University. on 27/11/95.

Dr. M. R. Sethuraj, Director, R. R. I. I. Kottayam on 30/11/95.

Dr. R. S. Paroda, D. G', ICAR on 27/12/95 and 28/12/95.

Sri. A. C. Jose, Chairman, Raidco on 3/3/'96.

### **KAU PRESS**

The KAU Press was established to cater to the printing needs of the University. During the period from 1-4-1995 to 31-3-1996, 181 works were received out of which 153 works were completed. This includes periodicals, publications, Kalpadhenu and other non-periodicals, technical bulletins, leaflets, pamphlets, folders were printed and published during this period. Besides printing of Annual Administration Report (Malayalam and English) and Krishi Vigjana Manjari series—reprints of various publications were also under taken and completed during the period. The printed forms and registers required for the University were also printed and supplied.

Sri. K. Rajappan, continued to be the Press Manager through out the period.

The staff position is as given below

Category	No. of posts		
	Sanctioned	In position	Vacant
Press Manager	1	1	—
General Foreman	1	1	(Retired on- 30-11-1995)
Senior Foreman	1	1	—
Proof Reader	2	2	—
Computer	1	1	—
Printer	6	4	2
Compositor	10	6	4
Copy Holder	2	—	2
Binder	4	4	—
Helper	1	1	—
Peon	1	1	—
Sweeper-cum-Attendant	1	1	(On working arrangement at RARS, Ambalavayal)
Section Officer	1	1	—
Assistants	3	3	—
Typist	1	1	—

### Central Training Institute

The Central Training Institute started in October 1986 as a Special Sub project II under NAEP-I with the financial assistance of the Government of India has now become the nodal point of all the training activities of the University. The Government of India assistance terminated on 31/3/1991 and the Central Training Institute is being run as a University programme since then. The Central Training Institute has a Sub Unit at Vellayani and Pilicode.

The Central Training Institute, caters to the training needs of State Development Departments, Commodity Boards, Banks, Defence Department, Union Territory of Lakshadweep etc. The State level Joint Training Committee under the Chairmanship of the Vice-Chancellor is the apex body to discuss and finalise the training proposals of the State Development Departments and other organisations.

**Staff position**

Category	Sanctioned	In position	Vacant
Professor of Extension	1	—	1
Assoc. Professor	1	1	—
Assistant Professor	1	1	—
Section Officer	1	1	—
Assistants	2	2	—
Typists Senior Grade	2	2	—
Farm supervisor (Agri)	1	1	On working arrangement at Information and Sales Centre, Mannuthy
Farm Asst. Gr. I	1	1	—
Driver LDV	1	1	—
Duplicator Operator	1	1	—
Peon	1	1	—

Dr. R. M. Prasad continued as the Head of Office

**Training Programmes conducted during 1994-95**

Sl. No.	Particulars	No. of training programmes	Mandays
<b>A. Inservice Training Programmes</b>			
I	Department of Agriculture	18	604
II	Department of Animal Husbandry	17	5573
III	Co-operative Banks	2	320
IV	Rubber Board	1	78
V	KERAFED	1	90
VI	U. T. of Lakshadweep	5	133
VII	Defence	1	360

**Krishi Vigyan Kendras (KVKs)**

Krishi Vigyan Kendras financed by the ICAR are the important Transfer of technology (TOT) centres under the Directorate of Extension. Other transfer of Technology programmes like National Demonstration, Lab to land programme. Operational research etc. have been integrated with the Krishi Vigyan Kendras.

There are three Krishi Vigyan Kendras financed by the ICAR viz. KVK Ambalavayal, Pattambi and Sadanandapuram.

The KVK at Manjeswar is fully financed by KAU and this KVK cater to the training needs of the linguistic minorities of Kasaragod district.

*Krishi Vigyan Kendra, Ambalavayal*

The Krishi Vigyan Kendra, Ambalavayal financed by ICAR become functional in 1984 under Kerala Agricultural University primarily to cater to the needs of the tribal population of Wayanad District, who constitutes more than 20 percent of the population of the district. However, now its mandate has been extended to cover non-tribal farmers also.

Dr. Radhamma Pillai was the Head of Station upto 10-9-95. Dr. K. C. Aipe took over as Head of the Station w. e. from 11-9-95.

**Staff position**

Designation/ Category	No. of posts		
	Sanctioned	In Position	Vacant
1	2	3	4
<i>Scientific staff</i>			
Assoc. Professor (Extn/Agron.)	1	1	—
Head of Office			
Asst. Professor	8	5	3
<i>Technical staff</i>			
Technical staff (Training Asst.)	5	5	—
<i>Administrative and supporting staff</i>			
Section Officer	1	1	—
Assistant Gr. II	1	Provisional hand	1
Typist Grade II	1	Provisional hand	1
Driver Grade I	1	1 Gr. II	—
Class IV Peon	1	1	—
Watchman	1	1	—
Attendant	1	1	—
Field Attendant	3	3	—
Cook	1	1	—

**Training achievements**

During the period under report 19 training programmes in Crop Production/Horticulture, seven in Agricultural Engineering, 29 in Animal Science, and one in Extension were conducted for the farmers. The total beneficiaries were 1904 out of which 624 persons belonged to SC/ST.

A total of 24 training programmes were conducted for rural youth in various aspects of Crop production, Horticulture, Home Science, Extension and Animal Science benefitting 506 of which 102 belonged to SC/ST.

Five training courses were also conducted for the Extension functionaries in Plant protection and Extension where in 138 persons were benefitted.

During the report period 11 field days, 31 seminars, 2 farmers' fair, 3 farm science clubs, 29 film shows, 2 exhibitions and 15 vaccination camps were organised by the centre. Besides one Village Adoption Programme was also initiated.

#### *Krishi Vigyan Kendra, Pattambi*

The Krishi Vigyan Kendra, Pattambi, is functioning in the RARS Campus, Pattambi and has operational area in the whole of Palakkad district. This Kendra is an innovative first line transfer of technology project which aims to reduce the time lag between the generation of technology and its adoption by the farmers in the larger interests of the farming community and the nation. In order to achieve this aim, the KVK has to perform the following major functions through integrated approach.

- A. Farm Advisory Service
- B. On-Farm Research Programme
- C. Training Programmes

Dr. Girija Sankaranarayanan continued as the Head of the Kendra.

#### **Staff**

Designation/ Category	No. of Posts		
	Sanctioned	In position	Vacant
Scientific staff	9	8	1
Technical staff	5	5	—
Administrative & supporting staff	12	12	—

#### **Details of Seminars/Symposium/Trainings attended by staff**

Dr. C. Narayanankutty, Asst. Professor (Hort) attended a summer Institute on Technology for Dry Land Horticulture in arid and semi arid area at M. P. K. V. V, Rahuri from 1-7-95 to 11-7-95.

Dr. Manu Mohan, Asst. Professor (V & A H) attended a training on Participatory Research Appraisal at N A A R M, Hyderabad from 26-9-95 to 30-9-95.



Dr. Syamakumari, Asst. Professor (Home Science) attended the U. G. C. sponsored refresher course from 7-11-95 to 4-12-95 at Avinash lingam Institute for Home Science and Higher education for women, Coimbatore.

Dr. S. Manu Mohan, Assistant Professor (V & A H) participated in the National symposium on Veterinary Pathology at Orissa University of Agricultural Technology, Bhubaneswar from 9-11-95 to 11-11-95.

Dr. Ahammed, Asst. Professor (Extn), Dr. Sureshkumar Asst. Prof (S.S.&A.C) and Sri. K. K. Remesan, Asst. Prof.(Agron.) participated in a training programme on composting of coir pith and treatment of green husk fiber organised by National Coir training and Design Centre, Kalavoor, Alleppey from 22-11-95 to 24-11-95.

Dr. S. Manu Mohan, Asst. Prof. (V&A H) attended National symposium on 'Towards sustainable poultry production at Centre of Advance studies in poultry Science. College of Veterinary & Animal Sciences from 11-1-96 to 13-1-96.

Dr. Ahammed, Asst. Prof. (Extn.) and Sri. K. K. Remesan Asst. Prof. (Agron), attended the VIII session of Kerala Science Congress held at Cochin University of Science and Technology from 27-1-96 to 29-1-96.

Dr. G.S. Narayanan, Assoc. Prof. & Head of this Kendra attended the Farmers-Scientists Interaction-Review meeting of South Zone at Thirupathi held on 27-1-96.

Dr. P. Ahammed, Asst. Prof. (Extn.), Dr. S. Manu Mohan, Asst. Professor (V&AH) and Sri.K.K. Remesan, Asst. Prof. (Agron) attended a training programme for core team members of Institution Village linked Programme held at CPCRI, Kasaragod from 19-2-96 to 2-3-96.

Smt. Asha Sankar M, Asst. Professor (Hort). attended a training programme on National training on plantation crops held at Central Training Institute, Mannuthy from 27-2-96 to 5-3-96.

Dr. S. Syamakumary, Asst. Prof.(Home Science) attended a workshop on 'Women and Development in Kerala conducted by British library and Indian Society of Inter Disciplinary studies held at Trivandrum in February 96.

#### **Involvement of staff in Academic Programmes**

Smt. Asha Sankar M, Asst. Professor (Hort) handled a class on 'Cell culture and secondary Metabolites' to P. G. students of M.Sc (Ag) programme for the course 'Advances in

plant Tissue culture' at College of Horticulture, Vellanikkara during the period under report.

Smt. Asha Sankar M. Asst. Professor (Hort.) Dr. C. Narayanan-kutty Asst. Prof. (Hort). Dr. P. Sureshkumar Asst. Prof. (S. S. & A. C) and Sri. K. K. Remesan, Asst. Prof. (Agron) handled sessions on 'Activities of Krishi Vigyan Kendra' to final year students of B.Sc (Ag) programme as a part of their training programme of Research Stations.

#### Important visitors

Name and Designation	Purpose	Date of Visit
Sri. S. Senthil Vinayakom Programme Officer, Zonal Co-ordinating unit Indian Council of Agri. Research, Bangalore	Inspection of K. V. K. Pattambi	4-8-95

#### *Krishi Vigyan Kendra, Kottarakkara*

The Krishi Vigyan Kendra under the Kerala Agricultural University (funded by the ICAR) sanctioned for the Kollam district, started functioning at Sadanandapuram in the campus of the Farming Systems Research Station with effect from 1st October 1994. The Kendra located at 40 km east of Kollam town and 5 km south of Kottarakkara has the operational area covering the entire Kollam district. The Kendra was inaugurated by the Hon'ble Pro-Chancellor and Minister for Agriculture, Kerala, Sri. P. P. George on 29th October, 1994. Sri. Balakrishna Pillai, Hon'ble Minister for Transport, delivered the Presidential address. Sri. Kodikunnal Suresh, Member of Parliament, Dr. A. M. Michael. Vice-chancellor, Kerala Agricultural University, the Executive Committee Members of the University and the Panchayat President of the locality delivered felicitations during the occasion.

Dr. K. Vasanthakumar, Assoc, Professor (Hort) has been appointed as the Training Organiser of the KVK. Staff required for the functioning of KVK were posted by transfer/deployment from the Research Station.

#### *Krishi Vigyan Kendra, Manjeswar*

The Krishi Vigyan Kendra, Manjeswar was established considering the general backwardness and preponderance of Kannada and Tulu speaking linguistic minorities of Kasaragod district. The Kendra envisages the imparting of periodic and timely training in skill oriented agricultural techniques and transfer of upto date knowledge on crop production technology to the farming community.

The Kendra started functioning with Kerala Agricultural University funds in a rented building at Thimmangur in Vorkady Village of Kasaragod District in October 1984. The proposals have been submitted for assistance from ICAR. About 19.10 acres of revenue land will be available for the Kendra at Dharmanagar in Vorkady village of Kasaragod district.

The Krishi Vigyan Kendra, Manjeswar was inaugurated by the Hon. Chief Minister of Kerala, Sri. K. Karunakaran on 12-10-85. The centre is presently conducting one day training classes on crop production technology to the farmers in local language. Apart from this, the staff of this centre also assist in the developmental activities of the other development agencies at this region. Vegetable seeds of improved varieties of KAU have been distributed to the farmers of this locality.

Sri. P. Ramachandran Nair continued as the Head of the Centre.

#### Staff

Designation/ Category	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientists</i>			
Professor	1	1	—
Asst. Professor	2	2	—
<i>Technical Staff</i>			
Farm Assistant (Agri.)	1	1	—
Field Associate	1	1	—

#### Other extension activities of different research station/ Colleges/Department

##### COLLEGE OF AGRICULTURE, VELLAYANI

#### NSS

Dr. M. M. Hussian, Assoc. Professor of Extension and Dr. Wilson, Asst. Professor, Plant Breeding functioned as NSS Programme Officers.

The NSS students strength allotted to this college was 2 units of 280 numbers.

The following activities were undertaken by the NSS Unit.

34 NSS volunteers donated blood during the period under report.

Tree planting programme—gap filling and intercultural operations were followed in the tree plantation.

The literacy centre attached to the Instructional Farm continued to function during the period under report for the purpose of farm labourers working in the farm.

The community centre at Kakkamoola and Palappoor also functioned during the period. Palappoor Village continued to be the NSS adopted village during the year.

World environment day was celebrated on 5th June, 1995 by arranging a campaign on environment protection in the adopted village. Prizes were distributed to the winners of poster and college competition.

Visit to adopted village. The two programme officers and volunteers visited the adopted village Palappoor and helped the farmers in the vegetable production and marketing programme.

Dr. D. Wilson, programme officer attended the programme Officers meeting at Mannuthy on 12-5-95.

The NSS Programme Officers and volunteers participated in the Independence day celebration on 15th August, 1995 in the campus.

Seven NSS volunteers participated in the Sadbhavana race in Trivandrum city on 20th August, 1995.

Programme Officers and 5 volunteers participated in one day seminar on youth for sustainable development and watershed management at Govt. Arts College, Trivandrum.

World AIDS day and fortnight organised.

Programme officers and 10 volunteers attended lawn making programme at Govt. Arts, College, Trivandrum.

Republic day was celebrated in Palappur adopted Village on January, 26, 1996 by involving the NSS volunteers and members of adopted village.

The NSS volunteers and programme officers arranged the farmers vegetable and Agricultural Exhibition in connection with the Kissan Mela arranged in the campus on 24th January, 1996.

A kitchen garden was raised in the community welfare centre, Kamaleswaram on 3-2-96 with the active co-operation of NSS volunteers and programme Officers.

## EXTENSION ACTIVITIES

### *Village adoption programme*

Dr. B. Balakrishnan and Dr. Luludas took classes on mushroom production and recipes for the farmers of Kalliyoor Panchayath as part of the programme under village adoption programme.

Village adoption programme for the year 1995-96 was conducted in the same Kalliyoor village Kakkamoola ward. Dr. S. Shailaja, Associate Professor Department of Agril. Extension continued as the leader of village adoption programme.

### *Work done during the period under report*

Follow up of the work done during 1994-95 was done by the leader of the village adoption programme and observed that the beneficiaries are continuously producing vermi compost and utilising the same for vegetable cultivation. Eighty percent of the seedlings of fruit trees distributed to the beneficiaries are coming up very well. They are taking care to keep the cattle shed and premises of their home clean.

During 1995-96 the following programmes were implemented in the adopted village.

### *Demonstration of organic manuring*

Five beneficiaries were selected for conducting demonstration. As the first stage of demonstration they were asked to prepare vermi compost since these beneficiaries selected for demonstration were given training on how to make vermi composts during the last year programme they were able to prepare the same without much difficulty. They were given centre worm at 100 nos./beneficiaries. The second stage of demonstration was crop demonstration. They were supplied with seeds of Snakeguard, Bitterguard, Tomato, Bhindi, Brinjal and Chillies and asked to raise nursery of chillies brinjal and tomato and they were supplied farmyard manure, poultry waste, factomphos, potash for along with azosprillum and necessary advice regarding the conduct of the demonstration. They raised the nursery and transplanted to the main field. Applied fertilizers and manure as per the instruction given to them. One difficulty faced by them was lack of sufficient raises. In spite of all the difficulties they managed the plot very well and obtained sufficient product and one plus point is that they were well convinced about the merit of the vermi compost. The crop is still in the field.

### *Training cum demonstration on mushroom cultivation*

The objective of the programme was to familiarise the beneficiaries about the cultivation of mushroom in their homesteads, and make them aware of the nutritive value of mushroom and preparation of various recipes.

One training cum demonstration as preparation of bed and preparing various recipes was conducted on 25-5-96. Dr. B. Balakrishnan (Associate Professor, Department of Plant Pathology) explained to them about the importance of mushroom and demonstrated to the beneficiaries about the preparation of bed and Dr. Lulu Das, Asst. Professor, Department of Plant Pathology demonstrated various recipes that can be prepared from mushroom and they were given necessary inputs for preparing two beds. Total 28 nos. of beneficiaries in the village attended the training and 20 beneficiaries were given necessary products for the preparation of the same.

### *Demonstration of cheap but nutritious food*

Objective of the programme was to impart training for utilising locally available cheap but nutritious food.

This programme was especially for the women folk of the village. 32 farm women attended the training programme. Mrs. Rajeni and Smt. Geetha, Asst. Professors from the Department of Home Science explained to them about the importance of locally available food material in their homesteads that can be converted to nutritious food without losing their nutritive value which would otherwise be neglected and wasted by the farm families. The demonstration to the beneficiaries the preparation Amaranthas squash, Bilimbi squash, Kinnanappam, halva, Vayanayappam, Pakkavada using locally available materials and convinced them about the nutritive value and that can be prepared in their own homesteads itself which can improve the health status of their children and other family members.

### *Training cum demonstration on the utility of botanical pesticides*

This training was conducted with the objective to create an awareness among the beneficiaries about the utility of various pesticides of plant origin and explaining to them about the preparation of these botanical pesticides using locally available material.

Dr. Saradamma, Associate Professor, Department of Entomology conducted the training cum demonstration of the adopted village on 3/95. She took a class on the importance of

botanical pesticides and its use in the fields, its importance, as far as health of human beings is concerned and demonstrated the preparation of Pukayila Kashayan, Neem oil emulsion, and two other insecticide preparation using the plant products available in the locality and explained to them how to use, when to use and frequency and how to preserve it. Total 26 beneficiaries from the Village attended the training cum demonstration.

#### **T & V Programme**

Dr. P. Karunakaran and Dr. Susamma Philip regularly attended the monthly T & V Programmes.

#### **Training programme organised**

The following training programmes were organised.

Training on Tissue culture (2 months) for unemployed youth.

Training on biotechnology (3 days) for Agri. Officers.

Six Training programmes on mushroom cultivation were conducted by Dr. Balakrishnan and Dr. Bhavani Devi for the educated unemployed youth.

Sri. N. Ramachandran Nair, Associate Professor conducted training classes on amaranthus production for master farmers of KHDP on 25-10-95. He has also conducted classes on the same subject to master farmers of KHDP on 12 and 19th March, 1996 at RATT Centre, Kazhakuttom and on 26th March at Mitraniketan.

Dr. S. G. Sreekumar, Associate Professor conducted a class on production technology of bhindi to KHDP master farmer trainees on 25-10-95 at College of Agri. Vellayani.

Training on fruit and vegetable preservation (25 days) 4 batches 59 participants.

One day of campus training on fruit and vegetable preservation, 1 batch 50 participants.

Continuous training on technical and income generating activities for women (3 months) 1 batch 10 participants

#### **Exhibition**

Smt. Subaida Beevi and Smt. C. Nirmala Assistant Professors participated in the Kisan mela organised by the State department of Agriculture at Uzhamalaykal on 6-2-96.

One Kisan Mela was organised by department of Agri. Extension at College of Agriculture, Vellayani on 24-2-96. Total 103 progressive farmers attended the mela. As part of the mela exhibition and Agricultural Seminar was organised.

The mela was inaugurated by Smt. B. L. Hema, President, Kalliyoor Panchayat. Dr. C. Sreedharan, Dean College, of Agriculture, Vellayani chaired the function. The gathering was welcomed by Dr. B. Babu, Professor and Head, Department of Agri. Extension. Felicitation address was given by Dr. G. Sreekantan Nair, Professor and Head, Department of Horticulture, College of Agriculture, Vellayani and Dr. M. M. Hussian, Associate Professor give away vote of thanks. The Agriculture Seminar started exactly at 11 am. Dr. P. Reghunath, Professor, KHDP handled class on Integrated Pest Management followed by sustainable agriculture by Dr. V. Muraleedharan, Microbial fertilizers by Dr. S. K. Nair, Professor, Department of Microbiology and vermicompost by Dr. P. Padmaja, Professor, Department of Agricultural Chemistry. After the Seminar the farmers were taken around the farm. Along with the exhibition on competition of farmers produces was also conducted and prizes were given to the best exhibits.

## COLLEGE OF FORESTRY, VELLANIKKARA

### Outreach programme

Under the auspicious of N. S. S. the volunteers donated blood for the patients. Village adoption programme was taken up in the Malayan colony near Puthoor. Seedlings of teak, mangium, mahogoni, thanni, aini, sandel, rosewood etc. were supplied to farmers from the college nursery. The planting materials were supplied to various research Institutions and colleges of the University. The teachers of the college offered consultancy services to farmers in various areas of forestry like nursery establishment, after care, propagation, tree planting, pest and disease control etc. Teachers also delivered topics through AIR, Trichur. Faculty members of the college brought out scientific publications and research articles related to various aspects of forestry. The college also participated in Trichur Pooram Exhibition and Agri. Horti. flower, fruit and vegetable show during April 1986. Tree seedlings of various species and minor forest produce were exhibited in these programmes.



## COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT MANNUTHY

### *NSS Regular/Special activities*

- 1-1-96 New Year celebration. The function was presided by NSS. Co-ordinator, Sri. Philip Sabu, Assistant Professor, College of C & B, reviewed the major events of 1995. Dr. E. Tajuddin, Director of Extension and Dr. M. Mohandas, Associate Dean i/c. and NSS Volunteers actively participated in the discussion.
- 14-2-96 Cleaning the College premises
- 12-3-96 to 21-3-96 10 days special camp at Allimooan Tribal Colony, Parambikulam.

## CROPPING SYSTEMS RESEARCH CENTRE, KARAMANA

- Extension : Mushroom spawn (Oyster mushroom) were prepared and sold to the farmers.
- Field training and technical advise : Conducted one day training in mushroom cultivation for the unemployed youth. Farm advisory service was rendered to the farmers of this locality on various field problems.
- Field training on routine activities of the station was imparted to the B. Sc. (Ag.) students from College of Agriculture, Vellayani as a part of their Degree programme from 29-1-96 to 9-2-96.

## AGRONOMIC RESEARCH STATION, CHALAKKUDY

### **Village adoption programme**

The front line demonstrations on improved vegetable cultivation were undertaken in 20 farmers' holdings of Kodakara Village. Different vegetables such as bhindi, pumpkin, cucumber and brinjal were grown in an area of 0.25 ha. Inputs like quality seeds of improved varieties, fertilizers and pesticides were supplied to farmers. Farmers were convinced themselves about the improved practices of vegetable cultivation in achieving higher yields and net income.

### **Advisory service to farmers**

A large number of farmers visited the station to seek advice on scientific cultivation of various crops especially on crop management and crop protection aspects.

## REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

### Extension activities and service rendered

Scientists of this station attended all the monthly T & V workshops as resource personnel.

Veterinary Hospital is functioning. An average of 120 cases are treated and 48 inseminations are done.

A number of farmers from different places visited the farm to study the various activities and achievements of this station.

Scientists of this station participated in several Farmers' Seminars organised by several institutes and handled classes effectively.

Demonstration plots for cashew are being conducted. A vermicompost production unit is functioning. Vermicompost is supplied to farmers.

A large scale mushroom spawn production unit is functioning. 400 bottles of spawn of mushroom (*Pleurotus sajar-caju*) were distributed to the cultivators. A great demand was noticed to mushroom cultivation. A demonstration unit on mushroom production is functioning.

Field problems brought by the Agricultural Officers were examined and suggested remedial measures.

The All India Radio, Kannur recorded and had broadcast one radio talk from this station and four popular articles were published.

### Other activities

#### *Monthly workshops*

Scientists of RARS, Pilicode participated in the T & V monthly workshop of Kozhikode, Kannur and Kasaragod Dist. Messages on production recommendation were formulated for the timely adoption by the farmers.

#### *Zonal workshop*

The 18th Zonal workshop on research and extension advisory council for the region was conducted at RARS, Pilicode on 31st January, 1996. Officers of the Department of Agriculture, Scientists from sister organization and representatives from input agencies participated in the deliberation and field problems were discussed in detail.

#### *Joint field visit*

The field problems reported by the Officers of the Department of Agriculture were discussed and investigated in detail by conducting joint field visit and sample analysis. Suitable remedial measures were also suggested.

### *Village Adoption Programme*

The programme was implemented in the Udinur village during the period under report. Vegetable seeds and fertilizer packets were distributed to 40 selected farmers in the village. One day training programme on vegetable cultivation was also organised for the benefit of farmers.

The village adoption programme at Pepper Research Station, Panniyur was implemented in Udayagiri village of Taliparamba Taluk. Ten farmers were selected and planting materials of pepper and mangala arecanut seedlings were distributed.

### *Demonstration plots*

Established 10 new demonstration plots of clonally propagated cashew.

Supervision and advisory service for the maintenance of 47 cashew demonstration plots laid out in 1995 and 1996.

### *Training programmes*

A total of 23 training programmes were organised during the report period. In addition to the above, theory and practical classes were conducted for the trainees of RATTC, Taliparamba. Three days training programmes on mushroom cultivation, three days training programmes on Biofertilizers for the Officers of the Department of Agriculture, basic training in fertilizers and pesticides, three days training on Export oriented floriculture and two days training on Integrated pest management of rice, coconut and cashew were organised during the period.

### *Exhibition*

Participated in the following exhibitions

Govt. High School, Kasaragod – January 24-30, '96.

Stadium Complex, Kalikkadavu – December '95.

### *Seminar/Farmers counselling*

Scientists participated in the Agricultural Seminars and handled classes on topics of interest to farmers. A total of 20 seminars were attended during the period. An average of 55 farmers per month came to this station for solving their agriculture related problems and regarding mushroom cultivation, coconut seedlings, plant protection and other aspects.

### *Information-cum-Sales Centre*

An Information-cum-Sales Centre is functioning at RARS, Nileswar to cater to the needs of the farmers of Northern Region for the supply of planting materials, technical advice and other agricultural requirements.

A one day training programme on mushroom cultivation is being organised, on 1st Saturday of every month.

*Veterinary Hospital and A. I. Centre*

A Veterinary Hospital is functioning at RARS, Pilicode. An average of 100 cases per month are treated in the Hospital and 30 insemination per month are done in the A. I. Centre.

**COLLEGE OF VETERINARY AND ANIMAL SCIENCES**

*N.S.S Unit*

There are two Units with 150 student volunteers in each unit. Dr. A. Rajan, Dean continued as the Chairman of the Advisory Committee and Dr. C. George Varghese, Professor and Dr. (Mrs.) M.R. Subhadra, Associate Professor as the Programme Officers.

*Special camping Programme*

A special camping programme was organised at Attappady Palakkad District from 26th to 30th May, 1996. Various programmes like an animal health and infertility camp, vaccination of cattle against different contagious diseases, a mini-exhibition and a farmers' seminar were the ones which were important, 150 volunteers participated in the camp, besides the faculty members, Dean and Director of Extension and Associate Director of Extension.

*Nature camp*

46 Student volunteers participated in a Nature Camp organised at Silent Valley National Park from 27th to 29th August, 95.

*One day camp*

A one day camp was organised at Mezhatoor, Palakkad District on 5/11/95 and the important activities included vaccination programmes, mini-exhibition and a farmers' seminar.

*Regular Activities*

30 Students donated blood to the needy admitted in various hospitals in Thrissur. 80 students participated in a campus cleaning programme on 25.8.95.

*Training programmes attended by Programme officers*

Dr. C. George Varghese attended a Refresher Course programme from 26th to 30th September at NSS Orientation and Training Centre at Kalamasserry and Dr. Subhadra attended UTA Training Programme from 18th to 21st October, 95 at the same Centre.

### *Participation in other programmes*

Six student volunteers participated in Animal Husbandry programmes in the Special Camping programme organised by NSS unit of Horticultural College at Peechi.

The post-graduate students and a few Faculty members participated in the Animal Health and Infertility camp organised by KARMA at Choondal.

25 N.S.S. student volunteers assisted Merchant Association Mannuthy in organising Republic day celebration on 26.1.96.

8 N.S.S. student volunteers helped the Veterinary Surgeon Mezhattoor in organising a Goraksha camp on 28/2/96.

### *Students union activities*

The students union was inaugurated by Hon. Minister for Agriculture and Animal Husbandry Sri. P.P. Thankachan on 22.5.1995. The Arts Club was inaugurated on the same day by Sri. Kamal, Cine Director on the same occasion. Miss. Anitha.G Winner of Mathrubhumi short Story Competition was honoured. The inaugural ceremony was followed by variety entertainments.

A get-together was arranged with the outgoing students on 23/8/95.

Social Service League - conducted a visit to Agathimandiram at Ramavarmapuram and hosted a feast for the inmates on 8th October 1995. Chapals and cloths were distributed to them. A campus cleaning programme was organised.

Arranged and conducted a programme on caricature and Hipnovision on 23/8/95.

A Book exhibition was conducted on 25th and 26th October 1995. On 19.7.95 a Programme 'SANGAMAM' was organised for the delegates of Summer Institutes. Athappukkalam competition was conducted on 30/8/95. Independence day was celebrated on 15th August.

### **Extension**

Village adoption programme - strengthen the organised effort on popularising goat farming, information was given on scientific management of goats to farmers of Vilvattam Panchayat. They are supplied with necessary deworming drugs and mineral mixture for their goats. Goats were supplied to farmers of adopted village, Vilangannore in Peechi and Dr. P.S. Pushkaran and Dr. M. R. Subhadra took classes about goat rearing

## Services rendered to farmers

### *Clinical Medicine*

<b>Biological samples examined</b>	
Faecal samples	— 150 nos.
Blood samples	— 65 ..
Urine samples	— 150 ..
Other materials	— 35 ..
<b>Vaccinations done</b>	
Anthrax spore vaccine	— 508
H.S. Oil adjuvant vaccine	— 500
Foot and Mouth Disease vaccine	— 1470
STAT for Brucellosis	— 102
Tuberculin test	— 16
Johnin test	— 16
<b>Cases treated in the hospital</b>	
<b><i>Mammuthy</i></b>	
Equine	— 30
Bovine	4708
Others	3611
<b>Total</b>	<b>8349</b>
Major surgical operation	59
Anti-Rabic vaccination	
Minor surgical operation	323
Ranikhet disease vaccination	7155
Anti Rabic ..	170
Clinical samples tested	903
<b><i>Details of postmortem diagnosis</i></b>	
Poultry autopsy and disease diagnosis	— 21180
Large animal autopsy	— 734
Rabies Diagnosis	— 1623
Histopathology	— 294
Feed sample analysed for mycotoxins	— 260
Ethmoid cancer cases Investigated	— 85
<b><i>Details of microbiological examination</i></b>	
Clinical samples examined for various Microbial agents	— 515
<b><i>Details of feed samples analysed</i></b>	
Feed samples analysed for proximate principles and mineral contents	— 373
Biological samples analysed for elements using A.A.S.	— 7330

The staff members are actively participating in disease investigation in different parts of the state. Organised and conducted A.H. Seminars, gave lectures in A H. Seminars organised by various agencies. attended disease committee meetings conducted vaccination, conducted and attended farmers seminar, taken classes on various aspects of A.H. gave radio talks, wrote popular articles, conducted surgical camp at various veterinary hospitals, delivered guest lectures, gave technical advice to feed manufacturers and farmers.

### **Centre for Advanced Studies in Poultry Science**

#### **Extesion Activities**

Consultancy services were rendered to 230 farmers during the period.

One-day Poultry Farmers seminar was organised on 22-8-95 and more than 100 farmers attended.

#### **Other activities**

Dr. K. Narayanankutty taken class on quail farming on 21-11-95 in connection with the Silver Jubilee celebration of Gandhi Smarak Ashtamichira High School to the teachers and students.

Dr. C. K. Venugopalan, Dr. Amritha Viswanath and Dr. K. Narayanankutty taken classes for farmers selected by CADA for 5 days.

Dr. A. K. K. Unni, Senior Scientist, AICRP on Poultry represented the University in the Committee constituted by the Government of Kerala for the establishment of the College of Veterinary and Animal Sciences in Wayanad Dist.

### **Centre of Excellence in Pathology**

Sevices rendered to farmers. The Centre provided diagnostic service for the farmers who bring the carcasses of animals and birds for diagnostic purposes. Besides this it serves as a central diagnostic centre for all the livestock farms (Cattle, Piggery, Goat, Sheep farms, poultry, etc.) at the Mannuthy Campus. This Centre also serves as a referral diagnosis centre for the department of Animal Husbandry, Govt. of Kerala. For expert diagnosis materials are received from all over the state.

In addition to the diagnostic work at the centre, staff members of the Centre of Advanced Studies also deputed to attend to the clinical diagnostic laboratory work at the University Vety. Hospitals at Mannuthy and Kokkalai.

#### No. of materials examined :

Large Animal autopsy	615
Poultry autopsy	20,180
Rabies diagnosis	497
Histopathology	1624
Feed samples for Mycotoxin analysis	337
Nasal smear for diagnosis of sinus tumour	350

This is the only Centre which is undertaking confirmatory diagnosis of Rabies in the State. All the animals suspected to have died of Rabies in the state, if the owner wants for confirmation are brought to this centre.

#### VETERINARY COLLEGE HOSPITAL, MANNUTHY

##### Extension Activities

Treatment of sick animals and birds and prophylactic vaccinations against common diseases of Livestock and poultry routinely carried out (proforma enclosed) consultancy service is rendered to Farmers and field veterinarians.

Dr. N. M. Aleyas, Professor acted as a member of the expert committee to investigate on diseases and recommendation of remedial measures to University Livestock Farm, Mannuthy, Thumburmuzhy and Thiruvazhamkunnu and private Farmers of the State.

#### LIVE STOCK RESEARCH STATION, THIRUVAZHAMKUNNU

##### Veterinary aid

Veterinary aid, AI and pregnancy diagnosis facilities were made available to the live stock farmers.

##### Village adoption programme

Five beneficiaries were selected from among the low-income scheduled caste group at Alanallor panchayat area. They were given a class on goat husbandry and given one female-goat each. Medicines and feed supplements were also given free of cost. Follow-up works were also done. They are maintaining the goats satisfactorily.

#### CATTLE BREEDING FARM, THUMBURMUZHI

##### Extension activities

Under the Village Adoption Programme, a fund of Rs. 3,000 was allotted to the farm. During the period under report 72 improved birds (Gramalakshmi) were distributed free of cost to 12 farmers in the Pariyaram Village. Each farmer was given 6 birds (5 females + 1 male).



Under the artificial insemination programme of the farm, 323 inseminations were conducted on local farmer's animals using semen of high quality pedigree bulls received from the Progeny Testing Programme, Mannuthy.

First aid/treatment was imparted to local farmer's animals and farmer's were given advice on various aspects of farm animal management.

#### **Extesion activities participated**

Dr. D. Sreekumar, Assistant Professor attended the Scientists meet conducted by ICAR at the College of Veterinary and Animal Sciences, Mannuthy.

Dr. D. Sreekumar, Assistant Professor judged the Dog show organised by Lion's International at Trichur in connection with All India Trade Fair.

## CHAPTER IV

### Students Welfare

#### Staff Position

Scientific staff	: 3
Technical staff	: —
Administrative & supporting staff	: 7

Designation/ Category	No. of Posts		
	Sanctioned	In position	Vacant
DSW	1	1 (i/c.)	1
Dy. DSW	2	1 (i/c.)	1
Phy. Edn. Teacher	1	1	—
Section Officer	1	1	—
Office Superintendent	1	1	—
Assistants	3	3	—
Typist	1	1	—
Peons	2	2	—

#### Faculty improvement programme

New post sanctioned/created/shifted	: Nil
Scholarships awarded/deputation of staff for higher studies	: Nil
Details of Seminars/Symposia/training programmes attended by staff	: Nil
Involvement of staff in Academic Programmes	: Nil
Research	
Major Research achievements	: Nil
Farm Revenue	: Nil
Publication by staff	: Nil
Important visitors	: Nil

## CHAPTER V

# Engineering Wing

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The Engineering Wing of Kerala Agricultural University consists of the Directorate of Physical Plant with its Headquarters at Vellanikkara, one Engineering Division at Fisheries College (Panangad) and four Civil Sub Divisions one each at Tavanur, Mannuthy, Vellanikkara and Vellayani. The Mechanical sub division at the Main Campus, Vellanikkara and two Electrical Sub Divisions one each at Vellanikkara and Vellayani also come under the purview of the Directorate.

Sri. P. O. Thomas continued as the Director of Physical Plant during the period under report.

No major construction works were undertaken during the period 1995-96. Developments and improvements to the existing buildings, providing additional facilities, repair and maintenance etc. were paid special attention.

Some important works executed by the Directorate during the period 1995-96 are highlighted in the Annual maintenance and repair works are excluded in it.

## CHAPTER VI

# KAU Estate and Campus Development, Vellanikkara

The KAU Estate was established in 1973 by acquiring an area of 379.56 ha. and an area of 11.83 ha. was additionally acquired during 1977-'81. The total area of the Estate was 391.44 ha.

Out of the total area of 391.44 hectares, 233.30 hectares has been allotted to other schemes as detailed below:

1 Botanical Garden	:	25.00 ha
2 Instructional farm	:	95.50 ha
3 Cocoa Project	:	6.00 ha
4 Olericulture & Medicinal plants	:	6.30 ha
5 Coconut (Plantation crops)	:	4.00 ha
6 K.A.D.P.	:	14.00 ha
7 Central Nursery	:	5.00 ha
8 Pepper & Pineapple	:	6.00 ha
9 N.B.P.G.R.I.C.A.R.	:	12.00 ha
10 Mango Orchard for 20 years	:	9.00 ha
11 Forestry	:	20.00 ha
12 Water Management Unit	:	5.00 ha
13 Cashew Research Station	:	5.50 ha
14 Coconut Development Board, Kochi	:	20.00 ha
	<b>Total</b>	<b>233.30 ha</b>

The remaining 158.14 ha is under Plantation Scheme.

### Production and Sales

A total quantity of 23677 kg of Latex produced during the year and 21800 kg of latex were sold during the year.

### Finance

Total expenditure for the year	1995-96	3842745.45
Total receipt for the year	1995-96	2293669.25

## Campus Development, Vellanikkara

The Campus Development programme at Vellanikkara was established in the year 1990. In addition to the prime responsibility of developing the entire campus comprising of 396.79 hectares, this unit now undertake multivarious activities like arranging Agri fairs at various parts of the state, participation in flower shows and providing farm advisory services.

As a part of the Campus Development Programme the Central Nursery started its function in the main campus with effect from 31st December 1991. This sub unit provides service to the farming community by way of production and distribution of quality seeds and planting materials. The idea of mass production of planting material was mooted by the Honourable Vice-Chancellor as a part of the technology transfer coupled with the support of State Agricultural Development policy.

### Staff Position

Designation/ Category	No. of posts		
	Sanctioned	In position	Vacant
Assoc. Professor	1	1	—
Asst. Professor	1	1	—
Farm Supervisor	2	2	—
Farm Asst.	2	1	1
Lab. Assistant	1	1	—
Office Superintendent	1	1	—
Assistant	1	1	—
Tractor Driver	1	1	—

The entire campus was divided into 33 blocks and each area was earmarked for different purpose.

Development of an integrated Water Supply System in the entire campus.

Conventional method of irrigation was stopped and integrated water supply system was installed in the main campus and maintained.

A concentrated drive has been initiated to increase the cultivable area.

The wastelands were brought under high value crops like cashew, mango, etc. which serve as a scion bank for the nursery purpose.

Mechanisation of farm operations.

## **Central Nursery**

The production and distribution of planting materials of elite varieties of Agricultural and Horticultural crops.

Quality planting materials of fruit plants like mango, jack, sapota, guava, and other minor fruits were produced and distributed.

Different varieties of ornamental plants like rose, crotons, philodendrons, begonias, palms etc. were also produced.

**Establishing an Orchidarium and collection of Anthuriums.**

Establishment of an Orchidarium and collection of elite species of anthurium is a felt need not only for strengthening the research effort in breeding and management of orchids but also for the production and distribution of planting materials for which the demand is ever increasing.

Manifold increase in the production of coconut and arecanut seedlings.

Intensification of vegetable seed production.

Development of adequate infrastructural facilities to facilitate the large scale production of planting materials.

Beautification and upkeep of main office building premises including the interior decorations.

Maintenance and upkeep of progeny orchards.

## **Botanical Garden**

The main objective are maintenance, upkeep and new planting of tree species. More than 200 tree species were maintained.

## **Standardisation of Agro-techniques for Anthurium**

To find out the optimum growing medium for anthurium.

To find out the nutrient requirement for anthurium.

To standardise the shade requirement for anthurium.

To find out the optimum water requirement for anthurium.

To find out the optimum spacing for anthurium when planted in the field and

To find out the optimum time of harvest and the methods to extend the vase life.

## **Farm development**

Approximately 5 ha of area in front of the KAU School have been cleared and developed. Approximately 2 ha of land has been cleared and planted with different elite varieties of cashew as progeny orchard.

## Major Achievements

A sale of 27.36 lakhs could be achieved during the period under report. Cleared weed growth of 10 acre area and brought it under cultivation. Progeny orchard for different varieties of mango has been extended to 2 ha.

Farm revenue  
(progressive) Rs. 27,36,300

## Expnditure

Name of station	Financial	Physical Remarks	
Budget Code	Out lay	target	
Name of Project	1995-96	as on 30.03.96	
1	2	3	4
383-31-302			
<b>Development of Main Campus</b>			
<b>Salaries</b>			
110 Scientists	1.733	1.96,639	
120 Tech. & SS	2.822	2,65,544	
130 Admn. Supp. & GS	1.125	1,13,451	
	5.680	5,75,634	
<b>Recurring</b>			
141 Cost of PL	0.740	65,425	
142 Cost of SL	6.370	8,00,564	
	7.110	8,65,989	
<b>Salaries</b>			
152 Health/Medical	0.070	4,314	
<b>Recurring</b>			
210 Res. Materials	2.400	2,33,550	
<b>Salaries</b>			
300 TA	0.050	1,537	
<b>Recurring</b>			
411 Maint.of FM	0.350	32,278	
<b>Non-Recurring</b>			
416 Furn./Fixt	0.000	0	
<b>Recurring</b>			
826 Security	0.220	18,765	
<b>Non-Recurring</b>			
921 Farm Development	1.400	1,18,587	
Head Total	17.280	18,50,634	

383-31-303 Est of Central Nursery (Plan)

	1	2	3	4
<i>Salaries</i>				
110 Scientists		0.000	0	
120 Tech. & SS		0.000	823	
130 Admn. Supp. & GS		0.000	0	
		0.000	823	
<i>Recurring</i>				
141 Cost of PL		2.150	2,47,247	
142 Cost of SL		7.900	8,96,159	
		10.05	11,43,406	
<i>Salaries</i>				
152 Health/Medical		0.000	3,353	
<i>Recurring</i>				
210 Res. Materials		8.000	8,21,578	
222 OE & M		0.150	16,347	
		8.150	8,37,925	
<i>Salaries</i>				
300 TA		0.000	2,575	
<i>Non-Recurring</i>				
420 Eq./Machinery		0.500	1,809	
<i>Recurring</i>				
821 Telephone		0.060	4,485	
<i>Non-Recurring</i>				
921 Farm Development		2.150	5,63,338	
Head Total		20.910	25,57,714	

383-31-305 Dev. of Botanical Garden & arboretum (Plan)

<i>Salaries</i>				
120 Tech. & SS		0.100	0	
<i>Recurring</i>				
142 Cost of SL		1.250	1,61,148	
<i>Salaries</i>				
152 Health/Medical		0.010	0	
<i>Recurring</i>				
210 Res. Materials		0.250	71,165	
<i>Salaries</i>				
300 TA		0.010	0	
<i>Non-Recurring</i>				
420 Eq./Machinery		0.100	17,179	
Head Total		1.720	2,49,492	



### 383-31-521 Standardization of Agro-techniques for Anthurium

1	2	3	4
<i>Salaries</i>			
110 Scientists	0.140	0	
<i>Recurring</i>			
210 Res. Materials	0.200	71,165	
<i>Salaries</i>			
300 TA	0.400	0	
<i>Non-Recurring</i>			
420 Eq. Machinery	0.200	5,544	
<i>Non-Recurring</i>			
921 Farm Development	1.050	47,320	
Head Total		1.990	52,864
Station Total		41.900	47,10.704

13. Publication : Prepared a module on 'Nursery Management' submitted to KHDP Cochin for favour of publication.
14. Radio talks : Nil
15. Training classes handled : Handled class for trainees on Orchid and Anthurium cultivations.

#### Visitors

Sri. M. P. Thami, MLA & Sri. K. C. Joseph, MLA visited the Central Nursery.

## CHAPTER VII

### Finance and Accounts

Sri. C. N. Muraleedharan Nair, PS to Vice-Chancellor assumed the post of Comptroller from 8-4-95 consequent on reversion of Smt. Elizebath John, IA & AS, to her Parent Department. Dr. N. Mohanakumaran, Director of Research was officiating as Comptroller with effect from 30-12-95. Smt. V. S. Bhanumathi Ammal IA & AS. (Rtd.) assumed charge as Comptroller on 22-2-96. The three Internal Audit Circles – Northern, Central and Southern manned by Assistant Comptrollers functioned properly during the year 95-96.

The University had adopted a Budget Estimate for Rs. 6763 lakhs for 95-96 anticipating grant-in-aid of Rs. 4600 lakhs from State Government. (Rs. 3250 lakhs under Non-Plan and Rs. 1350 lakhs under Plan) ICAR assistance of Rs. 499 lakhs and specific scheme tied assistance of Rs. 208 lakhs from other sources like DBT, DST, EEC etc. internal resources of Rs. 440 lakhs and Rs. 1016 lakhs from Pension Fund, Loans & Advances income from investements. Opening Balance etc.

Though an amount of Rs. 4600/-lakhs was anticipated, the State Government released only Rs. 3625.50 lakhs (Rs. 2425.50 lakhs under Non-Plan and 1200 lakhs under plan).

Receipts and expenditure for 95-96 are as below:

#### Receipts

#### Grant-in-aid from Government (in lakhs)

Non-Pan	:	Rs.	2425.50	
Plan	:	Rs.	1200.00	
Grant-in-aid from ICAR and other agencies	:	Rs.	701.46	
Internal resources	:	Rs.	481.82	
Opening balance	:	Rs.	575.49	
Total	:	Rs.	<u>5384.27</u>	lakhs

## Expenditure

Non-plan	: Rs.	2913.80 lakhs
State Plan (including State Share on ICAR Co-ordinated projects and ICAR Plan)	: Rs.	1333.79
ICAR Projects	: Rs,	361.47
Others (including EEC, KHDP)	: Rs.	261.60
Loans, advances, Pension fund etc.	: Rs.	403.60
Total	: Rs.	<u>5274.26 lakhs</u>

(The figures are provisional subject to finalisation of accounts)

Welfare measures to the Staff were implemented with special attention as in the past and substantial improvement has been made in clearing backlogs of loans. An amount of Rs. 20 lakhs was disbursed as house loan for construction of 77 houses at soft rate of interest to employees and labourers. All the applications under HFS have been cleared upto date. An amount of Rs. 5.99 lakhs has been released towards Motor Cycle advance. Further an amount of Rs. 6.30 lakhs was released towards Motor Car Advance.

GPF & WPF credit cards have been issued upto 1994-95.

The Annual accounts of the University for the year 95-96 is under preparation. All efforts were made to make the accounts upto date.

The Finance Committee met on 24-2-96 to finalise the Budget Estimate 96-97 and Revised Estimate 95-96. There were 3 sittings of the Accounts Committee during the year to consider Annual Accounts and Audit Reports for 1988-89 & 89-90.

Sri. C. Krishnankutty continued as the Government Auditor. Audit Reports for 88-89 & 89-90 were issued in 95-96. Audited Utilisation Certificate in respect of 70% ICAR and other externally aided projects upto 94-95 were issued in 95-96 to facilitate drawal of assistance from Funding Agencies. The Statutory audit wing also worked in full swing during the period.

# Appendix I

## MEMBERS OF THE STATUTORY AUTHORITIES

### GENERAL COUNCIL

#### EX-OFFICIO MEMBERS

His Excellency the Governor of Kerala, Raj Bhavan,  
Thiruvananthapuram.

The Hon'ble Minister for Agriculture, Thiruvananthapuram.

The Vice-Chancellor, Kerala Agricultural University,  
Vellanikkara, Thrissur.

The Secretary to Government, Department of Agriculture,  
Government Secretariat, Thiruvananthapuram.

The Secretary to Government, Department of Rural  
Development, Government Secretariat, Thiruvanantha-  
puram.

The Secretary to Government, Department of Finance,  
Government Secretariat, Thiruvananthapuram.

The Director of Agriculture, Thiruvananthapuram.

The Director of Animal Husbandry, Thiruvananthapuram.

The Director of Dairy Development, Thiruvananthapuram.

The Director of Fisheries, Thiruvananthapuram.

The Chief Conservator of Forests, Thiruvananthapuram.

The Registrar of Co-operative Societies, Thiruvanantha-  
puram.

The Dean, Faculty of Agriculture, College of Agriculture  
Vellayani, P. O. Thiruvananthapuram.

The Dean, Faculty of Fisheries, College of Fisheries,  
Panangad, Ernakulam.

The Dean, Faculty of Veterinary and Animal Sciences,  
College of Veterinary and Animal Sciences, Mannuthy,  
P. O. Thrissur.

The Dean, Faculty of Agricultural Engg. and Technology,  
Kelappaji College of Agricultural Engineering and Techno-  
logy, Tavanur, Malappuram.

The Director of Extension, Kerala Agricultural University,  
Mannuthy, P. O. Thrissur.

The Director of Research, Kerala Agricultural University,  
Veilanikkara, P. O. Thrissur.

The Director of Students Welfare, Kerala Agricultural  
University, Mannuthy, P. O. Thrissur.

## ELECTED MEMBERS

*Members of the Legislative Assembly* (5 Members One from  
SC or ST)

Sri Johny Nellor, M L A., House No. 8, Housing Colony,  
Moovattupuzha, Ernakulam.

Sri KC Joseph, M L A., Karuvelihara, Vadavathoor P. O.  
Kottayam.

Sri CP Narayanan, M L A, C P House, P. O. Kuttoor, Via.  
Mathamangalam Bazar, Kannur.

Sri K M Sooppy, MLA., Firoz Manzil P. O. Panoor-670 692,  
Kannur.

Sri K Raghavan Master, MLA., Kariyampathy House,  
Kalanadikolli, P. O. Pulpally, Sulthan Battery Expired  
during February '96.

## *Representatives of Students of Post Graduate Courses*

(2 members)

Sri S Sureshkumar, (94-17-02) M Sc. (Forestry) Student,  
College of Forestry, Vellanikkara, Thrissur.

Sri MV Sudheesh (94-11-06). M Sc. (Ag.) Student, College  
of Horticulture, Vellanikkara, Thrissur.

## *Representative of Students of the Doctorate Degree Courses*

(1 member)

Sri PN Premachandran (93-21-16), Ph. D. Scholar, Dept. of  
Soil Science & Agrl. Chemistry, College of Agriculture,  
Vellayani, Thiruvananthapuram.

## *Representatives of the Students of the Graduate Courses*

(2 members)

Sri B Ashok (90-03-69), IV year B. V. Sc. & A. H. Student,  
College of Veterinary & Animal Sciences, Mannuthy,  
Thrissur.

Sri KN Noushad Ali (91-03-10), III, year B. V. Sc. & A. H.  
Student, College of Veterinary & Animal Sciences, Mannuthy,  
Thrissur.

*Representatives of the Teachers (other than Deans) of Faculties*  
(Not more than four - One from each faculty)

*Faculty of Agriculture*

Dr FMH Kaleel, Assistant Professor, Krishi Vigyan Kendra,  
Sadanandapuram, Kottarakkara.

*Faculty of Veterinary and Animal Sciences*

Dr CB Manomohan, Associate Professor (NC), College of  
Veterinary & Animal Sciences, Mannuthy, Thrissur.

*Faculty of Fisheries*

Sri CG Rajendran, Associate Professor (NC), Rice Research  
Station, Vyttila, P. O., Kochi-19.

*Faculty of Agricultural Engineering and Technology*

Dr PC Antony, Assoc. Professor, Kelappaji College of Agri-  
cultural Engineering & Technology, Tavanur, Malappuram.

*Representative of Non-teaching staff of the University*  
(One member)

Sri R Vijayan, Binder, Kerala Agricultural University Hqrs.  
Vellanikkara-680 654, Thrissur.

MEMBERS NOMINATED BY THE CHANCELLOR

*Agricultural Scientists (2 Nos)*

Dr. KV Peter, Director, National Research Centre for Spices,  
Kozhikode.

Dr (Mrs) MK Sheela, Assoc. Professor, Directorate of  
Extension, Communication Centre, Mannuthy.

*Farmers (5 numbers) One from SC ST)*

Sri A Sujanapal, MLA., Advocate, Kozhikode.

Sri MA Wahid, Advocate, Ginsalayam, R. C. Junction,  
Kunnukuzhi, Thiruvananthapuram.

Sri CV Narayanan, Chettakkulam House, Madakkathara, P.O.  
Thrissur.

Sri K Gopalan, Congress House, Wayanad Road,  
Kozhikode-673 011.

Sri Varghese Pereppadan, Mala.

*One Non-official Representative from each of the following:-*  
*Co-operation*

Sri MV Kurien, Retd. Block Development Officer, Ollur P. O.  
Thrissur.

### *Fisheries*

Sri K Rajan, Kinattinkalath, Cheriyanamangad, Quilandy Beach, Quilandy.

### *Animal Husbandry*

Sri Prayar Gopalakrishnan, Prayar P. O., Oachira, Kollam.

### *One Non-official Representative of the Plantation Industry in the State*

Sri V. Saidu Mohammed Thangal, 'NISHANA' Near Najath Hospital, Ponnani, Malappuram.

### *Two Women Members*

Smt. Saraswathy Kunjukrishnan, Kalangara House, Kollam-13.

Prof. Savithri Lakshmanan MP, Krishna Kripa, Preshkar Road, Irinjalakuda.

### *One Engineer specialised in Agricultural Engineering*

#### *Irrigation*

Sri P John Zachariah, HOREB, 2 House, Perissery.

Chengannur-699 121.

### *One Educationist*

Dr K Ramadas, Professor, University Veterinary Hospital, Kokkalai, Thrissur.

### *Four members to represent Agricultural Labour, of whom one shall be a member belonging to the Scheduled Caste*

Sri CN Govindankutty, Cherpu P. O., Thrissur.

Sri MK Purushothaman, Quarter No. F 2 B, Painavu P. O. Idukki.

Sri Joseph Perumpilly, Chevvoor, Thrissur-680 027

Sri P Narayanan Nair, Omassery, P. O., Thamarassery,

Kozhikode. (Expired during December 1995)

### *One member to represent Plantation Labour in the State*

Sri VV Shoukkathali, Vadakkevalappil House, Vellaramkundu, Thenkara, P. O., Mannarghat, Palakkad.

### *Two Members belonging to the Scheduled Caste and One Member belonging to the Scheduled Tribe, of whom, one shall be Member of the Legislative Assembly of the State*

Shri MP Thami, M.L.A., (Sch. Caste) Mangalaparambil, P.O. Paruthur, (Via) Pattambi, Pallipuram.

Sri P C Retnakaran, (Sch. Caste) M M Hall, Perorkada, P.O., Thiruvananthapuram.

Sri Kurichipatta Gopalan, (Sch. Tribe) P.O. Bhoodana Colony, Pulpally, Waynad.

*Representatives of University Senates*

*Representatives of Cochin University of Science and Technology*

Sri C Haridas, Ex. M P, President, Kerala State Prohibition Council, Ponnani, Malappuram District.

*Representative of University of Kerala*

Sri C S Sasikumar, Anjana, Chinnappara, P.O. Vithura, Nedumanagd, Thiruvananthapuram.

*Representative of I.C.A.R.*

Dr E A Siddiq, Dy Director General (CS). I.C.A.R., Krishi Anusandhan Bhavan, New Delhi 110 012.

**EXECUTIVE COMMITTEE**

(From 31-1-1995)

**EX-OFFICIO MEMBERS**

The Vice-Chancellor, Kerala Agricultural University, Vellanikkara, Thrissur.

The Secretary to Government, Development Department, Government Secretariat, Thiruvananthapuram.

The Secretary to Government, Agriculture Department, Government Secretariat, Thiruvananthapuram.

The Secretary to Government, Finance Department, Government Secretariat, Thiruvananthapuram.

**OTHER MEMBERS**

**MEMBER REPRESENTING THE I.C.A.R.**

Dr. EA Siddiq, Deputy Director General (CS), Indian Council of Agricultural Research, Krishi Anusandhan Bhavan, Pusa, New Delhi-110 012.

**ELECTED DEAN OF FACULTY**

Dr A Rajan, Dean, Faculty of Veterinary & Animal Sciences, College of Veterinary & Animal Sciences, Mannuthy, Thrissur.

**ELECTED TEACHER**

Dr CB Manomohan, Associate Professor (NC). College of Veterinary and Animal Sciences, Mannuthy Thrissur.

**ELECTED NON-OFFICIAL MEMBERS**

**GENERAL**

Sri Johny Nelloor, MLA, House No 8, Housing Colony Muvattupuzha Ernakulam

Sri KC Joseph, MLA, Congress House,

Sreekantapuram Kannur - 6.0 631.

Sri KM Sooppy, MLA, Firoz Manzil, P O Panoor Mannur - 670 692.



## SC/ST RESERVATION

Sri K Gopalan, Congress House, Wayanad Road, Kozhikode-673 011.

## WOMEN RESERVATION

Smt Saraswathi Kunjukrishnan, Kalangara House, Kollam-13 Kollam District.

## ELECTED STUDENT

Sri MV Sudheesh (94-11-06) M Sc (Ag) Student, College of Horticulture, Vellanikkara Thrissur District

## ACADEMIC COUNCIL MEMBERS

(From 28-12-93 to 27-12-96)

Ex-officio members as per Section 17(1) (a) to (g) and (1) of KAU Act - Clause I of Statute 1(a) of SRO No. 529/72

Dated 19-10-72

The Vice-Chancellor, Kerala Agricultural University  
Vellanikkara, Thrissur

The Dean, College of Agriculture,  
Kerala Agricultural University  
Vellayani, Thiruvananthapuram

The Dean, College of Veterinary and Animal Sciences  
Mannuthy, Thrissur

The Dean, College of Fisheries, Panangad, Ernakulam

The Dean, Kelappaji College of Agricultural Engineering &  
Technology, Tavanur, Malappuram

The Director of Research, Kerala Agricultural University  
Vellanikkara, Thrissur

The Director of Extension, Kerala Agricultural University  
Mannuthy, Thrissur

The Director of Students Welfare, Kerala Agricultural  
University, Mannuthy, Thrissur

The Registrar, Kerala Agricultural University  
Vellanikkara, Thrissur

The Director of Agriculture, Vikas Bhavan  
Thiruvananthapuram

The Director of Animal Husbandry, Vikas Bhavan  
Thiruvananthapuram

University Librarian, Kerala Agricultural University  
Vellanikkara, Thrissur

Members nominated by the Chancellor from among the Heads of Department of the Faculties (6 members) as per Section 17 (i) of KAU Act

Dr. Al Jose, Professor and Head (Soil Science and Agricultural Chemistry), College of Horticulture  
Vellanikkara, Thrissur

Dr. K Pavithran, Professor and Head (Dairy Science)  
College of Veterinary and Animal Sciences  
Mannuthy, Thrissur

Dr. PS Pushkaran, Professor and Head (Extension)  
College of Veterinary and Animal Sciences  
Mannuthy, Thrissur

Sri .K Kerala Varma, Associate Professor and Head  
(Fishery Hydrography), College of Fisheries  
Panangad, Ernakulam

Dr. KI Koshy, Professor and Head (Supportive and Allied Courses), Kelappaji College of Agricultural Engineering and Technology, Tavanur, Malappuram

Members nominated by the Chancellor, from among the staff of the Research Station of the University (3 members as Section 17 (1) (i) of KAU Act

Sri. KS Purushan, Associate Professor  
Fisheries Research Station, Puduveypu, Ernakulam

Dr. U Jaikumaran, Associate Professor (NC)  
Agricultural Research Station, Mannuthy, Thrissur

Dr. Sosamma Iype, Professor, University Livestock Farm  
Mannuthy, Thrissur

Members nominated by the Chancellor from among the Scientists of Indian Council of Agricultural Research and or its Institutions, from other Universities in India or from among well-known Scientists in India (not more than 5 members) as per Section 17 (1) (a) (iii) of Statutes SRO No. 529 72 dated 19-10-72.

Dr. MR Sethuraj, Director  
Rubber Research Institute of India, Kottayam

Dr. R Gopalakrishnan, Retd. Director of Research  
Kerala Agricultural University  
Plot No. 228, Gate No. 4, Hill Gardens  
Kuttanellur, Thrissur-680 014

Dr AD Damodaran, Director, Regional Research Laboratory  
(CSIR), Thiruvananthapuram.

Dr V Subramaniam (Former Dean, Tamil Nadu Agril. University), 66, Natarajapuram North, Tanjavur, Tamil Nadu.

Dr SP Palaniappan, Professor of Agronomy, Agricultural College & Research Institute, Coimbatore - 641 003.

#### ELECTED MEMBERS

Two members from among the Post-Graduate Students and one member from among the Research students of the University as per Section 17 (1) (i) of the KAU Act.

BL Biju Lal (93-11-55) M. Sc. (Ag.) Soil Science & Agril. Chemistry) College of Horticulture, Vellanikkara.

KJ Kuriakose (92-12-13) II M. Sc.(Hort.) Student Department of Processing Technology, College of Horticulture Vellanikkara.

Dr. H. Subramanian (93-93-02) Ph. D. Student Department of Parasitology, College of Vety. & Animal Sciences, Mannuthy, Thrissur.

One member elected by the Teachers (other than the Dean) of each Faculty from among themselves as per Section (17) (1) (k) of KAU Act.

Dr MS Hajilal, Assistant Professor, AICRP on Agril. Drainage, Karumady.

Dr CS Jayachandran Nair, Associate Professor (NC) Department of Horticulture, College of Agriculture, Vellayani.

Dr KN Muraleedharan Nair, Professor, Department of Surgery, College of Vety. & Animal Sciences, Mannuthy, Thrissur.

Dr KV Jayachandran, Assistant Professor, College of Fisheries, Panangad, Cochin.

Members Co-opted (not more than ten) to secure adequate representation to different aspects of Agriculture, as Section 17 (2) of KAU Act (Act 33 of 1971).

Dr Al Jose, Associate Dean, College of Horticulture, Vellanikkara, Thrissur.

Dr U Mohammed Kunju, Director (Acad. & P. G. Studies) KAU Hqrs., Vellanikkara.

The Associate Dean, College of Forestry, Vellanikkara.

Sri M Mohandas Associate Dean i/c. College of Co-op. Banking and Management, Mannuthy, Thrissur.

Dr N Mohanakumaran, Associate Director, NARP (SR) College of Agriculture, Vellayani.

Dr K Gopalan, Former Vice-Chancellor, Cochin University of Science and Technology, Chameli Chembukkavu, Thrissur 30.

Dr MJ Thomas Associate Director, Directorate of Research KAU Hqrs., Vellankkara.

Dr PM Mathew, Professor (Fisheries Research) College of Fisheries Panangad.  
Associate Dean, College of Agriculture Pilicode Nileswar.

Smt KK Santha, Associate Professor, Directorate of Extension, Mannuthy, Thrissur.

Members nominated by the Chancellor from among those connected with service in Agriculture, Animal Husbandry, Forestry, Fisheries, Dairy Development, Co-operation and Community Development Department (not more than five members)

Sri AJ Aviyil Joseph 'Karshakasree' Ramacham Padam Chunkathara, Nilambur Malappuram District.

Sri VR Krishnan Nair Former Conservator of Forests and Special Officer College of Forestry, Kerala Agril. University (D7, Udayasree, Jawahar Nagar Thiruvananthapuram)

Sri Prayar Gopalakrishnan, Chairman, KLD & MM Board, Thiruvananthapuram.

Sri CN Balakrishnan, President District Co-operative Bank Thrissur.

Sri Viswanathan, Mithra Nikethan, Thiruvananthapuram.

## Appendix II

### SUB COMMITTEES

#### SUB COMMITTEES OF EXECUTIVE COMMITTEE

##### *Finance Committee*

Vice-Chancellor	Chairman
Sri Johny Nelloor, M. L. A.	Member
Secretary, Agriculture	"
Finance Secretary	"
Comptroller	Member - Convenor

##### *Planning and Development Committee*

Smt Saraswathy Kunjukrishnan	Chairperson
Sri KC Joseph, M. L. A.	Member
Sri Johny Nelloor, M. L. A.	"
Sri K Gopalan	"
Dr CB Manomohan	"
Sri MV Sudheesh	"
Director of Research	Member Convenor

##### *Research Review Committee*

Vice-Chancellor	Chairman
Sri KM Soopy, M. L. A.	Member
Dr A Rajan, Dean (Vety.)	"
Dr CB Manomohan	"
Director of Research	Convenor

##### *Establishment Committee*

Sri KC Joseph, M. L. A.	Chairman
Sri KM Soopy, M. L. A.	Member
Sri Johny Nelloor, M. L. A.	"
Smt Saraswathy Kunjukrishnan	"
Sri K Gopalan	"
Dr A Rajan, Dean (Vety.)	"
Sri CB Manomohan	"
Sri MV Sudheesh	"
Registrar	Member - Convenor

### *Students Welfare Committee*

Sri K Gopalan	Chairman
Sri KC Joseph, M. L. A.	Member
Dr CB Manomohan	"
Sri MV Sudheesh	"
Director of Students Welfare	Member-Convenor

### *Works Committee*

Sri KM Soopy, M. L. A.	Chairman
Sri Johny Nelloor, M. L. A.	Member
Smt Saraswathy Kunjukrishnan	"
Sri K Gopalan	"
Director of Physical Plant	Convenor

## SUB COMMITTEES OF GENERAL COUNCIL

### *Statute Sub Committee*

Prof. Savithri Lakshmanan, M. P.	Member - Chairperson
Sri KC Joseph, M. L. A.	Member
Sri MP Thami, M. L. A.	"
Sri K Raghavan Master, M. L. A.	"
(Expired during Feb. 1996)	
Dr CB Manomohan	"
Sri CG Rajendran	"
Dr F. M. H. Kaleel	"
Dr PC Antony	"
Sri R Vijayan	"
Sri MV Sudheesh	"
Sri CS Sasikumar	"
Sri Prayar Gopalakrishnan	"
Registrar	Convenor

### *Assurance Committee*

Sri C Haridas, Ex M. P.	Chairman
Sri Joseph Perumpilly	Member
Sri PN Premachandran	"
Sri B Asok	"
Sri KN Noushad Ali	"
Sri S Sureshkumar	"
Dr K Ramdas	"
Dr MK Sheela	"
Sri Kurichipatta Gopalan	"
Registrar	Convenor

### Accounts Committee

Sri MA Wahid	Chairman
Sri CN Govindankutty	Member
Sri MK Purushothaman	"
Sri CV Narayanan	"
Sri VV Shoukkathali	"
Sri Varghese Pereppadan	"
Sri Saidu Mohammed Thangal	"
Sri PC Retnakaran	"
Sri MV Kurian	"
Sri K Rajan	"
Sri CP Narayanan M. L. A. Comptroller	Convenor

### FACULTY RESEARCH COMMITTEE

#### 1. AGRICULTURE

Director of Research, KAU	Chairman
Director of Extension, KAU	Member
Dean, College of Agriculture, Vellayani	"
Assoc. Dean, College of Horticulture, Vellanikkara	"
Assoc. Dean, College of Co-operation, Banking and Management, Mannuthy	"
Assoc. Dean, College of Agriculture, Pilicode	"
Assoc. Director of Research (AR & T), Directorate of Research, KAU	"
Assoc. Director of Research (M&E), Directorate of Research, KAU	"
Assoc. Director of Research (Plg), Directorate of Research, KAU	"
Assoc. Director, High Range Region, Regional Agrl. Research Station, Ambalavayal	"
Assoc. Director, Regional Agrl. Res. Station, Pattambi	"
Assoc. Director, NARP Southern Region, College of Agriculture, Vellayani	"
Assoc. Director, Regional Agrl. Research Station, Kumarakom	"
Assoc. Director, Regional Agrl. Research Station, Pilicode	"
Special Officer, College of Forestry, Vellanikkara	"
Heads of Departments in the Faculty of Agriculture	"

### *Project Co-ordinators*

- Dr. L Rema Devi, Professor & Head, Rice Research Station, Moncompu
- Dr PC Balakrishnan, Associate Professor, Regional Agricultural Research Station, Pilicode
- Dr S Rajan, Head, Dept. of Olericulture, College of Horticulture, Vellanikkara
- Dr PK Rajeevan, Assoc. Professor and Head, Dept. of Pomology, College of Horticulture, Vellanikkara
- Dr EV Nybe, Associate Professor and Head, Dept. of Plantation Crops, College of Horticulture, Vellanikkara
- Dr V Murnaleedharan Nair, Professor, College of Agriculture, Vellayani
- Dr R Gopimony, Professor and Head, Dept. of Plant Breeding and Genetics, College of Agriculture, Vellayani
- Dr G Raghavan Pillai, Assoc. Director (Farms), Main Campus, Vellanikkara
- Dr G Sreekantan Nair, Professor and Head, College of Agriculture, Vellayani
- Dr Alice Abraham, Professor, College of Agriculture, Vellayani
- Dr A Visalakshy, Professor, and Head, Dept. of Agri. Entomology, College of Agriculture, Vellayani
- Dr K Rajmohan, Assoc. Professor, College of Agriculture, Vellayani
- Dr Jacob John, Assoc. Professor & Head, Dept. of Processing Technology, College of Horticulture, Vellanikkara
- Dr C. Bhaskaran, Head, Dept. of Extension, College of Horticulture, Vellanikkara
- Dr SK Nair, Professor, College of Agriculture, Vellayani
- Dr M Oommen, Professor & Head, Farming Systems Research Station, Kottarakkara
- Dr P Balakrishna Pillai, Assoc. Director of Research. (M & E) Main Campus, Vellanikkara
- Dr B Mohanakumar, Associate Professor, College of Forestry, Vellanikkara
- Dr VK Venugopal, Associate Professor, College of Agriculture, Vellayani
- Smt NK Vimalakumari, Assoc. Professor, College of Agriculture, Vellayani
- Sri VP Sukumara Dev, Professor, Regional Agri. Res. Station, Pattambi



## ii. VETERINARY & ANIMAL SCIENCES

Director of Research, KAU	Chairman
Dean, Faculty of Vety. & AS	Member
Director of Extension, KAU	"
Assoc. Director of Research (V &AS), KAU	"
Heads of Departments in the Faculty of Vety. and Animal Science	"
Professor (Farms)	"
Director, Vety. Research and Education	"
Professor, Co-ordinated Project on Agrl. Biproducts	"
Professor (Project Co-ordination), Cattle and Buffaloe	"
Professor (Research Co-ordination)	Secretary & Convenor

### *Project Co-ordinators*

- Dr S Sulochana, Professor, Dept. of Microbiology  
Dr Jacob. V Cheeran, Professor, Dept. of Pharmacology  
Dr Sosamma Iype, Professor Dept. of Animal Breeding  
and Genetics  
Dr AKK Unni, Sr Scientist, AICRP on Poultry  
Dr J Abraham, Assoc. Professor Meat Technology Unit  
Dr CK Thomas, Professor, Dept. of Livestock Production  
Management  
Dr K Prabhakaran Nair, Professor, Dept. of Animal Produc-  
tion  
Dr PS Pushkaran, Professor, Dept. of Extension  
Dr TG Rajagopalan, Professor and Head Dept. of Livestock  
Production Management  
Dr KT Punnoose, Professor of Microbiology

## AGRICULTURAL ENGINEERING

Director of Research, KAU	Chairman
Dean, Faculty of Agrl. Engg., KCAET, Tavanur	Member-Secretary
Director of Extension, KAU	Member
Head, Dept. of Irrigation & Drainage Engineering, KCAET, Tavanur	"
Head, Dept. of Supportive and Allied Course, KCAET	"

Professor of Agri. Engg., College of  
Agriculture, Vellayani Member

Professor Raghavan Nambiar, Head, Dept. of  
Civil Engineering, College of Engg., Thrissur "

Dr AN Namboodiri, Director, TBGRI,  
Thiruvananthapuram "

#### *Project Co-ordinators*

Professor CP Muhammed, KCAET, Tavanur "

Dr (Mrs.) AN Remadevi, Head, Dept. of  
Agri. Engineering, College of Agriculture,  
Vellayani "

#### FISHERIES

Director of Research Chairman

Dean, Fisheries Member

Director of Extension, KAU "

Heads of Departments of the Faculty of  
Fisheries "

Professor (Fish Research) Secretary

## Appendix III

### LIST OF STAFF AT HEAD QUARTERS

#### *Vice-Chancellor's Office*

PS to Vice-Chancellor	:	CN Muraleedharan Nair (re-employment terminated on completion of one year on 4.12.95 AN) VR Sankarankutty assumed a ddi charge of PS on 4.12 95 AN
PA to Vice-Chancellor	:	K Sadasivan Nair
Sr. Office Supdt.	:	P Haridasan
Peon	:	EK Padmanabhan TK Abdulla Ramachandra Bahadur
Driver	:	CP Karunakaran Nair

#### *Director of Research*

Assoc. Director of Research	:	Dr MJ Thomas Dr G Ravindranathan Pillai Dr P Balakrishna Pillai Dr P Ramachandran Dr C Raghavan Pillai from 15-5-95
Fodder Specialist	:	Dr P Girijavallabhan
Assistant Professor (Stat)	:	MP Abdul Razak
Assistant Professor (Agron)	:	KE Usha (upto 26-8-95) Sansamma George from 15-3-96
Assistant Professor (CS)	:	Ramesh Geetha from 26-12-95
Information Officer	:	TK Ajitha from 6-5-95
Programmer	:	M Viswanathan Nair (up to 25-11-95) Mollykutty George LWA from 26-11-95
Jr- Programmer	:	TA Sebastian
Administrative Officer	:	V Balagopalan
Section Officer	:	N Vijayakumar PR Sreedevikutty

Grade II Assistant	:	Sujatha Bai K Liakath Ali Khan ME Saleel from 19-4-95
Grade I Assistant	:	A Sheela Attokkaran K Harinath VS Sathyaseelan MK Ajayakumar
Senior Grade Assistant	:	KF Mathew
Sr. Office Superintendent	:	KN Santhakumari G Shanmughan
Office Superintendent	:	Ramachandran Unnithan A N Dasamma up to 12-5-95 K Saraswathy Amma
Selection Grade Typist	:	S Majida Beevi (up to 12-5-95)
Grade I Typist	:	S Fathima Beevi PT Ajith B Shiras PT Elizabeth upto 1-6-95 Vijayan
Lab. Assistant	:	K Thankamany
Duplicator Operator	:	KA Divakaran
LDV Driver	:	ES Chandran (1-4-95 to 3-4-95) VR Chandran N Sundaran
Class IV Employees	:	AP Manikkan IR Vilasini KM Ponnunon P Sakunthala from 30-6-95
<i>Registrar's Office</i>		
Sr. Dy. Registrar (Admn. I)	:	PM Chandran
Sr. Dy. Registrar (Admn. II)	:	CS Asokakumar
Deputy Registrar (Acad.)	:	V Chandrika
Asst. Registrar (Admn.) I	:	C Rajamma upto 22.5.95 V Venugopalan upto 20.11.95 TV Rajasekharan Nair from 21.11.95
Asst. Registrar (Admn.) II	:	K Kamala Bai upto 11.6.95 P Gopinathan from 12.6.95
Labour Officer	:	C Sasikumaran Nair
Recruitment Officer	:	T Aravindan

**Section Officers**

- : KK Gouthamy  
KP Ramachandran Nair  
VV Radhamma upto 10.1.96  
EK Prabhavathy from 11.1.96  
L Syamala  
TA Zainaba Beevi  
V Viswambharan  
AK Lyla  
T Remadevi  
PV Nalini  
MA Alikutty upto 2.11.95  
KP Mary from 10.1.96  
KV Sugunan  
KP Narayanikutty  
S Vanaja  
A Subhalakshmy Ammal  
MA Urmila Devi from 17.5.95

**Comptroller's Office****Deputy Comptroller**

- : K Sivanandan upto 31.12-95  
V Venugopalan from 1.1:96

**A. C. IAC (CR)**

- : VC Bharathan Pillai upto 18.7.95  
TV Rajasekharan Nair  
                                upto 20.11.95  
K Kuriakose from 21.11.95

**AICI (B&P)**

- : VR Sankarankutty

**A. C. (DD&A)**

- : DA Shyamala

**A. C. (P&L)**

- : K Rajamma upto 31.12.95  
Mary Amma Eapen upto 7.3.96  
K Chandramohan from 8.3.96

**Section Officer**

- : KI Chakkunny  
CC Rosily  
KK Sathesan  
PT Thankamany  
Susy Mathew  
R Thankamany  
KP Saramma  
NK Unnikrishnan  
CM Omana  
PA Lakshmy  
MN Sasidharan  
CV Santha  
M Rugmini  
KK Subramanian  
R Kuttappan Achary from 7.11.95  
MN Vijayakumar upto 11.6.95  
P Janardanan from 12.6.95  
Abdul Karim  
Mercy John from 17.5.95

### *Directorate of Students Welfare*

Section Officer : KR Dilap Kumar

Steno : KM Mary

### *Directorate of Extension*

Section Officer : N Usha Rani  
PV Sreekumar

Sr. Office Supdt. : TD Jose  
PP Rosy

Typist : AC Mancy  
G Hareendran

Pool Officer : N Somarajan  
(Retired on 30-4-95)

PO Elsy 5/95 onwards

Sr. Office Superintendent : VB Leelavathy Amma  
P A to Comptroller (Retired on  
30-4-95)

VT Kurian, P.A. to Comptroller  
5/95 onwards

KK Ramachandran Nair

VP Asokan, P.A. to Registrar

R Sadan

PR Sarojini

K Sadasivan Nair

K Sathyavathy Bai

P Subhashini, Steno to Director,  
PG studies

Reetha Joseph 5/95 onwards  
(on working arrangement at  
Engg. Sub Division, Mannuthy).

Office Supdts./Typists : MA Bhargavi

Selection Gr. Typist : KA Valsala

P Sarada

K Girija

LA Surendran

Sr. Gr. Typist : Sreemathy Kumari

Typist Gr. I : MA Rajani

Typist Gr. II : Z Sareena

TA Vincent

K Vimala upto 6/95

L Sobhanakumari upto 6/95

Selection Gr. Typist : S Remani  
 PK Easwary  
 Sr. Gr. Typist : A Vasantha upto 15-5-95  
 Typist Gr. I : KR Nirmala  
 Sr. Gr. Typist : AJ Mary  
 Typist Gr. II : E Sathi Devi  
 : TJ Leena  
 : TG Jalaja upto 5/95  
 : BK Padmaja  
 Sr. Gr. Typist : M Abdul Azeez  
 Typist Gr. I : MK Sajany  
 Sr. Gr. Typist : B Savitha Devi  
 : A Nandakumar  
 Resigned from 2/96  
 P Vasantha Kumari from 6/95  
 onwards  
 PK Kausallia from 24-5-95  
 Steno to Librarian : S Sudha Devi  
 Sr. Gr. Typist : KU Selmath  
  
*Directorate of Research*  
 Office Supdt. : K Saraswathy Amma  
 Typist Gr. I : Fathima Beevi  
 PT Ajith  
 Sr. Gr. Typist : B Shiras  
 PJ Elizebeth upto 6/95  
 N Dasamma upto 6/95  
 Office Supdt. : Ramachandran Unnithan  
 Majida Beevi upto 6/95  
 V Vijayan from 28-6-95  
 S Rosemary  
 from 22-5-95 to 18-5-96  
 Sr. Gr. Typist : V Santha Kumari from 18-8-95  
 B Leela Bai Amma  
 from 22-8-95 to 6/96  
 CC Babu from 11-10-93  
  
 Class IV  
 Duffadar : KA Mathiri

Peon	:	VA Paily
		TK Abdulla
		MN Vasu
		TR Raveendran
		P Suresh Babu
		PE Thankappan
		C Govindan
		CG Sumeesh
		PB Abdulrahiman
		TA Unnikrishnan
		KK Ramankutty
		AK Shylan
		M Somasekharan
		PB Sivadasan
		Saseedharan
		MD Roy
		K Santhakumary
		PA Santhakumary
		TV Santha
		PS Indira
		CP Kousallia
		PD Annamma
		A Kochammu
		MK Mukammi
		OG Santha
		PN Indira
Sweeper	:	M Lakshmikutty
		KK Nabeesa (on working arrangement at Ambalavayal)
Peon	:	PS Retnakumaran
		TK Kunjumon (Personal Attendant to VC at his residence)
Bus Attendant	:	Beer Bahadur Singh
		KA Abdul Rasheed
		CR Velayudhan
		KC Krishnan
		VV Vasu
Duplicator Operator	:	CA Divakaran
		M Gopinathan
		K Saji Antony
Driver (HDV)	:	VR Kochu
		IT Rappai
		KV Kochappan
		TK Govindan



Driver (HDV)	:	EK Thankappan PK Sasidharan
Driver (LDV)	:	KP Jose KM Subramanian KO John Stephen NA Sukumaran KC Chinnan TM Chacko KM Abubakker PK Santhosh
Binder	:	R Vijayan
Selection Grade Assistant	:	Baby Saroja MN Chandrasekharan V Chellamma K Dinesan PA Geetha K Haridasan M Jesseentha KC Joseph Krishnaprakash GV Kumar N Mary Joseph KS Paul PK Pushpaja ME Rajan A Santhakumari VR Santhakumari G Santhakumari C Sherly Mathew KR Suresh PL Tony C Usha P Vijayakumari
Senior Grade Assistant	:	KP Vasanthakumari KV Ammalukutty TJ Babychan EK Dalika K Girindrababu TC Jose MV Lathika MA Many Mary Joseph K Meera P Mohini VN Narayanan MP Narmada

	A Pradeep from 1/86 onwards
	K Pradeep
	PP Prema
	KN Radhakrishnan
	K Sreekumar
	KB Sudha
	P Sudha
	KK Sunitha
	PS Sureshkumar
	PJ Thimose
<b>Assistant Grade I</b>	CS Baburaj
	P Gopika
	C Kunhunni
	PN Ramesh
	CP Raphi
	PA Saraswathy
	V Unni
	EA Yousafali
	PK Ajayakumar
	EX Antony Joseph
	Babu Varghese
	KD James
	KN Leela
	A Rajeswary
	AN Rathidevi
	TM Asokan
	C Raveendranathan
	PM Saradha
	C Sivadasan
	Premeela Peter
	PD Toney
	MA Ullas
	Varghese J. Ollukkaran
	PB Abdul Kader
<b>Assistant Grade II</b>	T Ally
	KS Jitha
	NS Kumaranandan
	KM Mohammed Iqbal
	KK Sudharma
	MV Sureshbabu
	KN Santhamma
	MB Manikantan
	EM Shaibu
<b>Sr. Gr. Assistant</b>	K Mohanan
	Boby Abraham upto 1/96

**Assistant Gr. I** : A Anithakumari  
 TP Baburaj  
 CK Mariya John  
 GO Davis  
**Selection Gr. Asst.** : S Ramachandran Nair  
 from 11/95 onwards  
**Sr. Gr. Assistant** : NV Unnikrishnan Nair  
 O Sethumadhavankutty  
 from 1/96 onwards  
 Vigi G Priya  
 from 29.4.95 to 17.6.95  
**Assistant Gr. II** : V Mohammed 6.4.95 to 17.6.95  
 C Sundaraj  
**Sr. Gr. Assistant** : K Indiradevi  
**Selection Gr. Asst.** : KS Vijayalakshmi  
**Sr. Gr. Assistant** : TB Latha  
**Selection Gr. Asst.** : VA Achuthan

*Directorate of Students Welfare, Mannuthy*

**Selection Gr. Asst.** : D Sreekumari  
 PV Sreedharan  
**Assistant Gr. I** : IK Venugopalan

*Directorate of Extension, Mannuthy*

**Sr. Gr. Assistant** : K Girishbabu  
**Selection Gr. Asst.** : PV Ramani  
 Boby Abraham  
 from 1/96 onwards  
**Assistant Gr. II** : PK Ananthakumari  
**Selection Gr. Asst.** : TK Ambika  
**Sr. Gr. Assistant** : A Pradeep (upto 1/96)

*Directorate of Physical Plant*

**Executive Engineer** : P Sreekumaran  
 (On deputation from P.W.D.)  
**P.A. to DPP** : PM Vasudevan  
**Financial Assistant Gr. I** : A Basil  
**Section Officer** : KP Sreedharan  
 PJ John  
 KS Natarajan

<b>Assistants</b>	:	S Valsala
		EN Savithri
		N Krishnan Nair upto 18.5.95
		J Jeslet Mercy
		VS Skandakumar
		M Abdul Muthalavi
		KM Akberali
		NV Annie
		PM Latha
		TK Sarada
		VI Sureshkumar upto 5.1.96 FN
<b>Fair Copy Section</b>		
<b>Sr. Office Supdt.</b>	:	PI Itoop
<b>Office Supdt.</b>	:	HK Khadeeja Beevi
		upto 12.5.95FN
		S Radhamma
		From 20.6.95 to 16.5.96
		S Sudhadevi
		From 22.6.95 to 12.7.95
<b>Typist</b>	:	TM Meera
		MK Thankamani upto 31.5.95
		MK Parukutty
		PS Ranjitha upto 5.6.95 AN
		VK Rema from 6.5.95 to 29.2.96
<b>Blue Printer-cum-Stereo</b>		
<b>Operator</b>	:	Vacant
<b>Head Draftsman</b>	:	KV Ajitha
<b>Overseer</b>	:	EA Radhakrishnan upto 31.5.95
		TN Suresh Babu
		ET Lal upto 31.5.95
		KG Ajithkumar upto 30.6.95
		PA Meera Bai
		V Unnikrishnan from 1.6.95
		KH Abdul Rahiman from 18.7.95
		B Muhammed Irshad from 1.6.95
<b>Peons</b>	:	CV Vijayan
		NP Chandran
		PI Kunjumol
		MO Kochannam
<b>Driver</b>	:	PK Sasi
<b>Mechanical Sub Division, Vellanikkara</b>		
<b>Asst. Exe. Engineer</b>	:	TK Sugathan
<b>Asst. Engineer (Civil)</b>	:	KP Baburaj



**Overseer** : B Muhammed Irshad  
 From 1.3.95 to 31.5.95  
 V Unnikrishnan  
 From 1.3.95 to 31.5.95  
 PH Salim from 2.6.95 to 31.3.96  
 KK Anilan from 2.6.95 to 31.3.96  
 KN Satheesh  
 VE Nazerudheen  
 On leave without allowance  
**Assistant** : T Jagadeesan  
 M Lyla upto 29.1.96  
**Typist** : PA Mumtaz  
**Driver** : MA Joseph (LDV)  
**Peon** : C Mukundan Nair  
**Class IV** : V Mohammed  
 On W/A at RARS, Ambalavayal  
 from 1.3.95 to 17.7.95

**Engineering sub Division, Mannuthy**

**Assistant Executive** : PR Govindan  
**Engineer**  
**Assistant Engineer** : P Raman  
 KV Ramanunni  
 CI Sali  
**Technical Supervisor** : PK Vijayan  
 TS Govindan  
**Overseer** : CA James  
 S Rajendra Prasad  
 KV Sunil Kumar  
 Mathews K Kizhakoot  
**Pump Operator** : MV Parameswaran  
 VR Parameswaran  
 TM Kesavan  
 CC Velayudhan  
**Section Officer** : KK Bharathy  
**Assistant** : Sherin V Thomas  
**Typist** : Vacant  
**Peon** : Man Bahadur

**Engineering Sub Division, Vellayani**

**Assistant Executive** : K Suresh Babu  
**Engineer**  
**Assistant Engineer** : CV Vivekanandan Upto 31.7.95  
 AP Satheesan from 1.8.95  
**Section Officer** : K Parukutty

**Assistants** : J Jeslet Mercy  
 (post shifted to KAU Head-  
 quarters vide order No. GA.J1  
 17021 64 (i) dated 3.4.95)  
 N Valsan upto 22.8.95  
 SG Giriya (from 23.8.95)

**Office Supdt.** : P Lalitha

**Overseers** : V Harikumar  
 KHM Abdul Khader  
 VM Roy

**Driver** : P Reghunathan Nair

**Peon** : J Thampikunjan (upto 31.7.95)  
 S Soman (from 31.10.95)

**Electrical Sub Division, Vellayani**

**Assistant Executive Engineer (ele)** : EK Gokulan

**Assistant Engineer (Ele)** : Vacant

**Overseer** : Vacant

**Assistant** : Chandrikakumari upto 20.10.95

**Typist** : P Santha  
 S Rosemary

**Peon** : A Sathiyar

**Engineering Division, Panangad**

**Executive Engineer** : P Sreekumaran  
 (On deputation from P.W.D.)

**Assistant Engineer** : AP Satheesan

**Overseer** : Sabu Paul Mulerikal  
 PT Joy  
 MY Sunny  
 SR Antony

**Section Officer** : KM Vincent Pereira

**Assistant** : Prema B Nair  
 KB Jaya

**Office Supdt.** : TK Ponnamma

**Driver (LDV)** : AP Chacko

**Engineering Sub Division, KCAET Tavanur**

**Assistant Executive Engineer** : PM Mohamed Ismail

**Assistant Engineer** : TK Abdul Kader  
 KT Vasudevan  
 M Vijayakumari  
 (up to 17.6.95 an.)

**Overseer** : P Manoj  
 AV Kesavan  
 KK Anilan (upto 31.5.95 and  
 ET Lal from 12.6.95 f.n.  
 CV Poulose  
 CV Ambujan  
**Section Officer** : C Assainer  
**Assistant** : Ushadevi  
**Typist** : A Mohamedali  
**Peon** : KP Manikandan  
 Expired on 17.4.95  
**Driver (LDV)** : PK Kunhiraman  
**Clerical Assistant** : TN Aravindakshan  
 T Sasi  
 VA Ittara  
 KT Rajan  
 P Christy John  
 KK Ramachandnan  
 V Sreedevi  
 AN Saraswathy  
 K Thankamani  
 VM Baby (from 25.1.96)  
 PK Kamalakshy  
 MS Bhavana (from 25.1.96)  
 D Jolly Karerakkattil  
 (upto 18.5.95)  
**Jr Programmer** : M Viswanathan Nair  
 (on study leave w.e.f. 27.11.95)  
 Mollykutty George  
**Programmer** : TA Sebastian (from 11.8.95)  
**Lab. Asst.** : AT Francis (4.7.95)  
 V Vishnu (26.6.95)  
 PJ Wels (from 21.6.95)  
 Cheriyan K George  
 (from 7.7.95)  
 EK Mohanlal (from 31.1.96)  
 PK Sobhanaa (from 22.6.95)  
 (on l.W.A. from 16.2.96)

*AICRP on Agrl. drainage, Karumady*

*Scientific Staff*

**Assoc. Professor** : EK Mathew upto 21-7-95  
**(Agri. Engg.)**  
 MS Hajjial from 16-11-95 onwards  
**Asst. Professor**



<b>Asst. Professor (Agronomy)</b>	:	<b>Madhusudan Nair</b>
<b>Asst. Pro. (Agril. Engg.)</b>	:	<b>TD Raju</b>
<i>Technical Staff</i>		
<b>Farm Asst. (Agri) Sr. Gr.</b>	:	<b>G Udayakumar</b>
<b>Farm Asst. (Agri) Gr. II</b>	:	<b>KO Shahul Hameed I Krishnakumari</b>
<b>Lab Assistant Gr. II</b>	:	<b>M Mohammed Haneef</b>
<b>Overseer Gr. I</b>	:	<b>PT Joy</b>
<b>Driver Gr. II</b>	:	<b>PE Rajappan</b>
<b>Pump Operator</b>	:	<b>M Gopalan</b>
<i>Administrative &amp; Supporting</i>		
<b>Assistant Gr. I</b>	:	<b>EV Ambily</b>
<b>Typist Gr. I</b>	:	<b>V Lalitha</b>
<b>Watchman</b>	:	<b>KK Sreekumar R Mohanan</b>

*Regional Agricultural Research Station, Puttambi*

**NARP I**

<b>Professor</b>	:	<b>Dr N Krishnan Nair</b>
<b>Asst. Prof. (Soil Science)</b>	:	<b>Dr K Anilakumar</b>
<b>(Ag. Extension)</b>	:	<b>Dr P Rajendran</b>
<b>Horticulture</b>	:	<b>Dr TE George</b>
<b>Entomology</b>	:	<b>Dr PB Gopinathan</b>

**NARP II (Non Plan)**

<b>Asst. Professor Horticulture</b>	:	<b>ML Jyothin (on study leave)</b>
<b>Agri. Engg.</b>	:	<b>P Shaji James</b>

**NSP - BSP**

<b>Asst. Prof.</b>	:	<b>G Valarmathi</b>
--------------------	---	---------------------

**AICRIP**

<b>Assoc. Prof. (Pl.Br.)</b>	:	<b>Dr Leenakumari</b>
<b>(Agron.)</b>	:	<b>Dr Jose Mathew</b>
<b>(Path.)</b>	:	<b>Prof. VP Sukumara Dev</b>
<b>(Ento.)</b>	:	<b>Dr L Nadarajan</b>
<b>Asst. Prof. (Pl. Br.)</b>	:	<b>Kanakamany MT Tessy Joseph</b>
<b>(Agron.)</b>	:	<b>Jagadish kumar TK Bridgit (on study leave)</b>
<b>(Path.)</b>	:	<b>Rehumath Niza</b>

**AICRP on arid legumes**

<b>Assoc. Prof. Agronomy</b>	:	<b>Gracy Mathew</b>
<b>Pl. Breeding</b>	:	<b>E Sreenivasan</b>

<b>Non-plan Section Officer</b>	:	MP Ahamed PM Cherukutty Rajendra Babu TV Ravindra Mohan
<b>Assistants</b>	:	KP Kallyani NV Thankamany AV Sreenivasaraghavan PM Suresh AW Kishore MS Ramakrishnan Harigovindan (2 post vacant)
<b>S. O. S. Typist</b>	:	KT Thanka M Mohandas Leala Bai
<b>Lab Asst.</b>	:	P Santhakumari KS Chandrasekharan N Seffiya
<b>Peon</b>	:	M Krishnankutty P Mohammed P Kunhilakshmi
<b>Non-Plan Senior Farm Supervisor</b>	:	Abraham K Cheru
<b>Farm Supervisor</b>	:	Saidalikutty
<b>Farm Assistants</b>	:	PK Abdulsalam VP Ramakrishnan ER Soman
<b>Technician</b>	:	Surendran
<b>Tractor Driver III</b>	:	Vacant
<b>Regular Mazdoor</b>	:	T Rugmini N Hamza M Narayanan A Mohammedkutty PC Koya N Rugmini
<b>Class IV</b>	:	Beg Bahadur C Ramakrishnan MP Mohanan K Kumaran P Rayankutty P Mohammed KC Surya Bahadur
<b>Watchman</b>	:	C Mohammedkutty A Unnikrishnan

**NARP I****Administrative Officer  
Typist****: Rajamma  
: E Gopinath  
Krishnakumari****Duplicator Operator****: C Kunhan****Lab Assistant Gr. II****: VP Balasubramanian****Driver (LDV)****: K Parameswaran****Tractor Driver****: Vacant****NARP II (Non Plan)****Farm Supervisor (V)****: KV Mohanan, F.A. (V) Gr. II****Technician****: E Abdul Hakim****AICRIP****Farm Assistant Gr. I****: PK Rajasekharan****MJ Joseph****MV Yusuf****: Karthikeyan****Driver****: MV Arumughan****AICRP on Guar (Arid Legumes)****Farm Asst. (Agri) Gr. II****: TP Aboobacker****T Mohammed****Assistant Gr. I****: P Ramadasan****Typist Gr. II****: K Vijayalakshmi****Lab. Asst. Gr. II****: T Ramakrishnan****Peon****: PK Aboo****NSP - BSP****Technical Assistant****: —****Field/Lab Asst.****: K Divakara Panicker****Driver****: —****Information and Sales Centre, Mannuthy****Asst. Professor as Officer i/c** : **Dr PA Joseph from 22-2-94****FS. (Agri.) Gr. I** : **MJ Kochappan****Farm Supervisor****: John David****(Agri.) Gr. II****: PB Bashajan****Farm Asst. Agri. Gr. I****: KV Rosily****Farm Asst. Vety. Gr. I****: AN Manoj****Farm Asst. Agri. Gr. II****: KK Gopi****Pump Operator****: KJ Jose****Class IV****KK Gopi****SV Sujatha****MP Unnikrishnan**

*BRS, Kannara*

*Scientific Staff*

**AICRP (TF)**

Assoc. Professor (Hort.) : Dr Rema Menon  
 Asst. Professor  
 Asst. Professor (Hort.) : T Premalatha  
                                 (Pl. Path.) : Dr D Geetha upto 22-11-95  
   CA Mary from 1-12-95  
                                 (Ent) : Dr KR Lyla upto 23-11-95  
   Dr JSK Charles,  
   Assoc. Prof. (NC) from 24-11-95

**NARP**

Assoc. Professor (Pl. Path.) : TC Radhakrishnan upto 8-1-96  
   (Agron) : Dr SJ Pillai from 9-1-96  
 Asst. Professor (Hort.) : Dr PK Sudhadevi

*Technical Staff*

**AICRP (TF)**

Farm Asst. Gr. I : AK Vijayakumar  
                                 C Esarachandran  
                                 U Divakar  
                                 C Gireesan  
 Lab Asst. Gr. I : KR Gopalakrishnan  
 Oil Engine Driver : KA Narayanan  
 Mali : P Subhadra

**KAU**

Farm Supervisor Gr. II : PM Paulose  
 Farm Asst. Gr. I : S Nazeema (Sr. Gr.)

*Administrative and supporting staff*

**AICRP (TF)**

Typist Gr. II : KK Parmeswaran (Sl. Cr.)  
 Peon : K Sarada

**NARP**

Typist Gr. II : PK Gayathri

**KAU**

Administrative Asst. : AK Kamala Bai  
 Assistant Gr. II : KK Valsa (Sr. Gr.)  
 Driver Gr. II : PI Rappai  
 Pump Operator : CM Prabhakaran  
 Peon : RK Dhirjan Bahadur Singh  
 Watchman : Security Guard

*College of Veterinary and Animal Sciences, Mannuthy*

Senior Adm. Officer	:	C Rajamma
Section Officers	:	KM Mary
		VM Sarada
		P Aliyar
		Lillykutty Thomas
		Shirly Bai George
		AT Gracy
Senior Office Supdts.	:	MK Jainuva
		KK Damodaran
Typists-Selection Grade	:	S Akhileswary
Grade I	:	S Sarojini Amma
		Manjula Mercy Patric
		S Kaladevi
Grade II	:	TP Narayanan
Clerical Assistants / Lab Assistants	:	CC Sajeevkumar
		M Santhakumari
		K Valsala
Duplicator-Operator	:	AV Poullose
Peon	:	KN Saraswathy
		M Narabehadur
Class IV	:	PS Santhakumari
		TK Mariam
		AK Janaki
		ME Janaki
		VK Narayanan
Farm Assistant (Agri.) Assistants Sr. Gr.	:	M Girija
		Razia Beagum
		KV Alamelu
		MA Sujatha
Assistants Gr. I	:	PM Shanavas
		C Pradeep
		PV Asokan
Assistants Gr. II	:	R Usha
		NV Thankam
		MU Joy
		K Balachandran Nair
		VA Suprabha
		VN Sreekumar

**KAU School, Vellanikkara**

<b>Headmaster</b>	: AJ Abraham
<b>Teacher (Eng. Med.)</b>	: KP Thresiamma Dehorah Cyril AJ Lilly KS Indiradevi Latha Balaraman
<b>UPSA (Mal. Med.)</b>	: TJ Magy Najeema Unnikannu KS Leena
<b>UPSA Hindi</b>	: K Narayani
<b>UPSA Malayalam</b>	: —
<b>LPSA Malayalam</b>	: V Sasidharan PK Bhaskaran MA Ali MU Mary MK Mallika
<b>High School Asst.</b>	: —
<b>Special Teachers</b>	
<b>Physical Education</b>	: —
<b>Drawing</b>	: —
<b>Music</b>	: —
<b>Nusery School Asst.</b>	: P Devika DV Shylaja R. Kamala
<b>Ayah</b>	: KR Sumithra M Saudamini
<b>Class IV</b>	: VA Mathew M Parvathy Janaky
<b>Asst. Grade (Senior)</b>	: MW Wilson Raj

**KAU Estate Office**

<b>Estate Officer</b>	: K Sivanandan S Bhaskara Pillai S Krishnan Nair K Narayanan Namboothiri
<b>Section Officer</b>	: K Kuttappan Achari C Arumughan
<b>Sr. Farm Supervisor</b>	: M Rajaratnam S Sacheedevi D Subhadramma
<b>Farm Assistant</b>	: KS Thankappan
<b>Farm Supervisor Gr. II</b>	: —

<b>Assistants</b>	:	MS Valsalakumari NK Valsala M Harigovindan S Sushama
<b>Typist</b>	:	KS Xavier
<b>Driver LDV</b>	:	ES Chandran
<b>Class IV</b>	:	NV Vasu KP Kunjipoker KK Ramankutty
<b>Peon</b>	:	P Kunjunny
<b>Plantation staff</b>		
<b>Asst. Section Officer</b>	:	MA Jos
<b>Field Officer</b>	:	MK Vasu
<b>Peon</b>	:	Saleena Devassy
<b>Field Supervisor</b>	:	TK Raghavan
<b>Asst. Engine-Driver</b>	:	KK Prabhakaran
<b>Spl. Gr. Miller</b>	:	PM Poulouse
<b>Anatomy</b>		
<b>Professor &amp; Head</b>	:	Dr Lucy Paily
<b>Associate Professor</b>	:	Dr KR Harshan (NC) .. CK Sreedharan Unni (NC) .. Jose John Chungath (NC)
<b>Asst. Professor</b>	:	Dr N Ashok .. Shyla Prakash (on leave) .. KM Lucy .. S Maya
<b>Animal Reproduction</b>		
<b>Professor and Head</b>	:	Dr CP Neelakanta Iyer
<b>Professor</b>	:	Dr K Prabhakaran Nair .. E Madhavan .. E Mathai
<b>Associate Professor</b>	:	Dr T Sreekumaran (NC) .. KV Athman .. KN Aravinda Ghosh (NC)
<b>Asst. Professor</b>	:	Dr SP Suresan Nair .. Menilda Joseph (on leave)
<b>Scheme: Incidence, Nature and Magnitude of Prevalence of infertility condition in cross bred cattle</b>		
<b>Assoc. Professor</b>	:	Dr PP Balakrishnan (at Calicut)
<b>Asst. Professor</b>	:	Dr KR Ramachandran (on study leave)
<b>Professor</b>	:	Dr Sosamma Iype

**Centre of Excellence in Genetics & Breeding****Associate Professor : Dr KV Raghunandan (NC)****Animal Genetics and Breeding****Associate Professor : Dr CR Girijsa (NC)**

.. B Nandakumaran (NC)  
.. Stephen Mathew (NC)

**Assistant Professor : Dr P Nandakumar**

.. AP Usha (on study leave)  
.. TV Aravindakshan ( .. )

**Animal Management****Professor and Head : Dr TG Rajagopalan****Professor : Dr. CK Thomas****Assoc. Professor : Dr Francis Xavier (NC)**

.. KS Sebastian (NC)

**Asst. Professor : Dr E Leena**

(on leave for study purpose)

**Clinical Medicine****Professor and Head : Dr KM Alikutty****Professor : Dr NM Aleyas**

.. VS Balakrishnan

**Assoc. Professor : Dr PC Alex****Asst. Professor : Dr Usha Narayanan Pillai**

.. S Ajith Kumar (from Feb. 96)

**Dairy Science****Professor and Head : Dr E Pavithran****Professor : Dr UT Francis****Assoc. Professor : R Rajendrakumar**

(on deputation)

**Dr PI Geevarghese (NC)**

.. M Mukundan (NC)

**Asst. Professor : Dr Geetha C. Jayan**

(on study leave)

.. K Ajith Kumar

**Dairy Plant****Professor and Head : Dr MV Sukumaran****Assoc. Professor : Dr V Prasad****Asst. Professor : Dr Sreeja Rajmohan**

P Sudheer Babu

SN Rajkumar



### Extension

- Professor and Head : Dr PS Pushkaran  
Assoc. Professor : Dr MR Subhadra (NC)  
  ,, PJ Rajkamal  
  ,, SS Anil (on study leave)

### Microbiology

- Professor and Head : Dr S Sulochana  
Professor : Dr KT Punnoose  
  ,, PC James  
Assoc. Professor : Dr V Jayaprakash (NC)  
  ,, G Krishnan Nair (NC)  
Asst. Professor : Dr D Sudharma (on study leave)  
  ,, ES Mathews (on loss of pay  
  leave for taking up job abroad)  
  Dr M Mini (on study leave)

### Nutrition

- Professor and Head : Dr CT Thomas  
Professor : Dr N Kunjikutty  
  ,, PA Devasia  
  ,, CS James  
  ,, Maggie D Menachery  
Assoc. Professor : Dr George Mathen  
  ,, TV Viswanathan (NC)  
  (on study leave)  
  ,, M Nandakumar (Chemist)  
  ,, AD Mercy (NC) (on leave)

### ICAR Network Project on Micronutrients in Animal Nutrition and Production

- Asst. Professor : Dr P Gangadevi  
Centre of Excellence in Pathology  
Director : Dr A Rajan  
Professor and Head : Dr KM Ramachandran  
Assoc. Professor : Dr KV Valsala  
  ,, T Sreekumaran  
  ,, PK Ismail  
  ,, CR Lalitha Kunjamma (NC)  
  ,, CB Manomohan (NC)  
Asst. Professor : Dr N Divakaran Nair  
  ,, Koshy Varghese  
  ,, Mamman J Abraham  
  ,, B Gangadharan  
  ,, T Leenadevi  
  ,, TV Anilkumar  
  ,, M Gopalakrishnan Nair  
  (on study leave)

## Parasitology

Professor and Head	:	Dr K Chandrasekharan
Professor	:	Dr V Sathianesan
		„ C George Varghese
		„ M Madhavan Pillai
		„ C Pythal
Assoc. Professor	:	Dr H Subramanian (NC)
Asst. Professor	:	„ Lucy Sabu
		„ K Devada

## Physiology

Professor and Head	:	Dr KP Surendranathan
Assoc. Professor	:	Dr PT Philomina (NC)
		„ G Girish Varma
		„ V Ramnath
		„ Sisilamma George
		(on study leave)
		„ KP Sreekumar „
		„ KK Jayavardanan

## Pharmacology & Toxicology

Professor and Head	:	Dr MK Rajagopalan
Professor	:	Dr Jacob V Cheeran
		„ Zachariah Cherian
		„ P Marykutty
Assoc. Professor	:	Dr N Gopakumar
		„ AM Chandrasekharan Nair
		(NC)
		„ VR Reghunandan (Chemist)
		„ Dr AD Joy (NC)
		„ CM Aravindakshan (NC)
		„ K Venugopalan (on other duty)
Asst. Professor	:	Dr Usha PTA (on study leave)

## Poultry Science

Director	:	Dr A Ramakrishnan
Professor	:	Dr CK Venugopalan
Asst. Professor	:	Dr Amritha Viswanath
		„ K Narayanankutty

## Preventive Medicine

Professor and Head	:	Dr K Baby
Professor	:	Dr PT Georgekutty
Assoc. Professor	:	Dr K Venugopal (NC)
		(on leave for study purpose)
		„ MR Saseendranath (NC)

- Asst. Professor** : Dr K Vijayakumar  
 ,, PV Tresamol  
 ,, PG Baby (on working arrangement)
- AICRP on Poultry for Eggs**
- Sr. Scientist** : Dr AKK Unni
- Assoc. Professor** : Dr Leo Joseph (NC)  
 Dr (Mrs.) VK Elizebeth
- Asst. Professor** : Dr N Vijayan  
 Dr (Mrs.) P Anitha  
 Dr (Mrs) Laly John
- Statistics**
- Professor and Head** : Dr KC George
- Asst. Professor** : TK Indirabai  
 U Narayanikutty  
 Mathew Sebastian
- Surgery**
- Professor** : Dr KN Muraleedharan Nair  
 (Prof. and Head i/c)  
 Dr S Raveendran Nayar
- Assoc. Professor** : Dr T Sarada Amma (NC)  
 Dr K Rajankutty (NC)
- Asst. Professor** : Dr CB Devanand  
 Dr Shyam. K Venugopal  
 (on working arrangement in Vety. Hospital, Mannuthy)
- Vety. Public Health**
- Professor and Head** : Dr P Prabhakaran
- Professor** : Dr E Nanu
- Assoc. Professor** : Dr MT Jose (NC) (on long leave)
- Asst. Professor** : Dr Kumarasubrahmaniam  
 (on leave for higher studies)  
 Dr (Mrs.) C Latha
- Meat Technology Unit**
- Assoc. Professor** : Dr J Abraham  
 Dr P Kuttinarayanan  
 Dr George T Oommen  
 Dr M Sunil (From Feb, 98)
- Veterinary Hospital Mannuthy**
- Professor i/c** : Dr NM Aleyas
- Assoc. Professor** : Dr (Mrs.) Santha Kurian
- Veterinary Hospital Kokkalai**
- Professor** : Dr K Ramadas
- Asst. Professor** : Dr KM Jayakumar

<b>Physical Education</b>	
Assoc. Professor (NC)	OK Paul Molly Cherian (on leave)
<b>Anatomy</b>	
Farm Supervisor Class IV	M Narayanankutty MP Unnikrishnan (from 19.7.95 to 6.10.95)
<b>Animal Reproduction</b>	
Farm Supervisor Gr. I	VM Jacob
Gr. II	PS Kumaran
Farm Assistant	MK Rajendran Nair V Gopalakrishnan
Driver	TG Mohanan
Lab. Assistant	KK Gopalan Kumaran
Attendant Class IV	Kumaran KV Thressia
<b>Animal Breeding &amp; Genetics</b>	
Senior Office Supdt.	S Seemanthini
Typist	K Soudamini
Section Office Assistant	KN Namboothiri B Ajith Kumar
Technician, Fur and Meat Technology	C Ramadasan
<b>Animal Management</b>	
Farm Supervisor Gr. II Class IV	M Lalithamma K Saroja
<b>Clinical Medicine</b>	
Farm Supervisor Gr. II Class IV	P Remany PA Mini AI Thomas
<b>Dairy Science &amp; Extension</b>	
Farm Assistant	KT Sivasankaran
<b>Dairy Plant</b>	
Farm Assistant Gr. II	OP Premakumari
Technician Gr. I	EM Muraleedharan
Senior Grade Assistant	KC Varghese
Typist Gr. I Class IV	K Mohandas PV Prabha Kumar
Supporting	TA Liju IN Sreekumar VS Rajesh MS Suresh

## Extension

Farm Supervisor Sr. Gr : PA Francis  
Artist : KR Kumaran  
A.V. Operator : MR Gopinathan  
Class IV : TT Krishnankutty  
PK Rosy

## Microbiology

Lab Technician : KK Viswambharan (from 18 6.95)  
Class IV : Kum. Lakshmy

## Nutrition

Research Assistant : Anniamma Chacko  
Mariamma Chacko upto 31.5.95  
Lab. Technician : MG Vasu  
PN Madhavi

## Technician

Class IV : TR Viswambharan

## ICAR Net work Project

Class IV : PK Rosy

Driver : KV Kumaran

## ICAR Adhoc Project

Research Associate : CS Sharmila

## NABARD Project

Research Associate : Biju D 1.1.96 to 31 3.96

Research Fellow : Bindu P 14.2.96 to 31.3 96

## Small Animal Breeding Station

Farm Assistant : PK Ammini  
Paulson

## Pathology

Farm Supervisor : PC Mary  
PC Lilly (Working arrangement  
in Dept. of Physiology)

Sr Office Supdt. : BI Balamani

Farm Assistant : AP Peter

Driver : Sudhakaran (from 13.7.95)

Attendant : KO Rosakutty

PN Raghavan

Research Fellow : Bindu Chandrasekhar  
(from 25.1.96)  
Beena MK joined on 17.1.96

## Physiology

Farm Supervisor : MC Annie  
PC Lilly  
AG Rajendran  
Class IV : C Anitha

**Poultry Science**

Class IV : MK Janaki

**AICRP on Poultry Science**

Farm Assistant (Sr. Gr.) : V Indira  
 Farm Asst. Gr. II : N Gopinathan  
 Gr I : K Sivasankaran  
 Sr. Gr. Technician : EJ Paul  
 Sr. Gr. Assistant : PV Ambika  
 Sr. Gr. Typist : VG Girija  
 LDV Driver : KS Jayan  
 Peon : PT Varghese  
 Class IV : MK Vilasini

**Pharmacology**

Farm Supervisor : Sreedharan  
 Class IV : Somasundaran

**Preventive Medicine**

Farm Assistant : PG Thankom  
 Class IV : OG Santha  
 AI Thomas

**Statistics**

Jr. Programmer : KP Santhabai  
 Technical Asst. : KV Prasadani  
 Class IV : MJ Rosily

**Surgery**

Radiographer : K Indira Devi  
 Class IV : Paul Thirumala

**Public Health**

Farm Supervisor : A Leela  
 Class IV : PK Karappan

**Library**

Librarian : KC Ambili  
 Asst. Gr. I : Vijayalakshmi  
 Lib. Asst. : PJ Wels  
 S Sreekumar  
 NB Nisha

Lab. Asst. Gr. II : P Narendran  
 KK Velayudhan

Class IV : Unni  
 P Radhakrishnan Nair

*Centre of Excellence in Pathology*

*Technical staff*

Farm Supervisor Gr. I	:	PC Mary PC Lilly
Farm Assistant	:	AP Peter
Sr. Office Supdt.	:	MI Balamani
Driver	:	Sudhakaran
Audio Visual Operator	:	Gopinathan
Class IV	:	KO Rosakutty PN Raghavan
Research Associates	:	Beena Bindhu Chandrasekhar
Electron Microscope Trainee	:	Sanjayan

*University Veterinary Hospital, Kokkalai*

*Scientific*

Professor and Head	:	Dr K Ramdas
Assistant Professor	:	Dr KM Jayakumar (on working arrangement from Veterinary College)

*Technical*

Farm Supervisor	:	CC Narayanan
Farm Assistant Sr. Gr. (Vety.)	:	JK Narayanan KR Sivaraman
Pharmacist	:	CK Alias

*Administrative & Supporting Staff*

Section Officer	:	M Baby
Senior Gr. Assistant	:	VK Beena Gr. II from 1-4-94 to 29-5-94 VR Chandrika Sr. Gr. Assistant from 30-5-94
Attendant Special Grade	:	KO Varghese MK Sheik Abdul Rahiman
Peon	:	KS Radhakrishnan
Sweeper-cum-Scavenger	:	Vacant

*Pig Breeding Station, Mannuthy*

**AICRP**

*Scientific staff*

Associate Professor & Head	:	Dr. Kurian Thomas
Assistant Professor	:	Dr. Joseph Mathew

*Technical staff*

Sr. Farm Supervisor	:	KP George
---------------------	---	-----------

Farm Supervisor Gr. II	:	KK Sabidharan Nair
Farm Asst. Gr. II	:	PK Sukumaran
Pump Operator	:	KV John
<i>Administrative &amp; Technical staff</i>		
Administrative Asst.	:	CC Rosily
Senior Gr. Asst.	:	CT William
Assistant Gr. II	:	Philip George
Hr. Gr. Peon	:	V Saraswathy
Pig Attendent	:	V Pushpangadhan
	:	PB Velayudhan
<i>Communication Centre, Mannuthy</i>		
<i>Scientific staff</i>		
Associate Professor	:	Dr Joy Mathew Jose Joseph
<i>Publication Unit</i>		
Professor	:	KC Varghese
Associate Professor	:	TC Radhakrishnan
Assistant Professor	:	V Kunchu
Assistant Professor (A.H)	:	Vacant
<i>Information Unit</i>		
Professor (Agri. Extn.)	:	Dr O Abdul Rahiman Kunju
Assistant Professor (Aqua)	:	Dr AD Antony Dr PA Joseph (working arrangement at ICSC, Mannuthy)
Assistant Professor (A.H)	:	Vacant
<i>Exhibition and Graphic Services Unit</i>		
Associate Professor (Hort)	:	KK Santha
Assistant Professor	:	Vacant
<i>Farm Advisory Service Unit</i>		
Director of Extension i c.	:	Dr E Tajuddin
Professor (Agron)	:	
Professor (Pl. Prot.)	:	Dr KP Vasudevan Nair (upto 8-5-95)
Professor & Head	:	Dr P Varadarajan Nair (from 12-6-95)
Assoc. Professor (Agrl.Ent.)	:	Dr MK Sheela
	:	Dr Suma Paulose
(Agron)	:	Dr P Sreedevi
Asst. Professor	:	Dr Jayasree Sankar, S
(Ag. Chem. & Soil Sci.)	:	



Asst. Professor (Plant Pathology) : S Estelitta

Language Editor : K Mrudula Devi

Farm Supervisor Gr. I : Vacant

Farm Asst. Gr. I : Valsamma George

Audio Visual Operator : Eugene C Varghese

Photographer : VV Satheesan

Driver (LDV) : MP Paul upto 6-4-95

Senior Gr. Assistant : Benny from 6-4-95

TK Ambika upto 19.7.95

VM Ammini upto 1.6.95

NP Valsan upto 31.10.95

PA Jacob Joe from 1.11.95

KL Liza

PM Yeldose upto 17.5.95

Peon Hr. Gr. : MG Ammini upto 31.1.95

MK Ramakrishnan

Section Officer : MK Shailaja

Administrative Asst. : KN Pushpangadhan

Malayalam Translator : KN Chandralekha from 8.5.95

Assistant Gr. II : Santha Viswanathan from 20.7.95

*Kerala Agricultural University Press*

Press Manager : K Rajappan

General Foreman : G Narayana Pillai  
Retired on 30.11.95

Senior Foreman (HG) : PI Lonappan

Proof Reader Gr. I (HG) : Sherly Sam

Proof Reader (HG) : KK Sadasivan

Computer : K Santhakumari

Sr. Gr. Printer (HG) : TP Joseph

VR Kumaran

H. G. Printer : NJ Samuel

PR Aravindakshan

Sr. Gr. Compositor : V Subramanyan

KM Thankamma

PA Elsy

H. G. Compositor (Hr. Gr.) : V Rajendran

K Leela

PM Santha

H. G. Compositor : 4 posts vacant

LG Compositor : KR Vijayan

Sr. Gr. Binder : PT Annie

HG Binder (HG) : G Parvathy Ammal

LG Binder : M Kamalamma

Copy Holder	:	2 posts vacant
Helper	:	VN Hassan
Sweeper-cum-Attendant	:	KS Prema
Peon (HG)	:	IR Rajan
Section Officer	:	PK Nataraja Pillai upto 12.1.96 VV Radhamma from 12.1.96
Selection Gr. Asst.	:	MA Urmila Devi upto 16.5.95 Sophiamma Joseph from 1.8.95 C Mercy John upto 16.8.95 K Subramanyan from 2.11.95
Sr. Gr. Assistant	:	PA Jabob Joe upto 31.7.95
Assistant Gr. II (HG)	:	K Balakrishnan from 1.8.95
Selection Gr. Typist	:	PK Kousallia upto 21.5.95 KJ Lonan from 22.5.95 onwards
Plan scheme		
LG Printer	:	Two
Junior Foreman	:	One

*College of Co-operation, Banking and Management, Mannuthy*

Associate Dean i c.	:	Dr M Mohandas
Professor and Head	:	Dr N Rajan Nair
Associate Professor	:	Dr N Ravindranathan
Professor and Head	:	Dr PC Mathew
Assistant Professor	:	Dr KA Suresh Dr A Sukumaran Philip Sabu Dr KP Mani Philip Thomas EVK Padmini KS Sujatha Dr Molly Joseph E Vinaikumar Dr Jaya S Anand KM George Dr AM Jose M Mohanan P Shaheena KN Ushadevi Vanaja Menon Dr G Veerakumaran EG Ranjithkumar Dr MA Lizy KA Sunanda PJ Boniface

*KV K. Pattambi*

*Scientific staff*

Assoc. Professor and Head	:	Dr GS Narayanan
Asst. Prof. (Extn.)	:	Dr P Ahamed
" (Home Science)	:	Dr S Syamakumari
" (Hort.)	:	Dr C Narayanankutty
		upto 18.3.96
" (S. S. & A. C.)	:	Jyothi Bhaskar from 20.3.96
	:	Dr P Sureshkumar upto 29.2.96
	:	Betty Bastin from 29.2.96
" (V & AH)	:	Dr S Manu Mohan
" (Agro Forestry)	:	M Asha Sankar
" (Agron)	:	KK Remesan

*Technical staff*

Farm Supervisor Gr. I	:	EL Reichel
Farm Supervisor Gr. II	:	CPM Abdul Azeez
Farm Assistant Gr. I	:	T Velayudhrn
Farm Assistant Gr. II	:	M Rajendran
Audio Visual Operator	:	M Abdul Razak

*Administrative & supporting staff*

Section Officer	:	K Leelamma upto 27-5-95
	:	K Rangaswami from 23-6-95
Asst. Gr. II	:	K Surendran
Typist Sr. Gr.	:	V Santhakumari upto 2-8-95
Typist Gr. I	:	MK Thankamani from 1-9-95
Driver Hr. Gr.	:	TR Sasidharan upto 18-4-95
Driver Gr. II	:	MP Unnikrishnan upto 18-4-95
HDV Driver	:	A Krishnan from 1-2-96
Hostel Attendant	:	PK Govindan upto 30-2-95
Class IV	:	T Mohandas from 19-7-95
Peons Hr. Gr.	:	C Gopalakrishnan
Class IV	:	C Parukutty
	:	NP Thankamany
	:	AP Yasoda
	:	T Gangadharan up to 2-6-95
	:	M Sundaran from 3-6-95
	:	V Vasunni

*KV K Manjeswar*

*Scientific Staff*

Professor	:	P Ramachandran Nair
Asst. Professor (Fisheries)	:	B Santharam
(Agrl. Engg.)	:	KV Levan

*Technical staff*

Farm Asst. (Ag.) Gr. I : A Ramakrishnan

*Administrative & Supporting staff*

Section Officer : T Somasundaran

Driver Gr. III : Justine J. Kannamthadam

*Agronomic Research Station, Chalakudy*

ICAR

*Scientific staff*

Professor : PJ Ittyaverah from 9-2-95

Assoc Professor :  
(Agrl. Chemistry) : G Santhakumari from 29.3.82

(Agronomy) : V Sreekumaran from 23-8-93

(Agrl. Engg.) : VM Abdul Hakkim from 28-10-94  
(Asst. Professor)

Asst Professor (Agronomy) : MA Peter from 6-1-92

*Technical staff*

Farm Assistants : V Unnikrishnan from 6-5-89  
(Farm Supervisor Gr. II)

TA Vasanthy from 5-6-96  
(Senior Gr.)

PK Reghu from 1-6-90

V John George

from 28-5-93 to 12-10-95

V Jains from 31-10-95

VP James upto 25-3-96

Lab Assistant : TR Balakrishnan from 8-6-93

*Administrative & Supporting staff*

Assistants : K Hemalatha from 1-2-93

Driver : Ajikumar

from 22-4-95 to 18-9-95

MS Sabarinathan

from 18-9-95 to 17-10-95

VK Karunakaran from 6-11-95

Peon : PR Surendran upto 31-1-96

V Gopinathan from 21-3-96

Non Plan : Nil

*Scientific staff*

*Technical staff*

Farm Supervisor : NM Mohanan

Pump Operator : K<sup>A</sup> Subran

Plough man : K<sup>A</sup> Subran

*Administrative & Supporting staff*

**Administrative Assistant** : L Syamala Dev.  
: PU Kesavan  
**Assistant** : KN Murukes

**NARP I**

*Scientific staff*

**Assistant Professor**  
(Agronomy) : V Jayakrishnakumar  
(Soil Science) : Vacant  
(Agrl Engg.) : Vacant

*Technical staff*

**Farm Assistant** : Vacant  
**Lab Assistant:** : TV Parameswaran

*Administrative & Supporting staff*

**Typist** : MC Devassy

**NARP II**

**Scientific staff** : Nil  
**Technical staff** : Nil

*Administrative & Supporting staff*

**Typist** : KD Rosily

*Regional Agril. Res. Station, Ambalavayal*

*Scientific Staff*

**Assoc. Director of Research** : Dr K Kumaran  
**Assoc. Pro. (Agronomy)** : Dr KC Aipe  
**Asst. Professor** :  
(Plant Pathology) : Dr TP Mano mohandas  
**Ass't. Professor**  
(Agrl. Entomology) : CM George (Assoc. Professor)  
**Soil Science & Agrl.**  
**Chemistry** : Vacant

**AICRP (Spices)**

**Assoc. Professor** : Susamma P George  
(Plant Breeding) **Asst. Professor**

*Supporting Staff*

**Administrative Officer** : TV Rajasekharan Nair  
: A Kuriakose  
: K Ravikumar  
**Section Officer** : K Rangaswamy  
: K Kelappan  
: P Sulochana

Sr. Gr. Assistant : P Sulochana  
Asst. Gr. II : C Mareena  
Gopinathan kartha  
Asst. Cr. II : M Manjunathan  
K Sobhana (provnl)  
Nazirudheen Thangal  
MT Alphonza (provnl)  
Baby Sreeja (provisional)

Typist Gr. II : P Rethnakaran  
A Sudhakaran

Steno Typist : S Lezy (provnl)

Driver LDV Gr. II : PP Abdul Majeed

Peon : KR Chandrasekharan  
P Moosa  
RV Kunhipokku  
E KunhIRaman

*Supporting/Technical Staff*

*KAU-Non Plan*

Farm Supervisor Gr. II : A Imbichi Ali  
Farm Asst. Gr. I : CT Jacob  
Farm Asst. Gr. II : CP Nandakumar  
TT Jacob  
KJ Joseph  
NK Muraleedharan

Field Supervisor : K Raghavan  
Lab Asst. Gr. I : A Govindan Nair  
Lab Asst. Gr. II : CR Balakrishnan  
M Vasu

Tractor Driver : M Mohammedkutty  
Oil Engine Driver : A Varghese  
Budder : K Ramakrishnan  
Regular Mazdoor : E KunhIRaman  
E Alavi  
P Saidu  
M Khader  
N Krishnan

Class IV : E Ayamu  
E Aboo

*NARP*

Farm Asst. Gr. II : S Prabhakaran  
Farm Asst. Gr. II (vety) : K Radhakrishnan  
Technician Gr. I : K Vasudevan

**Watchman**

: M Chandu  
V Alikutty  
AT Mohammed  
V Mohammed  
MC Krishnan

**Class IV on working arrangement**

K Kuttan  
KK Nabeesa  
KS Prema  
KP Mukundan

**Central Sector Scheme**

**Farm Asst. Gr. I**

: KM George

**Cardamom Research Station, Pampadumpara**  
**Scientific staff**

**AICRP**

**Associate Professor & Head**  
**(Entomology)**

: Dr J Arthur Jacob

**Assistant Professor**  
**(Agronomy)**

: Dr C George Thomas

**NARP**

**Assistant Profesor**  
**(Plant Breeding)**

: VR Shajan

**KAU Non-plan**

**Assistant Professor**  
**(Agrl. Botany)**

: Dr Sunny K Oommen

**(Agrl. Chemistry)**

: M Murugan

**Technical staff**

**AICRP**

**Farm Asst. Gr. I**

: CG Pradeep

**Lab Asst. Gr. I**

: PV Joseph

**NARP**

**Farm Asst. Sr. Gr.**

: VP Prasad

**Farm Asst. Gr. I**

: KG Mohandas

**KAU Non-plan**

**Farm Supervisor Gr. I**

: K Devaky

**Farm Assistant Sr. Gr.**

: TV Kuttichan

**Administrative and supporting staff**

**AICRP**

**Peon**

: K Alekutty

**KAU Non-plan**

**Administrative Assistant**

: B Sukesan

**Assistant Sr. Gr.**

: AR Valsala





<b>Professor</b>		
(SS & AC)	:	V Sukumara Pillai
(Pl. Breed. & Gen.)	:	Vacant
(Entomology)	:	Sumangala S Nambiar
(SS & AC)	:	Dr CS Nair
(Pl. Path.)	:	KJ Alice
<b>Associate Professor</b>		
(Ag. Met.)	:	Dr GSLHV Prasada Rao
(N. C.) (Pl. Br.)	:	Dr PC Balakrishnan
(N. C.) (Pl. Path.)	:	PKUK Nair
(N. C.) (Aron.)	:	TM Kurien
(Ani. Sci.)	:	Dr KC Raghavan
<b>Assistant Professor</b>		
(Economics)	:	Dr U Ramachandran
	:	Dr C Latha Bastine
(Micro.)	:	Dr M Govindan
(Hort.)	:	Dr MP Giridharan
(Extension)	:	Vacant
(Ag. Engineering)	:	PK Mini
(Animal Science)	:	Dr K Anilkumar
(Pl. Breeding)	:	Dr BJ Naik
(Pl. Pathology)	:	Kamala Nair
(Pl. Breeding)	:	VP Neema
(Ag. Entomology)	:	Haseena Bhaskar
<b>Para-technical staff</b>		
<b>Farm Supervisor</b>		K Rugmini Amma Basil Rodrigues MM Sankaran
<b>Farm Supervisor Gr. II</b>	:	Imbichi Ali,
<b>Farm Assistant</b>		A Sasidharan KK Vijayakumar MK Sreedharan
<b>Lab Asst. Gr. II</b>	:	T Raghavan
<b>Lab Asst. Gr. III</b>	:	KK Velayudhan MV Radhakrishnan V Narayan
<b>Administrative staff</b>		
<b>Administrative Officer</b>	:	VV Radhamma
<b>Section Officer</b>		S Droupadi PMF Babu EV Sasidharan
<b>Selection Gr. Asst.</b>		Suma Varghese KM Joseph KK Assootty
<b>Asst. Gr. I</b>		P Radha
<b>Office Supdt.</b>		

Sr. Gr. Typist	K Raveendran MP Damodaran
Typist Gr. I	P Sarasu
Driver (LDV)	AP Pavithran PK Mohandas
Peon	P Raghavan T Damodaran K Cheriyanbu K Ambu
Farm Asst. (Vety.) Sr. Gr.	P Sasidharan Nair TP Balakrishnan Nair
Farm Asst. Gr. II	C Kunhircaman
Oil Engine Driver	PK Sadanandan
Pump Operator	PV Mohanan TV Madhavan
Regular Mazdoor	Vellayi Ambu R Krishnan KV Narayanan KV Kunhircaman V Chirukandan P Appu K Cheriyanbadi K Ambady P Cheriyankannan P Karimabu P Raghavan K Chandan P Pokkan P Kumaran KV Ambu
Class IV	TP Balakrishnan Nair K Pokkan KP Mukundan (working arrangement at RARS, Ambalavayal)
Cook-cum-Caretaker	Antony Sami (working on contract basis for one year)
Marico Scheme	
Research Associate	N Subhash
ICAR Adhoc Scheme on Cashew	
Research Associate	CS Gopakumar
All India Co-ordinated Cashew Research Project (AICRP on Cashew)	
Assistant Professor	Dr B Jayaprakash Naik

*Regional Cattle Infertility Research Centre, Kozhikode*

*Scientific staff*

Associate Professor : Dr PP Balakrishnan

*Technical Staff*

Farm Asst. (Vety.) Sr. Gr. : K Shanmughan  
Lab Technician : K Velayudhan  
Lab Assistant Gr. III : Abdulrahiman  
Attendent Hr. Gr. : P Devadasan

*Administrative and Supporting staff*

Assistant Sel. Gr. : N Kunhilakshmi  
Peon Hr. Gr. : C Kunhikrishnan

*Fisheries Station, Puduveyyu*

Associate Professor (Aq.) : Dr KS Purushan  
Asst. Professor (Aq.) : Dr MM Jose  
Assoc. Professor (Aq.) NC  
Dr Elizabeth Joseph  
Asst. Professor (Aq.)  
Asst. Professor (Aq.) : Dr Annamma George  
Assoc. Prof. (Agron.) NC

*Administrative and Supporting staff*

Administrative Assistant : MS Zulaika Beebi  
Assistant Gr. I : GO Davis upto 28-5-95  
PA George from 29-5-95  
Assistant Gr. II : MS Sanalkumar Sr. Gr.  
Farm Assistant Gr. II : AX George,  
Farm Asst Gr. I  
Fieldman (F) : KK Reghu  
Fieldman Hr. Gr.  
Pump Operator : El Anthrew  
Lab Assistant Gr. II : MS Moni  
Typist Gr. II : VK Rema  
Typist Gr. I upto 28-5-95  
TC Ajitha  
Typist Gr. I from 29-5-95  
Field Assistant : Gayathri Devi  
(Temporary) : TS Sindhu  
Class IV : KP Jayapalan

*Fisheries College, Panangud*

*Scientific staff*

Professor (Aquaculture) : Dr D Manikantan Thampi  
(Fishery Biology, Processing  
Technology) : Vacant (2 Nos.)

Prof. (Fisheries Research)	: Dr PM Mathew
Assoc. Prof. (Aquaculture)	: Dr Susheela Jose Dr Jayasree Vadhyar
(Fishery Hydrography)	: Dr K Kerala Varma
(Biological Oceanography)	: Dr CJ Cherian
(Fishing Technology)	: P Radhakrishnan Nair
(Processing Technology)	: Dr D Damodaran Nambudiri
(Management Studies)	: TM Sankaran
(Fishery Engg.)	: Vacant
Asst. Professor (Algology)	: Dr Thresiamma James
(Fish Breeding)	: Dr C Mohanakumaran Nair
(Fish Pathology)	: Dr C Thankappan Pillai
(Aquaculture)	: MV Mohan Aneykutty Joseph Devika Pillai (on leave) Dr S Shyama
(Fishery Biology)	: Dr J Rajasekharan Nair Dr KV Jayachandran (Both posted against the post of Assoc. Professor)
(Zoology)	: Dr TM Jose Dr R Shyajakumari (on leave)
(Microbiology)	: Dr MC George
(Ichthyology)	: TV Anna Mercy KG Sunny
(Chemical Hydrography)	: PS Mrithunjayan
(Meteorology)	: NN Raman
(Food Science & Nutrition)	: Lizy Behanan
(F. Processing Technology)	: Dr Sajan George S Krishnakumar
(Biochemistry)	: Dr PM Sherief
(Fishery Engg.)	: George Mathew
(Phy. Edn.)	: Sucey V John

Asst. Professor  
(Statistics) : Alphi Korath  
V Malika (on deputation  
for Ph. D.)  
(Commerce) : KM Mathew  
(Economics) : MS Raju

*Technical*

Reference Assistant : TA Joseph  
Library Assistant : VS Kunju Mohammed  
Lab. Assistant Gr. I : P Madhavankutty  
Lab. Assistant Gr. II : VR Lates  
Lab. Assistant Gr. III : PP Pushpakaran  
AN Reghu  
MA Sebastian  
John Mendez  
Technician Gr. I : KP Sreedharan Nair  
Hostel Manager : M Mohammed Mosadiq  
Duplicator Operator : K Rajendra Babu Pillai  
Pump Operator : AP Ayyappan  
Driver HDV : TK Ramanan  
Driver LDV : AS Sukumara Marar  
AM Abdul Khader  
Ajikumar (on working arrange-  
ment)  
Bus Attendant : PM Varghese  
Fieldman (Fisheries) : N Chakrapani  
Fieldman (Fisheries) : VK Balakrishnan  
Fisherman : PJ Kunjappan  
Farm Assistant (Sr. Gr.) : MC Sachidanandan  
Junior Programmer H. Gr. : Tessy K Thomas  
Field Asst. (STED project) : Binu Paul

*Administrative and supporting staff*

Administrative Officer Gr. I : Mary Amma Eapen  
Section Officer : L Syamala Devi  
MN Vijayakumar  
C Sucheta  
Sr. Office Superintendent : PV Brizitha  
R Sarada Devi  
Selection Grade Assistant : K Vinaya Bai  
VM Ammini

**Sr. Gr. Assistant** : MD Kunjamma  
 KP Sajan  
 P Annamma Scaria  
**Gr. I Assistant** : TM Maheswaran  
 B Anujan  
 Pius Felix  
**Gr. II Assistant** : KK Sreedevi  
 Sandhya Rabindranath  
**Office Superintendent** : HK Khadeeja Beevi  
**Selection Gr. Typist** : Salomi Silas  
 KA Geetha  
**Gr. II Typist** : CV Dinesan  
**Class IV** : R Gopal Singh  
 KA Sasikumar  
 KM Khadeeja  
 TK Abdul Majeed  
**Sweeper-cum-Attendant** : KJ Jose  
**Full Time Sweeper** : E Leelamani  
 PB Nabeesa

## Appendix IV

### LIST OF STAFF AT VARIOUS CAMPUSES

#### *College of Agriculture, Vellayani*

#### Plant Pathology Department

Dr P Karunakaran  
Dr S Balakrishnan  
Dr Susamma Philip  
S Sasikumaran  
Dr S Bhavani Devi  
Dr Sasikumar Nair

Associate Professor : Dr CK Peethambaran  
Dr B Rajagopalan

Associate Professor (N C) : Dr B Balakrishnan  
Dr M Vijayan  
Dr P Sivaprasad  
Dr A Naseema  
Dr P Santhakumari

Assistant Professor : Dr C Gokulapalan (Sr. Gr.)  
Dr Lulu Das (Sr. Gr.)  
Dr VK Girija

#### Plant Breeding Department

Professor and Head : Dr R Gopimony  
Professor : Dr P Manikantan Nair  
Dr ST Mercy

Assoc. Professor : Dr N Ramachandran Nair  
Dr P Manju  
Dr DI Sunabai  
Dr Chandramony  
Dr N Kamalam  
Dr SG Sreekumar  
Dr DS Radhadevi

Assistant Professor : Dr KM Abdulkhader  
Dr D Wilson  
Lekharani

Farm Supervisor : D Sulochanan

### **Agronomy Department**

- Professor and Head : Dr MRC Pillai  
 Professor : Dr Muraleedharan Nair  
 Associate Professor : Dr M Achuthan Nair  
 Dr Kuruvila Varghese  
 Shahul Hameed  
 PH Lathif  
 Dr R Pushpakumari  
 Dr VL Geethakumari  
 M Meera Bai  
 Assistant Professor : ER Sheela  
 L Girijadevi

### **Soil Science & Agrl. Chemistry Department**

- Professor and Head : Dr P Padmaja  
 Professor : Dr Thomas Varghese  
 Dr Alice Abraham  
 Abdul Hameed  
 PA Korah  
 Assoc. Professor : Dr S Pushkala  
 K Babukutty  
 VK Venugopal  
 Assistant Professor : Dr P Rajendran  
 Dr P Prabhakumari  
 Dr Ushakumari  
 Usha Mathew  
 Assistant Chemist : G Sushama  
 S Vasundhara Bai  
 Technical Assistant : K Muraleedharan Nair

### **Entomology Department**

- Professor and Head : Dr A Visalakshy  
 Professor : Dr George Koshy  
 Dr G Madhavan Nair  
 Dr K Sasidharan Pillai  
 KS Remamony  
 Associate Professor : Dr K Saradamma  
 K Santhakumari  
 Dr Susamma Mathai  
 Dr T Nalinakumari  
 Dr S Naseema Beevi  
 K Sudharma  
 Dr MS Sheela  
 Hebsy Bai



<b>Professor (NARP) (SR)Phase I :</b>	Dr D Dale
<b>(AICRP on Honey Bee)</b>	Dr Abraham Jacob
<b>(KHDP)</b>	Dr P Reghunath
<b>Asst. Professor :</b>	Dr S Pramila
	Dr Thomas Biju Mathew
	N Anitha
	R Krishnakumar
	T Jiji
	S Devanesan
<b>Home Science</b>	
<b>Professor :</b>	Dr L Prema
<b>Assoc. Professor :</b>	NK Vimalakumari
	Mary Ukkuru
<b>Asst. Professor :</b>	S Chellammal
	C Nirmala
	Subaida Beevi
	Soffi Cherian
	PV Nandini
	B Prasannakumari
	M Rajani
<b>Technician (H.G.) :</b>	N Ayyappan Achari
<b>Horticulture</b>	
<b>Professor &amp; Head :</b>	G Sreekantan Nair
<b>Assoc. Professor :</b>	BK Jayachandran
	CS Jayachandran Nair
	GR Sulekha
	K Rajmohan
	BR Reghunath
<b>Asst. Professor :</b>	Sabeena George Thekkoyam
	VL Sheela
<b>Assoc. Professor :</b>	Abdul Wahab
	L Rajamony
<b>Asst. Professor :</b>	PC Jessykutty
	VA Celine
	Sreeiathakumari
<b>Plant Physiology</b>	
<b>Professor &amp; Head :</b>	S Seshadrinath
<b>Associate Professor :</b>	Mayadevi
<b>Agri. Engineering</b>	
<b>Professor &amp; Head :</b>	AN Remadevi
<b>Associate Professor :</b>	MS Thomas
<b>Assistant Professor,</b>	Bini Sam

**Animal Husbandry**  
 Professor & Head : Skariah Oommen  
 Assoc. Professor : MR Rajan  
 Farm Supervisor : R Ramachandran Nair

**Physical Education**  
 Assoc. Professor, & Head : AC Marykutty  
 Assoc. Professor : S Pazhanian Pillai

**Academic Cell**  
 Professor : KK Ravindran Nair

**Extension**  
 Professor & Head : Dr Babu B  
 Assoc. Professor : Dr MM Hussain  
 Dr S Shylaja  
 Dr S Bhaskaran  
 Dr VB Padmanabhan  
 Dr G Sobhana

Asst. Professor : Dr N Kishorekumar  
 B Seema

**Agri. Economics**  
 Professor & Head : ER Narayanan Nair  
 Assistant Professor : K Raviraman  
 Elsamma Job

**Agri. Statistics**  
 Professor & Head : Dr P Saraswathy  
 Assoc. Professor : R Balakrishnan Asan  
 Asst Professor : Brijith Joseph  
 Junior Programmer : CE Ajithkumar  
 Technical Assistant : P Saraswathy

**Library**  
 Asst. Librarian : B Leela  
 P Sanjeev  
 Reference Assistant : R Manohar  
 KR Sarala

Senior Office Supdt. : CP Padmavathy

**Instructional Farm**  
 Assoc. Professor & Head : Dr K Harikrishnan Nair  
 Assoc. Professor : Dr S Mothilal Nehru  
 Dr R Prakash  
 Dr M Suharban  
 Dr D Geetha  
 Babu Mathew

<b>Administrative Officer</b>	:	Vincent Samuel
<b>Section Officer</b>	:	MN Sreedevi
<b>Farm Supervisor</b>	:	JR Fathima Malar
<b>Central Office</b>	:	G Raveendran Asari
<b>Administrative Officer</b>	:	S Krishnan Nair
<b>Section Officer</b>	:	N Rajasekharan
		NK Mohankumar
		V Chandrika
		P Jameela
		R Vasumathi
		J Remadevi Amma
		CP Padmakumari
		B Sukesan
		M Abdul Samath
<b>Senior Office Supdt.</b>	:	V Bhagaval Singh
		S Valsala Devi
		JA Emi Ammal
		A William

### *College of Horticulture Vellanikkara*

#### *Scientific*

<b>Associate Dean</b>	:	Dr CC Abraham (upto 11.12.96)
		Dr AI Jose (from 12.12.96)

#### **Agronomy**

<b>Professor and Head</b>	:	Dr R Vikraman Nair (holding addl. charge)
<b>Professor</b>	:	Dr NN Potty
<b>Asst. Professor</b>	:	R Gopinathan
		Dr KE Savithry
		Dr Mercy George

#### **Agri. Meteorology**

<b>Professor and Head</b>	:	Dr P Balakrishna Pillai
<b>Asst. Professor</b>	:	AS Anil Kumar (upto 11.10.95)
		Dr EK Lalitha Bai (from 12.10.95)

#### **Plant Breeding & Genetics**

<b>Asst. Professor</b>	:	Dr K Pushkaran
		Dr Achamma Oommen

#### **Agri. Economics**

<b>Professor &amp; Head</b>	:	Dr K Mukundan
<b>Assoc. Professor</b>	:	Dr EK Thomas
<b>Asst. Professor</b>	:	Dr P Indira

**Agri. Engineering**

Asst. Professor : MR Sankaranarayanan  
Subha Rani Kurien

**Agri. Entomology**

Professor and Head : Dr Seetha Rama Rao  
(Associate Prof.)

Associate Professor : Dr Jim Thomas

Asst. Professor : Dr Pathummal Beevi  
R Usha Kumari

**Agri. Extension**

Associate Professor : Dr C Bhaskaran

Asst. Professor : Dr Ranjan S Karippai  
Dr Kumari NP Sushama  
Dr PS Geethakutty (upto 20.3.96)

**Home Science**

Asst. Professor : Dr V Indira  
Dr V Usha  
Norma Xavier

**Agri. Statistics**

Professor and Head : Dr PV Prabhakaran

Assoc. Professor : Prof. VKG Unnithan

Asst. Professor : Graceamma Kurien  
P Soudamini  
S Krishnan

**Olericulture**

Professor and Head : Dr S Rajan

Assoc. Professor : Dr KV Suresh Babu  
(Asst. Prof.)

Asst. Professor : Dr Salikutty Joseph  
Dr P Indira  
Dr PG Sadhankumar  
(upto 10.7.95)

KP Prasanna

Baby Lissy Markose

**Plantation Crops and Spices**

Professor and Head : Dr EV Nybe

Asst. Professor : Dr S Prasannakumari Amma

„ Alice Kurien

„ PA Valsala

„ PC Rajendran

„ MR Shylaja

„ VS Sujatha

Lissamma Joseph

### **Pomology and Floriculture**

Professor and Head i/c	:	Dr PK Rajeevan
Asst. Professor	:	Dr PK Valsalakumari
		„ Lyla Mathew
		„ NK Parameswaran
		„ CK Geetha
		„ Sajan Kurian
		„ Sara T George
		A Sobhana

### **Processing Technology**

Professor and Head	:	Dr P Jacob John
Asst. Professor	:	KB Sheela
		PB Pushpalatha

### **Plant Pathology**

Professor and Head	:	Dr James Mathew
Assoc. Professor	:	Dr A Sukumara Varma
Asst. Professor	:	Dr MV Rajendran Pillai
		„ TN Vilasini
		Surendragopal (from 20.1.96)

### **Soil Science and Agri. Chemistry**

Professor and Head	:	Dr AI Jose (upto 11.12.95)
Assoc. Professor	:	K Leela
		Dr NP Chinnamma
		„ KC Marykutty
		„ KA Mariam
		„ CS Gopi
Asst. Professor	:	Dr MA Hassan
		„ PK Sushama
		„ Jacob John
		„ Sam T Kurumthottickal
		„ P Suresh Kumar

### **Physical Education**

Asst. Professor	:	Dr E Soman
-----------------	---	------------

### **Instrumentation**

Assoc. Professor	:	K Madhavan Nair
------------------	---	-----------------

### **Radiotracer Laboratory**

Assoc. Professor	:	NV Kamalam
(Safety Officer)	:	Dr PV Balachandran
Assoc. Professor	:	Dr N Saifudeen
Asst. Professor	:	

### **Coconut Nutrition and Physiological disorders**

Assistant Professor	:	CS Gopi
Asst. Engineer	:	Rajendra Prasad

**AICRP on weed control**

Assoc. Professor : Dr CT Abraham  
Asst. Professor : Durga Devi  
Mareen Abraham

**AICRP on Agrometeorology**

Asst. Professor : Dr AVR Kesava Rao

**AICRP on BCCP and W**

Assoc. Professor : Dr PJ Joy  
Asst. Professor : Dr KR Lyla

**PG Dip in NRP**

Asst. Professor : Dr PA Nazeem

**Manpower Development Scheme sponsored by Coffee Board**

Asst. Professor : Dr R Kesavachandran

**AICFIP**

Assoc. Professor : Dr PK Rajeevan  
Asst. Professor : Dr A Suma  
,, TP Murali

**Vegetable seed production Complex**

Asst. Professor : Meagle Joseph

**AICVIP**

Asst. Professor : Dr PG Sadhan Kumar  
,, Sally K Mathew  
,, S Nirmala Devi

**AICRP on Medicinal and Aromatic plants**

Assoc. Professor : Dr KT Prasanna Kumari  
Asst. Professor : Dr AS Anilkumar  
,, Dr Augustine

**Cadbury's Cocoa Research Project**

Professor : Dr R Vikraman Nair  
Assoc. Professor : Dr VK Mallika  
Asst. Professor : Dr Koshy Abraham

**AICRP on Ornithology**

Asst. Professor : NV Satheesan

**Technical staff**

Technician Sr. Gr. : KV Johny  
KP Sudarsanakumaran  
Technical Asst. : KV Dinesan  
Joicy T John

Lab. Asst. Gr. I	:	KR Chandran
.. Gr. II	:	KV Rukia
		PK Narayanan
		KG Krishnan
		PK Anandan
		AP Augusthy
		KV Padmavathy
Lab Asst. Gr. III	:	PR Unnikrishnan
		KK Prabhakaran
		V Nandakumaran
		CO Mercy
		AA Krishnan
		PK Velayudhan
		Govindankutty
Farm Supervisor Gr. I	:	KV Eliamma
		KB Sugathan
		PK Kalyani
		TC Sidharthan
		T Ravindran
		VM Mathew
Farm Supervisor Gr. II	:	S Sukumaran
		L Radhammal
Farm Asst. Gr. I	:	R Jayanthy
		TR Radhakrishnan
		AX George
		Padma Narayana Pillai
		GA Mathew
		VJ Paul
		MN Pavithran
		VD Thulasi Das
Farm Supervisor Gr. II	:	PK Ramachandran
		PP Philip
Processing Technology Asst. :		KP Karthikeyan Pillai
<i>Administrative &amp; supporting staff</i>		
Administrative Officer	:	K Subhashini
Section Officer	:	K Thankam
		KP Mary
		KA Vareed
		PE Halima
		T Rema Bai
		EK Prabhavathy
		VS Skandakumar
Asst. Sel. Gr.	:	KA Vareed (up to 9-1-96)
		S Viswakumaran Nair

Asst. Sr. Gr.	:	C Rajalekshmy M Komalam KV Jayasankar PV Amminikutty IC Sheela
Asst. Gr. I	:	Sathi Devi (upto 20-11-95) Sangeeth Thomas (upto 21-5-96) TK Jayaraj B Venugopalan MA Chandran VK Beena CV Flora
Asst. Gr. II	:	A Raghu KM George
Sr. Office Superintendent	:	T Valsala KM Mary
Office Superintendent	:	KA Joy
Typist Sr. Gr.	:	S Geetha Bai
Typist Gr. I	:	AN Malathy Mini Joseph PB Joshy PS Shilaja
Typist Gr. II	:	TD Baby
Peon Hr. Gr.	:	KV Ramachandran
Peon	:	MV Kunjai RB Ibrahim PM Ouseph T Kunjukutty PN Indira MS Bhavana KV Ambika SV Sujatha
Driver HDV	:	K Thankappan (upto 30-11-95) VN Sankarankutty (from 1-12-95)
Driver LDV	:	AN Mohanan CL Antony MK Surendran
Bus Attendant	:	TG Radhakrishnan
Duplicator Operator	:	A Jayagovindan CD Jose
Clerical Assi.	:	PR Surendran
Matron	:	Mary Bhamini



Hostel Manager : NP Chandran  
Asst. Librarian : MC Lalitha  
Ref. Asst. : C Abdul Razak

*Regional Agrl. Res. Station, Kumarakom*

Scientific Staff

RARS

Assoc. Director (Agronomy) : Dr R Ravindran Nair  
Assoc. Prof. (Ag. Entomology) : B Thomas  
                                     : KP Vasudevan Nair  
Assoc. Prof. (Ag. Stat.) : P Gangadharan  
Professor (Botany) : Alice Antony (Asst. Prof.)  
Asst. Professor : Elizabeth K Syriac

NARP Phase I

Assoc. Prof. (Ag. Hort.) : Dr Joseph Philip  
Asst. Prof. (Aquaculture) : Dr KG Padmakumar  
    " (Agron.) : KC Rajan  
    " (Aquaculture) : Dr Anuradha Krishnan  
    " (Pl. Breeding) : KA Inasi  
    " (Microbiology) : Dr AV Mathew (Pl. Path.)  
    " (Bio-Chemistry) : Dr Sosamma Cherian  
    " (Ag. Economics) : AM Santha  
    " (Chemistry) : Manorama Thampatti  
Professor (Extn.) : KP Ramachandran Nair  
Asst. Prof. (Ag. Engineering) : Asha Joseph  
Assoc. Prof. (Soil Science & Ag. Chemistry) : Dr M Subramonia Iyer

CRWD

Professor (Plant Pathology) : G Mathai  
Asst. Prof. (Agronomy) : K Geetha

*Administrative/supporting staff*

NARP I

Administrative Officer : Maryamma Eapen  
                             : VC Bharathan Pillai  
Office Superintendent : MC Jayakumar  
Sr. Gr. Typist : P Baby  
                             : K Radhamony  
                             : MR Ramachandran Nair  
Selection Gr. Asst. : PN Shylaja Devi  
Asst. Gr. I : CP Jayakumar  
Sr. Gr. Asst. : PS Retnam  
Lab. Asst. Gr. II : Mary Sebastian  
Lab. Asst. Gr. III : George Murickan  
                             : TP James

Peon (Hr. Gr.)	:	N Purandaran
Dupl. Mach. Operator	:	CG Mohanan
Driver (HDV)	:	PC Kurien
Technician Gr. I	:	Thomas Scaria
Section Officer	:	MP Govinda Pillai
..	:	D Vijayamma
Sr. Office Supdt.	:	KK Gopikuttan Nair
..	:	CB Merlin
Selection Gr. Asst.	:	PC Sreekantha Pai
Sr. Gr. Asst.	:	KP Sajan
Selection Gr. Asst.	:	B Bhanumathi
Lab. Asst. Gr. I	:	VK Vasu
Sr. Farm Supervisor	:	M Rajaretnam
Farm Asst. Sr. Gr.	:	S Sukumaran Nair (Gr. II)
..	:	K Sasidharan (Gr. I)
Farm Asst. Sr. Gr.	:	MK Vijayan
Farm Supervisor Gr. II	:	PV Reghunathan from 6-6-95
Farm Asst. Gr. II	:	KC Varghese Sr. Gr. Farm Assistant
Farm Asst. Gr. II	:	PS Sanalkumar Farm Asst. Gr. I
Driver LDV	:	TM Francis
Typist Gr. II	:	Mariamamma Mathew, Typist Gr. I
Peon Hr. Gr.	:	AP Meenakshy KK Thankappan
Bus Attendant	:	KK Raghavan
Sweeper cum Attendant	:	MT Ponnappan
Pump Operator	:	CC Punnann
Watchman	:	MK Sivaraman EP Sasidharan
<b>CRWD</b>		
Farm Assistant Sr. Gr.	:	CV Kuttappan MV Sasidharan Nair
Driver LDV	:	PS Babu
<b>IRP</b>		
Assistant Gr. II	:	TK Thankamma Sr. Gr. Asst.
Farm Asst. Gr. II (Vety.)	:	OK Sukumaran Farm Sup. Gr. II
Watchman	:	MR Sudhakaran
<b>Moncompu</b>		
<b>Scientists</b>		
Associate Professor	:	Reena Mathew Asst. Professor
Assistant Professor (Ent.)	:	Dr Sosamma Jacob Assoc. Professor (NC)
(Chemistry)	:	Dr Sumam Susan Varghese Assoc. Professor
(Botany)	:	R Devika Assoc. Prof. (NC)

Junior Statistician : PR Krishnakumariamamma  
 AICRIP

Asst. Professor (Botany) : Dr Remabai, Assoc. Professor  
 (Agronomy) : Dr PS John Assoc. Professor  
 (Entomology) : Dr Ambikadevi

NARP Phase I  
 Assoc. Prof. (Ent.) : Prof. D Joseph  
 Asst. Prof. (Pl. Path.) : PJ Joseph  
 (Chem.) : Annie Koruth  
 (Pl. Path.) : Dr L Remadevi, Professor  
 from 27-7-95

*Administrative/Supporting staff*

Farm Supervisor : VCM Das  
 Farm Assistant Gr. II : K Gopalakrishnan Nair  
 KS Sajeev  
 PK Sreekumar

Lab Asst. Gr. I : K Kunju Pillai  
 Lab Asst. Gr. II : V Viswanathan  
 Lab Asst. Gr. III : PG Balakrishnan  
 Lab Asst. Gr. III (Hr. Gr.) : G Vasudevan  
 Lab Asst. Gr. III : Joseph Peter  
 Admn. Assistant : B Sarasamma  
 Section Officer : KP Rajan  
 Senior Gr. Assistant : S Rajalakshmiamma  
 M Mohamed Basheer  
 Selection Gr. Asst.  
 Senior Gr. Assistant : V Govindarajan  
 Assistant Gr. II : PC Santhoshkumar  
 Typist Sr. Gr. : PK Sreedeviamma  
 Jeep Driver : CC Chacko  
 Peon : KG Pushpakumari  
 Radhamony  
 Boat Driver : MD Janardhanan

*Kayamkulam*

*Scientists*

Professor : K Sivan Pillai  
 Assoc. Professor : KP Jaganmohan from 10-8-95  
 (on working arrangement to  
 CRS Balaramapuram)  
 Dr S Shyam Kurup  
 Assitant Professor : I Johnkuty  
 (on study leave)  
 M Indira  
 G Suja

### AICRP on Oilseeds

Associate Professor	:	Dr Sverup John	
Assistant Professor	:	Dr. P Sushamakumary	
<i>Administrative/supporting staff</i>			
Sr. Gr. Farm Asst.	:	R Satheesan N Vasudevan VJ Rajmohan	
Farm Assistant Gr. I	:	D Prasannakumar	upto 8-2-98
Lab. Asst. Gr. III	:	MG Thomas	
Farm Asst. Gr. I	:	TK Vijayan	
Lab. Asst. Gr. III	:	N Padmakaran Pillai	
Admn. Assistant	:	B Thankamony	
Asst. Sl. Grade	:	K Govindan	
Asst. Sr. Grade	:	MP Vijayachandra Babu	
Typist Senior Grade	:	K Sobhana	
Peon (Hr. Gr.)	:	CT Balakrishnan	
Watchman	:	K Bhaskaran	
		K Krishnankutty	upto 31-8-95
		V Sindhu	from 12-10-95
Full time Sweeper	:	N Rajamma	upto 29-2-96
Regular Mazdoor	:	N Viswanathan	
		N Ravindran	
Driver Gr. III	:	A Sajeiv	
Tractor Driver (Hr. Gr.)	:	R Thankappan	

### Thiruvalla

#### Scientists

Professor	:	S Santhakumari	
Asst. Professor	:	Thomas Mathew R Ilangoan	

### AICRP

Associate Professor	:	D Alexander	
Asst. Professor	:	K Sreekumar Babu George	

### NARP

Asst. Professor (Hort.)	:	Jessy M Kuriakose	
----------------------------	---	-------------------	--

#### *Administrative/supporting staff*

Senior Gr. Farm Asst.	:	EK Sukumarn	
Farm Asst. Gr. II	:	V Muraleedharan	
Farm Asst. Gr. I	:	TK Omanakuttan	
Admn. Assistant	:	KP Rajendraprasad	
Assistant Gr. I	:	PB Anilkumar	
Typist Gr. I	:	AK Indiradeviamma	
Driver	:	CA Chacko	
Peon	:	K Lalu	

*RARS, Vellayani*

*Scientific staff*

**NARP Phase-I**

- Professor (SS & AC) : Dr PR Ramasubramonian  
AICRP (Forage Crops)  
Professor (Agronomy) : Dr G Raghavan Pillai  
Assoc. Professor : Dr M Achuthan Nair  
Assistant Professor : Mareen Abraham  
Lekha Rani C

**CSB scheme on Sericulture**

- Assoc. Professor : M Meera Bai  
(Agronomy)  
Asst. Professor (Ento) : R Krishnakumar

*Administrative and Supporting staff*

**NARP Phase I**

- Section Officer : G Joice  
S Saraswathy Amma  
Senior Office Supdt : R Sarada Devi  
N Haridas  
Asst. Sr. Gr. : Ansamma Philip  
Sel. Gr. : S Vallinayakom Pillai  
N Hrishikesan Nair

**NARP Phase II**

- Assistant Gr II : P Sreekumar  
AICRP on Forage Crops  
Lab Assistant Gr III : G Appu  
AICRP (Nematode Pests)  
Lab. Assistant Gr III : P Thankayyan (Hr Gr)  
AICRP (Honey Bees)  
Farm Assistant Gr I : KS Sujatha  
DBT Project on root diseases of Spice Crops  
Research Assoc. : KS Lekha  
Junior Research Fellow : PJ Joseph  
ICAR ad hoc scheme on *in vitro* propagation of mango  
Research Associate : Sunitha, S  
ICAR ad hoc scheme on Development of soya rice blended  
food recipes  
Research Associate : Anooja Thomas

*CSRC, Karamana*

**AICARP (ICAR)**

- Professor (Agron,) : Dr GK Balachandran Nair

## Vyttila

### Scientists

Professor (Soil Sci.)	:	K Chandrasekharan Nair	
Associate Prof. (Agron.)	:	NK Sasidharan	
Associate Prof. (Aqua.)	:	CG Rajendran	
Asst. Professor (Pl. Br.)	:	KS Shylaraj	upto 5-6-95
	:	K Arya	from 1-7-95

### Administrative/supporting staff

Farm Supervisor Gr. I	:	NJ Annakutty Jayamony	
Farm Supervisor Cr. II	:	George P Puravath	upto 12-5-95
Farm Asst. Senior Gr.	:	A Abdulla	
Farm Asst. Gr. I	:	PN Sadasivan	from 12-6-95
Driver Gr. II	:	J Joy	
Pump Operator	:	PR Prabhakaran	
Lab. Asst. Gr. III	:	PM Gopi	
Fisherman-cum-Watchman	:	KG Gopi P Viswanathan	
Admn. Assistant	:	AA Kousallia	
Asst. Sr. Grade	:	KS George	
Assistant Gr. I	:	AR Sheela	
Typist Gr. I	:	MP Rajani	
Peon (Hr. Gr.)	:	N Vasu NS Reghunandanan	

## AICRP on Agri. Drainage, Karumady

### Scientists

Asst. Professor (Ag. Engg.)	:	EK Mathew  MS Hajilal	
Associate Prof. (Agron.)	:	Madhusudan Nair	
Asst. Prof. (Ag. Engg.)	:	TD Raju	

### Administrative/supporting staff

Farm Asst. Sr. Gr. (Ag.)	:	G Udayakumar	
Farm Asst. Gr. II (Ag.)	:	KO Shalul Hameed I Krishnakumari	
Lab. Asst. Gr. II	:	Mohammed Haneefa	
Overseer Gr. I	:	PT Joy	
Driver Gr. III	:	PE Rajappan	
Pump Operator	:	M Gopalan	
Assistant Gr. I	:	EV Ambili Asst. Gr. II	
Typist Gr. I	:	V Lalitha	
Watchman	:	KK Sreekumar	Security guard
	:	R Mohanan	

Asst. Professor (Soil Scienc) : CR Sudharmaidevi  
Statistics : Dr Vijayaraghavakumar  
(From 1.12.1995)  
Tech. Asst. : Vacant  
Farm Assistant : KS Ajayakumar  
SR Rajeevan  
Typist : B Retnavally Amma  
Messenger (Class IV ) : GV Saju (w.e.f. F.N. of  
15.7.1995)  
Non-Plan  
Professor (Ag. Bot ) : K Gopakumar upto 21.12.95  
Asst. Professor (Pl. Path.) : Dr KK Sulochana (Assoc. Prof.)  
Entomology : Vacant  
Admn. Assistant : N Rajasekharan  
upto F. N. of 3.6.95  
B Rugmini Amma 3.6.95 to 7.3.96  
VM Lalithakumari  
w.e.f. F.N. of 25.4.96  
Assistant : S Viswakumaran Nair  
upto A.N. of 17.11.95  
S Sathee Devi  
w. e. f. F. N. of 1.12.95  
Lab Assistant : G Enose  
Peon (Hr Gr) : R Raghavan Pillai  
upto A.N. of 31.5.95  
G Francis w.e.f. 20.3.96  
Chowkidar : Vacant  
Part-time Sweeper : P Bharathi  
GV Kumar  
N Mary Joseph  
KS Paul  
PK Pushpaja  
ME Rajan  
A Santhakumari  
VR Santhakumari  
G Santhakumari  
C Sherly Mathew  
KR Suresh  
PL Tony  
C Usha  
P Vijayakumari

*CRS, Balaramapuram*

*Scientific*

- Professor & Head : Dr G Padmakumari  
(Plant Pathology)  
Assoc. Professor : Dr N Purushothaman Nair  
(Agronomy)  
(Pathology) : KP Jaogn Mohan  
(on working arrangement)

*Technical*

- Farm Assistant (Sr. Gr.) : L Mohandas  
(Gr. II) : KK Reghuraj  
Watchman (Hr. Gr.) : N Prabhakaran Nair

*Administrative & Supporting Staff*

- Administrative Asst. : G Joice  
Assistant (Sr. Gr.) : S Vasantha kumari  
B Sobhana  
Typist (Sel. Gr.) : A Vasantha  
Peon (Hr. Gr.) : K Mohanan

*FSRS, Sadanandapuram*

- Assoc. Professor : Darley Jose from 22-6-95  
(Horticulture)  
(Soil Science) : RS Shehana from 23-3-95  
Asst. Professor (Agronomy) : Dr S Chandini  
Dr K Vasanthakumar  
29-1-96 to 31-3-96  
(Entomology) : Vacant  
(Plant Pathology) : Dr S Ravi  
(Agrl. Economics) : Dr S Regeena  
(Horticulture) : Darley Jose upto 21-6-95  
(Veterinary) : Vacant  
(Soiland  
(Water conservation) : Vacant

*Para-Technical Staff*

- Farm Assistant Sr. Gr. : PA Sankutty  
Farm Asst. Gr. I : EN Raveendran Nair  
upto 11-6-95  
PG Ajayakumar from 11-6-95  
TK Ajmalkhan  
Farm Assistant (Vety.) Gr. I : P Sarojam from 25-5-95  
Lab Asst. Gr. II : Vacant  
Jeep Driver : S Sasi upto 31-10-95  
Peon Hr. Gr. : P Sunilkumar



*Administrative and Supporting Staff*

- Administrative Asst.  
Assistant Gr. I : M Abdul Salam  
: PK Mohanan  
N Ponnamma  
Typist Gr. I : Ponmany Mohana upto 13-5-95  
Bhamini Amma from 30-5-95

*Krishi Vigyan Kendra*

*Scientific Staff*

- Assoc. Professor : K Vasanthakumar upto 29-1-96  
Dr M Oommen  
Professor from 30-1-96  
Asst. Professor :  
(Extension) : Dr FMH Kaleel  
(Agronomy) : S Lakshmi  
(Horticulture) : P Sukumari  
(Plant Protection) : Kunjamma P Mathew  
(Animal Science) : MG Kurien  
(Home Science) : Rari John

*Para-Technical staff*

- Farm Supervisor : D Vighrahanadhan  
Farm Asst. : AR Venu  
(Vety.) : P Valsalakumari

*Administrative staff*

- Assistant Sr. Gr. : C Chandrikakumari  
Assistant Gr. I : D Suprabha  
Typist Gr. II : R Usha

*Auxillary, Supporting staff*

- Driver LDV : Madhukumar  
S Sasi from 31-11-95  
Peon : N Krishnan Nair  
Class IV : T Mohan Das upto 10-7-95  
P Suresh Babu  
G Pushpaleela upto 1-4-95  
vacant from 27-9-95  
Rajendran  
Vacant from 19-6-95

*ECF Unit, Kayamkulam*

*Scientific staff*

- Assoc. Professor : Abraham Varghese

*Technical staff*

Sr. Gr. Farm Asst. : G Shaji upto 26-10-95  
S Nazeema  
TJ Mathew  
Farm Asst. Gr. I : PC Girjavallabhan  
PA Abdul Majeed  
Farm Asst. Sr. Gr. : VJ Rajamohan from 9-2-96

*Administrative & Supporting staff*

Typist Gr. II : G Sukumaran Nair  
Watchman : KP Jayapalan  
(relieved on 29-2-96)  
V Sindhu from 1-3-96  
LDV Driver : KM Thomas Professional  
relieved on 20-4-95

*Rice Research Station, Vyttila*

*Scientific staff*

Professor, Soil Science : K Chandrasekharan Nair  
Assoc. Professor, Agro- : NK Sasidharan  
Assoc. Professor, Aq. : CG Rajendran  
Asst Professor, Pl Breeding : KS Shylaraj  
K Arya

*Para technical staff*

Farm Supervisor Gr. I : MJ Annakutty  
P Jayamony  
Farm Supervisor Gr. II : George P Puravath  
Farm Assistant Sr. Gr. : AA Abdulla  
Farm Asst. Gr. I : PN Sadasivan  
Driver Gr. II : J Joy  
Pump Operator : PR Prabhakaran  
Lab Asst. Gr. III : PM Gopi  
Fisherman-cum-Watchman : KG Gopi  
P Viswanathan

*Administrative staff*

Administrative Assistant : AA Kousalya  
Sr. Gr. Asst. : AS George  
Asst. Gr. I : AR<sup>s</sup> Sheela  
Typist Gr. I : MP Rajani  
Peon Hr. Gr : N Vasu  
: NS Reghunandan

*Agricultural Research Station, Mannuthy*

*Scientific staff*

Assoc. Professor and Head : Dr U Jaikumaran  
Asst. Professor (Agron). : T Sajitha Rani  
Asst. Professor (Hort) : Dr C Narayanankutty

<b>ICAR/NARP - AICRIP Double Cropping sub centre</b>	
Asst. Professor (Pl. Br.)	: Dr VV Radhakrishnan
<b>NARP - I Central Zone</b>	
Asst. Professor (Pl. Br)	: CA Rosamma
<i>Technical Staff</i>	
Sr. Farm Supervisor	: PG Yamuna, retired from service on 29.02.96 AN Radhamma Thankachi from 16.1.96 FN
Farm Assistant (Sr. Gr.)	: P R Sathian
Farm Asst. Gr. I	: PC Uthaman
Farm Asst. Gr. II	: CK Santhosh CP Alikutty
Lab. Assistant	: P Meenakshi
Tractor Driver	: Vacant
<b>NARP I Central Zone</b>	
Technician	: PM Ramesh Chandran Ambujan (On working arrangement from Directorate of Physical Plant, Sub Division Office, KCAE & T, Tavanur)
<i>Administrative Staff</i>	
Administrative Asst.	: Vivian Jose
Sr. Gr. Asst.	: A Daisy Anto CK Prabhavathy
Sr. Gr. Asst.	: T Vijayalakshmi
Typist	: R Noel
Peon	: I Parukutty RG Babu
Jeep Driver	: U Ravichandran
Watchman	: Pradeepkumar up to 31.05.95 Vacant since 01.06.95
<b>AMPRS, Odakkali</b>	
<i>Scientific staff</i>	
Associate Professor (Agronomy)	: Dr J Thomas
(Entomology)	: Dr Baby P Skaria
Assistant Professor (Agri. Chemistry)	: Dr Samuel Mathew
(Agronomy)	: PP Joy

*Technical staff*

Farm Supervisor Gr. I	: V James
Farm Asst. Sr. Gr.	: V John George
Farm Asst. Gr. I	: PM Joshi
	: NR Rajan
Lab Assistant-Graduate	: KK Santhakumari

*Administrative and supporting staff*

Administrative Assistant	: VK Pathumma
Asst. (Sel. Gr.)	: Prema B Nair
Assistant Sr. Gr.	: CC George
Typist Gr. I	: TC Jalaja
Peon Hr. Gr.	: MM Poulouse
Class IV	: KA Ponnamma
	: PV Ayyappankutty
Gardener	: KB Sivaramakurup

*Cashew Research Station, Madakkathara*

**AICCIP Staff**

*Scientific staff*

Assoc. Professor (Hort/Agron)	: Dr M Abdul Salam
Asst. Professor (Ento.)	: Dr Susannamma Kurien
	: Associate Professor
Sr. Tech. Assistant	: B Suma
	: Assistant Professor

*Technical staff*

**Non-plan**

Farm Supervisor Gr. I	: P Baskaran
LDV Driver Gr. II	: CL Antony
Assistant Gr. II	: PK Kochupaul
Lab Assistant Gr. II	: PA Ramani
Class IV—Mali	: K Rajeev
Farm Supervisor	: K Kesavan

(transferred for KADP)

*Cashew Research Station, Anak kayam*

*Scientific staff*

Associate Professor	: KC Chandy
Assistant Professor	: PV Nalini
	: PB Pushpalatha

*Technical staff*

Farm Supervisor Gr. I	: K Aboobacker
Farm Assistant Gr. I	: Sreenivasan Palasserri
Lab Assistant Gr. III	: V Ponnappan

*Administrative and supporting staff*

Sr. Gr. Assistant	:	C Rajagopalan
Sr. Gr. Typist	:	KT Vijayalakshmi
Peon Hr. Gr.	:	C Mohammed
Mali Hr. Gr.	:	KV Balakrishnan
Sweeper	:	KP Kadiyumma

*Pepper Research Station, Panniyur*

**AICSIP**

Associate Professor (Plant Pathology)	:	KP Mammooty
Assistant Professor (Plant Pathology)	:	Premanathan
(Agri. Botany)	:	Dr Gregory Sacharia
(Agronomy)	:	A Rajagopalan
Peon Hr. Gr.	:	MP Narayanan
Farm Asst. Gr. II	:	T Mohammed Haneefa K Lakshmanan

**Non-plan**

Administrative Asst.	:	M Leela
Sr. Gr. Assistant	:	PJ Simon Narayanan
Typist Gr. I	:	K Pushpavally
Jeep Driver Gr. II	:	EP Narayanan
Peon	:	P Janaki
Watchman (Class IV)	:	V Kunhiraman
Farm Supervisor Gr. I	:	NS Gertrude PJ Joseph
Farm Asst. (Ag.) Sr. Gr.	:	KA Kurien
Watchman Hr. Gr.	:	T Kunhiraman

*KCAET, Tavanur*

*Scientific staff*

Dean	:	Dr K John Thomas
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**Dept. of LWRCE**

Associate Professor	:	Dr Jobi V Paul
Assistant Professor	:	Noble Abraham Xavier K Jacob KP Rema J Renukakumari (on study leave)

**Dept. of IDE**

**Assistant Professor** : Alexander Seth  
Dr MS Hajilal  
Dr KP Visalakshi  
P Suseela  
EK Kurien  
F Mary Regina

**Dept. of FPME**

**Professor** : CP Muhammad  
**Assistant Professor** : Hamza Mollakadavath  
VR Ramachandran  
(on study leave)  
C Sreekala  
PR Jayan

**Dept. of PHT & AP**

**Assistant Professor** : Santhi Mary Mathew  
(on study leave)  
MV Prince

**Dept. of SAC**

**Professor** : Dr KI Koshy  
**Associate Professor** : Dr PC Antony  
**Assistant Professor** : VP Lakshmikutty  
Dr E Komala Amma  
M Velayudhan Kutty  
Dr PV Habeeburrahman  
Dr KM Valsamma  
M Bindhu  
Dr KA Bindhu  
Josephina Paul

**Instructional Farm**

**Assistant Professor** : P Rajendran (on study leave)

**ICAR Scheme on FIM**

**Asst. Professor** : Dr M Sivaswami

**AICRP on Energy Requirement in Agrl. Sector**

**Assoc. Professor** : Jippu Jacob  
**Asst. Professor** : Joby Bastian

**b) Technical/Administrative and Supporting staff**

**Sr. Admn. Officer** : AK Sreenarayanan  
**Section Officer** : K Leelamma  
P Unnikrishnan  
KU Prabhavathy  
MP Balan

Sr. Office Supdt.	: KP Abdurahiman
Selection Gr. Asst.	: KVP Nampiathiry KJ Kuruvilla A Shah
Asst. Gr. I	: A Radhakrishnan C Gopi P Radha Gopan
Asst. Gr. II	: P Sivaprasad M Muraleedharan
Typist Gr. I	: R Balasubramanian
Typist Gr. II	: VM Muraleedharan T Kamalam
Research Asst.	: AP Gopalakrishnan
Reference Asst.	: KP Sathian
Library Asst.	: Sebastian Dominic
Draftsman (Civil)	: KG Ajithkumar
Technical Supervisor	
(Carpentry)	: AK Padmanabhan
(Smithy)	: VP Kannan
(Fittings)	: CS Krishnan
(Auto & Tractor)	: C Velayudhan
(Turning)	: TR Aboobacker
Trade Asst. (Elec)	: T Surendran Pillai
Pump Operator	: E Parameswaran Nair MK Balakrishnan
Driver (HDV)	: PV Sudhakaran
Driver (LDV)	: NV Krishnan MK Narayanan
Bus Attendant	: Jobbar
Sr. Gr. Technician	: VK Asokan KT Ramachandran
Technician Gr. I	: P Balakrishnan K Aravindan N Narayanan
Matron	: TP Santhamma
Lab. Asst. Gr. I	: P Krishnankutty Nair

Lab. Asst. Gr. III	:	PV Kumaran K Abdurahiman I Jayaprakash KK Subramanian
Farm Supervisor (Vety.)	:	P Balakrishnan
Farm Assistants (Vety.) Gr. I	:	T Venu
Farm Supervisor (Agri.)	:	RV Balamani MV Raveendran K Sethumadhavan
Farm Assistant (Agri.) Gr. I	:	C Subramanian TP Ali
Gardener	:	K Mammikutty
Class IV	:	K Kunhan C Narayanan A Burhanuddin K Ammukurupathiar R Kuttykrishnan KV Moideenkutty KP Ayyappan P Amina K Kunhumon AV Dasan P Krishnan



## Appendix V

### LIST OF PUBLICATIONS/RADIO TALKS/ TV PROGRAMMES ATTENDED

*College of Agriculture, Vellayani*

#### **Publications**

- Anil, BK and Jayachandran Nair, CS 1995. Standardisation of spacing for tissue culture Banana CV Nendran (Musa AAB group) Proc. 7th Kerala Science Congress, Palakkad, pp. 181.
- Anil BK, Jayachandran Nair CS, and Jayachandran BK, '95. Effect of spacing on banana production, dry matter partitioning, yield and fruit quality in tissue culture banana (Musa) (AAB) Nendran. *Journal of Tropical Agriculture*, 33: 32-35.
- Abdul Vahab M, Nirmala Devi S, and Mathew SK '95. Performance of day-neutral dolichos bean (*Dolichos purpurens*) Proc. 7th Kerala Science Congress, Palakkad.
- Sulekha GR, Rajmohan K, Suneetha S, and Sreekandan Nair G '96. Rapid *in vitro* clonal propagation of Musa (AAB) 'Red banana'. Paper presented in symposium on Technological advancement in banana/plantain production and processing India International. Kerala Agricultural University, Vellanikara, 20-24, August, '96.
- Sheela VL, and Nair SR, '96. Nutrient requirement of tissue culture banana Musa (AAB group) 'Nendran'. Paper presented in symposium on Technological advancement in banana/plantain production and processing.
- Balakrishnan B. Nair MC, and Lulu Das. 'Mushroom cultivation and mushroom recipes'.
- Peethambaran CK, and Nair SK, "Safe use of pesticides" published by FIB.
- Nair SK, and Peethambaran CK, 'Jeevanu vaianganai' published by Kerala Agricultural University.

- Mareen Abraham, Lekha Rani, C, Girija Devi L, and Suma Bai DI, '95. 'Performance of rice bean *Vigna umbellata* (Thumb) ohwi and ohashi) in Kerala' Souvenir and Abstract of National symposium on forage production system for Agricultural Development, IGFRI, Jhansi Dec. 21-23: pp. 95-96.
- Wilson D, and Nayar NK, '96. Callus induction proliferation and rhizogenesis in rose cv. Folklore. Proceedings of the eighth Kerala Science Congress 27-29 January '96, Kochi. pp-553.
- Visalakshi A, and Naseema Beevi S '95. Eco-friendly plant protection in sustainable agriculture. Key note address in the National Seminar on Eco-friendly consumer and sustainable Farming (BIO-95) organised by COINAAR, Trivandrum, Souvenir pp. 1-2.
- Naseema Beevi S, Thomas Biju Mathew and A, Visalakshi '95. Management of pesticide residues in the environment. *Ibid*, pp-5-6.
- Devanesan S, Vijayaraghavakumar V, Ramachandran Nair, Thomas Biju Mathew, Ravi S, and Visalakshi A '95. Leaf folder resurgence a side effect of insecticide application in rice fields. *Entomon* 20 (2): 79 86.
- Dale A, '95. Bio-chemical basis of rice plant resistance to stem borer. Paper presented in the National Conference of Insect Bio-chemistry and Molecular Biology, Trivandrum, 10-12 Oct. '95.
- Sasidharan Pillai K, Nair VM, Meera Bai M, Krishnakumar R, Anitha N and Anilkumar AS '96. Global silk scenario 2001. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi pp 265-269.
- Sreelathakumari U, Reghunathan BR, and Sreekantan Nair G, '95. Improved varieties of black pepper. *Spice India* 3 (6) 5-6.
- Sreekantan Nair G, '95. Horticultural therapy (Mal.) *Spice India* 8 (4).
- Seama B, Shilaja S, and Sobhana G, '95 Training needs of rural women in nutrition and child care. Proceedings of seminar on women in Kerala –past and present held at Thiruvananthapuram on 11-12 Feb. '95.
- Shilaja S, Sobhana G, and Elsamma Job '95. Utilization of Farm waste in Homesteads of Kerala. National Seminar organised by KHDP & Kesari Memorial Journalists Trust 23-25 January '95.

Devi SP, Sobhana G, Shilaja S, and Seema B, '95. Employment and wage pattern of women Agricultural Labourers in Thiruvananthapuram. Seminar on women in Kerala. Past and present 11-12 Feb. '95. Abstract of papers pp. '97.

Shilaja S, '95. Knowledge and adoption of scheduled caste women on health nutrition and child care practices. Proceedings of seminar on women in Kerala. Past and present held at Trivandrum on 11-12 Feb. '95.

Seema B, and Bhaskaran S, Attitude towards internal evaluation. A comparative study. Proceedings of the seminar "Crises in Kerala's education" held at Thrissur, 17-19 March '95 International Congress on Kerala Studies.

Radha Devi DS, and Nayar NK '95. Gamma ray induced fruit character varieties in Banana variety Nendran (*Musa paradisiac. L*) Agric. Sci. Digest, 15 (3) 101-110, '95.

Radha Devi DS and Nayar NK, '95. Gamma ray induced bunch character variety in Banana (*Musa paradisiac L.*) Cuss. Agric Res. 8 (2) 41-43 '95.

Radha Devi, DS, and Nayar, NK, '95. Direct effect of gamma rays in flowering duration in Banana variety Nendran (*Musa paradisiaca L.*) Environment and Ecology B (4) 968-970, '95.

Deepa, IO, Radha, DS and Gopimony, R '96. New morphotypes isolated after mutagenic treatments in winged bean. Proceedings of Eighth Kerala Science Congress Jan, '96 Kochi pp. 149-150.

Kuruvilla Varghese, Irutharaj, MR '96. Response of sole and intercropped maize to irrigation and nitrogen levels. Madras Agric. J. 83 (3). 189-193.

Kuruvilla Varghese and Irutharaj, MR '95. Seasonal variation and heat unit requirement of maize Crop Res. 10 (1): 67-73.

#### Popular articles

Sheela, VL '95- Cultivation of Kuttimulla (Mal.) Mathrubhoomi May '95.

Sheela, VL '95. *Gladiolus Kerala Karshakan* 40 (12).

Wilson, D and Reghunath, BR '96. Mycorrhizal association for tissue cultured rose. *The Hindu*, February 29, '96.

#### Radio talks

Dr Jayachandran, ICS Associate Professor attended question answer Section of AIR, Trivandrum on 30-6-'95.

Dr Sreekantan Nair, G, Professor and Head attended question answer section of Doordarsan Kendra, Trivandrum.

Dr Thomas Varghese, Dr. Alice Abraham, Dr Pushkala, S and Dr Prabhakumari delivered radio talks on various topics of Agriculture.

Eight Radio Talks were given by the Scientists of the Department of Agricultural Extension during the period.

A talk by Dr Sasidharan Pillai on 'Prospects of Sericulture in Kerala' was featured by AIR in their Nattinpuram Programme on 17-3-'96.

A Radio talk of Sudharma, K was broadcasted in Karshakavedi AIR programme.

A talk by Dr Nalinakumari, T was broadcasted in Karshakavedi AIR programme.

#### T. V. programme

Dr Padmaja, P, Dr Prabhakumari, P and Dr Ushakumari participated in the T. V. Programme 'Vermicomposting/Vermiculture'.

A talk by Dr Nalinakumari, T 'പിണ്ണവർഷമാലിന്യങ്ങൾ കീടനിയന്ത്രണ മാർഗ്ഗം', was telecasted on 23-3-96 by Trivandrum Door-darsan.

### *College of Horticulture, Vellanikkara*

#### Publication by staff

##### Research papers

Abdul Wahab, M, Nirmala Devi, S, Maya Devi, SK and Prabhakaran, PV '94. Genetic divergence in Okra. *Hort. J.* 7:117-120.

Abraham, CC and Jim Thomas '95. Mud slurry as a base and carrier of insecticides against the banana pseudostem weevil *Odoiporus longicollis* Oliv. *Insect Environment.* 1 (2): 14.

Abraham, CC, Sudhakara, K and Ushakumari, R '95. Occurrence of *Bruchidius bilineatopygus* (Bruchidae : Coleoptera) as a pest of pods and seeds of the multipurpose tree species *Albizia odoratissima* (L. F.) *A. procera* (Roxb.) and *Paraserianthus falcatoria* (L). *Insect Environment.* 1 (1): 7-8.

Abraham, CC and Baby P Skaria '95. New record of the red borer *Zeuzera coffeae* Nietner (Cossidae : Lepidoptera) as a pest of all spice *Pimenta dioica* (Linn.) Merril. *Insect Environment.* 1 (1): 6.

Achamma Oommen, Namboothiri, KMN and Unnithan, VKG '94. Genetic analysis of some quantitative characters in pigeon pea. *J. Trop. Agric.* 32 : 109-111.

- Alice Kurien and Valsala, PA '95. Evaluation of turmeric types for yield and quality. *J. Trop Agric.* 33: 75-76.
- Bhaskar, J. Valsalakumari, PK and Rajeevan, PK '96. *In vitro* floral apex culture of red banana. *Proc. of the 8th Kerala Science Congress*, p. 531-533.
- Geetha, CK and Aravindakshan, M '96. Nutrient uptake in black pepper as influenced by sources of phosphorus. *Proc. of the 8th Kerala Science Congress*, p. 189-191.
- Hussain, CTS, Geetha, CK, Rajeevan, PK and Valsalakumari, PK '96. Plant regeneration from root derived callus in gladiolus. *J. Ornamental Hort.* 2 (344): 46-52.
- Hussain CTS, Geetha CK, Rajeevan PK, and Valsalakumari PK, '96. *In vitro* release of axillary buds in gladiolus 'Friendship' *Proc. of 8th Kerala Science Congress*. p. 199-201
- Ibrahim KK, Pillai VS, and Sasikumaran S, '93. Seed germination studies in Panniyur-I black pepper *J. Trop. Agric.* 31: 232-233
- Ibrahim KK, Pillai VS, and Sasikumaran S, 92. Variability and interrelationship of seedling characters in selfed and open pollinated seedlings of black pepper. *Indian Cocoa Arecant and Spices Journal*, 16:24-25
- Indira V, and Prema L, '96 Dietary habits of the Irula tribes of Attappady *Proc. of the 8th Kerala Science Congress*, P. 228
- Indira P, '95. Strategies for vegetable marketing in Kerala *Proc. of the Seminar. on Exploring strategies for agricultural market development*, 'Univ. of Mysore 15th-30th August
- Jacob S, '95. Pest in stored tamarind. *Spice India* 8 (7): 9-10
- Jalaja S, Menon and Nybe EV, '96. Performance of Plumbago (*Plumbago rosea* L) as an intercrop in young coconut plantation. *Proc. of the 8th Kerala Science Congress*, p. 136-138
- Joseph P, George M, Wahid, PA, John PS, and Kamalam NV '95. Dynamics of phosphorus mineralisation from 32 p labelled green manure. *J. Nuclear Agric. Biol.* 24: 137-144
- Joy, PJ, Lyla KR, and Sathesnan NV, '96 Biological weed suppression. *Compendium on Organic Farming in Kuttanad*, KAU
- Jyothi P, Bindu and Sosamma Jacob, '96. Reduced susceptibility in *Amrasca biguttula biguttula* (Ishida) infesting bittergourd to quinalphos. *Insect Environment*, 1 (4): 14
- Kesavachandran R, Ravishankar GA, and Abdul Khader JBM/ '95. Organogenesis from callus cultures of *Vetiveri zizanoides*. *Sym. on recent advances in Biotechnological applications of plant tissue and cell culture*, CFTRI, Mysore, p.35

- Kesavachandran R, and Abdul Khader JBM, '96. Callus induction and plant regeneration in *Vetiveria zizanioides* L. *Proc. of the 8th Kerala Science Congress*
- Kumari Sushama NP, and Bhaskaran C, '95. Assessment of training needs of farmers in agriculture *J. Trop. Agric.* 33 (1): 59-61
- Kumari Sushama NP, Nair GT and Bhaskaran C, '95. Constraint analysis of the student and teachers of vocational higher secondary education in agriculture *J. Trop. Agric.* 33 (1): 62-65
- Kumari Suahama NP, Nair GT, and Bhaskaran C, '96. Attitude of VHSEA students towards VHSEA programme. *Proc. of the 8th Kerala Science Congress*
- Latha A, John PS, Mercy George and Krishnan S, '94. Productivity of cashew as influenced by chlorophyll and leaf nitrogen content. *J. Trop. Agric.* 32: 83-88
- Lyla KR, Abraham CC, and Joy PJ, '96. Metabolic changes in *Chromolaena odorata* plants induced by partial grazing of its natural enemy *Pareuchaetes pseudoinsulata* (Arctidae: Lepidoptera) *Chromolaena odorata. Newsletter*
- Lyla KR, Abraham CC, and Joy PJ, '96. Studies on fecundity and hatching of *Pareuchaetes pseudoinsulata* Rego Barros (Arctidae: Lepidoptera) *Proc. of the 5th Internat. workshop on Biological control of Chromolaena odorata*
- Lyla KR, Abraham CC, Joy PJ, and Ranjith AM, '96. Feeding behaviour of *Pareuchaetes pseudoinsulata* Rego Barros (Arctidae: Lepidoptera) *Chromolaena. Newsletter*
- Manoj PS, George TE and Krishnan S, '94. Variability in Cashew (*Anacardium occidentale*) as influenced by hybridisation. *The Cashew* 10-12
- Manoj PS, George TE, and Krishnan S, '94. Correlation studies and path coefficient analysis in cashew (*Anacardium occidentale*) hybrids. *The Cashew* 10-14
- Mini B, Valsalakumari PK, and Geetha CK, '96. Effect of different explants of Musa 'AAB' Nendran on callus induction and regeneration. *Proc. of the 8th Kerala Science Congress*, p. 524
- Muralidharan P, and Jose AI, '94. Effect of micronutrients on the uptake of NP, and K in rice. *J. Trop. Agric.* 32 (2): 137-141
- Muralidharan P, and Jose AI, '94. Effect on boron and molybdenum on yield and uptake of nutrients in rice *J Trop Agric.* 32 (2): 157-158

- Murali TP, '96. Histological evidences for the superiority of floral apices as explants for micropropagation of banana. *Proc. of the 8th Kerala Science Congress* p 519-522
- Musthafa K, and Potty NM, '95. Concurrent resource and product generation technology for better sustainability of Khariff rice for the west coast of India. *Nat Symp on ecology and environment* 'IGFRI, Jhansi, Sept. 4-6 1995.
- Musthafa K, and Potti NN, '96. Yield limiting factors and their improvement in semi dry rice. *Proc. of 8th Kerala Science Congress*
- Narasimham P, and Jacob John P, '95. Controlled low temperature vacuum dehydration as an alternative to freeze drying of diced bread fruit *J. Food Sci. Tech.* 32 (4): 305-309
- Nazeem PA, Lissamma J, Rani TG, Valsala PA, Shaji P, and Nair GS, '95. Tissue culture system for *in vitro* pollination and regeneration of plantlets from *in vitro* raised seeds of ginger (*Zingiber officinale* Rosc) *Internat. Symp. on Medicinal and Aromatic plants*, Univ. of Massachussets, USA
- Prabha, J. and Kesavachandran, R., 1995. *In vitro* multiplication and field establishment of *Ananas comosus* (L).Merr. *All India Symp. on recent advances in Biotechnological applications of plant tissue and cell culture*, CFTRI, Mysore p. 26.
- Prabhakaran, PV, '96. Assessment of losses due to pests, diseases and drought in black pepper. *J. Ind. Soc. Agric. Stat.* 4 (1) 59-60.
- Prabhakaran, PV and John, R, '95. An alternative approach for the analysis of data of long term experiments. *J. Ind. Soc. Agric. Stat.* 4(1):106.
- Pushpa, J, Mercy, G, Wahid, PA, John, PS and Kamalam, MV, '95. Dynamics of phosphorus mineralization from <sup>32</sup>P labelled green manure. *J. Nuclear Agric. Biol.* 24(3):92-95.
- Rajeevan, PK, Ravidas, L and Geetha, CK, '96. Foliar application of nutrients on the growth, flowering yield and post harvest behaviour of gladiolus var 'Friendship'. *Proc. of the 8th Kerala Science Congress* p. 217-218.
- Raju, VK, Sheela, KB and Narayanankutty, MG, '95. Fruit and vegetable growing sector-potentials in Kerala. *Nat. Sem. on Agri business management* Bangalore, 29-30 th May '95.
- Ranjith, AM, and Rao DS, '96. Simple new killing bottle for entomologists. *Entomon.* 20 (3&4):277.
- Ssbitha, K and Jacob, S '94. Bioassay techniques and response of different populations of *Amrasca biguttula biguttula* towards commonly used insecticides in Kerala. *Indian J. Plant Prot.* 22(1):54-55.

Shammy Mathew and Rajendran. PC, '66. *In vitro* establishment and multiple shoot induction of juvenile and mature clove. *Proc. of the 8th Kerala Science Congress*.

Skaria, BP, Ushakumari, R and Thomas, J. '96. Psyllid, *Arytaina punctipennis* Crawford infestation on cultivated *Indigofera tinctoria* L. in Kerala. *Insect Environment* 2(1):28.

Sobha, P. P, Wahab, AM and Krishnan, S, '95. Euclidian cluster analysis in cowpea. *Proc. of the 7th Science Congress*. 163-165.

Sobhana, A, and Rajeevan, PK, '93. *In vitro* multiple shoot production in *Dendrobium* as influenced by cytokinins *J. Ornamental Hort.* 1, 1-5.

Sudeep, R, Rajeevan, PK, Valsalakumari, PK and Geetha, CK, '96. Influence of cytokinin related substances on shoot proliferation in *Dendrobium nobile*. *Proc. of the 8th Kerala Science Congress*, p 201-204.

Tessy Joseph, Kanakamany, MT and Prasanna, KP, '96. Performance of pulses and oil seed varieties in the rice fallows of kole lands. *Proc. of Nat. Symp. on technological advancement in rice production*, P. 48.

Valsalakumari, PK, Rajeevan, PK and Lakshmi, ML, 96. Embryo culture in banana. *Proc. of the 8th Kerala Science Congress* p. 188-184.

*Popular articles*

Baby Lissy Markose and Meagle Joseph, P, 95. വിളവെടുപ്പിലെ പച്ചക്കറി കൃഷി. കർഷകൻ 22 (2): 31-35.

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**Radio talk**

ആനുകൂല്യ പണിവളർത്തൽ  
പ്രകൃതിദത്ത കാലിത്തീറ്റകൾ  
വൈകാരികതയുടെ പൊന്നുകുമ്പു. യൂറിയ ചേർത്ത വർദ്ധിപ്പിക്കൽ.

**Athulya—a promising new hybrid layer**  
**Cross-bred specially suited for back yard in Kerala**  
കന്നുകാലികളിലെ കൃത്യസുരക്ഷ.  
പോയ വിവരങ്ങൾ

*University Pig Breeding Farm*

**Publication by Staff**

(Popular Articles)  
സംയോജിത കൃഷി സമ്പ്രദായവും, പണിവളർത്തലും  
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*Poultry Science-CAS*

**Popular articles/Radio talks/TV programme:**

- ഗിനിക്കോഴികൾ May, 1995 Karshakan
- കോഴികളിൽ വമ്പൻ കർക്കി Sept. 95 Karshakan
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- ഇങ്ങനെ വളർത്താം. താരാവീണ Dec. '95 Karshakan
- ഐക്യകൃഷികൾ January '96 Karshakan
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- ഇച്ചിക്കോഴികളെ ഇങ്ങനെ വളർത്താം. Sept. 95 Karshakasree
- സമൃദ്ധകൃഷികൾ കോഴിരോഗങ്ങൾ Oct. 95 Karshakasree

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- Kamma Barkataki, Narayanankutty K, Kuttynarayanan P, Venugopalan CK, and Ramakrishnan A, Effect of refrigeration storage of quail meat patties Kerala J. Vet. Anim, Sci. (Accepted for publication)
- Kamna Barkataki Narayanankutty K, Ramakrishnan A, Processing yields, losses and meat bone rates in Japanese quails. Kerala J. Vet, Anim. Sci. (Accepted for publication)
- Narayanankutty K, Leo Joseph and Ramakrishnan A, influence of floor densities on egg quality parameters. (Accepted for publication) Kerala J. Vet. Anim. Sci.
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A research paper written by Dr. N Vijayan, entitled 'Ameliorative effect of Niltox in aflatoxicosis in poultry' was accepted for presentation in the National Seminar at Bhubaneswar by JAVP.

A research paper entitled 'Observation of bursal enlargement under acute stress' was presented by Dr Vijayan N, at the National Seminar conducted by IPSACON-96 at Thrissur.

### *Regional Cattle Infertility Research Centre, Kozhikode*

#### **Radio Talks**

Two radio talks in the field of Animal Husbandry Practices by Dr PP Balakrishnan

#### *KCAET Tavanur*

#### **Publication by staff**

Ganesan V '96. Selective Mechanization—Karshakasree.

Visalakshi KP, Noble Abraham MR, Sankaranarayanan and Thomas J, '95. Technical feasibility of subsurface dykes in Kerala—Souvenir XXXI Annual ISAE Convention

Visalakshy, KP and TRS Rajput '95. Effect of surging on infiltration. Souvenir, XXXI Annual ISAE Convention.

Suseela P, and George TP, '95. Effect of stroke length and weight of waste valve on the beat frequency of hydraulic ram. Souvenir XXXI Annual ISAE convention.

#### *Fisheries Station, Puduveypu*

#### **Publication**

Dr Purushan KS, Associate Professor Adaptive farming technology. A boon to sustainable shrimp production from Kerala. *Seafood Export Journal Vol. XXXI No. 12 Dec. '95* pp 5-11

Challenging scenario of scientific shrimp farming in India—an overview. *Seafood Export Journal Vol. XXVII No. 2 January 1996* pp 17-23

Traditional methods of prawn farming in India—different farming systems—merits and demerits—evaluation of production—economics and its scope for avocation and rural development *Seafood Export Journal Vol. XXVII No. 3 March '96* pp 11-15

ചെമ്മീൻ കൃഷിയിലൂടെ പരിഹാരം

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സ്വയം തൊഴിലായി തിരച്ച വളർത്തൽ

*'Karshakasree' Vol. 1 No. 8 April 96 pp 72-73.*

അലങ്കാരമത്സ്യം വളർത്തൽ ഒരു മഹാബലി

*'Krisni Vigyana Manjari 47 '96*

പരമ്പരാഗത മെമ്പിൻ പാടങ്ങളിൽനിന്നും അധിക വിളവു നേടുമ്പോഴെങ്ങനെ?

*Kalpadhenu, Vol. 23 No. 3 '96 pp 19-20*

Jose, MM Associate Professor

കരിമിൻ കൃഷിയുൽപ്പാദനവും സംരക്ഷണ രീതികളും

*'Kalpadhenu' Vol. 23 No. 1 1995 pp 19-22*

കൊരമ്പിമ്പങ്ങളിലെ മത്സ്യകൃഷി സാധ്യതകൾ *'Kalpadhenu' -(in press)*

*'Strategies for mullet farming in Kerala'*

*'Seafood Export Journal' (in press)*

Annamma George and Dr. Elizabeth Joseph

തിരമൂല പത്മപ്പുറംകരയ്ക്കു മോലിച്ച സുസ്മിത കൃഷിരീതികൾ

*'Kalpadhenu' Vol. 23 No. 3. '96 pp 38-40*

അലങ്കാര മത്സ്യം വളർത്തലിൽ ശ്രദ്ധയിടകണ്ട കാര്യങ്ങൾ

*'Krishi Vigyana Manjari' No. 47 '96 pp 64-68*

## Appendix VI

### RESEARCH SCHEMES IN OPERATION UNDER DOR DURING THE PERIOD 1-4-95 - 31-3-96

Run Date 17-1-97

Project Title	Durn. (in yrs)	Date of start	Outlay (in Rs.)	Date of Termn.
1	2	3	4	5
<b>FACULTY OF AGRICULTURE</b>				
<b>ICAR Co-ordinated</b>				
<b>College of Forestry, Vellanikkara</b>				
AICRP on Agroforestry (Functioning at LRS, Thiruvazhamkunnu)	5	1-4-90	26,18,000	1-4-95
<b>NARP SR, Vellayani</b>				
AICRP on Nematode Pests	5	1-4-90	16,95,000	1-4-95
<b>AICRP on Agricultural Drainage, Karumady</b>				
AICRP on Agrl. Drainage	5	1-4-90	42,62,000	1-4-95
<b>PRS, Panniyur</b>				
AICRP on Spices - Research on Pepper	5	1-4-90	36,15,000	1-4-95
<b>CRS, Madakkathara</b>				
AICRP on Cashew - Research on Cashew (Madakkathara & Pilicode)	5	1-4-90	18,00,000	31-3-97
<b>CRS, Pampadumpara</b>				
AICS & CIP - Research on Cardamom	5	1-4-90	24,17,000	1-4-95
<b>College of Horticulture, Vellanikkara</b>				
AIC Floriculture Improvement Project	5	1-4-90	11,81,000	1-4-95
<b>BRS, Kannara</b>				
AICRP on Fruits (Banana)	5	1-4-90	32,05,000	1-4-95

1	2	3	4	5
RARS, Pattambi				
AICRP - Double Cropping Main Centre	5	1-4-90	9,79,000	1-4-95
ARS, Mannuthy				
AICRIP - Double Cropping Sub-centre	5	1-4-90	94,000	1-4-95
RRS, Moncompu				
AICRIP - BHP & GSV Merger - Sub-centre	5	1-4-90	4,02,000	1-4-95
RARS, Pattambi				
AICRP on Arid Legumes (Guar)	5	1-4-90	3,80,000	1-4-97
College of Horticulture, Vellanikkara				
AIC Vegetable Improvement Project	5	1-4-90	13,75,000	1-4-95
College of Horticulture, Vellanikkara				
NARP SR, Vellayani				
AICRP on Forage Crops	5	1-4-90	7,73,000	1-4-95
College of Horticulture, Vellanikkara				
AICRP on BCCP	5	1-4-90	20,32,000	1-4-95
SRS, Thiruvalla				
AICRP on Sugarcane	5	1-4-90	19,63,000	1-4-95
ARS, Chalakudy				
AICRP on Water Management	5	1-4-90	39,16,000	1-4-95
College of Horticulture, Vellanikkara				
AICRP on Weed Control	10	1-4-88	16,17,000	31-3-98
AICRP on Medicinal & Aromatic Plants	5	1-4-90	29,03,000	1-4-95
NARP SR, Vellayani				
AICRP on Pesticide Residue	5	1-4-90	25,53,000	1-4-95
RRS, Kayamkulam				
AICRP on oilseeds for groundnut and sesamum	5	1-4-90	15,62,000	1-4-95
College of Horticulture, Vellanikkara				
All India Network Project on Agricultural Ornithology	5	10-2-94	6,18,000	9-2-98

1	2	3	4	5
NARP SR, Vellayani				
AICRP on Honey bee	48	20-1-94	9,71,000	31-3-97
College of Horticulture, Vellanikkara				
All India Co-ordinated Research Project on Agrometeorology	5	1-4-95	7,68,000	31-12-99
NARP SR, Vellayani				
AICRP on Tillage requirement of major Indian soils for different cropping systems	5	5-1-96	4,48,000	31-12-99
ICAR				
RARS, Pattambi				
NSC - Breeder Seed Production Unit	5	1-4-90	21,10,000	1-4-95
ICAR Adhoc Scheme				
RARS, Pilicode				
Crop weather models for Cashew	3	6-5-92	4,67,800	6-5-95
NARP SR, Vellayani				
Nitrogen fixing bacteria associated with plantation and orchard crops of Kerala	3	9-6-92	6,60,000	8-6-95
Homestead agroforestry systems of Kerala. Productivity of the extent homestead models and increasing efficiency of the models	3	1-8-93	4,11,600	31-7-96
College of Forestry, Vellanikkara				
Rain water conservation in coconut based agro- forestry systems by harvesting techniques	3	27-5-93	2,80,800	26-5-96
Standardisation of bare root nursery techniques of some important tree species used for agroforestry planting in Kerala	3	29-4-93	5,21,600	31-8-96

	1	2	3	4	5
RRS, Moncompu					
Evaluation of cultivated and wild rice germplasm for biotic stresses	3		1-6-93	2,55,800	15-12-99
College of Horticulture, Vellanikkara					
Evaluation of tomato for summer season	3		11-10-93	2,90,300	11-10-96
NARP SR, Vellayani					
Epidemiology of honey bee disease in Kerala and its management	4		1-8-93	6,70,560	31-7-97
College of Horticulture, Vallanikkara					
Cytogenetic investigations of Kaempferia galanga L., Piper longum L. and Andrographis paniculata Brum.	3		28-4-93	4,80,000	27-4-96
NARP SR, Vellayani					
Collection, evaluation, cataloguing and genetic improvement to tailor better commercial varieties with export potential in Anthurim spp.	3		1-4-94	2,80,000	14-12-96
College of Horticulture, Vellanikkara					
Species relationship in the genus piper and the scope of related taxa in the improvement of Piper nigrum L.	3		1-6-94	6,09,000	26-1-97
Technology development for handling and utilization of common type of jackfruit of Kerala	2		15-6-94	1,75,500	26-1-96
College of C and B, Mannuthy					
An evaluation of group management techniques in Agriculture adopted to enhance production and productivity of paddy in Kerala.	3		25-1-94	5,77,500	24-1-97



1	2	3	4	5
<b>College of Horticulture, Vellanikkara</b>				
Standardisation of agrotechnique in foliage plants	3	1-8-94	5,71,458	22-6-97
Triploid breeding of Tetraploid hybrids of Palyankodan (Musa AAB Mysore) x Pisang Lilin (Musa AA Pisang Lilin) for disease resistance	4	1-8-94	4,31,000	26-6-98
Studies on the influence of variety, maturity and storage of Cashew apple on the quality of fermented products (Wine and liquor)	3	20-7-94	7,35,000	19-7-97
Traditional and appropriate technologies for in-situ rain water harvest under humid tropical situations	3	23-6-94	7,77,000	22-6-97
<b>College of Agriculture, Vellayani</b>				
Development of soya rice blended food recipes	3	6-10-94	4,02,000	5-10-97
<b>NARP SR, Vellayani</b>				
Evolving techniques for the invitro propagation of economically important mono and poly embryonic mango varieties of Kerala	2	28-7-94	5,71,000	27-7-96
<b>College of Horticulture, Vellanikkara</b>				
Nutritional studies on the availability of iron	36	2-4-94	2,92,000	31-3-97
<b>College of Forestry, Vellanikkara</b>				
Nutrient cycling in coconut based intensive multiple cropping systems	36	5-4-94	4,28,600	4-4-97

1	2	3	4	5
<b>RARS, Pattambi</b>				
Breeding for resistance to mosaic viruses in chilly ( <i>Capsicum annum</i> L)	3	19-3-94	4,49,680	18-3-97
<b>College of Horticulture, Vellanikkara</b>				
Survey, collection, evaluation, conservation and standardisation of vegetative propagation in five under-exploited minor fruits of Kerala	4	16-2-95	6,39,760	16-2-99
<b>EEC-KHDP, Vellanikkara</b>				
Genetic factors affecting nutrient content in vegetable <i>Amaranthus</i>	3	17-2-95	9,69,760	16-2-98
<b>NARP SR, Vellayani</b>				
Development of improved strains of Oyster mushrooms and standardisation of techniques for their commercial cultivation in Kerala.	3	21-2-95	5,12,000	20-2-98
<b>RARS, Pilicode</b>				
Survey, collection, conservation and utilisation of pickling type mangoes.	5	1-6-95	7,95,740	31-12-99
<b>RARS, Kumarakom</b>				
Studies on mosaic disease of bittergourd	3	1-4-95	2,86,880	31-3-98
<b>College of Forestry, Vellanikkara</b>				
Nutritional composition and decomposition of leaf biomass of selected woody leguminous species grown under rainfed conditions.	3	13-6-95	2,17,400	12-6-98
<b>College of Horticulture, Vellanikkara</b>				
Soil chemical and radio-ecological investigations of root wilt disease of coconut palm	2	21-2-95	1,13,500	20-2-97

1	2	3	4	5
Inter mat-Intra mat and crop competitive studies in banana (cv. palayamkodan) using tracer techniques.	4	4-2-95	3,59,400	3-2-99
EEC-KHDP Programme, Vellanikkara				
Heterosis in chilli and brinjal associated with reference to bacterial wilt	3	25-11-94	4,21,600	24-11-97
RARS, Pilicode				
Influence of weather and soil factor on growth, yield, nut weight and on nut quality of cashew in West and Eastern coast of India	3	1-4-95	3,92,260	31-3-98
AMPRS, Odakkali				
Standardisation of agro-techniques in lesser known aromatic and medicinal plants of Zingiberaceae	3	21-9-93	6,37,100	21-9-93
RARS, Pilicode				
Nitrogen use efficiency in plantation crops	3	22-1-96	4,28,500	21-1-99
College of Horticulture, Vellanikkara				
Rapid multiplication of rare and endangered medicinal plants	3	10-10-95	8,79,000	10-10-98
Rapid multiplication of cashew through in-vitro methods	3	2-12-95	7,03,500	1-12-98
Standardisation of agro-techniques for Anthurium	3	1-12-95	4,78,000	1-12-98
RARS, Pattambi				
Variability in iron and zinc availability in the laterite and lateritic soils of Central Kerala with reference to rice nutrition.	3	23-1-96	4,11,600	23-1-99

1	2	3	4	5
RARS, Pilicode				
Evaluation of Azolla Pinnata strains from Kerala for growth and nitrogen fixation and their effects on rice as biofertilizer in acid soil areas.	3	24-1-96	5,17,000	24-1-96
RARS, Kumarakom				
Pathology of diseases of fresh water fishes with special reference to epizootic ulcerative syndrome	3	6-2-96	4,69,900	6-2-99
RRS, Kayamkulam				
In vitro cloning and improvement of orchids	5	27-2-96	15,05,900	31-12-99
College of Horticulture, Vellanikkara				
Training and extension project for integrated homestead development	3	11-3-96	6,74,740	11-3-99
RARS, Kumarakom				
Ecology and management of rice gall midge, Orseolia oryzae in Kuttanad	3	16-2-96	10,79,760	16-2-99
CAD India Ltd.				
College of Horticulture, Vellanikkara				
Cocoa research collaborative project between KAU and Hindustan Cocoa Products Ltd.	10	1-4-87	32,60,500	31-3-97
Central Silk Board				
RARS, Ambalavayal				
All India Co-ordinated experiments on sericulture	3	25-1-94	5,66,900	24-1-97
College of Horticulture, Vellanikkara				
All India Co-ordinated experiments on sericulture.	3	2-12-93	5,66,900	1-12-95

	1	2	3	4	5
<b>Department of Biotechnology (GOI)</b>					
Tissue culture research on Black Pepper	3	20-2-92	5,71,000	20-5-96	
<b>NARP SR, Vellayani</b>					
Micropropagation of the tree spices in Kerala (Clove and Nutmeg).	3	5-6-92	5,00,000	5-6-95	
Management of root disease of important spice crops of Kerala with VA mycorrhiza	3	22-7-92	4,66,000	22-7-95	
Rhizobium pulses association development of efficient strain of Rhizobium suitable for acid soil conditions.	3	12-5-93	10,46,000	12-5-96	
<b>College of Horticulture, Vellanikkara</b>					
Tissue culture research on humid tropical plantation crops and spices.	5	5-5-94	41,96,000	4-5-99	
Establishment of distributed information sub centre of KAU.	2	6-5-95	15,23,000	5-5-97	
<b>Department of Agriculture and Co-operation (GOI)</b>					
<b>PRS, Panniyur</b>					
Central sector scheme for integrated programme for the development of spices. (Panniyur, Ambalavayal, Mannuthy, Vellanikkara and Pilicode).	1	16-3-94	57,50,000	31-3-97	
<b>AMPRS, Odakkali and COH, Vellanikkara</b>					
Central sector scheme for development of medicinal and aromatic plants.	10	1-4-90	39,15,000	31-3-98	

	1	2	3	4	5
<b>CRS, Madakkathara</b>					
Central sector scheme for integrated Cashew Development - Establishment of Madakkathara Centre.	3	21-2-94	8,00,000	31-3-97	
<b>RARS, Pilicode</b>					
Central sector scheme for the Integrated Cashew Development Establishment of Pilicode Centre.	3	21-2-94	4,00,000	31-3-97	
<b>KCAE &amp; T, Tavanur</b>					
Establishment of plasticulture development centre at Tavanur.	2	4-8-95	14,50,000	3-8-97	
<b>FSRS &amp; KVK, Kottarakkara</b>					
Central sector scheme on cashew Establishment of Regional Nursery, at FSRS, Kottarakkara.	4	14-8-95	12,00,000	13-8-99	
<b>Department of Science &amp; Technology (GOI)</b>					
<b>RARS, Pilicode</b>					
Crop growth simulation models rice.	2	6-8-92	2,13,620	5-5-95	
<b>College of Horticulture, Vellanikkara</b>					
Agrometeorological investigation on summer vegetables.	3	12-6-95	7,29,658	11-6-98	
<b>RARS, Pilicode</b>					
Starting of experimental agrometeorological advisory services at RARS Pilicode.	1	20-7-95	1,00,000	19-7-96	
<b>College of Horticulture, Vellanikkara</b>					
Solid waste management with special emphasis on sustainable agriculture.	2	22-7-95	5,30,300	21-7-97	

	1	2	3	4	5
<b>Department of Animal Husbandry, (GOK)</b>					
<b>NARP SR, Vellayani</b>					
NWDPRA—Research project for various agroclimatic zones.	1	3-8-95	19,40,000	2-8-96	
<b>RARS, Pattambi</b>					
NWDPRA—Research project for various agroclimatic zones.	1	3-8-95	1,96,000	2-8-96	
<b>RARS, Kumarakom</b>					
NWDPRA—Research projects for various agroclimatic zones.	1	3-8-95	8,12,700	2-8-96	
<b>RARS, Ambalavayal</b>					
NWDPRA—Research project for various agroclimatic zones.	1	3-8-95	6,60,000	2-8-96	
<b>AMPRS, Odakkali</b>					
NWDPRA—Research project for various agroclimatic zones.	1	3-8-95	4,20,000	2-8-96	
<b>Department of Atomic Energy, GOI</b>					
<b>College of Horticulture, Vellanikkara</b>					
Studies on coconut palm in coastal Quilon district of Kerala.	3	21-7-93	4,60,870	21-7-96	
<b>Directorate of Cocoa, Arecanut and Spices Development</b>					
Establishment of the Nursery for distribution of budded Cocoa plants and hybrid seedlings at the KAU.	5	7-9-93	11,18,000	7-9-98	
<b>Department of Soil Conservation</b>					
<b>NARP SR, Vellayani</b>					
Field testing of tissue culture plants and training in plant tissue culture operations (One center at Vellayani and 3 centres at Vellanikkara).	1	1-7-94	5,00,000	30-6-95	

	1	2	3	4	5
<b>EEC - KHDP Programme, Vellanikkara</b>					
Research and Development and breeder seed production programme of Kerala Horticulture Development Programme.	5	1-1-94	1,56,00,000	31-12-99	
<b>FACT</b>					
<b>College of Horticulture, Vellanikkara</b>					
Evaluation of slow release fertilizers for important crops of Kerala.	3	27-5-95	6,00,000	26-5-98	
<b>FAO - IPM, Philippines</b>					
<b>NARP SR, Vellayani</b>					
Extension-cum-demonstration of integrated pest management in rice in Kuttanad of Alappuzha district, Kerala.	1	31-7-95	21,900	30-7-96	
<b>ICSSR</b>					
<b>College of C &amp; B, Mannuthy</b>					
Organisational alteration for development A study on the role of Govtl. & Non-Govtl. organisations for rural development in Kerala.	18	24-9-94	37,800	23-3-96	
<b>ISRO GBP, National Natural Reso. Mgmnt. B'lore</b>					
<b>KCAE &amp; T Tavanur</b>					
Remote sensing based soil vegetation atmospheric transfer (SVAT) models for rice ecosystem of South India.	3	19-12-95	75,000	19-12-98	
<b>Kerala Community Irrigation Project</b>					
<b>College of Horticulture, Vellanikkara</b>					
Analysis of the impact of irrigation in coconut gardens in Thrissur district.	1	5-12-95	2,00,000	31-3-96	



1	2	3	4	5
<b>Kerala Forest Development Fund</b>				
<b>College of Forestry, Vellanikkara</b>				
Clonal propagation of Rosewood through tissue culture.	3	17-8-93	45,000	17-8-96
Standardisation of nursery techniques of selected tropical forest tree species.	2	2-8-93	50,000	2-8-95
Viability of Hopea Parviflora (Bedd.) seeds with reference to temperature, medium of storage and microencapsulation techniques.	2	2-12-94	40,000	1-12-96
Compilation and publication of checklist of Indian Mammals	1	15-2-96	60,000	15-3-96
<b>MARICO Industries limited Bombay</b>				
<b>RARS, Pilicode</b>				
Climate and Coconut	5	1-6-94	7,82,000	1-6-99
<b>Ministry of Water Reso. (GOI) &amp; CADA (GOK)</b>				
<b>KCAE &amp; T, Tavanur</b>				
Weed control and moist conservation using LDPE	3	28-4-95	2,16,000	27-4-98
<b>ARS, Mannuthy</b>				
Development of mulch-cum-drip and sub-surface pad irrigation systems for vegetables	3	6-5-95	5,87,000	5-5-98
<b>National Horticultural Board</b>				
<b>College of Horticulture, Vellanikkara</b>				
Pilot testing of technology of Papaya based products	3	4-5-94	3,52,000	3-5-97
Transfer of Technology in low cost nursery production and management technique	3	2-7-94	3,61,000	1-7-97

	1	2	3	4	5
Other Depts. (GOK)					
College of Forestry, Vellanikkara					
Habitat utilisation of animals and their parasitic burden with special reference to elephants in Vazhachal forest Division.	2	20-4-94		40,465	19-4-96
LRS, Thiruvazhamkunnu					
Establishment of forage and seed production units through effective utilisation of waste lands.	5	20-4-94		3,36,000	19-4-99
Potash Research Institute of India.					
NARP SR, Vellayani					
Standardisation of plant part as an index of potassium status in banana, musa Nendran	3	20-8-93		22,600	20-8-96
College of Horticulture, Vellanikkara					
Root activity studies on rubber using p 32 as a tracer	2	24-9-93		80,000	23-5-95
STEC/STED (GOK)					
Bio-ecological studies on the odonata (Dragon flies) with special reference to their predatory potential in the biological control of important rice pests.	3	23-4-92		24,000	23-4-95
NARP SR, Vellayani					
Monitoring of pesticide residues in milk and milk products in Kerala	3	1-9-92		67,500	1-9-95
Impact of sustainable farming practices on soil properties and crop productivity.	3	27-7-93		75,000	27-7-96
Potential of Bioagents (Bacillus macerak and Bacillus circulans) for the control of root knot nematode in the field	2	19-5-93		10,000	19-5-95

1	2	3	4	5
Studies on pesticide residues in meat body fat, blood and various organs of animals slaughtered for meat purpose.	3	16-10-93	70,000	16-10-96
College of Fisheries, Panangad				
Pesticide induced histopathological changes in selected fresh water fishes of Kuttanad, Kerala.	2	22-2-94	50,000	21-2-96
NARP SR, Vellayani				
Monitoring of residues of insecticides in vegetables collected from the markets of Kerala.	3	6-12-94	73,000	5-12-97
College of Agriculture, Vellayani				
Post harvest studies on processed products made from mangoes and pappaya.	2	5-12-95	25,000	4-7-97
NARP SR, Vellayani				
Recycling of vegetable garbage by vermiculture biotechnology	3	30-5-94	2,04,600	30-5-97
Development of mycoherbicides for the biocontrol of water hyacinth (Eichhornia crassipes (mart) solms)	3	28-8-95	75,000	27-8-98
Emeritus scientists fellowship Compilation of a compendium on crop improvement research in Kerala	1	27-2-96	30,000	27-2-99
USDA/FERRO				
College of Forestry, Vellanikkara				
Light utilization and canopy nitrogen use efficiency of component crops in some selected agroforestry systems	3	25-8-93	9,06,800	25-8-96

	1	2	3	4	5
<b>FACULTY: AGRICULTURAL ENGINEERING</b>					
<b>ICAR Co-ordinated Project</b>					
<b>KCAE&amp;T, Tavanur</b>					
AICRP on Farm Imple- ments & Machinery	5	1-4-90	7,12,000	1-4-95	
AICRP on energy requirements in Agri- culture sector	5	22-10-93	19,03,500	21-10-98	
<b>ICAR Adhoc Scheme</b>					
Development, testing and introduction of low and medium head, high discharge pumps.	3	1-6-95	8,27,800	31-5-98	
<b>Kole Land Development Agency Thrissur</b>					
Introducing mechani- sation programme for harvesting and threshing in kole lands of Thrissur and Malappuram districts	2	15-6-95	9,22,000	14-6-97	
<b>CAPART Scheme</b>					
<b>College of Horticulture, Vellanikkara</b>					
Modification of 'Petty & Para' to improve its efficiency and economy. (Functioning at COH, Vellanikkara	3	21-10-91	11,28,000	31-3-96	
<b>FACULTY: FISHERIES</b>					
<b>ICAR Adhoc Scheme</b>					
<b>Fisheries Station, Puduveyyu</b>					
Seed resources and production potential of selected carnivorous fishes in the south west coast of India-	3	9-2-95	4,49,000	8-2-98	
<b>Wasteland Development Board</b>					
Demonstration and Training model for a fishery based farming system in coastal waste land implemented at Fisheries Station Puduveyyu	3	23-9-94	12,49,000	22-9-97	

	1	2	3	4	5
<b>FACULTY:VETERINARY AND ANIMAL SCIENCES</b>					
ICAR Co-ordinated					
College of Vety. and Ani. Sci., Mannuthy					
AICRP on Poultry	5	1-4-90	69,92,000	1-4-95	
PBF, Mannuthy					
AICRP on Pigs	5	14-7-93	49,14,000	30-4-98	
College of Vety. and Ani. Sci., Mannuthy					
Field progeny testing project at Mannuthy	5	1-1-94	22,82,000	31-12-98	
Network programme on micronutrients in Animal Nutrition and production Implementation.	5	14-7-94	31,32,000	31-3-98	
Network programme on embryo transfer technology in animal production	3	12-12-94	30,00,000	31-3-97	
ICAR					
Centre of advanced study in veterinary pathology	3	25-1-95	41,25,000	24-1-95	
ICAR Adhoc					
Conservation of germ-plasm of Vechur Cattle of the coastal area and dwarf cattle of the high range of Kerala	3	13-10-92	25,52,000	30-6-96	
Effect of Tannin rich feeds on bypass protein availability	3	18-8-94	70,6,550	17-4-97	
Development of Cell culture duck plague vaccine for simultaneous vaccination with duck pasteurellosis.	3	1-7-95	9,18,940	1-7-98	
Aetiopathology and diagnosis of bovine mastitis	3	28-4-95	10,87,000	27-4-98	

1	2	3	4	5
Fungal Mastitis of animals with special reference to yeast mastitis	3	5 6-95	3,27,140	4 6-98
Centre for Adv. Studies in Plty. Sci. Mannuthy				
Characterisation and evaluation of native ducks in Kerala	2	16-9-95	68,000	15-9-97
Coconut Development Board				
College of Vety. Animal Sci., Mannuthy				
Development and standardisation of Dairy foods incorporating coconut	2	18-06-94	5,00,000	17-6-96
Dept. of Agriculture, Thiruvananthapuram				
Survey to evaluate SNF and Fat content of cows milk in Kerala	1	6-12-95	4,00,000	5-12-96
Dept. of Biotechnology (GOI)				
Molecular characterisation of duck plague virus	3	14-6-95	23,59,000	13-6-98
Dept. of Science & Technology (GOI)				
AICRP on Poultry, Mannuthy				
Introduction of cage system in egg production in the home-steads	3	27-3-95	8,14,000	26-3-98
Preliminary investigation on reproductive pathology in two strains of white leghorn with emphasis on endocrine system	1	18-11-95	1,80,600	17-11-96
Dept. of Animal Husbandry, (GOK)				
College of Vety. and Ani. Sci., Mannuthy				
Investigations on mortality of Ducks in Kuttanad, Kerala	3	17-4-93	1,50,000	17-4-96
Ascitic syndrome in poultry	2	28-1-94	20,000	27-10-96

1	2	3	4	5
Schistosomiasis in cattle in buffaloes in Thrissur and Palakkad districts	2	15-1-94	70,000	14-1-96
Etiology, diagnosis and control of Mastitis in crossbred Cattle	3	6-1-94	80,000	5-1-97
Kid Mortality	3	7-2-94	40,000	6-2-97
Infertility in crossbred cows with special reference to endome- tritis and remedial measures	2	16-9-95	40,000	15-9-97
Mortality among kids with special reference to gastro-intestinal nematodes	1	16-9-95	50,000	15-9-96
Coccidiosis in Poultry	2	16-9-95	50,000	15-9-96
<b>NABARD</b>				
Bioconservation tech- nology to augment the nutrient utilization of agro industrial bye- products for ruminants	3	1-12-95	9,26,780	30-11-98
Total outlay			16,75,47,401	

**TABULATED STATEMENT OF RESEARCH SCHEMES OPERATED  
BY DIRECTORATE OF RESEARCH DURING THE PERIOD  
1/4/95-31/3/96**

	Faculty				Total
	Agri.	Ag. Engg.	Fish	Vety	
Co-ordinated (75%-25%)	25	2	0	5	32
.. (100%)	1	0	0	1	2
Ad-hoc	43	1	1	6	51
NARP	0	0	0	0	0
External aided (100%)	58	1	1	14	74
External Aided (75%-25%)	0	1	0	0	1
<b>Total</b>	<b>127</b>	<b>5</b>	<b>2</b>	<b>26</b>	<b>1608</b>

## Appendix VII

### NEW HIGH YIELDING VARIETIES/CULTURES PROPOSED FOR EVALUATION AND RELEASE

Crop	Culture/ Selection	Evolved at	Remarks
1	2	3	4
Rice	Mangala Mashuri (RM-1)	RARS, Pattambi	Suited to ill-drained and temporarily flooded areas. Average yield 4554 kg/ha. Selection from Mashuri.
—	Vyttila-5 (KAU-655)	RRS, Vyttila	Mutant of Mashuri recommended for Pokkali and other flood prone areas. Average yield 3250 kg/ha.
—	Ranjini Mo-12	RRS, Moncompu	Average yield 3201 kg/ha. Resistant to blast, sheath blight, sheath rot and BPH.
Vegetable Cowpea	KMV-1	RARS, Kumarakom	Selection from Manjeri Red Plan. Average yield 13.5 t/ha. High protein content. Duration 90-120 days.
Winged beans	Revathy (RT-52)	COH, Vellanikkara	Average yield 600-700 g/plant. Immature pods contained 2.5% protein.
Brinjal	Swetha (SM-6-6)	—	Selection from SM-6. Cooking quality excellent. Tolerant to fruit borer. Yield potential 31.5 t/ha.
Chilli	Ujwala (CA. 219)	—	Clustered wilt resistant variety. Average yield per plant 713 g. Resistant to bacterial wilt and free from leaf curl and mosaic diseases.



1	2	3	4
Bitter-gourd	Priyanka (Sel. 1010)	SRS, Thiruvalla	Average fruit yield 28 t/ha. Tolerant to downy mildew.
—	Preethi (MC-84)	COH, Vellanikkara	Average fruit weight is 310g Duration 120 days.
Sugarcane	Madhurima (Cul. 527/5)	SRS, Thiruvalla	Cross from Co 740 x Co 7318. Tolerant to red rot disease. Average yield 125 t/ha.
Pepper	Panniyur-5 (Cul. 339)	PRS, Panniyur	Average yield 3070 kg/ha. Suitable for mono cropping and companion cropping
Long Pepper	Viswam (KAU-LP-1)	COH, Vellanikkara	Selection from Cheemathipali. Average yield 317 t/ha. Alkaloid content 2.83%.
Turmeric	Kanthi (VK 47)	—	Average yield 7.3 t/ha. Curcumin content 7.18%. Oleorosin content 12.13%.
Cashew	Dharasree (H-3-17)	CRS, Anakkayam	Hybrid progeny of Kottarakara x Brazil 18. Flowers early, mean yield 15 kg/tree/year. Suitable for laterite and red loam soils.
—	Sulabha (K-10-2)	—	Bold nuts with high yield and superior kernel characters. Suited for export purposes. Mean yield 23 kg/tree/year.
Oyster Mushroom	Ananthan (Vellayani-P2)	COA, Vellayani	Tolerant to Trichoderma disease. Pure white in colour, fleshy and impricute

## Appendix VIII

### STATUTE AMENDMENTS

#### I. Statute Amendments

Name of Statute	Amendment Notification No.	Date of Publication in Gazette
1. SRO No.70/72	GA/E3/34198/90 (i) dt. 21.3.95	4.4.95
2. SRO No.264/72	GA/E3/34198/90 (ii) dt. 21.3.95	4.4.95
3. SRO No.1112/79	GA/E3/34198/90 (iii) dt. 21.3.95	4.4.95
4. SRO No.1245/86	GA/E3/34198/90 (iv) dt. 21.3.95	4.4.95
5. Statute issued vide G.O. (MS) No. 34/82 AD dt.15.1.82	GA/E3/7934/95 dt. 4.4.95	16.5.95
6. SRO No.583/80	GA/E3/48854/92 dt. 5.7.95	22.8.95
7. SRO No.1112/79	GA/E3/6738/90 (i) dt. 18.8.95	19.10.95
8. SRO No.1245/86	GA/E3/6738/90 (ii) dt. 18.8.95	19.10.95
9. SRO No.447/72	GA/E3/4573/95 dt. 26.12.95	30.1.96

#### II. Act amendment

Amendments to Sub Section 4 of Section 42 of KAU Act (Act 33 of 1971) issued vide Notification No. 10673/leg. B1/95 Law dt. 7.7.95

## Appendix IX

### WORKS EXECUTED DURING THE YEAR 1995-96

Major civil works conducted by the Directorate during 1995-96

Sl.No.	Name of work	Amount
1	2	3
1.	Construction of Sales Centre and Information Centre at College of Agriculture, Vellayani	— 3,94,237
2.	Construction of Hostel and dining block for College of Forestry at Main Campus, Vellanikkara	— 2,08,553
3.	Construction of Academic Block at KCAET, Tavanur	— 22,29,391
4.	Construction and electrification to Training Complex at KCAET, Tavanur	— 7,96,887
5.	Construction of Trainees Hostel at KCAET, Tavanur	— 14,37,266
6.	Low cost housing—Construction of Type I Quarters (10 nos.) at KCAET, Tavanur	— 2,23,892
7.	Construction of buffalo shed at ULF, Mannuthy	— 6,55,201
8.	Construction of a Carp-cum-prawn hatchery at Fisheries College, Panangad	— 25,74,866
9.	Construction and furnishing of Academic Block at Fisheries College, Panangad	— 3,09,568
10.	Construction and furnishing of Ladies Hostel at College of Fisheries, Panangad	— 2,61,955
11.	Waste land development project on demonstration on training model for fishing based farming system in a coastal waste land—Construction of pond canals at Instructional Farm, Puduveypu	— 10,59,981
12.	Construction and electrification of additional classroom and seminar hall at College of Veterinary and Animal Sciences, Mannuthy	— 6,92,435
13.	Construction and electrification to the Virology and Toxicology Lab at Mannuthy	— 3,06,691

1	2	3
14.	Construction of clinical complex at College of Veterinary and Animal Sciences, Mannuthy	— 20,92,804
15.	Construction and electrification to the additional classroom in the 1st floor of Meat Technology buildings at Mannuthy	— 16,17,674
16.	Interior decoration of main seminar hall and conference hall of Pharmacology and Pathology lab at Mannuthy	— 8,33,618
17.	Renovation of Veterinary Impatient ward and construction of waiting shed at College of Veterinary and Animal Sciences, Mannuthy	— 3,35,834
18.	Construction and electrification of the farming houses at Pig Breeding Farm, Mannuthy	— 10,25,231
19.	Construction of compound wall along the roadside of the 'B' Block at CRS, Balaramapuram	— 2,44,078
20.	NARP Phase II—Providing street light facilities at CRS, Madakkathara and PRC, Vellanikkara	— 3,33,394
21.	Construction of compound wall at RARS, Ambalavayal	— 2,53,026
22.	NARP Phase II—Providing street light facilities at RARS, Pattambi	— 3,60,802
23.	NARP Phase II—Providing street light facilities at RARS, Pilicode	— 3,40,759
24.	Providing black topping to the existing farm road to the main approach road to PG Hostel at LRS, Thiruvazhamkunnu	— 5,16,496
25.	Construction of lab building for KHDP (EEC), Vellanikkara	— 11,28,796
26.	Construction of drying yard, labourers waiting shed, seed store, compound wall etc. KHDP, Vellanikkara	— 3,98,596
	Plan Scheme	— 3,08,59,573 (308 lakhs)
	Non-plan Scheme	— 1,07,88,025 (107 lakhs)

□□