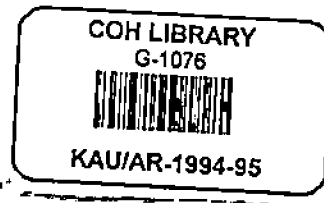


# **ANNUAL REPORT**

**1994 - '95**

G 1076



**KERALA  
AGRICULTURAL  
UNIVERSITY**

English  
ANNUAL REPORT  
1994--'95

March 1996

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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 1994-95 (1.4.1994 to 31.3.1995).

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	.do-
3	Comptroller	Smt. Elizabeth John	-do-
4	Director of Research	Dr. M. Aravindakshan i/c.	Upto 2.9.94 FN
5	-do-	Dr. G. Ravindranathan Pillai i/c.	2.9.94 to 7.9.94
6	-do-	Dr. N. Mohanakumaran, ADR i/c.	7.9.94 onwards
7	Director of Extension	Dr. V. K. Sasidhar Professor i/c.	Upto 27.6.94 AN
8	-do-	Dr. E. Thajuddin, Professor i/c.	27.6.94 AN onwards
9	Director of Physical Plant	Sri. P. O. Thomas	Throughout the period
10	Dean (Agri.)	Dr. C. Sreedharan i/c.	.do-
11	Dean (Vety)	Dr. A. Rajan	-do-
12	Dean (Agri. Engg.)	Dr. K. John Thomas i/c.	-do-
13	Dean, Fisheries	Dr. M. J. Sebastian i/c.	-do-

14	Director of Students Welfare	Dr. T. G. Rajagopalan i/c.	Throughout the period
15	Assoc. Dean (Horti.)	Dr. C. C. Abraham i/c.	-do-
16	Assoc. Dean(C&B)	Dr. M. Mohandas i/c.	-do-
17	Special Officer (Forestry)	Sri. Nagesh Prabhu, IFS	Upto 20.4.94
	-do-	Dr. U. Mohammed Kunju i/c.	20.4.94 to 20.6.94
	-do-	Director (Acad. & P.G.S.)	20.6.94
	-do-	Dr. S. Chinnamani, IFS	20.6.94 to 16.11.94
	-do-	Dr. P. A. Wahid, Professor i/c.	16.11.94 to 17.4.95
18	Special Officer College of Agriculture, Pilicode-Nileswar	Dr. U. Mohammed Kunju	11.7.94 onwards

## EDUCATION

The following 8 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 Sci. (FS & N)
College of Horticulture, Vellanikkara	B. Sc. (Ag), M. Sc. (Ag), M. Sc. (Hort) and Ph. D., M. Sc. Home Sci. (FS&N), M.Sc. (Agri. Stat.)
College of Veterinary & Animal Sciences, Mannuthy	B. V. Sc. & A. H., M. V. Sc. and Ph.D.
College of Fisheries, Panangad	B. F. Sc. & M. F. Sc.
Kelappaji College of Agri. Engg. and Technology, Tavanur	B. Tech. and M. Tech. (Agrl. Engg.)
College of Co-operation and Banking, Mannuthy	B. Sc. (C&B) and M. Sc. (C&B)
College of Forestry, Vellanikkara	B. Sc. (Forestry and M. Sc. (Forestry)
College of Agriculture, Pilicode-Nileswar	B. Sc. (Ag)

### Admission

Students are admitted to the U. G. courses of the University on the basis of ranks obtained by them in the Common Entrance Examination conducted by the Government of Kerala. For P. G. 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 below:

Degree	No. admitted	No. passed out
B. Sc. (Ag)	182	102
B. V. Sc. & A. H.	117	112
B. F. Sc.	42	9
B. Sc. (C&B)	25	11
B. Sc. (Forestry)	14	—
B. Tech. (Ag. Engg)	24	15
M. Sc. (Ag.)	62	49
M. Sc. (Hort.)	21	12
M. Sc. (Ag. Stat.)	4	1
M. Sc. (Forestry)	9	2
M. Sc. (C&B)	—	1
M. Sc. (FS & N)	10	3
M. Tech. (Ag. Engg.)	8	1
M. V. Sc.	35	22
M. F. Sc.	5	5
Ph. D. (Agriculture)	20	10
Ph. D. (Veterinary)	7	3
Ph. D. (Home Science)	1	1
<b>Total</b>	<b>586</b>	<b>359</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
a) UG Courses	
B. Sc. (Ag)	63
B. V. Sc. & A. H.	706
B. F. Sc.	127
B. Sc. (C&B)	95
B. Sc. (Forestry)	78
B. Tech (Ag. Engg.)	97
B. Sc. (D. Sc. & Tech)	42



1	2
<b>b) PG Courses</b>	
M. Sc. (Ag)	204
M. Sc. (Hort)	43
M. Sc. (Ag. Stat)	10
M. Sc. (C&B)	4
M. Sc. (Forestry)	12
M. Sc. (F. S. & N)	24
M. Tech (Ag. Engg)	17
M. V.Sc.	55
M. F. Sc.	10
Ph. D. (Agriculture)	108
Ph. D. (Vety. & Animal Science)	31
Ph. D. (Home Science)	4

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 co-ordinated by the Director of Students Welfare through physical education teachers and other teachers of various colleges. The Directorate of Students Welfare organised Inter-Collegiate tournaments for various games and sports during the year.

The Kerala Agrl. University continued to be a member of the Association of Indian Universities and Indian Agrl. Universities Association. The newly established College of Agriculture, Nileswar started functioning during the period under report.

## RESEARCH

Significant achievements could be made in solving location specific field problems confronted by the farmers of the State by reorienting the research programmes of the University. Problem oriented location specific research conducted have helped in evolving technologies and developing new varieties to boost agricultural production of the state in a sustainable way. Sixty externally aided projects have been sanctioned to KAU in important areas of research. In addition to the state funds the University has also received assistance from ICAR, World Bank, USDA, FERRO, Department of Electronics, Hindustan Cocoa products Ltd. DST, Central Silk Board, Coffee Board and various other agencies.

The five Regional Agricultural Research Stations established under NARP for conducting location specific problem oriented research for Southern, Central, Northern, High Range and Special Zone of Problem areas continued to function at Vellayani, Pattambi, Pilicode, Ambalavayal and Kumarakom respectively under the technical and administrative control of the concerned Associate Director of Research and the overall control of the Director of Research.

The following important meetings were held at the Directorate of Research during the period

- 1 Peer Group Meeting for assessing workload of Scientists
- 2 Labour norms fixation committee meeting
- 3 Meeting of all Associate Directors and Director of Research with IDA Supervision Mission
- 4 Meeting to discuss the research support to NWDpra
- 5 Plan Review Meeting
- 6 Meeting of Land Resource management
- 7 Project Co-ordinators Meeting
- 8 Meeting of Zonal Associate Directors of Research
- 9 Meeting to discuss the State Agricultural Fair 1994
- 10 Meeting of Associate Directors with regard to NARP regional meeting at Bangalore
- 11 Meeting of Associate Directors to discuss on NARP regional group meeting at Bangalore
- 12 Meeting of Standing Committee I of the Academic Council
- 13 Meeting of the Committee constituted for screening research proposals

The Zonal Research and Extension Advisory Council Meeting were conducted as shown below

1 Southern Zone	—	20-3-95
2 Problem Zone	—	10-3-95
3 Central Zone	—	8-3-95
4 High Range Zone	—	17-3-95
5 Northern Zone	—	20-3-95

The Faculty-wise details of externally aided research projects/schemes implemented as on 31-3-1995 are given below

Category	Faculty				
	Agri.	Ag.	Engg	Fish	Vety.
Co-ordinated (75%-25%)	24	2	0	5	31
Co-ordinated (100%)	1	0	0	1	2
Ad-hoc	29	0	1	4	34
External Aided (100%)	46	0	2	10	58
External Aided (75%-25%)	1	1	0	0	2
<b>Total</b>	<b>101</b>	<b>3</b>	<b>3</b>	<b>20</b>	<b>127</b>

**New high yielding varieties/cultures recommended by the KAU Variety Evaluation Committee for release**

Crop	Name Culture/Selection	Evolved at
Rice	Mangala-Mashuri	RARS, Pattambi
Rice	Vyttila-5/Ranjini	RRS, Vyttila
Rice	Ranjini/KAU-M-18-1-1	RRS, Moncompu
Vegetable Cowpea	KM-V-1/VS 4	RARS, Kumarakom
Cashew	Dharashree/H-3-17	CRS, Anakkayam
Cashew	Sulabha/K-10-2	CRS, Anakkayam
Sugarcane	Madhurima/Cul-527/85	SRS, Thiruvalla
Pepper	Panniyur-5/Cul-239	PRS, Panniyur
Bittergourd	Selection 10-10	SRS, Thiruvalla
Chilli	Ujwala/CA 219	COH, Vellanikkara
Brinjal	Swetha/SM-6-6	COH, Vellanikkara
Long Pepper	KAU-LP-I (Viswam)/ Cheema Thippali	AICRP on M & Ap. Project, CO H., Vellanikkara
Oyster Mushroom	Vellayani-P2/HII (2)	Dept. of Pl. Path., COA, Vellayani
Turmeric	Kanthi	COH, Vellanikkara
Winged bean	Revathy	COH, Vellanikkara.

**Major research Achievements**

*Rice and Rice based cropping system*

Thonnuran and Jyothi are promising varieties for Pilicode region other than Cul 1727.

The experiment on the identification of collateral hosts of causal organism of the udbatta disease of rice revealed that the common weed *Panicum repens* found in the rice fields harboured the pathogen.

In the evaluation of scented rice varieties, Jeerakashala recorded the highest grain yield (2887 kg/ha) followed by Gandhakasala (2217 kg/ha).

The CERES Rice model can be used for simulating grain yield of kharif, while it needs revalidation of Rabi.

Drainage needs of rice indicated significant difference in crop parameters between the sub surface drained area and control where farmers adopted only surface drainage according to their local practices.

Mangala Mashuri—A selection from Mashuri was released.

Application of herbicides alone on the third day of seeding resulted in severe mortality of rice seedling while addition of safener significantly improved seedling stand.

The ionic mechanism of salinity tolerance in rice genotype viz. Pokkali was identified as due to the compartmentalisation of sodium in the underground portion. In Chettivirippu salt exclusion mechanism also contribute to salinity tolerance. The high yielding variety Jaya is found to be susceptible to salinity owing to higher uptake and translocation of sodium and calcium coupled with reduced uptake and translocation of potassium to aerial parts.

A blast resistant culture KAU M 28-1-1 (MOS/improved sona) was released as MO 12 (Renjini).

#### *Aromatic and medicinal plants*

Morphological description of 423 accessions of lemongrass was made.

A lemongrass type with higher content of geranyl acetate which has high demand in perfumery industry has been identified.

A high eugend yielding cinnamon type has been identified.

#### *Vegetable crops*

The improved line of Melon (CS-1) was relatively tolerant to pests and diseases. Organoleptic test conducted to assess the bitterness revealed that the bitterness is confined to placental region only.

The percentage of incidence of Rhizoctonia leaf blight was significantly reduced in both 0.4% mancozeb in cowdung supernatant (Cds) and mancozeb in water treatments. Copper oxychloride 0.4% either above or in Cds caused significant reduction in incidence and intensity of this disease and the quality of the treated foliage was seriously impaired due to the blue coloured copper deposits on the foliage.

Snake gourd variety Kaumudi gives an average yield of 50t/ha. Its white colour with thick flesh and less fibre content has got great acceptance among farmers. Sowing in the month of September and October is the best to raise a mosaic free crop of pumpkin. Bubbler irrigation was found to be more effective than drip irrigation for bitter gourd. A short duration tapioca variety suitable for growing as an intercrop in coconut garden has been evolved.

#### *Fruits and floriculture*

The research conducted on mango revealed comparable fruit size, desirable physical characters such as reduced peel and stone contents and increased pulp content with slight inferior quality in respect of TSS for the fruits of Alphonso and Bangalora varieties from Palakkad district.

In cashew the hybrid H 1600 performed better in vegetative growth. The cashew nut yield was maximum in VLA 394 followed by the hybrid H 1591. The nut size and kernel weight were also maximum in H1591.

In Nendran banana August planting recorded higher bunch weight (9.198 kg.) followed by July planting (9.172 kg). December planting resulted in poor growth and yield.

#### *Banana*

Foliar application of Micro nutrients viz., Zn., Fe & Mn in single and in combination of Zn+Fe, Zn+Fe+Cu+Bo+Mn and soil application of commercial forms of micro nutrients was effective in enhancing growth, while soil application enhanced yield in banana.

Pseudostem borer was an important pest in Trichur district and experiments for the control of this pest was laid out.

#### *Coconut and coconut based cropping system*

Among the germplasm collection, coconut cultivars, Kudat and St. Vincent are the top yielders. The nut yield in coconut was not affected when irrigation was provided 450 lits./palm/week till water is available during summer. The equation developed using the moisture adequacy during summer and the humidity index during rainy season could explain 90% variations in nut yield of coconut. Hence, the equation can be used for predicting nut yield based on weather variables.

#### *Pulses and Oil Seeds*

Application of improved technology showed significant improvement in growth and yield of cowpea over traditional management practices. Variety played an important role.

Two ground nut cultures viz. Cul. 614 and Cul. 608 were found to be promising in summer rice fallows.

#### *Cashew*

Application of neem oil 5% on the tree trunk upto 1 m height is effective from preventing the attack of stem and root borer of cashew for a period of three months.

#### *Sugarcane*

Results of weedicidal trials conducted at Menonpara proved that, weed growth in Sugarcane could be controlled economically by two application of weedicide; one with Atrazine or 2,4-D immediately after planting and another 8-10 weeks after planting.

### *Plant Protection*

An experiment conducted with 6 treatments for the control of fruit fly in mango indicated that tulsi trap attracted and killed large number of male fruitflies. Spraying malathion 0.1% containing 1% sugar at monthly intervals combined with placement of tulsi traps could reduce fruit fly infestation in mango. For the control of basal swelling and wilt of cowpea, causing by *Fusarium* species, drenching followed by spraying copper oxychloride at 0.4% were found to be equally effective. Emulsified plant extracts of *Hyptis suaveolens* at 10% was effective against pea-aphid.

Studies on phytophthora foot rot and nematode management showed that minimum defoliation (4.03) and foliar yellowing (3.35%) was noticed in treatment receiving all cultural practice + 1 kg neem cake + 3 g a. i. phorate + 1% bordeaux mixture + drenching with 0.2% copper oxychloride.

Contaf (Hexaconazole) is effective against sheath blight disease of rice @ 2 ml/l and is comparable with Validamycin.

Izazophos (Miral), a systemic insecticide granule was effective against rice stem borer and gall midge when used @ 0.6 kg ai/ha.

### *Spices and Condiments*

Among 40 cultivars of turmeric maintained in the germplasm Amalapuram recorded the highest yield (42.80 tonnes ha) followed by Sugandham (42.01 t ha).

Among the 10 cultures/cultivars of pepper, tried for mixed cropping in arecanut garden, Panniyur-5 with mean green berry yield of 2.97 kg stood first followed by culture 406 (2.53 kg) and Karimunda (2.12 kg).

Pongalyam (*Ailanthus malabaricum*) was found to be the best live standard for growing pepper vine, followed by subabul ordinary and Erythrina.

### *Soils and Agronomy*

The indiscriminate use of complex fertilizers such as factomphos results in imbalanced nutrition leading to heavy pest and disease incidence.

In the irrigation cum fertilizer trial, of two black pepper cultivars, irrigation at IW/CPE ratio of 0.25 was found to be the best treatment for maximum spike yield.

### **VETERINARY AND ANIMAL SCIENCES**

A total of 900 cross bred animals were typed for haemoglobin. For typing the blood group of bovine more than 46

bovine monovalent blood typing reagents were produced at the College of Veterinary and Animal Sciences. The population was found to be in genetic equilibrium set of H6 locus.

A nucleus stock of Vechur and other dwarf Cattle of Kerala is maintained in the College. The milk fat percentage of Vechur Cattle vary from 4.1-5.8. They are found to be more disease resistant.

Cows milk in which the fat was replaced to the extent of 50% and 100% with coconut milk fat can be effectively utilised for preparation of Mozerella cheese.

Studies on downer cow syndrome revealed that higher incidence of this is among Jersey Cross bred cattle during summer season.

Studies to establish the nutrient requirement of broiler rabbit and to arrive at the optimum age of slaughter indicated that soviet chinchilla broiler rabbit required a crude protein level of 16.2% & 2500 k. Cal of DE per kg. feed for optimum growth. The optimum age of slaughter in terms of economic efficiency was identified to be 53-112 days after weaning.

It was demonstrated by transplantation studies and using various chemotherapeutic immuno suppressive agents that ethmoid cancer could be transplanted in mice successfully employing Cyclosporin and Cyclophosphamide:

By appropriate diagnostic techniques it was clarified that of the various species of animals suspected to have died of rabies only 17 dogs, 16 of cats, 45% of cattle and 12% of goats were only positive for rabies. Therefore, it was possible to save many unwanted vaccination in men and animals. By this way economic loss by way of unwanted vaccination could be prevented.

A modified sellers stain procedures was developed and this was shown to have better diagnostic efficacy.

A retrospective survey studies based on autopsy data revealed that enteritis was the most important disease in cross bred livestock.

Coccidial enteritis and pneumonia were identified to be the most important disease of goats.

Aflatoxin was demonstrated in the peripheral blood of animals bearing ethmoid carcinoma. They indicated its possible role in the actinopathogenesis of ethmoid carcinoma.

Studies conducted to synchronise oestrus in cross bred cows revealed that prostaglandin F2 $\alpha$  could be used successfully to induce oestrus in crossbred cows and heifers. Physical changes of reproductive tract like vulval oedema; hyperaemia of vulval mucosa, nature of vulval discharge, toxicity of uterine horns were similar or even better than natural oestrus. Majority of animals showed medium to high intensity of oestrus conception rate at the induced oestrus was better compared to natural oestrus.

It was found that whey solids in condensed form can be successfully incorporated in yoghurt as a replacement for skim milk powder. This increased the nutritive value of yoghurt and at the same time utilise a portion of milk solids which otherwise is wasted. This type of yoghurt was found to be a good vehicle for *Bifido Bacterium Bifidum*.

Studies on cytogenetic analysis of crossbred bulls revealed thirty pairs of chromosome and it is observed that the G-banded Karyotypes were similar to that of standard Karyotypes of cattle.

A modified intradermal test was developed for the diagnosis of paratuberculosis in goats. It gave a better result than the conventional intradermal test.

Bupacaine hydrochloride at 0.5% and 0.25% were found effective in inducing anaesthesia by nerve block.

From diseased ducks from Kuttanad area six strains of *Pasteurella anatipestifer* were isolated. These isolates were sensitive to chloramphenicol, neodox, flemiguine and pefloxacin pathogenic studies revealed that guinea pigs are refractive to infection by this organism. Bacterine prepared of these isolates were found more effective if given with adjuvant. Duck plague virus was isolated from two cases.

The research study among dairy farmers of Kerala State has revealed the need to validate farmer formulated rations for dairy cattle, for sustainable dairy farming. It has revealed the role of farmers as experimenters and disseminators and has helped in mapping the information system for feeding dairy cattle.

## FISHERIES

Continuous rearing and brood stock management of *Lates calcarifer* indicated that the quantum of growth increment in respect of length and weight was declining relative to aging process.



Controlling silt load by judicious water management in turbid water pond systems could result in higher survival and production of *chanos*.

#### AGRICULTURAL ENGINEERING

Development and tested the following implements successfully.

Power tiller operated transplanter for conventional seedings. Rotary type black pepper cleaner. Low cost power operated paddy thresher cum winnower. Pit digger for laterite terrain.

#### 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 CAR 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 45 Agricultural Seminars organised at Thrissur, Palakkad, Kozhikode, Malappuram, Alappuzha and Thiruvananthapuram district in which 3499 farmers were trained. Five hundred 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 180 letters seeking information on agriculture and allied subjects through mail. Besides 33 diagnostic field visits were also conducted during the period under report.

The Publication unit brought out 99 non-periodical technical publications which included 8 books and booklets and 11 leaflets. Kalpadhenu—the quarterly Malayalam magazine was also brought out from the centre during the period under report.

The Exhibition and Graphic unit conducted four exhibitions in and around Thrissur District. Colour transparencies, photographs and blow-ups were also prepared by the unit. Besides a cassette on underground irrigation system was produced. Five other scripts on mushroom cultivation, reproduction in cattle, mycotoxicosis in animals, diseases of ducks and rabbits were under various stages of preparation.

#### WORKS

The provision for the Engineering works for the year 1994-95 was Rs. 350 lakhs under plan and Rs. 55 lakhs under Non-plan. The total expenditure incurred during the period under report was Rs. 247.09 lakhs under plan and Rs. 74.58 lakhs under non-plan, respectively. The budget allotment for works (Plan) include provision of Rs. 126 lakhs earmarked for works under plan entrusted with CPWD.

#### 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 49720.670 kg rubber was produced during the year. The total receipt and expenditure during the year were Rs. 1602538 and Rs. 3581288, respectively.

#### KAU SCHOOL

A total number of 799 students were in the roll during the period. The strength of teaching staff was 18 and that of the non teaching staff 5. The School bagged 1st prize in 'Trichur District Science Fair' during the school year 94-95.

#### FINANCE

The University had adopted a budget of Rs. 5927 lakhs for operation for 94-95 anticipating a grant in aid of Rs. 4005 lakhs (Rs. 3030 lakhs under Non-Plan and Rs. 975 lakhs under plan). From the Govt. ICAR Assistance of Rs. 389 lakhs, Rs. 176 lakhs from other agencies (DBT, DST, Commodity Board etc.) and internal resources of Rs. 430 lakhs were also anticipated. The expenditure during the period under report for various functions of the University was Rs. 4710.38 lakhs against actual receipt of Rs. 4217.48 lakhs.

## CHAPTER I

# General Administration

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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 in the Main Campus. The University has six other teaching campuses, viz. College of Veterinary and Animal Sciences, Mannuthy; College of Co-operation and Banking, 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 incharge 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 eight elected members of the General Council 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 Universities. 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 1994-95, four meetings (64th to 67th) were held. Important decisions taken by the Academic Council were the following:

- 1 Recognised the Indian Institute of Horticultural Research Bangalore as a centre for PG research leading to Ph. D. programme under KAU.
- 2 Agreed in principle to establish a feed processing and technology unit in the Department of Animal Nutrition.
- 3 Revised rules were framed for conducting supplementary examinations.
- 4 Starting of new Agricultural College at Nileswar-Pilicode in Kasaragod district with an intake capacity of 30 students.
- 5 A new clause stating that 'no student will be allowed to temporarily discontinue his/her course of studies during the first two semesters' was incorporated in the UG regulations.
- 6 Decided to start Diploma course in Agricultural Sciences.
- 7 Establishment of a section of sericulture in the Department of Agricultural Entomology.
- 8 Revised the syllabus of the Forestry Degree programme.
- 9 The syllabus and mandatory regulations of B. V. Sc. & A. H. degree programme as per VCI directions were approved in principle.
- 10 Approved to start PG Diploma in Meat Processing Technology.
- 11 Decided to start Ph. D. programme in Rural Marketing Management at the College of Co-operation & Banking, and approved the syllabus.
- 12 Reservation of 16% of the intake capacity of B. V. Sc. & A. H. degree course for the candidates allotted by the Veterinary Council of India, based on All India Entrance Examination from 1995-96 onwards is approved.

### **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 Committee**

- 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 Students 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 proposals 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 1994-1995**

Dr. A. M. Michael continued as Vice-Chancellor of the University during the period of report. He was on leave without allowance for 4 days from 24-5-1994 to 27-5-1994. Dr. A. Rajan, Dean (Vety), was holding charge of the post for the leave period.

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 Review Committee, Research Council, P. G. Committee, Officers Meetings, Faculty Research Committees, Managing Council of Students Union and Students Union Council. He also chaired the Selection Committee Meetings.

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

Attended the public meeting chaired by the Hon. Minister for Agriculture, regarding the starting of new Agricultural College at Pihcode-Neeleswar on 4-4-1994. Inaugurated the Students Union activities of the students of the College of Vety. & Animal Sciences, Mannuthy on 8-4-94. Inaugurated the environmental education—three day training programme organized by Sastra Sahitya Parishad at Thrissur. Participated in the Agricultural University Vice-Chancellors meeting at New Delhi on 28-4-94. Attended the wrap up meeting with World Bank Team on NARP at Kochi on 29-4-94. Participated in the function in connection with the commissioning of Indoor Stadium at Agricultural College, Vellayani, Thiruvananthapuram on 3-5-94. Participated in the inaugural function of the Information and Sales Centre at Regional Agricultural Research Station, Pattambi on 4-6-94. Inaugurated the National Seminar on Fisheries at Panangad, Kochi, on 28-6-94. Attended the function in connection with the release of the fishing boat of the College of Fisheries, Panangad on 28-6-94. Attended the Project Steering Committee Meeting on Water Management at ICAR, New Delhi on 4-7-94. Presided over the Technology Clinic on Ayurvedic Drugs and Herbal Cosmetics at Thrissur on 17-8-94. Participated in the inaugural session of BBPGR Lab building at the Regional Station, Vellanikkara on 23-9-94. Inaugurated the workshop on Consumer Co-operatives in Educational Institutions at College of Co-operation and Banking, Mannuthy on 24-8-94. Inaugurated the mushroom house and the short term training-course on mushroom cultivation at College of Horticulture, Vellanikkara on 5-9-94. Attended the inaugural function of KAU Students



Union at Regional Theatre, Thrissur on 12-10-94. Attended as Chief Guest in the award giving ceremony of Vimala College, Thrissur on 21-10-94. Participated in the plan discussions at State Planning Board, Thiruvananthapuram on 24-10-94. Participated in the inaugural function of Krishi Vigyan Kendra, Sadanandapuram, Kollam District on 29-10-94. Inaugurated the training programme of National Horticultural Board at College of Horticulture, Vellanikkara on 3-11-94. Attended the National Symposium on Management of Ecosystem and Sustainable Utilization of Biological Resources at Thiruvananthapuram on 6-11-1994. Attended and inaugurated the Management Development Programme of ICDP at Ayyanthole. Inaugurated the P. G Department Annual Day of Economic Department of St. Aloysius College, Elthuruthu, Thrissur on 17-11-1994. Participated in the inaugural function of the research lab building of Sugarcane Research Station, Thiruvalla on 18-11-94.

The Vice-Chancellor attended the foundation stone laying ceremony of Veterinary College Hospital complex and inauguration of the Poultry Science Department building by the Hon'ble Minister for Agriculture on 17-11-94. Participated in the inaugural function of the Trainees Hostel at Cardamom Research Station, Pampadumpara on 20-11-94. Attended the inaugural function of the annual conference of Indian Society of Agricultural Statistics at Veterinary College, Mannuthy on 15-12-94. Participated in the Agricultural Fair at Thiruvananthapuram and delivered the keynote address in the Seminar on Womens' role in Agriculture at Thiruvananthapuram on 17-12-94. Participated in the inaugural function of the Kerala Agricultural University X'mas Bazaar at Sales Centre, Mannuthy on 19-12-94 by the Hon'ble Minister for Agriculture. Attended the one day workshop on Indigenous Knowledge of Systems in Farming at Horticultural College, Vellanikkara on 21-12-1994.

The Vice-Chancellor attended the inaugural function of the Pineapple Research Centre at Vazhakkulam on 2-1-95. Attended the Committee meeting at ICAR, New Delhi, on the Centre of Excellence to be sanctioned to the State Agricultural Universities on 4-1-95. Attended the inaugural function of the closing ceremony of S.M.V. High School Jubilee of Poonjar on 17-1-95. Inaugurated the School Day Celebrations of St. Paul's H. S., Kuriachira on 21-1-95. Attended the meeting convened by the Chief Secretary and Finance Secretary on the release of grant to the Universities in Kerala on 23-1-95. Attended the programme of award giving ceremony of Karshakakumaran and Karshakakumari organised by the Malayala Manorama at Ramanilayam on 7-1-95. Attended the

Poultry Seminar conducted at Veterinary College, Mannuthy on 9-1-95. Attended the annual day celebrations of St. Joseph School, Ollur. Inaugurated the Karshika mela and Seminar on 25-1-95 at Thodupuzha. Participated in the Republic Day functions, at University Headquarters and College of Veterinary and Animal Sciences, Mannuthy. Inaugurated the Calf Seminar organised by PDDP, Kalady at Ankamaly on 6-2-95. Inaugurated the St. Joseph College Day Celebrations at Irinjalakuda on 8-2-95. Attended the Steering Committee Meeting of Wasteland Development Programme of Krishi Vigyan Kendra, Manjeshwar on 11-2-95. Attended the ICAR Society meeting on 11-3-95 at New Delhi. Participated in the ICAR Award giving ceremony on 11-3-95. Attended the NARP Meeting at ICAR on 11-3-95. Attended the Seminar on rabbits at Veterinary College, Mannuthy on 8-3-95. Attended the seminar on foot and mouth disease at Veterinary College, Mannuthy on 22-3-95. Attended the inaugural function of the Agricultural Branch of South Indian Bank on 30-3-95. Attended the function of release of the Journal of Communication of the M. G. University at Kottayam on 30-3-95. Also participated in the IUCC meeting on 30-3-95 at M. G. University, Kottayam.

The Vice-Chancellor visited the University of Lund Sweden for the period from 25-5-94 to 27-5-94. He addressed the participants of International Water Courses at University of Lund, Sweden from 25-5-94 to 27-5-94.

On 12-6-94 the Vice-Chancellor visited the Central Plantation Crops Research Institute, Kasaragod. He visited University of Agricultural Sciences, Bangalore on 15-6-94 and 30-7-94. Visited Indian Institute of Horticultural Research, Bangalore on 15-6-94. Vice-Chancellor visited the Veterinary College, Hebbal, Bangalore on 30-7-94. Visited the Fisheries College, Mangalore on 8-8-94. Visited the Central Institute of Fisheries Education, Bombay on 11-8-94. Visited the Central Plantation Crops Research Institute, Regional Station, Kayamkulam on 27-8-94. Visited the Cardamom Research Station, Myladumpara of Spices Board on 21-11-94.

The Vice-Chancellor served as a member of the Governing Body of Kerala Forest Research Institute, Peechi, Centre for Water Resources Development and Management, Kozhikode, Science Technology and Environmental 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 27-4-94, 23-5-94, 4-7-94, 5-1-95 and 11-3-95. Held discussions with the Director General, Deputy Director General and other officials of the ICAR, combing the work with sponsored tours in most cases.

The Vice-Chancellor visited the Punjabrao Krishi Viswa-vidyalaya, Akola, Maharashtra. Held discussions with Vice-Chancellor and other officials. He also visited the Jain Irrigation Systems and allied centres at Aurangabad and Jalgaon Districts of Maharashtra State on 14-3-95 and 15-3-95.

Dr. A. M. Michael also visited the College of Agriculture, Vellayani, College of Fisheries, Panangad, Kochi, Kelappaji College of Agricultural Engineering and Technology, Tavanur, College of Veterinary and Animal Sciences, Mannuthy, College of Horticulture, Vellanikkara, College of Forestry, Vellanikkara, College of Cooperation and Banking, Mannuthy, College of Agriculture, Pilicode-Nileswar. He visited the Regional Agricultural Research Stations at Pilicode, Pattambi, Ambalavayal, and Kumarakom. He also visited the Livestock Research Station, Thiruvazhamkunnu, Thumburmuzhi, University Livestock Farm, Mannuthy, University Poultry Farm, Mannuthy and University Pig Breeding Farm, Mannuthy. The Vice-Chancellor visited the Agronomic Research Station, Chalakudy, Rice Research Station, Kayamkulam, Sugarcane Research Station, Thiruvalla, Krishi Vigyan Kendras at Manjeswar, Ambalavayal, Pattambi and Sadanandapuram. He visited the Fisheries Research Station, Puduvaipu, Kochi, Cashew Research Station, Madakkathara, Cardamom Research Station, Pampadumpara, Pineapple Research Station, Kannara and Vazhakkulam, Aromatic and Medicinal Plants Research Station, Odakkali, Rice Research Station, Vyttila. He also visited the Agricultural Research Station, Mannuthy. The Vice-Chancellor visited the Kerala Horticultural Development Project, Vellanikkara, Central Training Institute, Communication Centre and Directorate of Extension.

## CHAPTER II

# Education and Research

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### I. FACULTY OF AGRICULTURE

#### 1.1. COLLEGE OF AGRICULTURE, VELLAYANI

College of Agriculture was established in 1965 at Vellayani about 12 KM south of Thiruvananthapuram on the bank of Vellayani lake. College Campus has a total area of 243 hectares including 165 hectares of 'Kayal' land.

Dr. C. Sreedharan continued as the Dean in charge of the faculty of Agriculture and the Head of the institution.

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

#### Department of Agronomy

- " Horticulture
- " Soil Science and Agricultural Chemistry
- " Plant Breeding
- " Plant Physiology
- " Agricultural Entomology
- " Plant Pathology
- " Agricultural Economics
- " Agricultural Extension
- " Agricultural Statistics
- " Agricultural Engineering
- " Animal Husbandry
- " Home Science
- " Physical Education

#### Staff

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

### Major changes in staff position

Dr. N. Saifudeen, Assoc. Professor, Dept. of Soil Science & Agrl. Chemistry was transferred to College of Horticulture and Dr. M. Oommen, Professor of Agronomy entered on leave without allowances during the period under report.

Dr. K. Venugopal, Assoc. Professor (Soil Science & Agrl. Chemistry) Dr. Vijayaraghavakumar, Asst. Professor (Statistics) Dr. (Mrs.) V. K. Girija, Asst. Professor (Plant Pathology) and Sri. S. Devanesan, Asst. Professor (Entomology) and Smt. B. Seema, (Extension) have joined duty in the college during the period under report. Sri. A. K. Sherif, Asst. Professor (Extension) entered on study leave for undergoing Ph. D. programme.

### Seminars/Symposia/Training Programme attended by the staff

<i>Name of Scientist</i>	<i>Seminar/Symposium/Summer Institute etc.</i>
1	2
Dr. Kuruvilla Varghese	Attended the Summer Institute on integrated farming systems research management for subsistence Agriculture (6-15 June, 1994)
Sri. P. H. Latif	Attended the summer institute on integrated farming systems research management for subsistence Agriculture (6-15 June, 1994)
Dr. R. Gopimony	National Seminar on Indian Economics reforms, at Thiruvananthapuram on 14th and 15th July, 1994. One day farmers' seminar at Kottarakkara on 29-10-94. National symposium on management of Ecosystem and sustainable utilisation of biological resources at Thiruvananthapuram on 7th, 8th, 9th of November, 1994. Horticultural 1995 seminar at Thiruvananthapuram on 23rd and 24th January, 1995. Seminar on 'Post GATT opportunities and challenges in the field of herbal medicine' at TBGRI Palode on 10-2-1995.

1	2
Dr. R. Gopimony	State level farm feature workshop at Thiruvananthapuram on 17-3-'95
	One day Farmers Seminar at Kayamkulam on 23-3-1995.
Dr. D. Wilson	Orientation course for the programme officers of NSS, from 1-8-94 to 13-8-94 at NSS Training and Orientation Centre, Kalamassery.
	Summer Institute on Advance in Agricultural microbiology with special reference to the role of Mycorrhiza symbiosis and their role in crop productivity from 22-8-94 to 10-9-94 at UAS, GKVK Campus, Bangalore.
	Summer Institute on recent advances on basic and applied genetic research in crops from 10-5-95 to 29-5-95 at TNAU, Coimbatore,
Dr. P. Manju	17th NARP (SR), Zonal Workshop held at College of Agriculture, Vellayani on 20th March, 1995.
Dr. K. M. Abdul Khader	17th NARP (SR), Zonal Workshop held at College of Agriculture, Vellayani on 20th March, 1995.
Dr. D. Wilson	Organised and attended National integration camp from 1st to 5th May, 1994.
	NSS camp for 5 days from 5-11-94 to 9-11-94.
Dr. S. T. Mercy	Seminar on horticultural crops from 6-9 May, 1994 at Trivandrum sponsored by HPDC
	National seminar on Anthurium from 8-9 May, 1994 at Thiruvananthapuram sponsored by TBGRI, Palode and Anthurium growers society, Thiruvananthapuram.

1	2
Dr. S.T. Mercy	Conference of Association of Environmental biologists (AEB) from 7-9 November, 1994 at Thiruvananthapuram. One day seminar on crop breeding at Kerala University, Kariavattom on 3-2-1995.
Smt. N. K. Vimalakumari Associate Professor	One day Seminar on Women and their places in families sponsored by KSWDC at Thiruvananthapuram in 7/94.
Dr. L. Prema Professor and three students	Symposium on management of ecosystem and sustainable utilisation of Biological Resources at Thiruvananthapuram.
Dr. L. Prema, Professor	Workshop on Women Agriculture sponsored by Government of Kerala at Kanakakunnu Palace on 15-12-94 to 17-12-94.
Smt. N. K. Vimalakumari Assoc. Prof.	Workshop on Women in Agriculture sponsored by Govt. of Kerala at Kanakakunnu Place on 15-12-94 to 17-12-94
Dr. Mary Ukkuru, Assoc. Professor	Seminar on Role of Youth and Women in Agriculture at Kanakakunnu Palace on 17-12-94
Smt. S Chellamma, Assoc. Professor	-do-
Smt. P. Geetha, Assoc. Professor	-do-
Smt. Soffie Cherian, Assoc. Professor	-do-
Smt. B. Prasannakumari Associate Professor	-do-
Smt. N. K. Vimalakumari Associate Professor	National Seminar on Environment Hygiene promotional initiative organised by Socioeconomic units, Kerala and International Union for Health promotion and Education at Kanakakunnu Palace on 19-12-94-20-12-94

1	2
Smt. M. Rajani, Asst. Prof.	UGC/ICAR sponsored refresher course at Avinashilingam Home Science Institute for Higher Education for women at Coimbatore from 23-11-94 to 21-12-94
Smt. S. Subaida Beevi, Asst. Prof.	UGC/ICAT sponsored refresher course at Avinashilingam Home Science Institute for Higher Education for Women at Coimbatore from 23-11-94 to 21-12-94
Smt. S. Chellammal	A workshop on Women empowerment organised by KSWDC at Ernakulam on February, 1995
Smt. S. Subaida Beevi	A workshop on Women empowerment organised by KSWDC at Ernakulam on February, 1995
Dr. Mary Ukkuru Associate Professor	Seventh Kerala Science Congress at Palakkad from 27-1-95 to 29-1-95
Smt. S. Chellammal, Asst. Professor	Seventh Kerala Science Congress at Palakkad from 27-1-95 to 29-1-95
Smt. Soffie Cherian	State Level work experience exhibition at Ernakulam from 27th to 28th January, 1995
Smt. M. Rajani	State Level work experience exhibition at Ernakulam from 27th to 28th January, 1995
Smt. N. K. Vimalakumari, Assoc. Prof.	Seminar entitled Coir Industry in Kerala sponsored by Coirfed at VJT Hall, Trivandrum on 18-2-95
Smt. S. Subaida Beevi. Asst. Prof.	Preliminary workshop for the pre-preparation of text books for Sisulekshmi Nursery Teachers organised by BSS at Mascot Hotel on 21-4-95
Dr. M. C. Nair	One day seminar on mushroom cultivation at the animation centre on 2-9-94. Also attended the Virology conference organised by Indian Virological Society at SCT from 16-1-95 to 18-1-95



1	2
Dr. S. Balakrishnan & Dr. Susamma Philip	Attended the PLACROSYM at Kozhikkode from 30-11-94 to 3-12-94
Dr. C. K. Peethambaran	Attended the virology conference organised by Indian Virological Society at SCT from 16-1-95 to 18-1-95. Also attended the symposium organised by Horti National at Co-bank towers from 23rd to 25th January, 1995. Attended the VIIth Kerala Science Congress at Palakkad from 27th to 30th January 1995
Dr. C. Gokulapalan	Attended the one day seminar on mushrooms at the Animation centre on 2-9-94. Attended the Virology Conference organised by India Virological Society at SCT from 16-1-95 to 18-1-95
Dr. Gokulapalan	Attended the symposium organised by Horti national at Co-bank Towers from 23-1-95 to 25-1-95 and presented a paper
Dr. Lulu Das	Attended the one day seminar on mushrooms organised by KMGA at the animation centre on 2-9-94
Dr. Lulu Das	Attended the symposium organised by Horti National 95 and presented a paper
Dr. V. K. Girija	Attended the Virology Conference organised by Indian Virological Society at SCT from 16-1-95 to 18-1-95
Dr. V. K. Girija	Attended the VIIth KSC at Palakkad from January 27th to 30th 1995 and presented a paper
Vijayaraghava Kumar	Some combinational properties

presented at 48th Conference of Indian Society of Agri. Statistics in December, 1994

P. R. Sreenāth	"Some Combinational properties of design for neighbour effects and correspondence of these designs to directed graphs" presented at 48th Conference of Indian Society of Agri. Statistics in December, 1994
Dr. P. Rajendran	Attended the summer institute on integrated nutrient management at Rajendra Agricultural University, Bihar from 1-6-94 to 18-6-94
Dr. S. Pushkalā	Attended 7th Kerala Science Congress at Mercy College, Palakkad from 27-1-95 to 29-1-95
Dr. P. Rajendrañ	Attended refresher course in Bio-chemistry by UGC by Nagarjuna University, Andhra Pradesh from 1-3-95 to 21-3-95
Dr. P. Prabha Kumari	Diamond Jubilee Symposium of I. S. S. S. and presented research paper
Dr. S. Pushkala	Diamond Jubilee Symposium of I. S. S. S. and presented research paper
Dr. Thomas Varghese	Attended seminar on environment by STED from 18-1-95 to 20-1-95 at NVKSD College of Education, Alloor, presented paper on impact of Agrochemicals on ecosystem
Dr. P. Padmaja	Seminar on vermiposting by IHRD and presented papers in "Household waste management by vermitechnology" and "Management of market wastes by Vermitechnology"
Dr. P. Prabhakumari	-do-
Dr. K. Ushakumari	-do-

1	2
Dr. A. Visalakshi Professor	VI Annual Workshop of AICRP on Pesticide residues, Punjab Agrl. University, Ludhiana from May 16-17, 1994
Dr. T. Nalinakumari Assoc. Professor	-do-
Dr. S. Naseema Beevi Assoc. Professor	-do-
Dr. T. Nalinakumari Assoc. Professor	Training course on "Integrated Pest Management in Rice" at IRRI, Manila, Philippines from July 18th to Sept. 9, 1994
Dr. K. John Kuriyan Professor	Seminar on mushrooms, Thiruvananthapuram on 3-9-94
Dr. A. Visalakshy Professor	-do-
Sri. P. A. Rajan Asari Assoc. Professor	-do-
All members of the teaching staff of Entomology	National Symposium on Ecosystem Management and sustainable utilization of Biological Resources on December, 1994
Dr. M. S. Sheela Assoc. Professor and Smt. Anitha, Asst. Professor	NARP, Nematology Symposium on 25th March, 1995
Many members of teaching staff	National seminar on Horticulture from 23-25 January, 1995
Dr. K. Sasidharan Pillai Professor	International seminar on Sericulture, Mysore on 28-29 October, 1994
Dr. Nalinakumari	Placrosym XI Calicut on 11-10-94
Dr. C. S. Jayachandran Nair, Associate Professor	Attended Summer Institute on Advances in Fruit Production at IHR, Bangalore from 23rd August to 13th September 1994.
Dr. M. Abdul Vahab, Associate Professor	Attended Trainers Training at I.M.G., Trivandrum from 16th-21th August 1994.
Dr. M. Abdul Vahab, Associate Professor	Attended Group meeting of Vegetable researchers, at Indira Gandhi Krishi Viswa Vidyalaya, Raipur in January 1995.

1	2
Dr. S. Bhaskaran and Dr. N. Kishorekumar	Attended Summer Institute on Advances in Agri. Extension held at IARI New Delhi.
Dr. S. Bhaskaran Dr. N. Kishorekumar Dr. S. Shilaja Dr. G. Sobhana	International Workshop on alternative approaches in Extension for sustainable agriculture at Tamil Nadu Agri. University, Coimbatore.
Dr. N. Kishorekumar	Seminar on Forest Management, Indian Institute of Forest Management Bopal.
Dr. S. Shilaja	State level workshop on women in Agriculture.
Dr. S. Shilaja and Dr. G. Sobhana Dr. G. T. Nair Dr. B. Babu Dr. V. B. Padmanabhan Dr. M. M. Hussain	International Congress on Kerala Studies Agricultural Fair 1994-
Dr. B. Babu and Ms. Seema. B.	Seminar on Women and Youth in Agriculture held at Kanakakunnu Palace
Dr. S. Shilaja Dr. N. Kishorekumar	Attended the National Seminar HORT-NATIONAL-95 organised by KHDP in collaboration with Kesari Memorial Trust at Trivandrum

#### Academic programme

Student strength under each course during 1994-95 is as follows:

#### U. G. Programme

	No. of students
I Year (1994 admission)	73
II Year (1993 admission)	50
III Year (1992 admission)	61
IV Year (1991 admission)	61
V Year (1990 admission)	2

#### P G. Programme

1993 Admission	No. of students
i. M. Sc (Ag)	35
ii. M. Sc (Hort)	6
iii. M. Sc (Home Science)	5
iv. Ph. D	10
	56

**1994 Admission**

i. M. Sc (Ag)	31
ii. M. Sc (Hort)	6
iii. M. Sc (Home Science)	6
iv. Ph. D	6
	<hr/> 49 <hr/>

**1990, 91 and 92 Admissions**

i. M. Sc	1
ii. Ph. D	12
	<hr/> 13 <hr/>

**Degree/Diploma awarded**

During the year under report 54 students have successfully completed B. Sc (Ag) course and secured the degree. During the period 10 M. Sc (Ag) students and 3 M. Sc (Home Science) and 5 M. Sc (Hort) students successfully completed their requirements and secured degree.

From the Faculty of Agriculture six Ph. D scholars were also awarded doctorate during the period of report.

**Details of scholarship, Awards and other financial assistance to the students of College of Agriculture, Vellayani**

Name of the fellowship/scholarship financial assistance/awards	Total No.
ICAR Senior Fellowship	3
ICAR Junior Fellowship	22
KAU Merit scholarship	
a) 1991 Admission	9
b) 1992 admission	8
c) 1993 admission	4
KAU Junior Fellowship	
a) 1993 admission	30
National loan scholarship	2
Potash and phosphate India fellowship	1
AVP Merit scholarship	1
National Merit scholarship	6
District Merit scholarship	2
Educational concession to children of Fishermen	4
Grant from KSLWFC	3
Educational concession to OEC students	3
Educational concession to Kumara Pillai Commission report students	16
Educational concession to scheduled caste students	28

### **Work Experience programme**

As a part of the course curriculum work experience programme was implemented to the under graduate students. They have raised major crops. viz. rice, cassava, pulses, banana and different vegetable crops. They have also undertaken work experience programmes on plant propagation and nursery techniques, processing of fruits and vegetables, plant protection and soil testing. Training in computer application was also imparted as a work experience programme to the final year B.Sc (Ag) students.

During the last semester, the final year students were provided practical training under field conditions in the Krishi Bhavans of the State departments of Agriculture. The final year students were also given farm training in various research stations under KAU.

### **Study tours**

Sixty one students of second year B.Sc (Ag) 1992 admission and sixty students of 1991 admission were taken on South India study tour during the period under report. They had visited important Research Stations of TNAU, Coimbatore, UAS, Bangalore ICAR institutions at Ooty and Kasargode. They had also visited important research stations of KAU and acquainted with the activities of the research stations and main campus at Vellanikkara.

The third year students of B.Sc (Ag) class were taken for an All India Study tour from 18.9.94 to 8.10.94. They had visited ICAR, IARI New Delhi and other important ICAR Centres and Agricultural Universities in the northern part of the country.

### **Krishi vigyan**

A seminar-cum-exhibition was organised by the final year B.Sc (Ag) students at Peringamala on 17.7.94 in connection with their course Ag. Ext. 406 (Programme planning).

### **Extra Curricular Activities**

#### **Students Union Activities**

The students union activities were inaugurated on 16.5.94.

A one day seminar was conducted on "Recent trends in Agriculture" on 21.10.94. The seminar was inaugurated by Sri.

M. S. Joseph IAS, Agricultural Production Commissioner and the key note address was delivered by Dr. P. K. Iyengar, the Ex-chairman of atomic commission.

The union organised a women day on 26.10. 94 and seminar was inaugurated by the renowned poetess and social worker Smt. Sugathakumari. Felicitations were offered by Prof. Nabeesa Ummal.

During the period under report the student union labelled all the trees and plants in the campus with the vernacular, English and botanical name.

A three day Interclass Arts Festival was conducted in November 1994. Dr. D. Babu Paul IAS, inaugurated the arts festival. The ALCO Quiz competition was held on 27 th January 1995 and the Trivandrum Arts College won the trophy during the period under report.

The intercollegiate Arts Festival was conducted at this campus from 14th to 17th February 1995 and the Veterinary & Animal Science College, Mannuthy won the trophy.

### **Sports and Games**

The interclass athletic meet was held on 18th and 19th May 1994. The college team participated in the various Inter Collegiate tournaments conducted during the year. In KAU athletic meet, our college team won the overall championship. The womens Ball Badminton team won the University championship while the men team secured the runners up position. The Mens' Basket Ball and Womens' Basket Ball and Volley Ball team were also placed second in the University inter collegiate tournaments.

The multipurpose Indoor stadium was effectively utilized for the regular practice of all indoor games.

### **Hostels**

Dr. C. Sreedharan, Dean and Head of this Institution continued as the warden of three hostels in the campus.

The following staff members functioned as Asst. Wardens of the hostels.

- |                 |  |
|-----------------|--|
| 1 UG Hostel     | — Dr. S. Bhaskaran,<br>Assoc. Professor (Extn.)          |
| 2 PG Hostel     | — Sri. N. R. Nair,<br>Assoc. Professor (Plant Breeding)  |
| 3 Ladies Hostel | — Smt. Soffi Cheriyan,<br>Asst. Professor (Home Science) |

The strength of inmates in the hostels were as follows;

UG Hostel (Men)	—	50
PG Hostel (Men)	—	27
Ladies Hostel		
(Both, UG & PG students)	—	130

#### College Library

During the period under report, 45 Indian, 33 foreign journals were subscribed and also purchased 257 new books. In the College Library there were 23,662 books at the end of the year.

#### Instructional Farm, Vellayani

The instructional farm has 78 hectares of garden land and 1.5 hectares of 'Kayal' land. The farm provides all physical facilities required for imparting practical training and instructions to the students on modern techniques in crop production.

As part of the farm development programme with ultimate goal of increasing production and farm revenue irrigation facilities were extended to all the blocks and intensive cultivation of banana, vegetables (seed purpose) were undertaken.

Vegetable seeds, planting materials of fruit plants and ornamental plants were produced in large quantities and distributed throughout the state.

During the report period, the following mobile sale programmes were also conducted.

Sl. No.	Place	Period	No. of days	Revenue (Rs. in lakhs)
1	Kottayam	4.7.94 to 10.7.94	7	2.18
2	Palai	23.8.94 to 26.8.94	4	1.02
3	Kottayam	27.8.94 to 30.8.94	4	2.44
4	Alappuzha	3.10.94 to 7.10.94	5	1.29
5	Kottarakkara	28.10.94 to 30.10.94	3	0.26
6	Thiruvananthapuram (city)	12.12.94 to 17.12.94	6	1.36
7	Alappuzha	21.12.94 to 27.12.94	7	0.42
8	Pathanamthitta	2.2.94 to 5.2.94	4	0.10
			40	9.07



### **Livestock farm**

The Department of Animal Husbandry is maintaining a dairy unit and a poultry unit in the college campus. During the year 37712.25 litres of milk was obtained from the dairy animals and sold to the inmates of the hostel and residents in the campus. A total number of 65,625 eggs obtained from the poultry unit were also sold to the inmates of the hostel and residents in the campus.

In the Veterinary Hospital attached to the College under the Animal Husbandry department, 934 cases were treated and 641 birds were vaccinated against R. D. One hundred and twenty-six pregnancy diagnosis and 22 artificial insemination were also done.

### **Research**

Research activities approved 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. A study on enhancing nitrogen use efficiency with nitrification inhibitors in bhindi revealed that applying nitrogen @ 100 kg/ha as blended urea with neem cake resulted in maximum fruit yield.

Results of the experiment 'Economising nitrogen in brinjal (*Solanum melongena* L) using nitrification inhibitors indicated that 25% of nitrogen could be saved by mixing urea with neem cake and applying in a single dose. This practice was found to be more economical. Apart from the savings in the cost of fertilizers the additional expenditure for the split application of fertilizer could also be saved.

In soils of medium NPK status in October planted tapioca crop responded to the application of N & K upto 50 kg/ha.

From another study it was noticed that tannia (*Xanthosoma sagittifolium*) gave optimum yield with a spacing of 75 x 75 cm with an N & K level of 40 and 100 kg/ha respectively. The early trend of sustainable farming practices on soil properties and crop productivity indicated that an increase in crop yield to the tune of 50 to 100 percent in sustainable farming treatments in Bhindi crop. The treatment which received only the chemical fertilizers recorded the lowest yield.

In a CYT conducted with 20 grain cowpea selection and two check varieties during kharif 84, the highest seed yield was recorded by variety VCP-4 followed by variety V-271.

In amaranthus APGA-4 recorded highest yield over other varieties.

Among the different varieties of guinea grass PGG-489 recorded maximum fodder yield.

Eight indigenous VA mycorrhizal fungi were isolated from pepper rhizosphere and tested for its efficiency in controlling the quick wilt in pepper.

Standardisation techniques for cultivated native strains of pleurotias has been perfected and hybrid strains were released. In combination with a NPK dose of 50:8:25 kg/ha vermicompost at the rate of 12 t/ha gave appreciable yield increase in different green vegetable over the same dose of NPK with FYM.

*Eudrillus engeneae* was identified as suitable species for vermifecology in Kerala.

The agent responsible for honey bee disease was identified as "Thai sac Brood Virus". Eighteen colonies resistant to the virus were identified from different locations in Kerala.

A closer spacing of 75 x 75 cm was found ideal for mulberry under rainfed condition with an NPK dose of 130:65:65 kg/ha. A harvest interval of 60 days recorded maximum leaf yield. Blight caused by *Rhizoctonia solani* and leaf spot caused by *colletotrichum* sp were observed infesting mulberry crop during June and July. The fungus *Aspergillus niger* was found causing disease to silk worm during the first instar leading total mortality.

With respect to the number and yield of cocoons harvested, percentage of spinning and size of cocoons, NE 4 D2 ranked first among the biovottins. The quality parameters were also higher NE4 D2.

Red spider mites, *Tetranychus ludani*, *T. nazalidencus* and *T. cinnabarinus* were found infesting bhindi, rosé, dahlia, moringa and pumpkin. While false spider mite was infesting brinjal, rose and tulasi.

In the micropropagation study of tree spices of Kerala, media and explant condition for rapid axillary bud proliferation of clone and nutmeg were standardised.

In a study it was observed that storage of pulses over long periods (for more than six months) brings about a decrease in protein content and an increase in urea, uric acid and moisture level. Lengthening of storage period also brings about an increase in cooking time, water up take and decrease in volume expansion.

Addition of 10 per cent soyafLOUR to bread increased the protein content of bread without altering the organoleptic and shelf life and the soyfortified bread can be effectively utilized as a supplement in nutrition intervention programme.

In a study conducted by the Department of Agricultural Extension it was reported that the average per day wage rate of a coconut climber was Rs. 62.30 with a monthly income of Rs. 1496. They have low political and social participation with little economic and achievement motivation.

In another Agricultural extension project it was observed that agricultural labourers preferred more strenuous work such as ploughing, digging, basin preparation and taking pits etc. than plant protection operations, due to the fear of health hazards.

#### **Important Visitors**

Distinguished personalities who visited this institution include.

- 1 Mr. Jeremy Fry Organic farmer from U. K. visited on 8-4-94.
- 2 Mr. Wesley M. Shurn, Professor of Sociology, Rousima State University, USA visited on 24-2-95.
- 3 Dr. M. Subramonian, Dean, Jawharlal Nehru College of Agriculture, Pondicherry, visited on 29-6-94.
- 4 Dr. L. Sabob and Dr. M. B. Wakode, Professors from Nagapur Agricultural College visited the farm on 25-1-95.
- 5 Dr. S. Purushothaman, Dean, College of Agriculture, Madurai, (TNAU) visited the campus on 2-7-94.
- 6 Dr. R. P. Gupta, Project Co-ordinator (soil).

## 1.2 COLLEGE OF HORTICULTURE, VELLANIKKARA

Dr. C. C. Abraham continued as the Associate Dean i/c during the period.

The College of Horticulture was established in the Mannuthy Campus on 28.10.1972. The College was shifted to the main campus in November, 1977. The college has an Instructional Farm for imparting practical training to students and also for undertaking faculty research activities.

To start with, only 20 students were admitted for the four year B.Sc (Hort) degree programme (12 trimesters). The number of student admissions for this programme was increased to 30 from 1976-77 and again to 40 from 1979-80. The B.Sc (Ag) programme was introduced from the academic year 1977-78 with an intake of 50 students. The curricula of the B.Sc (Ag) and B.Sc (Hort) programmes were unified in 1980-81 and the latter course discontinued. The intake for the B.Sc (Ag) programme was consequently increased to 75. The Master's Degree programme was started in 1976-77 in six disciplines, namely, Horticulture, Agronomy, Agricultural Botany, Agricultural Chemistry, Agricultural Entomology and Plant Pathology. From 1979-80, Ph.D programmes in Horticulture in these six departments were started. In addition, Masters' programmes in Agricultural Economics and Agricultural Engineering were also commenced during this year. The P. G. Diploma Course in Natural Rubber Production was started in 1979-80 and offered up to 1982-83. After a break of 7 years, the programme was revived in 1990-91. The M.Sc (Ag. Stat) was started during the year 1978-79. A programme for M.Sc. in Agril. Economics was commenced during 1991-92. The M.Sc programme in Food Science and Nutrition was started during the year and two students were admitted. The World Bank funded Kerala Agricultural Development Project was launched in April, 1977 to conduct fundamental, applied and adaptive research in coconut, cashew, cocoa and pepper. This project was terminated in March 1986. The Radio Tracer Laboratory came into existence in June, 1982 under the KADP.

There are at present 15 departments in the College, namely, Pomology and Floriculture, Plantation Crops and Spices, Olericulture, Processing Technology, Agronomy, Agricultural Botany, Soil Science and Agricultural Chemistry, Agricultural Entomology, Plant Pathology, Agricultural Economics, Agricultural Extension, Agricultural Engineering, Agricultural Statistics, Agricultural Meteorology and Physical Education.

An Instructional Farm having an area of 95.35 ha was established in February 1988 to provide facilities for intensive on-farm practicals and work experience for students and faculty staff.

A total of 843 students completed their B.Sc (Ag)/B.Sc (Hort) programme during the period from 1976 to March 1995. A total of 64 students completed their P.G. Diploma in Natural Rubber Production so far. A total of 38 students completed their PG Programmes during the year.

**Academic staff as on 31.3.1995**

Out of a total of 133 sanctioned staff positions, 33 remained vacant as on 31.3.1995. The details are given in the Table 1. (page 30, 31).

**Para technical/Administrative/Ministerial/Supporting staff position as on 31.3.1995**

Out of a total of 127 sanctioned positions of non-teaching-staff belonging to various categories, 111 remained filled up, there being only 16 vacancies (Table 1 Appendix D). The details of administrative, ministerial and supporting positions attached to the College Office are as follows:

	Sanctioned	In position	Vacant
1	2	3	4
Administrative Officer	1	1	—
Section Officer	6	5	1
Sr. Office Superintendent	1	1	—
Office Superintendent	1	1	—
Office Assistant	14	14	—
Selection Grade Typist	1	1	—
Senior Grade Typist	—	—	—
Grade I Typist	2	1	1
Grade II Typist	2	2	0
Peon Higher Grade	1	—	1
Peon	5	5	—

	1	2	3	4
Watchman		2	2	—
Driver HDV		1	1	—
Driver LDV		2	1	1
Bus Attendant		1	1	—
Duplicator Operator		1	1	—
Hostel Manager		2	2	—
Total		43	39	4
<b>College Library</b>				
Librarian		1	—	1
Asst. Librarian		1	1	—
Reference Assistant		1	1	0
			(Two positions of Ref. Assts. converted as Library Asst. and redeployed)	
Assistant Grade I		1	1	—
Total		4	3	1
<b>Grand Total for College Office/Library</b>		47	2	45

### Academic programmes

#### Student Statistics—UG

As on 31-3-1995 there were a total of 277 students on rolls for the B. Sc.(Ag) Course. A fresh batch of 71 students were admitted on 16.11.1994 for the B. Sc. (Ag) Programme. The details are as follows;

Year of admission	Men	Women	Total
Admission prior to 1991	7	—	7
1991 admission	31	34	65
1992 admission	37	29	66
1993 admission	41	34	75
1994 admission	24	33	57
Make up course	7	—	7
Total	147	130	277

During the report period, 51 students completed their B. Sc. (Ag) Programme.

Year of admission	Men	Women	Total
1988 admission	1	1	2
1989 admission	1	—	1
1990 admission	20	28	48
Total	22	29	51

### Student Statistics--PG

There were a total of 197 students on rolls for the various PG programmes including 143 students for the Master's courses, 54 for the doctoral programmes and 12 for the PG Diploma in Natural Rubber Production. For the Master's programmes, there were a total of 143 students on rolls as on 31.3.1995. The course-wise break up of the students is as follows :

Course	Men	Women	Total
M. Sc. (Ag)			
Agron.	9	9	18
Pl. Breeding	4	9	13
SS & AC	9	12	21
Entomology	1	7	8
Agrl. Econ.	2	4	6
Pl. Path.	4	6	10
Agrl. Extn.	8	2	10
M. Sc. (Hort.)			
Pom. & Flori.	5	8	13
Pln. Crops	1	9	10
Oleri.	2	7	9
Processing	2	3	5
M.Sc. (Ag. Stat.)	1	11	12
M.Sc. (Ag. Econ.)	—	1	1
M.Sc. (FS & N)	—	6	6
M.Sc. (Agro. Met.)	—	1	1
Total for the Master's Programme			
	48	95	143

For the Doctoral Programmes there were a total of 54 students on rolls:

Course	Men	Women	Total
Ph.D. (Ag)			
Agronomy	7	5	12
SS & AC	2	4	6
Pl. Breeding	2	6	8
Entomology	—	3	3
Agri. Extension	2	1	3
Pl. Path.	—	4	4
Ph. D. (Hort)			
Pom. & Flori.	1	2	3
Proc. Tech.	1	—	1
Pln. Crops	—	6	6
Olericulture	2	6	8
Total	17	37	54

Table 1. Staff position in the

Departments/Scheme	Associate Dean			Professor		
	S	P	V	S	P	V
Head of Institute and supporting staff	1	1	—	—	—	—
Agromony	—	—	—	1	1	—
AICRP on Weed Control	—	—	—	—	—	—
Agro. Meteorology	—	—	—	1	1	—
Agri. Botany	—	—	—	1	—	1
Agri. Economics	—	—	—	1	1	—
Agri. Economics (Basic Science)	—	—	—	—	—	—
Agri. Entomology	—	—	—	2	1	1
AICRP on BCCP & W	—	—	—	—	—	—
Agri. Engineering	—	—	—	1	—	1
Agri. Extension	—	—	—	—	—	—
Home Science Unit	—	—	—	—	—	—
Agri. Statistics	—	—	—	1	1	—
Olericulture	—	—	—	1	1	—
Seed Production	—	—	—	—	—	—
AICVIP	—	—	—	—	—	—
Plantation Crops and Spices	—	—	—	1	—	1
Man Power Dev. Scheme (Coffee Board)	—	—	—	—	—	—
PG Diploma NRP (Rubber Board)	—	—	—	—	—	—
Cadbury Cocoa Res. Project	—	—	—	1	1	—
AICRP on M & AP	—	—	—	—	—	—
Pomology & Floriculture	—	—	—	1	—	1
AICFIP	—	—	—	—	—	—
Processing Technology	—	—	—	1	—	1
Plant Pathology	—	—	—	1	1	—
Soil Science and Agri. Chemistry	—	—	—	1	1	—
Coconut Nutritional Phys. Disorders	—	—	—	—	—	—
Radio Tracer Laboratory	—	—	—	1	1	—
Instrumentation Unit	—	—	—	—	—	—
Physical Education	—	—	—	—	—	—
Instructional Farm	—	—	—	1	1	—
<b>Total</b>	<b>1</b>	<b>1</b>	<b>—</b>	<b>17</b>	<b>11</b>	<b>6</b>

\* Includes 2 Farm Assistants borne on the Central



College of Horticulture as on 31-3-1995

Associate Professor			Assistant Professor			Total academic			Administrative/paratechnical/supporting staff		
S	P	V	S	P	V	S	P	V	S	P	V
—	—	—	—	—	—	1	1	—	47	42	5
1	1	—	5	3	2	7	5	2	3	2	1
—	—	—	3	2	1	3	2	1	4	3	1
—	—	—	2	2	—	3	3	—	2	2	—
—	—	—	5	2	3	6	2	4	1	1	—
1	1	—	5	1	4	7	3	4	—	—	—
—	—	—	2	1	1	2	1	1	1	1	—
1	1	—	4	4	—	7	6	1	2	1	1
1	1	—	1	1	—	2	2	—	3	3	—
—	—	—	2	2	—	3	2	1	2	2	—
1	1	—	4	3	1	5	4	1	—	—	—
—	—	—	4	3	1	4	3	1	—	—	—
1	1	—	8	5	3	10	7	3	2	1	1
1	1	—	5	5	—	7	7	—	5	5	—
—	—	—	2	2	—	2	2	—	—	—	—
—	—	—	3	3	—	3	3	—	2	2	—
—	—	—	7	7	—	8	7	1	3	3	—
—	—	—	1	1	—	1	1	—	—	—	—
—	—	—	1	1	—	1	1	—	1	1	—
2	2	—	—	—	—	3	3	—	7*	7	—
1	1	—	2	2	—	3	3	—	8	7	1
—	—	—	6	6	—	7	6	1	3	3	—
—	—	—	3	3	—	3	3	—	3	2	1
—	—	—	3	3	—	4	3	1	2	2	—
4	3	1	5	1	4	10	5	5	3	3	—
3	3	—	3	2	1	7	6	1	6	6	—
1	—	1	2	2	—	3	2	1	3	2	1
3	3	—	1	—	1	5	4	1	1	1	—
1	1	—	—	—	—	1	1	—	—	—	—
—	—	—	2	1	1	2	1	1	1	—	1
—	—	—	2	—	2	3	1	2	10	9	1
22	20	2	93	68	25	133	100	33	127	111	16

Sector Scheme on Cocoa

During the report period, a total of 35 students completed their Master's programmes in various disciplines. One student completed the Doctoral programme in Agronomy during the period and two in Horticulture.

	Men	Women	Total
<b>M.Sc. (Ag)</b>			
Agron.	2	5	7
Pl. Breeding	1	3	4
Agri. Extension	—	4	4
Agri. Economics	2	3	5
Entomology	1	2	3
Soil Science & Agril. Chemistry	1	—	1
Pl. Pathology	1	—	1
M. Sc. (Ag. Econ.)	1	—	1
M. Sc. (Ag. Stat.)	—	1	1
M. Sc. (Hort.)	2	6	8
<b>Total</b>	<b>11</b>	<b>24</b>	<b>35</b>
<b>Ph. D. (Ag)</b>	<b>1</b>	<b>—</b>	<b>1</b>
<b>Ph. D. (Hort)</b>	<b>0</b>	<b>2</b>	<b>2</b>

#### *Study tours*

The All India study tour for the III year B.Sc. (Ag) batch (1991) of students was conducted from 22-10-'94 to 16-11-'94. The students visited the premier institutions of agricultural research/education/development of Hyderabad, New Delhi, Dehra Dun, Solan, Kufri (Shimla), Cuttack, Trombay and Calcutta.

The II year batch (1992) of students were taken for their South Indian tour in two stages first during 17-10-'94 to 29-10-'94 covering Ooty, Coimbatore, Mysore, Bangalore, Vytal, Puttur, Ambalavayal, Pilicode, Kalpetta and the second stage from 3-11-'94 to 10-11-'94 covering Kayamkulam, Palode, Thiruvananthapuram, Kanyakumari, Madurai, Myladumpara, Mattupetty and Kottayam.

#### *Field training*

The field training programme for the final year B.Sc. (Ag) batch of students was conducted in Regional Agri. Research Station during 14-11-'94 to 26-11-'94 and in selected Krishi Bhavans during 28-11-'94 to 9-12-'94.

#### **College Library**

As on 31-3-'95, there were a total of 27625 titles and 161 journals (120 Indian, 21 foreign and 20 gratis/exchange copies).

### College Hostels

Dr. D. Seetharama Rao continued as the Assistant Warden of the Men's Hostel and Dr. N. P. Chinnamma continued as the Assistant Warden of the Ladies' Hostel. Mr. A. S. Anilkumar and Mr. E. V. Anoop were appointed as Resident Tutors of the Men's Hostel during the period and they assumed their duties on 16-11-'94 and 1-12-'94 respectively.

As on 31-3-1995, there were a total of 225 inmates in the Ladies' Hostel including 4 students of the College of Forestry and 40 of the College of Co-operation and Banking.

In the Men's Hostel, there were a total of 204 inmates as on 31-3-1995 including 52 students of the College of Forestry.

### Faculty Improvement

Dr. C. T. Abraham, Associate Professor (Agron) joined the Department of Agronomy on 30-5-1994 on completion of the 3 months training under Bio-Technology, National Associateship at Acibarn University, USA.

Smt. D. Girija, Asst. Professor, Microbiology was deputed to undergo the Ph.D programme in Agricultural Microbiology at the IARI New Delhi in September 1994.

Smt. S. Beena, Asst. Professor, Plant Pathology entered on leave for undergoing the Doctoral Programme in the College of Horticulture, Vellanikkara from 19-9-1994. Mr. M. C. Narayanankutty, Asst. Professor, Department of Processing Technology entered on study leave for 3 years for undergoing the doctoral programme in Horticulture from 19-9-1994.

Smt. K. A. Mercey entered on leave for undergoing her Doctoral programme in statistics at the KFRI, Peechi.

### Summer Institutes and Training Programmes attended by Faculty Staff

The members of the faculty staff attended several training programmes and summer institutes during the report period. The details are as follows :

Name of the Scientist	Course details	Venue & Date
1	2	3
Mr. K. Sathesh Babu	Summer institute on Advances in Agri. Economics with special references to Natural Resources and Environmental Economics	TNAU, Coimbatore 16 May to 4 June, 1994

1	2	3
Mr. S. Krishnan Asst. Professor Dept. of Ag. Stat.	Recent advances in Agri. Stat. with special reference to linear modelling	IASRI, New Delhi 16 May to 4 June 94
Dr. N. Saifudeen Associate Professor Radio Tracer Lab.	Computer Appli- cation in Agro Research	NAARM, Hyderabad 19-30 July 94
Dr. N. K. Parameswaran Associate Professor Dept. of Pom. & Flori	IX Specialised NARP Training in Horti- culture	CIHNIP Lucknow 17 May to 15 June 94
Mr. V. K. Raju, Professor i/c. Dept. of Proc. Tech.	"	"
Dr. C. K. Geetha, Assistant Professor Dept. of Pom. & Flori	Summer Institute on Advances in the production technology of temperate fruits	Dr. Y. S. Parmar University of Horti. & Forestry, Solan 3-24 July 94
Dr. Sajan Kurien Assistant Professor Dept of Pom. & Flori Dr Sarah T. George Assistant Professor Dept. of Pom. & Flori	"	"
Dr. R. Keshava- chandran Assistant Professor Dept. of Pln. Crops and Spices	Summer Institute on Cell Technology and Genetic Engineering	Centre for Plant Mole- cular Biology (CPMB), TNAU, CBE 15th June to 5th July 94
Dr. K. T. Prasanna kumari Asst. Professor Dept. of Pl. Breeding	"	"
Dr. K. Pushkaran Associate Professor Dept. of Agri. Bot.	KHDP Trainer's Training	Institute of Manage- ment in Government Trivandrum 16-27, August 94
Smt. Lissamma Joseph Asst Professor Dept of Pln. Crops and Spices	Training on <i>in vitro</i> and cryopreser- vation technology for gene banks	NBPCR, New Delhi 10-29 October 94

1	2	3
Dr. N. N. Potti Professor, Agronomy	Training on Management Development programme on integrated programme for cereal development	Sponsored by MANAGE held at the Extension Directorate, 7-18 November 94
Dr. A. M. Ranjith Associate professor Dept. of Agri. Ent.	Intensive bivoltine Training Programme in Sericulture	Central Sericulture Research & Training Institute, Mysore Nov 8 to 13 Dec. 94
Dr. P. Balakrishna Pillai Professor and Head Dept. of AgroMet.	Medium range weather forecasting	IITM. Pune, October 24 - November 8, 1994
Dr. A. V. R. Kesava Rao Asst. Professor Dept. of Agro Met.	Five week training on Remote Sensing Fundamentals and Applications to Agri-culture and Soils	Space Applications Centre, ISRO, Ahmedabad from Dec. 19th, 1994 for a month
Dr. P. Balakrishna Pillai, ADR & Head of Dept. of Agro Met.	Training in Agri. Meteorology (DST Sponsored)	CRIDA, Hyderabad, 16-30 January 1995
Dr. Mercey George, Asst. Professor Dept. of Agronomy	XIV NARP Training on Agroforestry, Forage Production and Animal Nutrition	IGFRI, Jhansi from 1st February, to 1st March, 95
Dr. K. E. Savithri Assoc. Professor Dept. of Agronomy	Short Course on Onfarm Water Management	CWRDM, Calicut from February, 95 to 4th March, 95

#### Participation of faculty staff in workshops/seminars/symposia

The following scientists of the College attended Workshops/ Training/Symposia/Seminars. The details are as follows:

1	2	3
Dr. A. Sukumara Varma	National Symposium on Mushrooms, Solon	8-10 April, 94

1	2	3
Dr. Sally K. Mathew Assoc. Professor	National Seminar on diseases of spices	NRCS, Calicut 7-8 April, 94
Dr. P. K. Rajeevan Professor & Head i/c Dept. of Pomology and Floriculture	National Floriculture Seminar	Trivandrum 6-7 May, 94
Dr. C. Bhaskaran Assoc Professor & Head, Dept. of Ag. Extension	Int. Congress on Kerala Studies	Trivandrum 27-29, August, 94
Dr. T. P. Murali Asst. Professor Dept. of Pomology and Floriculture	XXIV Int. Hort. Congress	Kyoto, Japan 21-27 August, 94
Dr A.V R Keshava Rao Asst. Professor Dept. of Agro Met.	Third Review meeting of AMFU Project	Technology Bhawa DST, New Delhi, 25-27 July 94
Dr. P. J. Joy Professor Entomology	Group meeting of Bio Control Workers	UAS, Bangalore 18-19, October 94
Dr. S. Rajan Professor & Head i/c Dept. of Olericulture	IX National Seed Seminar	TNAU, Coimbatore 7-9 December 94
Dr. K. T. Prasanna- kumari and Smt. T. Girija Dept. of Agri. Bot.	"	"
Dr. T. P. Murali Asst. Professor Dept. of Pomology and Floriculture	XII AICFIP Workshop	APAU, Hyderabad 12-14 Dec. 94
Smt. A. Sebhana Asst. Professor Dept. of Pomology and Floriculture	"	"
Dr. C. Bhaskaran Professor & Head Dept. of Ag. Extn.	Int. Workshop on Alternative Extension approaches	TNAU, Coimbatore 13-17, Dec. 94
Dr. P. A. Nazeem Assoc. Professor Dept. of Pin. Crops and Spices	PLACROSYM XI Calicut	30 November to 3 Dec. 94
Dr. K. Mukundan Professor Dept of Agrl.Economics	"	"
Smt. M R Shylaja As-t. Professor Dept. of Pin. Crops and Spices	PLACROSYM XI, Calicut	30 November to 3 December, 94

1	2	3
Smt. Lissamma Joseph Asst. Professor Dept. of Pln. Crops and Spices	"	"
Dr. R. Vikraman Nair Professor, CCRP	"	"
Dr. A. Sukumaravarma Assoc. Professor, Dept. of Plant Pathology	"	"
Dr. Koshy Abraham Assoc. Professor Dept. of Plant Pathology	"	"
Dr. V. D. Mallika Assoc. Professor CCRP	"	"
Prof. P. V Prabhakaran Professor of Agri. Statistics	48th Annual meeting of the Ind. Soc. of Agri. Statistics	College of Veterinary and Animal Sciences 15-17 December, 95
Mr. V. K. G. Unnithan Assoc. Professor Agri Statistics	"	"
Dr. N. P. Kumari Sushama Asst. Professor Dept. of Agrl. Extension	Regional Conference on Women and Eco. Development	C. P. Ramaswamy Aiyar Foundation, Madras 19-21 January, 95
Dr. V. Usha Assoc. Professor Division of Home Science	"	"
Smt. Norma Xavier, C. Asst. Professor Division of Home Science	"	"
Dr. V. Indira Associate Professor Dept. of Agrl. Extn.	7th Kerala Science Congress	27th to 29th January, 1995
Dr. N. P. Kumari Sushama Asst. Professor Dept. of Agrl. Extn.	"	"
Dr. P.S Geethakutty Asst. Professor Dept. of Agrl. Extn.	"	"
Smt. Norma Xavier, C. Asst Professor Division of Home Science	"	"

### Training Programmes conducted

During the year, the training activities were considerably stepped up. Several short term courses were offered to farmers and unemployed youth to enable them to undertake ventures of gainful selfemployment. A total of 483 persons were trained during the year. Sixty three extension functionaries of the Dept. of Agriculture were also trained in the recent developments in selected frontier areas.

Infrastructure for training on mushroom and mushroom spawn production was established during the year and a total of 117 farmers/unemployed persons were trained in various aspects of mushroom growing. Training on Nursery Production & Management was conducted in three batches and 62 unemployed youth attended this training in three batches. Short-term training in flower arrangement on a commercial scale was introduced during the year and 132 persons mostly women were trained in the various aspects.

Intensive training of 2 months' duration was started during the year and 10 Science graduates/post-graduates were trained. The details of the training programmes are as follows:

Details of the training programmes and periods	Course Directors	No. of persons trained
1	2	3
Training on mushroom cultivation (5-7 September, '94)	Dr. A. Sukumaravarma	25 farmers
(3-5 October, '94)	Assoc. Professor & Head, Mushroom Unit	21 farmers
(17-19 October, '94)	"	13 farmers
(7-9 November, '94)	"	25 farmers
(15-17 December, '94)	"	16 farmers
(16-18 January, '95)	"	7 women sponsored by KSWDC
(6-8 March, '95)	"	10 disabled persons sponsored by FAITH (NGO)
Training on Plant Tissue culture (1 July to 31 August, '94)	Dr. R. Vikraman Nair	4 nursery men/ Science graduates/ post-graduates
(1 October to 30 November '94)	Professor CCRP	2 "
(16 January to 31 March '95)	"	4 "



1	2	3
Flower arrangement on commercial scale (24-25 August, '94)	Smt. Norma Xavier, C. Asst. Professor Home Science Unit Dept. of Ag. Extn.	18 unemployed persons
(1-2 September, '94)	"	54 unemployed persons (13 sponsored by SC/ST Corporation)
Flower arrangement on commercial scale (12-13 January, '95) (KSWDC sponsored) (16-17 January, '95)	Smt. Norma Xavier, C. Asst. Professor Home Science Unit Dept. of Ag. Extn.	44 unemployed youth in two batches
Flower arrangement & Flower preservation (23-25 March, '95)	Dr. T. P. Mutali Asst. Professor Dept. of Pom. and Floriculture	16 unemployed youths
Post-harvest Technology of Spices (24-26 August, '94)	Dr. E. V. Nybe Professor i/c. Dept. of Plantation Crops and Spices	17 Dy. Directors and Asst. Directors of the Dept. of Agriculture
Recent advances in Commercial Vegetable Production (27-30 September, '95)	Dr. Sairavkutti Joseph Assoc. Professor Dept. of Oleri.	9 officials from Dept. of Agriculture
Training on Post harvest handling and processing of fruits and vegetables (25-29 October, '94)	Mr. V. K. Raju Professor i/c. Dept. of Processing Technology	10 Asst. Directors from the Dept. of Agriculture & one official from the KHDP
Nursery production and Management (3-18 October, '94) (3-17 February, 95) (28 Feb. to March 15, '95)	Dr. P. K. Valsalakumari Assoc. Professor Dept. of Pomology and Floriculture	62 unemployed youth in three batches
Home Scale Food Preservation and Processing (16-18 August, '94) (28 September to 1 October, 94)	Dr. V. Usha Assoc. Professor Home Science Unit Dept. of Ag. Extn.	16 women
	"	10 women

1	2	3
Herbicide use in rice cultivation (6-8 September, 94)	Dr. C. T. Abraham AICRP on Weed Control	9 Asst. Directors of the Dept. of Agriculture
Home Scale Processing and Preservation of fruits and vegetables (23-25 March, '95)	Smt. Norma Xavier. C. Asst. Professor Home Science Unit Dept. of Ag. Extn.	10 persons
Bakery & Confectionary KSWDC Sponsored (6-8 March, 1995)	Smt. Norma Xavier, C. Asst. Professor Home Science Unit	42 persons
Hybrid vegetable seed production (24-26 November, 94)	Dr. S. Rajan Professor & Head Dept. of Olericulture	12 officials from Dept. of Agriculture
Cool Season Vegetable Cultivation (11-13 January, 95)	Dr. S. Rajan Professor & Head Dept. of Olericulture	6 Agricultural officers
Vegetable Cultivation (13-15 February, 95)	..	21 SC/ST candidates sponsored by KSWDC for SC/ST

#### Students' Union Activities

The Students' Union 1993-94 was inaugurated on 6-4-'94 by Artist Mr. Namboodiri. Smt. Oormila Unni, Cine Actor inaugurated the Arts Club.

The Interclass Arts Festival "Sraavanam 1994" was held on 3-5 August '94. The III year B. Sc. (Ag) batch secured the first position in the competition.

The Hostel Unions were inaugurated on 27-5-'94 by Smt. Neena Rawat, IPS, ASP, Thrissur. Mr. C. P. Rajasekharan, Station Director i/c., AIR, Thrissur felicitated.

The College team actively participated in the KAU Youth Festival 'Varsham 1994' held at the Mannuthy Campus on 8, 9, 10 August, 1994 and secured the runner up trophy for having obtained the second overall position (101.5 points).

An exhibition of the paintings of Ms. Kavitha Balakrishnan was held on 20-7-'94.

The post graduate day was held on 3-9-'94. Mr. Kunjunny Master, eminent poet, felicitated the post graduate students on the occasion.

The College team participated in the Inter Collegiate Badminton shuttle tournament held at Thrissur on 22-23 July, '94 and won the third position for Men and Women teams.

For the Inter Collegiate Table Tennis tournament held on 22-23 July, '94 the College Men's team won the first place and the Women secured the second place.

The College team also actively participated in the next KAU Youth Festival held at the College of Agriculture, Vellayani during 14-17 February, '95

The annual athletic meeting was held on 15-16 March, 1995. Mr. O. F Joy, Secretary of the District Sports Council was the chief guest during the closing ceremony.

The College team participated in the KAU Inter Collegiate tournaments held at the College of Agriculture, Vellayani during 23-25 February, '95. The Volleyball team (Men) won the first place and the Women team got the second position.

The valedictory function was held on 14-3-'95. Mr. M. N. Krishnamoorthi, IPS was the chief guest on the occasion.

#### **Instructional Farm**

Dr. K. K. Ibrahim, Professor i/c. continued to held charge of the Instructional Farm during the period. The total area of the farm is 95 35 ha of which coconut occupied 32.00 ha. The other perennial crops are mango (4.00 ha), cocoa (2.15 ha), cinnamon (1.40 ha), clove (1.25 ha), guava (1.00 ha), sapota (0.85 ha). The area under annual crops occupied 3.00 ha. Rubber occupied 35.00 ha, the area under roads, buildings, forest trees being 14.70 ha.

Work on the production of hybrid coconut seedlings was started during the year in the Instructional Farm for the first time. A total of 138 bunches were hybridized in selected mother palms with promising pedigree record. (LO x GB; WCT x GB; WCT x MYD). The setting of nuts in hybridized bunches was quite good.

Large scale production of planting materials of fruits, ornamentals, plantation crops and vegetable seeds was continued actively.

#### **RESEARCH**

##### **Research project implementation (KAU Projects)**

As on 31-3-95 there were 209 KAU projects under implementation in various departments. A total of 21 projects were conducted during the year.

**Externally funded research/TOT projects started**

The following 14 projects involving a total financial outlay of Rs. 68.25 lakhs were started during the year:

Project	Duration and financial outlay	Principal Investigator	Date of start
1	2	3	4
Species relationship in the genus Piper and the scope of the related taxa in the improvement of <i>Piper nigrum</i> (ICAR ad hoc)	3 years Rs. 6.90 lakhs	Dr. V. S. Sujatha Asst. Professor Dept. of Pln. crops and Spices	1-6-1994
Nutritional studies on the bio-availability of iron (ICAR adhoc)	3 years Rs. 2.92 lakhs	Dr. V. Usha Assoc. Professor Home Science Unit, Dept of Ag. Extn.	10-8-94
Traditional and appropriate technologies for <i>in situ</i> rain water harvest under humid tropical conditions	2 years Rs. 7.77 lakhs	Dr. R. Gopinathan Assoc. Professor Dept. of Agronomy	20-8-94
Pilot testing of technology of papaya based products (National Horti. Board)	3 years Rs. 3.52 lakhs	Smt. K. B Sheela Asst Professor, Dept. of Processing Technology	8-6-94
Technology development for handling and utilisation of common types of jack fruit of Kerala (ICAR ad hoc)	2 years Rs. 2.45 lakhs	Mr. V.K. Raju Assoc. Professor, Dept. of Processing Technology	15-6-94
Triploid breeding of tetraploid hybrids of Palayankodan x (Musa AAB-Mysore) - Pisang lilin (Musa AA-Pisang-lilin), for disease resistance (ICAR ad hoc)	4 years Rs. 4.32 lakhs	Dr. P. K. Valsalakumari Assoc. Professor, Dept. of Pomology and Floriculture	1-8-94

1	2	3	4
Standardisation of agrotechniques in foliage plants (ICAR ad hoc)	3 years Rs. 6.82 lakhs	Dr. C. K. Geetha Asst. Professor, Dept. of Pomology and Floriculture	1-8-94
TOT on low cost nursery production and management techniques (National Horti. Board)	3 years Rs. 7.00 lakhs	Dr. P. K. Valsalakumari Associate Professor, Dept. of Pomology and Floriculture	2-7-94
Studies on the influence of variety, maturity and storage in cashew apple (on quality of fermented products, wine and liquor (ICAR ad hoc)	3 years Rs. 7.5 lakhs	Mr. A. Augustine Asst. Professor Biochemistry Unit	1-10-94
Transfer of technology in low cost nursery production and management techniques (NHB)	3 years Rs. 7.0 lakhs	Dr. P.K. Valsalakumari Associate Professor, Dept. of Pomology and Floriculture	3-11-94
Pilot Project in Tissue Culture	1 year Rs. 0.75 lakhs	Dr. P. K. Rajeevan Professor and Head i/c, Dept. of Pomology and Floriculture	3-11-94
Nitrogen use efficiency in Plantation Crops (ICAR)	3 years Rs. 4.30 lakhs	Dr. P. A. Wahid Professor, RTL	
Soil Chemical and Radio-ecological investigations of the root (wilt) disease of coconut palm (ICAR)	2 years Rs. 1.20 lakhs		
Collaborative Project on slow release N fertilizers	3 years Rs. 6.00 lakhs	Dr. A. I. Jose Professor and Head Dept. of SS and AC	Feb. 1995

## RESEARCH HIGHLIGHTS

### Commercial Crops

In cashew greater absorption of foliar applied urea was obtained within 7 days when nutrient solution was sprayed along with teepol between 11.00 hrs. and 14 00 hrs. directing the spray to the lower surface of terminal leaves of the latest emerging flush in March. As the cashew leaves possess thinner cuticle with large number of stomata on the lower aspect, it is desirable to target the ventral sides of the lamina for foliar application of nutrients.

Among the major nutrient elements, only nitrogen showed a significant influence on cane yield. The increase in yield of cane due to application of N above 165 kg/ha was not significant. The N P-K treatments had no influence on the juice quality parameters.

### Spices

The turmeric lines VK-47 and VK-82 were advanced to farm trials. VK-47 has a production potential of 36 t/ha of fresh rhizomes with a drage of 20.15% and curcumin content of 7.25%. The advanced line VK-82 yields 30 t/ha of fresh rhizomes having curcumin content of 7.32%. The check variety yielded only 16 t/ha of fresh rhizomes with dry rhizome output of 4.29 t/ha, the curcumin content being 6.15%.

Propagation studies in nutmeg revealed that forkert budding on three years old nutmeg seedling was the most successful method of propagation when done in July. Orthotropes in nutmeg could be induced by cutting back the existing orthotropes close to the tree trunk leaving 30 cm stump.

### Vegetable Crops

The winged bean culture PT 52, pumpkin line CM-349 (yield per plant 10.59 kg), tomato line LE-79-5 and the snakegourd hybrid line RR.1 were approved for conducting farm trials. The tomato line LE 79-5 is having medium sized and white coloured fruits possesses field resistance to bacterial wilt and fruit cracking. The yield potential of this variety is 43.5 t/ha.

The farm trial series on the chilly line CA-219, the brinjal type LM 6-9 and the white fruited bittergourd MC-84 were completed and release proposals were submitted to the University Variety Release Committee. SM 6-6 is an early variety (45-55 days) having nonprickly stem and white and medium long fruits with a

mean productivity of 1.42 kg/plant (30 t/ha). Proposed for release as 'Sweha', this is the first white fruited brinjal variety in India which possesses resistance to bacterial wilt.

CA-219 which is proposed for release as 'Ujwala', is an advance over Manjeri in terms of bacterial wilt resistance and pungency (Capsaicin 0.49%) and colour value (139.29 ASTA units). This possesses long fruits of dark green colour at maturity turning bright deep red on ripening. Ujwala is an ideal variety for pot culture in homesteads because of its compact growth and attractive clustered fruits.

The best season for paprika cultivation was found to be from August to January under warm tropical humid situation. Among 20 paprika genotypes evaluated, CA-517 with medium sized deep red fruits showed promise in terms of incidence of the bacterial wilt disease.

#### **Fruits & Floriculture**

The Gerbera variety Presly was found to possess earliness in flowering with maximum number of blooms. Growth regulator treatments with GA 100 ppm and CCC 750 ppm showed positive influence on the induction of earliness, on flowering, number of blooms, longevity of flowers, flower size and vase life.

#### **Plant Protection**

The plant extracts from *Phyllanthus fraternas*, *Glycorrhiza glabra*, *indigofera tinctoria* and *Plumbago rosea* showed antiviral properties against the cucumber mosaic virus, the extracts from *P. fraternas* being most effective among the extracts evaluated.

#### **Aromatic & Medicinal plants**

Comparative evaluation of five selected types of *Piper longum* revealed that the angle of insertion of spike bearing branch, number of spikes/branch, number of spike bearing branches and green spike yield are characters influencing dry spike yield. Seemathppali showed superior performance in respect of all these attributes.

Dry rhizome output from Katcholam was comparable under shade and open conditions, indicating the scope for successful introduction of the crop in coconut gardens as a promising inter crop. Rhizome yield and oil out turn were found to be two independent characters and this brings out the need for selection criteria for high yielding types and those with better oil content.

## **Bio-technology**

Somatic embryos and *in vitro* shoots derived from field explants could be successfully regenerated to plantlets by micro-propagation. This is an important break through in the micro-propagation of cocoa.

Callus mediated organogenesis could be obtained from root and inflorescence explants of *Gladiolus*.

The effect of various supplements added to the MS and VW media on the shoot proliferation in *Dendrobium* was studied and the best treatment was found to be peptone 40 ppm+NAA 2.0 ppm +BA 5.00 ppm in VW medium. *In vitro* pollination techniques resulted in seed set in ginger for the first time. Histological examination of ovules after pollination confirmed development of the embryo after fertilization.

All stages of micropropagation namely, culture establishment, propagule multiplication, rooting, hardening and plant out were standardised for the high yielding varieties of black pepper.

## **Papers published**

During the year a total number of 46 scientific papers and 17 popular papers were published (Appendix V)

## **1.3 COLLEGE OF CO-OPERATION & BANKING, 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 under graduate 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.



**Academic staff as on 31-3-95.**

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

\*Upgraded as Professor

**Changes in Academic position during the period**

Name of faculty	Designation	Department	Date of joining
1. Dr. G. Veerakumaran	Asst. Prof.	Co-operative Management	9-11-94
2. Smt. Vanaja Menon	"	Rural Marketing Management	1-11-94
3. Smt. Usha Devi K. N.	"	Rural Marketing Management	1-11-94
4. Sri. E. G. Renjithkumar	"	Co-operative Management	1-11-94
5. Smt. K. A. Sunanda	"	Development Economics	7-12-94
6. Dr. M. A. Lizzy	"	Rural Banking and Finance Management	26-11-94

**Para-technical/Administrative/Ministerial/Supporting staff positions as on 31-3-95**

Name of post	Sanctioned	In position	Vacant
Administrative Officer	1	1	—
Section Officer	2	2	—
Sr. Office Supdt.	1	1	—
Assistant	6	6	—
Typist	3	3	—
Ref. Asst.	1	1	—
Duplicator Operator	1	1	—
Driver	1	1	—
Peon	2	2	—
Hostel Manager	1	1	—

**Academic programmes**

**a) Students Statistics**

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

Year of admission	Men	Women	Foreign students	Total
1990	12	7	—	19
1991	11	6	—	17
1992	15	8	—	23
1993	18	12	—	30
1994	17	12	—	29

**ii. P. G. Programme (on the rolls)**

1992	1	2	—	3
1993	2	—	—	2

**iii. Students who completed the course during the period**

Name of course	Men	Women	Foreign students	Total
B. Sc. (C & B)	8	4	—	12
M Sc (C & B)	—	—	—	—

**Study tours during the period**

All India Study Tour February 26th to March 22nd 95. (1991 and 92 batch of B.Sc. (C & B) students).

**Faculty Improvement**

- a) Details of Scientific staff deputed for higher studies : Nil

**Staff position**

**a) Scientists**

<b>Cadre</b>	<b>Sanctioned</b>	<b>In position</b>	<b>Vacant</b>
<b>NARP Phase I</b>			
Associate Director	1	1	—
Associate Professor	3	3	—
Assistant Professor	6	6	—
<b>NARP Phase II</b>			
Assistant Professor	4	4	—
<b>AICRP (Forage Crops)</b>			
Associate Professor	1	1	—
Assistant Professor	4	4	—
<b>AICRP (Nematode Pests)</b>			
Associate Professor	1	1	—
Assistant Professor	2	2	—
<b>AICRP (Pesticide Residues)</b>			
Associate Professor	1	1	—
Assistant Professor	3	3	—
<b>AICRP (Honey Bees)</b>			
Associate Professor	1	1	—
Technical Assistant	1	—	1
<b>ICAR ad hoc Scheme on Homestead Agroforestry</b>			
Research Associate	2	—	2
<b>ICAR ad hoc Scheme on Nutritional Studies on Pula</b>			
Sr. Research Fellow	3	3	—
<b>ICAR adhoc Scheme on VAM</b>			
Research Associate	1	1	—
<b>ICAR adhoc Scheme on Nitrogen Fixing Bacteria</b>			
Research Associate	1	1	—
<b>ICAR adhoc Scheme on Epidemiology of Honey Bee Disease in Kerala &amp; its management</b>			
Research Associate	2	—	2
Agriculture Assistant	1	—	1
<b>STED Project on Identity of Phytophthora affecting coconut and pepper and their control</b>			
Res. Fellow	1	1	—
<b>Central silk board scheme</b>			
Assistant Professor	2	2	—
Sr. Research Fellow	2	2	—
<b>DBT project on root diseases of spice crops</b>			
Research Associate	1	1	—
Jr. Res. Fellow	1	1	—
<b>DBT project on micro-propagation of tree spices</b>			
Research Associate	1	1	—
<b>DBT project on rhizobium-pulse association</b>			
Jr. Res. Fellow	1	1	—
<b>Emeritus Scientist Scheme</b>			
Res. Fellow	1	—	1
<b>Total</b>	<b>48</b>	<b>41</b>	<b>7</b>

b) *Administrative/supporting/paratechnical*

Name of post	Sanctioned	In position	Vacant
<b>NARP Phase I</b>			
Admn. Officer	1	1	—
Section Officer	2	2	—
Sr. Office Supdt.	1	1	—
Typist Gr. I (Steno)	1	1	—
Typist Gr. I	2	2	—
Assistant Gr. I	2	2	—
Assistant Gr. II	2	2	—
Farm Asst. (Agri) Gr. I	3	3	—
Lab. Asst. Gr. I	1	1	—
Driver (LDV) Gr. II	2	2	—
Photographer	1	1	—
Duplicator Operator	1	1	—
Class IV	1	1	—
One Farm Asst. on working arrangement at the I. F., Vellayani			
<b>NARP Phase II</b>			
Assistant Gr. I	1	1	—
Assistant Gr. II	1	1	—
<b>AICRP (Nematode pests)</b>			
Farm Assistant Gr. II	1	1	—
Lab. Assistant Gr. III	1	1	—
Farm Asst. is on working arrangement at the I. F., Vellayani			
<b>AICRP (Pesticide residues)</b>			
Lab. Assistant Gr. II	2	2	—
<b>AICRP (Forage crops)</b>			
Farm Assistant Gr. I	1	1	—
Farm Assistant Gr. II	2	2	—
Assistant Gr. II	1	1	—
Typist Gr. II	1	1	—
Lab. Asst. Gr. III	1	1	—
Peon	1	1	—
<b>AICRP on honeybees</b>			
Farm Assistant Gr. I	1	—	1
Lab. Asst. Gr. II	1	—	1
<b>Central Silk Board Scheme</b>			
Farm Assistant Gr. I	2	2	—
Lab. Asst. Grade III	2	2	—
<b>DBT project on micro-propagation of tree spices</b>			
Lab. Asst. Gr. III	1	1	—
<b>Total</b>	<b>40</b>	<b>38</b>	<b>2</b>

## MAJOR RESEARCH ACHIEVEMENTS

(Co-ordination group & crop-wise)

RARS, VELLAYANI

### Rice

In the two experiments conducted at (1) Nilamel ela of Neyyattinkara sub division & (2) CSRC, Karamana, the percentage of yield increase of grain over that of the control in insecticide, fungicide and its combination treatments was 23.5, 5.9 & 21.6 in the location (1) and 5.4, 7.1 & 16.0 in the location (2) respectively during virippu of 1994.

### Pulses and Oilseeds

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

In the project, evolving high yielding grain cowpea varieties suited to southern region of Kerala, fourteen varieties were selected for CYT. Eight cultures from six different parental combinations were selected for IET.

### Vegetable crops

#### Bhindi

Source of resistance of yellow vein mosaic virus of bhindi has been located in species viz. *Abelmoschus tetraphyllus*, *A. manihot* ssp. *tetraphyllus*, *A. ficulneus*, *A. moschatus* and *Hibiscus huegelii*.

#### Watermelon

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

### Plant Protection

From the studies on the degradation of mancozeb residues in pepper, the mean initial deposit of 9.80 mg/kg and 13.46 mg/kg dissipated to 97.84 & 99.80 per cent respectively within 28 days of treatment. In dry pepper berries, the initial levels of 23.5 mg/kg 38.86 mg/kg dissipated to below detectable level in 28 days.

Forty three isolates of *Phytophthora* from foot rot infected pepper, six isolates from bud rot affected coconut, two isolates from cocoa and orchid were brought into pure culture and their characters studied. Mating studies, cross inoculation studies and isolation of antagonists are in progress.

Waiting periods of quinalphos and monocrotophos for cardamom was fixed as 23 days and 22 days, dimethoate and

quinalphos for pepper as five days and 12 days respectively and quinalphos in brinjal was fixed as 11 days.

The integration of nursery and mainfield treatments like ploughing and covering the soil with polythene sheet was found effective in controlling the root-knot infestation in brinjal.

In paddy, the residues of quinalphos and butachlor applied @ 1 kg ai/ha at transplanting were below detectable level in grains; straw and husk, while 0.01 and 0.14 ppm could be recorded in the straw when triazophos was applied at 0.25 and 0.5 kg ai/ha one month before panicle initiation stage. Hence these can be safely applied to paddy at the specified stages.

In cowpea, the dissipation pattern of lindane revealed that even the initial deposit of lindane was below MRL of 3 ppm when applied at both the doses of 0.05 and 0.10 per cent concentration. The effect of decontamination techniques showed that 25.5 to 46.9 per cent residue could be removed by washing alone, while 30.66 to 59.38 per cent by washing followed by cooking.

In cardamom, the mancozeb residues from the initial deposit of 7.07 ppm (0.2 per cent) and 14.76 ppm (0.04 per cent) dissipated to below the MRL of 3 ppm within 12 and 19 days respectively. The residue could be brought down to the tune of 37 to 82 per cent by vigorous washing.

In cowpea and amaranthus, carbofuran residues dissipated below the MRL of 0.1 ppm in 27 days when applied @ 0.50 kg ai/ha while in 29 days when applied @ 1.0 kg ai/ha. Waiting periods were fixed for carbofuran in amaranthus as 28 days and 30 days when applied @ 0.05 kg ai/ha and 1.00 kg ai/ha respectively.

Monitoring of market samples of animal feed concentrates showed HCH residues in all the samples in range 0.141 to 0.409 mg/kg. Green fodder and straw were free of any HCH or DDT residues.

Monitoring of pesticide residues in farm gate vegetable samples viz., cowpea, bhindi, bittergourd, snakegourd and brinjal showed that cowpea and bittergourd had residue of monocrotophos and bhindi had residues of phosphamidon, all above the MRL level of 0.20 ppm, while snakegourd and brinjal had monocrotophos residues in levels below MRL.

Recovery of monocrotophos studied in bittergourd, cowpea, snakegourd and cucumber at 2 levels of fortification i.e. 0.20 and 0.50 ppm indicated 83.34, 79.40, 80.31 and 81.50 per cent mean recovery in bittergourd, cowpea, snakegourd and cucumber respectively.

Mites belonging to the family Tetranychidae (*Tetranychus* sp) were found to infest *Adathoda* severely. *Tetranychus ludeni*, *Tetranychus neocalidonicus*, *T. cinnabarinus* and *T. cucurbitae* are the major phytophagous mites of the family Tetranychidae infesting vegetables and ornamentals. *Brevipalpus phoenicia* and *Tenuipalpus* sp. belonging to the family Tenuipalpidae are causing severe chlorosis in ornamental plants and medicinal plants. The important predatory mites belong to the genus *Amblyseius*.

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 and neem cake basal (1 t/ha) basal + carbofuran (1 kg ai/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.

### 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.

Studies on standardisation of pots and potting mixtures for bush pepper revealed that the largest pot size 45 x 30 cm and potting mixture 1:2:2 are superior in terms of yield and biometric characters.

### Forage crops

Guinea grass varieties (42) were maintained in the germplasm. They are being catalogued with the help of a descriptor.

Fifteen varieties of *Stylosanthes* were maintained in the germplasm.

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 grass over gamba grass.

## **Beneficial micro-organisms and productive insects**

### **Honey bee**

The wild tree "Maruthi" (*Terminalia paniculata*) has been found to be a good source of nectar for migratory bees keeping after the rubber honey flow season.

The performance of the recently introduced Italian bees has been satisfactory so far, no disease has been observed in these colonies.

Observations on the effect of artificial feeding of sugar syrup to Italian honeybees indicated that 500 g sugar per colony per week and 1000 g sugar per colony biweekly rate advisable with regard to good brood development, honey and pollen stores. Peak hours of foraging activity of *A. mellifera* was found to be from 9 to 11 hours, while lowest activity was found to be 6 am and 6 pm.

### **Honey bee diseases**

The disease infecting the honey bees has been identified as the Thai sac Brood caused by a virus. Survey made in several disease belts in Kerala revealed that a few colonies apparently free from disease survived. Eighteen such colonies were procured and kept under observation.

### **Sericulture**

Application of NPK @ 130:65:65 kg/ha/year and 300:120:120 kg/ha/year under the rainfed and irrigated conditions of inter-cropping in coconut gardens respectively recorded the maximum foliage production in mulberry.

In rainy season silk worms could be reared successfully at a spacing of 75 larvae/ sq. ft. and by feeding with leaves harvested and spread one day prior to feeding.

### **VAM**

Artificial inoculation of tissue culture plantlets of rose with VAM fungi significantly increased their growth and establishment. *Glomus etunicatum* recorded 65 per cent establishment against zero establishment noticed in mycorrhizal plantlets.

Standardised VAM culture *Glomus monosporum* considerably reduced the nematode infestation in black pepper. The mortality rate of pepper cutting in the nursery due to 'foot rot' disease was reduced to 40 per cent as against 100 per cent recorded by the control.

VAM fungus *Glomus fasciculatum* was found to be the predominant VAM fungus associated with pepper plants grown in different locations in Kerala.



Native VAM cultures have been developed, of which isolate 4 and 6 significantly increased the nursery growth of pepper plants. Cuttings inoculated with isolate 6 showed considerable tolerance against foot rot disease.

Pot and field studies conducted in ginger, turmeric and cardamom indicated that inoculation with VAM fungi at the time of planting significantly increased the growth and resistance to root pathogens (root knot nematode and *Pythium* in ginger and *Phytophthora* in cardamom). Native VAM fungi have been isolated and developed for ginger, turmeric and cardamom.

Developed two native VAM cultures of black pepper for improving the growth and tolerance to foot rot disease of pepper. Developed a coir pith based mass production technique for VAM.

#### *Rhizobium*

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

#### *Nitrogen fixing bacteria - Azotobacter and Azospirillum*

The effect of azotobacter and azospirillum inoculation on root induction in bush pepper, growth and establishment of pepper, mango, jack, clove and nutmeg seedlings showed better growth response in nutmeg and pepper after inoculation.

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 *Azobacter* and *Azospirillum* biofertilizers in the State.

#### *Vermi-compost*

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

Vermicompost as an organic source (12 t/ha) along with NPK (30-8-25-1) 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.

## Biotechnology

The tree species (clove & nutmeg) under study are found to be slow in responding to *in vitro* culture. However, multiple shoots (6x) could be induced in nutmeg shoot tip cultures and single axillary shoots could be induced from nodal explants of clove.

In nutmeg multiple shoots could be separated, elongated and rooted. Acclimatization and planting are being attempted.

In nutmeg physiological pre-conditioning of the explant sources (mother trees) by physical & chemical treatments *in vivo* (mainly using plant growth regulators) could generate sizeable number of juvenile orthotropic shoots which could be used as good explants for culturing.

### *Pilot Project on Field evaluation of tissue culture plants*

Production of plantlets (Red banana, jack, orchid and anthurium) for field evaluation is in progress. Site selection in different districts is in progress. Field planting will be undertaken during next season in collaboration with the Department of Agriculture.

Somatic embryoids could be induced from nucellar tissue of mango varieties like Neelum, Pulichi and Varikka. Work is in progress for inducing normal maturation of the embryoids.

## Sustainable Agriculture

Studies on the impact of sustainable farming practices on soil fertility and crop productivity made during Rabi 93 and Kharif 94 with test crop bhindi indicated a clear tendency by the sustainable plot to enhance total yield from season to season compared to conventional system.

Early results from the field experiments of the STED project on sustainable farming indicate that the crop yield can be brought to average level under sustainable farming practices through a period of 4-5 years.

## Fruits and Floriculture

### *Red banana*

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

### *Anthurium*

A total number of 99 anthurium plants belonging to 12 varieties were collected and maintained as gemplasm in the shade house. For genetic improvement hybridisation has been taken

up. About 30 cross combinations have been attempted. Morphological and floral characters of the parent plants are being evaluated. Polyploidy induction through colchicine treatment is also under study.

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, white, lady jane and kalympong orange. In five combination, the hybrids have started flowering and they are being evaluated along with their parents.

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

### *Gladiolus*

Management practices on gladiolus for the southern zone of Kerala revealed that spikelength was ideal for cut flowers in Friendship and Happyend. Oscar and Tropic seas produced spikes with maximum number of florets and the latter had the highest vasselife.

### 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.

### Soils and Agronomy

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

### CSRC, KARAMANA

Under the project "Evaluation of component vegetable crops on rice-based cropping system", it was found that rice-rice-bhindi is the best in terms of yield, cost-benefit ratio and influence on the succeeding crop of rice.

The experiment on "Multiple use of cowpea and nutrient balance in a rice based cropping system" revealed that a crop of cowpea grown as green manure after two rice crops in kharif and rabi was found as the best in terms of yield and economics. As far as nutrients are concerned, the succeeding crop of rice was found to be benefitted by the cowpea grown as green manure.

The study on "Permanent Plot Experiment on integrated nutrient supply system" revealed that the application of 50% recommended NPK through fertilisers and 50% through FYM during Kharif and 100% through fertilisers during Rabi gave significantly higher grain yields. This treatment was found to be the best in terms of economics and soil physical condition.

The results of the trial Long range effect of continuous cropping and manuring on soil fertility and yield stability" indicated that higher levels of N (80 and 120 kg/ha) and P (40 and 80 kg/ha) produced higher yields.

## CRS BALARAMAPURAM

### Coconut

In the "NPK fertilizer experiment starting from young seedlings", the yield per palm increased significantly with N, P and K. The main effect of K alone was significant. When K was applied at 450 g/p/y, the yield of nuts increased from 32 to 122 (Two-year block analysis of 1988 & 1989). The yield increased further to 153 nuts when K was increased to 900 g/p/y. PK interaction was found to be significant. The highest yield of 79 nuts/p/y was recorded by P<sub>2</sub>K<sub>2</sub>.

Spacing had no effect on yield when the palms were not fertilised. The 10 x 10 m spacing recorded the highest yield of nut both at M1 and M2 levels of manuring. NP interaction was significant. In the absence of N no difference in yield was seen at different levels of P. In the presence of N the highest yield (41 nuts/palm/year) was observed for N<sub>2</sub>P<sub>2</sub> combination. But the effect of P was quadratic at P<sub>2</sub> and hence N<sub>2</sub>P<sub>1</sub> was found to be sufficient. No interaction was also significant. Among NK combination the highest yield was observed for N<sub>2</sub>K<sub>2</sub> (49 nuts/palm/year). PK interaction was absent except during the early periods. It was observed that there had been drastic adverse effect on the growth and yield of palms which received KO with higher levels of both N and P.

The experiment on "*Management practices for a multi-storied cropping system in red loam soils of Kerala*" was laid out during 1990. But the clove seedlings established only during 1992. The biometric observations were recorded. The experiment is in progress. The experiment was discontinued with effect from 5-12-1994 as per the suggestion of the Committee constituted to discuss about the long term experiments at Coconut Research Station, Balaramapuram. The Committee suggested to continue this experimental plot as a demonstration plot to the Farmers to educate the farmers the importance of intercropping in coconut garden, also the irrigation system developed.

## FSRS SADANANDAPURAM, KOTTARAKKARA

The first year of the study entitled "Standardisation of pots and potting mixture for bush pepper showed that the largest pot (45 x 30 cm) recorded the highest value for mean number of lateral branches and leaves compared to two other smaller pots tested. The potting mixture of 1:2:2 soil: sand: FYM was found to be superior among the potting mixtures tried. The bush pepper grown in pots of 45 x 30 cm gave the highest per plant yield.

Under the study "Genetic Improvement of popular variety cheradi for Mundakan" 144 cheradi types/cultures collected from all over the cheradi tract were tested with 10 standard varieties at the State Seed Farm, Kottarakkara during mundakan 1993-94. Among the 144 cheradi types there exhibited a wide range of variation for plant height, tiller number, panicle length and yield of grain as well as straw. The grain yield ranged from 123 to 608 g/m<sup>2</sup> and straw yield ranged from 150 g to 1389 g/m<sup>2</sup>. The standard cheradi gave a grain yield of 344 g/m<sup>2</sup> and straw yield of 854 g/m<sup>2</sup>.

The experiment IET-II was laid out during 1994-95 mundakan season at the same site and harvested on 6-2-95. There exhibited a wide range of variability for grain yield among cheradi types (178 g to 626 g with a mean of 350.8 g). The type No.97 recorded maximum yield (626 g/m<sup>2</sup>) followed by No.94 (589 g/m<sup>2</sup>) and No. 147 (538 g/m<sup>2</sup>). The lowest yield was recorded by type No.45 (178 g/m<sup>2</sup>). The standard cheradi registered a grain yield of 25 g/m<sup>2</sup>.

Among the standards, Nila recorded maximum yield (403 g/m<sup>2</sup>) followed by Resmi (324 g/m<sup>2</sup>). The comparative yield trial (CYT) will be conducted during mundakan 1995-96 by bulking similar elite pure lines.

Under the project "Comparative economics of homestead farming with and without livestock in and around Sadanandapuram" it was revealed that farmers in both groups followed a crop combination of perennials, annuals and seasonals. The sample had a high cropping intensity of 167 per cent which is likely to come down in the near future as rubber takes over most of the dryland area. Average livestock population of the sample was 2.3 with a predominance of local breeds over cross-breeds. The output to input ratio was 1.07 for local breeds and 1.20 for cross-breeds animals.

Introduction of livestock into the homestead is an attractive proposition both in terms of income and employment generation.

The staggered distribution of income from livestock was an added attraction as compared to the income from crops.

**New projects sanctioned/started**

**RARS, VELLAYANI**

Project	Principal Investigator	Date of implementation
STED project on recycling of vegetable garbage by vermiculture technology	Dr. Prabhakumari Assoc. Prof. (NC) (Soil Sci. & Ag. Chem).	30.5.94
ICAR <i>ad hoc</i> scheme on collection, compilation, cataloguing and genetic improvement to tailor better commercial varieties with export potential in <i>Anthurium</i> spp.	Dr. S. T. Mercy Professor (Agrl. Botany)	1.8.94
ICAR <i>ad hoc</i> scheme on evolving techniques for the <i>in vitro</i> propagation of economically important mono and poly embryonic varieties of mango	Dr. K. Rajmohan Assoc. Prof. (NC) (Horticulture)	18.8.94
Scheme for field testing of tissue culture plants and training in plant tissue culture	-do-	18.8.94
ICAR <i>ad hoc</i> scheme on Development of soya-rice blended food recipes	Dr. L. Prema Professor (Home Science)	14.11.94
STED project on investigations on the diseases of bamboo and reeds in Kerala	Dr. B. Balakrishnan Assoc. Prof. (NC) (Plant Pathology)	Dec. 94
STED project on Monitoring of pesticide residues in vegetables collected from the market	Dr. Thomas Biju Mathew Asst. Professor (Entomology)	1.1.95

**FSRS, KOTTARAKKARA**

1. Occurrence and severity of plant diseases in homesteads as influenced by component crops and density
2. Impact of vermicompost on soil fertility and crop productivity in the homesteads of South Kerala

Name of Scientist	Training programme	Date & Venue
Smt. S. Lekshmi Asst. Professor	Biofertilizers	25-2-95 NW DPR, Kalluvathukkal
Smt. Asha Sanker Asst. Professor	Tissue Culture	29-11-94 DAF, Anchal
Dr. M. O. Kurien Asst. Professor	Infertility Camp	25-11-94 ICDP, Kottarakkara
-do-	Sterility Camp	5-1-95 ICDP, Velium
-do-	Sterility Camp	8-1-95 ICDP, Melila

#### Computer utilisation

The facilities of the EDP & IC were utilised for the successful conduct of the "PG Entrance Examination 1994" during the period under report. Various reports and documents were typeset by Sri. P. Sreekumar, using the facilities of the Computer Centre.

The computers and the DTP were utilised for preparing various reports during the period under report.

#### Visitors

Name & address	Purpose	Date
Dr. A. N. Goswamy, Dean and Joint Director, IARI, New Delhi	Visit & Extension lecture	2-5-94 Vellayani
Dr. D. P. Singh, ADG (Vegetables) ICAR, New Delhi	Visit	June, 94 Vellayani
Dr. C. J. Thampi, State Land Use Commi- sioner, Kerala	Discussion on pre- paring a prespective plan for land use	16-7-94 Vellayani
AICRP (Forage) Monitoring team	Monitoring of the progress of AICRP (Forage)	15 and 16 Aug. 94 Vellayani
Dr. Mathur, ADG (Edn.) ICAR, New Delhi	Visit	6-8-94, Vellayani
AICRP (Forage) Monitoring team	Monitoring of the progress of AICRP (Forage)	1st January 95 Vellayani

**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 5.0 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 95 m 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.

**Station Head**

Dr. K. Vasanthakumar, Associate Professor functioned as the Head of the station during the report period.



Category	Sanctioned strength	No of persons in position.	Vacancies any within period.
1	2	3	4
<b>I. F. S. R. S. Sadanandapuram</b>			
<b>1. Scientific Staff</b>			
<b>Associate Professor</b>			
Horticulture	1	—	Vacant from 1-10-94
Soil Science	1	—	Vacant from 12-11-94
<b>Assistant Professor</b>			
Entomology	1	—	Vacant from 1-10-94
Pathology	1	1	—
Agronomy	2	1	Vacant from 1-10-94
Economics	1	1	—
Horticulture	1	1	—
Soil and Water Engg.	1	—	Vacant from 26-11-94
Veterinary	1	—	Vacant from 1-10-94
<b>II Para technical staff</b>			
Farm Assistant (Agri.) Gr. I	2	2	—
Farm Assistant (Agri) Sr. Gr.	1	1	—
Farm Assistant (Vety) Gr. I	1	1	—
Lab Asst. Gr. III	1	—	1 (through out the period)
Jeep Driver	1	—	1 (from 27-2-95)
Agri Techn. Gr. I	1	—	—
<b>Administrative staff</b>			
Administrative Assistant	1	1	—
Assistant Gr. I	2	2	—
Typist Gr I	1	1	—

	1	2	3	4
<b>II Krishi Vigyan Kendra</b>				
<i>Scientific staff</i>				
Associate professor	1		1	—
<b>Assistant Professor</b>				
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 (Agronomy)	1		1	—
Farm Assistant (Home Science)	1		1	—
Farm Assistant (Fisheries/Sericulture)	1		1	—
<i>Administrative staff</i>				
Assistant, Sr. Gr.	1		1	—
Typist Gr. II	1		1	—
Assistant Gr. II	1		1	—
<i>Auxiliary, Supporting staff</i>				
Driver (LDV)	1		1	1
Peon	1		1	—
Horticulture Attendant (Class IV)	1		1	—
Animal Attendant (Class IV)	1		1	—
Watch man (Class IV)	1		1	1

\* Krishi Vigyan Kendra, Sadanandapuram, Kollam is established at the Farming Systems Research Station, Sadanandapuram, Kottarakkara on 1st October 1994.

#### **Faculty Improvement Programme**

New posts sanctioned/created/shifted/abolished etc.

The Krishi Vigyan Kendra, Kottarakkara is established at this station on 1st October 1994. There are 7 new posts of Scientists, 3 Para Technical Staffs, 3 Administrative Staffs and 5 Auxiliary and Supporting Staffs were sanctioned under this scheme by the ICAR.

Scholarships awarded to staff for higher studies : Nil

Deputation of staff for higher studies : Nil

**Details of Seminars/Symposium/Training Programme attended by the staff**

Name of staff	Seminars/ Symposium/ Training programmes/ Workshops etc.	Date	Venue
Dr. K. Vasanthakumar	Training on uses and application of computer	11.4.94 to 12.4.94 & 18.4.94 to 19.4.94	College of Agriculture, Vellayani
All Scientists	XVI Zonal workshop of NARP (SR)	6.5.94	College of Agriculture, Vellayani
Smt. Darley Jose	1. Environmental Seminar held by Gandhi Peace Foundation	17.5.94	Kollam
	2. Seminar on GATT, Environment and Development	21.5.94	Rationalist Society of Kerala, Kollam
	3. Integrated Farming Systems and Development for sustainable Agriculture	6.6.94 to 18.6.94	Coimbatore, Tamil Nadu
Smt. S. Lekshmi All Scientists	Karshaka Seminar	29.10.94	F. S. R. S, Sadanandapuram
Dr. K. Vasanthakumar, Assoc. Professor	Symposium on Environmental Biology	7.11.94	Co-Bank Towers, Trivandrum.
"	Group Seminar on Cashew	5.12.94	KJP Foundation, Kollam.
All Scientists	17th NARP Zonal Workshop	20.3.95	College of Agriculture, Vellayani.
Dr. K. Vasanthakumar, Assoc. Professor	Production of Commercial Ornamental crop	18.1.95 to 25.1.95	Trainer's Training Centre, Indian Institute of Horticultural Research, Bangalore.
Darley Jose Asst. Professor	1. National Seminar on Women in Kerala: past and present	11.2.95 to 12.2.95	Govt. Women's College, Trivandrum.

### **Involvement of staff in Academic Programme**

Dr. K. Vasanthakumar, Associate Professor is the major advisor of M. Sc. (Ag) student at Department of Horticulture, College of Agriculture, Vellayani.

Dr. S. Chandini, Associate Professor is the major advisor of a M. Sc. (Ag) student at the Department of Agronomy and member of the advisory Committee of one Ph. D. student in the discipline of Soil Science and Agri. Chemistry, College of Agriculture, Vellayani.

Dr. S. Regeena, Assistant Professor handled post-graduate courses Ag. Econ. 609, Ag. Econ. 516 & Ag. Econ. 508 at College of Agriculture, Vellayani. She is also major advisor of a M. Sc. (Agri. Economics) student and a member of the advisory committee of yet another Agri. Economics student.

Smt. Darley Jose, Assistant Professor is a member of the Advisory Committee of a M. Sc. (Ag) student in the Department of Agronomy, College of Agriculture, Vellayani.

### **Research activities/achievements**

- a. No. of Research Projects in progress : 13
  - KAU-Plan : 4
  - Non-Plan : 8
  - ICAR : 1
- b. Co-ordination group:
  - 1. Integrated farming systems
  - 2. Spices
  - 3. Rice
- c. Projects concluded during the year : 1
- d. Projects sanctioned during the year : 2
- e. Highlights of Research results

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

The first year of the study showed that the largest pot (48x30 cm) recorded the highest value for mean number of lateral branches and leaves compared to two other smaller pots tested. The potting mixture of 1:2:2 soil:sand: FYM was found to be superior among the potting mixtures tried. The bush pepper grown in pots of 45x30 cm gave the highest per plant yield.

### **Genetic Improvement of popular variety cheradi for Mundakan**

144 cheradi types/cultures collected from all over the cheradi tract were tested with 10 standard varieties at the State Seed Farm, Kottarakkara during mundakan 1993-94. Among the 144 cheradi types there exhibited a wide range of variation for plant height, tiller number, panicle length and yield of grain as well as straw. The grain yield ranged from 123 to 608 g/m<sup>2</sup> and straw

yield ranged from 150 g to 1389 g/m<sup>2</sup>. The standard cheradi gave a grain yield of 344 g/m<sup>2</sup> and straw yield of 854 g/m<sup>2</sup>.

The experiment IET-II was laid out during 1994-95 mundakan season at the same site and harvested on 6.2.95. There exhibited a wide range of variability for grain yield among cheradi types (178 g to 626 g with a mean of 350.8 g). The type no.97 recorded maximum yield (626 g/m<sup>2</sup>) followed by no.94 (569 g/m<sup>2</sup>) and no. 147 (538 g/m<sup>2</sup>). The lowest yield was recorded by type no. 45 (178 g/m<sup>2</sup>). The standard cheradi registered a grain yield of 25 g/m<sup>2</sup>. Among the standards, Nila recorded maximum yield (403 g/m<sup>2</sup>) followed by Resmi (324 g/m<sup>2</sup>). The comparative yield trial (CYT) will be conducted during mundakan 1995-96 by bulking similar elite pure lines.

#### **Comparative economics of homestead farming with and without livestock in and around Sadanandapuram**

Farmers in both groups followed a crop combination of perennials, annuals and seasonals. The sample had a high cropping intensity of 167 per cent which is likely to come down in the near future as rubber takes over most of the dryland area. Average livestock population of the sample was 2.3 with a predominance of local breeds over cross-breeds. The output to input ratio was 1.07 for local breeds and 1.20 for cross-breeds animals.

Introduction of livestock into the homestead is an attractive proposition both in terms of income and employment generation. The staggered distribution of income from livestock was an added attraction as compared to the income from crops.

#### **Important visitors to the station**

Name and address	Period of visit	Purpose
Sri. P. P. George Minister for Agriculture	29-10-94	Inauguration of KVK
Sri R. Balakrishna Pillai Minister for Transport	29-10-94	Felicitation for the inauguration of KVK
Sri. Kodikkunnil Suresh M.P.	29-10-94	
Dr. A. M. Michael Vice-Chancellor, KAU	29-10-94	Presiding over the inaugural function of KVK

#### **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 "Fertilizer 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' Fields (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.

Sri. V. Ramachandran Nair, Professor continued as the Head of station.

Category	Sanctioned	In position	Vacant
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*Scientific staff*

a) AICARP			
Professor (Agronomy)	1	1	—
Asst. Professor (SC & AC)	1	1	—
Asst. Professor (Stat)	1	—	From 13-6-84
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 (on long leave)
Messenger	1	—	1
b) Non-plan			
Administrative Assistant	1	1	—
Office Asst.	1	1	—
Peon	1	—	1 From 1-6-85
Chowkidar	1	—	1
Part-time Sweeper	1	1	—

## Research projects in operation

- a) AICRP (Externally aided)
- b) KAU Projects

### AICRP Project on Cropping pattern

1. Expt. 1 a<sub>1</sub> : Evaluation of component vegetable crop or varieties in a rice based cropping system  
(Code No. RIC-07-03-02/92 KAR(1) ICAR Co-ord.)

The main objective of the experiment is to identify economically viable vegetable crops as a crop component in rice based cropping system.

The results obtained reveal that the treatment Rice-Rice-Bhindi is the best in terms of yield, cost-benefit ratio and influence on the succeeding crop of rice.

2. Expt. 1 a<sub>2</sub> : Multiple use of cowpea and nutrient balance in a rice based cropping system.  
(Code No. RIC-07-03-01/92 ICAR (1) Co-ord.)

This experiment was started with the objective of studying the effect and economics of growing cowpea for different purposes on growth and yield of rice and nutrient balance of soil:

A crop of cowpea grown as green manure after two rice crops in Kharif and Rabi was found as the best in terms of yield and economics. As far as nutrients are concerned, the succeeding crop of rice was found to be benefitted by the cowpea grown as green manure.

3. Expt. 2 a:—Permanent Plot Experiment on integrated nutrient supply system.  
(Code No. BR 01-00-12/85-KAR-ICAR Co-ord)

The main objective of the experiment was to develop a suitable integrated nutrient supply system for a cereal based crop sequence involving more efficient use of fertilizers in conjunction with organic manures.

On the basis of the pooled analysis up to the year 1993-'94 it was revealed that application of 50% recommended NPK through fertilisers and 50% through FYM during Kharif and 100% through fertilisers during Rabi gave significantly higher grain yields. This treatment was found to be the best in terms of economics and soil physical condition.

4. Expt 2b:—Long range effect of continuous cropping and manuring on soil fertility and crop productivity.  
(Code No. BR-01-00-10/77 KAR-ICAR Coord)

This experiment aims to study the long range effect of a crop rotation with high yielding varieties at graded fertiliser levels on yield stability and soil fertility.

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.

5. Expt. 2 e:—Determining frequency of P for judicious use of fertilisers.  
(Code No. RIC-09-01-12.93 KAR (3) KAU)

The objective of the experiment was to find out the frequency of P application for rice based cropping systems with a view to increase the P use efficiency.

The results so far show that there is no significant difference in grain yield between treatments either in the main plots or in the sub plots.

6. Expt. 4 a:—Maximisation of rice yield/productivity using FYM, spacing and levels of fertilisers.  
(Code No. RIC-09-01-13/93 (3) KAU)

The objective is to find out the effect of different levels of NPK, FYM and spacing on yield of paddy and soil physico chemical properties.

No significant effect due to treatments could be obtained so far in this experiment.

#### Significant research results generated during the period.

Application of 50% recommended NPK through fertilisers and 50% through FYM during Kharif and 100% NPK through fertilisers during Rabi can be recommended for a cereal based crop sequence for more efficient and judicious use of fertilisers in conjunction with organic manure for enhancing the yield without detriment to long term soil fertility.

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.

New Research Projects taken up during the period: Prepared a project entitled "Management of nursery diseases of vegetables with VAM and antagonistic organisms" and forwarded to ICAR for approval.



List of post Graduate projects taken up during the period : Nil  
 Important visitors to the station

Name of visiting dignitary	Institutional affiliation	Date of visit
Dr. N. Mohanakumaran	Director of Res., KAU	10.12.1994
Dr. R.P. Singh	Project Coordinator	3.3.1995

**Civil works in the station**

1. Construction of Compound wall—nearing completion
  2. Construction of waiting shed—nearing completion
- Infrastructural development under the : Installed a  
 equipments purchased, laboratory : sprinkler irrign  
 facilities developed etc. : system  
 Faculty improvement : Nil
- Participation of scientists in seminars/symposium/workshops/  
 summer institute etc.

Sl.No	Name of scientist	Participation	Period of Participation
1.	Smt. C. R. Sudharmai Devi	ISSS, Diamond Jubilee Symposium	28.11.1994 1.12.1994

2. All the scientists of this station participated in the NARP zonal workshop held on 20.3.1995 at College of Agriculture, Vellayani.

**Distribution of farm produce**

Name of produce	Quantity (kg)
1. Bhindi	300.5
2. Bhindi seed	40
3. Drum stick	5
4. Amaranthus	121.25
5. Vegetable cowpea	18.5
6. Brinjal	79
7. Tomato	10
8. Red banana	127
9. Jack fruit	30
10. Tapioca	164.5
11. Banana ordinary	15
12. " nendran	34.5
13. Mushroom	1.25
14. Coconut	2271 (Nos)
15. Paddy seed	1735
16. Bulk paddy	9746
17. Straw	9850

## **Publications**

Research articles	—	3
Popular articles	—	6
Radio talks	—	2

## **Important Visitors**

The following dignitaries visited the station during the dates noted against each.

1	Sri P. S. Gahlart, Chief Manager, Indian Potash Ltd. New Delhi	12 th May '94
2	Sri. Shekhar Tulshibagwale, Dept. of Computer science and Industrial Engineering, Lousiane, USA	6 th May '94
3	Mr. Wesley M. Shrum, Ph. D. Secretary, Society for Social studies, Lousiana, USA	23 rd May '94
4	Dr. Gurbachan Singh, Principal Scientist, ICAR, New Delhi	12 th Oct. '94
5	Dr. M. N. Sinha, Zonal Co-ordinator Krishi Vigyan Kendra, Bangalore	28 th Oct. '94

## **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, 4.0 km. South of Balaramapuram on the Balaramapuram-Vizhinjam road. The station was taken over by the Kerala Agricultural University in February '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 coconut.

**Staff**

Dr. G. K. Balachandran, Professor was the Head of Office during the period under report.

Category	No. of posts		
	Sanctioned	In position	Vacant
<b>Scientific</b>			
Professor	1	1	—
Assistant Professor (Plant Pathology)	1	1	—
<b>Administrative and supporting</b>			
Farm Supervisor	2	2	—
Administrative Assistant	1	1	—
Assistant Gr. II	2	2	—
Typist (Sr. Gr.)	1	1	—
Peon (Hr. Gr.)	1	1	—
Watchman	2	2	—

### SPECIAL ZONE OF PROBLEM AREAS

#### 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', 15kms north of Kottayam town. The history of R.A.R.S., 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 21.49 ha 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.

**Staff**

Category	Sanctioned strength	In position	Vacant
<i>Scientists</i>			
Associate Director	1	1	—
Professor	3	3	—
Associate Professor	8	3	5
Assistant Professor	10	8	2
<i>Administrative</i>			
Administrative Officer	1	1	—
Section Officer	2	2	—
Senior Office Superintendent	2	2	—
Office Superintendent	1	1	—
Senior Grade Assistant	2	2	—
Senior Grade Typist	1	1	—
Assistant Grade I	1	1	—
Typist Grade I	1	1	—
Assistant Grade II	3	3	—
Typist Grade II	1	1	—
<i>Para-technical and supporting</i>			
Senior Farm Supervisor	1	1	—
Farm Supervisor Grade I	1	1	—
Farm Assistant (Agri.)	7	5	2
Farm Assistant (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

## **Research Highlights**

Results of survey conducted on the socio economic impact consequent on the commissioning of the Thanneermukkom salt water barrier indicated that paddy cultivators and toddy tappers were beneficiaries of the Thanneermukkom Regulator. Coconut cultivators were not benefited by the Regulator. Fisherman community, coir workers, shell collectors were all adversely affected by the Regulator.

Study conducted to develop an integrated farming system model involving crop, livestock and fish under Kuttanad conditions revealed encouraging results. The interspace available under coconut garden can be utilised as fringes.

Trial with different sizes of daughter corm of elephant foot yam indicated that planting of finger corm of 80 g size at a closer spacing of 45 x 45 cm was the optimum for maximum yield. The cost benefit ratio was also high in this case.

A short duration tapioca variety suitable for growing as an intercrop in coconut garden has been evolved by the R.A.R.S. Kumarakom. This cultivar has been found to be very promising for cultivation in the Special Zone of Problem Areas. The KAU Variety Evaluation Committee has recommended its release and the same is now pending for approval of the State Variety Release Sub-committee.

A simple algebraic formula has been derived in this station to estimate precisely the influence of area and productivity of a crop over a period of time. The formula can be used, both for research and extension activities. It can be used by the Government agencies in highlighting the achievements and for taking various policy decisions relating to various crops.

### **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.

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

2. Standardisation of management practices so as to increase productivity.

3. Formulating integrated management practices to control weeds, pests and diseases. Evolving low cost production technology for Kuttanad.

Dr. C. A. Joseph continued as Professor and Head during the period under report.

**Staff**

Category	Sanctioned	In position	Vacant
<i>Scientific Staff</i>			
<b>Research on Rice</b>			
Assoc. Professor (Agronomy)	1	1	—
Asst. Professor (Entomology)	1	1	—
Asst. Professor (Chemistry)	1	1	—
Asst. Professor (Botany)	1	1	—
Jr. Statistician	1	1	—
<b>AICRIP Centre, Moncompu</b>			
Asst. Professor (Botany)	1	1	—
Asst. Professor (Agronomy)	3	2	1
Asst. Professor (Entomology)	1	1	—
<b>N. A. R. P.</b>			
Prof. of Plant Breeding	1	1	—
Assoc. Professor (Entomology)	1	1	—
Asst. Professor (Pl. Pathology)	2	2	—
Asst. Professor (Pl. Breeding)	1	1	—
Asst. Professor (Plant Phy.)	1	—	1
Asst. Professor (Ag. Chemistry)	1	1	—
<i>Paratechnical staff</i>			
Farm Supervisor (Gr. I)	2	2	—
Farm Assistant (Gr. II)	2	2	—
<i>Administrative and supporting</i>			
Admn. Asst.	1	1	—
Section Officer	1	1	—
Sr. Gr. Asst.	3	3	—
Asst. Grade I	1	1	—
Sr. Gr. 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. Asst. Gr. III	3	—	—
Boat Syrang	1	—	—

## Research Highlights

KAUM 28-1-1 (MO 5 improved sona), a promising red kernelled blast resistant culture from the project "Evolution of blast resistant varieties of rice" has been approved for release as MO 12 (Renjini).

Culture MO 120-19-4, a mutant of MO 1 was found promising and will be proposed for release after farm trial.

It is found that application of Zinc sulphate at a rate above 25 kg ha has detrimental effect on rice crop. It results in reduction in grain yield due to nutritional imbalance.

The residual effect of 50% partially acidulated phosphate rock (PAPR) was higher when compared to 10 and 30% PAPR, single super phosphate and mussorie rock phosphate.

Out of total of 2395 accessions of rice screened for sheath blight and sheath rot, 117 varieties showed a score value of 3 and below for sheath blight, 116 recorded score value of 3 and below for sheath rot and 74 accessions showed multiple resistance/tolerance to both sheath rot and sheath blight.

The trials conducted at the station since 1990 showed that "Contaf (Hexaconazole)" is effective against sheath blight disease of rice (@ 2ml/l) and is comparable with Validamycin. The chemical is now used for farm trial in Alappuzha, Pathanamthitta, Kottayam, Kollam and Thiruvananthapuram districts.

Another study revealed that IZAZOPHOS (Miral), a systemic insecticide granule was effective against rice stem borer and gallmidge when used (@ 0.6 kg ai/ha. From a trial using six insecticides, it has been found that Carbofuran (@ 1 kg ai/ha and Chlorpyrifos @ 0.5 kg ai/ha was effective against gall midge. Grain yield was also higher in the plots where these treatments were applied.

Herbicide Pretilachlor and Butachlor in combination with safener were found promising under direct sown condition. Pretilachlor and safener @ 0.6 kg ai/ha and Butachlor and safener @ 1.5 kg ai/ha produced grain yield on par with hand weeding twice. The lower doses of these herbicides @ 0.4 kg ai/ha and 1.0 kg ai/ha respectively when supplemented with one hand weeding at 20 DAS recorded the highest grain yields. These herbicides did not show any phytotoxicity to rice seedlings contrary to Anilophos and Benthocarb which are significantly inferior as far as grain yield and weed control efficiency are concerned.

### 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-Punalur road.

The Station was established in the year 1937 under the erst-while 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 objective 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.

#### Staff

Dr. K. Sivan Pillai was holding full additional charge as Professor and Head during the period.

Designation	Sanctioned	In position	Vacant
<i>Scientists</i>			
<i>Research on rice</i>			
Professor	2	2	—
Professor (Ent.)	1	1	—
Assoc. Professor (Pl.Path.)	2	1	1
Asst. Professor (Agron.)	1	1	—
Asst. Professor (Ent.)	1	1	—
Asst. Professor (SS & AC)	1	1	—
<i>NARP-II</i>			
Assoc. Professor (Hort.)	1	1	—
<i>AICRP on Oil Seeds</i>			
Asst. Professor (Pl. Br.)	1	1	—
Asst. Professor (Agron.)	1	1	—
<b>Total</b>	<b>11</b>	<b>10</b>	<b>1</b>



	1	2	3	4
<b>Administrative and Supporting staff</b>				
<b>Research on rice</b>				
Admn. Asst.		1	1	—
Sr. Gr. Asst.		1	1	—
Assistant Gr. I		1	1	—
Typist Grade I		1	1	—
Peon		1	1	—
Watchman		2	2	—
Driver (LDV)		1	1	—
Full-time Sweeper		1	1	—
Lab. Assistant Gr. III		2	1	1
Farm Supervisor Gr. I		1	1	—
Farm Asst. Sr. Grade		1	1	—
Farm Assistant		2	2	—
Regular Mazdoor		2	2	—
<b>AICRP on Oil seeds</b>				
Lab Asst. Grade II		1	1	—
Farm Assistant Gr. I		1	1	—
<b>NARP Phase II</b>				
Tractor Driver		1	1	—
<b>Total</b>		<b>20</b>	<b>19</b>	<b>1</b>

### Major Research Achievements

Mutation breeding programme was undertaken to refine the popular varieties of this locality, viz; Ptb-20 and Lekshmi. The mutant of Ptb-20 irradiated at 22 kr was found to be promising over its parent. The Cul-P-22 was therefore selected, and accepted for farm trial by the zonal workshop.

From the hybrid progenies of the crosses involving Ptb-20x Mashoori, the culture 8781 was identified as most suited to this region. This culture is also recommended for farm trial,

Oorumundakan local was subjected to irradiation at 22, 33, 44 and 55 kr. The progenies obtained by irradiating at 44 kr only was selected because of its good performance and is now recommended for IET.

Under hybridization programme, F3 of the cross OM-1xH4 (5 lines) and F2 of the cross OM-1 x Pankaj (7 lines) have been selected for further evaluation.

A project for evaluation of high-yielding varieties of grain cowpea with synchronised maturity suited to the summer rice fallows of Onattukara was taken up during VIII Plan. A few promising cultures (38 lines) obtained from the crosses (CO3x

COVU-623, COVU-358 x COVU-623, COVU-846 x COVU-623, V2 x COVU 623 & V 118 x COVU-623) were selected for further evaluation.

In an experiment to manipulate the frequency and quantity of irrigation using triazoles in cucumber (*cucumis melo* L) it was found that the triazole derivative triadimefon at 30 ppm could be effectively utilized for reducing the frequency of irrigation.

The field experiment to control the major pests of cowpea revealed that Malathion and tobacco decoction are equally effective against stem fly. Garlic extract applied at 500 g/5l water has been rated as the best against leaf webber.

In mango, *Ocimum* trap was found to be very effective in trapping large population of fruit flies.

*In vitro* regeneration of orchids and anthurium.

The protocol for *in vitro* regeneration via embryo culture four *Dendrobium* hybrids, one *cymbidium* and one *Aranda* hybrid has been standardised successfully.

#### 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. The station was taken over by the Kerala Agricultural University in 1974. Taking into account the importance of fish/prawn culture during the saline phase, a unit for fisheries research was established during 1976. Now the 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 prawn in brackishwater ponds.

Prof. K. M. George officiated as the Head of the station during the period under report.

Staff

Posts	Sanctioned	In position	Vacant
<b>Scientists</b>			
Professor (Soil Science)	1	1	—
Assoc. Professor (Agronomy)	1	1	—
Assoc. Professor (Aquac.)	1	1	—
Asst. Professor ( )	1	1	—
Asst. Professor (Pl. Br.)	1	1	—
<b>Para technical</b>			
Farm Supervisor Gr. I	1	1	—
Gr. II	1	1	—
Farm Assistant Gr. I	1	1	—
Gr. II	1	1	—
Lab. Assistant Gr. III	1	1	—
Driver Gr. II	1	1	—
Fisherman cum Watchman	3	2	1
Pump Operator	1	—	1
<b>Administrative</b>			
Administrative Assistant	1	1	—
Assistant Gr. I	1	1	—
Senior Grade Assistant	1	1	—
Typist Gr. I	1	1	—
Peon (Hr. Gr.)	2	2	—
Watchman	1	—	1

### Research Highlights

The ionic mechanism of salinity tolerance in rice genotype viz. Pokkali was identified as due to the compartmentalisation of sodium in the underground portion. Higher uptake of potassium and translocation into upper leaves and lower uptake of calcium and translocation into upper stem and upper leaves are other possible ionic mechanisms of salinity tolerance in pokkali. In chettivirippu salt exclusion mechanism also contribute to salinity tolerance. The high yielding variety Jaya is found to be susceptible to salinity owing to higher uptake and translocation of sodium and calcium coupled with reduced uptake and translocation of potassium to aerial parts.

The exploratory work revealed that the filamentous blue green algae *Oscillatoria irrigua* and *Lingbya zeylanica* are the predominant nitrogen fixing blue green algae of the pokkali agro-eco system. They flourish well in this tract and are mainly responsible for maintaining the high fertility status of the pokkali soils.

The research works conducted to modify the existing land preparation methods in pokkali system of rice cultivation, revealed that ridge formation can be resorted as an alternate method mound formation if the sowing is done 1-2 weeks prior to the setting in of monsoon. Sowing on ridges taken at 40 and 60 cm apart gave very good germination and plant stand establishment.

#### v) SUGARCANE RESEARCH STATION, THIRUVALLA

The Sugarcane Research Station, Thiruvalla was established during the year 1976, with the complete assistance from I.C.A.R. 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 Nedumparam Village, 5km 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.

The research efforts on sugarcane envisages to increase production and productivity of sugarcane in the command areas of Travancore Sugars and Chemicals, Thiruvalla and Co-operative Sugars, Chittoor, Menonpara by evolving high yielding, high sugared red rot resistant varieties and formulating optimum crop management research. Two sugarcane varieties released from the station Madhuri and Thirumadhuram had occupied more than 60 per cent of the sugarcane growing area.

Cul 527/85 was identified on a superior sugarcane cultivation for the region and the farm trial results have shown that it has outyielded Madhuri. It has been proposed to the University varietal release committee in the name of Madhurima and it has been accepted. Co 8-017 was identified on a high yielding variety with superior juice quality and farm trials are being conducted during 94-95.

Research on vegetable is also in progress under NARP phase II. Evaluation of promising varieties and accessions of cucurbitaceous vegetables were undertaken. A highly preferred type of Snake gourd "Kaumudi" was accepted by the University Release Committee and it has been proposed to the state release committee for its final release.

The results of the evaluation conducted on bitter gourd accessions collected from different location helped in the identification of an ecotype No. 1010 which was proposed to the University varietal release committee in the name of "Priyanka" and got accepted. The fruits of the above bittergourd ecotype has got special feature with regard to its quality and cooking. Research on vegetable is being done utilizing the funds provided under VIII plan.

#### Staff

Category	No. of posts		
	Sanctioned	In position	Vacant
<b>Scientific</b>			
Professor	1	1	—
Assoc. Professor	2	1	1
Asst. Professor	1	1	—
Jr. Asst. Professor	4	3	1
<b>Paratechnical</b>			
Farm Supervisor	1	1	—
Farm Assistant (Gr. I)	1	1	—
Farm Assistant (Gr. II)	1	1	—
<b>Administrative</b>			
Administrative Assistant	1	1	—
Assistant (Gr. I)	1	1	—
Assistant (Gr. II)	1	1	—
Typist (Gr. II)	1	1	—
Driver	1	1	—
Peon	2	1	1
Watchman	1	1	—

#### Faculty improvement programme

Smt. Jessy M. Kuriakose is undergoing her Ph. D. programme on part time basis.

Sri K Sreekumar had submitted his Ph. D. thesis.

#### Details of seminars/symposia and training programme attended by staff

Smt. S. Santhakumari, Professor attended the zonal workshop of problem zone held in May 94 and chaired the T & V monthly workshop.

Dr. D. Alexander acted as the resource personnel for the monthly T & V workshop.

Attended the zonal workshop of problem zone held in May 94.

Attended the workshop organised by the Agricultural Department to discuss rice production held on 4-6-94.

Acted as the resource person in the agricultural seminar organised by the Department of Agriculture on 17-8-94.

Attended the 20th biennial workshop of AICRP on Sugarcane held at Gujarat Agricultural University, Navasari.

Jessy. M. Kuriakose (Assistant Professor) attended the zonal workshop of problem zone held in May 94 at Kumarakom.

Acting as resource personnel in the monthly T&V workshop.

Sri. K. Sreekumar (Assistant Professor) attended the zonal workshop of problem zone held in May 94 at Kumarakom.

Attended the co-ordination group meeting of commercial crops at College of Agriculture, Vellayani.

Thomas Mathew (Assistant professor) attended the zonal workshop problem zone held in May 94 at Kumarakom.

Handled a class on rice production technology in the District Agricultural seminar held at Pandalam sponsored by the Department of Agriculture on 28-1-95.

Delivered a talk on fertilizer in various crops held at Venmony in the Agricultural seminar conducted by FACT.

Handled a class on sugarcane production technology held at Thiruvandoor in the Agricultural seminar conducted by FACT on 28-2-95.

Dr. R. Illangovan (Assistant Professor) attended the zonal workshop of problem zone held at Kumarakom in May-94.

Attended the zonal workshop of central zone held in May 94.

Imparted training for Agricultural officers and Agricultural Assistants held at Regional Training Centre, Malampuzha.

Handled class on Agricultural production technology of sugarcane in Agricultural seminars conducted by Department of Agriculture.

### **Research highlights**

The Kerala Agricultural University released two high yielding sugarcane varieties from the elite clones produced at this station. Madhuri cul. No. 750 83 is now a popular variety among the cultivators, yielding 116t to 124 t/ha. It is a middle maturing variety moderately resistant to red rot disease and suitable for flood prone situations.

The variety *Thirumadhuram*, Cul. No. 577/84 is midlate high yielding variety with average yield of 104 to 133 t/ha in the garden land situation of South Kerala and semi arid tracts of Palakkad district.

The research efforts for the evolution of sugarcane varieties for different agroclimatic tracts of Kerala through fluff exchange programme of 1986 series, 1987 series and 1987 series have resulted in the evolution of following clones such as 81/86, 519/86, 536/86, 1150/87, 2604/87 and 2606/87. All these cultures are under farm trial stage.

Cul. 527 was identified as a superior sugarcane cultivars in the farm trials conducted. It has been proposed to the University varietal release committee in the name of Madhuri and it has been accepted. Actions are initiated for its proposed to state release committee for its final outcome.

In the zonal trials conducted Co-88017 was identified on a high yielding variety with superior juice and jaggery recovery. Hence it was recommended for farm trial and it is being conducted.

Results of the weedicidal trials conducted at Menonpara proved that weed growth in sugarcane can be controlled by two applications of weedicide one with atrazine after planting and another 2,4-D. 8 to 10 weeks after planting.

The University release committee had accepted the snake gourd variety *Kaumudhi* and it has been proposed to the state release committee for its final release. This variety given an average yield of 50 t/ha. It is having white colour with thick flesh and less fibre content. In bitter gourd selection 1010 proposed in the name of *Priyanka* was accepted by the University Release Committee and actions are initiated to propose it to the State Release Committee. It gives an average yield of 15 to 20 t/ha with less incidence of mosaic disease and with superior fruit qualities.

#### 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:

To comprehend the effect of a surface and subsurface drainage system on the movement of soil liquids.

- ii. To study the pattern of hydrological cycle occurring in the watershed areas and its importance and influence on the drainage.
- iii. To develop a feasible technology for the lay out of sub-surface drainage system suitable to peak and muck soils.
- iv. To develop criteria for design parameters of surface drainage.
- v. To develop drainage pattern required for different crops.
- vi. To develop the feasibility of using the return flow from drainage for irrigation in relation to water quality rating.
- vii. To evaluate the socio-economic benefits accrued from the drainage projects.

#### Staff

Sri. E. K. Mathew, Assistant Professor (Agrl. Engg.) continued as Head of the station:

Cadre	Sanctioned	In position
<b>Scientists</b>		
Associate Professor (Ag. Engg.)	1	1
Assistant Professor (Agron.)	2	2
Assistant Professor (Ag. Engg.)	1	1
<b>Administrative/supporting</b>		
Farm Assistant Sr. Gr.	3	3
Overseer Gr. I	1	1
Draftsman Gr. II	1	1
Lab Assistant Gr. II	1	1
Technician Gr. II	2	2
Typist Gr. I	1	1
Assistant Gr. I	1	1
Peon	1	1
Watchman	2	2
Driver Gr. II	1	1
Section Officer (KAU post)	1	1

#### Faculty Improvement Programme

Sri. E. K. Mathew, Assistant Professor has been selected for deputation to undergo Ph. D. programme in the discipline of Soil and Water Engineering.

#### Research Highlights

From the data collected since 1985 it is inferred that the average hydraulic conductivity is 0.231 m/day and the transmissivity is 0.334 m<sup>2</sup>/day. The above values can be used for future large scale adoption of Sub surface drainage in this area.



The results of the study on drainage needs of rice indicated that there was significant difference in crop parameters between the sub surface drained area and control where farmers adopted only surface drainage according to their local practice. All the parameters were found to be significantly influenced by sub-surface drainage leading to increased grain yield.

The incremental yield by adoption of sub-surface drainage was 28% in the 30 m in spacing.

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 onfarm 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 on farm trials in Onattukara, Kuttanad areas of the NARP special zone; mainly on food crops, oilseeds and pulses.

**Staff**

Designation	Sanctioned	In position	Vacant
Assoc. Prof. (Agron.)	1	1	—
Farm Assistants	6	6	—
Typist Gr. II	1	1	—
Driver	1	1	—
Watchman	1	1	—

**Workshops/Seminars attended**

1. XXI Project Directorate of Cropping Systems Research workshop at Agrl. College, Pune 2.4-August. '94.
2. 7th Kerala Science Congress at Palakkad January 95.
3. 2nd Agri. Science Congress at Andhra Pradesh, Agrl. University, Hyderabad 19-21 January, '95.
4. NARP—KAEP, Zonal workshop at Regional Agrl. Research Station, Kumarakom from 10th March, '95.

## Research Highlights

### Kharif '94

During kharif 1994-'95 standardisation trial of rice varieties were conducted in Onattukara (10 trials) and Kuttanad (78 trials) and recommended the following varieties.

Onattukara: Thulasi, C-10-1-1 & Red Thriveni ranked first followed by Onam and Bhagya.

Kuttanad: Short duration rice—Thulasi, Red Triveni C 10-1-1 and Aruna were the best.

Medium duration rice:

C. 168, Kanakom and Remya were the best.

### Rabi '94

Integrated Nutrient Management trials on rice were done in Onattukara and found that vermicompost to supply 25% NPK, gave maximum yield of rice. Azospirillum, Azotobacter and BGA had no response over 5 tons FYM ha.

### Summer Season

Thirty two trials on Integrated Nutrient Management on rice proved that Azospirillum was able to reduce N requirement of rice in Kuttanad by 25 percent both in Karapadoms and Karilands.

Trials on method of seeding rice in Kuttanad showed that ordinary wet broadcasting is the best practice followed by broadcasting of seedlings. Ordinary transplanting gave the least yield.

In Onattukara area use of coir pith was able to conserve moisture for catchcrop in rice fallows during summer season.

## 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 district 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 air from Tamil Nadu through the Palakkad gap in the western ghats.

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 and Pest and disease surveillance unit, 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 re-organisation of 30.36 ha of land in 1945 additionally, the research activities of the Station were further intensified. With the re-organisation 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-I (Kanakamany) and Ptb-2 (Krishnamany).

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

#### Staff

Scheme	Sanctioned	In position	Vacant
1	2	3	4
<b>Non Plan A</b>			
Associate Professor	2	0	2
Assistant Professor	2	1	1
Jr. Asst. Prof. (Any discipline)	4	0	4
<b>Total</b>	<b>8</b>	<b>1</b>	<b>7</b>
<b>NARP I</b>			
Professor	2	1	1
Associate Professor	4	0	4
Assistant Professor	12	5	7
<b>Total</b>	<b>18</b>	<b>6</b>	<b>12</b>

1	2	3	4
<b>NARP II (Non Plan)</b>			
Assistant Professor	3	2	1
<b>NSP-BSP</b>			
Assistant Professor	1	1	0
Total	4	3	1

<b>AICRP</b>			
<b>Associate Professor</b>			
Plant Breeding	1	1	—
Agronomy	1	1	—
Pathology	1	1 Prof.	—
Entomology	1	1	—
Plant Breeding	2	2	—
<b>Assistant Professor</b>			
Agronomy	1	1	—
Pathology	1	—	1
Total	8	7	1

<b>AICRP ON ARID LEGUMES</b>			
Associate Professor	2	2	0

**Administrative/supporting/para-technical/ministerial/other posts (Non-plan)**

Category	Sanctioned	In position	Vacant
1	2	3	4

<b>Non-plan (A)</b>			
Section officer	4	4	0
Assistants	9	8	1
Senior Office Superintendent	1	1	0
Typist	2	2	0
Lab Assistant	5	4	1
Driver (LDV)	1	0	1
Driver (HDV)	1	1	0
Peon	3	3	0

<b>Non plan (B)</b>			
Senior Farm Supervisor	1	1	0
Farm Supervisor	2	1	1
Farm Assistant	5	4	1
Technician	1	1	0
Tractor Driver III	1	0	1
Regular mazdoor	6	6	0
Class IV	7	6	1
Watchman	4	4	0

1	2	3	4
<b>NARP I</b>			
Administrative Officer	1	1	0
Typist	2	2	0
Duplicator Operator	1	1	0
Lab Asst. Gr II	1	1	0
Driver LDV	1	1	0
Tractor Driver	1	0	1
<b>NARP II (Non-Plan)</b>			
Farm Supervisor (V)	1	1	0
Technician	1	1	0
Assistant Grade II	1	1	0
<b>AICRP : B. Supporting</b>			
Farm Assistant Gr I	4	4	0
Driver	1	1	0
Tractor cum Jeep driver	1	0	1
<b>AICRP on Guar (Arid Legumes)</b>			
Farm Asst. (Agri.) Gr. II	2	2	0
Asst. Gr. I	1	1	0
Typist Gr. II	1	1	0
Lab Assistant	1	1	0
Peon	1	1	0
NSP-BSP			
Technical Assistant	2	0	2
Field/Lab Assistant	1	1	0
Driver	1	0	1

#### Changes in faculty position during the period

Dr. P.B. Gopinathan, Professor of Entomology in the AICRP scheme and Dr. L. Nadarajan, Associate Professor of Entomology in NARP were mutually shifted.

Mrs. T. K. Bridgit, Associate Professor entered on study leave w.e.f. 19.9.94.

Dr. Leena Kumary, S, Asst. Prof. joined for duty on 18.7.94 on completion of study leave from SRS, Thiruvalla.

Smt. Kanakamani, M. T., Asst. Professor joined for duty on 10.10.94 on transfer from ARS, Mannuthy.

## Faculty improvement

### Details of Scientific staff deputed for higher studies

Name of Scientist & Deputation	Details of deputation	Name of University to which deputed
Mrs. T. K. Bridgit	Study leave w.e.f. 19.9.94 for 3 years	For Ph D Programme in KAU
Smt. Elsy, C.R.	Study leave for 3 years w.e.f. June 94	For Ph.D Programme in TNAU, Coimbatore
Smt. Rehmath Niza, T. J.	Study leave for her Ph D course	At TNAU, Coimbatore

### Details of Scientists participated in seminars/workshops/summer institutes/symposia etc.

Name of Scientist	Seminars/symposia/venue to which deputed	Period of deputation
1	2	3
V.P. Sukumara Dev	Attended the 17th Zonal Res. and Extension Committee Meeting of Central region held at RARS Pattambi	March 8th 1995
Dr. Jose Mathew	Third NARP Training programme on "Computer applications in Agrl. research" at NAARM, Hyderabad	19-30 July 1994
Dr. Jose Mathew	Attended the 7th Kerala Science Congress at Mercy College, Palakkad and presented paper	27-29 January '95
Mrs. T. K. Bridgit	International workshop on "Constraints, opportunities and innovations for wet seeded rice" at Bangkok, Thailand	May 31-June 3 '94
Dr. L. Nadarajan	Third NARP Training Programme on "Computer applications in Agrl. research" at NAARM, Hyderabad	19-30 July 1994
Dr. L. Nadarajan	Attended the training Programme on "Computer Management Information System" held at NAARM, Hyderabad	6 to 19 Feb. '95

1	2	3
Dr. L. Nadarajan	Attended International symposium on plantation crops (PLACROSYM XI) Kozhikode	30 Nov. to 3 Dec. '94
Dr. P. Rajendran	Attended the 7th Kerala Science Congress at Mercy College, Palakkad and presented paper	27-29 Jan '95
Dr. P. Rajendran	Attended the National Workshop on Manpower Development in Extension Education for meeting future challenges of Agriculture' held at NAARM. Hyderabad	13-16th Feb. '95
Dr. Leena Kumary, S	7th Kerala Science Congress at Mercy College, Palakkad	27-29th Jan, 95

#### Involvement of Scientists in Academic Programmes

Chirman, 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 hybrid 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 a bacterial wilt resistant genetic background in tomato".

#### Research

The number of research projects under implementation during the period under report are given below.

Discipline	Rice		Horticulture	Observational trials
	AICRIP	KAU		
Plant Breeding	3	7	—	1
Agronomy	9	1	—	—
Pathology	4	—	—	—
Agri. Chemistry	—	4	—	—
Horticulture	—	—	4	—
Entomology	6	1	—	1



## **Major 'Research' Achievements**

- a) Conservation of rice germplasm collection, cataloguing and evaluation

A germplasm collection of more than 400 varieties including traditional varieties, improved varieties, elite cultivars developed within and outside the state etc. is being maintained at RARS, Pattambi. During 1994-95, some 60 entries including 40 varieties from Maruteru, 12 elite cultivars from Tamil Nadu, five local varieties and three japonica cultures from IRRI were added to the collection. A wild species of rice collected from an isolated spot near Alathur in Palakkad was also added to the germplasm collection. Cataloguing of the Pattambi varieties has been completed and that of the local cultivars is in progress, to enable identification of the varieties for seed analysing and certifying agencies and also for use in future breeding programmes.

- b) Reselection in Mahsuri for red kernel colour and stress tolerance.

Culture 'RM-1' comparable to Mahsuri in yield (4654 kg/ha) having tolerance to major pests and diseases, flooding, iron toxicity etc. with red kernel was identified in this programme to be promising. This culture in the name 'Mangala Mahsuri' was proposed for release as per recommendations of the XVI NARP & ZRAC meeting to the University Variety Evaluation Committee.

- c) Breeding high yielding, tall, photosensitive varieties with good straw yield, specifically suited for Mundakan season.

One photosensitive culture viz., Cul-87117 from the cross Co-25/H4 has been found to be promising in multi-locational trials and farm trials in Palakkad, Thrissur and Ernakulam Districts. Release proposal for the same will be submitted to the University.

- d) Breeding lodging resistant rice varieties for dry sown conditions during Virippu season.

Recently released varieties viz. Kairaly, Kanchana and Cul-8755 etc. were found good for dry sowing. An initial yield trial with eleven short duration cultures along with three check varieties viz., Jyothi, Cul-8755 and Matta Triveni was conducted during Virippu 1994. Cul. No. C2-1 (M210/PTB 28) recorded the maximum yield of 3858.6 kg/ha followed by A 4-4-2 (M210/PTB 28) with 3655.0 kg/ha. C2-1 also recorded very low score for blast and was found not to germinate on panicle even though rains coincided with its maturity. A-4-4-2 was found to show tolerance to leaf folder.

e) Evolution of Semi tall/dwarf types of tall indica rice varieties

An yield trial with ten mutant derivatives along with five check varieties was conducted during Kharif 1994. Cul-210-25 (M210/M2/M210) recorded the maximum yield of 3115.08 kg/ha followed by Cul- 210-29 (3015.87 kg/ha). Cul- 20D-1, a mutant of PTB. 20 was found to be the highest yielder during Rabi 1994.

f) Improvement of rice varieties for increased consumer acceptability

Four high yielding varieties with multiple tolerance to biotic and abiotic stresses viz., Kairaly, Kanchana, Aathira and Aiswarya have already been released under this programme.

Crossing programme involving BR 52 and Edavaka was started in 1990 and progenies from the cross BR 52/Edavaka were evaluated and selected in subsequent generations. Ten advanced cultures from this cross were selected after the F8 generation during Kharif 1994.

g) Evolving rice varieties with tolerance to Sheath blight.

A few promising lines from the Cross Jyothi/Cul-25331 have been advanced for further selection. Fresh crosses involving Jyothi, Ptb 32, Zenith, Kanchana and Triveni were made during 1994 Kharif. The F2 generation of these crosses have been raised in the field.

h) Evolution of high yielding rice hybrids suitable for Kerala

The project was initiated during Rabi 1994 as a part of the net work programme on Hybrid rice.

Four CMS lines viz., IR 58025 A, IR 62829 A, V 20 A and CO MS 37 A and their maintainers were collected from other hybrid rice varieties and were evaluated for pollen and spikelet sterility. V 20A was found to give 100% pollen and spikelet sterility whereas a few plants among IR 62829 A and IR 58025 A, population showed some amount of pollen fertility. COMS 37 A was found to be partially fertile.

Cent percent sterile plants from all these CMS lines were selected and used in hybridisation programme. A total of one hundred and nineteen cross were made involving these three CMS lines and fifty four male parents from the germplasm. From these, ninety nine hybrids also with forty four parents have been raised during this season to evaluate their performance.

**PULSES (KAU)**

Selection of green gram varieties for high yield and short duration suitable for summer rice fallows having good cooking quality (Approved in 37th FRC).

Eight best yielders selected from 1993-94 trial were tested during 1994-95 summer. Pusa 9072 was the highest yielder with 510.3 kg/ha followed by pusa 9032 with 499.3 kg/ha grain yield.

## Rice

### Crop Improvement

#### AICRP

##### Initial Variety Trial—Early

IET No. 13928 recorded the highest yield (5952 kg/ha) followed by IET No. 14301 (5714 kg/ha)

##### Initial Variety Trial—Very Early

Highest yield was recorded by IET No. 14363 (55955 kg/ha) followed by IET No. 14365 (5476 kg/ha compared to local check Hraswa which recorded only 2024 kg/ha.

##### Initial Variety trial—Irrigated Mid Early

Seeds of 60 entries were received during June 1995 and sowing is completed.

##### Advanced varietal trial—IME

34 entries were sown during May 1995 and transplanted during June 1995.

##### Initial variety trial—Irrigated Medium

63 entries were received during June 1995.

#### Scheme: Intensification of research on pulses

##### i) Cowpea germplasm

164 entries were maintained in the cowpea germplasm

##### ii) Selection of greengram varieties

Pusa 9072 was found to be the highest yielder with 510.3 kg/ha.

#### AIC Project on Pulses (Arid legumes)

Seeds of the co-ordinated trials for Kharif 95 have not been received.

## RICE

### Crop Management

#### a) Agronomy

Number of ongoing experiments—AICRP 9 (Rice)

KAU	1
Total	<u>10</u>

Studies on the choice of rice varieties under delayed planting situations indicated that there was progressive decline in grain yield with every fortnightly delay in planting beyond July 20. But the yield obtained in July 20 and August 5, planting were comparable. Among the genotypes, Red Mahsuri and IET 5914 were found to perform well both under early and delayed planting situations, indicating stable performance of these genotypes.

Trials with Partially Aciduated Phosphate Rock (PAPR) indicated that application of 30 and 60 kg  $P_2O_5$ /ha as superphosphate, PAPR 30% and PAPR 50% significantly increased the grain yield over no P control but the yields were comparable among these treatments. Not recorded any significant increase in yield, over the control, both at 30 and 60 kg  $P_2O_5$ /ha.

In a study on phosphorus fertilizer saving techniques in transplanted rice, the effect of varieties and sources and methods of P application gave no significant variations in grain yield. However, the variety Abhaya performed better than Rasi particularly in the case of treatments receiving P fertilization. In no P treatment, Rasi performed better than Abhaya. Among the methods of P application, root dipping in superphosphate slurry followed by the application of P as DAP in the nursery recorded the highest yields.

Weed control studies in wet seeded rice indicated that application of herbicides alone on the third day of seeding resulted in severe mortality of rice seedlings whereas addition of safener to herbicide significantly improved the seedling stand. With regard to grain yield, the formulations involving pretilachlor as well as butachlor along with safener recorded comparable yields with that of weed free and hand weeded treatments. Highest yield was recorded by butachlor+safener, applied @ 1.5 kg ai/ha.

Pooled analysis of the data on grain yield, as influenced by multiplex micronutrient products, indicated significant variations among the treatments. Basal application of "Zinc high soil application" @ 19 kg/ha, either alone or in combination with foliar sprays of "paddy foliar spray powder", "general liquid" or "zinc high foliar spray powder" gave promising results.

#### b) Soil Science

Application of cattle manure either alone or partly (50% of N schedule) with chemical fertilizers recorded significantly higher yield than green leaves applied either alone or partly with chemical fertilizers and chemical fertilizers for dwarf and tall indica rice.

Continuous addition of green leaves alone without the application of chemical fertilizers or cattle manure has adverse effect on the growth and yield of rice on long term basis.

To maintain soil fertility and productivity of rice at substantial level requires more addition of organic matter at least to the tune of 50% of N schedule.

The rate of N loss through ammonia volatilization was more under mundakan season compared to virippu.

Spilt application of urea significantly reduces the N loss through ammonia volatilization in water logged rice soils.

The response of P solubilizing bio fertilizer on the growth and yield, soil availability of P, and P uptake was marginal in lowland rice, where there is little response to applied P.

### **Crop protection**

#### **Plant Pathology**

Out of 1141 entries comprising NSN-1, NSN-2, NSN, IRBN and KAU tested 66 entries were rated as resistant and 200 as moderately resistant to leaf blast. In the Donor Screening Nursery (DSN) PTB-10 was recorded as a low scoring entry to blast at 60% of the locations tested at All India level.

In the International Rice Blast Nursery (IRBN), the reactions of International Rice blast differentials subjected to the field populations of the pathogens, suggested the predominant rice flora prevalent at test locations belonged to IC Rice groups.

Out of the 795 entries tested for sheath blight resistance, 73 entries showed resistant reaction to sheath blight, while 120 entries were rated as moderately resistant.

Among the new fungicides tested against blast, Beam-7.5 WP (Tricyclazole) and Baycor-25WP (Buteranol) were found significantly superior than other test fungicides in checking disease and with higher grain yield.

Out of the new fungicides tested against sheath blight Contaf-5 E.C. was effective and comparable to Validacin in reducing the disease pressure.

#### **Entomology**

Evaluation of insecticides for pest control in rice indicated better performance by Miral 3G and Hostathion 0.25 kg a.i./ha. in the first crop. In the second crop at 45 DAT the dead heart incidence was lowest in Ekalux 20 AF and Ekalux 20 CS. All the other treatments were on par with no insecticide treatment. There was no significant difference in the yield.

Screening of 70 cultures against gall midge indicated 31 as resistant, 11 as moderately susceptible and 28 as highly susceptible.

Multiple resistant screening of 183 genotype showed RM-25, Navara (Black), PTB 7, culture 8781 as moderately resistant to gall fly. The genotype Kanchana, Cul-8757, Aathira, RN-15, Cul-90-01 Jayathy, Edavaka, Navara (NBPGR), Cul-8781, Cul-C-3-2 and PTB-28 was moderately resistant to stem borer.

Out of the 188 cultures screened under National screening nursery, moderate resistance was shown by 31 cultures against gall midge and by 12 cultures against stem borer.

Studies indicate the effectiveness of sex pheromones for attracting the male ones of stem-borer whereas the technique is not effective against leaf folder.

There was a heavy population of yellow stem borer, rice bug and White Jassid during January, which reduced subsequently to a low ebb during February and March, 1995.

## **Pulses**

### **Crop improvement**

#### **a) Advanced varietal trial on cowpea**

In the advanced varietal trial on cowpea with 16 entries, variety GC 8946 with a duration of 70 days recorded significantly superior grain yield of 872.7 kg/ha followed by GC 8932 with a grain yield of 616 kg/ha. The local check Kanakamony with a duration of 81 days recorded 494.7 kg grain yield per hectare.

#### **b) Advanced varietal trial on horsegram**

In the advanced varietal on horsegram with 10 entries, the variety Co DB-2 with 81 days duration recorded the highest grain yield of 438 kg/ha and is on par with Marukulthi, the local variety with 61 days duration.

#### **c) MUNG AVT-1**

i) Among 5 entries tested during Rabi 1994, Pusa Baisakhi recorded the highest with 339.75 kg/ha grain yield, followed by PDM 54 with 285.75 kg/ha.

ii) Twelve entries were tested during summer '94-95 WGG 62 with 325.667 kg/ha grain yield ranked first. This is followed by Pusa 9371 with 286.667 kg/ha.

#### **d) MUNG AVT-2**

i) Among 5 entries tested during Rabi 94, LGG 60 with 295.50 kg/ha recorded maximum yield followed by WGG-21 with 258.75 kg/ha.

ii) Seven entries were evaluated during summer 1994-95 TARM-26 ranked first with 293.667 kg/ha grain yield, followed by Co4 with 266.33 kg/ha grain yield.

#### **e) URD AVT**

Among the 6 entries evaluated during Rabi 94, LBG 402 gave highest yield of 539.25 kg/ha followed by LBG 17 with 472.75 kg/ha.

## **KAU Plan**

- a) Selection of green gram varieties for high yield and short duration suitable for summer rice fallows having good cooking quality (Approved in 37th FRC):

Eight best yielders selected from 1993-94 trial were tested during 1994-95 summer. Pusa 9072 was the highest yielder with 510.3 kg/ha. followed by Pusa 9032 with 499.3 kg/ha grain yield.

- b) Maintenance and evaluation of cowpea germplasm (Approved in 41st FRC)

Variation was noticed within the lines during 1994-95 and thus observations could not be recorded. During this year, new accessions will be collected from different sources. Characterisation will be carried out and descriptors will be formulated.

## **Horticulture**

### **Research Highlights**

As a part of the ICAR Adhoc Scheme on "Breeding for resistance to mosaic viruses in chilli", one hundred and ten accessions of different species of Capsicum were collected from different parts of the country and abroad. These collections include the reportedly mosaic resistant varieties/accessions such as Tam Mild Jalapeno-1, Tam Mild Chile-2 (Texas), IHR-24-3, IHR-582, IHR-544, IHR-384, IHR 517-1, IHR-1613, IHR-1616-8, IHR-1617-5, IHR-1618, IHR-1680 (Bangalore), and Pusa Jwala (New Delhi). All these genotypes were evaluated for growth parameters and mosaic incidence. Seven mosaic virus isolates collected from different parts of the state were artificially inoculated on to known susceptibles for multiplication, maintenance and identification.

In the study on 'Identification of suitable Chinese potato types for Central Region', thirty eight genotypes of Chinese potato collected from different parts of the state were evaluated for their performance. These genotypes differed significantly for the characters, mean leaf area, tuber yield, tubers per plant, individual tuber weight and cooking quality parameters like appearance, aroma, texture, taste, consistency and overall acceptability score. Cul-59 recorded the highest tuber yield per plant (530.35g) followed by Cul-44 (480.35 g) and Cul-28 (467.85 g). Maximum number of tubers per plant was also recorded by Cul-59. This genotype had 151.0 tubers per plant. Individual tuber weight was maximum (8.24g) in case of Cul-12 which incidentally had the minimum number of tubers per plant. While the Culture 59 had a fair overall acceptability score in terms of cooking quality parameters, the cultures 44 and 28 had a good overall acceptability score.

In the experiment on "Influence of organic and inorganic forms of fertilizers on quality of fruits and seeds in cucumber and ash gourd", 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. 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. There was no much difference in the seed viability up to 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 and chemical fertilizers. Above results underscore the role of organic forms of nutrients in enhancing the shelf life of fruits and seed viability.

Studies on effect of planting time on mosaic incidence in pumpkin revealed that sowing in the months of September and October is the best to raise a mosaic free crop of pumpkin.

In the experiment on "Breeding for mosaic resistant cultivars of ash gourd", sixty seven types of ash gourd were screened for mosaic incidence. Of these, three viz. AG-53, AG-54 and AG-25 were found to be tolerant to mosaic.

### **Pulses (Agronomy)**

#### **Salient results**

Application of improved technology showed significant improvement in growth and yield of cowpea over traditional management practices. Variety played the important role. Application of recommended fertilizer dose also had a prominent role in increasing yield.

Rainfed cowpea showed positive response to phosphorus application upto 60 kg P 205 per ha. But added sulphur failed to show any significant response in yield.

In Kharif cowpea, integrated weed management which involve pre-emergent application of 0.75 kg a.i./ha Pendimethalin followed by one hand weeding 35 DAS is effective in checking weed growth and realising higher economic returns.



### **Extension activities**

Dr. Jose Mathew regularly attended the monthly T & V workshops of Palakkad (till Oct. 94) and Malappuram districts as resource person.

Dr. Jose Mathew as Course Director, organised an "Advanced training on rice production technology" for the Agricultural Officers of Krishi Bhavan of central and northern region during 25-28 Oct. 1994.

Dr. Jose Mathew handled classes in the following training programmes.

- i) Training for Agricultural Officers at RATTC, Malampuzha on 10-5-94.
- ii) State level training on quality seed production in rice at RARS Pattambi on 9-8-94.
- iii) State level training on Herbicide use in rice cultivations for Asst. Directors at CTI Mannuthy on 7-9-94.
- iv) Advanced training on rice production technology for Agricultural Officers of Krishibhavan of central and northern region at RARS Pattambi on 27-10-94.
- v) State level training on "Central crop production technology" at RARS Pattambi on 7-2-95.
- vi) Visiting teacher trainees from DIET, Anakkara at RARS, Pattambi on 31-1-95.

Dr. K. Anilkumar, participated in the training programme "Management Development Programme for integrated cereal development programme in rice based cropping system", organised by MANAGE Hyderabad from 7-11-94 to 18-11-94.

Dr. Leenakumari attended the monthly T & V workshops of Palakkad and Malappuram District from October 1994 to March 1995.

Smt. Valarmathi was the Course Director for the training on quality seed production conducted for the Agricultural Officers of seed farms organised at the station during August, 1994.

Dr. Leenakumari and Smt. Valarmathi have handled classes on various topics during the training programmes—Quality seed production and advanced training on rice production technology for the Agricultural Officers, Krishibhavans of Central and Northern region organised at the station.

1. Prof. V. P. Sukumara Dev. attended the monthly T&V workshops of Palakkad and Malappuram districts as resource person and chairman.

2. Training classes on Integrated Pest Management were taken by Agricultural Officers of Palakkad by Prof. V. P. Sukumara Dev
3. Classes were taken by Prof. V. P. Sukumara Dev on Quality Seed Production to Agricultural Officers of Kerala.
4. Students of Agricultural and Horticultural College were given training in identification of rice diseases and their control

Dr. L. Nadarajan Assoc. Professor	Training in IPM on 6-8-94	Agri. Officers and Farm Assistants, Department of Agriculture, Malappuram
Dr. L. Nadarajan Assoc. Professor	Safe handling of pesticides on 17.8.94	Farmers and Agricultural labourers on <i>Karshakadinam</i>
Dr. L. Nadarajan Assoc. Professor	Rice pests and their management 24.11.94	Final B.Sc. (Ag.), Students
Dr. L. Nadarajan Assoc. Professor	IPM in rice	Malappuram District farmers
Dr. L. Nadarajan Assoc. Professor	IPM in rice	Palghat Dt. Farmers

#### Resource person of T & V Workshop

The following scientists are serving as resource persons for T & V workshop of Palakkad and Malappuram district.

- 1 Prof. V. P. Sukumara Dev
- 2 Dr. L. Nadarajan
- 3 Dr. Jose Mathew
- 4 Dr. P. B. Gopinathan
- 5 Dr. Leenakumari, S
- 6 Dr. Anilkumar
- 7 Dr. T. E. George

Details of seminars/workshops/symposia/training programmes conducted at the station.

Particulars	No. of participants
17th ZREAC meeting of Central zone on 8.3.1995	50
Monthly T & V workshop of Palakkad and Malappuram districts	20 each
Advanced training on rice production technology for Agricultural Officers of Krishi Bhavan of Central and Northern region on 25-28 Oct. 1994	9

### Training classes handled

Date	Topic	Target Group
<b>Dr. T. George</b>		
12-7-94	Vegetable cultivation in homestead	Nehru Yuva Kendra, Volunteers, Palakkad
5-8-94	Vegetable cultivation	Mithrakissans of Palakkad district
17-8-94	Production Technology of Horticultural crops	Farmers and Agricultural Labourers, Pattambi
28-10-94	Vegetable cultivation in summer rice fallows	Agricultural Officers
2-11-94	Laying out a Nutrition garden	KIRTADS Trainees
23-11-94	Recent Trends in vegetable cultivation	Final B. Sc. (Ag.) students
<b>Ms. M. L. Jyothi</b>		
13-7-94	Cultivation in Homeateads	Nehru Yuva Kendra Volunteers, Palakkad
20-7-94	Agriculture & Ecology	Farmers of Paramelppadi, Pazhayannoor
2-11-94	Nursery Techniques	KIRTADS trainees
23-11-94	Nursery Techniques	Final B. Sc. (Ag) students
11-3-95	Nursery Techniques	Trainees from DIET, Palakkad
<b>Dr. K. Anilkumar</b>		
4-8-94	Mithrakisan of Pavukonam watershed	Soil sample collection and date interpretation
9-8-94	Quality seed production training programme to Agricultural Officers	Fertilizer management for quality seed production
17-8-94	Agricultural Seminar at Thiruvillamala	Importance of organic manuring
26-10-94	Advanced training on rice production technology to Agri. Officers. Vegetable cultivation in summer rice fallows	Soil health and sustained rice production
31-10-94	Training programme to ST youths	Soil testing
21-11-94	Final year B. Sc. (Ag) students	Integrated nutrient management to rice
29-11-94	Agricultural seminar at Peruvembu	Fertilizer use efficiency
4-2-95	Agricultural seminar at Kumbidi	Integrated nutrient management
7-2-95	State level training programme technology to Agri-Officers	Integrated nutrient management

Prof. V. P. Sukumara Dev is a member of the advisory committee of two Ph. D. students in the Department of Agricultural Botany.

Two Agricultural Seminars, one on rice and the other on coconut were conducted in January, 1995 for the benefit of the farmers of Central Zone.

The Scientists of RARS Pattambi attended a seminar on rice at Paruthikavu, Palghat dt. and explained the rice production technology to 65 selected representatives of various Padasekhara Samithies.

Three sessions of Farmer-Scientist interaction on quality seed production technology on rice were conducted in RARS Pattambi.

Conducted agricultural exhibitions at Trivandrum, Vazhakkulam, Thodppuzha, Palakkad and Pattambi for the benefit of the farmers under the auspices of RARS Pattambi.

#### **Important Visitors**

- 1 Dr. A. M. Michael, Vice-chancellor, visited the station on 22-10-94.
- 2 Dr. Wesley M. Shrum of Louisiana State University and his team visited the station on 18-5-94.

#### **ii) CASHEW RESEARCH STATION, ANAKKAYAM**

Cashew Research Station, Anakkayam was started in 1963, under a scheme included in the 3rd five year plan. It is situated in Anakkayam Village in Ernad Taluk in Malappuram district.

The Station occupies an area of 9.92 ha. out of which 8 ha. are under cashew and 0.5 ha. are under coconut cultivation. Rest of area is set apart for buildings and roads. Soil in the Station is red laterite. The elevation of the Station is 106.8 metres above MSL. The land is sloppy and uneven terrain. The average rainfall in the station for the last 10 years is 269 cm.

#### **Objectives**

The prime objective of the station is to evolve materials, methods and means to increase the yield potential of cashew through crop improvement by recommending proper manurial schedules, cultural practices and plant protection measures. Evolution of suitable vegetative propagation methods and distribution of quality planting materials also from one of the major activities of the Station.

#### **Thrust areas of Research Identified**

- i) Introduction (including survey and collection) of indigenous and exotic dwarf genotypes and maintenance of promising types.

- ii) Evolution of high yielding dwarf genotypes suited for high density planting.
- iii Canopy management - Pruning and training.

The presently cultivated cashew types are tall statured and can accommodate only 170 trees/ha. If dwarf genotypes could be identified, they can be utilised for multiplication and further breeding programme. In future they can be used for high density planting which will lead to increased yield from unit area. In dwarf type the cost of plant protection, harvesting etc. can be reduced to some extent

Station Head : Sri. K. C. Chandy, Associate Professor.

**Staff**

Category	Sanctioned	In position	Vacant
<i>Scientific Staff</i>			
Associate Professor	1	1	—
Assistant Professor	2	2	—
<i>Administrative and supporting staff</i>			
Farm Assistant	2	2	—
Mali	1	1	—
Regular Mazdoor	1	1	—
Lab. Assistant	1	1	—
Assistant	1	1	—
Typist	1	1	—
Peon	1	1	—
Full Time Sweeper	1	1	—
Security guard	2	2	—

**Faculty improvement programme**

- a New post sanctioned/created/shifted/abolished : Nil
- b Scholarships awarded to the staff and deputation of staff for higher studies  
Smt. P. B. Pushpalatha, Assistant Professor of this station was granted study leave for one year for undergoing Ph. D. Programme.

**Research Highlights**

Two hundred and sixteen progenies evolved under 18 parental combinations are under evaluation to select superior ones.

Among the old hybrids (H-1 to H-6 series); the hybrid H-3-17 which showed a stable performance with regard to yield and having superior kernel characters is recommended for varitey release in the name "DHARASHREE".

### 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 NBPGRI 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. The scientists of the station also offers courses in the College of Veterinary and Animal Sciences. The station is a main centre for the production and distribution of quality fruit plants, ornamental plants, vegetable seeds, and breeder, foundation and truthfully labelled seeds of paddy, varieties especially of those suited to kule lands. This station also produces seedling of 'LO' coconut seedlings from the nuts produced from Lakshadweep Islands and distribution to various production centres for raising quality seedlings. This station has also started hybrid coconut seed production programme to produce 'Kera Ganga' and 'Kera Sree' hybrids during the period under report.

The following plan schemes are being operated during the year 1994-95.

- 1 Seed and nursery programme (306 31-251)
- 2 Breeding rice varieties etc. and standardisation of management practices (306-31-266)

- 3 Evolving varieties of vegetables (Bittergourd and Snake-gourd) - (306-31-267)
- 4 AICRIP on Rice (306-31-627)
- 5 Integrated programme for development of spices (306-31-817)

Apart from these, the following non-plan schemes were also in operation:

- 1 ARS Mannuthy (306-31-034)
- 2 NARP phase I (306-31-035)

#### Staff

- a) Charge : Dr. U. Jaikumar, Assoc. Prof. & Head
- b) Details of sanctioned strength of staff:

Category	Posts sanctioned	In position
Associate Professor	1	1
Assistant Professor	3	3
Administrative Assistant	1	1
Assistant Sr. Gr.	2	2
Assistant Gr. I	1	1
Sr. Office Superintendent	1	1
Peon	2	2
Watchman	2	1
Technician Sr. Grade	1	1
Workshop Attendant	—	—
Driver LDV Grade III	1	1
Lab. Asst. Gr. III	1	1
Farm Supervisor Gr. I	2	1
Farm Asst. Sr. Grade	1	1
Farm Asst. Gr. II	3	3
Tractor Driver	1	vacant

#### Faculty Improvement Programme

- a) New posts sanctioned/created/shifted/abolished : Nil
- b) Scholarship awarded to the staff/deputation of staff : Nil  
One Asst. Professor (Agron.) is being paid study leave salary for Ph. D. Programme at IARI, New Delhi.
- c) Details of Seminars/Symposia/Training Programme attended:

Dr. V. V. Radhakrishnan, Assistant Professor attended the Summer Institute on 10 days duration 'Recent Advances in breeding for biotic and abiotic stresses on crop plants' at PAU, Ludhiana from 4th to 13th July '94.

Smt. Rosamma, C. A. Assistant Professor attended the International Rice Research Conference at IRRI, Philippines from 13-2-'95 to 18-2-'95 and received the award for Outstanding Young Women in Rice Science.

#### **Involvement of staff in the academic programme**

##### **a) U. G. Programme**

- 1 The work experience programme in paddy for B. Sc. (Ag.) students was conducted at this station by Dr. U. Jaikumaran.
- 2 Smt. Sajitharani, T. offered the course (MP 121-Fodder production 2+1 course) to the B. Sc. (D. Sc.&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**

- 1 Dr. U. Jaikumaran, Head of Station guiding M. Sc. (Ag.) student in Agronomy at College of Horticulture, Vellanikkara.
- 2 Dr. V. V. Radhakrishnan, Asst. Professor was the course leader for the PG students of College of Horticulture, Vellanikkara for course programme, Population Genetics (2+1); Guiding M. Sc. (Ag.) student as main advisor.

#### **Achievements**

- 1 The station proposed to the release of rice Culture 10-1-1 having short duration and suitability for cultivation in kole land.
- 2 Hybrid coconut seed production programme was started at this station to produce 'Kera Ganga' and 'Laksha Ganga' hybrid coconuts.
- 3 F<sub>1</sub> hybrid of rice is being maintained under hybrid rice production programme.
- 4 Developed 10 promising rice cultivars as hybrid derivatives from the cross Hraswa x Mahsuri, Culture 10-1-1 x Mahsuri, Matta Triveni x Mahsuri under evaluation of short duration rice cultures for kole lands.
- 5 The seed and seedling production programme was stepped up many fold to augment utilization of available resources and to enhance revenue.
- 6 Mango orchard (4 ha) was cleared of its wild growth and loranthus was removed from 230 mango trees.

#### **Important visitors**

- 1 Executive Committee members viz. Smt. Saraswathy Kunjukrishnan, Sri. Johny Nelloor, MLA, Sri. M. P. Thami,



MLA and Jose Joseph visited the station on April 7th and 8th April 1994 in connection with the conduct of physical endurance and work proficiency test for the selection of casual labourers.

- 2 Sri. V. M. Shamsudheen, Director of Agriculture, Union Territory of Lakshadweep Islands visited the station on 25-6-94.

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  $\frac{1}{2}$  km away from Mannuthy on the left side of Mannuthy-Chirakkakkode 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
Assoc. Professor (Agron./Hort)	1	1	—
Asst. Professor (Entomology)	1	1	—
Asst. Professor (Hort.)	1	1	—
Sr. Technical Assistant	1	—	1
Farm Supervisor	1	1	—
Farm Assistant Gr. II	1	1	—
Assistant Gr. I	1	1	—
Lab. Assistant	1	1	—
Class IV Mali	2	2	—

### Faculty Improvement Programme

New posts sanctioned/created/shifted/abolished — Nil

Scholarships awarded to the staff/Deputation of staff for higher studies.

Dr. S. Pathummal Beevi was selected for the common wealth fellowship.

Details of seminars/symposia/training programmes attended by the staff — Nil.

### Involvement of staff in the Academic programme

Dr. M. Abdul Salam, Associate Professor offered a course (Agron. 708) at College of Horticulture, Vellanikkara.

### Research Achievements

A total of 14 experiments were continued during the year under the AICCIP (11 numbers) and NARP (3 numbers).

Fifty six hybrid seedlings were planted in the field. During 1991, thirty five hybrid nuts could be obtained from different cross combinations and twenty seven seedlings obtained were planted in the field. Hybridisation was continued during the period under report. A total of 191 hybrids seeds were produced till date.

Application of neem oil 5% on the tree trunk upto 1 m. height is effective from preventing the attack of stem and root borer of cashew for a period of three months. Observations were recorded on the incidence of major and minor pests of cashew and it was observed that the pest incidence was low during the period.

### Seeds & Seedling produced

Items	Quantity/number
Cashew grafts	55,242 No.
Cashew seeds	2272 kg.
Cashew seedlings	5477

### Receipts (Rs.)

Nursery	—	7,17,561
Farm Revenue	—	2,76,464
Total	—	<u>9,94,025</u>

### Important visitors

Dr. N. R. Dasari, Director of Horticulture, Department of Primary Industry and Fisheries, Darwin N. T., Australia visited the station on 13.1.94.

Dr. Rathinam, Assistant Director General, ICAR visited the station on 19.1.94.

The Director, Directorate of Cashewnut Development Corporation Cochin has visited the station on 29.3.94.

The Director, Directorate of Cashew Development Corporation, Cochin has visited the station on 10-6-94.

The Director of Research visited the station on 2.7.94. Sri. R. N. Hedge, Technical Manager, NABARD, visited the station on 27.9.94.

The Director, Central State Seed Farm, Aralam visited on 10.10.94.

Sri. P. P. Balasubramaniam, Director, Directorate of Cashewnut Development Corporation visited the station on 1.11.94.

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 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 station.

**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**

Category	Sanctioned	In position	Vacant
1	2	3	4
<i>Scientific staff</i>			
<b>AICFIP</b>			
Associate Professor (Hort.)	1	1	—
Assistant Professor (Hort )	1	1	—
Assistant Professor (Pl. Path.)	1	1	—
Assistant Professor (Ento.)	1	1	—
<b>NARP</b>			
Associate Professor (Nemat.)	1	1	—
Associate Professor (P P.)	1	1	—
Assistant Professor (Hort )	2	2	—
Assistant Professor (Agron.)	1	1	—
<i>Technical staff</i>			
<b>AICFIP</b>			
Farm Assistant Gr. I	3	3	—
Lab Assistant Gr. I	1	1	—
Oil Engine Driver	1	1	—
Mali	1	1	—
Watchman	2	2	—
<b>NARP</b>			
Farm Supervisor Gr. II	1	1	—
Farm Assistant Gr. II	1	1	—
<i>Administrative and Supporting staff</i>			
<b>AICFIP</b>			
Typist Gr. II	1	1	—
Peon	1	1	—
<b>NARP</b>			
Typist Gr. I	1	1	—
Administrative Assistant	1	1	—
Assistant Gr. II	1	1	—
Driver Gr. II	1	1	—
Pump Operator	1	1	—
Peon	1	1	—
Watchman	1	1	—

**Faculty Improvement Programme**

- a) 1 Details of posts sanctioned/created/shified/abolished.  
Two posts of senior technical assistants remained vacant under AICFIP
- 2 Scholarship awarded/deputation or study leave granted : Nil

**b) Details of Seminars/symposium/Training programme/  
Workshop/Extension activities attended by the staff**

<b>Name of Scientist and designation</b>	<b>Seminar/Symposia/ venue to which deputed</b>	<b>Period of deputation</b>
Sri. T. C. Radhakrishnan, Assoc. Professor	Zonal Workshop (Central Region) held at RARS, Pattambi	One day on 26.4.94
Dr Rema Menon, Asst. Professor	Zonal Workshop (Central Region) held at RARS, Pattambi	One day on 26.4.94
Sri. K. P Pradeep, Asst. Professor	Zonal Workshop (Central Region) held at RARS, Pattambi	One day on 26.4.94
Smt. T. Premalatha, Asst. Professor	Zonal Workshop (Central Region) held at RARS, Pattambi	One day on 26.4.94
Dr. D. Geetha, Asst. Professor	Zonal Workshop (Central Region) held at RARS, Pattambi	One day on 26.4.94
Smt. K. R. Lyla, Assoc. Professor	Zonal Workshop (Central Region) held at RARS, Pattambi	One day on 26.4.94

**Involvement of Scientific Staff in Academic Programme**

Dr. J. S. K. Charles offered a PG Course Ag. Ent. 614 (2+1) to students in the Department of Entomology, College of Horticulture, Vellanikkara during the II semester of 1993-94 commenced on 16.3.94. He is the major Advisor of a M.Sc. (Ag.) student of the Department of Agricultural Entomology at College of Horticulture, Vellanikkara.

Dr. D. Geetha, Assistant Professor offered a course "Agr 154 (Forestry Pathology)" to the III year B.Sc. (Forestry) students and "Principles of Plant Pathology (2+1) to the II B.Sc. (Ag) Students of the College of Horticulture, Vellanikkara.

### **Major research achievements**

The spacing trial in banana var. Palayankōdan revealed that increasing plant density increased the height of plants, delayed shooting and brought about reduction in bunch weight, number of hands and fruits.

Comparison of tissue culture plants of Robusta and Dwarf Cavendish with sucker derived plants showed that the former was superior in terms of plant growth and earliness in shooting.

The experiment to study the organic and inorganic fertilizer requirement of banana var. Palayankōdan showed that applying organic N beyond 25% of total N requirement was not beneficial.

Foliar application of micronutrients viz. Zn, Fe and Mn in single and combination of Zn+Fe, Zn+Fe+Cu+Bo+Mn and soil application of commercial formulation of micronutrient was effective in enhancing the growth while soil application of commercial formulation of micronutrient enhanced the yield in banana.

Screening of thirty banana varieties to leaf spot disease showed that Pisang lili, Sannachenkadali, Hybrid H<sub>1</sub>, Hybrid H<sub>2</sub>, Chinali, Kanchikela, Manoranjitham, Virupakshi, Krishnavazha and sugandhi recorded less than 10 per cent disease incidence while Dwarf Cavendish, Kadali and Kodappanillakunnan recorded more than 5 per cent disease incidence.

Survey conducted in the different locations of Trichur district showed that pseudostem borer was the most serious pest of banana. The experiment of the chemical control of this pest was laid out.

### **vi) AGRONOMIC RESEARCH STATION, CHALAKUDY**

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 On-farm Water Management studies financed by Ministry of Water Resources, Government of Kerala was started functioning from 1.4.1989 and concluded. In 1994-95, on-farm 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 station consists of an area of 8.95 ha. of which 7.05 ha. is of wetland and 1.90 ha. of upland. It is reported

that of the total rainfall, 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 caused 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

Smt. G. Santhakumari, Associate Professor (Agrl. Che.) has been in charge of the station till 8th February 1995. Later Professor P. J. Itiyaverah, Professor (Agron.) assumed the charge of the Head of the station on the F.N. of 2.2.95.

Designation	Posts sanctioned	Post in position
<b>ICAR</b>		
Professor/Chief Scientist	1	1
Associate Professor		
Agrl. Chemistry	1	1
Agronomy	1	1
Agrl. Engg.	1	1
Assistant Professor		
Agronomy	1	1
Farm Assistant Gr. I	2	2
Farm Assistant Gr. II	3	3
Lab Assistant Gr. III	1	1
Assistant Gr. I	1	1
Driver Gr. I	1	1
Peon	1	1
<b>Non Plan</b>		
Administrative Assistant	1	1
Assistant Gr. II	1	1
Farm Supervisor	1	1
Pump Operator	1	1
<b>NARP Phase I</b>		
Assistant Professor (Agron.)	1	1
Farm Assistant	2	2
Typist Gr. II	1	1
Lab Assistant Gr. II	1	1
<b>NARP Phase II</b>		
Typist Gr. II	1	1

### **Details of Seminar/Symposia/Training Camps attended**

Sri. V. M. Abdul Hakkim, Asst. Professor (Ag. Engg.) attended 10 day training programme on Onfarm Water Management at CWRDM, Calicut during the months of May 1995.

### **Research activities and achievements**

#### **Research Highlights**

The results of the Pilot Project on On-Farm Water management conducted at Mekkannoor Village under Chalakudy irrigation command indicated that during summer season, where there is scarcity of water, irrigation to rice can be prolonged upto 3 days after the disappearance of ponded water without much yield reduction.

In the experiment to evaluate the comparative performance of drip and bubbler irrigation on the growth and yield of bitter gourd, the results indicated the superiority of Bubbler method of irrigation over drip system. The highest yield (4488 kg/ha.) was recorded by bubbler irrigation at 100% Eo, closely followed by bubbler irrigation at 75% Eo which were on par and significantly superior to the rest of the treatments. The higher yields recorded by bubbler treatments may be attributed to the more uniform wetting of the entire basin area of the mounds taken in the sandy loam soils.

The results of the experiment on drip and basin methods of irrigation in coconut revealed that palms receiving irrigation at 100% ET through drip system recorded the maximum number of leaves, nuts and flowered earlier compared to the rest of the treatments.

The drip irrigation of coconut is found to significantly influence the growth attributes viz., number of leaves compared to basin method.

As part of vegetable seed production, the following vegetables were cultivated during the period. Bittergourd, snake gourd, ashgourd, cucumber, pumpkin, brinjal, chilli, amaranthus, cowpea.

#### **Important Visitors**

Dr. I. C. Mahapatra, Ex. Vice-Chancellor, Orissa University of Agril. Technology, Bhubaneswar, Orissa

Dr. R. K. Bhatta, Project Co-ordinator, Directorate of Water Management Research, Rahuri.

Sri. S. N. Pradhan, Ex. Managing Director, Lift Irrigation Corporation, Bhubaneswar, Orissa.

Dr. Shambu Mahapatra, Ex. Addl. Director of Agriculture, Bhubaneswar, Orissa.



vii) AROMATIC & MEDICINAL PLANTS RESEARCH STATION,  
ODAKKALI

With a modest beginning in 1951, the station continues to be the lead research centre for lemongrass in the country. It has been recognised as one of the centres for development and cultivation of medicinal plants by the Ministry of Health and Family Welfare, Government of India and emphasis has been given to strengthen research on aromatic crops with special reference to post harvest technology during the 8th plan period. Under a new scheme sponsored by the Ministry of Agriculture, Government of India, the Phytochemical laboratory of the station is recognised as one of the Regional Analytical laboratories for medicinal and aromatic plants and an intensive programme for seed production and distribution of selected target plants is taken up.

Staff

Dr. J. Thomas, Associate Professor, continued to be the Station Head.

Category	Sanctioned	In position	Vacant
Associate Professor	1	1	—
Assistant Professor (Agri. Che.)	1	1	—
Assistant Professor (Agro.)	1	1	—
Asst. Professor (Plant Breeding)	The post has been shifted to KHDP from 1-1-96		

Administrative/supporting/para technical/ministerial/other posts (Non Plan)

Category	Sanctioned	In position	Vacant
Administrative Assistant	1	1	—
Lab. Asst. - Graduate	1	1	—
Lab. Assistant - Non Graduate	1	—	1
Peon Hr. Gr.	1	1	—
Watchman	2	2	—
Sweeper-cum-attendant	1	1	—
Typist Gr. II	1	1	—
Assistant Gr. II	1	1	—
Assistant Sr. Gr.	1	1	—
Lab. Assistant Gr. III	1	—	1
Farm Supervisor Gr. II	1	1	—
Farm Assistant Sr. Gr.	1	1	—
Farm Asst. Gr. II	2	2	—
Gardener	1	1	—

### Changes in faculty positions during the period

The post of Assistant Professor (Plant Breeding) has been shifted to KHDP from 1-1-1995.

### Faculty Improvement

Details of Scientific staff deputed for higher studies: Nil

### Details of participation of Scientist to Seminar/Workshop/ Summer Institutes/Symposia etc.

Name of Scientist	Seminar/Symposia/Venue to which deputed	Period of deputation
Dr. J. Thomas	Perspective of herbal medicine for 21st century organised by Dr. Vasudeva Foundation, Trivandrum	26 & 27 Nov. 1994
Dr. J. Thomas	Medicinal plants as intercrop in rubber plantation	20 Dec. 1994
Dr. J. Thomas	Seminar on medicinal plants Hort. Development Programme, Kottayam	18 March, 1995

Details of seminar/workshop/symposia, etc. conducted at the station : Nil

### Major Research achievements.

#### Lemongrass

- i Morphological description of 423 accessions of lemongrass accessions was made.
- ii A lemongrass type with high content of geranyl acetate which has high demand in perfumery/agarbatti industry has been identified.

OD-455 (hathimalangtha grass): Cultivation practices of OD-455, a geraniol yielding accession, were standardized.

Cinnamon: A high eugenol yielding cinnamon type has been identified.

Kacholam: Manurial requirement for kacholam was optimised.

A BLC/method for differentiating male and female secretion of civet has been developed.

### Important Visitors

Dr. U. S. Sarma, Director (RDT & E), Central Coir Research Institute, Coir Board, Alleppey, visited the station on 20-8-94.

Mr. Sukumaran, Executive Director, Oriental Manure Mills, Kottayam visited the station on 17-8-94.

Mr. Raveendran, Scientist, Directorate of Cocoa, Aracanut & Spices Development visited the station on 24-2-1993.

Dr. R. C. Pandalai and Dr. E. M. Muraleedharan, Scientists, KFRI, Peechi visited the station on 7-3-95.

**viii) PINEAPPLE RESEARCH STATION & PEST AND DISEASE SURVEILLANCE UNIT, VAZHAKULAM**

The Pineapple Research Station and pest and disease surveillance unit was started at Vazhakkulam 10 kms. from Moovattupuzha towards east on 2nd January, 1993. The main objective of the station is to conduct survey on pests and disease occurrence in pineapple and to carry out research on nutritional aspects, cropping intensity and post harvest technology.

Sri. Kuriakose, K. P., Assistant Professor is the head of the station.

**Staff**

Category	Sanctioned	In position	Vacant
Assistant Professor (Plant Breeding)	1	1	—

**Extension activities and service rendered to the farmers  
Seminars & Exhibitions**

Participated as General Coordinator of the KAU pavilion of the Karshikamela at Vazhakulam during 13-14th January, 1995.

Attended the Karshikotsavam at Pattambi on 20.1.95

Participated in the State Agri. Fair 1995 at Thodupuzha during 25.1.95 to 28.1.95

Participated in the Flower show at Muvattupuzha during 8-2-95 to 12-2-95.

Participated in the Agri. Seminar organised jointly by Agri. Department, FACT and Service Co-op. Bank, Vazhakulam on 4.3.95 and took class on coconut management.

Attended the Zonal Research Extension Advisory Committee meeting at Pattambi on 8-3-95.

**Radio talk**

Gave a radio talk on Lemongrass cultivation broadcasted on 23.3.95.

**Village Adoption Programme**

Three Villages, viz. Kallorkad, Arakuzha and Thirunaradi were adopted.

## NORTHERN ZONE

### i) REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

Coconut research in India started in the West coast at the erstwhile Madras state with the establishment of four Research Stations in 1916 – one each at Kasaragod and Pilicode and two at Nileswar. 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 when the Kerala Agricultural University came into being one of the stations at Nileswar (Nileswar II) and the station at Pilicode were transferred to Kerala Agricultural University with headquarters 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 1-6-80. The present area at RARS, Pilicode is 57.87 ha and that of Nileswar 17.25 ha.

Dr. N. Krishnan Nair, Associate Director was the head of the station till 4-6-94 and later Dr. U. Mohammed Kunju, Special Officer, College of Agriculture, Pilicode-Nileswar was in charge of the Associate Director of this station.

The main objectives 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 as 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. Monthly workshops under T & V programmes, exhibitions etc. are being arranged in addition to the above programme.

An information-cum-sales counter, is functioning at RARS, Nileshtar. Seed and nursery programme is also in operation at RARS, Pilicode and Nileshtar.

**Staff**

Designation	No. of posts sanctioned	In position	Vacant
1	2	3	4
<b>NARP Phase-I</b>			
Associate Director	1	1	—
Professor	5	4	1
Associate Professor	11	4	7
Assistant Professor	3	4	—
Research Associate (against the post Asst. Prof)	4	2	2
<b>Para-Technical Staff</b>			
Farm Supervisor	5	4	1
Lab. Asst. Gr. II	5	4	1
<b>Administrative staff</b>			
Admn. Officer	1	1	—
Sr. Gr. Typist	2	1	1
Typist Gr. I	2	2	—
LDV Driver	2	1	1
Tractor Driver	1	—	1
Peon	1	1	—
<b>Non-plan</b>			
Assistant Professor	6	—	6
<b>Para-Technical Staff</b>			
Farm Supervisor Gr. I	2	2	—
Farm Assistant	2	2	—
Farm Assistant (Vety.)	1	1	—
<b>DST Project on Rice (Scheme terminated w. e. f. 31.3.95)</b>			
Research Associate	1	1	—
Jr. Research Fellow	1	1	—
Farm Asst. (Agromet)	1	1	—
<b>ICAR Adhoc Scheme on Cashew</b>			
Research Associate	1	1	—

1	2	3	4
<i>Administrative staff</i>			
Section Officer	3	3	—
Sr. Gr. Assistant	3	2	1
Assistant Gr. I	2	2	—
Assistant Gr. II	1	1	—
Office Superintendent	1	1	—
LDV Driver Hr. Gr.	1	—	1
Oil Engine Driver	1	1	—
Peon Hr. Gr.	3	3	—
Pump Operator	2	1	1
Watchman	1	—	1
Regular Mazdoor Class IV	15 3	15 2	— 1
(working arrangement at Ambalavayal)			
Sweeper-cum-Sanitation Worker	1	1	—
Cook-cum-Caretaker	1	1	—
		(daily wage)	
		(on contract basis)	
<i>Training Scheme</i>			
Assistant Professor	1	1	—
Sr. Gr. Assistant	1	1	—
<i>Para-Technical</i>			
Farm Supervisor Gr. I	1	1	—
<i>NARP Phase II</i>			
Associate Professor	2	1	1
Assistant Professor	4	2	2
<i>Para-Technical Staff</i>			
Farm Asst. (Vety.)	2	2	—
Mechanic (Technician Gr. II)	1	—	1
<i>Computer Centre</i>			
Junior Programmer	1	—	1
Res. Associate (Agro.)	1	1	—
Res. Associate (Horti.)	2	2	—
Res. Associate (Soil Science)	1	1	—
<i>AICRP on Cashew</i>			
Asst. Professor	1	1	—
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	—

1	2	3	4
<b>AICRP</b>			
<i>Para-Technical Staff</i>			
Lab. Assistant	1	—	1
Farm Asst. Gr. II	3	3	—
Peon Hr. Gr.	1	1	—
<b>Central Nursery (OEAP)</b>			
Farm Asst. Gr. II	1	1	—

<b>Faculty Improvement Programme</b>			
New posts sanctioned/ created shifted/abolished	nil	nil	nil
Deputation of staff	nil	nil	nil

**Details of Scientists participated in Seminars/Workshops/  
Summer Institutes/Symposia etc.**

Name of Scientist	Seminars/Symposia and Venue	Period
<b>RARS, Pilicode</b>		
Dr. GSLHV Prasada Rao	TROPMET-95. NRSA, Hyderabad	8-11 February, 1995
Dr. GSLHV Prasada Rao	Course on computer application in Agriculture, NAARM, Hyderabad	19-30 July, 1994
Sri. N. Subash	Training programme on Simula- tion and system analysis for Rice Production, WTC, TNAU, Coimbatore	20-27 Decem- ber, 1994
Dr. M. Govindan	Summer Institute on Advances in Agrl. Microbiology with special reference to mycorrhi- zal symbiosis, GKVK, Bangalore	22 August— 10 September
Dr. M. Govindan	Course on Computer Applica- tion in Agriculture NAARM, Hyderabad	19-30 July, 1994

**Involvement of staff in Academic Programme**

Scientists of Pilicode offered undergraduate courses in the College of Agriculture, Pilicode-Nileshwar. A few staff members were in the Advisory committee of PG students. One Ph. D student (Agronomy) conducted field experiments at RARS, Pilicode as a part of the research programme.

## Major research achievements

### Coconut

Morphological and yield characters of all the available germplasm in coconut were recorded to evaluate the performance of different cultivars.

Among the 51 cultivars studied for their copra out turn per year for an average of 32 years, Andaman Giant and Philippines Ordinary out yielded the other cultivars by producing 19.13 Kg and 17.96 Kg respectively. The lowest copra yielder was Malayan Orange Dwarf (4.79 Kg).

Among the 15 new introductions planted during 1976 the cultivars Kudat and St. Vincent found to be promising followed by Seychelles in cumulative nut production.

The already released four hybrids namely, Kerasankara (WCT x COD), Chandrasankara (COD x WCT), Keraganga (WCT x GB) and Lakshaganga (LO x GB) are performing better than all the other treatments. The hybrids Chandrasankara, Kerasankara and Keraganga are on par in cumulative nut production.

To evaluate the performance of coconut hybrids at different agro climatic regions of Kerala, 185 WCT, 360 LO, 180 and 43 GB seednuts were planted at Pilicode Farm, Vellanikkara and 25 LO and 5 GB seedlings were planted at Sadanandapuram. 15 Malayan Yellow Dwarf seedlings were planted during the year 1992. The general growth of the seedlings planted at RARS, Pilicode is good. Flowering was noticed first time during the season in the experimental plots. It includes nine Gangabondam and two Lakshaganga palms.

The management trials on stem bleeding conducted so far showed that Calixin 25 ml./25 ml. of water as root feeding or 25 ml./25 ltrs. of water as soil drenching was highly effective in the control of the disease. Seven onfarm trials on management of stem bleeding disease was conducted in September 1991 as per the recommendations of the XIV NARP Workshop. The results showed the effect of Calixin soil drenching (25 ml./25 ltrs. at four months interval in reducing stem bleeding disease. Maximum reduction was obtained in palms which received both Neemcake applications and Calixin soil drenching. An experiment was set up to study the effect of different doses of Calixin as root feeding/soil drenching in managing stem bleeding disease.



## Rice

Among the high yielding varieties tested Jyothi was the high yielder (2.88 tons/ha) and was on par with Mala and AU-1. In the case of straw yield Mala recorded a maximum straw yield of 3.44 tons ha and was on par with Cul. 8754.

Thonnuran and Jyothi are promising varieties for this region other than Cul. 1727.

The CERES-Rice Model was tested for test varieties viz. Jaya, Jyothi and Triveni for Kharif 1993 and 1994 and for Rabi 1992-93, 1993-94 and 1994-95. The simulated and observed grain yields were in good agreement in Kharif 1993 while the simulated values were higher when compared to that of observed in Kharif 1994. The low yield in Kharif 1994 was due to continuous heavy downpour of rain which resulted in high incidence of gall midge, rice bug and brown spot. In Rabi, the CERES-Rice Model could not be tested as the model runs under flooded water management conditions. The CERES-Rice Model can be used for simulating grain yield of Kharif while it needs revalidation for Rabi.

Pureline selection was made in two of the popular tall indica cultivars of this region, viz. Thouvan and Alikkannan. Thouvan cultures T 101 & T 82, Alikkannan cultures A 21 & A 10 were found to be promising for the region.

## Vegetable

The improved line of Melon (CS-1) were grown along with local check to observe the incidence of pest and diseases. It was found that the line was relatively tolerant to pests and diseases. Organoleptic test conducted to assess the bitterness revealed that the bitterness is confined to placental region only. The line CS-1 was recommended for release as a new variety.

## Medicinal plants

Replicated trial with six species viz. Kacholam, Kasthuri-manjal, Arrow root, Thippali, Iruveli and Koduveli grown in coconut garden was conducted during May 1994. *Maranta arundinaceae* recorded the highest yield (18.33 t/ha) followed by *Coleus veteveroides* (15.5 t/ha). Among the six species, Thippali was found to be the most economic intercrop with a C- B. ratio of 1:1.87.

## Cashew

In cashew, the hybrid H 1600 performed better in vegetative growth. The cashew nut yield was maximum in BLA 39-4

followed by the hybrid H 1591. The nut size and kernel weight were also maximum in H 1591.

The boldnut types of cashew varying from 8 to 14 of nut weight were identified and described as per the description. A few very early types, flowering in October and fruiting in November and December were also identified.

The preliminary observations indicated that a significant variation was noticed in crop duration (BLA-139-1) from south to north of Kerala. The crop duration was only 102 days at Kottarakkara (Quilon District) while it was 148 days at Puttur (South Kanara District, Karnataka). Interestingly, the crop duration was 164 days at Anakayam while it was 114 days at Madakkathara though both the locations fall under central regions of Kerala.

The length of rainy season and crop initiation (bud break) showed no relationship between them. Though the length of rainy season varied from October to November, the bud break was noticed in the end of September at all the locations except at Puttur where it was on 1st November. However, there was a significant difference in crop maturity from place (south to north of Kerala). The crop was over by 1st week of January (2.1.93) at Kottarakkara while it was by the end of March (26.3.93) at Puttur.

All phenological phases in cashew delayed towards north of Kerala. The length of rainy season and bud break in cashew showed no relationship.

The trend analysis was carried out using the data on coconut production (State-wise as well as District-wise). The coconut productivity over Kerala was maximum during the decade 1951-1960 (5935 per hectare) and started declining till 1983-84 and reached the lowest level of 3814 nuts in 1983-84. The above nut decline in 1983-84 was due to the disastrous unprecedented drought occurred over Kerala in summer 1983. Thereafter the coconut productivity started increasing. However, the present level of State's coconut productivity does not reach to the previous stage of the decade 1951-60. The coconut productivity of the northern region is relatively low. However, the increasing trends in coconut productivity in Kannur and Kasaragod Districts were encouraging where the productivity was the lowest in the State.

The equations developed using the moisture adequacy during the summer and the humidity index the rainy season

could explain 90 per cent variations in nut yield of coconut. Hence, the equations can be used for predicting nut yield in advance based on weather variables.

Providing irrigation @ 450 litres palm/week till water is available during summer is not detrimental to coconut palms.

#### **Exhibition**

Participated in the following exhibitions

SI No.	Place	Date
1	GHS, Kuttamath	18.10.1994
2	Trichur	23-25th September 1994
3	Alakode	30-31st December 1994
4	Rajas High School	2-30th January 1995
5	Bekal	20-27th January 1995

#### **Seminars/Farmers' Councelling**

Scientists participated in the Agricultural Seminars and handled classes on topics of interest to farmers. A total number of 15 seminars were attended during the report period. An average 50 farmers per month came to this station seeking their agricultural problems regarding mushroom cultivation, coconut seedlings, plant protection and other aspects.

#### **Information-cum-Sales Centre**

An information-cum-sales centre was functioning at RARS, Nileshwar to cater to the needs of the farmers of Northern Region for the supply of planting materials, technical advice and other agricultural requirement.

A one day training programme on mushroom cultivation was organised, on 1st Saturday of every month.

#### **Veterinary Hospital and A.I. Centre**

A Veterinary Hospital was functioning at RARS, Pilicode. An average of 100 cases per month were treated in the Hospital and 35 Insemination per month were done in the A.I. Centre.

#### **Important Visitors**

1 Sri. P. P. George, Agricultural Minister of Kerala, Sri. M. P. Thami and Sri. K. C. Joseph, Executive Committee Members, Dr. A. M. Michael, Hon. Vice-Chancellor visited the RARS, Pilicode on 5.4.1994.

Dr. Hamley M Eisai, Dr. T. C. Jain and Dr. T. C. Verma of the IDA Mission visited PRS, Panniyur on 27.4.94 to review the progress of experiments.

- 3 Dr. Jayathilak, I.A.S., Sub Collector, Mananthody and Mrs. Nishitha Roy, Sub Collector, Tellicherry visited PRS, Panniyur on 22.12.94.
- 4 Dr. A. K. Sadanandan, Project Coordinator (Spices), NRCS, Calicut visited PRS, Panniyur on 12.1.95 to inspect the ongoing experiments.

ii) PEPPER RESEARCH STATION, PANNIYUR

Pepper Research Station, Panniyur enjoys a unique position among other institutions of Agricultural Research being the only Research Station solely devoted for research on black pepper. The origin of the station dates back to 1952, which had a modest beginning as a small scheme on Scientific aid to pepper industry in South India launched by the erstwhile Madras Department of Agriculture. Consequent to the formation of Kerala State, the Station came under the Department of Agriculture, Government of Kerala in 1956 and further, with the organization of Kerala Agricultural University, this became one of its constituent research stations from 1.2.1972 onwards. Almost the entire package of practices recommendations on black pepper were evolved in this station.

**Thrust areas of Research**

The station was set up with a mandate to rehabilitate the ailing pepper cultivation and industry on a sound footing by augmenting production and productivity and to face challenges from international competition.

The thrust areas of research included Nursery Management, Crop Improvement, Crop Management and Crop Protection right from the date of its inception. Post harvest aspects are also being taken up recently.

Scheme like AICRP on Spices, NARP etc. are also in operation at the station.

**Staff**

Sri. K. P. Mammooty, Assoc. Professor continued as the Head of the station during the period.

Sl. No.	Designation	No. of posts sanctioned	In position	Vacant
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**Scientific Staff**

**a. KAU Non-Plan**

1	Professor	1	1	—
2	Asst. Professor (Botany)	1	—	1
3	Asst. Professor (Agro.)	1	—	1
4	Asst. Professor (Pl. Br.)	1	—	1

1.	2	3	4	5
<b>b. NARP Phase II</b>				
1	Asst. Professor (Ento.)	1	—	1
<b>c. AICRP on Spices</b>				
1	Assoc. Professor (Pl. Path.)	1	1	—
2	Asst. Professor (Pl. Path)	1	1	—
3	Asst. Professor (Agron.)	1	1	—
4	Asst. Professor (Pl. Br.)	1	—	1
<b>Supporting Staff</b>				
<b>a. KAU Non-Plan Para-Technical</b>				
1	Farm Supervisor Gr.I	2	2	—
<b>Administrative Staff</b>				
1	Administrative Asst.	1	1	—
1	Sr. Gr. Asst.	2	2	

**Details of scientists participated in seminars/workshops/  
summer institutes/symposia etc.**

Sri. K. P. Mammooty	National Seminar on diseases of Spices, NRCS, Calicut	7-8 April, 1994
Sri. K. P. Mammooty	Group meeting on Phytophthora diseases of Hort. crops, NRCS, Calicut	21-22 September, 1994

**Research Highlights**

In the germplasm collection of cultivated types of pepper, 76 accessions are maintained. During 1994-95, only 58 accessions produced spikes. Karimunda III, TMB IV and Balankotta I were the best performance.

In the intervarietal hybridisation of pepper, 576 open pollinated/hybrid progenies are maintained. Only 5 cultures viz. cul. 5308, 4700, 5198, 5403 and 4563 produced more than 1 kg of green pepper per vine. A new variety, Panniyur-5 was recommended for release by KAU Variety Release Committee.

Karimunda, Culture 239 (Panniyur-5) and KS 27 (Sreekara) performed well in the comparative yield trial of pepper genotypes.

In the multilocational trial of promising culture, Karimunda with a mean yield of 1.21 kg ranked first.

In the MLT of promising cultivars, Karimunda and Neelamundi gave the maximum green berry yield of 0.94 kg. followed by Kuthiravaly and Kottanadan.

Among the ten cultures/cultivars, of pepper tried for mixed cropping in arecanut garden, Panniyur 5 with a mean green berry yield of 2.97 kg. stood first followed by Culture 406 (2.53 kg) and Karimunda (2.12 kg).

Pongalyam (*Ailanthus malabaricum*) was found to be the best live standard for growing pepper vines, followed by Subabul ordinary and Erythrina.

In the irrigation-cum-fertilizer 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.

Studies on *Phytophthora* foot rot and nematode disease management showed that minimum defoliation (4.06) and foliar yellowing (3.35%) was noticed in the treatment receiving all cultural practices + 1kg. neemcake + 3 g a.i. phorate + 1% Bordeaux mixture + drenching with 0.2% Copper oxychloride.

Application of neemcake @ 2kg + 0.1% carbendazim + g.a.i. phorate/vine checked the slow decline disease of pepper.

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.

### HIGH RANGE ZONE

The high range zone is a sub-region of Western Ghats lying at an elevation of 750 meters above MSL comprising of the hill districts of Wayanad, Idukki, Nelliampathy and Attappady ranges of Palghat, Thannithode and Seethathode Panchayats of Pathanamthitta, Aryankavu, Kulathupuzha and Thenmala areas of Kollam district, Peringamala, Aryankavu, Vithura, Amboori and Kalikadu Panchayat of Thiruvananthapuram district. The total geographical area of the zone is 1140.67 sq. km sharing 23.67 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 grown are coffee, paddy, cardamom, rubber, pepper, tea, tapioca etc. The climate prevailing here 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 19.4.92. Under the National Agricultural Research Project, the Regional Agricultural Research Station at Ambalavayal functioned as the lead station, with Cardamom Research Station at Pampadumpara as its sub-station.

**i. 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 Department 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.

**Lead function**

Pepper and pepper based cropping in high ranges, hill paddy, cool season vegetables, soil and water management, subtropical fruits, coffee based cropping system.

**Verification function**

Essential oils and medicinal plants, ginger.

**Staff**

Head of Station: Dr. K. Kumaran, Associate Director of Research.

Cadre	Sanctioned		
	In position	Vacant	
1	2	3	4
Associate Professor	1	1	—
Professor (Hort)	1	—	1
Associate Professor (Agro.)	1	—	1
Associate Professor (Pl.Path)	1	—	1
Assistant Professor (Pl. Path)	1	1	—
Assistant Professor (P. Breeding)	1	—	1

1	2	3	4
Assistant Professor (Agrl. Botany)	1	—	—
Assistant Professor (Ento)	1	1	—
		(Associate Professor in position)	
Assistant Professor (Soil Science & SS)	1	—	1
<b>AICRP ON SPICES</b>			
Associate Professor (Pl. Breeding)	1	1	—
		(Assistant Professor in position)	
<i>Administrative/supporting</i>			
Administrative Officer	1	1	—
Section Officer	1	1	—
Assistant (Sr. Grade)	1	1	—
Assistant (Gr. I)	2	2	—
Assistant (Gr. II)	2	2	—
		(One is provisional hand)	
Typist (Gr. II)	2	2	—
Steno-typist	1	—	—
Driver	1	—	—
Peon (Hr. Gr.)	3	3	—
Farm Supervisor (Gr. II)	1	1	—
Farm Assistant (Gr. I)	2	2	—
Farm Assistant (Gr. II)	5	5	—
Farm Assistant (Vety. Gr. I)	1	1	—
Field Supervisor	1	1	—
Lab. Assistant (Gr. I)	1	1	—
Lab. Assistant (Gr. II)	2	2	—
Technician (Gr. I)	1	1	—
Tractor Driver	1	1	—
Oil Engine Driver	1	1	—
Budder	1	1	—
Regular Mazdoor (Hr. Gr. with special pay)	1	1	—
Regular Mazdoor (Hr. Gr.)	4	4	—
Class IV	2	2	—
Class IV (on working arrangement)	5	5	—
Watchman	3	3	—



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

Scientists of the station participated in the XII Zonal Research & Extension Advisory Committee Meeting held on 22-4-94 NS XIII Zonal Research & Extension Advisory Council Meeting held on 17th March 1995.

Dr. K. Kumaran, Associate Director attended the Regional Group meeting of NARP South Zone held at UAS, Bangalore on 5,6 January 1995.

Sri. P.K. Unnikrishnan Nair, Associate Professor participated in the T & V Workshops held at Calicut on 29-4-94 and Thikkodi on 14-7-94. He also attended the Seminar on the management of foot rot disease of pepper held at Kaniambetta (3.5.94), Meenangodi (7.5.94), Padinjarathara (13.5.94) and Kottahara (17.8.94).

Sri. C.M. George, Associate Professor attended the meeting held at Central Sericultural Research & Training Institute, Mysore on 4.8.94. He participated in an agricultural seminar held at Sulthan Battery on 26.9.94. He also served as a resource person for the Integrated Pest Management Training for Rice farmers held at Padinjarathara (3.10.94), Kaniyambetta (4.10.94), Edavkaa (5.10.94), and Kadamanchira (6.10.94).

Dr. T. P. Manomohan has attended the training programme on the Application of Computers in Agricultural Research held at National Academy of Agricultural Research Management, Hyderabad from 17.7.94 to 30.7.94. He served as the resource person for the training programme on the Integrated Management of Pests in Rice held at Padinjarathara (10.10.94), Kaniyambetta (11.10.94), Edavaka (12.10.94) and Kadamanchira (13.10.94). He attended the meeting held under the joint auspicious of Agricultural Department, NRCS, and Directorate of Cocoa, Arecanut & Spices at Kalpetta on 14.11.94 to chalk out a programme for the eradication of little leaf disease of pepper in Wayanad on 22.3.95 and 23.3.95.

The staff of the station actively participated in the Agricultural Seminar and Exhibition organised as a part of Karshikamela by Mathrubhumi at Kalpetta from 15 to 17, May, 1994. The station also actively participated in the Flower Shows held at Kalpetta from 13.1.95 to 18.1.95 and Calicut from 25.1.95 to 30.1.95. Many prizes were won by the station in these flower shows. The Wayanad Exhibition, Trade Fair and Tribal fest organized at Valliyookavu from 18.3.95 to 28.3.95 was also attended by the station.

## Involvement of staff in Academic Programme

A batch of thirteen B.Sc. (Ag.) students from the College of Horticulture, Vellanikkara were given field training at this station from 14.11.94 to 26.11.94.

## Major Achievements

### A. Fruits

In Nendran Banana, August planting recorded higher bunch weight (9.198 Kg.) followed by July planting (9.172Kg.) December planting resulted in poor growth and yield as in previous years.

### B. Spices

Among the thirty six accessions in the ginger germplasm V2E5-2 recorded the highest yield of 57.53 t/ha. This cultivar was given for Farm Trials in Idukki District.

The cultivars of ginger when screened against the incidence of Bacterial wilt disease, Ernadan and SG-639 recorded the lowest incidence (2.08%) of the disease. The incidence was comparatively lower in Rajgarh, SG-603 and V2E5-2.

Among the forty cultivars of turmeric maintained in the germplasm Amalapuram recorded the highest yield (42.86t/ha) followed by Sugandham 42.01 t/ha).

In the comparative yield trial with 6 turmeric cultivars Sugandham recorded the highest yield (41.69 t/ha) followed by Mundakkayam (38.61 t/ha).

### C. Rice

Among the 53 accessions in the rice germplasm Kirwana recorded the highest grain yield of 5320 Kg/ha followed by Puttabetta 5072 kg ha.

Multilocal trial with red kernelled Mashoori genotypes from Rice Research Station, Pattambi revealed that RM-7 (red kernelled Mashoori) is on par with White Mashoori and Edavaka with respect to grain yield.

In the evaluation of scented rice varieties, Jeerakasala recorded the highest grain yield (2887 Kg/ha) followed by Gandhakasala (2217 kg/ha)

The experiment on the identification of collateral hosts of causal organism of the udbata disease of rice revealed that the common weed *Panicum repens* found in the rice fields harboured the pathogen.

### Important Visitors

Name and Designation	Date of Visit
Sri. P. Michael Vedasiromani, Managing Director, MILMA	22.04.94
Dr. A. K. Sadanandhan, Project Co-ordinator, NRCS, Calicut	01.10.94
Dr. K.I. Khual, Horticulture Commissioner, Government of India.	29.11.94

### 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 cardamom 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. This 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. Associate Professor (Ent.)

#### Staff position

Cadre	Sanctioned	In position	Vacant
Associate Professor (ICAR)	2	1	1
Assistant Professor (KAU Non-plan)	8	4	4
Associate Professor (NARP)	1	1	
Assistant Professor (NARP)	1		1

#### Administrative/supporting staff

#### ICAR

Farm Assistant	1	1	—
Lab Assistant	1	1	—
Peon	1	1	—

1	2	3	4
<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	—

### Research

The germplasm collection consists of 87 types of which 72 are cultivated and 14 are wild. During the last year critical evaluation was made on yield and other important characters. Among the 72 lines, the highest yield was recorded by clone 57 (507 grams of dry capsules per plant). The capsule borer infestation was comparatively low on this clone. Other high yielding lines are Cinchona selection, PS-9, PS-4, S-1, PS-1, PS-12, PS-22 compound panicle and PS-5.

### Multilocational trial on black pepper

Maximum vine length was noticed in Cul. 239 (195 cm) and minimum in Subhakara (143 cm). The variety cul. 5128 showed the highest leaf size (14.9 cm x 11.1 cm) and Sreekara the least (9.8 x 6.3 cm).

All varieties were susceptible for quick wilt and found not affected by slow wilt. In case of quick wilt only leaf symptoms were noticed and the incidence was high in culture 1558 and low in Panniyur-1. Colletotrichum leafspot incidence was higher in Kottanadan (ACC 2426) and lowest in Subhakara, Vellanamban (control) showed maximum incidence of bacterial leaf spot and Kottanadan (ACC 2445) showed the minimum.

### Visitors

Sri. M. K. Purushothaman, GC Member visited the station on 4.4.94.

Sri. M. S. Veeraraghavan, IAS (Retd.) Rose Breeder visited the station on 26.9.94.

Sri. Johny Nellor, MLA, and Sri. E. M. Agasthy, MLA visited the station on 10.10.94.

Sri. M. K. Purushothaman, GC Member, KAU, Dr. A. M. Michael, Hon'ble Vice-Chancellor, KAU, Sri. P. P. George, Hon'ble Minister for Agriculture and Sri. D. Vijayakumar, GC Member, KAU visited the station on 21.11.94.

Dr. Potti, Director of Research, Spices Board, visited the station on 6.12.94.

Sri. John M. John, Director of Development i/c, Spices Board visited the station on 6.1.95.

Sri. K. K. Thomas, MLA, Peerumedu visited the station on 1.3.95.

## KERALA HORTICULTURAL DEVELOPMENT PROGRAMME, VELLANIKKARA

### Research and Development Project

The Research and Development (R & D) component of Kerala Horticulture Development Programme (KHDP) started at the Kerala Agricultural University with effect from February, 1994. This forms a part of the joint venture of the Kerala State Government and the European Economic Community. The R & D component of KHDP is fully financed by the KHDP (EEC). The R & D activities of KHDP at the University is functioning in two Campuses (College of Horticulture, Vellanikkara and College of Agriculture, Vellayani).

### Mandate

The mandate of R & D Unit of KHDP are:

To conduct research on fruit crops (Banana, Mango and Pineapple), vegetable crops, and post harvest technology of fruits and Vegetables based on farmer's/field problems.

To supply quality planting materials i.e. breeder/foundation seeds of vegetable crops, 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.

Dr. S. Ramachandran Nair, Professor & Head i/c, General Co-ordinator, KHDP, Vellanikkara and Vellayani units.

**Staff Position (Scientists)**

Cadre	Sanctioned	In position	Vacant
General Co-ordinator	1	1	—
Associate Professor (Horticulture [Fruits])	2	2	—
Assistant Professor (Horticulture [Fruits])	1	1	—
Associate Professor (Horticulture (Vegetables))	1	1	—
Assistant Professor (Horticulture (Vegetables))	1	1	—
Assistant Professor (Horticulture Seed Production)	1	1	—
Professor (Ag. Entomology)	1	1	—
Associate Professor (Agron)	1	1	—
Assistant Professor (Pl. Path)	2	2	—
Assistant Professor (Ag. Ent.)	1	1	—
Assistant Professor (Pl. Physiol)	1	1	—
<b>Total</b>	<b>14</b>	<b>14</b>	<b>—</b>

**Administrative/Supporting staffs,**

1	2	3	4
<b>B. Administrative staff</b>			
Administrative Officer	1	1	—
Assistant (Sr. Grade)	1	1	—
Assistant Grade I (D/R Office)	1	1	—
Assistant Grade II	1	1	—
Office Attendant	1	1	—
<b>Total</b>	<b>5</b>	<b>5</b>	<b>—</b>
<b>C. Supporting staff</b>			
Farm Assistant (Agri.)	6	6	—
Stenographer	1	1	—
Typist	1	1	—
Research Associate	7	—	7
<b>Total</b>	<b>15</b>	<b>8</b>	<b>7</b>

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

Name of Scientists	Seminar Symposia/ Workshop	Period and venue
Dr. V. S. Devadas	IX All India Seed Seminar	7-9 Dec. 1994 TNAU, Coimbatore
All Scientists	Horti-national-95 National Seminar	23-25 Jan. 1995, Trivandrum
Dr. T. R. Gopalakrishnan	'AICVIP-Work Group meeting on vegetables'	2-5 February 1995, MPAU Raipur

**Involvement of staff in academic programmes**

All the scientists attached to the KHDP had offered courses at the College of Horticulture, Vellanikkara

**Projects sanctioned/extended during the period**

Project	Principal Investigators	Date of Implementation
43 experiments of various Scientists of KHDP		1994-95
ICAR ad hoc scheme "Heterosis in Chilli and brinjal associated with resistance to bacterial wilt"	Dr. T. R. Gopalakrishnan	Sanction obtained in 1994
ICAR ad hoc scheme "Genetic factors affecting nutrient content in Vegetable Amaranthus"	Dr. V. S. Devadas	Sanction obtained in Jan. 1995
Pilot project on Tissue Culture	Dr. K. Aravindakshan & Dr. A. K. Babyatha	1994 April

**RESEARCH HIGHLIGHTS**

**Banana**

Field problems -Ernakulam district

More than 75% of Nendran banana cultivation is on leased paddy fields.

The lease amount varies from Rs. 8000 to Rs. 12000 per acre (ie. Rs. 8 to 12 per banana plant).

The manuring depended upon whether the cultivation is in own land or in leased land. Heavy manuring with organic is practised in own lands, while in leased lands inorganic fertilizers are mainly used. The farmers use three to four times more fertilizers than the recommended dose. The indiscriminate use of complex fertilizers such as factomphos results in imbalanced nutrition leading to heavy pest and disease incidence.

Manjeri Nendran and Mettupalayam Nendran are the two ecotypes mainly grown. The ecotypes like Chengalikodan, Nedunendran, though heavy yielders, are not very common due to their duration compared to Manjeri Nendran.

#### **Integrated pest and Disease Management in Amaranthus (Thiruvananthapuram)**

The Rhizoctonia leaf blight is a serious problem causing economic loss to amaranthus (var. Arun) all over the State. The disease assumes serious proportions when hot humid conditions prevail, leading to reduction in marketability brought about by the severe blighting and consequent drying up of leaves. The control measures presently adopted are far from satisfactory.

The use of Mancozeb at 0.4% applied as fine spray in cowdung supernatant (CdS) at weekly intervals gives satisfactory control of the disease. (The cowdung supernatant can be prepared by mixing 1 kg fresh cowdung in 10 l. water). The application of mancozeb in cowdung supernatant was found to be consistently superior to other treatments in reducing the disease intensity and increasing the crop yield during both the trials. The percentage incidence was significantly reduced in both "mancozeb in CdS" and "mancozeb in water" treatments.

The two other fungicides tried viz., carbendazim and copper oxychloride alone and in combination with CdS were not found to be suitable for the management of this foliar disease. The application of the systemic fungicide, carbendazim 0.1% either alone or in CdS was effective in reducing the disease incidence and intensity on comparison with the control; but there was considerable reduction in plant growth as exhibited by stunting, leading to a significant reduction in yield over the control. The copper fungicide, copper oxychloride (0.4%) either alone or in CdS caused significant reduction in incidence and intensity of the disease in



comparison with the control; but it was found that the quality of the treated foliage was seriously impaired due to the blue coloured copper deposits on the foliage.

Of the fourteen amaranthus accessions raised during the two seasons, Co-1 (*Amaranthus dubious*) was found to exhibit field tolerance to the leaf blight disease.

#### **Integrated pest and disease management in Cowpea (Thiruvananthapuram).**

*Azadirachta indica* (Neem)/*Samadera indica* (Karingotti) seed oil emulsions at 10% concentration gave good control of American serpentine leaf miner (*Liriomyza trifolii*) and aphids (*Aphis craccivora*). The insecticides, malathion 0.05% and quinalphos 0.03% and dimethoate 0.05% were less effective for the control of the American serpentine leaf miner when compared with seed oil emulsions.

Emulsified plant extracts of *Hyptis suaveolens* at 10% was effective against the pea aphid (*Aphis craccivora*).

In plots treated with neem or karingotti seed oil emulsion, mosaic suppression symptoms were observed.

For the control of basal swelling and wilt of cowpea, caused by *Fusarium* sp. drenching followed by spraying copper oxychloride at 0.4% were found to be equally effective.

Maximum yield was recorded in a treatment with neem and karingotti seed oil emulsions.

#### **Vellanikkara**

Setting up of catalogue fields and identification of elite domestic cultivars of important vegetable crops of KHDP Pilot Project areas

#### **Identification of promising selections in cowpea**

During the evaluation of 26 cowpea accessions conducted for three seasons during 1994-95 and 1995-96 two promising selections, namely, VS-13-2 (green poded) and VS-21-1 (Violet poded) were identified and are ready for testing in the farmers' fields in the KHDP pilot project area. The above two selections continuously out yielded all the local cultivars and released varieties in all the three seasons.

In general, the results indicated comparable fruit size, desirable physical characters such as reduced peel and stone contents and increased pulp content with slight inferior quality

in respect of TSS for the fruits of Alphonso and Bangalora varieties collected from the major mango growing tracts of Palakkad district. Mangoes from Palakkad exhibited earliness, the main season of harvest being April-May.

#### Management of major pests and diseases of mango

Pink disease of mango was serious during September, 1994 in the three year old Alphonso plants. The treatments tried were Bordeaux Mixture 1%, Neem oil 5% and Calixin 0.1%. Removal of affected plant parts and application of 1% Bordeaux Mixture using a brush at the initial stages of infection gave good control of the disease.

An experiment conducted with six treatments and four replications for the control of oriental fruit fly, *Dacus dorsalis*, in mango, indicated that tulsii trap attracted and killed large numbers of male fruit flies. Spraying malathion 0.1% containing 1% sugar at monthly intervals combined with placement of tulsii traps could reduce fruit fly infestation in mango. Further trials will be conducted for confirmatory results.

#### Pineapple

##### Population density trial on pineapple var. Mauritius

The first year data showed that high density planting is possible in Mauritius. Eventhough there was some decrease in individual fruit size when the plant population was increased from 22,000 to 37,000, the estimated yield was found to be about 44 tonnes per hectare (plant population 37,000 ha) as against 32 tonnes (plant population 22,000 per ha). However, further studies are required to confirm the results.

##### Investigations on Marbled fruit disease in pineapple

Survey conducted in the major pineapple growing areas of Ernakulam and Thrissur districts revealed that the incidence of Marbled fruit disease in pineapple varies from 10 to 57%. The study indicated that the disease incidence is severe only during May, June and July when heavy rainfall occurs after a hot summer season.

From the infected tissues fungi like *Penicilium sp.*, *Aspergillus sp.*, and *Fusarium sp.* were isolated. Further studies are in progress.

Analysing the quality aspects, the diseased fruits recorded a lower value for total sugar, reducing sugar and vitamin C content. Observations on growth parameters have shown that leaf area, leaf area index, crop growth rate and total drymatter production are more in diseased fruits than in healthy ones.

## VEGETABLES

### Vellayani

Setting up of catalogue fields and identification of elite domestic cultivars of important vegetable crops of KHDP pilot project areas

Several accessions (14) of vegetable amaranthus including the released varieties such as Arun, Kannara Local, Co1, Co2 and Pusa Kiran were evaluated for yield, pest and disease incidence for two seasons during 1994-95. It was observed that the green variety released from Tamil Nadu Agricultural University (Co 1) belonging to *Amaranthus dubious* was found to be highly tolerant to the devastating leaf blight disease caused by *Rhizoctonia solani*.

Abortion of fingers in bunches of Manjeri Nendran is noticed. In certain cases all the female flowers get aborted resulting in total failure of bunch development. This disorder is noticed in Manjeri Nendran alone. Detailed investigations to detect the causes of the disorder are to be taken up.

Pseudostem weevil is the major pest. To control the pest, farmers resort to indiscriminate use of insecticides such as BHC 50% WP periodically.

The occurrence of Kokkan disease (Banana Bract Streak Virus disease) is more in Manjeri Nendran than in the other Nendran types.

More than 90% of the farmers sell their produce at half mature stage itself to the commission agents at very low price. This indicates disorganized marketing system prevailing in the area.

The farmers reported that introduction of crop insurance is necessary against loss due to natural calamities.

### Field problems—Thiruvananthapuram district

The pseudostem weevil (*Odioporus longicollis*) banana leaf caterpillar (*Spodoptera litura*) and banana rhizome weevil (*Cosmopolites sordidus*) are the major pests in Thiruvananthapuram tract. The sigatoka leaf spot (*Mycosphaerella usicola*), bunchy top disease and Kokkan disease are also prevalent.

The farmers apply factamphos as inorganic source of fertilizer and poultry manure as organic. Factamphos is applied frequently and the imbalance application results in pest and disease incidence.

Marketing of bunches is through the commission agents who take away the major chunk of the profit.

### **Developing low cost propping system for Nendran banana**

"Tying 4' long wooden logs on either inside or outside of the banana plant, placed from bunch stalk downwards and chain tying to the four sides with coil", showed promise as a substitute for propping with 12' long bamboo/wooden poles:

The plants producing 10 to 12.5 kg bunches were carried to maturity, without any damage by adopting this method during 94-95 propping season.

The new method of propping reduces the cost to 30%, compared to the conventional propping.

### **Management of important pests and diseases of Banana**

The pseudostem borer, *Odoiporus longicollis* is a serious pest of banana in Kerala. An experiment was conducted at Vellanikkara during 1994-95 with three chemicals to test their effectiveness against the pest. The insecticides were applied at monthly intervals, starting from the fourth month after planting. The results show that smearing Chlorpyrifos 0.05% and smearing Sevin 0.5% in mud slurry could protect banana plants from the infestation of pseudostem borer. The experiment will be repeated for confirmatory results.

### **Mango**

#### **Collection and evaluation of mango varieties/hybrids for commercial cultivation.**

The quality parameters of Alphonso and Bangalora mango fruits available in Palakkad district were subjected to detailed physio chemical analysis so as to compare the fruits to those from other States.

Samples were collected from the major mango growing tracts of Palakkad district for the study. Similar results reported from Regional Fruit Research Station, Vengurla and Fruit Research Station, Sangareddy are taken for the purpose of comparison.

#### **Identification of high yielding bacterial wilt resistant and long duration brinjal**

During the evaluation of 85 accessions of Brinjal conducted for three seasons, the light green, long and stout fruited brinjal selection SM 141-1-1 was found to be high yielding and free from the dreadful disease, (bacterial wilt) caused by *Pseudomonas solanacearum*. This selection is ready for testing in the farmers' field in the KHDP pilot project area.

## **Extension activities**

### **Taking classes in Agril. Seminars/Kissan Mela**

- 1 All Scientists of the KHDP used to take part in farmer- interaction sessions (more than a dozen each) and consultancy to KHDP farmers regularly
- 2 Sheela Paul, Dr. Maicykutty P. Mathew and Dr. T. Radha, Associate Professor participated in Mango Exhibition-cum-Seminar and took a class on Mango cultivation held at Pudukkottai on 23-7-94; and Dr. T. R. Gopalakrishnan chaired a session.
- 3 Dr. A. K. Babylatha, Assistant Professor, Dr. K. Nandini, Assistant Professor and Dr. Sheela Paul, Assistant Professor participated in Seminar-cum-exhibition on Pineapple cultivation at Vazhakkulam on 5th November 1994.
- 4 Sheela Paul attended the plant clinic organised at Agri-Horti Fair 1995 at Kothamangalam.
- 5 Dr. Sheela Paul, Dr. T. Radha, Dr. Nandini, Dr. Maicykutty P. Mathew and Dr. S. R. Nair participated and took classes on various aspects of Mango cultivation in the Seminar held at Pudukkottai and Kozhijampara on 6.7.94 and 7.7.94.

## **2. FACULTY OF VETERINARY AND ANIMAL SCIENCES**

### **2.1 COLLEGE OF VETERINARY AND ANIMAL SCIENCES, MANNUTHY**

The College of Veterinary and Animal Sciences was established in 1955 with a view of training sufficient veterinary personnel. For the first few years the institution was directly under the administrative control of Kerala Government but subsequently brought under the control of Department of Animal Husbandry. The post graduate programmes leading to M. V. Sc. & Ph. D. Degrees were started in 1982 and 1985 respectively. The College became a constituent unit of the Kerala Agricultural University in February 1972.

The College has associated with it, a Livestock Farm, a Poultry Farm, a Pig Breeding Farm and a Goat Farm, a Dairy Technology Unit and Meat Technology Unit in the Campus. Two Veterinary Hospitals, one at Mannuthy and another at Kokkalai and a Farm clinic at U. L. F. Mannuthy are also attached to the College.

In addition to teaching, a number of research projects aided by the University and External agencies are being operated at the College. Importance was given for the transfer of technology.

The following Research stations - Livestock Research Station, Thiruvazhamkundu and Cattle Breeding Farm, Thumburmuzhi are also attached to the College to facilitate research and training.

The College and the residential campus cover an area of 195 hectares.

There are 20 Departments viz., 1) Anatomy, 2) Animal Reproduction, 3) Animal Breeding and Genetics, 4) Bio-Chemistry, 5) Clinical Medicine, 6) Dairy Science, 7) Extension, 8) Livestock Production Management 9) Livestock Products Technology, 10) Microbiology, 11) Nutrition, 12) Parasitology, 13) Pathology, 14) Pharmacology and Toxicology, 15) Physiology, 16) Poultry Science, 17) Preventive Medicine, 18) Surgery, 19) Statistics and 20) Veterinary Public Health. The Department of Veterinary Biochemistry and Livestock products technology were created during 1994-95.

All the Departments except Biochemistry and Livestock Products Technology are offering Post graduate course at Masters level and all except Extension, Preventive Medicine Veterinary Public Health, Bio-chemistry, Livestock Products Technology and Statistics are offering Ph. D. Programme.

Dr. A. Rajan continued as the Dean for the period under report.

Category	Sanc- tioned	In position	Vacant
1	2	3	4
Dean	1	1	—
<b>Anatomy</b>			
Professor	1	1	—
Assoc. Professor	3	3	—
Asst. Professor	6	2	4
<b>Animal Reproduction</b>			
Professor	3	3	0
			(One post shifted)
Assoc. Professor	3	2	1
Asst. Professor	6	5	1

	1	2	3	4
<b>Infertility Scheme</b>				
Assoc. Professor		1	1	0
Asst. Professor		1	1	0
<b>Animal Production Economics</b>				
Professor		1	1	0
<b>Clinical Medicine</b>				
Professor		3	2	1
Assoc. Professor		3	1	2
Asst. Professor		4	1	3
<b>Dairy Science</b>				
Professor		3	2	1
Assoc. Professor		3	2	1
Asst. Professor		4	2	2
<b>Extension</b>				
Professor		1	1	0
Assoc. Professor		2	1	1
Asst. Professor		6	1	5
<b>Genetics</b>				
Director		1	1	0
Professor		1	0	1
Assoc. Professor		3	0	3
Asst. Professor		6	3	3
<b>Livestock Production Management</b>				
Professor		2	2	0
Assoc. Professor		2	2	0
Asst. Professor		4	1	3
<b>Microbiology</b>				
Professor		2	2	0
Assoc. Professor		2	2	0
Asst. Professor		5	0	5
<b>Nutrition</b>				
Professor		5	5	0
				(4 upgraded 2 on study leave 1 on study leave)
Assoc. Professor		4	4	0
Asst. Professor		5	2	3
<b>SABS</b>				
Asst. Professor		1	—	1
<b>ICAR Network Project</b>				
Assoc. Professor		1	1	0

	1	2	3	4
<b>Pathology</b>				
Director		1	0	1
Professor		1	1	0
Assoc. Professor		3	3	0
Asst. Professor		9	8	1
<b>Parasitology</b>				
Professor		6	6	—
Assoc. Professor		1	1	—
Asst. Professor		2	2	—
<b>Pharmacology</b>				
Professor		4	4	—
Assoc. Professor		5	5	— (2 N.C.)
				(1 on working arrangement in ULF, Mannuthy)
Asst. Professor		2	1	1
<b>Physiology</b>				
Professor		1	1	—
Assoc. Professor		3	1	2
Asst. Professor		6	4	2
<b>Poultry Scienc</b>				
Director		1	1	—
Professor		2	1	1
Assoc. Professor		1	—	1
Asst. Professor		2	2	—
<b>Physical Education</b>				
Asst. Professor		2	2	—
<b>Preventive Medicine</b>				
Professor		2	2	—
Assoc. Professor		2	—	2
Asst. Professor		7	4	3
<b>Statistics</b>				
Professor		1	1	—
Assoc. Professor		1	—	1
Asst. Professor		4	4	—
<b>Surgery</b>				
Professor		2	4	1
			(1 Vacant, 3 upgraded)	
Assoc. Professor		4	2	—
			(1 on study leave)	
Asst. Professor		3	3	—
			(1 on study leave	
			1 on working arrangement in	
			ULF, Mannuthy)	



	1	2	3	4
<b>Veterinary Hospital, Kokkalai</b>				
Professor	1	1	—	
Asst. Professor	1	1	—	
<b>Veterinary Hospital, Mannuthy</b>				
Assoc. Professor	1	1	—	
Asst. Professor	2	2	—	
		(2 on working arrangement in other department)		
<b>Veterinary Public Health</b>				
Professor	2	2	—	
Assoc. Professor	2	2	—	
Asst. Professor	5	5	—	
<b>Director of Research Co-ordination Centre of Excellence in</b>				
Animal Diseases	1	—	1	
Director	1	—	1	
Professor	1	—	1	
Assoc. Professor	1	—	1	
Asst. Professor	1	—	1	
<b>Library</b>				
Librarian	1	—	1	
Asst. Librarian	1	1	—	

*Paratechnical/Administrative/Ministerial/Supporting position*

	Sanctioned	In position	Vacant
Administrative Officer	1	1	—
Section Officers	6	6	—
Sr. Gr. Assistants	18	15	3
Gr. I Assistant			
Gr. II Assistant			
Sr. Office Supdt.	4	4	—
Office Supdt.			
Typists			
Radiographer	1	1	—
Audio Visual Operator	1	1	—
Artist/Photographer	1	1	—
Duplicator operator	2	2	—
Matron	1	1	—
Steward	2	2	—
Syce	1	1	—
Regular Mazdoor.	1	1	—

1	2	3	4
Gardener	1	1	—
Groom	1	1	—
Electrician	1	1	—
Librarian	1	—	1
Assistant Librarian	1	1	—
Reference Assistant	4	—	4
Research Assistant	1	1	—
Lab. Technician	—	—	—
Research Assistant	4	2	2
Junior Programmer	1	1	—
Technical Supervisor (Boiler Attender)	1	1	—
Lab Assistant	2	2	—
Clerical Assistant	6	6	—
Technical Assistant	1	1	—
Dairy Mechanic	1	—	1
LDV Driver	7	5	2
HDV Driver	2	2	—
Farm Supervisor	9	7	1
Farm Assistant	16	16	—
Peon	7	7	—
Attendant	9	9	—
Sweeper-cum-Attender	16	16	—
Sweeper	1	1	—
Sweeper-cum-Scavenger	7	1	6
Class IV	2	—	2
Helper	1	1	—
Cleaner-cum-Attendant	1	1	—
Bus Attendant	1	1	—
Institute Librarian	1	—	1

### Faculty Improvement

#### a) Details of Deputation/Study Leave

Dr. V. Vijayakumaran, Assoc. Professor (NC), Animal Reproduction is continuing his Doctorate Study under deputation.

Dr. K. Venugopalan, Assoc. Professor (NC), Preventive Medicine, Dr. K. Devada, Asst. Professor, Parasitology, Dr. M. Gopalakrishnan Nair, Asst. Professor, Pathology, Dr. S. S. Anil and Dr. S. Ramkumar, Asst. Professor, Extension, Dr. M. Mini, Asst. Professor, Microbiology, Dr. K. P. Sreekumar and Dr. Sicilamma George, Asst. Professor, Physiology, Dr. A. D

Mercy and Dr. T. V. Viswanathan, Assoc. Professor, (NC)-Nutrition, Mr. Rajendrakumar, Assoc. Professor, Dairy Science, Dr. K. Rajankutty, Assoc. Professor (NC), Surgery, Dr. N. Padmakumar, Asst. Professor, Surgery, Dr. A. P. Usha, Asst. Prof., Genetics, Dr. Kumarasubrahmoniam, Asst. Professor, Veterinary Public Health and Dr. A. Sreekumar, Asst. Professor Poultry Science are continuing their higher studies during the period under report.

Dr. N. Ashok, Asst. Professor, Anatomy, Dr. Joseph Mathew, Asst. Professor, Animal Management and Dr. Usha. P.T.A., Asst. Professor, Pharmacology and Dr. K. Ramachandran, Asst. Professor, Gynaecology have entered on study leave during the period for Ph.D. Programme.

Dr. N. Divakaran Nair, Assoc. Professor (NC), Pathology, Dr. T. Saradamma, Assoc. Professor (NC), Surgery, Dr. A. M. Chandrasekharan Nair, Assoc. Professor (NC), Pharmacology and Dr. H. Subrahmoniam, Assoc. Professor (NC) Parasitology, joined the concerned Department after their study leave on 1.9.94. Dr. Mammen. J. Abraham, Asst. Professor, Pathology joined in the department on 3.1.93 after study leave.

**b) Change in Academic staff**

Name and designation	From	To	Date
1	2	3	4
Dr. Shyla Prakash, Asst. Professor, Anatomy	Loss of pay leave		20.11.94
Dr. K. Prabhakaran Nair, Professor, Animal Reproduction	Mannuthy	LRS-Third vazhamkunnu	July 1994
Dr. K. Ramachandran Asst. Professor, Animal Reproduction	Calicut	Mannuthy	September 1994
Dr. P. J. Rajkamal, Asst. Professor Extension	KVK Pattambi	Mannuthy	1.11.94
Dr. M. R. Saseendranath Assoc. Prof. (NC) Preventive Medicine	Ambalavayal	Mannuthy	4.4.94
Smt. U. Narayanikutty Asst. Professor Statistics	NARP Special Station, Karamana	Mannuthy	

1	2	3	4
Dr. E. T. Jacob Assoc. Professor, Physiology	Thiruvazham- kundu	Mannuthy	25.11.94
Dr. George Mathen Assoc. Professor, Nutrition	Thumburmuzhi	Mannuthy	12.9.94
Dr. C. Lalitha Kunjamma, Assoc. Prof. (NC) Pathology	AICRP Poultry	Pathology Dept.	11.5.94

#### New appointments

Dr. V. Ramnath, Asst. Professor, Physiology joined on 28.11.94.

Dr. P. V. Treesamol, Asst. Professor, Medicine joined on 5.11.94.

Dr. C. Latha, Asst. Professor, Vety. Public Health joined on 5.11.94.

Dr. T. V. Anilkumar, Assistant Professor, Pathology joined on 23.11.94.

Sri. Rajakumar, Assistant Professor, Dairy Science, joined on 5.11.94.

Sri. K. Ajithkumar, Assistant Professor, Dairy Science joined on 5.11.94.

#### Retirement from service on superannuation

Dr. P. O. George, Professor, Surgery.

Dr. M. G. Ramakrishna Pillai, Professor, Physiology.

Dr. E. T. Jacob, Assoc. Professor, Physiology.

Dr. O. J. George, Assoc. Professor, Poultry.

#### c) Details of participants of scientists in Seminar/Workshops/ training/symposia/summer institute

Name and designation	Type of course.	Venue	Period
1	2	3	4
Dr. K. Prabhakaran Nair, Professor, Animal Reproduction	National Symposium of Animal Reproduction	Akola	—

1	2	3	4
Dr. S. P. Suresan Nair Asst. Professor, Animal Reproduction	National conference of Vignana Bharathi	—	29 & 30 th October
Dr. B. Nandakumar Assoc. Professor (NC) Animal Breeding & Genetics	International conference of Animal Genetics	Prague	23-29 July, 1994
Dr. George Varghese Professor, Parasitology	National conven- tion of Indian Vety. Parasitologist	Goa	23-25 January 1995
Dr. M. R. Saseendranath Assoc. Professor (NC) Medicine	National Workshop on Mycobacterial infection of livestock	Madras	22-23 February 1995
Dr. G. Krishnan Nair Assoc. Professor (NC) Microbiology	Short term training course in Modern technique in Animal Vaccino- logy.	Madras Vety. College	July, August 1994
Dr. Jacob. V. Cheeran, Professor, Pharmacology	Seminar on Science and Law	Cochin Univer- sity	16-17 March 1995
Dr. A. D. Joy, Assoc. Professor (NC) Pharmacology	International seminar on recent trends in Pharmaceutical Sciences.	Ootaca- mond	18-20 February 1995
Dr. K. V. Valsala Assoc. Professor Pathology Dr. Koshy Varghese and Dr. B. Gangadharan Asst. Professors Pathology	Annual Convention of Veterinary Pathology	Veterinary College Anand	Dec. '94
Dr. V. Sathianesan Professor Parasitology	6th National Congress of Veterinary Parasitology	Jabalpur	October '94

1	2	3	4
Dr. C. B. Manomohan Assoc. Professor	Summer Institute on Advances in Pathology	CV & AS Mannuthy	June '94
Dr. Koshy Varghese Dr. B. Gangadharan Dr. T. Leena Devi Assistant Professors of Pathology			
Sri. Jacob Thomas & Sri. Mathew Sebastian Assistant Professors of Statistics	Summer Institute on Advances in Agrl. Statistics	I. A. S. I. New Delhi	May June '94
Smt. U. Narayanikutty Asst. Professor Statistics	Refresher Course in Statistics	Cochin University	21-1-95 to 25-1-95
Smt. T. K. Indira Bai	"	"	3-11-94 to 26-11-94
Dr. K. Babu Professor and Head Medicine	Seminar cum Workshop on Veterinary epidemiology and Preventive Medicine	Institute of Animal Health and Biological Mangalore	Nov. '94
Dr. K. Vijayakumar Asst. Professor Medicine	Summer Institute on Epidemiologi- cal models in the forecasting of diseases of livestock and poultry.	I. V. R. I Izatnagar	June '94
Dr. G. Girish Varma Asst. Professor Physiology	Summer Institute in Animal Nutrition		March '94
Dr. Jacob V. Cheeran Professor Pharmacology	International Seminar on Wild life	Delhi	29-31st October '94
Dr. George Mathen Assoc. Professor Animal Nutrition			

1	2	3	4
Dr. George Mathen Assoc. Professor Animal Nutrition	Seminar on Agriculture and Feeds	Vijayawada	29-30th Sept. '94
Dr. T. P. Balagopalan and Dr. C. B. Devanand Asst. Professors of Surgery	Summer Institute on recent advance in Surgical Technique and their application in Madras Farm and Pet animals	Madras	June '94
Dr. Rajankutty Assoc. Professor (NC) Surgery	Workshop on package of practice on Livestock and Poultry	Mannuthy	May '94
Dr. Stephen Mathew Assoc. Professor (NC) Animal Breeding and Genetics	Training in Animal production and Management	Hissar	Nov. '94

**Details of Training/Symposia/Workshop etc. conducted**

Date	Type of course	Period	No. of participants
1	2	3	4
1.8.94	Advanced training on Fertility Management of Livestock for Officers of Animal Husbandry Department	1.8.94 to 12.8.94	10
1.9.94	Training on Special Clinical diagnostic procedure	1.9.94 to 13.9.94	6
6.5.94	Package of Practice workshop	6.5.94 to 7.5.94	350
9.1.95	L. S. A. Training course	9.1.95 continuing	21
8.3.95	One day Seminar on Rabbits	8.3.95	80
1.11.94	Short term training course in manufacture and standardisation of biological product	1.11.94 to 31.1.94	4
1.2.95	Short term training in biological techniques including mastitis diagnosis	1.2.95 to 30.4.95	15

1	2	3	4
23.8.94	Short term training in disease investigation	23.8.94 to 3.9.94	14
27.6.94	Practical training in Clinical diagnosis and Lab Technics for para technical staff	27.6.94 to 1.7.94	1
20.3.95	-do-	20.3.95 to 24.3.95	1
18.10.94	Training Programme on Applied Nutrition and Feed analysis	18.10.94 to 28.10.94	6
28.12.94	Training on Post mortem techniques to Vety. Surgeon	28.12.94 to 13.1.95	3
6.1.95	Training on Aflatoxin analysis to Veterinary Surgeons	6.1.95 to 11.1.95	1
16.1.95	Training on diagnosis of Poultry diseases for field Veterinarians	16.1.95 to 28.1.95	1
27.3.95	One day seminar on Foot and Mouth disease (Farmers)	27.3.95	180
October '94	Training for Senior Officers of the Animal Husbandry Department	October to December '94	5
22.3.95	Practical training in the farms under "Self employment course oriented training programme"	23.1.95 to 22.3.95	21

Details of Training/Symposia/Workshop etc. conducted at the College

Date	Type of Course	Period	No. of participants
1	2	3	4
February 94	Training for field Veterinarians in disease diagnosis	3 months	14
July 94	"	"	15
June 94	Summer Institute on Advances in Veterinary Pathology and Disease Diagnosis	20 days	15
June 94	Training to Para Technical Staff	20 days	1
April 94	Training in feed analysis for Para Technical Staff of A. H. Department of Lakshadweep Administration	25 days	1



1	2	3	4
Nov. 94	Production and standardization of Veterinary Biologicals	3 months	5
Sept. 94	Animal disease diagnosis	10 days	14
October 93	Training for Animal Husbandry Officers in Poultry Production and Management	3 months	5
Sept. 94	Training on special clinical diagnostic procedure	10 days	6
October 94	Training in applied nutrition and feed analysis for Officers of A. H. Department	10 days	7
December 94	Training in diagnosis and control of parasitic disease for Veterinary Officers	15 days	3
December 94	Annual Conference of the Indian Society of Agricultural Statistics	3 days	150

#### Academic Programme

##### Students statistics

##### I. U. G. Programme (on the rolls)

Year of admission	Men	Women	Total
1983	2	—	2
84	1	—	1
85	2	—	2
86	11	1	12
87	10	4	14
88	13	6	19
89	61	35	96
90	59	25	84
91	57	23	80
92	58	28	86
93	69	31	100
94	72	43	115
		Total	611

##### Dairy Technology:

93	7	13	20
94	12	9	21
		Total	41

	1	2	3	4
<b>II. P. G. Programme:</b>				
<b>M V. Sc.</b>				
92		14	5	19
93		22	4	16
94		22	4	16
<b>Ph. D. (Including part time)</b>				
89		1	—	1
91		5	—	5
92		5	—	5
93		5	1	6
94		4	1	5

*No. of students passed out during the period:*

B.V.Sc.	—	113
M.V.Sc.	—	17
Ph. D.	—	1

**i) Practical training Programme**

The undergraduate and post graduate students had farm training in the various instructional farms.

**ii) Study tours conducted**

As in previous year All India Study tour, South India study tour and All Kerala Study tour were conducted during the current year.

**Scholarships, Awards and Aids to students**

1. Fee Concession under KPCR
2. KAU Merit Scholarship
3. ICAR Merit-cum-Means Scholarship
4. District wise Merit Scholarship
5. Kerala Labour Welfare Fund Scholarship
6. KAU Junior Fellowship
7. ICAR Senior Fellowship
8. ICAR Junior Fellowship
9. Educational concession to Lakshadweep students
10. Educational concession to SC & ST students
11. Educational concession to OBC/X'tian convert students
12. National Merit Scholarship

**Library**

No. of books procured during the period	—	120
No. of books as on 31.3.1995	—	20552
No. of Indian & foreign journal subscribed during the period	—	164

## Hostels

Hostel	Warden	Asst. Warden	Steward/ Matron	Strength
U.G. Main	Dr. A. Rajan			
		Dr. P.G. Baby	Mr. Babu	105
U. G. Annexe	"	Dr. Jose John Chungath	Mr. Raveendran	155
P.G.	"	Dr. V.S. Balakrishnan	—	40
Ladies	"	Dr. Girija Nandakumar	Smt. K. K. Chandra	190

## Outreach programme

### The Students Union activities for the period

8.4.94	Inauguration of the Students' Union.
12.7.94	Inter class Fashion Parade under hobby centre
14.7.94	Lecture and demonstration of Rhythms of Kerala.
26 and 27.7.94	Inter class Arts festival
15.8.94	Celebrated Independence day.
2.9.94	News Reading competition
6.9.94	Spelling and Pronunciation Quiz
7.9.94	Inter Class Quiz
12.9.94	Athapookalam competition
23.10.94	Distribution of dress to Mental hospital, Thrissur
3.12.94	Pharmaceutical product exhibition
20.1.95	Visit to SOS village and distributed sweets to Children
6.2.95	Interclass debate conducted
9.2.95	Conducted a talk on AIDS
14 to 17.2.95	Participated in KAU youth festival
24.2.95	Conducted Inter-class dumb sharade competition
28.2.95	Prathibha Sangamam

## RESEARCH

A total of 40 new research projects have been started during the period under report.

### Major research achievements

During the period under report 215 milk samples were examined for infectious agents. Out of this, 170 samples were found to be +ve for infectious agents. The percentage of +ve isolates were higher in 1994. Staphylococci emerged as the single major organism causing mastitis. The antibiogram pattern and the drugs of choice were identified.

Studies on the immunosuppressive effects of aflatoxin in ducts revealed that it significantly suppressed the bone marrow. This was characterised by leukopaenia and anemia. In the same species when carbofuran and 2-4 D were administered slight leukocytosis with neutrophilia and reduction in haemoglobin was observed.

Survey on the chromosome abnormalities in goat revealed that reproductive abnormalities such as subfertility, repeat breeder, etc. has no correlation with chromosome status.

A total of 900 cross-bred animals were typed for haemoglobin. For typing the blood group of bovine more than 46 bovine monovalent blood typing reagents were produced at this College. The population was found to be in genetic equilibrium set of H6 locus.

Under the progeny testing scheme in cross-bred cattle, survey showed that a good percentage of cows are having less than 3.5% fat in their milk.

A nucleus stock of Vechur and other dwarf Cattle of Kerala is maintained in the College. The milk fat percentage of Vechur Cattle vary from 4.1—5.8. They were found to be more disease resistant.

Studies on the utilisation of condensed cheese whey proved that it can be effectively used for replacing skim milk powder in the preparation of yoghurt.

For enhancing the therapeutic value of yoghurt it was found that *Bifido bacterium bifidum* can be used as an adjuvant bacteria in the preparation of yoghurt.

The antibacterial activity of dehi and yoghurt against some common pathogens was found to be increased by *L. acidophilus*.

Studies on serum cholesterol level in rats fed with dehi and yoghurt containing *L. acidophilus* revealed that it significantly reduced the serum cholesterol level.

Cows milk in which the fat was replaced to the extent of 50% and 100% with coconut milk can be effectively utilised for preparation of Mozerella cheese.

Studies on downer cow syndrome revealed that higher incidence of this was more common among Jersey cross-bred cattle during summer season. The metabolic profile test recorded hypocalcemia, hypophosphatemia, hypoproteinemia and hypoalbuminemia.

Incorporation of dried spleen @ 0.1% in the diet of rats and rabbits enhance the growth rate and nutrient utilization. At least 25% of the feed nutrients can be spared by adopting this method.

In broiler rabbits a ration containing 16% crude protein and 2500 k.Cal/Kg. of DE is found to be satisfactory for optimum growth upto third month after weaning but for overall growth 20% of C.P. is found to be essential for optimum biological efficiency.

Studies to assess the mineral status of animals indicated that the levels of major as well as trace elements in the blood of cattle and the feed samples collected from the farm and neighbouring areas around Mannuthy were all within normal range indicating satisfactory mineral status in the locality.

Studies to establish the nutrient requirement of broiler rabbit and to arrive at the optimum age of slaughter indicated that soviet chinchilla broiler rabbit required a crude protein level of 16.2% and 2500 k. Cal of DE per kg. feed for optimum growth. The optimum age of slaughter in terms of economic efficiency was identified to be 56-112 days after weaning.

It was demonstrated by transplantation studies and using various chemotherapeutic immuno suppressive agents that ethmoid cancer could be transplanted in mice successfully employing Cyclosporin and Cyclophosphamide.

Systematic investigation on the aetiology of Mastitis revealed that staphylococci were the most common pathogen associated with mastitis.

As experimental study was designed to elucidate the aetiopathogenesis of Ascites Syndrome in chicken. It was demonstrated by employing various elegant diagnostic probes and markers, that Furazolidone and sodium chloride could be responsible for the syndrome depending upon the dose level employed.

By appropriate diagnostic techniques it was clarified that of the various species of animals suspected to have died of rabies only 75% dogs, 16% cats, 45% cattle and 12% goats were only positive for rabies. Therefore, it was possible to save many unwanted vaccination in men and animals. By this way economic loss by way of unwanted vaccination could be prevented.

A modified sellers stain procedures was developed and this was shown to have better diagnostic efficacy.

By taking mouse and rat as experimental model it was clarified that ethmoid carcinoma can be experimentally transplanted in mouse by immunosuppression. The mouse was identified to be the model of choice and cyclosporin-A was proved to be the drug of choice for immunosuppression. Tryprimisation was shown to be of value in establishing tumour tissue in cell cultures.

It was demonstrated in the duck model systems, employing various immunological markers carbofuran and 2-4 D in sub-lethal doses had immunosuppressive effect.

The comparative biological effects of aflatoxin in fish and duck were studied. In both species there was reduction in growth rate and feed consumption. The immune markers employed indicated immunosuppressive effect of aflatoxin in ducks.

A retrospective survey studies based on autopsy data revealed that enteritis was the most important disease in cross bred livestock.

Coccidial enteritis and pneumonia were identified to be the most important disease of goats.

Experimental studies employing duck embryos clarified that lead acetate in very small doses could cause various types of teratological abnormalities reduced hatchability and embryos mortality. The observations made pointed out the adverse biological effects of environmental pollution.

It was identified by survey studies on livestock feed that aflatoxin is an important dietary toxic factor which could cause an economic loss of nearly 88 crores per year in the state.

Aflatoxin was demonstrated in the peripheral blood of animals bearing ethmoid carcinoma. This indicated its possible role in the actinopathogenesis of ethmoid carcinoma.

Studies on postnatal development of the oviduct in the Japanese quail showed that the oviduct was simple and without any coiling at the beginning. Coiling starts at 25 days and rapid changes were noticed between 30-40 days and by 45 days the organ gained the adult structural pattern.

Studies conducted to synchronise oestrus in cross-bred cows revealed that Prostaglandin F<sub>2x</sub> could be used successfully to induce oestrus in crossbred cows and heifers. Physical changes of reproductive tract like vulval oedema, hyperaemia of vulval mucosa, nature of vulval discharge, toxicity of uterine horns were similar or even better than

natural oestrus. Majority of animals showed medium to high intensity of oestrus conception rate at the induced oestrus was better compared to natural oestrus.

Investigation on the pathological conditions of ovary in Crossbred cattle revealed the percentage of different pathological conditions and they are Inactive ovaries (23.41%), Cystic ovary (2.73%) Cystic corporalutea (2.78%) haemorrhage in ovary (5.56%) persistent corpus luteum (0.79%) retention cyst (0.79%) parovarian cyst (3.17%) parovarian abscess (0.40%).

It was found that whey solids in condensed form can be successfully incorporated in yoghurt as a replacement for skim milk powder. This increased the nutritive value of yoghurt and at the same time utilise a portion of milk solids which otherwise is wasted. This type of yoghurt was found to be a good vehicle for *Bifido bacterium bifidum*.

Studies on keeping quality of yoghurt showed that by converting the set yoghurt into frozen yoghurt by freezing and hardening at  $-2^{\circ}\text{C}$  increased the shelf life for many more days.

Meat patties made of quail meat was evaluated for its acceptability and shelf life. The result indicated that quail meat patties can be stored at  $5^{\circ}\text{C}$  upto six days and  $15^{\circ}\text{C}$  upto 60 days without any loss of quality of consumer acceptance. The overall consumer acceptability of the product was good.

A modified intradermal test, was developed for the diagnosis of paratuberculosis in goats. It gave a better result than the conventional intradermal test.

Studies were carried out to evaluate the effect of different anaesthetics. A combination of Ketamin & Xylazine was found satisfactory for long duration of anaesthesia in pigeons and quails.

Use of lactic acid solution at 1% level as a sanitizer was found to produce highly significant reduction in bacterial count.

Antisera raised against cattle and buffalo using blood serum was found to provide good immune response when administered in these animals intramuscularly.

Studies on cytogenetic analysis of crossbred bulls revealed thirty pairs of chromosome and it was observed that the G-banded Karyotypes were similar to that of standard Karyotypes of Cattle.

Diploid/tetraploid mosaicism was observed in a bull producing sperms with Knobbed head defect.

Microbial load of frozen semen samples was assessed by cultural screening. Nine fungal and 39 bacterial strains were isolated.

Different antigen preparations of *Pasteurella multocida* were studied for their efficacy to evoke immune responses. Sonicated antigen was found to be superior.

Study on *Campylobacter jejuni* indicated its prevalence in pigs and man. Antibiogram of these isolates showed that they are sensitive to chloramphenicol, gentamicin and nalidixic acid, microbial degradability rates and to formulate suitable feed combinations based on their by pass protein availability to achieve optimum milk production and milk composition in cross bred cows. The results indicated that ground nut oil cake and gingelly cake are more soluble and rapidly degradable in the rumen, whereas cotton seed cake and coconut cake were more resistant to microbial degradation and better source of bypass protein for ruminants. On a grass based diet a bypass protein level of 63.38% is optimum in a concentrate mixture with 20% protein and 70% TDN for higher production.

Studies on anaesthesia in goats revealed that satisfactory desensitisation of flank for abdominal surgery is possible in goats by blocking the 18th thoracic, first and second lumbar nerves.

Bupacaine hydrochloride at 0.5% and 0.25% were found effective in inducing anaesthesia by nerve block.

Studies conducted on autogenous rib graft for immobilisation of metacarpus gave successful results. It can be used for immobilisation of fractures of metacarpus and it induced early healing with minimum callus formation.

Studies on anaesthesia in birds revealed that intraperitoneal route is satisfactory for administration of anaesthetics in pigeons and quails.

Different classes of immunoglobulins in serum bile and mucosal washings of trachea and intestine of ducks were separated and quantified.

Thirtytwo strains of staphylococcus were isolated and their resistance to common antibiotics and heavy metals was studied. Some strains showed multiple resistance. Plasmix profile of selected strains was brought out. The number and molecular weight of the plasmid were determined.

From ailing and dead kids eighty seven samples were culturally processed. The predominant isolates were E-coli



and salmonella sensitive to chloramphenicol, gentamicin and norfloxacin and resistant to streptomycin, ampicillin and tetracyclin.

From diseased ducks from Kuttanad area six strains of *Pasteurella anatipestifer* were isolated. These isolates were sensitive to chloramphenicol, Neodox, flomigine and pefloxacin pathogenic studies revealed that guinea pigs are refractive to infection by this organism. Bacterins prepared of these isolates were found more effective if given with adjuvant. Duck plague virus was isolated from two cases.

## EXTENSION

### Village Adoption Programme

Strengthen the organized effort on popularising goat farming, information was given on scientific management of goats to farmers of Vilvattam Panchayat. They were supplied with necessary deworming drugs and mineral mixture for their goats. Nine goats were supplied to 9 farmers of adopted Village Vilangannore in Peechi and took classes about goat rearing by Dr. P. S. Pushkaran and Dr. M. R. Subhadra.

### Services rendered to farmers

#### a) Total number of A. I. and Revenue collected

Details of A. I.	Kokkalai	Mannuthy	Total
No. of cows and buffaloes	1578	2338	3916
No. of goats	189	151	340
Revenue collected in Rs	18330	24032	42362

#### Details of Small animals distributed to Institutions

Animals	Nos.	Amount
Albino rats	2457	41595
Albino mice	384	3971
Guinea pigs	31	8314
Rabbits	55	
Feed	500kg.	4677
		58557

### Feed sample analysis for proximate principles

During the period under report 353 feed samples were analysed for various proximate principles and mineral contents.

Samples analysed by atomic absorption spectrophotometer for trace elements - 10500 Nos.

**Diagnostic services by the Department of Pathology**

Poultry autopsy and disease diagnosis	19883
Large animal autopsy	538
Rabies diagnosis	361
Histopathology	1768
Clinical pathology	613
Feed samples analysed for mycotoxins	624
Ethmoid cases investigated	108
Field visits made	75

**Details of vaccinations conducted and diagnostic tests carried out**

Rinderpest vaccination	348 animals
Haemorrhagic septicaemia	325 "
Foot and mouth disease	950 "
Johne's disease diagnosis test	256 "
Faecal samples, skin scrapings, wet films, blood smears, blood urine, milk samples testing	15 Nos./day

**Cases treated in the Vety. Hospital, Mannuthy**

Equine	38
Bovine	4695
Others	3386
<b>Total</b>	<b>8119</b>
Castration done	2
Major surgical operation	93
Minor surgical operation	423
Ranikhet disease vaccination done	5242
Prophylaxis for canine	164
Clinical samples examined	1219

**Cases treated in the Vety. Hospital, Kokkalai**

Large and small animals treated	—	27296
Operations done: Major	—	28
Minor	—	736
Castration	—	74
Vaccination done: Antirabic	—	1060
Avian disease	—	6943
Clinical sample examined	—	1324

**Milk products made and Revenue collected**

Revenue collected from sale of pasteurised milk	—	Rs. 12,09,499.50
Revenue collected from different milk products		4,39,068.00
<b>Total</b>		<b>Rs. 16,48,567.50</b>

**Details of water and biological samples tested for toxine**

Water samples	190 Nos.
Feed samples for OP, OC, Carbamate,	
Zinc, Aluminium, Alkaloids	78
Drug samples for steroids	6
Mineral mixture for flourine	5
Biological samples for OP, OC,	
Rodenticides and heavy metals	138

The General Council rewarded the following Scientists for this Scientific achievements in different fields. Dr. A. Rajan, Dr. M. Krishnan Nair, Dr. K. M. Ramachandran, Dr. K. V. Valsala, Dr. K. I. Maryamma, Dr. A. Lalithakunjamma, Dr. A. Ramakrishnan, Dr. A. K. K. Unni, Dr. Amrithavally, Dr. C. K. Venugopalan and Dr. Maggie D. Menacherry.

Dr. K. Vijayakumar won the young scientist award instituted by the Indian Society for Veterinary Medicine.

Dr. K. Venugopal, Associate Professor (NC) has won the Dr. K. S. Nair Memorial prize for the year 1991.

Dr. N. Ashok, Assistant Professor, Anatomy received the Kulaingner Dr. M. Karunanidhi award for the best thesis in Anatomy during 1992 awarded by Tamil Nadu Veterinary University, Madras.

An earn while you learn students' broiler programme was conducted from October '94 to December '94.

The Indian Council of Agricultural Research, considering the outstanding contributions made by the Centre of Excellence in Pathology granted National Centre of Advanced Studies in Veterinary Pathology in 1994. The ICAR provided a financial assistance of 42 lakhs for this Centre. Dr. A. Rajan is the Director of the National Centre. A carcass utilization plant was sanctioned by the Government of India costing about 1.2 crores.

**Important Visitors**

Dr. K. Mohandas—Director, Sreechitra Institute, Thiruvananthapuram.

Sri. Prayar Gopalakrishnan—Chairman—MILMA

Dr. K. R. Rao, Manager (Tec.) Dept. of Economic Analysis and Research, NABARD.

Dr. P. V. Sukhatme, Exe. President ISAD.

Dr. K. Gopalan, former Vice-Chancellor of CUSAT.

Dr. Prem Narain, Secretary, ISAS.

Dr. S. S. Pillai, Joint Director, IASRI (Retd.)

Dr. O. P. Kathuria, Director, IASRI.

## 2.2 POULTRY AND DUCK FARM, MANNUTHY

The University Poultry and Duck Farm originally under the State Department of Animal Husbandry was brought under the Kerala Agricultural University from 1.2.'72.

Dr. G. Raghunathan Nair, Professor was in-charge of the unit during the period.

Major objectives of the farm are to provide hatching eggs, chicks and breeders for farmers, to provide instructional facilities for teaching and research and to take up independent research in various aspects of Poultry Production.

Category	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
Assoc. Professor	1	1	
Asst. Professor	2	1	
<i>Administrative staff</i>			
Senior Farm Supervisor	1	1	
Farm Supervisor Gr. II	2	2	
Farm Asst. Gr. I	1	1	
Farm Asst. Gr. II	1	1	
Poultry Attendant	3	3	
Admn. Asst.	1	1	
Sr. Gr. Asst.	1	1	
Assistant Gr. I	1	1	
Peon Hr. Grade	1	1	
Watchman	1	1	

The research efforts of the University Poultry Farm could bring out the strain White Leghorn, namely 'F' strain as one of the best layers as per VII Random Sample Test Results of Hesserghatta in 1978. The farm was able to develop a cross-bred chicken by name Gramalakshmi (Austra White) which as an ideal bird has attracted the attention of poultry farmers and is in great demand. This technology has been taken over by the State Department of Animal Husbandry and is being supplied through its farm.

Research on ducks is being undertaken only by few research centres in the country. The research efforts on this species carried out in the farm has placed the Kerala Agricultural University as a centre for information on duck in the country.

Recently, the farm has taken up popularisation of quail farming which has attracted many farmers in Kerala.

The State Department of Animal Husbandry is assisted by the farm in implementing its programme of 'Poultry Nursery Project' through supply of chicks. The efforts are being continued.

### 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.

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
Professor and Head	1	1	—
Assoc. Professor	1	1	—
Asst. Professor	3	3	—
<i>Administrative and supporting staff</i>			
Administrative Assistant	1	1	—
Senior Grade Assistant	2	2	—
Assistant Gr. I	2	2	—
Typist	1	1	—
Senior Farm Supervisor	1	1	—
Farm Supervisor Gr. II	1	1	—
Farm Assistant Gr. II	2	2	—
Pump Operator	1	1	—
Peon Hr. Gr.	1	1	—
Pig Attendants	3	3	—
Watchman	1	1	—

The Scientists handled classes for UG and PG students. Physical facilities were provided for PG students and research scholars for research work. A booklet in Malayalam entitled Pannivalarthal was published.

#### Research Activities

1. Conducted research on the feasibility of using jack fruit as a feed to both Yorkshire and Desi pigs.
2. Preliminary steps for the cross breeding programme of yorkshire and desi pigs in progress.

#### 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.

Dr. A. Ramakrishnan continued to be the Director of the Centre.

#### 2.5. ALL INDIA CO-ORDINATED PROJECT ON POULTRY BREEDING

The ICAR sponsored project was initiated in 1976 to develop a commercial layer of average yield of 270 eggs of standard size during 500 days of age with less than 1% layer house mortality per month.

During 1992-93, S14 generation of both IWN and IWP strains were raised and tested at Mannuthy Centre for their part year production. Overall performance of both the strains was found to be good. Four pedigree hatches of IWN and IWP strains were taken at five day intervals to produce S15 generation.

Dr. A. K. K. Unni continued as the Senior Scientist in-charge of the project.

#### 2.6. CENTRE FOR ADVANCED STUDIES IN ANIMAL GENETICS AND BREEDING

The Department of Animal Genetics and Breeding started in the year 1976 was raised to the status of Advanced Centre in the year 1985. Dr. G. Mukundan continued to be the Director. The details of activities are given in the report of the College of Veterinary and Animal Sciences.

#### Staff

Name of post	Sanctioned	Vacant
Director	1	Nil
Associate Professor	1	Nil
Assistant Professor	1	1

#### 2.7 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.

In addition to the regular teaching, research and extension activities the centre is actively engaged in extensive research on animal diseases, comparative oncology, mycotoxicosis and poultry diseases.

Considering the outstanding contribution of the Centre for Excellence in Pathology the Indian Council of Agricultural Research has sanctioned a National Advances Centre in Animal Pathology. An amount of Rs.42 lakhs has also been sanctioned. This centre of Excellence in Pathology will offer postgraduate courses for candidates from all State Agricultural Universities and organise various Training programmes at the National level for teachers and research workers in Animal Pathology. This is the only centre in the country for this subject. Research on frontier areas in this discipline will also be undertaken.

## 2.8 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.

### *Teaching and Technical Staff*

Category	Sanctioned	In position	Vacant
<i>Scientific Staff</i>			
Professor	1	1	—
Assoc. Professor	1	1	—
Asst. Professor	1	1	—
<i>Supporting staff</i>			
Farm Assistant Gr. I	1	1	—
Permanent Labourer	1	1	—

### Cases treated

Equine	: 38
Bovine	: 4695
Others	: 3386
Total	: 8119
Daily average attendance	: 22
Castrations done	: 2
Surgical operations	: 516

## 2.9. LIVESTOCK RESEARCH STATION, THIRUVAZHAMKUNNU

Livestock Research Station, Thiruvazhamkunnu is located in Kottoppadam Village, Mannarkkad Taluk, Palakkad district. The station is situated 17 kms. north of Mannarkkad with an area of 163.3 ha

The farm was started under the postwar development scheme of Animal Husbandry Department of Madras Government in the year 1950 with its office at Perinthalmanna. The farm was then transferred to Department of Animal Husbandry, Kerala in 1956 and then to Kerala Agricultural University in February, 1972. It was converted into Livestock Research Station on 14.8.1978. An A.I.C.R.P. on Agroforestry was started on 8.12.1983 and continues to be under operation.

Dr. P. Ramachandran, Professor continued as the Head of the Station.

### Main objectives

To evolve elite breed of cattle by scientific breeding, feeding and management.

To hold problem oriented and adaptive research projects in the field of Animal feeding, production and management.

To advise local farmers on scientific management livestock and technology transfer to villages.

To provide artificial insemination and animal health care to animals of local farmers.

### Staff position as on 31.3.1995

	Station			AICRP on A.F. <sup>1</sup>		
	Sanct- ioned	In position	Vacant	Sanct- ioned	In position	Vacant
Scientific Staff	8	6	2	3	3	0
Technical/Supp.	35	22	13	7	3	4
Admn./Gen.	10	8	2	2	2	0
Total	53	36	17	12	8	4



L. R. S. Thiruvazhamkundu staff position as on 31.3.1995

Designation	Sanct- ioned	In position	Vacant	Remarks
1	2	3	4	5
Research Technical				
Assoc. Professor (Nutrition)	1	1	0	Professor (A. N)
Assoc. Professor (Animal Reproduction)	1	1	0	Working arrangement
Professor (Animal Reproduction)	1	1	0	Post shifted from C.V. & A.S.
Professor (A.B&G)	1	1	0	
Professor (Extension)	1	1	0	
Asst. Professor (Pathology)	1	1	0	
Asst. Professor (Animal Management)	1	0	1	
Asst. Professor (Dairy Sci)	1	0	1	
	8	6	2	
Para Technical				
Farm Supervisor (Vety) Sr. Gr.	1	1	0	
Farm Supervisor (Vety) Gr. I	1	0	0	
Farm Asst. (Vety)	2	2	0	
Lab Asst. (Technician)	1	1	0	
Farm Supervisor (Agri)	1	0	1	
Farm Asst. (Sr. Gr. (A)	1	1	0	
Farm Asst. Gr. I	3	3	0	
Farm Asst. Gr. II	1	0	1	
Refrigeration Mech.	1	0	1	Dairy Operator Trainee on cons. pay
Driver	1	1	0	
Technician	1	1	0	
Tractor Driver	1	0	1	
Pump operator	2	2	0	
Field Supervisor (Dairy)	1	1	0	
Maistry	2	2	0	
Watchman-Class-IV	8	2	6	
Regular Mazdoor	1	1	0	
Mazdoor-Class-IV	5	3	2	
Sweeper	1	1	0	
	35	22	13	

1	2	3	4	5
<b>Ministerial</b>				
Admn. Asst.	1	1	0	
Asst. Sr. Gr./ Gr. I	4	2	2	
Asst. Gr. II	1	1	0	
Typist	2	2	0	
Peon	2	2	0	
	10	8	2	

#### **AICRP ON AGROFORESTRY**

##### **Research/Technical**

Assoc. Prof. (Fore.)	1	1	0	
Asst. Professor (Agro.)	1	1	0	
Asst. Professor (Agrl. Engg.)	1	1	0	
	3	3	0	

##### **Para Technical**

Technical Asst.	2	0	2	2 JAPS post abolished & 2 new posts created
Farm Asst. (Agri.)	2	1	1	
Driver	1	0	1	
Lab Asst. Gr. III	2	2	0	
	7	3	4	

##### **Administrative**

Asst. Gr. II	1	1	0	
Peon	1	1	0	
	2	2	0	
<b>Total</b>	12	8	4	

#### **Faculty improvement programmes**

Dr. Mammen, J. Abraham, Asst. Professor (Pathology) continued to be under deputation as a Ph. D. Scholar at Madras Veterinary College.

#### **Details of seminars, symposia, training programmes attended by staff**

Dr. V. Raju, Professor (Extn) attended the National Seminar on Forage Seed Production Technology at Dhoni, from 24.10.94 to 26.10.94.

### Involvement of staff in academic programme

- a. Dr. P. Ramachandran, continued to be the major advisor of M.V.Sc. student Dr. R. Subramanian in Animal Nutrition.
- b. Internship Training of B.V.Sc. Final year students
- c. Farm Training for B.V.Sc. students
- d. Vocational Higher Secondary School (Alanalor) courses in Dairy Husbandry and Dairy Products Technology (Plus 2 level)

### 2.10 CATTLE BREEDING FARM, THUMBURMUZHI

Thumburmuzhi, a hill tract area is located about 13 km east of Chalakudy town in the Chalakudy-Sholayar route. In 1957, Government of Kerala started a dry cattle salvage farm under the Animal Husbandry department of Thumburmuzhi. By the end of 1957, a Cattle Breeding Research Station was started at Thumburmuzhi with the financial assistance from the Indian Council of Agricultural Research. The dry cattle salvage farm was wound up in 1962. The ICAR scheme continued upto 1969. Since then a Livestock Farm was started under Animal Husbandry Department. The farm was taken over by Kerala Agricultural University on 1.2.72 and now this Institution is functioning as Cattle Breeding Farm.

The total area of the farm is 63 acres. Resurvey of the area is proposed. Area under fodder cultivation is 40 acres (rainfed 14 acres and irrigated 26 acres). More of area has been brought under fodder cultivation. At present, the farm is having the following fodder crops.

Guinea grass	— Improved variety (Riversdale, Co I)
Hybrid Napier	— (Co I, Co II)
Thin Napier	
Congo Signal	
Teosinte	

Action taken to initiate legume fodder cultivation. *Desmanthes virigatus* has been introduced.

The farm is having 578 bearing coconut trees and 197 young trees.

The main objectives of the farm are (1) to develop the farm into a model dairy farm (2) to extend facility of artificial insemination to the cattle of the surrounding villages and to supply improved varieties of fodder slips. (3) To provide facility for PG Research on large animals.

Dr. D. Sreekumar continued as the Head of the Station during the period.

**Staff position**

Category	No. of posts		
	Sanctioned	In position	Vacant
<b>Scientific Staff</b>			
Associate Professor	1	1	—
Assistant Professor	1	1	—
<b>Administrative, Supporting &amp; Technical</b>			
Administrative Asst.	1	1	—
Typist Sr. Gr. I	1	1	—
Assistant Gr. I	1	1	—
Assistant Gr. II	1	1	—
Peon Hr. Gr.	1	1	—
Farm Supervisor Gr. I	1	1	—
(Vety.)			
(Ag) Gr. I	1	1	—
Farm Assistant (Vety) Gr. I	2	1	1
LDV Driver	1	1	—
Pump Operator	1	1	—
Herdsmen (Spl. Gr.)	1	1	—
Herdsmen	4	4	—

**Research activities**

Breeding of crossbred cattle for evolving an elite herd continued during the period under report. The salient features of performance particulars of the herd maintained in the farm are as follows:

**Herd strength of crossbred cattle**

Sl. No.	Age group/type	Strength	
		as on 1.4.93 (1993-94)	As on 1.4.94 (1994-95)
1	Upto 6 months	7	24
2	6 months -12 months	5	17
3	12 months -18 months	8	6
4	Above 18 months -heifers	56	34
5	Dry cows	8	13
6	Cows in advanced pregnancy	17	15
7	Milch cows	21	42
	<b>Total</b>	<b>122</b>	<b>151</b>

The total number of crossbred cattle increased by 25 percent as on 1.4.94 when compared to the strength on 1.4.93.

## Performance Record

Basic data on herd production and reproduction are regularly recorded and evaluated to assess the herd performance.

### Production and disposal particulars of milk

Sl. No.	Parameter	Period 1994-95
1.	Average number of animals in milk	46
2.	Total milk production (kg)	1,06,536
3.	Average daily milk yield (kg)	291.88
4.	Average monthly yield (kg)	8,878
5.	Milking average (kg/animal/day)	6.34
6.	No. of calvings	56
7.	No. of animals purchased	Nil
8.	No. of animals died	6
9.	No. of animals culled	—

### 2.11. CATTLE INFERTILITY SCHEME, KOZHIKODE

The cattle infertility scheme was started functioning during 1.9.1980 at Veterinary Hospital, Calicut and shifted in 1984 to rented building at Vellimadukunnu.

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 crossbred 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.

**Staff position**

Designation	Sanctioned	In position	Vacant
Assoc. Prof.	1	1	—
Asst. Professor	1	1	—
Junior Asst. Professor	1	—	1
<i>Technical &amp; Supporting staff</i>			
Senior Gr. Farm Asst. (Vety.)	1	1	—
Lab Technician	1	1	—
Lab Assistant Gr. III	1	1	—
Attendant	1	1	—
<i>Administrative staff</i>			
Assistant Gr. II (Sr. Gr. Asst.)	1	1	—
Peon	1	1	—

**2.12 UNIVERSITY VETERINARY HOSPITAL, KOKKALAI**

This University Veterinary Hospital situated in the 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 need 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.

Residential quarters are provided to the officers in order to attend emergency cases brought outside office hours.

Dr. K. Ramdas continued as Professor and Head during this period.

#### Staff position

Category	Sanctioned	In position	Vacant
<b>a) Academic</b>			
Professor	1	1	—
Asst. Professor	1	1	—
Farm Supervisor (Vety) Sr.Gr.	1	1	—
Farm Assistant (Vety) Sr.Gr.	1	1	—
Pharmacist	1	1	—
<b>b) Administrative Staff</b>			
Section Officer	1	1	—
Assistant Sr. Gr.	1	1	—
Class IV employees	4	4	—

Besides the above staff members, experts from the Veterinary College Departments like Medicine, Surgery, Animal Reproduction and Parasitology attend different speciality units for imparting clinical training to the undergraduate and postgraduate students. Hospital is functioning regularly from 8 a.m. to 12 noon and 3 p.m. to 5 p.m. During outside hours emergency cases are attended by the Resident Veterinary Officer.

#### Research

Various Research Schemes on various diseases of the animals are operated here. This includes clinical trials in the newer drugs, studies on reproduction disorders in animals and cheaper techniques for treatments.

#### Other activities

The following extension activities are given to the farmers

- a) Expert Veterinary advice on various disease problems are given to the farmers.
- b) Poultry vaccination. Anti-rabies vaccination and parvo-viral vaccination are given during hospital hours.
- c) Analysis of clinical samples brought from various Veterinary hospitals and sub centres.
- d) Consultancy services to Field Veterinarians and farmers.

A brief account of cases treated during the year 1993-94 are given below :

1. Total no. of cases treated	:	27296
Total no. of referred cases	:	1820
2. Castration	:	74
3. Operation : Major/Minor	:	28 756
4. PAR Vaccination	:	1060
5. Birds treated	:	3938
6. Birds vaccinated : RD vaccination	:	6768
Fowl pox vaccination	:	175
7. Daily average of cases	:	74.8
8. Clinical samples examined in the laboratory	:	1324

### 2.13 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.

#### Livestock Section

Animals as on 31-3-95

Milch cows	:	72
Dry cows (including experimental)	:	64
Bullocks	:	nil
Calves	:	39
Heifers	:	49
<b>Total</b>	<b>:</b>	<b>224</b>
Total milk production 1994-95	:	1,77,044.250 litres
Cost of milk produced @ Rs. 7/ltr	:	12,39,309.75
Average no. of milk cows maintained	:	86 nos.



### **Fodder Section**

There is a total area of 69 hectares of land of which about 15 hectares are located in the plains (irrigated) and rest is in hilly area of the farm. There is no waste land.

#### **Total fodder production 1994-95**

Quantity (MT)	
1 Green grass	: 2446.325 MT
2 Maize fodder	: 11.00 MT
3 Silage	: 757.540 MT
4 Cowpea	: 9.600 MT
5 Hay	: 2.000 MT
6 Green leaves	: 1.800 MT
Total	: <u>3228.265 MT</u>

#### **Total fodder slips distributed in 1994-95**

1 Hybrid Napier slips	: 90,650.00 nos.
2 Improved Guinea grass slips	: 67,950.00 nos.
Annual Receipt during 1994-95	: Rs. 22,47,395.98
Annual Expenditure during 1994-95:	Rs. 79,62,862.45

### **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 the 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	Strength		V	Remarks
	S	P		
Professor	4	3	1	Prof. (Fish Biol) Vacant
Associate Professor	14	13	1	Fish. Engg. Vacant (In 2 posts Asst. Prof. working)
Assistant Professor	23	18	5	
Administrative Officer	1	1	—	
Section Officer	3	3	—	
Asst. Librarian	1	—	1	
Reference Assistant	1	1	—	
Sr. Office Superintendent	2	2	—	
Typist Sr. Gr.	2	2	—	
Typist Gr. II	2	2	—	
Selection Gr. Asst.	4	4	—	
Sr. Gr. Assistant	1	1	—	
Assistant Gr. II	5	5	—	
Hostel Manager	1	1	—	
Lab. Assistant Gr. I	1	1	—	
Lab. Asst. Gr. II	1	1	—	
Lab. Asst. Gr. III	4	4	—	
Technician Gr. I	1	1	—	
Farm Asst. Gr. I	1	1	—	
Fieldman (Fisheries)	2	2	—	
Fisherman-cum-Watchman	1	1	—	
Driver (HDV)	1	1	—	
Driver (LDV)	2	2	—	
Bus Attendant	1	1	—	
Duplicator Operator	1	1	—	
Pump Operator	1	1	—	
Class IV	5	4	1	
Full-Time Sweeper	2	2	—	
Junior Programmer	1	1	—	
Skipper Gr. II	1	—	1	
Engineer i/c.	1	—	1	
Gear Technician	1	—	1	
Deckhand	1	—	1	

### Faculty Improvement Programme

Smt. V. Malika, Asst. Professor, is deputed for undergoing Ph. D. Programmes in Fishery Statistics at Central Institute of Fisheries Education, Bombay.

## Seminars/Symposia/Workshops/Refresher Courses/Training

### Programmes attended by Scientific staff

The All India Workshop on Fisheries Education, sponsored by I. C. A. R., was organised by the College at Central Marine Fisheries Research Institute, Cochin, on 28th and 29th of June, 1994.

Five numbers of the Scientific Staff attended the Workshops/Refresher Courses at different places during the period.

#### Academic Programme

##### Dept. of Aquaculture

Courses under the UG and PG programmes in the discipline at Aquaculture were offered by the Department.

##### Dept. of Fishery Biology

Courses under the UG programme in Fishery Biology and in the minor field of M. F. Sc. (Aquaculture) were offered.

##### Dept. of Fishery Hydrography

Courses under the UG programme in Fishery Hydrography were offered.

##### Dept. of Fishing Technology

Courses under Gear Technology I and II, fishing methods, onboard fishing experience, navigation and seamanship were offered for the UG programme.

##### Dept. of Fishery Engineering

The courses fishing craft technology, fish farm and harbour engineering, marine engines and aquaculture engineering for B. F. Sc. and essentials of design and maintenance of fish processing plants for the M. F. Sc. (Processing Technology) were offered.

##### Dept. of Processing Technology

The Department offered courses for the B. F. Sc. and M. F. Sc. programmes in Processing Technology and in the minor fields of M. F. Sc. (Aquaculture) Programme.

##### Dept. of Management Studies

Courses like Statistics, Economics, Extension, Commerce, Management, Co-operation and Banking, Physical Education and related subjects were offered for the B. F. Sc. Courses under the minor fields of M. F. Sc. (Aquaculture) were also offered.

**U. G. Courses****a) Strength of Students as on 31st March, 1995**

Batch	Men	Women	Total
1988	—	1	1
1989	1	1	2
1990	4	—	4
1991	13	6	19
1992	16	3	19
1993	20	12	32
1994	28	13	41
	82	36	118

**b) No. of outside students**

— Nil

**c) No. of students who obtained the Degree during the year**

19 11 30

**P. G. programme****a) Strength of students as on 31st March, 1995.**

Batch	Men	Women	Total
1992	2	4	6
1993	2	1	3
1994	2	2	4
	6	7	13

**b) No. of outside students**

: Nil

**c) No. of students who obtained the degree during the year**Men Women Total  
2 4 6**Ph.D. Not offered****Details of Scholarships; Awards and other financial assistance to students**

Name of Scholarships Award	No. of recipients
I.C.A.R. Junior Fellowship	3
K.A.U. Junior Fellowship	3
K.A.U. Merit Scholarship	11
K.P.C.R.	4
SC ST/OEC Edl. Concession	23
Fishery Edl. Concession	14

**Practical Training Programme**

: Work experience was given to the students in fish farms, fishing vessels and processing plants. Under the practical training programme fishing trips and field trips for operation

of Oceanographic instruments, were conducted for students. Under 'Earn while You Learn' programme, training in integrated farming was undertaken by students.

#### **Study Tour**

The 1992 batch of B.F.Sc. Students were taken on an All India Study Tour during the period 1.3.1995 to 12.3.1995. During the period, the students visited Central Institute of Freshwater Aquaculture, Bhubaneswar; Govt. of Orissa Prawn, Hatchery at Konark; Central Inland Capture Fisheries Research Institute, Barrackpore (W.B.); National Institute of Cholera under I.C.M.R., Calcutta Mudalya Sewagefed Fish Farm, Calcutta; C.I.B.A., Madras; Southern India Aqua Farms, Madras and Marine Beach Aquarium, Madras. Dr. D. D. Nambudiri and Dr. Susheela Jose, Associate Professors, conducted the Tour.

#### **Extra/Co-curricular Activities**

##### **N.S.S. Programmes**

A combined valedictory function of the two batches of trainees under the training programme on 'Self-employment for Rural Youth' was conducted under the auspices of NSS Training and Orientation Centre, Kalamassery and the NSS Unit of the College, at the College in April, 1994.

Under the 'Training Programme for Unemployed Youth' organised jointly by the NSS Unit of the College and NSS Training and Orientation centre, Rajagiri College of Social Sciences, a three-day training was conducted by the Department of Processing Technology, during 26th to 28th May, 1994.

Seven NSS Volunteers of the College attended the National Integration Camp (Phase-I) at Parambikulam during the period 1st to 5th May, 1994. Dr. T. M. Jose, Programme Officer, attended the closing ceremony of the Camp.

Under the joint auspices of the NSS Unit of College of Fisheries, Panangad and Rajagiri College of Social Sciences, Kalamassery, a seminar on 'AIDS Awareness' was conducted in the College on 16th December, 1994, in connection with the National level 2-weeks long 'AIDS Awareness Campaigning'.

##### **Students' Union activities**

The College Union was inaugurated on 26th Oct., 1994 by Sri. P. T. Kunjumohammed, MLA.

The Inter-class Arts Festival was held in October, 1994.

A Poster exhibition and a Seminar on the topic 'Status of Women in the Contemporary era' were organised by the Students' Union on 16th Dec., 1994.

### Sports & Games

The Annual Athletic Meet of the College was held on 3rd May, 1994 at GCDA Stadium, Ernakulam. Sri. Lokanath Behra, IPS, City Police Commissioner, was the Chief Guest of the function.

The College team secured second position in the Inter-collegiate Athletic Meet of the KAU, held at Mannuthy on 30th & 31st March, 1995.

### Hostels

Name of Warden : Dr. M. J. Sebastian, Dean i/c.  
 Name of Asst. Warden : Dr. P. M. Mathew, Professor (FR)  
 Name of Hostel Manager : Sri. M. Mohammed Mosadiq  
 Hostel Strength : Boys 82; Girls 30;

(As the Lady's Hostel is yet not ready, the students are accommodated in YWCA, NSS Working Womens' Hostel and Athurasramam Womens' Hostel)

### Library

The details of books and journals in the College Library are as follows:

	Books (including Reports, Bulletins, etc)	Journals Sub-cribed	
		Indian	Foreign
No. as on 1.4.'94	11,528	32	21
No. as on 31.3.'95	11,853	32	27
Additions during the period	325	—	—

### Instructional Farm

Out of the 30 ha College Campus approximately 10 ha are wet land and the rest garden land. A significant portion of the garden land has been occupied by buildings, roads and playgrounds. In the remaining area, coconut is the main crop and there are 1381 yielding trees. The yield obtained during the period was 29,922 nuts.

Out of the wetlands 5ha are leased out for prawn filtration, 0.5 ha used as experimental prawn culture fields and 2.5 ha area converted as experimental fish ponds, where fresh and brackishwater fish and prawn are cultivated.

Steps are being taken to increase the production of table fish, prawn, fish seed, freshwater prawn seed and ornamental fishes.

#### Research programmes

The 12th Faculty Research Committee (Fisheries) was held at the College on 13.1.'95. The Committee approved three new P. G. Projects. The following are the research projects under implementation as on 31st March, '95.

- 1 Intensive culture of giant freshwater prawn, *M. rosenbergii* in pokkali field ponds.
- 2 Selective breeding of gold fish *C. auratus* and breeding and rearing of a few selected ornamental fishes.
- 3 Growout of giant freshwater prawn *M. rosenbergii* alone, and along with fishes.
- 4 Culture of the pearlspot *Etroplus suratensis* in homestead ponds
- 5 Standardisation of oxygen packing and transporting procedure of *M. rosenbergii* seed.
- 6 Induced maturation and spawning of penaeid prawns for commercial larval production.
- 7 Induced maturation of *Penaeus indicus* with exogenous hormones.
- 8 Chromosomal and electrophoretic studies of certain palaemonid prawns of Kerala.
- 9 Studies on wave refraction along the shoreline near Kochi.
- 10 Preparation of reagent kits for on the spot assessment of water quality in fish farms.
- 11 Development of pelleted feed for prawn in aquaculture.
- 12 Effect of different dietary levels of lecithin on growth, survival, moulting and body phospholipid levels in *M. rosenbergii* post-larvae.
- 13 Dietary phosphorus requirement and deficiency syndromes in *M. rosenbergii* juveniles.
- 14 Vitamin-C requirement and its deficiency syndromes in *M. rosenbergii* juveniles.

#### Research highlights

i) The pelleted prawn feed, based on clam meat as the animal protein source, which is cheaper as compared to the commercial prawn feeds, has been economically viable with

FCR of 1.1.8, both for the marine prawn *Penaeus monodon* and freshwater prawn *M. rosenbergii* with respective production rates of 733 kg/ha 82 days and 830 kg/ha/6 months.

ii) Deoiled silk worm pupae as such has been found as a suitable supplementary feed for the popular fish murrel (*Channa marulius*).

iii) Compound feed prepared with silkworm pupae as the animal protein source has been found suitable for the culture of milkfish, *Chanos chanos*, with the production rate of the fish working out to 2,460 kg/ha/year when stocked @ 5,000 nos./ha.

iv) Technology has been developed for the repeated breeding of Angelfish (*Pterophyllum scalare*). Using this the fish, which breeds normally only once or twice in a year, has been successfully bred ten times during a season lasting for about 6 months.

#### Visitors

1. Dr. Lamina Henry, Hon'ble, Minister of Fisheries of Meghalaya, visited the College on 4th January, 95.
2. Sri. Rasalam, Additional Director of Fisheries, Government of Kerala, visited the College on 28th July, 94.
3. Sri. P. T. Kunju Mohammed, MLA, visited the College on 26th October, 94.
4. Sri. C. Cherian, President, Indian Sea Food Exporters' Association; Dr. K. Gopakumar, Director, CIFT, Kochi and Sri. M. K. R. Nair, Director, Integrated Fisheries Project, Kochi, visited the College in November, 94.

#### 3.2 FISHERIES STATION, PUDUVEYPU

An area covering 161.11.84 ha. belonging to Revenue Department, Govt. of Kerala was handed over to the Kerala Agricultural University for establishing an Instructional Farm for brackishwater fish and shrimp culture. Of this 101.11.84 ha. was handed over on 16.7.79 and the remaining 60 ha. was allotted on 31.3.93. The farm is located at a distance of about 2 km west of Murikumpadom Road. Arabian sea on the west, Cochin barmouth, on the south and a canal emerging from the barmouth in the east form its main boundaries. Northern side of the Station faces mainland.

The campus is partially marshy with a lot of mangrove vegetation, low lying water logged canals and ditches. There are 1015 coconut palms including seedlings of different age groups. Of this, 445 are yielding.



Imparting practical training on brackishwater fish culture for B. F. Sc. and M. F. Sc. students, collection and distribution of cultivable varieties of shell fish and finfish, conducting various experiments to develop appropriate farming methods to achieve better production from unit area etc. are the important programmes undertaken at this place.

Sri. K. S. Purushan, Associate Professor (Aqua) continued to be the Head of Station.

**Staff**

Designation	No. of posts		
	Sanctioned	In position	Vacant
Assoc. Professor (Aq.)	1	1	—
Asst. Professor (Agron.)	1	1	—
Assistant Professor (Aq.)	2	2	—
<i>Administrative and Supporting staff</i>			
Administrative Assistant	1	1	—
Asst. Gr. I	1	1	—
Asst. Gr. II	1	1	—
Typist Grade II	1	1	—
Farm Asst. Gr. I	1	1	—
Fieldman (Fisheries)	1	1	—
Lab Asst. Gr. III	1	—	1
Pump Operator	1	1	—
Jeep Driver (WA)	1	1	—

Faculty improvement programme : Nil

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

Dr. K. S. Purushan, Associate Professor (Ag.) participated in the Review meeting of Wasteland Development projects, under the auspices of NWDB, New Delhi at Veterinary and Animal Sciences University, Kattupakkam Campus, Madras on 19.7.1994.

Attended the Farmer's Seminar under the auspices of Krishi Bhavan, Nayarambalam and took class on 'Aspects of Scientific fish farming', at Mangalya Auditorium, Nayarambalam on 17.8.1994.

Participated in the International Congress on Kerala Studies under the auspices of AKG Centre for Research and Studies, Thiruvananthapuram to present the paper on improved Farming practice for suitable shrimp production from traditional system in Kerala, at University College, Thiruvananthapuram on 29.2.1994.

Attended the Shrimp farmers seminar under the auspices of KITCO, Kochi and offered a talk on 'Shrimp aquaculture prospects in Kerala' at Hotel Kamala International, Kannur on 8.3.95.

#### Involvement of staff in the Academic Programme

Classes on various aspects of brackishwater fish and shrimp farming were imparted to the students of the College of Fisheries, Panangad. Different techniques of seed collection, rearing and management of broodstock of important species were also offered to students from inside and outside KAU. The details of natural formation of mangroves and its significance to fisheries were also explained to the Forestry students of KAU in connection with their study tour to the campus.

The Head of Station also participated in the Academic Council meeting at KAU headquarters on 30.8.94, 2.12.94 and 7.3.95 as a member of the body.

#### Research Activities

At present, six approved research projects including the externally aided one are in different stages of implementation. Sanction has also been accorded for the implementation of a project on seed resources by the ICAR.

a) Concluded projects : Nil.

b) Ongoing projects

#### Development of broodstock and hatchery production of *Lates calcarifer*

The broodstock development of *Lates calcarifer* in the growout system is continued giving adequate care and attention to promote faster growth. Water quality parameters were maintained within tolerable ranges. The mean growth assessed at quarterly intervals are 5397 g/809.4 mm and 5428.5 g/810.1 mm in December 1994 and March 1995, respectively. The data revealed that the quantum of growth increment in respect of length and weight has come down, relative to to aging process, as furnished earlier. Eventhough, the size range of specimens varied between 4595 g and 6860 g, none of them indicated any advanced stage of gonadal maturity. Hence, induced breeding work was not taken up.

#### Studies on the effect of turbidity on growth and production of brackishwater fishes

The experiment continued as per the technical programme. The second operation of the experiment resulted in

relatively very high fish production in treatment ponds (2165.4 kg/ha/year) than in the control (1217.3 kg/ha/year) indicating the effect of clay turbidity on production. In respect of *Chanos chanos* better growth rate and production was registered in treatment ponds than the control. Nevertheless, clay turbidity does not seem to have affected growth of *Mugil cephalus* as evidenced by the excellent performance of the species, in the control pond.

*Studies on the reproductive physiology and induced breedings of grey mullet*

The broodstock of *M. cephalus* in ponds II & III were properly maintained as per the technical programme. Important physico-chemical and biological parameters were monitored at weekly intervals. Specimens collected from the brood ponds did not show any advancement in maturity stages, during the period under report. Hence breeding trials were not taken up.

*Agricultural cropping pattern suitable for a cocount-fish farming system in an accreted wetland*

The intercrops planted around coconut in twelve treatment combinations on the pond bunds, as per the technical programme were harvested and yield recorded except that of pineapple. The yield for each system will be obtained only after the harvest of Pineapple. The results obtained so far is encouraging.

*Intensive farming and seed production of monosex tilapia (*Oreochromis mossambicus*) in coastal wetlands*

The first phase of the experiment was completed by the end of December 1994. Better growth rate and production was resulted in the treatments ( $T_1$  to  $T_2$ ) than that in the control ( $T_0$ ). The mean weight of the fish at the end of 6 months in the treatments  $T_1$  to  $T_4$  were 51.64g, 78.51g, 77.87g and 76.43 g respectively. The second phase commenced since January 1995 is in progress.

**Externally aided Project treated by NWDB**

Demonstration and Training model for a fishery based farming system in coastal wasteland.

Fifty farmers selected from different panchayats covered under the project have been given six days' training on utilization of coastal wastelands for increased production. Awareness campaign on rational utilization of coastal wastelands for enhanced production has been carried out amongst the panchayats of Vypeen island. A compendium in Malayalam

containing the essential aspects of brackishwater fish and shrimp farming along with suitable agricultural crops on the pond bunds was released. Excavation of 28 miniponds within 20 ha area and two main canals connecting the bar mouth, one cross canal and two subcanals between the pond series are almost completed. On the whole the progress of the project is very much satisfactory.

#### Externally aided project under ICAR

Seed resources and production potential of carnivorous fishes in Southwest coast of India.

The project has been approved for implementation by ICAR and work has just begun.

#### Research Highlights

Continuous rearing and broodstock management of *Lates calcarifer* indicated that the quantum of growth increment in respect of length and weight was declining relative to aging process.

Controlling silt load by judicious water management in turbid water pond systems could result in higher survival and production of *C. chanos*.

#### Important Visitors

Date of visit	Name & Designation	Institutional affiliation
7.10.94	Dr. P. Jambulingam Asst. Director	VCRC, Pondichery
17.10.94	Dr. A. M. Michael Vice-Chancellor	KAU
24.12.94	Sri. V. K. Babu Sri. Khalid Executive	MLA Brackishwater fish Farmer's Develop- ment Agency
15.2.95	Sri. A. K. Unnithan Scientist	KVK, Narakkal
21.2.95	Sri. Sarvodayam Kurian	Survodaya Centre, Narakkal
„	Dr. M. K. Kandoran Scientist	CIFT, Cochin
25.2.95	Dr. M. R. Karim Assoc. Director, Extension	Bangladesh Agri- cultural University
„	Sri. R. C. Chaudhari, IAS	
„	Sri. M. S. Joseph, IAS	
„	Sri. Thomas Mathew, IAS	
„	Sri. Amitab Kant, IAS	
„	IAS Secretary to Revenue	

## Extension Activities

### Technical guidance

Information of practical aspects of fish and shrimp culture was given to aquaculturists who visited with queries on the topic and also those who purchased fish seed from the station, for culture purposes.

Farmer's fields were also visited for giving appropriate guidance in plant protection methods to be adopted for coconut palms.

## 4. FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY

### 4.1 KELAPPAJI COLLEGE OF AGRIC. ENGG. 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 59 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 & Technology on 2nd October, 1985 and the Institute was upgraded and renamed as 'Kelappaji College of Agricultural Engineering & 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

### Academic programmes

Strength of students under each programme

B.1 Tech. (Agrl. Engg.) programme

	Men	Women	Total
1989 Admission	2	—	2
90 Admission	7	1	8
91 Admission	10	7	17
92 Admission	12	6	18
93 Admission	16	9	25
94 Admission	14	10	24

**M. Tech. (Agrl. Engg.) programme:**

	Men	Women	Total
1993 Admission	6	2	8
94 Admission	1	7	8

**Practical Training programme & Study Tour**

A Study Tour to the Regional Agricultural Research Station, Pattambi was conducted as a part of Practical Training for the course SAC 48 Extension Education

**Details of Scholarships, Award to Students**

KAU Merit Scholarship

Educational concession to SC/ST students

KAU Junior Fellowships

**Extra Curricular Activities**

**Tournaments, Championships etc.**

The College team have participated in the KAU Inter-Collegiate tournaments and in the Malappuram District Championships. No noteworthy achievements have been achieved during the year under report.

**Students' Union Activities**

The following were the Students Union activities for the period under report.

The Election of the College Union for the year 1993-94 was held on 16.7.94 and the results were declared on 18.7.1994

- 1 The Union of 1993-94 was inaugurated by Dr. E.J. James, Executive Director, C.W.R.D.M.
- 2 The Students of this college participated in the KAU Youth Festival held at Vellanikkara from 6.8.94 to 12.8.94
- 3 They also participated in the Inter Engineering College Arts Festival (SPLASH'94) from 1.9.94 to 3.9.1994
- 4 A programme viz., Poothappattu was organised by Sastra Sahitya Parishad on 26.8.94 under the auspices of KCAET Students' Union.
- 5 A debate was held on 26.10.94 on 'New Censorship Policy'.
- 6 The College Arts festival was held from 3.11.94 to 7.11.94

7 Garden Club organises a campus beautification programme on 26.1.1995

8 Film festival was conducted from 6.2.95 to 8.2.95

### Hostels

#### Ladies Hostel

Name of the Warden : Dr. K. John Thomas, Dean i/c  
Name of Asst. Warden : Smt. Santhy Mary Mathew,  
Asst. Professor  
Name of Matron : Vacant  
Number of Inmates : 44

#### Men's Hostel

Name of the Warden : Dr. K. John Thomas, Dean i/c  
Name of Asst. Warden : Sri. Xavier. K. Jacob

### Library

1. Number of Books as on 1.4.94	16848
2. Number of Books procured (1.4.94 to 31.3.95)	332
3. No. of books under Centrally sponsored Scheme	242
4. No. of books procured under Centrally sponsored scheme	60
5. No. of Indian Journals	62
6. No. of Foreign Journal	32

### Instructional farm

#### Administration

Sri. P. Rajendran, Assistant Professor continued to be in-charge of the farm.

Dr. P.V. Habeeburrahman, Asst. Professor (Agron.) was involved in the cropping activities in the farm. He was also associated with the academic programme of the college.

### Labour

The labour strength as on 31.3.95 was as follows:

1 Permanent men	— 20
2 Permanent women	— 24
3 Casual men	— Nil
4 Casual women	— Nil

The available labourers are insufficient to carry out the primary farm operations.

**Area**

A) Total area of the farm	:	40.19 ha
B) Area under cultivation	:	27.55 ha
C) Waste land including fallow	:	12.54 ha
a) Area occupied by roads and buildings	:	6.54 ha
b) Area vacant and not utilised	:	Nil
c) Area not suitable for cultivation	:	4 ha.
d) Fallow land	:	2 ha

**Cropping****Paddy**

Season	Variety	Area	Production in Kilogram		
			Seed	Bulk	Total
1st Crop:	Red Triveni	3.3 ha	7705	1950	9655
	Jyothi	1.9 ha	1828	1850	3678
	Athira	1.8 ha	1450	1150	2600
	Kanchana	0.8 ha	1500	300	1800
					17733
IInd Crop:	Hraswa	1.2 ha	820	857	1677
	Red Thriveni	1.3 ha	—	2990	2990
	Jyothi	0.3 ha	400	550	950
	<b>Total:</b>	<b>2.8 ha</b>			<b>5617</b>

**Coconut**

A total number of 55816 nos. of nuts were harvested and sold. 3591 barren nuts were also sold.

A coconut nursery with 3000 seedlings were also raised.

**Production of grafts and seedling**

Item	No. of production	Sale
Cashew	8125	7571
Mango	1925	793
Pepper cuttings	8800	2462



## Vegetables

Vegetables were cultivated in an area of 1.5 acres. Production details of vegetables and seeds are given below:

Name of crop	Bulk in Kilogram	Seed in Kgs.
Bhindi	56	17.6
Cowpea	—	5.6
Bitter gourd	32	9.6
Ash gourd	39	17.28
Pumpkin	138	-
Bottle gourd	45	18.8
Cucumber	77	50

The following items were sold on auction at the amounts noted during the period under report.

Items	Amount in Rs.
Mango fruits	2711.00
Jack fruits	2400.00
Gingelly bulk	1725.00
Arecanut	950.00
Pepper	1000.00
Cashew	750.00
Gooseberry	1000.00
Ceiba pods	8100.00

## Banana

A total number of 500 Nendran banana which were planted in November 1993 were harvested and 3300 kilograms of banana fruits were obtained.

## Farm development

A drip irrigation system was laid out in the Mangala Arecanut garden in an area of 1 acre.

Facility for irrigation was extended to an additional area of about 5 hectares of coconut.

A seedling production unit was established to produce quality seedlings of mango, cashew, sapota and other fruit trees and ornamental plants.

## Dairy Unit

Quantity of milk produced	—	16159.5 litres
Quantity of milk sold	—	14823 litres
Number of animals	—	30
Number of animals culled	—	19
Number of calves sold	—	6
Number of animals died	—	2

## **Research programme**

The following research programmes have been concluded:

Studies on wick Irrigation system for cropping on flat roof terraces.

Socio economic feasibility of selected farm implements for rice cultivation.

Evaluation and modifications of power tiller operated paddy reaper.

Development of a power tiller operated transplanter for conventional seedlings.

Development and testing of a rotary type black pepper cleaner.

Development and evaluation of a low cost power operated paddy thresher cum winnower.

Design and fabrication of a large diameter pit digger for laterite terrain.

Simulation studies on different design parameters of spurs (Groynes).

Design, fabrication and testing of a low cost green house.

### **Studies on modification of existing petti & para'**

The work on hydraulic performance of Petti and Para was continued at the specially designed and constructed test bed at KAU Headquarters, Vellanikkara. During the period under report, extensive further studies for optimising the speed of operation were carried out. Evaluation was also done for the efficiency for the various designs of the impeller.

### ***Evaluation of APAU rice transplanter***

An improved version of power tiller operated APAU Paddy transplanter was fabricated with modified structural design and constructional pattern. The unit transplants 3 to 4 seedlings at 4 to 5 cm depth with 55 hills per Sq. m. with 12% missing hills. The actual field capacity is 0.08 ha/hr. Saving of an amount of Rs. 560 per ha. as well as saving of 230 man-hour per ha. were achieved in transplanting of paddy.

### ***Evaluation of vertical conveyor reapers***

#### **i) Self propelled 5 HP paddy reaper winnowers**

Structural modifications were made for efficient operation and to have easy balancing. Demonstration was conducted at

Trichur, Malappuram and Palghat districts. The machines having actual field capacity of 0.15 ha/hr. could save Rs. 735 per ha. and 125 man-hr. ha.

#### **Power Tiller operated Paddy reaper winnower**

Work is in progress to make the unit completely balanced for easy operation. With 0.25 ha/hr. actual field capacity the reaper could save Rs. 855/ha. and 127 man-hr./ha.

#### **Tractor operated Paddy reaper winnower**

The 2.2 m wider paddy reaper with MF-245 tractor was made technically suitable in actual field conditions with a field capacity of 0.38 ha/hr. saving of Rs. 900/ha. and 130 man-hr./ha. were achieved by tractor operated reaper.

#### **Evaluation of Rasp-bar Paddy threshers cum winnower.**

The chocking of moist paddy straw was avoided by providing an improved concave. Efficient paddy threshing, winnowing and cleaning operations are achieved with the thresher which needs 4 hours to thresh 1 ha. paddy crop. An amount of Rs. 900/ha. as well as 150 man-hr./ha. can be saved.

#### **CSS—Central Sector Scheme of Strengthening of State Agricultural Universities through training**

Ministry of Agriculture (Department of Agriculture and Co-operation) Krishi Bhavan have accorded sanction for the implementation of Strengthening of State Agricultural Universities with an initial outlay of Rs. 50 lakhs during the last of VIII<sup>th</sup> Plan period.

The scheme has the main objectives for the VIII plan.

Training of farmers in the selection, operation, repair and maintenance of farm machinery.

To organise off-campus courses for farmers.

To organise short duration courses for extension workers, private personnel, entrepreneurs etc.

Develop literature in regional languages on selection, repair, maintenance and dos and don'ts on farm machinery.

#### **Seminar/Symposia/Workshop/training attended**

- 1 Dr. M. Sivaswamy, Asst. Professor, Dept. of Farm Power Machinery and Energy attended the 2157 annual

workshop on AICRP on Farm implements (ICAR) held at MPKV Rahore, Maharashtra during January 10-18, 1995.

- 2 Dr. N. Sivaswamy, Asst. Professor presented a talk at the Seminar organised by KITCO, Ernakulam at Thrissur.

#### 5. KAU SCHOOL, VELLANIKKARA.

Kerala Agricultural University School was started in 1981 with a view to providing school education to the wards of University employees in the Mannuthy and Vellanikkara campuses. University former Vice-Chancellor late Dr. N. Kaleeswaran, IAS had taken special interest in establishing this institution. It became a complete High School during the Academic year 1990-91. At present classes from I to X are functioning in this school. Preprimary and Creche are also functioning along with this. Now it has become an attractive institution.

#### Staff

Eighteen staff under teaching section and five staff under non-teaching section had worked in this school during this 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	—
Highschool Assistant	7	—	7
Special Teachers			
Phy. Education	1	—	1
Drawing	1	—	1
Music	1	—	1
Nursery School Assistants	4	3	1
Ayah	4	2	2
Asst. Grade I	1	1	—
Class IV	3	2	1

### Strength of pupils during 1994-95

Standard	Strength
L K G	40
U K G	46
I	56
II	75
III	75
IV	61
V	97
VI	99
VII	77
VIII	60
IX	57
X	56
Total	799

#### *Extra Curricular Activities*

A Science club and a Maths club are functioning in the KAU School. During this period the school lifted the first prize in "Trichur District Science Fair". A unit of scouts and guides are also functioning well.

#### *Parent Teachers Association*

The Parent Teachers Association of the school is functioning actively. Sri. K. S. Natarajan, Section Officer, Directorate of Physical Plant Office, Vellanikkara is the President of the Association.

## 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 spear head 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. V. K. Sasidhar, Professor (Agronomy) Farm Advisory Service continued to hold full additional charge of the Director of Extension upto 27.6.94 A.N. 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

Communication Centre, during the period under report. 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 500 farmers in person. Replies were also sent to 180 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 the Farm Advisory Service served as resource personnel in the farmers' seminars organised at the following places, in collaboration with the Dept. of Agriculture, and input agencies.

Date	Place	No. of participants
1	2	3
5.4.94	Chittilanchery High School	165
6.4.94	Elavanchery	250
8.4.94	Puthunagaram Koduvayoor	200
8.4.94	-do-	150
9.4.94	Malayatoor	200
9.4.94	Desasevini Grandhasala	
	Neerkunnam Alappuzha	55
16.4.94	Kolazhi	150
2.5.94	Pattalakunnu	100
4.5.94	Chittilanchery High School	136
6.5.94	Elappully Shornur (FN)	36
6.5.94	Pulppally (A. N.)	50
12.5.94	Vilengannur Badhani	50
30.5.94	Manalur	45
9.6.94	Departmental Office, Agrl. Dept.	
	Palakkad	50
9.6.94	District level IPM Workshop, Malampuzha	50
25.6.94	Thumbacode School: Group farming	
	Padasekaram	95
16.7.94	YMCA Hall Kodukulanhi	55

1	2	3
17.8.94	Kozhukully	100
9.9.94	Ambalappad U. P. School, Kundukadu	75
14.9.94	Velloorkkara Krishi Bhavan	150
24.9.94	Govt. School, Mullurkkara, Vadakkanchery	105
26.9.94	Trichur Town Hall State level Seminar - Coconut Development year 1994	1500
30.9.94	IPM Cluster demonstration and Training programme, Thrissur (Dt)	75
1.10.94	Anandapuram Krishi Bhavan Govt. UP. School	150
4.10.94	RATTC, Malampuzha	100
5.10.94	Block Office Palakkad, Cherpu	200
18.10.94	Kallemtumkara, Irinjalakuda	100
21.10.94	Konchira church, Venkitengu	150
19.11.94	Govt. High School, Kandasamkadavu	73
31.12.94	EMLP School, Kattakampal (Kunnamkulam) Monadi, Kodakara	100
7.12.94	Joseph Mundassery Hall, Thrissur	100
7.1.95	Monadi, Kodakara	100
18.1.95	Payyanam (near Kannara) SNDP Hall	125
23.1.95	Champakulam Farmers Field School IPM Programme	30
24.1.95	Ramankary Farmers Field School of IPM Programme	30
21.2.95	Pandiparambu	125
23.2.95	Vellangallore Sree Narayana Hall	250
25.2.95	Zenana Mission LP School, Kolazhy	180
4.3.95	Zenana Mission LP School, Kolazhy	40
14.3.95	Ollukkara Kalyana Mandapam Hall	338
24.3.95	Chelakkara, Canara Bank	110
27.3.95	Pananchery Panchayat Building	185
29.3.95	Cherpu Kalyana Mandapam	120
Total beneficiaries		6499

#### 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.



A total of 52 news items both technical and functional related to KAU were sent to AIR for broadcast on every Friday at 6.40 a.m. under the banner 'Agricultural University News' having a duration of five minutes each.

Under the visual media, the following video cassettes were produced.

Underground pipeline water distribution system for undulating terrains

Five other scripts were under various stages of preparation

1. Mushroom cultivation
2. Reproduction in cattle
3. Mycotoxicosis in animals
4. Diseases of duck
5. Diseases of rabbits

Eleven Radio talks were broadcast through AIR.

Fifteen articles were published through leading Malayalam Dailies of the State.

As a part of the celebration of the 'Karshakadinam', one day agricultural seminar was organised at KESS Centre, Nadathara on 17.8.94 at Kozhukully under the Farm Advisory Service Unit of the Centre.

'Onam fair' was organised by Communication Centre at Information cum Sales Centre, Mannuthy for the sale of banana, coconut and fruit products, X'mas bazar was also opened at Information and Sales Centre, Mannuthy in December for the sale of various products.

#### **Exhibition and Graphics services**

Major and Mini exhibitions conducted

1. Thrissur Pooram Exhibition and KAU bagged the special prize for the best pavilion
2. Agri-Horti Society Exhibition at Thrissur
3. Trade Fair in Thirunakkara, Kottayam
4. State level Exhibition at Thiruvananthapuram in which KAU bagged the first prize for the best pavilion. Apart from the above, KAU sent exhibits to the Kerala pavilion for the Agri Expo '94 organised at New Delhi.

Graphics unit also prepared the blow-ups, photographs and transparencies for the various exhibitions.

#### **Publication Unit**

This unit had brought out the following periodicals and non periodicals.

(a) *Periodicals published*

1. Kalpadhenu (Malayalam quarterly)
  - Vol XXI (1) July-September, 93
  - Vol XXI (2) October-December, 93
  - Vol XXI (3) January-March, 94
  - Vol XXI (4) April-June, 94

2. *Non-periodicals published*

(i) *Books and Booklets*

1. Status Report on the Nematological Investigation on Banana
2. A glimpse to problem soils of Kerala
3. Sustainable rice production through integrated nutrient management
4. Analytical manual of fish and fishery products
5. പാലുല്പാദനം.
6. കറവമടയ്ക്കു വളർത്തൽ.
7. Coconut breeding and management
9. Rice in wet land eco system

(ii) *Leaflets*

1. കടലുല്പാദനം (English and Malayalam)

**Reprints**

1. മരച്ചീനി വിഭവങ്ങൾ
2. കടലുല്പാദനം
3. Mushroom
4. സൂക്ഷ്മജീവി വളങ്ങൾ
5. മഞ്ഞരം
6. Manual of Teaching techniques for field extension workers
7. ഇറച്ചിക്കടലു
8. കാലിത്തീറ്റ

**Staff position**

Category	Sanctioned	In position	Vacant
<b>Communication Centre</b>			
<b>Scientific Staff</b>			
Asst. Professor (Extn)	2	1	1
<b>Unit Total</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>Publication Unit</b>			
Assoc. Professor	1	—	1
Asst. Professor (Extn)	1	—	1
Asst. Professor (Ani. Sci.)	1	—	1
<b>Unit Total</b>	<b>3</b>	<b>—</b>	<b>3</b>

1	2	3	4
<b>Information Unit</b>			
Assoc. Professor (Extn.)	1	1	—
Asst. Professor (Ani. Sci.)	1	1	—
Asst. Professor (Extn.)	2	2	—
Unit Total	4	4	—
<b>Exhibition and Graphic Service</b>			
Asst. Professor	3	1	2
Unit Total	3	1	2
<b>Farm Advisory Service</b>			
Professor (Agronomy)	1	1	—
Professor (Plant Protection)	1	1	—
Assoc. Professor (Agronomy)	1	1	—
Assoc. Professor (Pl. Prot.)	1	1	—
Assoc. Professor (Ani. Hus.)	1	1	—
Assoc. Professor (Entomology)	1	1	—
Assoc. Professor (Poul. Sci.)	1	—	1
Assoc. Professor (Hort.)	1	—	1
Asst. Professor (Agri.)	1	1	—
Asst. Professor	1	1	—
(Soil Sci. & Agri. Chemistry)			
Asst. Professor		1	—
(Plant Pathology)			
Unit Total	11	9	2
Grand Total	23	16	8

#### **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.

Officer in charge: Dr. P. A. Joseph, Assistant Professor (Agron.) continued as the Officer in charge.

### *Involvement of staff in academic programme*

Dr. P. A. Joseph, Officer-in-charge was associated with the academic programme of the College of Horticulture, Vellanikkara during the period under report.

The total receipts in the Information and Sales Centre, Mannuthy during the period was as follows :

(a) Receipts from sale	: Rs. 43.30 lakhs
(b) Receipts by way of rent collection from I. C. H. operating at the Sales Centre	: Rs. 0.27 lakhs
Total receipts from a + b	: Rs. 43.58 lakhs
Total expenditure for contingencies	: Rs. 3,38,907.07
Payment to supplying centres during 1994-95	: Rs. 41,72,851.00
Payment to Comptroller (excess corpus of revolving fund)	: Rs. 2.00 lakhs

### *Other activities at the Information and Sales Centre*

a) Farm Advisory Service arranged during 94-95	530
b) Video cassette projection arranged during 94-95	70
c) Correspondence to enquiries from farmers	124
d) Subscription arranged for Kalpadhenu :	163
e) Onam bazar 94-95 and X'mas bazar 94-95 were conducted at the Sales Centre	

### *Important visitors at the Centre*

12.5.94	: Sri. K. C. Joseph, Member, Executive Committee, KAU
17.8.94	: Dr. M. R. Reddy, Professor, UAS, Bangalore
11.10.94	: Dr. Gurcharan Singh, Professor, IARI
15.10.94	: Sri. George Mascree, MLA
22.10.94	: Dr. K. V. Peter, Director, NRCS, Calicut
28.10.94	: Dr. Ashwani Kumar, Deputy Director, ICAR
28.10.94	: Dr. Ajay K. Gupta, Sr. Project Officer, NCPA
19.12.94	: Sri. P. P. George, Hon. Minister for Agriculture
19.12.94	: Sri. Therambil Ramakrishnan, MLA
14.2.95	: Neela Gangadharan, IAS, Secretary of Agriculture
24.2.95	: Dr. Razaul Karim, Associate Director of Extension, Bangladesh Agricultural University

### KAU Press

The KAU Press was established to cater to the printing needs of the University during the period from 1.4.94 to 31.3.95. 122 works were received out of which 150 works were completed. This includes periodicals, publications, Kalpadhenu, Kerala Journal of Veterinary Science and other non-periodical, Technical bulletins, leaflets, pamphlets, folders were printed and published during this period. Besides printing of Research Report, Annual Administration Report (Mal. & Eng.) and Krishi Vignana Manjari Series—reprints, of Publication/Journal etc. were undertaken 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 throughout 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	—
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	—
Class IV	3	3	—
Peon	1	1	—
Sweeper-cum-attendant	1	1 (on working arrangement of RARS Ambalavayal)	—
Watchman	1	—	1
Section Officer	1	1	—
Assistants	3	3	—
Typist	1	1	—
Plan Scheme			
L. G. Printer	2	—	2
Jr. Foreman	1	—	1

### Central Training Institute

The Central Training Institute started in October 1986 as a Special Sub project II under NAEP-1 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	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

Abstract of Training Programmes conducted during 1994-95

Sl. No.	Particulars	No. of training programmes	Mandays
1	2	3	4
<b>A. Inservice Training Programmes</b>			
I	Department of Agriculture	18	604
II	Department of Animal Husbandry	17	5873
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
VIII	State Bank of Travancore	1	40
IX	Canara Bank	1	52
X	STEC, Government of Kerala	1	68
XI	National Training Courses	3	385

1	2	3	4
<b>B. Vocational Training Programmes</b>			
I Kerala State Women Development Corporation		4	355
II Kerala State Development Corporation for SC & ST		3	123
III ANERT Government of Kerala		1	—
IV SCA:TO-SCP		1	—
V National Waste Land Development Board		1	—
VI National Horticultural Development Board		1	868
VII Unemployed Youth, Housewives, Farmers		14	2086
Total		76	11132

#### **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. P. Jacob John was the Head of Station during the period under report.

**Staff**

Designation	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
<b>Professor</b>			
Agronomy/Extension	1	1	—
<b>Assoc. Professor</b>			
Agronomy	1	—	1
Animal Science	1	—	1
Home Science	1	1	—
Horticulture	1	—	1
<b>Asst. Professor</b>			
Extension	1	—	1
Engineering	1	—	1
Home Science	1	—	1
Animal Science	1	—	1
Horticulture	1	—	1
Plant Protection	1	1	—
<i>Administrative/supporting staff</i>			
Section Officer	1	1	—
Assistant Grade II	1	—	1
Typist (Gr. II)	1	—	1
Driver Gr. II	1	1	—
Farm Assistant	5	5	—
Class IV	7	7	—
<b>Total</b>	<b>27</b>	<b>17</b>	<b>10</b>

**Training achievements**

During the period under report 22 training programmes in Crop production/Horticulture, one in plant protection, two in Agricultural Engineering and 15 in Animal Science were conducted for the farmers. The total beneficiaries were 999 out of which 321 persons belonged to SC/ST.

A total of 18 training programmes were conducted for rural youth in various aspects of Crop production, Horticulture, Home Science, Extension and Animal Science benefitting 569 of which 116 belonged to SC/ST.

Three training courses were also conducted for the Extension functionaries in Plant protection and Extension wherein 54 persons were benefitted.

During the report period 26 field days, 33 seminars, 2 farmers' fair, 7 farm science clubs, 46 film shows, 4 exhibitions and 3 vaccination camps were organised by the centre.

**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

Category	Sanctioned	In position	Vacant
Training Organizer	1	1	—
Training Associate	—	—	—
Agri. Extension	1	1	—
Agronomy	1	1	—
Horticulture	1	—	1
Veterinary Science	1	1	—
Home Science	1	1	—
Agro-forestry	1	—	1
Plant Protection	1	—	1
Soil Science	1	1	—
Technical Assistants	—	—	—
Agronomy	1	1	—
Animal Husbandry	1	—	1
Home Science	1	—	1
Fisheries Sericulture	—	—	—
Rural crafts	1	—	1
Art-cure-AV Aids	1	1	—

Note: Against the vacant posts of technical assistants viz; Animal husbandry, Home Science and fisheries three Farm Assistants (Agri) are posted, and are in position.

Section Officer	1	1	—
Typist Grade II	1	1	—
Assistant Grade II	1	1	—
Class IV Employees	—	—	—
Peon cum Messenger	1	1	—
Watchman	1	1	—
Attendant Sweeper	1	1	—
Field/Extension attendant	3	—	3
Driver Grade II	1	1	—
Tractor Driver	1	—	1

A total of 9 training courses were conducted for the farmers in Crop production, Extension and Fisheries in which 223 persons were benefitted.

For unemployed rural youth 21 training programmes were conducted in different topics under Extension, Fisheries, Home Science and general Agriculture wherein 537 persons were trained.

A total of 11 field days, 5 conventions, 4 farmers fair, 9 farm science clubs and 6 exhibitions were organised during the period under report.

#### *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.

A one day Agricultural Seminar was conducted in connection with the inauguration which was attended by nearly 500 farmers. An agricultural exhibition was also organised in the campus. A cattle show arranged in the premises of the Kendra was an added attraction. Eighty six animals were brought by farmers for the show. Prizes were distributed for the winners (farmers) of the cattle show contest by the Minister for Agriculture, Kerala. Seeds, seedlings, grafts and publications were sold.

The foundation stone for the construction of an Information-cum-Sales Counter attached to the FSRS, Kottarakkara was laid by the Hon'ble Minister for Agriculture, Kerala—Sri. P. P. George on 29.10.1994.

Dr. K. Vasanthakumar, Assoc. Professor (Hort) has been appointed as the Training Organiser of the KVK. Staff required for the functioning of the KVK were posted by transfer/ deployment from the Research Station.

## Training achievements

A total of 19 training programmes were organised for farmers in different topics under Crop Production, Horticulture, Plant protection and Nutrient management. Besides, two sterility camps and one infertility camp were also conducted during the report period.

### *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 Kasargod district.

The Krishi Vigyan Kendra, Manjeshwar 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	No. of posts		
	Sanctioned	In position	Vacant
	2	3	4
<b>Scientists</b>			
Professor	1	1	
Asst. Professor	2	2	
<b>Technical:</b>			
Farm Asst. (Agri)	1	1	
Field Associate	1	1	

1	2	3	4
<b>Administrative:</b>			
Sr. Gr. Assistant	1	1	—
Typist Gr. II	1	—	1
<b>Supporting</b>			
Peon Attender	1	—	1
Watchman	1	—	1
Daily paid Helper	1	1	—

#### **Training achievements**

A total number of 260 farmers in 10 batches were given one day training in different topics such as improved practices in coconut production, fresh water fish culture, soil and water conservation measures and on electric motors and pump sets.

Twenty seven field visits were also made during the period under report.

#### **Other extension activities of different research stations/ Colleges/Departments**

##### **COLLEGE OF AGRICULTURE, VELLAYANI**

##### **A. NSS Programme**

Dr. M. M. Hussain, Assoc. Professor (Agrl. Extension) and Dr. D. Wilson, Asst. Professor (Plant Breeding) continued as NSS programme officers. During the year 280 NSS volunteers were enrolled and they were allotted two units in this institution.

The following activities were undertaken by the NSS volunteers.

##### **Literacy among farm labourers**

Saksharatha Samithi of Kalliyoor Panchayat and the NSS volunteers of the college took classes to the farm labourers twice in a week during their afternoon interval. Fifteen labourers attended the classes regularly and were provided with necessary learning materials.

##### **Community centres**

Two community centres at Kakkamoola and Palappur functioned during the period and the members were kept informed of the latest developments in agriculture and their practical importance in their fields.

##### **Blood donation**

The volunteers of the two units of NSS donated blood to the needy people throughout the year. In connection with

'International Blood donors day' - on 1.10.94 a 'Blood transfusion march 94' was organised by SCT, Trivandrum and the Agricultural college NSS contingent won the trophy for the best unit.

#### **World Environment day**

A seminar on environmental protection was arranged on 4.6.94. The day was celebrated also with a poster competition highlighting the importance of pollution free environments.

#### **Medical camp**

A 'one day' medical camp was organised on 28.10.94. About 250 members of the adopted village was examined by 12 specialist doctors of the camp.

#### **Birth anniversary of Mahatma Gandhi**

In connection with the 125th birth anniversary of Mahatma Gandhi a debate on 'Expensive marriage—a social need' was conducted.

The NSS volunteers participated in the following other activities also.

On 24.9.94 NSS volunteers and programme officers participated in the NSS, silver jubilee celebration award ceremony at University senate Hall, Trivandrum.

A Special NSS camp for 5 days (5th to 9th November '94) was organised at Veli Youth Hostel, Trivandrum and 80 volunteers actively participated in the camp.

12 volunteers and one programme officer participated in the University level National integration camp at Parambikulam from 1st to 5th November 94.

NSS volunteers participated in 'Sad Bhavana' mass run organised by the Regional NSS Unit, Trivandrum on 20.8.94.

Stray dogs of the campus were eliminated by two 'dog kill' programmes during the period under report.

#### **Extension activities**

##### **T & V activities**

Scientists from different departments of the College served as resource personnels in the monthly T & V workshops and also served in the diagnostic teams and made field visits to different part of southern Kerala to investigate and suggest suitable remedies to the field level problems.

##### **Village Adoption Programme**

Village adoption programme was implemented in Venganoor and Nellivila.

Group discussions were conducted in the adopted village, about the importance of organic farming. Eleven farmers in the adopted village volunteered to prepare vermicompost and they were given technical guidance and earth worm (*Eudrillus engeneac*). The compost was used for vegetable cultivation in the adopted village.

The beneficiaries of the village adoption programme were provided with various fruit plant seedlings (jack, mango, guava and cherry) under 'tree planting programme'.

Three trainings were conducted for the beneficiaries of the adopted village on milking, calf and poultry management and general hygiene.

#### Training programme

The training service scheme attached to the Department of Agricultural Extension conducted eight trainings during the period under report. The details are given below:

Sl. No.	Name of the training	Category of training	No. of batches	Duration
1.	Vermiculture	Deputy and Asst. Directors of Dept. of Agriculture	1	3 days 26.9.94 to 28.9.94
2.	Biotechnology	Deputy and Asst. Directors of Dept. of Agriculture	1	3 days 27.9.94 to 30.9.94
3.	Tissue culture	Graduate farmers and Nurserymen	2	2 months (Oct. to Nov. 94)
4.	Advances in Agriculture	Agricultural Extn. Officers of Bank	1	2 weeks (7.10.94 to 22.10.94)
5.	Sericulture	Asst. Directors of Dept. of Agriculture	1	4 days (18.10.94 to 21.10.94)
6.	Extension methods	Asst. Directors/ Co-operative inspectors of IERAFED	1	One week (24.10.94 to 29.10.94)
7.	Basic training in Agriculture	Supervisors of primary Co-operative Banks	1	Two weeks (28.11.94 to 9.12.94)
8.	Basic training in fertilizers and pesticides	Secretaries and Sale personnel of PACS and FSCBS	1	4 days (19.12.94 to 23.12.94)

### **Exhibition**

The College departments and Instructional Farm participated in the 'State Agricultural Fair' at Kanakakunnu, Thiruvananthapuram from 14th to 17th December, 1994.

### **Farm Advisory Service**

Pests and disease affected plant samples brought by farmers and field staff from the Department of Agriculture were examined and proper control measures suggested. Farmers were also given necessary advice on crop management aspects to increase production as and when they visited the departments of Agronomy, Soil Science, Horticulture, Entomology and Plant Pathology. Necessary advice to the livestock farmers was also rendered by the scientists of Animal Husbandry department. A large number of farmers, school children and students from Higher Secondary Schools also visited the campus.

### **Publications**

Scientific and popular articles published by the members of the faculty are furnished in Appendix V.

### **COLLEGE OF HORTICULTURE, VELLANIKKARA**

#### **TOT and Rural Development**

The informal inter-personal communication network that is existing among the members of the group farming committee was found to contribute significantly towards diffusion of location specific and problem oriented improved agricultural technology.

The feasibility of using certain techniques for the improvement of precision in the estimation of treatment effects was examined empirically and it was found that the use of appropriate functional forms of the covariance adjustment model with pre-experimental yield as the concomitant variable resulted in a significant reduction of error. The nearest neighbour-hood analysis (NNA) and moving block method were also found to be better than the conventional method of stratification.

#### **Extension Activities, TOT Services and services rendered to farmers**

##### *Large scale production of seeds, planting materials of crops, processed products*

During the report period, 17221 no. of packets (250g) of the oyster mushroom spawn valued at Rs. 1.72 lakhs were produced by the mushroom production unit and distributed through the Information & Sales Centre, Mannuthy.

A total of 12,033 Nos. of various kinds of fruit plants - mango, sapota, jack, garcinia, tamarind grafts, guava, lemon, pomegranate, West Indian cherry, papaya etc. were produced in the Dept. of Pomology and Floriculture.

The Cocoa Research Project produced and distributed 21,500 budded cocoa plants of superior clones for planting in Kerala, Tamil Nadu, Karnataka States.

The Instructional Farm produced 35,000 Nos. of coconut seedlings, 23,000 Nos. of arecanut seedlings, 5,701 Nos. of various kinds of fruit plants and 272.0 kg of vegetable seeds.

The Dept. of Plantation Crops & Spices produced 33,000 Nos. of tree spice seedlings, 6,000 Nos. of cashew grafts and Tissue Culture plants of black pepper and katcholam (3000 Nos.)

The Department of Processing Technology produced several kinds of fruit products valued at Rs.1.61 lakhs during the year.

The items were sold mainly through the Information & Sales Centres of the Kerala Agricultural University.

Vegetable seeds totalling 1156 kg was produced in the Department of Olericulture during the period.

#### **Consultancy services:**

The Departments of Entomology, Plant Pathology, Soil Science and Agricultural Chemistry, Pomology and Floriculture, Plantation Crops and Spices, Olericulture and Processing Technology continued to provide advisory and consultancy services to needy farmers.

#### **Broadcasts through the AIR:**

The members of the faculty in the AICRP Centre on Medicinal and Aromatic Plants and certain scientists in the disciplines of Entomology and Plant Pathology actively participated in the farm school on AIR on 'Sasyajam Mrutyumjayam' sponsored by the Thrissur Station.

Besides lessons of the above farm school the faculty staff gave 38 talks/interviews, on various subjects through the AIR Station, Thrissur.

#### **Farmers' seminars**

The members of the faculty attended over 30 farmers' seminars organised by the Department of Agriculture and delivered talks on various selected topics for the benefit of the cultivators.



### **Participation in Exhibitions:**

The College Departments actively participated in the State Agri Fair held at Trivandrum during 14-18 December 1994.

### **Workshop on traditional knowledge systems:**

The Department of Agricultural Extension in collaboration with the National Watershed Development Programme for the rainfed areas (NWDPPRA) conducted a one day workshop on traditional knowledge systems (പുഴുറുവു, സ.വുവു) on 21.12.1994 in the College. The Hon. Vice-Chancellor inaugurated this workshop which was attended by sixty farmers and thirty extension functionaries of the Dept. of Agriculture. Indigenous cultivation practices of rice, coconut, banana and vegetable crops were identified and the scientific rationale behind the practices codified for field testing through adaptive trials.

### **NSS:**

Smt. Norma Xavier and Dr. Ranjan S. Karippai continued as the NSS Programme Officers during the period. The NSS volunteers participated in the University level NSS camp held at Anappara (Parambikkulam) during 2-7 May, 1994.

Blood donation services were continued and 47 volunteers donated blood during the report period. Classes were taken for the benefit of 300 women beneficiaries on post-harvest technology of various fruits and vegetables, kitchen gardening, mushroom cultivation.

Ten peer leaders (NSS) were trained on AIDS/HIV for the UTA programme.

The NSS units celebrated the AIDS fortnight during 1-14 December, 1994 by conducting group discussions using AV aids.

### **COLLEGE OF CO-OPERATION AND BANKING, MANNUTHY**

#### **Extension Activities and services rendered to farmers:**

Scientists of the College were identified as resource persons for the training programmes conducted by C. T. I. Mannuthy, Extension Training Centre, Kerala Institute of local Administration, Small Industries Service Institute, District Co-operative Banks etc. Dr. M. Mohandas, Associate Dean i/c had served as a member of the technical advisory committee of Trichur District Paddy Processing and Marketing Society and also served as the convenor of the District level Co-ordination Committee for Implementation of Intensive Development Programme at Mattathur Panchayat. Dr. N. Rajan Nair, Professor,

Dept. of Rural Marketing Management and Dr. A. Sukumaran, Asst. Professor of the same department served as Guest Faculty for the part time M.B.A. programme conducted by University of Calicut.

### **Outreach Programmes**

#### **N.S.S. Activities**

- |      |          |   |
|------|----------|---|
| 1994 | Aug. 15  | — Observation of Independence Day                               |
| „    | Aug. 17  | — Chingam Ist was celebrated as 'Karshaka Dinam'                |
| „    | Aug. 19  | — Campus Cleaning Programme                                     |
| „    | Aug. 20  | — Observation of Sadbhavana Day                                 |
| „    | Sept. 6  | — National Integration Day was celebrated                       |
| „    | Sept. 10 | — Conducted Anti-Drug campaign                                  |
| „    | Dec. 7   | — Made a kitchen garden at Juvenile Home, Ramavarmapuram        |
| „    | Dec. 30  | — The Annual NSS 10 days special Camp was inaugurated at Monody |

10 days NSS Special Camp at Monody from 31.12.95 to 8.1.95.

### **COLLEGE OF FORESTRY, VELLANIKKARA**

#### **Outreach programmes**

##### **N.S.S. Activities**

A socio-economic survey was conducted by the N.S.S volunteers in the Malayan colony of Peechi forest range during December 1994. The N.S.S. volunteers also donated blood for the patients.

##### **Village Adoption programme**

This programme was conducted in Malayan colony of Puthoor panchayat on 10.3.95. Tree seedlings of various species and also vegetable seeds were supplied to villages. Various forestry operations were demonstrated to farmers and villagers.

##### **Other Extension activities**

The seedlings of teak, mangium, mahagoni, ptherocarpus, rosewood etc., were supplied to farmers from the college nursery. The planting materials were also 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 and maintenance, tree planting and pests and diseases. Dr. B. Mohankumar and Dr. K. Gopikumar, Assoc. Professors prepared training module on seed technology (both in English and Malayalam) for KHDP training programmes. Mr. Nameer has delivered a guest lecture at M. E. S. College, Ponnani on conservation of bio-diversity.

## Training classes handled

### RARS, VELLAYANI

Dr. R. Gopimony, Professor (Pl. Br.) took classes on 'Sustainable farming' at Krishi Vigyan Kendra, Kottarakkara on 21.1.95 and TBGRI, Palode on 10.2.95.

### FSRS, KOTTARAKKARA

The Scientists of the P.S.R.S. viz. Dr. K. Vasanthakumar, Assoc. Professor and Head, Dr. S. Chandini, Assoc. Professor, Dr. S. Ravi, Asst. Professor, Dr. S. Rajeena, Asst. Professor and Ms. Darly Jose, Asst. Professor handled classes for trainees of on-campus and off-campus training courses, during the period under report.

### Seminars/Symposium/workshop/Training Programmes/ summer Institutes, Extension lecture etc organised

Programme	Date	Venue	Organised by	Partici- pants
1	2	3	4	5
Karshaka Seminar organised in conne- ction with the inauguration of KVK	29.10.94	FSRS, Sadananda- puram	KVK	500
Training on current trends in animal production for home- steads of Kerala	16.10.94 to 18.11.94	..	KAU	20
Training on mushroom cultivation	12.12.94 to 14.12.94	..	Women's Develop- ment Cor- poration	
Training on Nursery techniques in Plant- ation Crops, Spices and fruit plants	19.12.94 to 21.12.94	..	KAU	20
Training on Nursery Management, vegeta- ble cultivation, seed production, mushroom cultivation, plant protection etc.	22.12.94 to 31.1.95 I batch 1.2.95 to 25.3.95 II batch	..	DDA	20 20

1	2	3	4	5
Guest Lecture on Permaculture by Dr. Venkat of the Permaculture Centre, Hyderabad	23.12.94	FSRS	KAU	11
Training for Mithra Kisan (1 batch)	16.1.95 to 21.1.95	FSRS	NWDPRA	30
Training for Mithra Kisans (2nd batch)	23.1.95 to 29.1.95	FSRS	NWDPRA	30
Training on mushroom cultivation and spawn production	7.2.95 to 8.2.95	FSRS	Saksharatha Samithy	8
Training on Nursery techniques, vegetable growing, mushroom cultivation	27.3.95 to 29.3.95	FSRS	Kerala Iykya Mahila Samajam	16

**CROPPING SYSTEMS RESEARCH CENTRE, KARAMANA**  
**Extension activities**

Extension : Mushroom spawn (Oyster mushroom) were prepared and sold to the farmers.

**Village Adoption programme**

Edakkode village is selected under the village adoption programme of CSRC, Karamana. Under the village adoption programme, the scientists of the CSRC, Karamana offered technical advice to the local farmers in solving field constraints. Ten farmers identified in the adopted village, and vegetable seeds and fertilizers were distributed to them.

**Farm Advisory Service**

Farm advisory service was rendered to the farmers of this locality on various field problems including bunchy top disease of banana, foot rot and stem bleeding in coconut, coreid bug, rhinoceros beetle and red palm weevil attacks in coconut, fruit rot diseases jack, mango etc., and cultivation methods of mushrooms. 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 6.2.95 to 18.2.95 and 7.3.95 to 18.3.95.

**REGIONAL AGRICULTURAL RESEARCH STATION,  
KUMARAKOM**

**1. T & V Programme**

Ten monthly T & V workshops were conducted at this station during the period under report. Four scientists acted

as resource personnel in Kottayam and one in Pathanamthitta district. Four diagnostic team visits were arranged for identifying field problems and advocated appropriate recommendations.

## **2. Training programme conducted**

Four short term training programmes were conducted on mushroom production for unemployed youth in August '94, October '94, January '95 and March '95.

Two field trainings for B. Sc. (Ag.) students of College of Agriculture, Vellayani were organised during November '94 and February '95 respectively:

One short term training on fish breeding, hatchery management and fish farming was conducted for M. Sc. (Aquaculture) students of Rajeev Gandhi Institute of Science, Technology and Development, Trivandrum from 5-9th September '94.

## **3. Exhibitions/ Agricultural seminars**

Under the auspices of Instructional farm, Vellayani, R.A.R.S. Kumarakom and Kottayam municipality an agricultural marketing mela was organised at Thirunakkara Maidan, Kottayam from 4th to 8th July 1994.

One agricultural seminar was conducted at Kodukulanhi at Chengannur on 16th July 94.

One agricultural seminar was organised jointly by Kerala Agricultural University, F.A.C.T. and Catholicate Diocese at Kumarakom on 19th November '94.

The scientists of the station participated in two agricultural exhibitions. Haritholsavam organised by Syndicate Bank at Kuravilangad during January '95 and the flowershow organised by Agri.-Hort. Society in Chengannur during February '95.

Classes were handled on Fish Farming in the agricultural seminar at Kayamkulam in connection with Bloomex '95 on 2nd January '95.

## **4. Participation of scientists in seminars/symposia/summer Institutes**

Prof. G. Mathai attended the National Symposium on Mushrooms held at NCMRT, Solan between 8-10 April 1994.

Dr. Anuradha Krishnan and Sri. K. A. Inasi, Assistant Professors attended the training on computer application held at N. A. A. R. M. Hyderabad from 19 th to 30 th July 1994.

Prof. G. Mathai was nominated as expert for giving Professional guidance to the state department of Agriculture, Tripura on mushroom production from 22nd October to 8th November '94.

Sri. P. Gangadharan, Associate Professor attended the 48th Annual Conference of the Indian Society of Agricultural Statistics held during 15-17 December '94 at the College of Veterinary and A S, Mannuthy.

Sri. G. Mathai, Professor was deputed for participating in the state level training on post harvest and packaging technology of mushroom at the Directorate of Horticulture, Hyderabad on 30-31, January '95.

Sri. K. A. Inasi, Assistant Professor and Smt. Alice Antony, Asst. Professor attended specialised training on production, protection and post harvest technology of horticultural crops at CIHNP, Lucknow from 28th January to 20th February '95.

Sri. K. C. Rajan, Associate Professor attended a training on farm water management from 20th February to 4th March at CWRDM, Kozhikode.

#### 5. Workshops conducted

The Zonal Research Advisory Council of Special Zone of Problem Areas was held during May '94 and March '95.

A one day workshop by name "Kuttanad Darsan" was organised under the auspices of Changanassery Social Service Society at RARS, Kumarakom on 28th March '95.

#### 6. Village Adoption Programmes

Five demonstrations were arranged under the Village Adoption Programme of 1994-95 in Kumarakom village on Integrated Farming (Duck-Fish culture).

#### RICE RESEARCH STATION, MONCOMPU

##### Village Adoption Programme

Scientist in charge : Prof. P. J. Ittyaverah till 31.12.1994

Dr. P. S. John, Associate Professor from 1.1.1995.

Name of the Village adopted : Mitrakari

##### Programmes implemented.

###### 1. Raising of nutrition garden

Fifty farm families were selected. Seeds of improved variety of vegetable seeds were supplied to them free of cost. Seeds of cowpea, bittergourd, snake gourd, cucumber, bhindi and amaranthus were included in the kit. Fertilizers and pesticides required for the gardens were also supplied. The gardens have been raised successfully.

**2. Conducting demonstrations using rice culture evolved at Rice Research Station, Moncompu**

Two demonstrations of 2000 m<sup>2</sup> area each were laid out. The Culture used was Cul. No. 126

Yield obtained : Plot No. 1 — 6120 kg./ha.  
 „ 2 — 6030 kg./ha.

**3. Advisory service**

The nutrition gardens and demonstration plots were regularly visited by the Scientists and required advice on their management were given.

**4. Field Day**

A field day and Agricultural seminar was organised in the adopted village on 29.3.1995. One hundred and twelve farmers participated in the seminar arranged in the "Mahila Seva Sangham Building, Mithrakari". Scientists of Kerala Agricultural University handled classes on vegetable production and mushroom rearing.

**Training programmes conducted at the Station**

**A. Programmes allotted from the Central Training Institute**

1. State-level training on Rice Production Technology.  
 (For Assistant Director and Agricultural Officers).

The training was conducted at this station from 7.12.1994 to 9.12.1994.

Thirteen Officers attended the training classes. Classes on Crop Improvement, Crop Management and Protection were handled by the Scientists of Kerala Agricultural University. Course Director—Dr. C. A. Joseph, Professor and Head.

2. Pest surveillance training

(For Assistant Directors and Agricultural Officers.)

During the year, this training was organised at this station from 10.12.1994 to 13.12.1994. Nine Officers attended. Scientists of Kerala Agricultural University handled classes on Pest Surveillance, Integrated Pest Management, Pest Management and Biological control.

(Course Director — D. Joseph, Professor (Entomology).)

**B. Other Training Programmes**

1. Trainees from RATTTC - Kozha and Vyttila

Programme	Date	No.	Designation
1	2	3	4
a) Training on Rice Production Technology	20.5.94	12 Nos.	Agricultural Officers
b) Training on Rice production Technology	18.6.94	10	

1	2	3	4
c) Rodent Management	6.7.94	15	Agri. Officers
d) Rodent Management	8.7.94	17	Agricultural Assistants
e) Rice Production Technology	20.7.94	10	Agricultural Officers
f) Pest Surveillance	23.7.94	9	"
g) Basic Principles and Practices of Integrated Management of weeds	6.9.94	12	Agricultural Assistants
h) Biological control of pests and diseases of crop plants	12.10.94	15	"
i) Integrated Nutrient Management	2.12.94	7	Agricultural Officers

**Seminars/workshop attended**

Name of the Scientists	Classes handled in Seminar	Classes handled in training programme	T & V Workshop	ZRAC meeting	National/International seminars attended
Dr. C. A. Joseph	—	—	12	3	—
Dr. L. Remadevi	4	—	—	2	—
Dr. P. V. Nair	2	4	8	1	—
Dr. K. V. Mammen	—	—	5	1	—
Prof. D. Joseph	4	6	2	1	—
Prof. P. J. Ittyaverah	5	2	4	1	—
Dr. N. Remabai	4	3	—	1	—
Dr. D. Ambika Devi	6	8	—	1	—
Dr. Suman Susan Varghese	2	2	—	1	—
Dr. P. S. John	4	3	—	1	—
Smt. Annie Koruth	2	2	10	1	—
Smt. R. Devika	1	3	—	1	—
Smt. Ahmed Regina	1	3	—	1	—
Smt. Reena Mathew	4	3	7	—	—
Smt. P. R. Krishnakumariam	—	—	—	1	2

Radio Talks—12

Quiz programmes—2

TV programmes participated by the staff—1

Popular articles—4



Farmers' Field School conducted under Integrated Pest Management :

1. Dr. D. Ambika Devi
2. Prof. D. Joseph

**Agro-clinic**

Fortytwo farmers contacted the Scientists in the Station and made use of the advisory service.

*Supply of natural enemies of salvinia :*

During the year, *Cyrtobagous salviniae*, the natural enemy of *salvinia* was supplied to ten farmers of the area.

**Extension activities**

*Imparting training*

- Short term training on mushroom cultivation and spawn production was imparted to 91 people (5 batches) during the year.
- Imparted training to the Agricultural Assistants on Production Technology of Pulses and Oil Seeds.

**RICE RESEARCH STATION, PATTAMBI**

*Extension activities and service rendered to the farmers :*

Dr. Jose Mathew regularly attended the monthly T & V workshops of Palakkad (till October 94) and Malappuram districts as resource person.

Dr. Jose Mathew as Course Director, organised an "Advanced training on rice production technology for the Agricultural Officers of Krishibhavan of Central and Northern region" during 25-28 October 94.

Dr. Jose Mathew, Dr. K. Anilakumar, Dr. Leenakumari, Dr. L. Natarajan, Prof. V.P. Sukumaradev, Dr. T.E. George, Miss. M. L. Jyothi handled classes for the Agricultural Officers of the Department of Agriculture and for farmers in the training programmes organised by various Krishi Bhavans in the District during the period under report.

*Resource person of T & V Workshop*

The following scientists had served as resource personnel for T & V workshop of Palakkad and Malappuram district

Prof. V. P. Sukumara Dev

Dr. L. Nadarajan

Dr. Jose Mathew

Dr. P. B. Gopinathan

Dr. S. Leenakumari

Dr. Anilakumar

Dr. T. E. George

*Exhibitions.*

Dr. T. E. George—Participated in the Agricultural Exhibition conducted at Gandhi Study Centre, Thodupuzha during the period from 25.1.95 to 29.1.95.

**AROMATIC AND MEDICINAL PLANTS, RESEARCH STATION,  
ODAKKALI**

**Extension activities**

The various extension activities undertaken by the station during the year 1994-95 are furnished below.

*Training*

The following training programmes were conducted  
A team of 30 farmers from Malappuram District visited the station on 16.5.94 and they were given one day training on the oil extraction technology of various aromatic crops.

One day training was conducted for the farmers and Agricultural Officers of Ernakulam District on Rice Production Technology at Perumbavoor on 28.5.94.

A training class was taken for the farmers and Agricultural Department staff of Maneed Panchayat on 17.8.94.

One day training on the oil extraction technology and essential oil analysis was imparted to 40 Assistant Directors and Deputy Directors of Department of Agriculture at the station on 8.9.94.

The Assistant Director of Agriculture, Thirumangalam, Madurai District, Tamil Nadu along with 32 farmers visited the station on 9.12.94. They were taken around the farm and the phytochemical laboratory and the multipronged activities of the station were explained to them.

The Deputy Director of Agriculture, Mahe with a team of 23 farmers visited the station on 8.12.94 and they were imparted training on oil extraction technology and essential oil analysis.

Conducted one day training on cultivation of medicinal plants in rubber plantations on 20.12.94 at Kottayam.

One day training on instrumentation technology and advances in analytical techniques was imparted to a team of 15 M.Sc. (Agri.) students of KAU on 11.1.95.

A team of 59 students of 2nd year B.Sc. (Agri.) was given one day training on essential oil extraction and analytical techniques on 6.2.95.

A training class was taken on Role of subsurface dykes in watershed management on 15.2.95 at Kaloor as a part of one week training course for mithrakisans and Officers of Department of Agriculture under the National Watershed Development Project for rainfed areas.

#### *Linkage and Co-ordination*

Dr. J. Thomas, Associate Professor and Head acted as the resource person for KAEP of Idukki district. Other scientists also occasionally participated in the KAEP meeting. Dr. Thomas also functioned as a member of the District Planning Council.

This station has become a National Centre for Aromatic and Medicinal Plants. Demand for technical know-how comes from every nook and corner of the country and abroad. United Nations Industrial Development Organization directs entrepreneurs to this centre for advice regarding their research and development needs on lemongrass. Regular correspondence is maintained with farmers extension personnel and industrialists on various aspects of cultivation and utilization of medicinal and aromatic crops.

#### *Seed/planting material distribution*

The station continues to be the main centre for the distribution of certified seeds of aromatic crops and planting materials of medicinal plants. During the year under report 58 kg of lemon grass seed, 5.5 kg of palmarosa seed, 900 kg of ginger and 339 kg of Kacholam seeds were distributed from this centre. More than 20,000 plants of various medicinal plants were also distributed from this centre, even though production of planting materials of medicinal plants was started only during the year. Large scale multiplication of planting materials will be taken up this year. This station has continued selling of essential oils of lemongrass, palmarosa, cinnamon and eucalyptus in sample bottles of 20 g each. During the period under report more than 500 sample bottles of lemongrass, 150 palmarosa, 170 cinnamon and 100 eucalyptus were sold out from the station. Arrangements have also been made for selling the station products from the University Sales centre at Mannuthy, Pattambi and Trivandrum.

#### *Laboratory and Library service to the Public*

Modern methods of quality analysis using advanced equipments like HPLC, GLC, FT-IR are followed in the Regional Analytical Laboratory attached to this station. Several project works leading to Ph. D and M. Sc degree of KAU and other

Universities have been undertaken at this centre. This laboratory facilities are available to the public at nominal charges. Essential oil samples brought by industrialists, traders and cultivators are analysed in the laboratory and results are given on payment basis.

The station library with more than 600 accessions on medicinal and aromatic plants is also available to researchers, students and industrialists free of cost, who regularly visit the station library for collecting on the cultivation and utilisation of aromatic and medicinal plants.

#### **Publications and liaison with the public**

Regular demand and enquiries are received from the public including researchers, industrialists, traders and growers for published literature and project report on aromatic and medicinal plants. Available literature are made available to the needy farmers.

#### **Extension melas and Exhibitions participated**

AMPRS, Odakkali participated in the farmers day and exhibition organized at L. P. School, Maneed on 17.8.94.

Participated in the seminar and exhibition arranged by KALA Deepika, Dharma Giri Vikas Bhavan and KAU at Kothamangalam from 2nd and 5th September 1994.

Participated in the seminar and Exhibition organised by Rubber Board at Kottayam on 20.12.94.

Participated in the agricultural seminar and Exhibition at Kallurkkad on 17 and 18 December 1994 organized by the Kallurkkad Farmers Co-operative Bank Ltd., Muvattupuzha.

Participated in the Agri-Horti-Exhibition at Vazhakkulam on 13th and 14th January 1995.

Participated in the Agri-Horti Exhibition at Kothamangalam from 23th to 28th January 1995.

Participated in the Agri-Horti Exhibition at Thodupuzha from 25th to 28th January 1995.

Participated in the Agri-Horti Exhibition at Muvattupuzha from 8.2.95 to 12.2.95.

#### **Cashew Research Station, Anakkayam**

Cashew grafts of high yielding types were produced and distributed to the farmers. Local youths were given training on soft wood grafting technique and being utilized in nursery programme. Training on soft wood grafting on cashew were imparted to unemployed youths and to workers from Munderi Seed Farm and Plantation Corporation, Mannarghat.

Ten demonstration plots (Central - Sector Scheme) sponsored by Directorate of Cashewnut Development of Cashew were established in Malappuram District.

An Exhibition/sale of planting materials and publications of Kerala Agricultural University was arranged at Makkaraparamba on Oct. 29th - 30th 1994.

The Scientists of this Station attended the monthly T & V workshop of Malappuram District. The Scientists participated in Kisan Melas organised by Department of Agriculture on different occasions.

Rendered advice and guidance on package of practices of cashew cultivation to farmers and plantation owners.

Village Adoption Programme in five villages of Malappuram District was organised. Four hundred chicks were supplied to 40 farmers at a cost of Rs. 12000/- and 7 pair of rabbits and cages were supplied to the Harijan Colony at a cost of Rs. 3000/-

#### **Cashew Research Station, Madakkathara**

A large number of farmers visited the station for technical advice.

Training on cashew graft production for unemployed girls and vocational higher secondary school students was given.

#### **Banana Research Station, Kannara**

**Extension activities and service rendered to the farmers**

On first Chingam (17.8.94) 'Karshaka Day' was celebrated at Banana Research Station, Kannara with the scientists and 20 leading farmers from the Marakkal area. A group discussion on the various aspects of banana cultivation was conducted.

A documentary on 'Banana Cultivation' was taken up by the Institute of Management, Government of Kerala during September, '94 and Doordarshan, Trivandrum during December, '94.

Sri. T. C. Radhakrishnan and Dr JSK Charles visited farmers fields at Pananchery and Kadaplavattom of Trichur district and Adimali of Idukki district and rendered necessary technical guidance to the problems experienced by the farmers.

Dr. Job Sathya Kumar Charles took classes on banana cultivation to farmers of Kodakara Taluk arranged by the

National Service Scheme of the College of Horticulture, Vellanikkara.

Farm advisory services regarding crop management aspects and pests and disease problems in banana and pineapple were rendered to the farmers through field visit and postal consultancy.

**Agricultural Research Station, Mannuthy**

Participated in the sales mela at Makkaraparambu on 29.10.1994 to 30.10.1994.

Participated in the sales mela at Kodungalloor on 30.12.1994 to 2.1.1995

Participated in the Agri. Horti. festival at Trichur from 21.1.95 to 26.1.95

Participated in the exhibition at Vazhakulam organised by pineapple growers association from 13-14 January

**Pineapple Research Station, and pest and disease surveillance Unit, Vazhakulam**

**Extension activities and service rendered to the farmers  
Seminars & Exhibitions**

Participated as General Co-ordinator of the KAU pavilion of the Karshikamela at Vazhakulam during 13-14th January, 1995.

Attended the Karshikotsavam at Pattambi on 20.1.95.

Participated in the State Agrl. Fair '95 at Thodupuzha during 25.1.95 to 28.1.95.

Participated in the flower show at Muvattupuzha during 8.2.95 to 12.2.95.

Participated in the Agrl. Seminar organised jointly by Agrl. Department, FACT and Service Co-op. Bank, Vazhakulam on 4.3.95 and took class on coconut management.

Attended the Zonal Research Extension Advisory Committee meeting at Pattambi on 8.3.95.

**Village Adoption Programme**

Three villages, viz. Kalloorkad, Arakuzha and Thirumaradi were adopted.

**Farmers' visit**

Several farmers visited the station for obtaining informations on Pineapple cultivation, - pest and disease problems etc.

## **Agronomic Research Station, Chalakkudy**

### *Extension activities*

As part of the On farm water management programme, Kodakara Village has been selected and the farmers have been selected for the implementation of the programme. For the Village Adoption Programme, a near by village Koratty was selected and seeds of improved varieties of vegetable were supplied to them. Scientific cultivation techniques were imparted to them for the successful production of vegetables. The Scientists of the centre participated in a number of seminars organised by the Department of Agriculture. A number of farmers visited the station for seeking advice on scientific crop husbandry including water management and plant protection.

## **REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE**

### *Extension activities*

#### *Monthly Workshop*

Scientists of this station participated in the T & V monthly workshop of Kozhikode, Kannur and Kasaragod Districts. Messages on production recommendation were formulated for the timely adoption by farmers.

#### *Zonal Workshop:*

The Zonal Workshop of the region was organized at this station on 15th March 1995. Officials of the Department of Agriculture, Scientists from sister organisation and representatives from input agencies and progressive farmers participated in the deliberations and field problems were discussed.

#### *Joint Field Visit*

The field problems reported by the officials of the Department of Agriculture were discussed and investigated in detail by conducting joint field visits and suitable remedial measures were also suggested.

#### *Village Adoption Programme*

The Programme was implemented in Udinoor Village during the period under report. Vegetable seeds, fertilizers and Mango grafts were distributed to 40 selected farmers in the Village. One day training programme on Scientific 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, mango, arecanut seedlings were distributed.

### *Seminars/Farmers Counselling*

Scientists of this station attended Agricultural Seminars and handled classes on topics of interest to the farmers. A total number of 15 seminars were attended during the period under report.

### *Training Programmes*

A total of 25 training programmes were organised under the training service scheme during the period under report. Four days training programme on fertilizers and pesticides were organised from 24.10.94 to 27.10.94 to the benefit of personnels of the service co-operative societies. Conducted 3 days Training Programme on Biofertilizers at this station and RATTC, Taliparamba to the officers of the Department of Agriculture from 3-5 October 1994 in collaboration with the Biofertilizer centre, Bangalore.

One day Training Programme in Mushroom cultivation was conducted in collaboration with Nithyananda Polytechnic, Kanhangad.

A Training Programme on Agrometeorology of plantation crops was conducted to the Assistant Directors/Deputy Directors of the Department of Agriculture during 26-29 December 1994.

Conducted 3 days Training Programme on Biofertilizers from 26-28 September '94 to the Assistant Directors of the Department of Agriculture.

A Training Programme was organised on improved Agricultural practices in the watershed area to Mithra Kisans of Kasaragod under National Watershed Development Programme. Scientists of this station, handled classes for the Agricultural Officers at RATTC, Taliparamba. Scientists of this station handled classes on the cultivation of fruits and vegetable in the Agricultural Seminars organised at Talassery Social Service Society at Thalassery during November 1994.

### *Exhibition*

An Agricultural Exhibition was organised at the Town Hall, Thrissur on 24-25th September 1994 in connection with the inauguration of State Level Coconut Development Scheme.

An Agricultural Exhibition at the N.S.S. High School, Alakode was organised during December 1994 in connection with the Agricultural Seminar. Participated in the Agricultural Exhibition conducted at Kanakakunnu Palace, Thiruvananthapuram from 14-18 December 1994. Another Exhibition was



arranged at Government High School, Kuttamath on 17-18 October 1994. An Exhibition was organised at Raja's High School, Nileshwar on 20-30th January 1995. Another Exhibition was organised at Bekal on 20-27th January 1995.

*Details of Scientists participated in Seminars/Workshops/Summer Institutes/Symposia etc.*

Name of Scientists	Seminar Symposia	Periods
Dr. GSLHV. Prasada Rao	TROPMET 95 NRSA, Hyderabad Course on Com- puter Application in Agrl. NAARM, Hyderabad.	8-11 to Feb.95  19-30th July '94
Dr. M. Govindan	Summer Institute on Advances in Agrl. Microbiology with Special reference to Mycor- rhizal Symbiosis, GKVK, Bangalore	22nd August to 10th Sept. '94
Dr. M. Govindan	Course on Computer Application in Agri. NAARM, Hyderabad	19-30th July 94

#### *Information-cum-Sales Centre*

An Information-cum-Sales Centre is functioning at RARS, Nileshwar to cater to the needs of the farmers of Northern Region for the supply of planting materials, technical advice and other agricultural requirements.

#### **REGIONAL AGRICULTURAL RESEARCH STATION, AMBALAVAYAL**

##### **Extension activities**

The twelfth and thirteenth Zonal Research and Extension Advisory Council Meeting of the high range zone were held at R.A.R.S., Ambalavayal on 22.4.'94 and 17.3.'95 respectively. The scientists of Kerala Agricultural University, National Research Centre for Spices, Coffee Board, extension personnels from the Department of Agriculture and progressive farmers from the different parts of the district attended the meeting.

Scientists of the station participated in the *Karshikamela* organised by Mathrubhoomi from 15 to 17th May at S. K. M. J. High School, Kalpetta.

The Station participated in Kalpetta flower show held from 13.1.'95 to 18.1.'95, Calicut flower show held from 25.1.'95 to 30.1.'95 and Wayanad District Exhibition, Trade Fair and Tribal Fest held at Valliyoorkavu from 18.3.'95 to 28.3.'95.

The scientists of the station served as resource personnel for the training programme on Integrated Pest Management of Rice implemented in the District.

The scientists of the station attended the training programmes, seminars and meetings organised by Krishi Vigyan Kendra, Department of Agriculture and Commodity Boards.

#### **CATTLE BREEDING FARM, THUMBURMUZHI**

##### **Extension activities**

- a) Under the Village Adoption Programme, Rs. 3,000 - was allotted to the farm. During the financial year under report, it was proposed to distribute improved varieties of layer birds (Gramalakshmi) to 15 farm families. The selected farmers were given an orientation into the various aspects of feeding and management of improved birds under backyard system of rearing.
- b) Under the Artificial Insemination Scheme of the farm, 318 inseminations were conducted on local farmers' animals using semen of high pedigree bulls received from the Progeny Testing Programme, Mannuthy.
- c) Extension activities participated  
Dr. D. Sreekumar, Assistant Professor and Dr. K. S. Anil, Assistant Professor attended N. S. S. Camp conducted by the students of the College of Co-operation and Banking, Mannuthy at Monadi, Chalakudy on 5.1.95.  
Dr. D. Sreekumar and Dr. K. S. Anil acted as judges in the Cattle and Dog Shows at Chalakkudy, Palakkad and Thrissur.

##### **Extension lectures conducted by Scientists**

Dr. D. Sreekumar, Assistant Professor presented a lecture on "Scientific Management of Milch Cattle" in connection with the seminar organised by the Mettipadam Water Shed Committee at St. Antony's Church, Thazhur, Kodassery, Chalakudy on 22.2.95.

##### **Extension**

1. Veterinary aid and AI facilities provided for animals of farmers
2. Short-term training programmes for TRYCEM/DWCRA/ NYK beneficiaries
3. Village adoption programme implemented

**Other matters**

1. Conducted a one day seminar for the farmers
2. Conducted training for inservice veterinarians from Department of Animal Husbandry
3. Provided training and advices to farmers interested in Pig breeding

**Other activities**

The following extension activities were given to the farmers:

- a) Expert Veterinary advice on various disease problems are given to the farmers.
- b) Poultry vaccination, anti-rabies vaccination and parvoviral vaccination are given during hospital hours.
- c) Analysis of clinical samples brought from various Veterinary Hospitals and sub centres.
- d) Consultancy services to Field Veterinarians and farmers

A brief account of cases treated during the year 1994-95 are given below :

1. Total no. of cases treated : 27296

## CHAPTER IV

### Students Welfare

Dr. T. G. Rajagopalan continued as Director of Students Welfare during the report period.

#### Staff

Category	Sanctioned	In position	Vacant
Director of Students Welfare	1	1	—
Deputy Director of Students Welfare (Sports and Games)	1	1	—
Deputy Director of Students Welfare (Acad. and Counselling)	1	—	1
Jr. Asst. Professor (Lady Phy. Education)	1	1	—
Section Officer	1	1	—
Assistant	3	3	—
Typist (Gr. II)	1	1	—
Peon	2	2	—

#### SPORTS AND GAMES

##### *Inter Collegiate Tournaments*

Inter Collegiate shuttle badminton and Table Tennis tournaments were conducted at Trichur on 22 nd and 23 rd July, 94. College of Veterinary & Animal Sciences Teams, both men & women won Shuttle badminton and Vety women team won the Table Tennis matches. The College of Horticulture men team won the Table Tennis title.

The following teams of KAU were participated in the Inter Collegiate tournaments conducted by the Sports Council Trichur.

- 1) Foot ball (men)
- 2) Volley ball (men)
- 3) Basket ball (men)
- 4) Athletics (men)
- 5) Swimming (men)

### *Inter University Tournaments*

KAU Cricket team has participated in the Inter University Cricket tournament held at Manomanian Sundaranar University Thirunelvely during 30.12.94 to 31.12.94.

KAU Ball badminton (women) team has participated in the Inter University Ball badminton tournament held at Mangalore during 28.12.94 to 3.1.95.

KAU Table Tennis (men) team has participated in the Inter University Table Tennis tournament held at Kurnool from 7.11.94 to 10.11.94.

### **KERALA AGRICULTURAL UNIVERSITY UNION**

The 17th KAU Union was elected into Office on 27.8.94.

Inauguration of the University Union took place on 12th October 94 at the Regional Theatre, Trichur. It was inaugurated by Sri. Ezacheri Ramachandran. Hon' ble Vice-Chancellor, A. M. Michael. Dr. CC Abraham and Dr. A. Rajan, Dean Vety felicitated the function.

Thereafter, the University Union held a Journalism camp - a 2 day seminar on the importance of Media and Mass Communications at the College of Co-operation and Banking Mannuthy. The camp was inaugurated by the Asst Editor of Sahithya Academy Publications, Sri. Kodanadu Prabhakaran.

AIR took part in the Seminar. The camp was held on the 16th and 17th of December 94.

The Union conducted a programme 'Shree' in various campuses (in connection with Womens Day) as follows.

'Shree poster exhibition-17th Dec. 94 College of Fisheries.

'Shree' poster exhibition cum seminar on status of women in Society-19th and 20th Dec. 94 College of Horticulture.

The seminar was inaugurated by Prof. Meenakshi Thampan, MLA.

The Youth Festival of 93-94 was conducted during 14th to 17th February 95 at Vellayani.

**The Annual Indira Gandhi Inter University Debate Competition.**

Kum. Simi. B, College of C and B and Sri. Suresh Kumar S, College of Forestry were participated in the Debate competition at New Delhi from 22nd to 24 th December. 94.

**Report on NCC Activities of 1 (K) R & V Sqn NCC Mannuthy**

Regular parades equestrian training, mounted activities and animal management were conducted during the period.

a) 'B' and 'C' certificate examinations were conducted during March/April 94.

- b) Some of our ex-cadets were persuaded to apply for RVC Commission during June 94.
- c) Our three cadets have been sent to basic leadership course at Silguri (West Bengal) during 27.6.94 to 8.7.94.
- d) Tree sapling numbering 300 provided by College of Forestry were planted by our cadets at Mounted training area on 12.6.94.
- e) 17 numbers of our Cadets attended Annual Training Camp at Thyagaraja Polytechnics, Alagappanagar from 13.4.94 to 22.6.94.
- f) Eye donation pledge. One Regular Officer and one Associate NCC officer and 27 NCC Cadets took eye donation pledge during April, 94.
- g) Independence Day Celebration. One Assoc. NCC Officer, 2 PI staff, 45 NCC cadets and 5 horses participated in the Independence Day Celebrations held at KAU Headquarters.
- h) Cycle expedition. One PI staff and 15 NCC cadets went for a cycle expedition from Mannuthy to Mysore and back from 2.7.94 to 11.7.94.
- i) Attachment training with Regular Army Unit, 10 NCC cadets attended the attachment training with KAU at Jaipur from 11.7.94 to 25.7.94.
- j) Tree plantation—500 saplings of trees have been planted on 10.8.94 at Vety College campus by the NCC cadets.
- k) CAWATC. 10 NCC cadets attended CAWATC at Sri Krishna College Gurufayur from 14 to 25 September. 94.
- l) DCATC. This unit organised and conducted All Kerala Directorate combined Annual Camp at College of Vety and AS Mannuthy from 30th September to 11 th October 94.
- m) Sadbhavana Celebrations: Sadbhavana Celebration was celebrated from 20th August to 5 th September 94 at Trichur. 50 NCC cadets attended the NCC symposium on communal harmony at Town hall, Trichur, on 3rd September 94. One Assoc. NCC Officer and 70 NCC Cadets participated in the Sadbhavana Diwas at Vety. College Auditorium on 20th August 94.
- n) NCC Cadets of the unit attended the Rock Climbing Training at Karnataka from 1.10.94 to 12.10.94 and National Integration camp at Bangalore from 20th to 31st Oct. 94.
- o) RDC-94: 4 Boy cadets and 2 Girl cadets have been selected to attend pre RDC at New Delhi.

## 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 KCAET, 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 94-95. Developments and improvements to the existing buildings, providing additional facilities, repairs and maintenance etc. were paid special attention.

Major civil works — Construction of Central Library and Auditorium at Vellanikkara and construction of Academic Block and Ladies Hostel at Fisheries College, Panangad are in progress under the direct supervision of C. P. W. D.

Some important works executed by the Directorate during the period 1994-95 are furnished in Appendix VIII. Annual maintenance and repair works are excluded.

## CHAPTER VI

### KAU Estate and Campus Development, Vellanikkara

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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 391.39 ha.

Out of the total area of 391.39 hectares, 233.30 hectares has been allotted to other schemes as detailed below:

1 Botanical Garden	:	25.00 ha
2 Instructional farm	:	95.50 „
3 Cocoa Project	:	6.00 „
4 Olericulture & Medicinal plants	:	6.30 „
5 Coconut (Plantation crops)	:	4.00 „
6 K. A. D. P.	:	14.00 „
7 Central Nursery	:	5.00 „
8 Pepper & Pineapple	:	6.00 „
9 N. B. P. G. R./I. C. A. R.	:	12.00 „
10 Mango Orchard for 20 years	:	9.00 „
11 Forestry	:	20.00 „
12 Water Management Unit	:	5.00 „
13 Cashew Research Station	:	5.50 „
14 Coconut Development Board, Kochi	:	20.00 „
	Total	: <u>233.30</u> „

#### Production and sales

A total quantity of 49720.670 kgs. of latex produced during the year, 1994-'95. 47600 kgs. of latex were sold during the year, 1994-'95.



## Finance

Total expenditure for the year, 1994-95	=	35,61,288.00
Total income for the year, 1994-95	=	16,02,536.00

## Campus Development, Vellanikkara

The Campus Development Programme was launched at the Main Campus in the year 1990. It comprises of the following four components.

- 1 Campus Development
- 2 Central Nursery
- 3 Mango Research Unit and
- 4 Botanical Garden

### Campus Development

The Campus Development programme involves the General development and beautification of the Campus. Avenue trees were planted along all the important roads, the total distance being about 4 km, and were maintained. The species used include mango, jack, nelli, Jamun, May flower, bauhinia, caesalpinea and chambakom. Lawns were laid out and were maintained around the administrative block. Annual flower beds were raised and maintained.

Conventional method of irrigation was stopped and integrated water supply system was installed in the entire Vellanikkara Campus with the assistance of the Agro Industries Corporation. One Papaya garden was established during the year. Five varieties of Papaya viz. Co. 1, Co. 2, Co. 3, Co. 5 and Co. 6 were collected and planted.

A cropping plan for the whole KAU Main Campus, Vellanikkara was prepared. The entire campus was divided into 33 blocks and the area was earmarked for different purposes.

### Central nursery

The Central Nursery is a plant propagation and nursery management facility created at the main campus to produce planting materials of elite species of horticultural crops. Quality planting materials of major fruit plants like mango, jack, sapota, lovi lovi, champa, arinelli, West Indian cherry, guava, averrhoa and garcinia were produced and distributed. Different varieties of ornamental plants like rose, dieffenbackia, aralea, Calathea, maranta, crotons, begonia, ferns, orchids and palms were also produced and sold out during the period under report.

Beautification and upkeep of the main office building and its premises including interior decoration was attended to by the Central Nursery.

Ornamental plants and mango grafts for the Campus Development Scheme and Mango Research Unit was produced and supplied.

The progeny orchard with important varieties of mango, sapota, guava, lime and jack and minor fruits was maintained. A germplasm collection of 357 varieties of roses, 45 types of orchids, 26 types of anthurium and 47 types of begonia were maintained. Besides a large collection of other ornamental foliage plants were also maintained. Twelve number of nursery structures were constructed and are maintained.

A tissue culture laboratory for the commercial production of planting materials for Banana and Pineapple was inaugurated during the period under report.

Sprinkler irrigation system in the Central Nursery was laid out and commissioned.

Internal revenue by sale of plants was Rs. 3.75 lakhs during the period under report

#### **Mango Research Unit**

The germplasm collection of mango varieties was enriched by planting 116 varieties in addition to the 38 varieties planted during last year. The plants are well maintained and the stand of the crop is good.

An experiment on high density planting in mango was laid out and planted. The variety used is 'Alphonso', the grafts being collected from Fruit Research Station, Vengurla. The spacing treatments are 9 x 9M, 6x 6M and 3 x 3M.

The bulk planting of prior variety consists of 120 plants which are being maintained well.

#### **Botanical garden**

In the botanical garden, 153 tree species had already been planted. They were maintained properly during the year. Lawns were laid out in the botanical garden under trees with shade loving grass species viz. St. Augustin grass in an area of 1.5 hectares. Seeds and seedlings of 150 new species of plants were collected from different locations in the country.

**Progress of works**

**Civil works**

1) An overhead water tank of 500-litres capacity has been completed and commissioned.

2) Two numbers of mini nusting unit and one each of fog chamber and rooting chamber have been provided with irrigation line also.

**Farm Development**

10 Nos. of green house structures have been completed and commissioned. Sprinkler irrigation line was extended to an additional area of 2 ha in Vellanikkara campus and a new sprinkler line was provided to the Cashew Research Station, Madakkathara. About 20 acres of new area was brought under cultivation with various crops like banana and cashew. Gap filling of the existing orchard with the different species of fruit plants was done.

**Major achievements**

Achieved a sale of around 20 lakhs during the period under report. Cleared weed growth of 10 acre area and brought under cultivation. Progeny orchard for different varieties of mango has been extended to 2 ha.

**Financial progress**

**Development of Main Campus (Plan)**

	Outlay sanctioned for 95-96 (in lakhs)	Progress as on 30.9.95 (in lakhs)	Percentage of achieve- ment
Salary	4.690	**5.08498	107.42
RC	6.900	11.91074	172.62
NRC	0.050	0.0015	3
Farm Development	1.000	1.4494	144.94
<b>Total</b>	<b>14.530</b>	<b>18.44662</b>	<b>145.94</b>

\*\* Rs. 30905 Transfer credit from AICRP on Medicinal and Aromatic Plants, College of Horticulture, Vellanikkara vide MAP/13/dt. 7.5.94 and Rs. 5589 Transfer credit from KHDP, Vellanikkara vide No. A1/401/905/dt. 24/02/95.

**Establishment of Central Nursery (Plan)**

	Outlay sanctioned for 95-96 (in lakhs)	Progress as on 30.9.95 (in lakhs)	Percentage of achievement
Salary	2.600	0.04798	1.85
RC	9.950	16.00608	160.87
NRC	0.400	0.02136	5.34
Farm Development	1.000	2.32966	232.97
<b>Total</b>	<b>13.950</b>	<b>18.40508</b>	<b>131.94</b>

**Development of Botanical Garden Arboretum (Plan)**

	Outlay sanctioned for 95-96 (in lakhs)	Progress as on 30.9.95 (in lakhs)	Percentage of achievement
Salary	—	—	—
RC	1.800	1.35207	75.25
NRC	0.200	0.59625	298.13
<b>Total</b>	<b>2.000</b>	<b>1.94832</b>	<b>97.42</b>

## CHAPTER VII

### Finance and Accoun

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Smt. Elizebath John, IA & A. S. continued as the Comptroller. Three internal audit circles-Northern, Central and Southern manned by Assistant Comptrollers also functioned during the year 94-95.

#### Budget Estimate 94-95

The University had adopted a budget estimate for Rs. 5927 lakhs for 94-95, anticipating grant-in-aid of Rs. 4005 lakhs from the State Government (Rs. 3030 lakhs) under Non-Plan and Rs. 975 lakhs under Plan, ICAR assistance of Rs. 389 lakhs, specific scheme-tied assistance Rs. 176 lakhs from other sources like DST, DBT etc, internal resources of Rs. 430 lakhs and Rs. 927 lakhs by recoveries from Pension Fund, loans and advances, income from investment, opening balance etc.

Though an amount of Rs. 4005 lakhs was anticipated, the State Government released only Rs. 3260 lakhs in this Budget (Rs. 2310 lakhs under Non-Plan, Rs. 900 lakhs under Plan). Government have released additional Plan assistance of Rs. 110 lakhs (Rs. One crore for the College of Agriculture, Pilicode and Rs. 10 lakhs for the course in Meat Science and Technology).

Receipts and expenditure for 94-95 are as below.

#### Receipts

##### Grant-in-aid from Government (in lakhs)

Non-Plan	:	Rs. 2310.00
Plan	:	Rs. 1010.00
Grant-in-aid from ICAR and other agencies	:	Rs. 492.58
Internal resources	:	Rs. 404.90
		Rs. 4217.48
Opening balance	:	Rs. 488.59
Total	:	Rs. 4706.07

## Expenditure

Non-Plan	: Rs. 2874.23
State Plan (including State share on ICAR Co-ordinated Projects)	: Rs. 1227.15
ICAR Plan (ICAR share)	: Rs. 44.00
ICAR Project	: Rs. 301.10
Others (including EEC, KHDP)	: Rs. 263.88

(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 the backlogs. An amount of Rs. 51.5 lakhs was disbursed as house loan for construction of 79 houses at soft rate to employees and labourers. The applications under HFS have been cleared up-to-date. An amount of 3.25 lakhs was released towards Motor Cycle Advance.

A novel Welfare Fund Scheme was introduced to the labourers. Under this scheme, the dependents of a labourer who joins the scheme by paying membership of Rs. 250 and monthly subscription of Rs. 10 will be eligible for financial assistance of Rs. 50,000 in case of death of the labourer. Families of two labourers were compensated under the Scheme in 94-95.

GPF and WPF Credit Cards have been issued upto 92-93.

The Annual accounts of the University for the year 93-94 was under preparation. All efforts were made to clear the arrears in account.

The Finance Committee met on 2.3.95 to finalise the Budget Estimate 95-96 and the Revised Estimate 94-95. There were 11 sittings of the Accounts Committee during this year to consider Annual Accounts and Audit Reports for 84-85 and 85-86.

### Statutory Audit Wing

Sri. C. Krishnankutty continued as the Government Auditor. Audit Reports for 1988-87 and 88-89 were issued in 94-95. Audited Utilisation Certificates in respect of 70% ICAR and Other externally aided projects upto 93-94 were issued in 94-95 to facilitate drawal of assistance from funding agencies. The Statutory Audit Wing has also been strengthened by additional staff to clear the backlog in Audit.

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# Appendix I

## MEMBERS OF THE STATUTORY AUTHORITIES

### GENERAL COUNCIL

The term of previous General Council expired on 30.1.1995 and the new General Council reconstituted with effect from 31.1.1995.

#### EX-OFFICIO MEMBERS

The Chancellor

The Pro Chancellor

The Vice-Chancellor

The Secretary to Government (Agriculture)

The Secretary to Government (Development)

The Secretary to Government (Finance)

The Director of Agriculture

The Director of Animal Husbandry

The Director of Dairy Development

The Director of Fisheries

The Chief Conservator of Forests

The Registrar of Co-operative Societies

The Dean, Faculty of Agriculture, Kerala Agricultural University.

The Dean, Faculty of Fisheries, Kerala Agricultural University.

The Dean, Faculty of Veterinary & Animal Sciences, Kerala Agricultural University

The Dean, Faculty of Basic Sciences & Humanities, Kerala Agricultural University.

The Dean, Faculty of Agricultural Engineering and Technology, Kerala Agricultural University.

The Director of Extension, Kerala Agricultural University.

The Director of Research, Kerala Agricultural University.

The Director of Students Welfare, Kerala Agricultural University.

## ELECTED MEMBERS

*Members of the Legislative Assembly* (5 members—One from SC or ST)

Shri KC Joseph, MLA, Karuvelithara, Vadavathoor P.O. Kottayam.

Shri KM Sooppy, MLA, Firoz Manzil, Panoor P.O, Pin: 670 692,

Shri MP Thami, MLA, Mangalam Parambil House,

Paruthoor PO, Pattambi (Via), Pallippuram; Palakkad (Upto 30-1-95)

Shri. TV Chondramohan MLA, 14/587, Govind, Puzhakkal Road, Poonkunnam, Thrissur (Upto 30-1-95)

Shri P Raghavan, MLA, Munnad P.O., Chengala (Via), Kasaragod (Upto 30-1-95)

Shri Johny Nelloor, MLA, House No. 8, Housing Colony, Muvattupuzha (From 31-1-95)

Sri CP Narayanan, MLA, CP House, Kuttoor P.O., (Via) Mathamangalam Bazar, Kannur (From 31-1-95).

Shri K Raghavan Master, MLA (ST), Kariyampathy House, Kalanadikolli P. O., Pulpally, Sultan Battery (From 31-1-95)

### *Representatives of Students of Post Graduate Courses (2 Nos.)*

Jin Raj PV., M.Sc. Student (93-11-64), College of Agriculture, Vellayani (From 18-5-94 to 30-1-95),

Kuriakose KJ M.Sc. (Horticulture) (92-12-13), College of Horticulture, Vellanikkara (From 18-5-94 to 30-1-95.)

Suresh kumar S (94-17-02) M. Sc. (Forestry) Student, College of Forestry, Vellanikkara, Thrissur (From 31-1-95)

Sudheesh MV (94-11-06), M.Sc. (Agriculture) Student, College of Horticulture, Vellanikkara, Thrissur (From 31-1-95)

### *Representatives of Students of the Doctorate Degree Course (1 No.)*

Jagadeesh kumar TN Ph. D. Scholar (93-21-04) College of Horticulture, Vellanikkara. (From 18-5-94 to 30-1-95).

Premachandran PN (93-21-16) Ph.D. Scholar, Department of Soil Science & Agrl. Chemistry, College of Agriculture, Vellayani, Thiruvananthapuram (From 31-1-95).

### *Representative of the students of the Graduate courses, (2 Nos.)*

Sri Mohammed Shafy (89-03-61) B.V.Sc. & AH Student, College of Vety. & Animal Sciences, Mannuthy, Thrissur (Upto 30-1-95).



Sri. Thomas K. Thomas (88-03-22) B.V.Sc. & AH Student  
College of Vety. & Animal Sciences, Mannuthy, Thrissur  
(Upto 24-07-94)

Ashok B (90-03-69), IV year B.V.Sc. & AH Student College of  
Vety. & Animal Sciences, Mannuthy, Thrissur (From 31-1-95)

Noushad Ali, KN (91-03-10) III year B.V.Sc. & AH Student,  
College of Vety. & Animal Sciences, Mannuthy, Thrissur  
(From 31-1-95).

*Representatives of the Students of Diploma courses and Certificate  
courses (1 number)*

Vacant

*Representatives of Teachers of Faculties (Other than Deans)  
(Not more than four—one from each Faculty)*

*Faculty of Agriculture*

Sri Jose Joseph, Assistant Professor, Communication Centre,  
Mannuthy, Thrissur (upto 30-1-95)

Dr FMH Kaleel, Assistant Professor, Krishi Vigyan Kendra,  
Sadanandapuram, Kottarakkara (From 31-1-95)

*Faculty of Veterinary and Animal Sciences*

Dr CB Manomohan, Associate Professor (NC), College of  
Veterinary and 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 K John Thomas, Professor, Kelappaji College of Agri-  
Engineering and Technology, Tavanur, Malappuram Dist.  
(Upto 30-1-95)

Dr PC Antony, Associate Professor, Kelappaji College of  
Agrl. Engineering and Technology, Tavanur, Malappuram  
District (From 31-1-95)

*Representatives of Non-teaching staff (1 No.)*

Sri VS Skandakumar, Senior Grade Assistant, Kerala  
Agricultural University Headquarters, Vellanikkara,  
Thrissur (Upto 30-1-95)

Sri R Vijayan, Binder, Kerala Agricultural University Head-  
quarters, Vellanikkara, Thrissur (From 31-1-95)

*Representatives of the Presidents of Panchayats in the State*  
(4 Nos)

Sri MM Ashtamoorthi Namboodiripad, President, Elamkulam Panchayat, Kunnakkavu P.O., Chenikara (Via), Malappuram District. (Upto 30-1-95)

Sri KR Chakkunny, President, Ollukkara Panchayat, Mannuthy P.O., Thrissur (Upto 30-1-95)

Sri TM Rameshan, President, Thillenkery Panchayat, Thillenkery P.O., Kannur District (Upto 30-1-95)

Sri V Sivankutty, President, Ulloor Panchayat, Medical College P.O., Thiruvananthapuram (Upto 30-1-95)

(From 31-1-95 the above vacancies are lying vacant).

*Representatives of Mayors of Municipal Corporations and  
Chairman of Municipal Councils, in the State. (1 No.)*

Sri P Kerala Varma, Chairman, Thripunithura Municipality, Thripunithura, Ernakulam Dist. (Upto 30-1-95)

**MEMBERS NOMINATED BY THE CHANCELLOR**

*Agricultural Scientists (2 Nos.)*

Dr KV Peter, Director, National Research Centre for Spices, P.O. Marikunnu, Kozhikode

Dr A Jalaluddin, Associate Professor (NC), AICRP on Poultry, College of Veterinary and Animal Sciences, Mannuthy, Thrissur (Upto 30-1-95)

Dr (Mrs) MK Sheela, Associate Professor (NC), Directorate of Extension, Kerala Agricultural University, Mannuthy, Thrissur (From 31-1-95)

*Farmers (5 Nos.) (One from SC/ST)*

Sri D Vijayakumar, Advocate, Chengannur, Alappuzha District (Upto 30-1-95)

Sri Ahamed Bavappa, Munayankunnu, Erakadavu P.O., Kumaranelloor-679 552, Palakkad District (Upto 30-1-95)

Sri K Janardhanan, Ambady, Vazhuthacaud, Thycaud, P.O., Thiruvananthapuram, (Upto 30-1-95)

Sri A Sujanapal, MLA, Advocate, Kozhicode. (From 30-1-95)

Sri MA Wahid, Advocate, Girisalayar, RC Junction, Cunnukuzhi, Thiruvananthapuram. (From 31-1-95)

Sri CV Narayanan, Chettakkulam House, Madakkathara P.O; Thrissur.

Sri K Gopalan, Congress House, Wayanad Road,

Kozhikode-673 011.

Sri Varghese Pereppadan, Mala. (From 31-1-95)

*One non-official representative from each of the following:*

*Co-operation:*

Sri MV Kurien, Retired Block Development Officer,  
Ollur P.O., Thrissur.

*Fisheries*

Sri N Prabhakaran, Advocate, 'Sreenivas', Madappally,  
College P. O., Vadakara, Kozhikode. (Upto 30.1.95)

Sri K Rajan, Kinattinkara, Cheriamangad Beach, Quilandy.  
(From 31-1-95)

*Animal Husbandry*

Sri Prayar Gopalakrishnan, Prayar, P.O., Ochira, Kollam.

*One non-official representative of the Plantation Industry in the State*

Sri Johny Nelloor, M.L.A., House No. 8, Housing Colony,  
Moovattupuzha. (Upto 30.1.95)

Sri V Saidu Mohammed Thangal, Valiyajaram House, P. O.,  
Ponnaninagaram, Malappuram. (From 31.1.95)

*Two Women members*

Smt C Dhanalakshmi, Advocate, Ezhavamthuruthu, Ponnani,  
P.O., Malappuram District. (Upto 30.1.95)

Smt Saraswathy Kunjukrishnan, Kalangara House, Kollam-13.  
Prof. Savithri Lakshmanan, M.P., Krishna Kripa, Peshkar  
Road, Irinjalakuda. (From 31.1.95)

*One Engineer specialised in Agricultural Engineering or Irrigation*

Dr. AM Salim, Chief Projects Division, State Planning Board,  
Pattom, Thiruvananthapuram. (Upto 30.1.95)

Sri John Zacharia, Former Commissioner, Agricultural  
Machinery, Government of India, Chengannur.  
(From 31.1.95)

*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. F2B, Painavu P.O.,  
Idukki.

Sri Joseph Perumpilly, Chevoor, P.O., (Via.) Cherpu,  
Thrissur-680 027.

Sri P Narayanan Nair, Omassery. P.O., Thamarassery,  
Kozhikode.

*One member to represent Plantation labour in the State*

Sri VV Shoukathali, Vadakkevalappil House, Vallaramkunnu,  
Thenkara P.O., Mannarkad, 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*

Sri K Raghavan Master, MLA, Kariyampathi House,  
Kalanadikolli P.O., Pulppally, Wayanad Dist. (Upto 30-01-95)

Sri. Thankappan, Advocate, Vizhinjam,  
Thiruvananthapuram (Upto 30-01-95)

Sri V Retnakaran, 'Vrindavanam', Near Toll Booth,  
Valappattanam, Kannur District (Upto 30.01.95)

Sri MP Thami, MLA., Mangalamparambil, Paruthur, PO  
(Via.) Pattambi, Pallippuram, Palakkad (From 31.01.95)

Sri PC Retnakaran, MM Hall, Peroorkada P. O.,  
Thiruvananthapuram (From 31.01.95)

Sri Kurichipatta Gopalan, Bhoodana Colony P. O.,  
Pulpally-673 579, Wayanad District (From 31.01.95)

**OTHER MEMBERS**

*Representatives of University Senates (3 Nos)*

*University of Calicut*

Dr K Unnikrishnan, Head of the Department of Botany,  
(Upto 30.01.95)

University of Calicut, Calicut University P. O. (Presently  
Vacant)

*Cochin University of Science and Technology*

Sri Binoy Viswam, 333, Vikas Nagar, Kozhikode-673 006  
(Upto 30.01.95)

(Vacant from 31.1.95)

*University of Kerala*

Vacant

*Representative of I.C.A.R*

Dr M Aravindan, Principal Scientist (ASE), ICAR, Krishi  
Anusandhan Bhavan, Pusa, New Delhi-12. (Upto 30.01.95)  
(Vacant from 31.01.95)

## EXECUTIVE COMMITTEE

### I. EX-OFFICIO MEMBERS

The Vice-Chancellor, Kerala Agricultural University

The Secretary to Government, Department of Agriculture, Secretariat, Thiruvananthapuram

The Secretary to Government, Rural Development Department, Secretariat, Thiruvananthapuram

The Secretary to Government, Finance Department, Secretariat, Thiruvananthapuram

### II. OTHER MEMBERS—MEMBERS REPRESENTING I.C.A.R

Dr M Aravindan, Principal Scientist (ASE), I.C.A.R., Krishi Anusandhan Bhavan, Dr KS Krishnan Marg, New Delhi-110 012. (Upto 30.1.95)

### ELECTED DEAN OF FACULTY

Dr C Sreedharan, Dean, Faculty of Agriculture, College of Agriculture, Vellayani, P. O., Thiruvananthapuram (Upto 3.4.94)

Dr A Rajan, Dean (Vety.), College of Veterinary & Animal Sciences, Mannuthy (From 25.4.94 and upto 30.1.95)

### III. ELECTED TEACHERS

Sri Jose Joseph, Asst. Professor, Communication Centre, Mannuthy, P.O., Thrissur District. (Upto 30.1.95)

### IV. ELECTED NON-OFFICIAL MEMBERS

#### SC/ST Representative

Sri MP Thami, MLA, Mangalamparambil House, Paruthoor, P. O, Pattambi (via), Pallippuram, Palakkad Dist. (Upto 30.1.95)

### V. WOMEN REPRESENTATIVE

Smt Saraswathy Kunjukrishnan, Kalangara House, Kollam-13. (upto 30.1.95)

### VI. OTHER ELECTED NON-OFFICIAL MEMBERS

Sri KC Joseph, MLA, Congress House, Srikantapuram, Kannur Dist. (Upto 30.1.95)

Sri Johny Nelloor, MLA, House No.8, Housing Colony, Moovattupuzha, Ernakulam Dist. (Upto 30.1.95)

Sri KM Sooppy, MLA, Firoz Manzil, Panoor, P.O., Kannur Dist. (Upto 30.1.95)

## VII. ELECTED STUDENT REPRESENTATIVE

Sri Thomas K Thomas (88.3.22),  
B.V.Sc. & A.H. Student, College of Veterinary & Animal  
Sciences, Mannuthy (Upto 24.7.94)

Sri Kuriakose KJ (92-12-13),  
M.Sc. (Hort.) Student, College of Horticulture,  
Vellanikkara, Thrissur. (From 11.11.94 to 30.1.95)

## LIST OF ACADEMIC COUNCIL MEMBERS

(From 28.12.1993 to 27.12.1996)

Ex-officio members as per section 17 (1) (a) to (g) and (1) of  
KAU Act-Clause 1 of Statute 1 (a) of SRO No. 529/72  
dated 19.10.1972

The Vice-Chancellor, Kerala Agricultural University  
Vellanikkara, Thrissur

The Dean, College of Agriculture, Kerala Agricultural  
University, Vellayani, Thiruvananthapuram

The Dean, College of Vety. & Animal Sciences, Mannuthy,  
Thrissur.

The Dean, College of Fisheries Panangad, Ernakulam

The Dean, Kelappaji College of Agrl. Engg. & Technology  
Tavanur, Malappuram

The Director of Research, Kerala Agrl. University,  
Vellanikkara, Thrissur

The Director of Extension,  
Kerala Agrl. University, Mannuthy, Thrissur

The Director of Students Welfare  
Kerala Agrl. University, Mannuthy, Thrissur

The Registrar, Kerala Agrl. University, Vellanikkara,  
Thrissur

The Director of Agriculture, Vikas Bhavan,  
Thiruvananthapuram

The Director of Animal Husbandry, Vikas Bhavan,  
Thiruvananthapuram

Members nominated by the Chancellor from among the Heads  
of departments of the Faculties (6 members)

Dr KM Narayanan Namboodiri, Professor & Head (Agrl  
Botany) College of Horticulture, Vellanikkara, Thrissur

Dr Al Jose, Professor & Head (Soil Science & Agrl.  
Chemistry), College of Horticulture, Vellanikkara, Thrissur

Dr K Pavithran, Professor & Head (Dairy Science).  
College of Vety. & Animal Sciences, Mannuthy, Thrissur.

Dr PS Pushkaran, Professor & Head (Extension)  
College of Vety. & Animal Sciences, Mannuthy, Thrissur.  
Sri K Kerala Varma, Assoc. Professor & Head (Fishery  
Hydrography), College of Fisheries, Panangad, Ernakulam.  
Dr KI Koshy, Professor & Head (Supportive & Allied Courses)  
Kelappaji College of Agrl. Engg. & Technology, Tavanur,  
Malappuram.

Members nominated by the Chancellor, from among the staff  
of the Research Station of the University (3 members) as  
Section 171 (i) of KAU Act

Sri KS Purushan, Assoc. Professor, Fisheries Research  
Station, Puduveypu, Ernakulam.

Dr U Jaikumaran, Assoc. Professor (NC), Agricultural  
Research Station, Mannuthy, Thrissur.

Dr Sosamma Iype, Professor, University Livestock Farm,  
Mannuthy, Thrissur.

Members nominated by the Chancellor from among the Scient-  
ists 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 /  
19.10.1972.

Dr MR Sethuraj, Director, Rubber Research Institute of India  
Kottayam.

Dr R Gopalakrishnan, Retd. Director of Research, Kerala  
Agrl. University Plot No.228, Gate No. 4, Hill Gardens,  
Kuttanellur, Thrissur-680 014

Dr AD Damodaran, Director, Regional Research Laboratory  
(CSIR), Thiruvananthapuram

Dr Subramanian, Former Dean, Tamil Nadu Agricultural  
University, Coimbatore

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) (j) of the KAU Act.

Biju Lal, BL (93-11-55), M. Sc. (Ag.) Soil Science & Agrl.  
Chemistry, College of Agriculture, Vellayani

Kuriakose, KJ (92-12-13), II M. Sc. (Hort.) student,  
Department of Processing Technology, College of  
Horticulture, Vellanikkara .

Dr H Subramanian (93-23-02), 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.

Sri MS Hajilal, Asst. Professor, Kelappaji College of Agrl.  
Engg. & Technology, Tavanur

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 CC Abraham, Associate Dean i/c.  
College of Horticulture, Vellanikkara

Dr U Mohammed Kunju, Director (Acad. & P. G. Studies),  
KAU Hqrs., Vellanikkara

The Special Officer, College of Forestry, Vellanikkara

Sri M Mohandas, Assoc. Dean i/c.

College of Co-op. & Banking, Mannuthy, Thrissur

Dr N Mohanakumaran, Assoc. Director, NARP (SR);  
College of Agriculture, Vellayani

Dr G Mukundan, Director, Centre of Advanced Studies in  
Animal Breeding & Genetics

College of Vety. & Animal Sciences, Mannuthy, Thrissur

Dr MJ Thomas, Associate Director,  
Directorate of Research, KAU Hqrs., Vellanikkara

Dr PM Mathew, Professor (Fisheries Research)  
College of Fisheries, Panangad

Associate Dean/Special Officer,  
College of Agriculture, Pilicode-Nileswar

Smt KK Santha, Associate Professor  
Directorate of Extension, Mannuthy, Thrissur



## I. BOARD OF STUDIES

### i FACULTY OF AGRICULTURE

Dean, Faculty of Agriculture, KAU	— Chairman
Heads of Departments under the faculty	— Members
Agronomy	..
Physiology	..
Agrl. Entomology	..
Agrl. Economics	..
Agrl. Meteorology	..
Agrl. Extension	..
Agrl. Statistics	..
Horticulture	..
Plant Pathology	..
Soil Science & Agrl. Chemistry	..
Plant Breeding and Genetics	..
Plantation Crops and Spices	..
Pomology and Floriculture	..
Olericulture	..
Processing Technology	..
Home Science	..
Co-operative Management	..
Rural Marketing Management	..
Rural Banking and Finance Management	..
Development Economics	..
Silviculture and Agro-Forestry	..
Tree Physiology and Breeding	..
Forest Management and Utilisation	..
Wood Science	..
Wild Life Science	..

#### *Two Specialists*

Dr. NM Ramaswami, Dean, P. G. Studies, Tamil Nadu Agrl. University, Coimbatore.

Dr P. Pushpangadan, Director, Tropical Botanical Garden, Palode, Thiruvananthapuram.

*Such other members (Two members) appointed by Executive Committee from among the teachers of Kerala Agricultural University*

Sri KK Ravindran Nair, Professor, College of Agriculture, Vellayani

Dr N Mohanakumaran, Assoc. Director, NARP (SR), Vellayani

*Student representatives*

Sri BL Bijulal (93-11-55) M. Sc (Ag) College of Agriculture, Vellayani.

Sri KJ Kuriakose (92-12-13) M. Sc (Hort), Department of Processing Technology, College of Horticulture, Vellanikkara-

*Special Invitees*

Director of Agriculture, Thiruvananthapuram

Dean i/c. Kelappaji College of Agrl. Engg. & Technology, Tavanur

Assoc. Dean, College Horticulture, Vellanikkara

Special Officer, College of Forestry, Vellanikkara

Assoc. Dean, College of Co-operation and Banking, Mannuthy

ii. FACULTY OF VETERINARY AND ANIMAL SCIENCES

Dean, Faculty of Veterinary and Animal Sciences	Chairman
Heads of Departments under the Faculty of Veterinary and Animal Sciences	Members

Livestock Production Management	"
Anatomy	"
Dairy Science	"
Preventive Medicine	"
Microbiology	"
Parasitology	"
Poultry Science	"
Pharmacology	"
Surgery	"
Animal Breeding and Genetics	"
Animal Reproduction	"
Extension	"
Nutrition	"
Pathology	"
Physiology	"
Clinical Medicine	"
Veterinary Public Health	"
Statistics	"

*Two Specialists in the subject with which the Faculty is concerned*

Dr S Shanmugha Sundaram, Dean, Veterinary College, Namakkal, Salem Dist.

Dr O Ramakrishna, Principal, Veterinary College, Thirupathy, Chittoor Dist., Andhra Pradesh

*Such other members (Two members) appointed by the Executive Committee from among the teachers of the University*

Dr. K. Madhavan Pillai, Professor (Parasitology), College of Veterinary and Animal Sciences, Mannuthy

Dr. Zacharias Cherian, Professor, Department of Pharmacology, College of Veterinary and Animal Sciences, Mannuthy.

*Student representative*

Dr. H. Subramaniam (93-23-2), Ph. D. Student, Department of Parasitology, College of Veterinary and Animal Sciences, Mannuthy.

*Special invitee*

Director of Animal Husbandry, Thiruvananthapuram

iii. FACULTY OF FISHERIES

Dean, Faculty of Fisheries	Chairman
Heads of Departments in the Faculty of Fisheries	Members
Aquaculture	"
Fishery Biology	"
Processing Technology	"
Fishery Engineering	"
Fishing Technology	"
Fishery Hydrology	"
Management Studies	"

*Two specialists in the subject with which the Faculty is concerned*

Dr. Varghese, Professor of Aquaculture, Fisheries College, Mangalore.

Dr. N. R. Menon, Director, School of Marine Sciences, Foreshore Road, Kochi.

*Such other members not exceeding two appointed by the Executive Committee from among the teachers of the University*

Dr. P. M. Mathew, Professor (Fisheries Research) College of Fisheries, Panangad, Kochi

Smt. Jayasree Vadhias, Assoc. Professor, Department of Aquaculture, College of Fisheries, Panangad, Kochi.

*Student representative* Nil

*Special Invitee*

Director of Fisheries, Thiruvananthapuram

The Director of Research, Director of Extension and Director (Acad & P. G. Studies)

**IV: FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY**

Dean, Faculty of Agri. Engg. and Technology      Chairman  
Heads of Departments under the faculty  
(4 members)

*Specialists*

State Agricultural Engineer, Department of Agriculture,  
Government of Kerala, Thiruvananthapuram

Sri N Abdul Azeed, Additional Director of Soil Conser-  
vation, Directorate of Agriculture (S. C. Unit) Thiru-  
vananthapuram

*Two members from among the teachers of the University*

Dr ER Nair, Assoc. Director of Research, Directorate of  
Research, KAU Headquarters, Vellanikkara

Dr. Dr K Pavithran, Prof. and Head, Department of Dairy  
Science, College of Veterinary, and Animal Sciences,  
Mannuthy

*Student Representative*

Nil

*Special Invitees*

Dr C Gopinath, Director, Centre for Management Studies,  
Thycaud, Thiruvananthapuram

Sri KR Swaminathan, Dean, College of Agri. Engineering,  
Tamilnadu Agricultural University, Coimbatore-641 003.

Dr AN Remadevi, Professor, Department of Agri. Engi-  
neering, College of Agriculture, Vellayani, Thiruvanantha-  
puram

Sri P John Zachariah, Rtd. Jt. Commissioner, Government  
of India, HOREB-12, Perissery, Chengannur-889 121

Dr M Jayakumar Scientist 'F' and Project Director, IMTC,  
CWRDM, Kunnamangalam PO. Kozhikode 673 571

Dr GT Kurup, Scientist CTCRI, Sreekaryam, Thiruvanantha-  
puram

The Director of Research, Director of Extension and Asso-  
ciate Director (Academic) of Kerala Agricultural University

## Appendix II

### SUB COMMITTEES

#### SUB COMMITTEES OF EXECUTIVE COMMITTEE (Ceased to exist with effect from 31-01-1995)

##### *Finance Committee*

The Vice-Chancellor	Chairman
Sri KM Sooppy, M L A	Member
The Secretary to Government (Finance Expenditure)	..
The Secretary to Government (Agriculture)	..
The Comptroller, K.A.U.	Convenor

##### *Planning & Development Committee*

Sri Johny Nelloor, M.L.A.	Chairman
Sri MP Thami, MLA	Member
Sri KC Joseph, M L A	..
Sri KM Sooppy, M L A	..
Smt Saraswathy Kunjukrishnan	..
Sri Jose Joseph, Teachers' Representative	..
The Secretary to Government (Agriculture)	..
Sri Thomas K Thomas, Students Representative (Upto 24-07-1994)	..
The Comptroller, KAU	..
The Director of Research, K A U	Member-Convenor

##### *Research Review Committee*

Sri KM Sooppy, M L A	Chairman
Sri KC Joseph M L A	Member
Sri Johny Nelloor. M L A	..
Sri MP Thami, M L A	..
Smt Saraswathy Kunjukrishnan	..
Sri Jose Joseph, Teachers' Representative	..
Director of Research, K A U	Member-Convenor

### *Establishment Committee*

Smt Saraswathy Kunjukrishnan	Chairperson
Sri KC Joseph, MLA	Member
Sri Johny Nelloor, MLA	"
Sri KM Sooppy, MLA	"
Sri MP Thami, MLA	"
Dr A Rajan, Dean (Vety.) (from 9.6.96)	"
Sri Jose Joseph, Teachers' Representative Registrar, KAU	Member Convenor

### *Students Welfare Committee*

Sri Johny Nelloor, MLA	Chairman
Sri KC Joseph, MLA	Member
Sri KM Sooppy, MLA	"
Sri Thomas K Thomas, Students' Representative (upto 24.7.'94	}
Sri KJ Kuriakose, (from 11.11.'94 to 30.1.'95)	
Sri MP Thami, MLA	"
Smt Saraswathy Kunjukrishnan Director of Students' Welfare	Member- Convenor

### *Works Committee*

Sri MP Thami, MLA	Chairman
Sri Johny Nelloor, MLA	Member
Sri KC Joseph, MLA	"
Sri KM Sooppy, MLA	"
Smt Saraswathy Kunjukrishnan	"
Sri Jose Joseph, Teachers' Representative The Registrar, KAU	Member- Convenor
The Director of Physical Plant, KAU	Permanent Invitee

### **SUB COMMITTEES OF GENERAL COUNCIL**

#### *Assurance Committee (Upto 30-1-'95)*

Sri K Gopalan	Chairman
Sri K Janardhanan	Member
Sri CV Narayanan	"
Sri N Prabhakaran	"
Dr K Ramadas	"
Sri Binoy Viswam	"
Sri TN Jagadeesh Kumar (from 22.7.94 to 30.1.95)	"
Registrar, KAU	Convenor

*Accounts Committee (Upto 30-1-'95)*

Sri D Vijayakumar	Chairman
Sri CN Govindankutty	Member
Sri MK Purushothaman	"
Sri P Narayanan Nair	"
Sri VV Shoukathali	"
Sri V Retnakaran	"
Sri Prayar Gopalakrishnan	"
Sri V Sivankutty (upto 31-10-'94)	"
Comptroller, KAU	Convenor

*Statute Committee (Upto 30-1-'95)*

Sri MV Kurien	Chairman
Smt Saraswathy Kunjukrishnan	Member
Sri Jose Joseph	"
Sri CG Rajendran	"
Dr CB Manomohan	"
Sri A Thankappan	"
Sri VS Skandakumar	"
Sri Joseph Perumpilly	"
Sri Dhanalakshmi	"
Dr A Jalaludeen	"
Sri Thomas K Thomas (upto 24.7.94)	"
Dr John Thomas	"
Registrar, KAU	Convenor

**OTHER COMMITTEES**

*Research Council*

Vice-Chancellor	Chairman
Director of Research	Secretary
Members (KAU officials)	
Director of Extension, KAU	
Dean, College of Agriculture, Vellayani	
Dean, College of Veterinary and Animal Sciences, KAU	
Dean, College of Fisheries, Panangad	
Dean, Kelappaji College of Agricultural Engineering and Technology, Tavanur	
Associate Dean, College of Horticulture, Vellanikkara	
Associate Dean, i/c., College of Co-operation and Banking, Mannuthy	
Officer i/c., College of Forestry, Vellanikkara	
Professor (Fisheries Research), College of Fisheries, Panangad	

Professor (RC), College of Agriculture, Vellayani  
 Professor (RC), College of Veterinary and Animal Sciences;  
 Mannuthy  
 Teacher Representative in the Executive Committee of KAU  
 Associate Director, NARP (SR), College of Agriculture,  
 Vellayani  
 Associate Director, Regional Agricultural Research Station,  
 Pilicode  
 Associate Director, Regional Agricultural Research Station,  
 Ambalavayal  
 Associate Director, Regional Agricultural Research Station,  
 Pattambi  
 Associate Director, Regional Agricultural Research Station;  
 Kumarakom  
 The Managing Editor, Kerala Journal of Veterinary  
 Research, College of Veterinary and Animal Sciences,  
 Mannuthy  
 The Managing Editor, Agricultural Research Journal of  
 Kerala, College of Horticulture, Vellanikkara

*Co-opted Members*

Director, Kerala Forest Research Institute, Peechi  
 Director, Central Plantation Crops Research Institute,  
 Kasaragod  
 Director, Central Tuber Crops Research Institute,  
 Thiruvananthapuram  
 The Executive Director, Spices Board, Kochi  
 Director of Research, Rubber Research Institute of India,  
 Kottayam  
 Joint Director, National Research Centre for Spices,  
 Kozhikode  
 Director, Central Institute of Fisheries Technology, Kochi  
 Director of Agriculture, Vikas Bhavan, Thiruvananthapuram  
 Director of Animal Husbandry, Thiruvananthapuram  
 Principal Chief Conservator of Forests,  
 Thiruvananthapuram  
 Director, Dairy Development, Pattom, Thiruvananthapuram  
 Director, Centre of Earth Sciences Studies,  
 Thiruvananthapuram  
 Director, Centre for Water Resources Development and  
 Management, Kozhikode  
 Director, Marine Products Export Development Authority,  
 Kochi  
 Director, Indo-Swiss Project, Mattupatty



### *Co-opted Members (Non-official)*

- Sri KM Sooppy, MLA, Ferosh Manzil, Panoor P. O., Kannur  
670 692
- Sri MP Thami, MLA, Mangalamparambil House, Parathoor PO  
(Via) Pattambi, Pallippuram, Palakkad Dist.
- Sri Johny Nelloor, MLA, House No. 8, Housing Colony,  
Muvattupuzha
- Sri KC Joseph, MLA, Congress House, Sreekanthapuram,  
Kannur
- Sri TV Chandramohan, MLA., 14/587, Govind, Puzhakkal  
Road, Punkunnam, Thrissur-2
- Smt Saraswathy Kunjukrishnan, Kalangara Vee'du, Kollam
- Sri Ahammed Bavappa, Munayamkunnu, Eravukadu,  
Kumaranelloor, 679 555, Palakkad Dt.
- Sri PC Nair, Thripathi, Engineers Line, Thrissur
- Sri Joseph Alappat, Thoppil, Green Gardens, Karanchira
- Sri CK Joseph, Chamachaparambil, Ramangari P. O.  
Kuttanadu
- Sri KK Velayudhan, Karshakashri
- Sri Prayar Gopalakrishnan, Chairman, Milma,  
Thiruvananthapuram

### **FACULTY RESEARCH COMMITTEE**

#### **I. AGRICULTURE**

Director of Research, KAU	Chairman
Director of Extension, KAU	Member
Dean, College of Agriculture, Vellayani	"
Assoc. Dean, College of Hort., Vellanikkara	"
Assoc. Director of Research (AR&T)	"
Assoc. Director of Research (M&E)	"
Assoc. Director of Research (Plg)	"
Assoc. Director, RARS, Ambalavayal	"
Assoc. Director, RARS, Pattambi	"
Assoc. Director, NARP (Southern Region, College, of Agriculture Vellayani	"
Assoc. Director, RARS, Kumarakom	"
Assoc. Director, RARS, Pilicode	"
Assoc. Dean, College of Co-operation & Banking, Mannuthy	"
Special Officer, College of Forestry, Vellanikkara	"
Heads of Departments in the Faculty of Agriculture	"

ii. VETERINARY & ANIMAL SCIENCES (FRC)

Director of Research, KAU	Chairman
Dean, Faculty of Vety. & Animal Sciences	Member
Director of Extension, KAU	"
Assoc. Director of Research (V&AS)	"
Heads of Departments in the Faculty of Veterinary & Animal Sciences	"
Professor (Farms)	"
Director, Veterinary Research & Education	"
Professor, Co-ordinated Project on Agrl. Bye-products	"
Professor (Project Co-ordinator) Cattle and Buffaloe	"
Professor (Research Co-ordination)	Secretary & Convenor

iii AGRICULTURAL ENGINEERING (FRC)

Director of Research, KAU	Chairman
Dean, Faculty of Agrl. Engineering	Member Secretary
Director of Extension, KAU	Member
Heads of Departments in the Faculty of Agrl. Engg.	
Professor of Agri. Engineering, College of Agriculture, Vellayani	
Prof. Raghavan Nambiar, Head, Dept. of Civil Engineering, College of Engg., Thrissur	
Dr AN Namboodiri, Director, TBGRI, Thiruvananthapuram	

iv. FISHERIES (FRC)

Director of Research	Chairman
Dean, Fisheries	Member
Director of Extension, KAU	"
Professor (Fisheries Research)	Secretary
Heads of Departments in the Faculty of Fisheries	Member
Head, Dept. of Fishing Technology, College of Fisheries, Panangad	
Head, Dept. of Management Studies, College of Fisheries, Panangad	

*Extension Advisory Committee*

Vice-Chancellor, Kerala Agricultural University, Vellanikkara	Chairman
Director of Extension, Kerala Agricultural University, Mannuthy	Member-Convenor

**Non-officials from General Council and  
Executive Committee (Govt. State)**

To be nominated

**Govt. Officials - State**

Development Commissioner Govt. of  
Kerala, Thiruvananthapuram  
(Or Nominee Additional Commissioner for  
Rural Development Department, CSI  
Buildings, LMS Compound, Thiruvananthapuram) Member  
Director of Agriculture, Vikas Bhavan

Thiruvananthapuram  
(Or Nominee - Additional Director of  
Agriculture (Extension), Vikas Bhavan  
Thiruvananthapuram)

Director of Animal Husbandry, Vikas  
Bhavan, Thiruvananthapuram (or nominee

Director of Dairy Development, Pattom,  
Thiruvananthapuram (or nominee)

Director of Fisheries, Vikas Bhavan,  
Thiruvananthapuram

(Or Nominee - Additional Director,  
Fisheries, Thiruvananthapuram)

Chief Conservator of Forests, Chief Forest  
Conservators Office, Thiruvananthapuram

(Or Nominee - Forest Conservator, Thrissur)

Registrar of Co-operative Societies  
Vazhuthacaud, Thiruvananthapuram

(Or Nominee - Additional Registrar (General)  
Office of the Registrar of Co-operative

Societies, Thiruvananthapuram)

Principal Information Officer, Farm Information  
Bureau, Thiruvananthapuram

**Other Science and Technology Organisations**

Director, State Committee on Science,  
Technology and Environment (STEC);  
General Hospital Road, Thiruvananthapuram Member

**Mass Media**

Station Director, All India Radio,  
Thiruvananthapuram

Station Director, All India Radio, Thrissur

Station Director, All India Radio, Kozhikode

Editor-in-chief, Kerala Kaumudi Daily,  
Pettah, Thiruvananthapuram

Sri MC Varghese, Chief Editor, Mangalam Daily

P. B. No. 1, Kumaranelloor P. O. Kottayam

### *Commodity Boards*

Joint Director, Publications and Public Relation, Rubber Board, Sastri Road, Kottayam	Member
Director, Spices Board, St. Cross Vincent Road, Kochi	"

### *Voluntary Organisations*

Fr. Joseph Muttumana, Peoples Dairy Development Project, Mattur, Kalady, Ernakulam District	"
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### *Kerala Agricultural University*

Dean, College of Agriculture, Vellayani	"
Director of Research, KAU, Vellanikkara	"
Dean, College of Vety. and Animal Sciences, Mannuthy	"
Dean, College of Fisheries, Panangad	"
Dean, Kelappaji College of Agrl. Engineering and Technology, Tavanur	"
Associate Dean, College of Horticulture, Vellanikkara	"
Professor and Head, Department of Home Science, College of Agriculture, Vellayani	"
Professor and Head, Department of Extension College of Agriculture, Vellayani	"

### *Farmers*

Dr KC George, IX/49, Karanchira, Vettikkal PO, Ernakulam Dt. 682 313	Member
Sri MK Vijayaraghavan, Thrissur 680 007	"
Sri AM Varghese, Velangannoor Milk Society, Velangannoor	"

### *Variety Evaluation Committee.*

Director of Research, KAU	Chairman
Director of Extension, KAU	Member
Director, CTCRI or his nominee	"
Director, CPCRI or his nominee	"
Director, National Research Centre for Spices	"
Director of Agriculture or his nominee	"
Heads of Departments in the Faculty of Agriculture	"

Assoc. Director of Research (AR & T)	Member
Assoc. Director of Research (M & E)	"
Assoc. Director of Research (Plg)	"
Assoc. Director of Research, RARS, Pattambi	"
Assoc. Director, RARS, Ambalavayal	"
Assoc. Director, RARS, Pilicode	"
Assoc. Director, RARS, Kumarakom	"
Assoc. Director, Southern Region, Vellayani	"

*N. S. S. Advisory Committee*

Vice-Chancellor, Kerala Agricultural University	Chairman
District Collector, Thrissur	Member
Registrar, KAU	"
Agriculture Secretary, Govt. Secretariat, Thiruvananthapuram	"
Asst. Programme Advisor, NSS Regional Centre, Thiruvananthapuram	"
Co-ordinator, Training and Orientation Centre, Kalamassery	"
Professor of Agrl. Extension, College of Veterinary and Animal Sciences, Mannuthy	"
All Heads of Colleges having NSS Units of the KAU	"
President, KAU Students Union	"
Secretary, KAU Students Union	"
One Programme Officer from each of the College having NSS Units (In the case of colleges having more than one unit the Programme Officer to be included in the Committee will be nominated by the Dean of the College concerned)	"
State Co-ordinator, NSS, Govt. of Kerala, Thiruvananthapuram	"
Director, Mitraniketan, Thiruvananthapuram	"
Comptroller, KAU	"
Director of Students' Welfare, KAU	"
Programme Co-ordinator, NSS, Kerala University Thiruvananthapuram	"
Programme Co-ordinator, Calicut University	"
" MG University, Kottayam	"
" NSS Technical Cell, Thrissur	"
Programme Co-ordinator, NSS, KAU	Member-Convenor

*Post-graduate Committee*

Vice-Chancellor, KAU	Chairman
Director, PG Studies	Member
Dean, Faculty of Agriculture, KAU	"
Dean, Faculty of Vety: and Animal Sciences, KAU	"
Dean, Faculty of Agrl. Engineering, KAU	"
Director of Extension, KAU	"
Director of Research, KAU	"
Dean, Faculty of Fisheries, KAU	"
Assoc. Dean, College of Horticulture, Vellanikkara	"
Assoc. Dean, College of Co-operation and Banking, Mannuthy	"
Special Officer (Forestry), College of Forestry, Vellanikkara	"
Professor, Research Co-ordination (Agri)	"
Professor, Research Co-ordination (Vety)	"
Registrar, KAU	Convenor

*Sports Board*

Vice-Chancellor, KAU	Chairman
Director of Extension	Vice-Chairman
Heads of constituent colleges	Member
Chairman, Students' Welfare Committee	"
Student Representative in the Executive Committee	"
Teacher Representative in the Executive Committee	"
Comptroller, KAU	"
Director of Physical Plant	"
Teachers in Physical Education	"
Officers in charge of the Sports and Games of the Constituent Colleges where no teacher in Physical Education is available	"
Athletic Secretaries of Constituent Colleges	"
Dy. Director of Students' Welfare i/c, Convenor & Secretary	"

## Appendix III

### LIST OF STAFF AT HEADQUARTERS

Vice-Chancellor	:	Dr AM Michael
<i>Vice-Chancellor's Office</i>	:	
PS to Vice-Chancellor	:	CN Muraleedharan Nair retired on 30.11.94 Reappointed as PS to VC from 5.12.94 for one year
PA to Vice-Chancellor	:	K Sadasivan Nair
Sr. Office Supdt.	:	P Haridasan
Peon	:	V Krishnan retired on 30.9.94 TK Abdulla from 7.11.94 EK Padmanabhan A Ramachandra Babadur CP Karunakaran Nair
Driver	:	
<i>Registrar's Office</i>	:	
Registrar	:	EK Majhi
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
Asst. Registrar (Admn.) II	:	R Kamala Bai
Labour Officer	:	C Sasikumaran Nair
Recruitment Officer	:	T Aravindan
Section Officer	:	KK Gauthamy KP Ramachandran Nair VV Radhamma L Syamala TA Zainaba Beevi V Viswambharan AK Lyla R Remadevi PV Nalini MA Alikutty KV Sugunan KP Narayanikutty S Vanaja A Subhalakshmy Ammal

*Comptroller's Office*

Deputy Comptroller	:	O. Vinodakrishnan (upto 31.12.94) Lalitha Bai (from 4.1.95)
Asst. Comptroller IAC(CR)	:	R Kamala Bai (upto 31.5.94) VC Bharathan Pillai (upto 1.6.94)
Asst. Comptroller (B&P)	:	VR Sankarankutty
Asst. Comptroller (DD&A)	:	S Bhaskara Pillai (upto 20.12.94) DA Shyamala (from 21.12.94)
Asst. Comptroller (P&L)	:	S Krishnan Nair (from 23.12.94 to 24.2.95) K Rajamma (from 25.2.95)
Section Officer	:	KI Chakkunny CC Rosily KK Sadeesan PT Thankamany Susy Mathew R Thankamany KP Saramma NK Unnikrishnan CM Omana PA Lakshmy MN Sasidharan CV Santha M Rugmini KK Subramonian K Chandramohanan MN Vijayakumar

*Directorate of Students Welfare*

Section Officer : KR Dileepkumar

*Directorate of Research*

Admn. Officer Gr-II : V Balagopalan  
Section Officer : PR Sreedevikutty  
N Vijayakumar

*Directorate of Extension*

Section Officers : Usha Rani  
PV Sreekumar  
Programmer : Mollykutty George  
M Viswanathan Nair  
Junior Programmer : TA Sebastian

(on LWA from 3.3.1994 to  
10.8.95)



**Mal. Translator** : KN Chandralekha (upto 6.8.95)  
**Clerical Assistant** : TN Aravindakshan  
 T Sasi  
 P Christy John  
 KK Ramachandran  
 VA Ittira  
 K Thankamani  
 AN Saraswathy  
 V Sreedevi  
 PK Kamalakshy  
 Jolly D Karerakkattil  
 (from 11.4.94 to 18.5.95)  
 V Sunil Kumar  
 (from 2.5.94 to 8.7.94)

**Pool Officer** : N Somarajan

**Senior Office Superintendent** : PO Elsy  
 VB Leelavathy Amma  
 (P. A. to Comptroller)  
 KK Ramachandran Nair  
 VP Asokan (P.A. to Registrar)  
 P Haridasan (Steno to  
 Vice-Chancellor)  
 R Sadan  
 PR Sarojini  
 K Sadasivan Nair (P.A. to  
 Vice-Chancellor)  
 K Sathyavathybai

**Office Superintendent/Typist** : MA Bhargavi  
 KA Valsala  
 P Sarada  
 K Girija  
 IA Surendran  
 Sreemathy Kumari  
 MA Rajini  
 S Sudhakaran Nair (On deputation  
 to the P.S. of Minister of  
 Agriculture)  
 Z Sareena  
 VM Muraleedharan (Upto 6/94)  
 TA Vincent  
 K Vimala  
 L Sobhanakumari  
 S Remani  
 PK Easwary

A Vasantha  
AJ. Mary  
E Sathidevi  
TJ Leena  
P Subhashini (Steno to Director  
Acad)  
C Padmavathy (Upto 26.5.94)  
TG Jalaja (From 16.6.94)  
BK Padmaja (From 31.12.94)  
Abdul Azeez M (From 16.6.94)  
Savitha Devi (From 18.6.94  
to 9/95)  
MK Sajany  
A Nandakumar

**Directorate of Students Welfare**

Typist KM Mary (Steno to Director)

**Directorate of Extension**

Senior Office Supdt.

TD Jose  
PP Rosy (From 4.6.94)

Typist

AC Mancy  
PP Rosy (Upto 4.6.94)  
G Hareendran

**Directorate of Research**

Senior Office Supdt.

KN Santha kumari  
G Shanmughan  
K Saraswathy Amma  
Fathima Beevi

Typist

PT Ajith  
B Shiras  
PJ Elizabeth  
N Dasamma  
S Raghavan (Upto 6/94)  
A Ramachandran Unnithar  
P Baby (On working arrange-  
ment at Vellayani)  
Majida Beevi (From 6 94)

**Headquarters**

Sr. Gr. Asst.

A Abdul Kareem  
VA Achuthan  
MN Chandrasekharan  
V Chellamma  
K Dinesan  
PA Geetha  
K Haridasan  
M Jesseentha  
KC Joseph

Sr. Gr. Asst.

GV Kumar  
KK Kuttappan  
N Mary Joseph  
KS Paul  
PK Pushpaja  
A Santhakumari  
G Santhakumari  
VR Santhakumari  
C Sherly Mathew  
C Shobhanakumari  
K Subramonian  
KR Suresh  
PL Tony  
C Usha  
P Vijayakumari  
Vallinayakam Pillai  
Baby Saroja  
P Krishna Prakash  
ME Rajan  
KP Vasanthakumari  
TC Jose  
MV Lathika  
MA Many  
Mary Joseph  
K Mohanan  
P Mohini  
K Meera  
KV Ammalukutty  
CS Baburaj  
TJ Babychan  
Boby Abraham  
EK Dalika  
K Girindrababu  
VN Narayanan  
MP Narmada  
K Pradeep  
PP Prema  
KN Radhakrishnan  
K Sreekumar  
KB Sudha  
P Sudha  
KK Sunitha  
PS Sureshkumar  
PJ Thimose

Asst. Gr. I

: KP Gopi  
C Kunhunny  
TC Latha  
U Mukundan  
PN Ramesh  
CP Raphi  
PA Saraswathy  
V Unni  
EA Yousafali  
PK Ajayakumar  
EX Antony Joseph  
TM Asokan  
M Babu Varghese  
I Indira  
KD James  
KN Leela  
A Rajeswary  
AV Rathidevi  
C Raveendranathan  
PM Saradha  
C Sivadasan  
P Sreekumar  
PD Toney  
MA Ullas  
Varghese J. Ollukaran  
KP Sajan (Upto 30.10.94)  
PM Shanavas (Upto 30.10.94)  
Shakila Javad

Asst. Gr. II

·PB Abdul Kader  
·T Ally  
KS Jitha  
PK Kochu Paul  
NS Kumaranandan  
·KM Mohammad Iqbal  
·KK Sudharma  
·MV Sureshbabu  
·KN Santhamma  
·MB Manikantan  
EM Shaibu

*D. S. W., Mannuthy*

Sel Gr. Asst

D Sreekumari -

Asst. Gr. I

PV Sreedharan

·JK Venugopalan

*D. O. R., Vellanikkara*

Sel. Gr. Asst. : KF Mathew  
Sr. Gr. Asst. : VS Sathiaseelan  
Sheela A Attokaran  
Asst. Gr. I : MK Ajayakumar  
K Harinath  
A Sujathabhai  
Liakath Alikhan

*D. O. E., Mamuthy*

Sel. Gr. Asst. : PV Ramani  
Sr. Gr. Asst. : K Girish Babu  
K Indiradevi  
A Pradeep  
Ananthakumari  
VR Kochu  
IT Rappai  
TK Govindan  
VN Sankarankutty  
PK Sasidharan  
LDV Driver CP Karunakaran Nair  
KP Jose  
KM Subramanian  
KO John Stephen  
NA Sukumaran  
KA Jebbar  
(on leave without allowances)  
KC Chinnan  
TM Chacko  
N Sundaran  
KM Abubakker  
MS Reghu

(died on 16-6-95)

Binder : R Vijayan  
Class IV : TS Keralavarman  
Duffedar : MK Vasudevan  
Peon : EK Padmanabhan  
MN Vasu  
V Gopinathan  
KV Chetty  
V Krishnan  
AP Manikkan  
CO Varuni  
NV Sathoshkumar

	PE Thankappan
	VI Balan
	VA Mathew
	MK Thankappan
	KA Basheer
	TR Raveendran
	C Govindan
	K Saji Antony
	MD Roy
	PB Sivadasan
	VA Paily
	KM Ponnunon
	TK Abdulla
	TK Ismail
Peon	CP Kousallya
	KK Chandra
	PV Devoo
	TV Santha
	K Santha Kumari
	IR Vilasini
	PD Annamma
	A Kochammu
	PS Indira
	PA Santha kumari
	M Lakshmi Kutty
	KK Nabeesa
	PD Rosa
Watchman	A Ramachandra Bahadoo
Duplicator Operator	IR Govindan
	VM Gopinathan
	CA Divakaran
Bus Attendant	KA Abdul Rasheed
	Beer Bahadur Singh
	KC Krishnan
	M Jabbar
<b>Directorate of Physical Plant</b>	
Director of Physical Plant	PO Thomas
Executive Engineer	P Sreekumaran
PA to D.P.P.	PM Vasudevan from 8-6-94
Financial Assistant Gr.I	A Basil
Section Officer	KP Sreedharan
	PJ John
	KS Natarajan

Assistant	S Valsala	
	EN Savithri	
	Hrishikesan Nair from 2-7-94	
	VS Skandakumar	
	M Abdul Muthalavi	
	KM Akberali	
	B Sobhana upto 28-5-94	
	NV Annie	
	PM Latha	
	TK Sarada	
	VI Sureshkumar	
Senior Office Supdt.	PI Ittoop	
Office Supdt	N Haridas	upto 31-5-94
	Khadeeja Beevi	from 17-6-94
Typists	KA Geetha	upto 31-5-94
	TM Meera	
	MK Thakamani	upto 31-5-95
	MK Parukutty	
	PS Ranjitha	from 15-6-94
Blue printer-cum-Stere operator	Vacant	
Head Draughtsman Overseer	KV Ajitha	
	EA Radhakrishnan	
	TN Suresh Babu	
	ET Lal	
	PA Meera Bai	
	KG Ajithkumar	
Peon	CV Vijayan	
	NP Chandran	
	PI Kunjumol	
	MO Kochannam	
Driver	PK Sasi	
Mechanical Sub Division, Vellanikkara		
Assistant Executive Engineer :	TK Sugathan	
(Mech)		
Assistant Engineer (Civil) :	KP Baburaj	
Road Roller Driver :	MK Bhaskaran	
Pump Operator :	KM Baby	retired on 31-10-94
	KK Francis	
	VB Eusaf	
	A Narayanan	
	CC Velayudhan	
	MS Mohanan	
	PV Kumaran	retired on 31-7-94
	CM Prabhakaran	upto 17-6-94
	VK Ramachandran	
	KA George	

Assistant : Y Rajas from 1-6-94  
MA Sahida Beegam

Typist : VH Umaiva

Peon : VA Pareed

**Electrical Sub Division, Vellanikkara**

Asst. Exe. Engineer (Ele) : PM James

Asst. Engineer (Ele.) : AJ Anto  
B Lukose

Tech. Supervisor : CA Varghese

Lineman : KV Ravi (expired on 30-9-94)

Assistant : Naveen Narayanan

Typist : OA Ushakumari

Peon : KK Balan

**Engg. Sub Division, Vellanikkara**

Asst. Exe. Engineer : K Savy Joseph

Asst. Engineer : PM Vasudevan (upto 7.6.94)  
MV Chakoan

Overseer : B Mohamed Irshad  
V Unnikrishnan  
AV Kesavan  
(from 3.5.94 to 31.5.94)  
CK Nazerudheen on LWA  
KN Sathees

Assistant : T Jagadeesan  
MS Valsalakumari (upto 8.7.94)  
M Lyla (from 9.7.94)

Typist : PM Mumtaz

Driver : MA Joseph (LDV)

Peon : C Mukundan Nair

Class IV : O Asokan (upto 17.7.94 on  
working arrangement at KVK,  
Ambalavayal)  
Mohammed (18.7.94 to 31.3.95  
on W/A at RARS, Ambalavayal)

**Engg. Sub Division, Mannuthy**

Asst. Exe. Engineer : PR Govindan

Asst. Engineers : P Raman  
KV Ramanunni  
CI Sali

Technical Supervisor : PK Vijayan  
TS Govindan



**Overseer** : CA James  
 PH Salim  
 KV Sanilkumar  
 Mathews M. Kizhakoot  
**Pump Operators** : MV Parameswaran  
 MR Parameswaran  
 TM Kesavan  
**Section Officer** : EK Bharathy  
**Assistant** : AT Gracy (upto 5.12.94)  
**Typist** : Rosy K Francis  
**Peon** : Man Bahadur

**Engg. Sub Division, Vellayani**

**Asst. Executive Engineer** : K Suresh Babu  
**Asst. Engineer** : CV Vivekanandan  
**Section Officer** : VM Lalithakumari (upto 21.6.94)  
 Parukutty (from 21.6.94)  
**Assistant** : B Sukesan (upto 31.7.94)  
 Jeslet Mercy  
 N Valsan  
**Office Supdt.** : P Lalitha  
**Overseer** : V Hariharan  
 KHM Abdul Kader  
 VM Roy  
**Driver** : P Reghunathan Nair  
**Peon** : J Thampikunhan

**Electrical Sub Division, Vellayani**

**Asst. Exe. Engineer (Ele.)** : EK Gokulan  
**Asst. Engineer (Ele.) I/c.** : AJ Anto  
**Overseer** : Vacant  
**Asst.** : Chandrikakumari  
 PKrishnakumari (from 26.12.94)  
**Typist** : T Santha  
 S Rosemary  
**Peon** : A Sathyan

**Engg. Sub Division, Panangad**

**Executive Engineer** : P Sreekumaran  
 (deputation from State P.W.D)  
**Asst. Engineer** : AP Satheesan  
**Overseer** : Sabu Paul Mulericak  
 PT Joy  
 MY Sunny  
 SR Antony (from 14.9.94)  
 Saji Markose (upto 6.7.94  
 from 7.7.94 on leave)

Section Officer	: KM Vincent Pereira
Assistant	: Prema B Nair
	: KB Jaya
Office Supdt.	: TK Ponnamma
LDV Driver	: AP Chacko
<b>Engg. Sub Division, Tavanur</b>	
Asst. Exe. Engineer	: PM Mohammed Ismail
Asst. Engineer	: TK Abdul Kader
	: KT Vasudevan
	: M Vijayakumari
Overseer	: P Manoj
	: KK Anilan
	: AV Kesavan
	: V Poullose
	: CV Ambujam
Section Officer	: K Leelamma upto 8.6.94
	: C Assainar from 9.6.94
Typist	: A Mohamedali
Driver	: PK Kunhiraman
Peon	: M Sundaram
	: KP Manikandan (from 8.6.94)

## Appendix IV

### LIST OF STAFF AT VARIOUS CAMPUSES

#### *College of Agriculture, Vellayani*

Dean i/c	: Dr C Sreedharan
Research Co-ordination	: Dr KM Rajan
Department of Agronomy	: P Chandrasekharan
Professor & Head	MR Chidananda Pillai
	Dr V Muraleedharan Nair
Associate Professor (NC)	: Dr VL Geetha Kumari
	Dr Kuruvilla Varghese
	Dr R Pushpa Kumari
	PN Latif
Asst Professor	: K Viswambharan
Department of Soil Science and Agrl Chemistry	
Professor & Head	Dr P Padmaja
	Thomas Varghese
	Abdul Hameed
	Dr Alice Abraham
	Dr PA Korah
Associate Professor	: Dr S Pushkala
	Dr K Babukutty
	Dr VK Venugopal
	Dr P Rajendran
	P Prabhakumari
	P Ushakumari
	Usha Mathew
Department of Plant Breeding & Genetics	
Professor and Head	: Dr PD Vijayagopal
	(From 18-4-94)
	Dr R Gopimony
Professor	: Dr P Manikantan Nair
	Dr ST Mercy
Associate Professor	: N Kamalam
	Dr D Chandramony
	DS Radha Devi

Assistant Professor : D Wilson  
KM Abdul Khader  
C Lekha Rani

**Department of Plant Physiology**

Professor & Head : Dr S Seshadrinath

Associate Professor (NC) : Dr Maya Devi

**Department of Horticulture**

Professor & Head : Dr G Sreekantan Nair

Assoc. Professor (NC) : Dr BK Jayachandran  
Dr GS Jayachandran Nair  
Dr BR Reghunath  
K Rajmohan

Asst. Professor : Sabeena George  
VL Sheela  
I Sreelatha Kumari

**Department of Agricultural Entomology**

Professor & Head : Dr John Kurian

Professor : Dr G Madhavan Nair  
Dr K Sasidharan Pillai  
Dr George Koshy  
KK Ravindran Nair  
KS Remamony  
Dr A Visalakshy

Assoc. Professor : Dr K Susamma Mathai  
R Santhakumari  
K Saradamma

Assoc. Professor (NC) : PA Rajan Asari

Asst. Professor : Devanesan

**Department of Plant Pathology**

Professor and Head : Dr M Chandrasekharan Nair

Professor : Dr CK Peethambaran  
Dr Susamma Philip  
Dr P Karunakaran  
Dr Sasikumar Nair  
Dr KJ Alice

Associate Professor : Dr B Rajagopalan  
S Bhavani Devi

Associate Professor (NC) : P Sivaprasad  
P Santhakumari  
A Naseema  
Dr M Vijayan

Assistant Professor : Dr Lulu Das

**Department of Agrl. Economics**

Professor	:	K Venugopal ER Narayanan Nair
Assistant Professor	:	Raviraman Elsamma Job

**Department of Agrl. Extension**

Professor and Head	:	Dr B Babu
Associate Professor (NC)	:	Dr S Bhaskaran Dr VB Padmanabhan Dr S Shylaja Dr Mothilal Nehru
Associate Professor	:	M Mohammed Hussain
Assistant Professor	:	Dr N Kishore Kumar

**Department of Agrl. Statistics**

Professor and Head	:	Dr P Saraswathy
Assistant Professor	:	Brigit Joseph P Soudamini

**Department of Animal Husbandry**

Professor	:	Dr Skariah Oommen
Associate Professor (NC)	:	Dr MR Rajan
Associate Professor	:	Dr R Vijayan (on study leave)

**Department of Home Science**

Professor and Head	:	Dr L Prema
Associate Professor	:	NK Vimala Kumari
Associate Professor (NC)	:	P Mary Ukkuru
Assistant Professor	:	P Geetha Subaida Beevi Rari John C Nirmala Soffi Cheriyān B Prasanna Kumari Chellammal M Rajani

**Department of Agricultural Engineering**

Professor and Head	:	Dr AN Remadevi
Associate Professor	:	MS Thomas
Assistant Professor	:	Bini Sam

**Department of Physical Education**

Associate Professor	:	AC Marykutty
Assistant Professor	:	S Pazhania Pillai

**Instructional Farm**

- Professor : Dr M Oommen  
(upto 12.8.94)
- Associate Professor : Dr Harikrishnan Nair  
(from 13.8.94)
- Associate Professor (NC) : CA Mary  
Dr Suharban
- Assistant Professor : P Babu Mathew  
PB Usha

**Instructional Farm***Administrative/supporting staff*

- Administrative Officer : Kochukunju  
(retired on 31.1.95)  
Krishnan Nair  
(from 1.2.95)
- Section Officer : MN Sreedevi  
Fatima Malar

**College of Agriculture, Vellayani***Administrative and Supporting Staff*

- Administrative Officer : L Wilson  
(Retired on 31.5.95)
- Section Officer : K Ravikumar  
V Chandrika  
Janardhanan  
P Jameela  
VM Lalithakumari  
CP Padmakumari  
S Saraswathy Amma  
J Remadevi Amma  
R Vasumathy

**College of Horticulture, Vellanikkara**

- Associate Dean : Dr CC Abraham

**Department of Agronomy**

- Professor & Head : Dr IPS Nambiar  
(Dr R. Vikraman, Nair holding  
additional charge as Head from  
28-6-94 AN)

- Associate Professor : Dr NN Potty Professor
- Assistant Professor : (Dr R Gopinathan  
Associate Professor (NC)  
Dr KE Savithri  
Associate Professor (NC)  
Dr Mercy George

Farm Assistant Grade I : VD Thulasi Das  
 Lab Assistant : K Govindankutty  
 Peon : Vacant  
**AICRP on weed control**  
 Associate Professor : Dr P Sreedevi  
 (Agron.) : Associate Professor (NC)  
 upto 29-5-94  
 Dr CT Abraham  
 Associate Professor (NC)  
 from 30-5-94  
 Assistant Professor : KM Durga Devi (from 1-10-93)  
 (Residue Chemist)  
 Assistant Professor : K Arya (upto 30-6-94)  
 (Plant Taxonomist)  
 Farm Assistant Gr. I : PB Bhashajan (upto 28-6-94)  
 PM Joshy (from 29-6-94)  
 Assistant Gr. I : VK Sobhana (upto 29-7-94)  
 KJ Shibu (from 30-7-94)  
 LDV Driver : VR Chandran (upto 4-1-94)  
 Mathai Kurian  
 (from 5-1-94 to 30-3-94)  
 Vacant from 1-4-94  
 Class IV : KG Gopalakrishnan  
**Department of Agrometeorology**  
 Professor and Head : Dr P Balakrishna Pillai  
 Assistant Professor : Dr AVR Keshava Rao  
 AS Anilkumar (from 5-9-94)  
**Department of Agricultural Botany, Plant Breeding and Genetics**  
 Professor and Head : Dr KMN Namboodiri  
 (upto 23-2-95)  
 Assistant Professor : Dr K Pushkaran  
 Associate Professor  
 (Holding the charge of Head  
 of Dept. from 24-2-94)  
 Dr Achamma Oommen  
 Associate Professor (NC)  
 Dr KT Prasanna Kumar  
 T Girija  
 Vacant  
 Lab Assistant Gr. III : P Narendran

### Department of Agricultural Economics

- Professor and Head : Dr V Radhakrishnan  
Associate Professor : Dr K Mukundan  
Professor  
Assistant Professor : Dr EK Thomas  
Associate Professor (NC)  
K Satheesh Babu  
3 posts vacant  
Includes 2 posts created for  
the Faculty of Basic Science  
and Humanities  
Senior Grade Typist : S Geetha Bai  
(Faculty of Basic Sciences  
and Humanities)

### Agricultural Entomology

- Professor of Entomology : Dr Baby P Skaria  
Associate Professor (NC)  
Posted against Professor's post  
Dr TS Venkitesan  
(upto 21-4-94)

~~Associate Professor~~

Assistant Professor

- : Dr Jim Thomas (NC)  
: Dr D Seetharama Rao  
Associate Professor (NC)  
Dr Sosamma Jacob  
Associate Professor (NC)  
Dr AM Ranjith  
Associate Professor  
R Ushakumary

Lab Assistant Gr. III

- : TV Parameswaran  
(upto 16-4-94)  
PK Anandan (from 17-4-94)  
Vacant

### AICRP NO BCCP & W

Associate Professor (Ent)

- : Dr PJ Joy  
Professor

Assistant Professor

- : NV Satheesan

Technical Assistant

- : KV Dinesan

Farm Assistant

- : TR Radhakrishnan  
MT Varghese



**Department of Agricultural Engineering**

- Professor and Head : Vacant  
Assistant Professor : MR Sankaranarayanan  
Subha Rani Kurien  
from 30-01-1995  
2 posts vacant  
Technician : KV Johny  
P Balakrishnan

**Department of Agricultural Extension**

- Associate Professor and Head : C Bhaskaran  
Associate Professor (N/C)  
Assistant Professor : Dr Ranjan S Karippai  
Associate Professor (N/C)  
Dr PS Geethakutty  
Dr NP Kumari Sushama  
Audio Visual Operator : Vacant  
Home Science Unit  
Assistant Professor : Dr V Indira  
Associate Professor (N/C)  
Dr V Usha  
Associate Professor (N C)  
Norma Xavier  
Vacant

**Department of Agricultural Statistics**

- Professor and Head : PV Prabhakaran  
Associate Professor : VKG Unnithan  
Assistant Professor : Graceamma Kurien  
KA Mercy upto 22-10-94  
S Krishnan  
KL Sunny  
Associate Professor (N/C)  
upto 31-03-95  
TK Ajitha  
P Soudamini from 10-06-94  
Junior Programmer : Vacant  
Technical Assistant : Joicy T. John

**Department of Olericulture**

- Professor and Head : Dr S Rajan  
Associate Professor  
(Holding charge)  
Associate Professor : Dr KV Suresh Babu  
Assistant Professor  
Assistant Professor : P Indira  
Baby Lizzy Markose

Assistant Professor : KP Prasanna  
 K Krishnakumari  
 Dr TE George  
 Assoc. Professor (N/C)  
 (upto 16-5-'94)  
 Dr Salikutty Joseph  
 Assoc. Professor (N/C)  
 (from 17-5-'94)

**Vegetable seed production complex,**

Asst. Professor : Meagle Joseph  
 PG Sadhankumar (from 6-5-'94)  
 Farm Supervisor : KV Eliamma (upto 30-4-'94)  
 Farm Asst. : PK Kalyani (from 1-5-'94)  
 L Radhammal  
 Ramachandran (from 14-12-'94)  
 Lab Assistant : AP Augusthy  
 Typist : PS Shylaja

**AICVIP**

Asst. Professor (Hort). : Dr M. Abdul Vahab  
 Assoc. Professor (N/C)  
 Dr S Nirmala Devi  
 (Pl. Pathology) : Dr Sally K Mathew  
 Assoc. Professor (N/C)  
 Farm Asst. Gr. I : K Vijayanarayanan  
 PA Abdul Majeed  
 (upto 25-5-'94)  
 Padma Narayana Pillai  
 (from 13-6-'94)

**Department of Plantation Crops and Spices**

Professor and Head : Dr EV Nybe  
 Assoc. Professor (N/C)  
 (Holding charge)  
 Asst. Professor : S Prasannakumari Amma  
 Associate Professor (N/C)  
 Dr Alice Kurian  
 Assoc. Professor (N/C)  
 A Valsala  
 Assoc. Professor (N/C)  
 S Sujatha  
 M R Shylaja  
 Sissamma Joseph  
 C Rajendran (from 1-1-'95)  
 One post shifted from Dept.  
 of Pomology & Floriculture

Farm Assistant : T Raveendran  
T Sidharthan  
One post is in KADP

Lab Assistant : KK Chandran  
KV Padmavathy

**Manpower development scheme of the Coffee Board**

Asst. Professor : R Keshavachandran

**PG Diploma in Natural Rubber Production (NRP)**

Asst. Professor : Dr PA Nazeem  
Assoc. Professor (N/C)

Farm Assistant : P Bhaskaran

**Pepper Unit**

Farm Assistant : Vacant

**Cadbury-KAU Cocoa Research Project (CCRP)**

Professor and Head : Dr R Vikraman Nair

Assoc. Professor : Dr VK Mallika

(Pl. Breeding)

„ (Pl. Pathology) : Dr Koshy Abraham

Assoc. Professor (N/C)

Farm Assistant : PK Haridas

KV Natarajan

Office Assistant : S Sreelal

PV Mohanan

LDV Driver : KM Davy

Farm Assistant : AG Rajendra Babu

(DBT Scheme)

M George

**AICRP on Medicinal and Aromatic Plants**

Assoc. Professor : TV Viswanathan

Asst. Professor (Agronomy) : Dr EK Lalitha Bai

(Bio Chemistry) : Dr A Augustine

Technical Asst. (Farm Asst.) : CA Mathew

VJ Paul

Fieldman : MN Pavithran

Lab Assistant : KV Padmavathy

Working arrangement to Dept.  
of Plantation Crops & Spices

Beldar (Class IV)

CC Babu

TE Abdul Muthaleef

K Krishnankutty

Clerk-cum-Typist

Vacant

### **Department of Pomology and Floriculture**

<b>Professor and Head</b>	: Dr PK Rajeevan Associate Professor (N/C) (holding charge)
<b>Assistant Professor</b>	: Dr PK Valsalakumari Associate Professor (N/C) Dr Lila Mathew Associate Professor (N/C) Dr NK Parameswaran Associate Professor (N/C) Dr Sarah T George Dr CK Geetha Dr Sajan Kurien
<b>Farm Assistant</b>	CB Sugathan VCM Das Jayanthi
<b>Lab Assistant</b>	TA Kunhan
<b>AICFIP</b>	
<b>Associate Professor</b>	Dr PK Rajeevan Associate Professor (N/C)
<b>Assistant Professor</b>	A Sobhana (upto 7-3-96) Dr TP Murali A new post sanctioned with effect from 1-4-94
<b>Mali</b>	CA Muthu CP Elsy

### **Department of Processing Technology**

<b>Professor and Head</b>	VK Raju Associate Professor (N/C) (holding charge)
<b>Assistant Professor</b>	VK Raju Associate Professor (NC) KB Sheela MC Narayanankutty (upto 18-9-94)
<b>Processing Tech. Asst</b>	KL Karthikeyan Pillai On deputation from the Dept. of Agriculture
<b>Lab Assistant</b>	KG Krishnan

## Department of Plant Pathology.

Professor and Head	CK Ramakrishnan, Professor (upto 14-6-94) Dr James Mathew, Professor. (from 15-6-94)
Professor	Vacant
Associate Professor	Dr A Sukumara Varma Dr S Balakrishnan, Professor (upto 18-5-94) Dr B Balakrishnan Associate Professor (N/C) (from 28-5-94 to 9-12-94) 2 posts vacant
Assistant Professor	TN Vilasini Associate Professor (N/C) Anita Cheriyān S Beena (upto 19-9-94) 2 posts vacant
Assistant Professor (Microbiology)	Dr MV Rajendran Pillai Associate Professor (N/C)
Farm Assistant	NJ Eliamma
Lab Assistant	V Nandakumaran CO Mercy

## Department of soil Science and Agricultural Chemistry

Professor and Head (1) (Against the post of project Co-ordinator (S&A) shifted from College of Agriculture, Vellayani)	Dr AI Jose
Associate Professor	K Leela Dr NP Chinnamma (Professor) -Vacant Dr KC Marykutty
Associate Professor, (Soil Physics)	
Assistant Professor	Dr KA Mariam Associate Professor (N/C) Dr PK Sushama Associate Professor (N/C) Vacant
Assistant Professor (Bio-Chemistry)	Dr Jacob John
Lab Assistant	K Ruckiya P Unnikrishnan KK Prabhakaran

Duplicator Operator	: CD Jose
Peon	: MV Eliamma
Typist	: KM Mary
<b>Scheme for Coconut Nutrition and Physiological Disorders</b>	
Assistant Professor	CS Gopi Associate Professor (NC) Dr MA Hassan Associate Professor (NC) V Rajendra Prasad
Assistant Engineer (Electronics)	
Lab Assistant	PK Narayanan
LDV Driver	Vacant
<b>Radio Tracer Laboratory</b>	
Professor (Radio Tracer)	: Dr P Abdul Wahid
Associate Professor (Safety Officer)	: NV Kamalam
Assistant Professor (Agronomy)	: Dr PV Balachandran Associate Professor (NC)
Assistant Professor (SS & AC)	: Dr VK Venugopal Associate Professor (upto 1-6-94) Dr N Saifudeen Associate Professor (NC) (from 16-6-94)
Assistant Professor (Microbiology)	: D Girija (upto 9-9-94)
Typist	: K Padinavathy
<b>Instrumentation Wing</b>	
Associate Professor (Instrumentation)	: K Madhavan Nair
<b>Dept. of Physical Education</b>	
Assistant Professor	: E Soman Associate Professor (NC)
<b>Instructional Farm, Vellanikkara</b>	
Professor (Agronomy)	: Dr KK Ibrahim Assistant Professor (holding the charge from 1-2-94)
Assistant Professor (Agron/Hort)	: Vacant
Assistant Professor	: Vacant
Administrative Assistant	KA Mohammed
Assistant	UP Davis PR Murali

Typist : CR Sasidharan  
 Farm Assistant : CV Thomas  
                   MP George  
                   B Radha  
                   VN Gopi  
                   NT Satheesh Babu  
 Technician : KO Porinchu

**College of Co-operation and Banking, Mannuthy**

**Dept. of Co-operative Management**

Professor : Vacant  
 Associate Professor : Vacant  
 Associate Professor : Dr PC Mathew  
 Assistant Professor : Philip Thomas  
                           AM Jose  
                           E Vinaikumar  
                           G Veerakumaran  
                           EG Renjithkumar

**Dept. of Rural Marketing Management**

Professor : Vacant  
 Associate Professor : N Rajan Nair  
                           One post vacant  
 Assistant Professor : KN Ushadevi  
                           Philip Sabu  
                           A Sukumaran  
                           M Mohanan  
                           Vanaja Menon

**Dept. of Rural Banking & Finance Management**

Associate Professor : Vacant  
 Assistant Professor : EVK Padmini  
                           Molly Joseph  
                           Jaya S Anand  
                           KM George  
                           MA Lizzy

**Dept. of Development Economics**

Professor : Vacant  
 Associate Professor : M Mohandas  
                           N Ravindranathan  
 Assistant Professor : P Shaheena  
                           IP Mani  
                           KA Suresh  
                           KA Sunanda  
 Asst. Professor (Ag. Stat.) : KS Sujatha

Asst. Professor Co-operative Management	Dr G Veerakumaran (from 9.11.94)
Asst. Professor Rural Marketing Management	Vanaja Menon (from 1.11.94) KN Usha Devi
Asst. Professor Co-op. Management	EG Renjithkumar
Asst. Professor Development Econ.	KA Sunanda (from 7.12.94)
Asst. Professor Rural Banking & Finance Management	MA Lizzy (from 26.11.94)
Administrative Officer Section Officer	D Gilbert (Gr. I) PM Balakrishnan PK Manikutty KV Lalithamma T Vijayalakshmi TB Latha KN Sarojini VK Sobhana Mabel Philip (HG) VT Kurian K Leela VC Mariamma TK Sukumari PA Francis V Gopalakrishnan PB Abdul Rahiman TK Ismail PD Rosa CK Shylaja M Radhakrishnan
Sr. Gr. Assistant	
Asst. Gr. I	
Senior Office Supdt. Office Supdt. Sel. Gr. Typist	
Duplicator Operator Driver (LDV) Peon	
Reference Asst. Hostel Manager	
<i>CRS, Anakkayam</i>	
Associate Professor Assistant Professor	KC Chandy PV Nalini PB Pushpalatha K Aboobacker Farm Supervisor (from 28.10.94) Sreenivasan Palasseri KV Balakrishnan EU Kunhimoideen V Ponnappan
Farm Assistant	
Mali Regular Mazdoor Lab Assistant	



Assistant	: C Rajagopalan
Typist	: KT Vijayalakshmi
Peon	: C Mohammed
Full Time Sweeper	: KP Kadiyumma
Security Guards	: VK Veugopalan K Bhaskaran

*Farming Systems Research Station, Sadanandapuram and  
Krishi Vigyan Kendra, Kollam*

**FSRS Sadanandapuram**

*Scientific staff*

Assoc. Professor	Dr K Vasanthakumar
(Horticulture)	(upto 30.9.94)
(Soil Science)	Sumam George (upto 11.11.94)
Asst. Professor	
(Agronomy)	Dr S Chandini S Lekshmi (upto 30.9.94)
(Entomology)	Kunjamma P Mathew (upto 30.9.94)
(Plant Pathology)	: Dr KK Sulochana (upto 25.5.94) Dr S Ravi (from 3.6.94)
(Agril. Economics)	: Dr S Rageena
(Horticulture)	: Darley Jose
Veterinary	: Dr MO Kurien (upto 30.9.94)
(Soil & Water Conservation)	: Gomathy Sarojam (upto 20.5.94) (Provisional) (30.5.94 to 30.7.94) (27.8.94 to 25.11.94).

*Para technical staff*

Farm Asst. Sr. Gr.	: D Vighrahanathan (upto 30.9.94)
Farm Asst. Gr. I	: PA Sankutty EN Raveendran Nair TK Ajmalkhan (from 31.12.94)
(Vety.) Gr. I	: P Valsalakumari (upto 30.9.94)
Agril. Tech. Gr. I	: A Raju
Lab Asst. Gr II	: Vacant
Jeep Driver	: V Sasidharan Nair (upto 30.7.94) (Provisional) K Sasidharan (1.9.94 to 26.2.95) (Provisional)
Peon (Hr. Gr.)	: N Krishnan Nair (upto 30.11.94) P Sunil Kumar (from 20.2.95)

*Administrative staff*

Administrative Asst.	: M Abdul Salam D Suprabha (upto 30.9.94)
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Assistant Gr. I	: PK Mohanan (from 16.12.94)
	: N Ponnamma
Typist Gr. I	: N Ponmani Mohana
	: (from 26.12.94)
	: R Usha (upto 24.10.94)
<b>Krishi Vigyan Kendra</b>	
<i>Scientific staff</i>	
Associate Professor	: Dr K Vasanthakumar
	: (from 1.10.94)
Asst. Professor	
Extension	: FMH Kaleel (from 10.10.94)
Agronomy	: S Lekshmi (from 1.10.94)
Horticulture	: Asha Sanker (from 3.10.94
	: to 31.1.95)
	: P Sukumari (from 1.2.95)
Plant Protection	: Kunjamma P Mathew
	: (from 1.10.94)
Animal Science	: Dr MO Kurien (from 1.10.94)
Home Science	: Rari John (from 15.10.94)
<i>Para technical staff</i>	
Farm Assistant	: D Vighranathan (from 1.10.94)
	: P Valsala kumari (from 1.10.94)
	: AR Venu (from 7.12.94)
<i>Administrative staff</i>	
Senior Gr. Asst.	: C Chandrika kumari
	: (from 27.10.94)
Assistant Gr. I	: D Suprabha (from 1.10.94)
Typist Gr. II	: R Usha (from 1.10.94)
<i>Auxiliary, Supporting staff</i>	
Driver, LDV	: Vacant
Peon	: N Krishnan Nair (from 1.12.94)
Class IV <sup>TC</sup>	: T Mohandas (from 9.3.95)
	: G Pushpaleela (from 28.2.95)
	: Vacant
<b>RRS, Kayamkulam</b>	
<b>Research on Rice (Non-Plan)</b>	
Professor (Pl. Breeding)	: Dr K Sivan Pillai
	: Professor & Head
Assoc. Professor (Pl. Path)	: KP Jagan Mohan
Asst. Professor (Agron)	: Sri Johnkutty
	: (On study leave for Ph. D.)
	: (Ag. Ent)
	: G Suja
	: (M.C.P. (S.S. & A.C.)
	: M Indira

**NARP Phase-II**

Assoc. Professor (Hort) : Dr Shyam S Kurup

**AICRP on Oil Seeds**

Assoc. Professor (Pl. Br N/C) : Dr Sverup John

Asst. Professor (Agron) : Dr P Sushamakumary

**Administrative and supporting staff****Research on Rice (Non-Plan)**

Administrative Assistant : B Thankamony

Asst. Sr. Gr. : K. Govindan

MP Vijayachandra Babu

Typist Sr Gr : K Sobhana (from 8-6-94)

Peon : T Balakrishnan

Watchman : K Bhaskaran

V Sindhu

Jeep Driver : PS Babu upto 8-6-94

Vacant from 9/6/94

(Drivers on Temp.basis engaged for the remaining period)

Full time Sweeper : N Rajamma

Lab Asst. Gr. III : MG Thomas

**AICRP on Oil Seeds**

Lab Asst. Gr. II : N Padmakaran Pillai

**Research on Rice (Non plan)**

Farm Supervisor (Gr. I) : A Mohammed Kunju

upto 10-1-94

Farm Assistant Sr. Gr. : R Satheesan

(Holding charge of F.S.)

N Vasudevan from 8-6-94

Farm Asst. Gr. I : D Prasannakumar

VJ Rajamohan

**AICRP on oil seeds**

Farm Asst. Gr. I : TK Vijayan

**Res. on Rice (Non plan)**

Regular Mazdoor : N Viswanathan

N Raveendran

**NARP Phase II**

Tractor Driver : R Thankappan

**ECF Unit, Kayamkulam****Scientist**

Assoc. Professor (Agronomy) : Abraham Varghese

G Shaji

**Technical & Supporting staff**

Farm Assistant : S Nazeema  
TJ Mathew  
KC Sanuprasad  
PC Girijavallabhai  
AA Abdullah  
PA Abdul Majeed  
(from 26.5.94)

**Administrative & Supporting staff**

Typist Gr. II : G Sukumaran Nair  
Driver : J Joy (upto 10.6.94)  
KM Thomas (provisional from  
25.10.94)  
Watchman : EV George (upto 19.7.94)  
KP Jayapalan (from 20.7.94)

**Agronomic Research Station, Chalakudy**

**ICAR**

Professor/Chief Scientist : PJ Ittyverah  
Assoc. Professor :  
Agrl. Chemistry : G Santhakumari  
Agronomy : V Sreekumaran  
Agrl. Engg. : VM Abdul Hakkim  
(Asst. Professor)

**Assistant Professor**

Agronomy : MA Peter  
Farm Assistant Gr. I : V Unnikrishnan (Sr. Gr.)  
TA Vasanthi (Sr. Gr.)  
Gr. II : PK Reghu (Gr. I)  
V John George (Sr. Gr.)  
VP James  
Laboratory Asst. Gr. III : TR Balakrishnan  
Assistant Gr. I : K Hemalatha  
Driver Gr. I : MP Paul (upto 28.2.95)  
Peon : PR Surendran

**Non Plan**

Administrative Asst. : L Syamala Devi  
Assistant Gr. II : KN Murukes  
Farm Supervisor : NM Mohanan  
Pump Operator : KA Subran

**NARP Phase I**

Asst. Professor (Agron.) : N Purushothaman Nair  
Assoc. Professor (upto 14.1.95)  
V Jayakrishnakumar

Farm Assistant : V John George (upto 28.2.95)  
 VP James (upto 26.2.95)  
 Typist Gr. II : MC Devassy  
 Lab Assistant Gr. II : TV Parameswaran

**NARP Phase II**

Typist Gr. II : KD Rosily

*Banana Research Station, Kannara*

*Scientific staff*

**AICFIP**

Assoc. Professor (Hort) : Dr Rema Menon  
 Asst. Professor  
 Asst. Professor (Hort) : T Premalatha  
 " (Pl. Path) : D Geetha  
 " (Ento) : KR Lyla  
 Assoc. Professor

**NARP**

Assoc. Professor (Nemat) : Dr Job Sathykumar Charles  
 (P. P.) : TC Radhakrishnan  
 Asst. Professor (Hort) : PK Sudhadevi  
 " (Agron) : KP Pradeep  
 " (Proc. Tech) : Vacant

*Technical staff*

**AICFIP**

Farm Assistant Gr : MN Pavithran (Transferred  
 College of Horticulture,  
 Vellanikkara on 10.1.95)  
 R Jayanthi " on 18.3.95  
 C Esarachandran  
 GU Divakar (Joined on 18.3.95)  
 KR Gopalakrishnan  
 KA Narayanan  
 P Subhadra  
 KT Rajan w. e. f. 28.8.94  
 Watchman : K Krishnankutty  
 relieved on 31.5.94  
 Vacant

**NARP**

Farm Supervisor Gr. II : N Vasudevan Farm Asst. Sr. Gr.  
 (Transferred to RRS,  
 Kayamkulam w.e.f.  
 28.5.94 AN)  
 AK Vijayakumar  
 joined on 7.12.94

Farm Asst. Gr. I : PM Paulose  
Farm Asst. Sr. Gr.

*Administrative and Supporting staff:*

**AICFIP**

Typist Gr. II : KK Parameswaran  
Typist Sr. Gr.

Peon : K Sarada

**NARP**

Typist Gr. I : PK Gayathri  
Typist Gr. II

**KAU**

Administrative Asst : AK Kamalabai  
Assistant Gr. II : KK Valsa  
Asst, Sr. Gr.

Driver Gr. II : PI Rappai  
Driver Gr. I

Pump Operator : CM Prabhakaran

Peon : RK Dhirjan Bhadur Singh

Watchman : Vacant

*Sugarcane Research Station, Thiruvalla*

Professor (Agrl. Botany) : S Santhakumari

**KAU**

Asst. Professor (Agronomy) : Thomas Mathew  
R Illangovan

**AICRP**

Assoc. Professor (Agronomy): Dr D Alexander

Asst. Professor (Pl. Breeding): K Sreekumar

Assoc. Professor (NC)  
(Pl. Pathology): KP Jaganmohan (NC)

**NARP**

Asst. Professor (Hort) : Jessy M Kuriakose

**KAU**

Farm Supervisor : EK Sukumaran

Farm Asst. Gr. II : B Muralidharan Pillai

**AICRP**

Farm Asst. Gr. I : TK Omanakuttan

*Administrative staff*

Administrative Asst. : KP Rajendraprasad  
Asst. Gr. I : S. Gopakumar  
PB Anilkumar  
Typist Gr. I : AK Indiradeviamma  
Driver : CA Chacko  
Peon : K Lalu

*Livestock Research Station, Thiruvazhankunnu*

*Scientific staff*

Associate Professor : Dr P Ramachandran  
(Animal Nutrition) Professor  
Associate Professor : KV Athman  
Professor : Dr K Prabhakaran Nair  
(Animal Reproduction) from 8-9-94  
Professor (Genetics) : Dr CA Rajagopala Raja  
from 28-9-94  
Asst. Professor (Pathology) : Dr Mammen J Abraham  
upto 3-1-95  
On study leave for Ph.D. at  
Madras Veterinary College  
from 1-3-93 Reposted at  
CV & AS, Mannuthy  
Professor (Extension) : Dr V Raju upto 3-1-95  
Post of Professor shifted  
from CV & AS to LRS  
Asst. Professor (Pathology) : Dr SR Krupesha Sharma  
from 30-11-94  
Joined duty on 30-11-94  
Assistant Professor : ET Jacob  
(Dairy Science) Associate Professor  
2-6-94 to 16-11-94  
Transferred to Dept. of  
Physiology, CV & AS  
Assistant Professor : Vacant  
(Animal Management)

*Para-technical staff*

Farm Supervisor (Vety Sr.Gr.) : PK Vijayamoni upto 31-12-94  
Transferred to Mannuthy  
PP Narayana Panicker  
from 1-1-95  
Promoted as Sr. F. S. (Vety)  
Farm Supervisor (Vety) Gr. I : Vacant  
Farm Supervisor (Vety) Gr. II : MK Vijayakumar

Farm Assistant (Vety) Gr. I	:	KK Gangadharan
Lab Asst./Tech. Gr. II	:	C Mohammed Usman
Farm Supervisor (Agri) Gr. II	:	K Sasidharan, F S Transferred to CBS, Thumburmuzhi
Farm Asst. (Agri) Sr. Gr.	:	M Ummer
Farm Asst. (Agri) Gr. I	:	PA Moni Farm Asst. (Sr. Gr.) VM George Farm Asst. (Sr. Gr.) A Abdul Rahiman
Farm Asst. (Agri) Gr. II	:	Vacant
Refrigeration Mechanic	:	Dairy Operator trainee on consolidated pay of Rs. 1000/- has been posted from 19-8-94
Driver LDV Gr. I	:	PM Mohammed
Technician Gr. II	:	A Sankaran Sr. Gr. Technician
Tractor Driver	:	Vacant
Pump Operator	:	N Appunni M Ramachandran
Field Supervisor	:	V Appukuttan upto 30-11-94 C Chami from 1-12-94 Posted as F.S. w.e.f. 1-12-94
Maistry - Class IV	:	P Vasudevan P Balakrishnan
Class IV/Watchman	:	A Chachunni Vacant Upto 30-11-94 worked as Watchman transferred to Dairy as F. S. K Manukuttan K Ayyappan Sasidharan from 8-8-95 Transferred to Vellanikkara on 31-3-95 P Veerankutty M Narayanan P Rajagopalan
Regular Mazdoor/Class IV	:	C Kumaran
Mazdoor/Class IV	:	C Chellamma P Vijayalakshmi upto 25-4-94 K Mammed V Sunilkumar



	: K Mohammedali Posted in this station consequent on retirement of K Mohammed, Peon
Sweeper cum Sanitary Worker	: K Ayisha
<i>Ministerial staff</i>	
Administrative Asst	: C Assainar (upto 1.6.94) Transferred to KCAE & T Tavanur N Sujatha (27.6.94 to 1.12.94) KS Nirmala (from 1.12.94).
Sr. Gr. Asst./ Gr. I Asst.	: Surendran TG Deenamma
Assistant Gr. II	: MS Noble Asst. Gr. I (upto 30.6.94) Transferred to NARP, Vellayani B Ayujan
Typist Gr. II	: P Sowmini Devi, Typist Gr. I V Mohandas Typist Gr. I (from 23.6.94)
Peon Hr. Gr.	: K Narayanan, Peon Spl. Gr. K Krishnan
<b>AICRP on agroforestry</b>	
<i>Scientific/Academic</i>	
Assoc. Professor (Forestry)	: The Asso. Professor is working in the Forestry College, Vellanikkara
Asst. Professor (Agronomy)	: Suman Jacob George Asst. Professor (Forestry) (from 3.11.94)
Asst. Professor (Agrl. Engg.) (Soil Conservation)	: KK Sathian, Asst. Professor (Agrl. Engg.) (from 29.10.94)
<i>Para Technical</i>	
Technical Assistar*	: Vacant (Two JAP's post abolished and two new posts created)
Farm Asst. (Ag)	: Thomas Chirakandathil (from 23.8.94)
LDV Driver	: Vacant
Lab Asst./Cl.	: P Vijayalakshmi (from 8.6.94)
Asst. Gr. III	: V Sunilkumar (from 16.7.94)

**Administrative/Supporting staff**

Assistant Gr. II : PV Chamunni  
Peon : V Appukuttan (from 1.12.94)

**University Poultry Farm, Mannuthy**

**Scientific staff**

Professor : Dr G Reghunathan Nair  
Associate Professor : Dr PA Peethāmbaran  
Jr. Asst. Professor : Vacant

**Technical staff**

Senior Farm Supervisor : KP George  
Farm Supervisor Gr. I : Vacant  
Senior Grade Farm Asst. : N Sugathan  
Farm Assistant : KA Chackochan  
KV Rosily

**Administrative & Supporting staff**

Administrative Assistant : AD Omana  
Senior Grade Assistant : E Hymavathy  
Assistant Grade I : Vacant  
Selection Gr. Typist : KK Mary  
Peon Higher Grade : TK Saleena  
Class IV : KK Gopi  
KN Somasekharan  
MB Chandran  
Watchman : K Lalithakumari

**University Livestock Farm and Fodder Research & Development Scheme, Mannuthy**

**Scientists**

Professor & Head : Dr Sosamma Iype  
Asst. Professor : Dr K Ally from 4-11-94

**Para-technical Staff**

Senior Farm Supervisor : PP Sankaran upto 16-9-94  
PK Vijayamani 9-1-95 to 31-1-95  
Farm Supervisors Gr I : KV Balan  
K Krishnankutty  
MK Chandramathy  
Farm Supervisor Gr. II : KL Jose  
VS Bhaskaran  
Farm Assistant (Vety) Gr. I : PG Thankam  
KR Sasidharan  
Farm Assistant (Vety) Gr. II : KK Pushpa  
CC Vijayamma

Farm Assistant (Agri) Gr. I : AG Rajendra Babu  
 Farm Assistant (Agri.) Gr. II : CI Surendran  
 Pump Operator : TP Jose Mathew  
 Lab Assistant Gr. III : PA Remani

*Administrative staff*

Administrative Assistant : DA Shyamala upto 4-7-94  
 K Rajamma 4-7-94 to 5-12-94  
 VR Vijayamma from 5-12-94  
 Section Officer : KK Beena  
 Selection Grade Assistant : PP Annamma (from 31-1-95)  
 Senior Gr. Assistant : PP Annamma upto 31-1-95  
 PG Madhusoodanan  
 from 10-2-95  
 TD Anie from 31-1-95  
 Assistant Gr. I : TD Anie upto 30-1-95  
 PG Madhusoodanan upto 9-2-95  
 Assistant Gr. II : VC Sathy  
 Senior Gr. Typist : MK Muraleedhara Karnavar  
 upto 4-6-94  
 Selection Gr. Typist : B Kumari Sathya Bhama  
 upto 25-9-94  
 MK Muraleedhara Karnavar  
 from 4-6-94  
 Officer Superintendent : B Kumari Sathya Bhama  
 (from 26-9-94)

*Supporting Staff*

Class IV : E Narayanankutty  
 T Bhaskaran  
 MK Mukami  
 KV Rosa  
 MA Sebastian upto 12-4-94  
 KP Kunjipocker from 1-6-94

*Information cum Sales Centre, Mannuthy*

*Scientific*

Asst. Professor : Dr. PA Joseph  
 Officer in-charge  
 V Kunchu (upto 19.9.94)  
 Farm Supervisor Gr. I : MJ Kochappan  
 Gr. II : John David  
 Farm Assistant Gr. I : KV Rosily  
 PB Bashajan (from 30.6.94)  
 AN Manoj (from 7.12.94)  
 Assistant : A Pradeep  
 (from 1.2.94 to 27.1.95)

ass IV

KK Gop.  
KJ Jose  
PB Sivadasan (upto 31.5.94)  
P Thirumala  
from 4.6.94 to 24.9.94)  
SV Sujatha (from 26.9.94)  
IV Manoj

Data Entry Trainee

*Campus Development, Vellanikkara*

Special Officer : MJ Thomas  
Associate Professor : Dr. Babu M Philip  
Asst. Professor : KP Prameela (from 24.2.94)  
Agrh.Eng. (Provisional) : KK Sathian (upto 30.7.94)  
Service terminated  
Sr. Gr. Farm Supervisor : PK Vijayalakshmi  
Sr. Gr. Farm Assistant : NT Satheesh Babu (upto 11.7.94)  
Transferred to IF Vellanikkara  
Office Superintendent : PK Kalliani (upto 30.6.94)  
Working arrangement from  
D.R., KAU, Vellanikkara

Typist Gr. I : P Baby  
Working arrangement from  
Instructional Farm, Vellayani,  
Thiruvananthapuram. Shifted  
to Directorate of Research,  
KAU, Vellanikkara

Assistant Gr. II : TA Sadanandan  
Lab. Assistant Gr. II : KL Fathima beevi  
On working arrangement to  
KHDP

Asst. Professor (Agri. Engg.) : VM Abdul Hakkim  
(from 24.8.94 to 27.10.94)  
On special duty from AICRP on  
Water Management

Farm Supervisor Gr. I : S Krishnan Chettiar  
(from 12.7.94)

Farm Assistant Gr. II : MK Johnson  
KM Vijayakumar (from 1.12.94)

*Directorate of Extension, Mannuthy*

Director of Extension : Dr VK Sasidhar i'c  
upto 27-6-94 AN  
Dr E Tajudeen  
from 27-6-94 AN

Assoc. Director of Extension : Vacant

Section Officer : PV Sreekumaran,  
 Sr. Gr. Assistant : MN Chandrasekharal.  
upto 30-7-94 AN  
 Senior Office Supdt. : TD José  
 Office Superintendent : PP Rosy  
 Typist Grade I : AC Mancy  
 Senior Grade Typist : G Hareendran from 4-6-93  
 Driver : NA Sukumaran  
 Peon : KV Sukumaran  
 PD Annamma

**Communication Centre.**

Assistant Professor : Dr Joy Mathew  
 Associate Professor  
 Jose Joseph

**Publication Unit**

Assoc. Professor (Extension) : KC Varghese  
 Professor and Head  
 V Kunchu  
 (On study leave)

Asst. Professor (AH) : Vacant

**Information Unit**

Assoc. Professor : Dr O Abdul Rehiman Kunju  
 Professor

Asst. Professor (AH) : Vacant

Asst. Professor (Agrl. Extn.) : PA Joseph from 22-2-94

**Exhibition and Graphic Service**

Asst. Professor (Agrl. Extn.) : KK Santha  
 Assoc. Professor from 1-10-93  
 Two posts vacant

**Farm Advisory Service**

Professor (Agro) : Dr VK Sasidhar DE i/c  
upto 27-6-94 AN

Professor (PP) : Dr E Tajudeen  
 Dr KP Vasudevan Nair  
from 27-6-94 AN

Assoc. Prof. (Hort.) : Vacant

Assoc. Prof. (A. H.) : Vacant

Assoc. Prof. (Poultry Science) : Vacant

Assoc. Prof. (Agron.) : P Sreedevi

Assoc. Prof. (Plant Prot.) : Dr MK Sheela

Asst. Prof. (Soil Science/  
 Agrl. Chemistry) : Dr Jayasree Shanker

Asst. Prof. (Plant Pathology) : S Estelitta

Asst. Prof. (Ent.)	:	Suma Poulose Associate Professor
Asst. Prof. (Aquaculture)	:	Dr AD Antony
<i>Non-teaching staff</i>		
Administrative Assistant	:	KN Pushpangathan
Section Officer	:	MK Shylaja
Assistant Sr. Gr.	:	TK Ambika S Ramachandran VM Ammini NP Valsan
Gr. I Assistant	:	KL Liza PV Yeldose
<i>Technical staff</i>		
Farm Supervisor Gr. I	:	Vacant
Farm Supervisor Gr. II	:	John David
Farm Asst. Gr. II	:	Valsamma George AN Manoj
Technician Hr. Gr.	:	Eugine G Varghese
Photographer	:	VV Satheesan
LDV Driver	:	NP Paul
Language Editor	:	Mrudula Devi
"    (English)	:	Vacant
Class IV	:	MS Ammini (Peon Hr. Gr.) MK Ramakrishnan (Peon Sr. Gr.) KJ Jose from 9-7-93
Sweeper-cum-Sanitation Worker	:	Vacant
Artist	:	Vacant
<i>Central Training Institute, Mannuthy</i>		
Professor of Extension	:	KP Ramachandran Nair
Assoc. Professor	:	KK Santha upto 30-9-93 R Muraleedhara Prasad from 1-10-93 onwards
Asst. Professor	:	Alexander George (joined on 1-3-94 on completion of study leave) One post vacant
Section Officer	:	KK Radhakrishnan
Farm Supervisor	:	MJ Kochappan on working arrangement
Typist Sr. Gr.	:	ER Vilasini
Typist Gr. I	:	P Prasannakumari
Farm Assistant	:	Vacant

Assistant Gr. II	: Samson J Koladi
Duplicator Operator	: MN Jayanthi
LDV Driver	: CR Antony
Peon	: (from 14-8-93 onwards)
	: VN Dasan
	: KL Devassy
<i>KAU Press, Mannuthy</i>	
Press Manager	: K Rajappan
General Foreman	: G Narayana Pillai
Senior Foreman H. G.	: PI Lonappan
Proof Reader H. G.	: Sherly Sam
Proof Reader	: KK Sadasivan
Computer	: K Santhakumari
Sr. Gr. Printer H. G.	: TP Joseph
	: VR Kumarah
Hr. Gr. Printer	: NJ Samuel
Lower Gr. Printer	: PR Aravindakshan
	: Two posts vacant
Sr. Gr. Compositor	: V Subramanian
	: KM Thankamma
	: PA Elsy
Hr. Gr. Compositor	: V Rajendran
	: K Leela
L. G. Compositor	: PM Santha
	: 4 posts vacant
Sr. Gr. Binder	: KR Vijayan
Hr. Gr. Binder	: PT Annie
L. G. Binder	: M Kamalamma
	: G Parvathy Ammal
Copy Holder	: 2 posts vacant
Helper	: VN Hassan
Sweeper-cum-Attendant	: KS Prema
Security/Class IV	: PB Anilkumar
Peon H. G.	: IR Rajan
Section Officer	: PK Nataraja Pillai
Sr. Gr. Assistant	: KK Sathesan
	: C Mercy John
Assistant Gr. I	: PA Jacob Joe
Selection Gr. Typist	: PK Kousallia
Junior Foreman	: Vacant
<i>Agricultural Research Station, Mannuthy</i>	
Assoc. Professor and Head	: Dr U Jaikumaran
Asst. Professor	: Tessy Joseph
	: T Sajitha Rani
	: George Thomas

Driver LDV	MS Sabarinathan
Lab. Asst. Gr. II	P Meenakshy
Farm Supervisor Sr. Grade	CK Vijayan TK Mithran PG Yamuna
Farm Supervisor Gr. II	TK Mithran PG Yamuna
Farm Asst Gr. I	R Raghu PR Sathian
Farm Asst. Gr. II	CP Alikutty CK Santhosh PC Uthaman
Tractor Driver	Vacant
Administrative Assistant	Vivian Jose
Assistant Sr. Gr.	A Daisy Anto CK Prabhavathy
Assistant Gr. II	TP Babu Raj
Sr. Office Superintendent	R. Noel, Typist Sr. Gr.
Peon	I Parukutty (Hr. Grade) RG Babu
Watchman	E Abu S Pradeepkumar
Asst. Professor	MT Kanakamany CA Rosamma
Technician Sr. Grade	PM Ramesh Chandran
Asst. Professor	Dr VV Radhakrishnan

*College of Veterinary and Animal Sciences, Mannuthy*

**Anatomy**

Professor and Head	Dr Lucy Paily
Assoc. Professor	Dr KR Harshan (NC) Dr CK Sreedharan Unni (NC) Dr Jose John Chungath (NC)
Asst. Professor	Dr N Ashok Dr Shyla Prakash (on leave)

**Animal Reproduction**

Professor and Head	Dr CP Neelakanta Iyer
Professor	Dr K Prabhakaran Nair " V Sudarsanan " E Madhavan " E Mathai



Assoc. Professor : Dr T Sreekumaran (NC)  
 .. KN Aravinda Ghosh (NC)  
 .. V Vijayakumar (NC)  
 (on deputation for  
 higher studies)

Asst. Professor : Dr SP Suresan Nair  
 .. Metilda Joseph

**Incidence, Nature and Magnitude of prevalence of infertility condition in Cross bred cattle**

Assoc. Professor : Dr PP Balakrishnan (at Calicut)  
 Asst. Professor : Dr K Ramachandran  
 (on study leave)

**Centre of Advanced studies in Genetics and Animal Breeding**

Director : Dr G Mukundan till 14.3.95  
 from 14.3.95 vacant

Assoc. Professor : Dr KV Reghunandan (NC)

**Animal Genetics & Breeding**

Assoc. Professor : Dr CR Girija (NC)  
 Dr B Nandakumaran (NC)  
 Dr Stephen Mathew (NC)

Asst. Professor : Dr P Nandakumar  
 Dr AP Usha (on study leave)  
 Dr TV Aravindakshan ( .. )

**Animal Management**

Professor & Head : Dr TG Rajagopalan  
 Professor : Dr CK Thomas  
 Assoc. Professor : Dr Francis Xavier (NC)  
 Dr KS Sebastian (NC)

Asst. Professor : Dr K Leena (on leave for study  
 purposes)

**Animal Production Economics**

Professor : Dr T Prabhakaran

**Clinical Medicine**

Professor & Head : Dr KM Alikutty  
 Professor : Dr NM Aleyas  
 Dr VS Balakrishnan

Assoc. Professor : Dr PC Alex

Asst. Professor : Dr Usha Narayana Pillai  
 Dr PG Baby

**Dairy Science**

Professor & Head : Dr K Pavithran  
 Professor : Dr MV Sukumaran  
 Dr UT Francis

<b>Assoc. Professor</b>	: R Rajendrakumar (on deputation) Dr V Prasad (NC) Dr PI Geevarghese (NC) Dr M Mukundan (NC)
<b>Asst. Professor</b>	: Dr Geetha C Jayan Dr Sreeja Ramachandran Dr K Ajithkumar SN Rajakumar Sudheer Babu
<b>Extension</b>	
<b>Professor &amp; Head</b>	: Dr PS Pushkaran
<b>Assoc. Professor</b>	: Dr MR Subhadra (NC)
<b>Asst. Professor</b>	: Dr PJ Rajkamal Dr SS Anil (on study leave) Dr S Ramkumar ( , , )
<b>Microbiology</b>	
<b>Professor &amp; Head</b>	: Dr S Sulochana
<b>Professor</b>	: Dr KT Punnoose Dr PC James
<b>Assoc. Professor</b>	: Dr V Jayaprakash (NC) Dr R Madhusoodhanan Pillai (NC) Dr G Krishnan Nair (NC)
<b>Asst. Professor</b>	: Dr D Sudharma (on leave for study purpose) Dr ES Mathews (on loss of pay leave for taking up job abroad) Dr M Mini (on study leave)
<b>Nutrition</b>	
<b>Professor &amp; Head</b>	: Dr CT Thomas
<b>Professors</b>	: Dr N Kunjukutty Dr PA Devassia Dr CS James Dr Maggie D Menachery
<b>Assoc. Professor</b>	: Dr George Mathen Dr TV Viswanathan (NC) (on leave) M Nandakumar (Chemist) Dr AD Mercy (NC) (on leave)
<b>Asst. Professor</b>	: Dr Annamma Kurian (Retired from service w.e.f. 31.3.95)

**ICAR network project on Micronutrients in Animal nutrition and production**

**Asst. Professor** Dr P Gangadevi  
(9.11.94 to 31.3.95)

**Centre of Excellence in Pathology**

**Director** Dr A Rajan

**Professor & Head** Dr KM Ramachandran

**Assoc. Professor** Dr KV Valsala

Dr T Sreekumaran

Dr PK Ismail

Dr CR Lalitha Kunjamma (NC)

Dr CB Manomohan (NC)

**Asst. Professor**

Dr N Divakaran Nair

Dr Koshy Varghese

Dr Mammen J Abraham

Dr B Gangadharan

Dr T Leenadevi

Dr TU Anilkumar

23.11.94 to 30.11.94

Dr M Gopalakrishnan Nair  
(on study leave)

**Parasitology**

**Professor & Head**

**Professor**

Dr K Rajmohan

Dr K Chandrasekharan

Dr V Sathianesan

Dr C George Varghese

Dr K Madhavan Pillai

Dr C Pythal

**Assoc. Professor**

Dr H Subramanian (NC)

**Asst. Professor**

Dr Lucy Sabu

Dr K Devada (on study leave)

**Physiology**

**Professor & Head**

Dr MG Ramakrishna Pillai

upto 14-12-94

Dr KP Surendranathan

upto 14-12-94

Dr ET Jacob retired on 31-3-95

**Assoc. Professor**

Dr PT Philomina (NC)

Dr G Girish Varma

Dr V Ramnath

Dr Sisilamma George

(on study leave)

Dr KP Sreekumar

## **Pharmacology and Toxicology**

- Professor & Head** : Dr MK Rajagopalan  
Dr Jacob V Cheeran  
Dr Zacharias Cherian  
Dr P Marykutty
- Assoc. Professor** : Dr N Gopakumar  
Dr AM Chandrasekharan  
Nair (NC)  
VR Reghunandan  
(Chemistry)  
Dr AD Joy (NC)  
Dr CM Aravindakshan (NC)  
Dr K Venugopalan  
(on other duty)
- Asst. Professor** : Dr P.T.A. Usha (on study leave)

## **Poultry Science**

- Director** : Dr A Ramakrishnan
- Professor** : Dr CK Venugopalan
- Asst. Professor** : Dr Amritha Viswanath  
Dr K Narayanankutty

## **AICRP on Poultry for Eggs**

- Sr. Scientist** : Dr AKK Unni
- Assoc. Professor** : Dr Leo Joseph (NC)  
Dr VK Elizabath
- Asst. Professor** : Dr N Vijayan  
Dr P Anitha  
Dr Laly John

## **Preventive Medicine**

- Professor & Head** : Dr K Baby
- Professor** : Dr PT Georgekutty
- Assoc. Professor** : Dr K Venugopal (NC)  
on leave for study purpose  
Dr MR Saseendranath (NC)
- Asst. Professor** : Dr Vijayakumar  
Dr PV Treesamol

## **Statistics**

- Professor & Head** : Dr KC George
- Asst. Professor** : TK Indirabai  
U Narayanikutty  
M Jacob Thomas  
Mathew Sebastian

<b>Surgery</b>	
<b>Professor</b>	: Dr KN Muraleedharan Nayar (Professor & Head i/c) Dr AM Jalaludheen Dr C Abraham Varkey Dr S Raveendran Nayar
<b>Assoc. Professor</b>	: Dr T Sarada Amma (NC) Dr K Rajankutty (NC) (on study leave)
<b>Asst. Professor</b>	: Dr TP Balagopalan Dr N Padmakumar (on study leave) Dr CB Devanand
<b>Veterinary Public Health</b>	
<b>Professor &amp; Head</b>	: Dr R Padmanabha Iyer
<b>Professor</b>	: Dr M Soman Dr P Prabhakaran Dr E Nanu
<b>Assoc. Professor</b>	: Dr MT Jose (NC) (on long leave)
<b>Asst. Professor</b>	: Dr Kumarasubrahmaniam (on leave for higher studies) Dr C Latha
<b>Meat Technology Unit</b>	
<b>Assoc. Professor</b>	: Dr J Abraham Dr P Kuttinarayanan Dr George T Oommen
<b>Veterinary Hospital, Mannuthy</b>	
<b>Professor i/c</b>	: Dr NM Aleyas
<b>Assoc. Professor</b>	: Dr Santha Kurian
<b>Physical Education</b>	
<b>Assoc. Professor</b>	: OK Paul (NC)
<b>Asst. Professor</b>	: Molly Cherian (on leave)
<b>Paratechnical/Administrative Staff</b>	
<b>Anatomy</b>	
<b>Farm Supervisor</b>	: M Narayanankutty
<b>Animal Reproduction</b>	
<b>Farm Supervisor Gr. I</b>	: VM Jacob
<b>Gr. II</b>	: PS Kumaran
<b>Farm Assistant</b>	: MK Rajendran Nair V Gopalakrishnan
<b>Driver</b>	: TG Mohanan
<b>Lab. Assistant</b>	: KK Gopalan AA Krishnan
<b>Class IV</b>	: M Divakaran

### **Animal Breeding and Genetics**

Sr. Office Superintendent : S Seemanthini  
Typist : K Soudamini  
Section Officer : KN Namboothiri  
Assistant : B Ajithkumar  
Technician Fish & Meat  
technology : C Ramadasan

### **Animal Management**

Farm Supervisor Gr. II : M Lalithamma  
Class IV : K Saroja

### **Clinical Medicine**

Farm Supervisor Gr. II : P Remany  
Class IV : PA Mini

### **Dairy Science & Extension**

Farm Assistant : KT Sivasankaran  
Dairy Plant  
Farm Assistant Gr. : OP Premakumari  
Technician Gr. I : KM Muraleedharan  
Asst. Gr. I : CC George  
Office Supdt. : KJ Lonan  
Class IV : PV Prabha Kumar

### **Extension**

Farm Supervisor Sr. Gr. : PA Francis  
Artist : KR Kumaran  
AV Operator : MR Gopinathan  
Class IV : TT Krishnankutty  
PK Rosy

### **Microbiology**

Research fellow : Smt AG Usha Rani  
(from 27.10.94 to 31.3.95)  
Farm Asst. Sr. Gr. : OK Sukumaran  
(from 1.4.94 to 31.5.94)  
Farm Asst. Gr. I : KK Viswambharan  
(from 18.6.95 to 31.3.95)  
Attender : VM Baby  
Nutrition  
Research Assistant : Anniamma Chacko  
Mariamma Kurian  
Farm Supervisor : MG Vasu  
Technician : KP Sudarsanakumar  
(upto 8.6.94)  
TR Viswambharan (from 8.6.94)  
Class IV : KK Ramachandran

**ICAR Net Work Project**

Class IV KV. Thressia  
 Driver KV. Kumaran

**ICAR-Adhoc Project**

Research Associate Indira Devi  
 (from 8.9.94 to 20.9.94)  
 CS Sharmila  
 (from 20.10.94 to 31.3.95)

**Small Animal Breeding Station**

Farm Supervisor KG Kamalamma  
 Farm Asst. PK Ammini

**Pathology**

Farm Supervisor PC Mary  
 PC Lilly  
 (Working arrangement in  
 Department of Physiology)

Sr. Office Supdt. BI Balamani  
 Farm Assistant AP Peter  
 Driver CT Louis  
 Attendant KO Rosakutty  
 PN Raghavan

Trainee for Electron  
 Microscope Lab.  
 Research fellow

KK Sanjayan  
 U Bindu  
 P Manju

**Physiology**

Farm Supervisor MC Annie  
 PC Lilly  
 Class IV AG Rajendran  
 C Anitha

**Poultry Science**  
 Class IV

MK Janaki

**AICRP Poultry Science**

*Para Technical Staff*

Farm Assistant (Sr.) V Indira  
 Farm Assistant Gr. K Sivasankaran  
 Gr. N Gopinathan  
 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 : VK Gracy  
Class IV : OG Santha  
AI Thomas

**Statistics**

Jr. Programmer : KP Santhabai  
Technical Assistant : KV Prasadani  
Class IV : MJ Rosily

**Surgery**

Radiographer : K Indira Devi (on long leave)  
Jimmy Stephen (Posted against  
Smt Indira Devi)  
Class IV : Paul Thirumalai

**Public Health**

Farm Supervisor : A Leela  
Class IV : PK Karappan

**Library**

Librarian : KC Ambili  
Assistant : Vijayalakshmi  
Clerical Assistants : Gopalan  
Muraleedharam  
Class IV : Unni  
P Radhakrishnan

**Senior Administrative  
Officer**

Section Officer : KP Koyamu  
KM Mary  
VM Sarada  
P Aliyar  
Lillykutty Thomas  
Shirly Bai George  
AT Gracy

**Senior Office Supdts**

: MK Jainuva  
KK Damodaran  
P Reetha Joseph

**Typists Sel. Grade  
Grade I**

: S Akhileswary  
: S Sarojini Amma  
Manjula Mercy Patric  
S Kaladevi



Grade II	:	TP Narayanan
Clerical Assistants/ Lab Assistants	:	KK Balakrishnan CC Sajeevkumar M Santhakumari KP Reetha
Duplicator Operator	:	AV Poulouse
Peon	:	KA Mathiri KN Saraswathy KK Madhavi M Narabahadur
Class IV	:	PS Santhakumari TK Mariam AK Janaki M Somasekharan VK Narayanan
Farm Assistant (Agri). (Campus Development)	:	Surendran
Assistants Sr. Grade	:	M Girija Sophiamma Joseph KS Vijayalakshmi MA Sujatha CP Jayakumar
Gr. I	:	PM Shanavas C Pradeep PA George
Gr. II	:	R Usha NV Thankam MU Joy PC Santhoshkumar VN Sreekumar

*Veterinary Hospital, Kokkalai*

*Teaching Staff*

Professor and Head	:	Dr K Ramadas
Asst. Professor	:	Dr KM Jayakumar (On working arrangement from the College of Veterinary and Animal Sciences)

*Non teaching staff*

Section Officer	:	M Baby
Sr. Gr. Assistant	:	VK Beena, Asst Gr. II (upto 29.5.94) VR Chandrika, Sin. Gr. Asst. (from 30.5.94)

Pharmacist CK Alias (Post shifted from CBF, Thumburmuzhy)  
 Farm Supervisor JK Narayanan  
 Sr. Gr. (Vety) Farm Supervisor Gr. II  
 Farm Assistant (Vety) Sr. Gr. KR Sivaraman  
 Attendant MK Sheik Abdul Rahiman Sp

Peon KO Varghese Gr. I  
 Sweeper-cum Scavenger KS Radhakrishnan  
 Vacant

*Cattle Breeding Farm, Thumburmuzhi*

*Scientific staff*

Assoc. Professor Dr George Mathen (upto 2.9.94)  
 Transferred to CV & AS, Mannuthy)  
 Dr Francis Xavier (upto 3.9.94 to 5.11.94)  
 Transferred to CV & AS, Mannuthy  
 Dr D Sreekumar  
 Asst. Prof. 5.11.94  
 (Head of the Station)

Asst. Professor Dr D Sreekumar 5.11.94  
 Working arrangement  
 Dr Sreeja Rajmohan  
 Working arrangement to Dairy Plant, Mannuthy  
 KS Anil from 5.11.94

*Technical and Supporting staff*

Farm Supervisor (Agri) (Vety.) : VK Sasidharan Gr. II  
 Farm Asst. (Vety.) : V Sukumaran Nair Gr. I  
 : K Chacko Gr. I  
 : P Mohanan Nair Gr. II  
 Pump Operator : MP Joseph  
 Herdsman : TK Thomas upto 1.9.94  
 : KK Ramakrishnan  
 : KP Jose  
 : ES Yesodha  
 : TN Sasi

*Administrative staff*

Administrative Asst : VK Pathumma upto 1.9.94  
 Transferred to AMPRS, Odakkali  
 PK Elsy from 26.4.94

**Assistant** : KK Kuttappan  
 PV Asokan 17.6.94  
 PV Xavier from 31.5.93  
**Typist** : PK Sara Sr. Gr.  
**LDV Driver** : KK Padmanabhan  
**Peon** : KV Bhaskaran Hr. Gr.  
 (Retired on superannuation on  
 31.8.94)  
 TK Thomas from 1.9.94

*Pig Breeding Farm, Mannuthy*

**Professor and Head** : Dr Kurien Thomas

*Scientific*

**Assoc. Professor** : Dr KS Sebastian (NC)  
**Asst. Professor** : Dr KM Syam Mohan  
 (from 4.11.94)  
 Dr P Gangadevi  
 Dr Joseph Mathew upto 25.9.94

*Administrative and supporting*

**Administrative Asst.** : VJ Rosily  
**Sr. Gr. Assistant** : VR Chandrika upto 28.5.94  
 KS Nirmala upto 30.11.94  
**Gr. I Assistant** : NL Sivakumar from 1.7.94  
 CT William from 1.7.94  
**Typist** : T Sudha from 1.6.94

*Paratechnical staff*

**Sr. Farm Supervisor** : AS Karunakaran  
**Farm Supervisor Gr. II** : KK Sasidharan Nair  
**Farm Asst. Gr. II** : CN Soman  
 PP Saradha

*Supporting staff*

**Pump operator** : KV John  
**Peon Hr. Gr.** : V Saraswathy  
**Pig attendants** : PB Velayudhan  
 V Pushangadhan  
**Watchman** : PV Balakrishnan  
 (Redesignated as pig attendant  
 w. e. f. 26.5.94)

**CENTRE FOR ADVANCED STUDIES IN POULTRY SCIENCE**

*Scientific*

**Director** : Dr A. Ramakrishnan  
**Assoc. Professor** : Dr A Jalaludeen

*Supporting*

Steno to Director	: H Razia Beevi
Sr. Office Supdt.	
Management Trainee	: Biji M. Raj (from 13.6.'94 to 12.12.'94) PS Mangalam (from 18.10.'94)

*College of Fisheries, Panangad*

Dean i/c:	: Dr. MJ Sebastian
<b>Dept. of Aquaculture</b>	
Professor & Head	: MJ Sebastian
Professor (Aqua)	: Dr DM Thampy
Assoc. Professor (Aqua)	: Dr Suseela Jose Dr K Jayasree Vadhyar
Asst. Professor (Algology)	: Dr Thresiamma James
" (Fish. Path.)	: Dr C Thankappan Pillai
" (Fish Breeding)	: Dr C Mohanakumaran Nair
" (Aquaculture)	: Dr MV Mohan Aneykutty Joseph
Fieldman (Fisheries)	: N Chakrapani VK Balakrishnan
Lab Asst. Gr. III	: MA Sebastian VR Lates
<b>Dept. of Fishery Biology</b>	
Professor & Head	: Vacant
Professor (Aqua)	: Dr DM Thampy (officiates as Head of Dept.)
Asst. Professor (F. Biol)	: Dr J Rajasekharan Nair Dr KV Jayachandran (Both posted against the post of Assoc. Professors)
" (Zool)	: Dr TM Jose Dr R Shylajakumari (on L W A)
" (F. Biol)	: Vacant
" (Ichthyology)	: Dr TV Anna Mercy Dr KG Sunny
Lab. Asst. Gr. III	: John Mendez
<b>Fisheries Research</b>	
Professor	: Dr PM Mathew
<i>Administrative and Supporting staff</i>	
Sr. Administrative Officer	: R Rajendran Unnithan
Section Officer	: A Kuriakose PU Kesavan C Suchetha

Asst. Librarian	: Vacant
Reference Asst.	: TA Joseph
Sr. Office Supdt.	: PV Brizitha KT Thanka
Selection Grade Assistant	: PG Sreekantha Pai LR Santha K Vinaya Bai
"	: B Bhanumathy
Asst. Sr. Gr.	: MO Kunjamma (on leave)
Asst. Gr. II	: TM Maheswaran C Preleema Peter Sandhya Rabindranath VA Suprabha KK Sreedevi
Typist Sr. Gr.	: Salomi Silas KA Geetha
Typist Gr. II	: CV Dinesan TC Ajitha
Lab. Asst. Gr. I	: P Madhavankutty
Technician Gr. I	: KP Sreedharan Nair
Hostel Manager	: Mohammed Mosadiq
Duplicator Operator	: K Rajendra Babu Pillai
Driver H. D. V.	: P Moideen
Driver L. D. V.	: MJ Joseph Abdul Khader AS Sukumara Marar
Bus Attendant	: PM Varghese
Pump Operator	: Gopalan
<b>Dept. of Fishery Hydrography</b>	
Assoc. Professor and Head	: Dr KK Varma
Assoc. Professor (Biol. Oceanography)	: Dr CJ Cherian
Assoc. Professor (Chemical Ocean.)	: PS Mrithunjayan
Assistant Professor (Biol. Oceanography)	: Vacant
Assistant Professor (Meteorology)	: NN Raman
Lab. Assistant Gr. III	: PP Pushpakaran (Posted against the post of Clerical Asst. Library)

**Dept. of Fishing Technology**

Assoc. Professor and Head	:	P Radhakrishnan Nair
Assistant Professor (Fishing Technology)	:	Vacant
Assistant Professor (Gear Technology)	:	Vacant
Fisherman-cum-Watchman	:	PJ Kunjappan

**Dept. of Processing Technology**

Professor and Head	:	Vacant (Post shifted to Aquaculture)
Associate Professor (Proc. Technology)	:	Dr DD Nambudiri (Officiates as HOD)
Associate Professor (Food and Nutrition)	:	Lizy Behanan
Assistant Professor (Microbiology)	:	Dr MC George
Assistant Professor (Biochemistry)	:	Dr PM Sherief
Assistant Professor (Processing Technology)	:	Dr Sajan George Dr S Krishnakumar
Lab. Assistant Gr. III	:	AN Reghu

**Dept. of Fish. Engineering**

Assoc. Professor and Head	:	Vacant
Assistant Professor (Fish. Engineering)	:	George Mathew

**Dept. of Management Studies**

Assoc. Professor and Head (Fish. Stat.)	:	TM Sankaran
Assoc. Professor (Physical Education)	:	Susy V John
Asst. Professor (Business Management)	:	Vacant
Asst. Professor (Stat.)	:	Alphi Korath V Malika (on deputation for Ph.D.)
Asst. Professor (Commerce)	:	KM Mathew
Asst. Professor (Economics)	:	MS Raju
Class IV - Peon Hr. Grade	:	R Gopal Singh KN Sasikumar TS Abdul Majee KM Khadeeja
Full-time-Sweeper	:	E Leelamani PB Nabeesa



**Dept. of IDE**

Professor and Head : Dr K John Thomas  
Assistant Professor : Alexander Seth  
Dr MS Hajilal  
EK Kurien  
P Suseela  
F Mary Regina

**Dept. of FPME**

Professor : CP Muhammed  
On LWA for taking up  
employment abroad  
Associate Professor : Jippu Jacob  
Assistant Professor : Hamza Mollakkadavath  
VR Ramachandran  
Deputation for Ph.D.  
Programme at TNAU,  
Coimbatore Relieved on  
25-6-94  
G Sreekala  
Joby Bastin

**Dept. of PHT**

Assistant Professor : Santhy Mary Mathew  
MV Prince

**Dept. of SAC**

Professor and Head : Dr KI Koshy  
Associate Professor : Dr PC Antony  
Assistant Professor : Dr E Komala Amma  
VP Lakshmikutty  
M Velayudhankutty  
Dr KM Valsamma  
Dr KA Bindu

**Instructional Farm**

Assistant Professor : P Rajendran  
Dr PV Habeeburrahman

**ICAR scheme on FIM**

Assistant Professor : Dr M Sivaswami  
PR Jayan

*Administrative and Supporting*

Administrative Officer : AK Sreenarayanan  
Section Officer : C Arumughan  
P Unnikrishnan  
KU Prabhavathy  
MP Balan



Senior Gr. Office Supdt.	: KP Abdurahiman
Selection Gr. Assistant	: KV Purushothaman Nambiathiri KJ Kuruvilla S Ushadevi
Assistant Gr. I	: C Gopi A Radhakrishnan S Satheedevi
Assistant Gr. II	: P Sivaprasad Radha Gopan Treesamma Titus One post vacant
Typist Gr. I	: R Balasubramanian
Typist Gr. II	: T Kamalam VM Muraleedharan 2 posts vacant
Asst. Agrl. Engineer	: Vacant
Research Assistant	: AP Gopalakrishnan
Reference Assistant	: KP Sathian
Draftsman (Civil)	: KG Ajithkumar
Technical Supervisor (Carpentary)	: AK Padmanabhan
Technical Supervisor (Smithy)	: VP Kannan
Technical Supervisor (Fitting)	: CS Krishnan C Velayudhan TP Aboobacker
Trade Asst. (Plumbing)	: MK Balakrishnan
Pump Operator	: E Parameswaran Nair TP Vijayan
Driver HDV	: PK Devassy
Driver LDV Gr. I	: NV Krishnan
Bus Attendant	: VV Vasu
Steward	: Vacant
Lab Assistant Gr. I	: P Krishnankutty Nair
Lab Assistant Gr. III	: KK Subramanian K Abdurahiman I Jayaprakash.
Peon (Higher Grade)	: P Kunhukutta Menon C Ponna P Krishnan P Amina

Peon (H.Gr.) : AP Ayyappan  
 C Narayanan  
 KP Ayyappan  
 KV Moideenkutty  
 CP Damodaran  
 K Kuttykrishnan  
 K Ammukurupathiar

Peon : K Ravunni  
 K Kurhan  
 K Kunhumon  
 A Burhanuddin

**Instructional Farm**

Farm Supervisor (Ag.) Gr. I : RV Balamani  
 MV Raveendran  
 Gr. II : K Sethumadhavan

Farm Asst. (Ag.) Sr. Gr. : C Subramanian  
 Gr. I. : TP Ali

Farm Supervisor (Vety.) : P Balakrishnan  
 Gr. I.

Farm Asst. (Vety) Gr. I : T Venu

Gardener : K Mammikutty

**DASc.**

Lab Assistant Gr. III : PV Kumaran

**AICRP on FIM (ICAR)**

Technician Gr. I : K Aravindan  
 N Narayanan  
 „ (Sr.Gr.) : KT Ramachandran

Workshopmate : TN Balan

Assistant Gr. II : M Muraleedharan

**NARP**

Technician : KP Sudarsanakumar

Technician grade I : Vacant

Technician grade II : Vacant 3 Nos

**KAU School, Vellanikkara**

Headmaster : AJ Abraham

Teacher (English Medium) : KP Thresiamma  
 Deborah Cyril  
 AJ Lilly  
 KS Indiradevi  
 Latha Balaraman

UPSA (Malayalam Medium)	:	TJ Mary Najeema Unnikkamu KS Leena
UPSA (Hindi)	:	K Narayani
UPSA (Malayalam)	:	Vacant
LPSA (Malayalam Medium)	:	V Sasidharan PK Bhaskaran MA Alli MV Mary MK Mallika
High School Assistant	:	—
Special Teachers	:	—
Phy Education	:	—
Drawing	:	—
Music	:	—
Nursery School Assistant	:	P Devaki DV Shylaja R Kamalam
Ayah	:	KR Sumithra M Soudamini
Asst. Grade I	:	Mariya John
Class IV	:	VA Mathew M Parvathy

## Appendix V

### LIST OF PUBLICATIONS/RADIO TALKS/ TV PROGRAMMES ATTENDED

*College of Agriculture, Vellayani*

#### Scientific Articles

- ✓ Kuruvilla Varghese, Meera Bhai. M and Sateesh Babu, K. 1994. Evaluation of multiseason intercropping the Cassava (*Mahihot esculanta*). Indian Journal of Agricultural Science 64 (7): 38-41.
- ✓ Bindu, KK, Maya, P and Saraswathy, P. '94 Genetic divergence in Bhindi. Journal of tropical Agriculture 32 (2) 115-117
- ✓ Manju, P & Gopimony, R '94. Estimation of in breeding depression through Embryo and Kernel analysis in coconut types. Journal of Tropical Agriculture 32 (1): 121-122
- ✓ Sreekumar, SG, Gopimony, R Gopinathan Nair, V & Mohanakumaran, N, '94. Marathakom—a high yielding guinea grass done—Journal of Tropical Agriculture 32: 112-114
- ✓ Chandramony, D and Nayar, NK .94. Genetic basis of yield attributes in sesamum. Indian J. Agri. Res., 29 (3): 214-218
- ✓ Mercy, ST '95. Rice Breeding in Kerala. Proceedings of the seminar on crop breeding in Kerala. Dept of Botany, University of Kerala, Kariavattom pp. 9-28
- ✓ Karunakaran. P, Nair, MC and Lulu Das. Grey blight of Cinnamon. Journal of spices and Aromatic crops 2 (1 & 2): 66-67
- Vijayaraghava Kumar, Sreenath, PR, Some combinational properties of design for neighbour effects and correspondance of these designs for directed graphs.
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- Hebsy bai, MS Sheela, T Jiji and K John Kuriyan, Nemic association and avoidable yield loss in turmeric. Paper presented in Placrosym XI.
- Sheela, MS Hebsybai. T Jiji, K John Kuriyan, Nematodes associated with ginger in Kerala, their extent of damage and management Ibid.
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- Ajith K, and Sheela MS, '94. Role of green leaves in nematode management strategy—a case study. Ibid.
- Arthur Jacob, Hebsy bai and Johnkuriyan K, '94. Effect of systemic nematicides on larval emergence of root-knot nematode *Meloidogyne incognita* Ibid.
- Hebsybai MS, Sheela N, Anitha and Johnkuriyan K'95. Seedling root dip-an economically feasible nematode management strategy for brinjal. National Seminar on Horticulture (Hort National '95) abstract p. 63, 23-25 January '95, Trivandrum, Kerala.
- John Kurian K, '95. Practical control measures of nematodes Ibid. p. 12.
- Naseema Beevi S, Thomas Biju Mathew K, Sudharma and T, Nalinakumari 95. Endosulfan and lindane safer insecticides for vegetable cowpea, Ibid. P. 61.
- Prabhakumari S, Jiji T, Padmaja Premila '95. Earthworms as potential agents for composting farm and market wastes Ibid., p. 64.

- Politano L, Reghunath P, and Gokulapalan C '95. Disease resistance a breeding strategy. *Ibid.*, p. 13.
- Sheela MS, Hebsy Bai, Anitha N and John Kuriyan K. '95 Integrated management of Plant parasitic nematodes in banana : *Ibid.*, p. 63.
- Sudharma K, Thomas Biju Mathew, Nalinakumari T, Naseema Beevi and Visalakshi '95. Residues of carbofuran in amaranthus *Ibid* p. 62.
- Reghunath P, and Gokulapalan C, '95. Management of Pests and diseases in banana *Ibid* 11.
- Thomas Biju Mathew, Naseema Beevi S, Sudharma K, and Visalakshi A '95. Monocrotophos and Phosphamidon—the major contaminants in vegetables exported from Trivandrum. *Ibid.* p. 2.
- Visalakshi A; Tomas Biju Mathew and Naseema Beebi S '95 Pesticide residues in fruits and vegetables *Ibid*, p. 1.
- Shilly B and Saradamma K, '95. Antifeedant action of different extracts of *Clerodendron infortunatum* on adults and grubs of epilachna beetle. *Henosepilachna vigintioctopunctata* E. Paper presented in the National Symposium on Ecosystem Management and Sustainable utilisation of biological resources. 7-9-'94. Trivandrum Kerala.
- Thosalind RS, and Visalakshi A, '94. Monitoring of Organochlorine insecticide residues in the inland ecosystems of Kerala *Ibid*.
- Sudharma K, and Madavan Nair G. Occurrence and Control of orchid mite. *Tenuipalpus* sp F. *Tenuipalpidae*) in Kerala. *Ibid*.
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- Naseemabeevi S, and Thomas Biju Mathew, '94 Fate of carbofuran in cucumber plants. *Ibid*.
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- Thomas Biju Mathew, Mohandas N, and Visalakshi A, '94 Persistence of plant-mediated resurgence effects induced by insecticides on rice plant. *Ibid*.

- Thomas Biju Mathew, Mohandas N, and Visalakshi '94 Effects of sublethal doses of insecticides on the progeny production of rice brown plant hopper, *Nilaparvata lugens* stap. Ibid.
- Saradamma K D, Dale and Dás NM '94 Juveno-mimetic activity of plant extracts on the red cotton bug *Dysdercus cingulatus* (Fb). Ibid.
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- Sheela MS, Anitha N and John kuriyan K, '94. Effects of different levels of root knot nematode on the growth and yield of Bhindi Ibid.
- Jiji T, and Venkitesan TS, '94. Checking combined and lone infestation of root-knot and reniforme nematodes in Brinjal by granular pesticides Ibid.
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- Nandakumar CP, Reghunath, Visalakshi A, and Sarawsthy P, '94. Nut damage index as a parameter to study the extent of infestation by coreid bug *Paradasynus rostratus* Dist. on coconut Ibid.
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- Sasikumar SP, Sivaprasad, Hebsybai and Vijayan '94. The relationship between VA Mycorrhizal colonisation and nematode population in ginger. Ibid.
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- Sheela MS and Venkitesan TS '95. Selection of media for mass production of the bacterial pathogen. *Bacillus macerans*. Paper presented in the 7th Kerala Science Congress Janu. 27-29-'95. Trivandrum.
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- Mathew, SK, Abdul Vahab, M and Nirmala Dewi, S '94 Seasonal occurrence of chilli diseases. Paper presented in National Seminar on diseases of spices, Kozhikode, 7-8th April '94.
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Kumar, NK '94. Profile analysis of tribes in Kerala. National Seminar on Forest Management at Indian Institute of Forest Management, Bhopal.

Kumar, NK '94. Consultative Extension. Approach Issues and Implementations. International Seminar on Appropriate Cost Effective Extension Strategy held at Tamil Nadu Agrl. University, Coimbatore.

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Seema, B, Shilaja, S and Sobhana, G '95 Training needs of rural women in nutrition and child care. Proceedings of Seminar on Women in Kerala Yesterday, Today held at Trivandrum on 11 & 12th February '95.

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#### Popular Articles

Sabina George, T and Ramachandran Nair, S '95. Garden layout and maintenance. Mathrubhumi Agricultural supplement. January '95 (Malayalam).

Sabina George, T '94. Commercial floriculture—Prospects of Kerala souvenir, State Agricultural Fair '94.

Abdul Vahab, M '94. Leguminous vegetables—food for man and soil. Mathrubhumi Agricultural Annual, May '94.

Abdul Vahab, M. Harvest of money through watermelon cultivation. Mathrubhumi Daily, December '94.

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Manju, P, and Gopimony, R, 'കോമാടൻ ഒരു മികച്ച തെങ്ങിനം'—ജനപഥം '9-94.

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Abdul Khader 'തെങ്ങിൽ ശാസ്ത്രീയ വളപ്രയോഗം'—ജനപഥം 9-94.

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Prakash, R, 'തിലക'—അത്യുൽപാദനശേഷിയുള്ള എള്ളിനം—മാതൃഭൂമി 30-8-'94.

Prakash, R, 'ചെറിപഴം വീട്ടിലുണ്ടാക്കാം'—ചനിൽ October Vol. I

Prakash, R, 'പാവയ്ക്കയിൽ നിന്ന് ഏയ്ഡ്സിസ് മരുന്ന' Kerala Kaumudi 21.11.'94.

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Suharban, M 'സ്പാഷ് അഥവാ കുഞ്ചുവിത്ത്'—കേരള കർഷകൻ

Sabina George, T, Nair, SR, 'Garden Layout and Maintenance' Agrl. supplement - Mathrubhumi '95.

Sabina George, T, 'Commercial floriculture prospects of Kerala' Souvenir, State Agricultural Fair '94.

Abdul Wahab, M, 'Leguminous Vegetables—food for man and Soil' Agricultural Supplement - Mathrubhumi - '94.

**Radio talks and Doordarsan Programme**

Scientists from different disciplines did broadcast on the radio and telecast on Doordarsan the various aspects of modern farming and technological advancements. A total number of 50 AIR and 6 Dooradarsan programmes were presented by the scientists of the college.

*College of Horticulture, Vellanikkara*

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- Koshy Abraham, K, Prem. EE and Nair RV '94. Screening of cocoa types for resistance to *phytophthora* foot rot. Paper presented in the PLACROSYM. XI, Calicut, 30 Nov.3 to Dec. '94 (Abstract p. 28).
- Kumari Sushama, NP, Nair, GT and Bhaskaran, C '94. A model for effective vocational Agricultural Education Programme in Kerala. Pdgs. of International Congress on Kerala Studies 27-29 Aug. '94, Thiruvananthapuram.
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- Nair, RV, Mallika, VK, Sunitha, S and Santhy, V '94. Improvement of cocoa through vegetatively propagated planting material. *Indian Cocoa Arecanut and Spices, J. XVI* (3&4) p. 93-95.
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- Prabhakaran, PV '94. Assessment of losses due to pests' diseases and drought in the yield of black pepper Paper presented in the Symposium on plantation crops and their role in the new economic scenario at the 48th Annual Conference of Indian Society of Ag. Statistics held at Mannuthy, Thrissur, December '94.
- Prabhakaran, PV '94. Inter district disparities in agricultural development in Kerala. Paper presented in the International Congress on Kerala Studies, AKG Centre, Thiruvananthapuram, August 94 (Abstract Vol. 5, pp 34-35).
- Prabhakaran, PV and Rari John, V 1994. A non parametric alternative for the interpretation of data collected from groups of experiments. *J. of the Ind. Soc. Agr. Stat.* 46 (2): 201-210.
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- Prasannakumari, KT, Viswanathan, TV, Jim. Jose Chittattu and Augustine, A '94. Evaluation of geographical races of *Kaempferia galanga* for yield. *Indian Perfumer.* 38 (2): 56-59.

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- Sally, KM Abdul Vahab, M and Nirmala Devi, S '94. Standardisation of spray schedule for the management of die-back and fruit rot of chillies. Paper presented in the National Seminar on Diseases of Spices held at Calicut, 7-8 April 1994.
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#### **Radio broadcast and Doordarshan programmes**

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Dr Thomas Biju Mathew, Assoc. Prof. (NC) of Entomology. Talk on Pesticide Residue and health hazards. AIR broadcast on 20-5-94.

Dr. PR Ramasubramonian. Professor of Soil Science. Talk on 'Balanced fertilizer use --Farmers should know this'. AIR broadcast on 16-6-94.

Dr Nazeema Beevi, Assoc. Professor (NC) of Entomology. Pesticide residue in milk and milk products. Talk recorded on 16-6-94 for broadcast over AIR.

Dr. Thomas Varghese, Professor Soil Science and Co-ordinator, USREC project participated in a programme on Ecofriendly agriculture, which was telecast over Thiruvananthapuram Doordarshan on 15-2-95.

Dr. Manju, P Assoc. Prof. (NC) of Pl. Breeding. Talk on 'Thengile Machinga kozhichil' AIR broadcast on 20-3-95.

Ramachandran Nair, N, Assoc. Prof. of Plant Breeding. Talk on 'Pulses suitable for garden lands'. AIR broadcast on 30-3-95.

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Dr. Padmakumari, G, Professor of Plant Pathology, Talk on Village Adoption. AIR broadcast on 19-6-94.

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Dr Rema Menon—"Planting of banana suckers"—*Kalpadhenu* — Oct-Nov-Dec, '94

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Radhakrishnan TC - "Important diseases of banana and their control" -21,6/94

Dr Rema Menon - "Selection of suckers and planting in banana" - An Interview 27/8 94

Premalatha T "Selection of suckers and planting in banana" - Talk in Malayalam

Dr Rema Menon - "Non-Nendran banana varieties" 16/2/95

Sri Radhakrishnan TC - "Bunchy top disease of banana" - 24/1 95

**KHDP Vellanikkara**

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Devadas, VS and Seemanthini Ramadas '94 Heterosis and combining ability for bitter principles in *Momordica charantia* *Cucurbits Genetic Co-operative Report*. 17: 132-134

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Omana Pavunny -Cashew apple products, A.I.R. on 29/3/'95

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- Dr K Anilkumar Manuring for virippu crop AIR, Kozhikkode on  
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*ECF Unit, Kayamkulam*

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*Acacia enathil petta vrukshagal*

Thomas Mathew, '94. Kalpadhenu, 22 (2) 3-7.

*Karimbu*—A booklet prepared & published by S Santhakumari.

**AIR Programme**

Held a talk on the balanced fertilization need of the hour.

Held a talk on coconut based farming system: perennial crops  
and answering to the questions of the listeners.

## *RARS, Kumarakom*

### **Publications**

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Joseph Philip and RR Nair, '94. Effect of time of planting and irrigation on growth and yield of elephant foot yam, *Amorphophallus paeonifolius* grown in the garden lands of Kuttanad, Kerala. *Crop Res.* 8(3):552-557.

## *RRS, Vyttila*

### **Publications**

#### **Research paper**

Shylaraj, KS George KM and Sasidharan, NK '94. IR-4630-derived lines are stable high yielder under saline conditions in Kerala, India, IRRN. 19-2 pp 21.

Shylaraj, KS, Chandrasekharan Nair, K and George, KM '95. Ionic mechanism of salinity tolerance in pokkali genotypes Proc. 7th Kerala Science Congress, 21-23 January. '95 Palakkad.

Rajendran, CG, Mohan, MV Sasidharan, NK, George PU and George, MK '94. Feasibility of monosex culture of male Tilapia (*Oreochromis mossambicus*) along with paddy in pokkali fields. *J. of Aquaculture in the tropics* pp 173-178.

Popular Articles: 1

Radio talks : 9

## *AICRP on Agrl. Drainage, Karumady*

### **Scientific articles**

EK Mathew - 1994. Sub-surface drainage to boost up rice in acid - saline soils of Kuttanad, Kerala. Paper presented at 7th Kerala Science Congress held at Palakkad. Booklet Drainage and Rice Productivity.

## *AMPRS, Odakkali*

### **Scientific articles**

Samuel Mathew and Agnihotri, NP. A terrestrial agro-ecosystem model for the study of environmental behaviour of agro-chemicals. Presented at the 44th Annual Symposium of the Academy of Environmental Biology, Thiruvananthapuram 7-9 Nov. '94.

Samuel Mathew and Agnihotri. Fate of 14C-deltamethrin applied to cotton in model terrestrial agro-ecosystem. Presented at the 44th Annual Symposium of the Academy of Environmental Biology, Thiruvananthapuram 7-9 Nov. 1994.

Samuel Mathew, Gim Jose, C and Thomas, J OD 468—A high geranyl acetate yielding chemotype of lemongrass (Paper sent for publication in Indian Perfumer).

Francis Xavier, Balakrishnan, M, Samuel Mathew, Gim Jose, Thomas, J 95. Studies on the perineal gland secretion (civet) of the small Indian civet *Viverricula indica* Desmarest. Proc. 7th Kerala Science Congress, Jan. 95, Palakkad, p 331-334.

### *CRS, Madakkathara*

Abdul Salam M and Balasubramanian, '94. Plant cashew in peninsular soils upto 700 m altitude to condition or inhabit wastelands and to earn forex '*Indian Horticulture*'.

Usha KE, Jagadeesh Kumar, and Dr Pathummal Beevi, S 'Kanaka and Dhana' Cashew Bulletin 3-6.

### *Communication Centre, Mannuthy*

#### **Scientific Articles**

Sreedevi, P, Thomas, CG, Bai, EKL, Durgadevi, KM, and Arya, K, 94. Integrated Weed Management in Cassava. Abstracts, VI Biennial Conference of Indian Society of Weed Science, 94. Annamalai Nagar February, 9-10, 95. pp 93.

Sreedevi, P, George, A, Santhakumari and Bai, EKL, 94. Integrated Weed Management in Sesame. Abstracts. VI Biennial Conference of Indian Society of Weed Science, 94. Annamalai Nagar February, 9-10, 95 pp 65.

Sreedevi, P and Thomas, CG, 94. Control of *Pennisetum polystachyon* in young plantations of Kerala. Abstracts, VI Biennial Conference of Indian Society of Weed Science, 94. Annamalai Nagar, February, 9-10, 95 pp 121.

Thomas, SL and Sreedevi, P 94. Effect of preemergence herbicides on phytotoxicity and Weed control in dry seeded rice in Kerala, Abstracts, VI Biennial Conference of Indian Society of Weed Science, 94. Annamalai Nagar, February, 9-10, 95 pp 23.

### *College of Forestry, Vellanikkara*

Jamaludheen V, Gopikumar K and Sudhakara K, '95. Variability studies in lagerstroemia (*Lagerstroemia speciosa*) *Indian Forester* 121:137-142.

- Gopikumar K, and Moktan MR: '94. Studies on the effect of plant hormones on seed germination and growth of tree seedlings in the nursery, *J. Tropical Forestry-X* (1) : 45-51.
- Anoop, EV, and Gopikumar K: '94 Nutrient deficiency symptoms of ailanthus seedlings. Presented in the 15th Annual Session of the Academy of Environmental Biology at Trivandrum Nov. 7-9, '94.
- Animon MM, Gopikumar K and Santhoshkumar S, '95. Mangium - A Multipurpose Tree, KAU, Vellanikkara.
- Kumar BM, Long JN and Kumar P, '95., A density management diagram for teak plantations of Kerala in peninsular India. *Forest Ecology and Management*, 74 : 125-132.
- Kumar BM, Shajikumar V and Mathew, T '95. Floristic attributes of small cardamom *Elettaria cardamom* (L) areas in the Western Ghats of peninsular India *Agroforestry Systems* 30 : 1-15.
- Anoop EV, Kumar BM and Abraham CT, '94. Teak growth in response to weed control treatments. *J. Trop Forest Sc.* 6 : 379-386.
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- Abraham CC, Sudhakara K and Ushakumari R '95 Occurrence of *Oruchidus bilineasofigus* (Bruchidae; Coleoprua) as a pest of pods and seeds of the multi-purpose tree species *Allizia odoretissima* (L. F.), *A: Procure* (Roxb.) and *Paraserianthus falcataria* (L). *Insect Environment* 1 (1) : 7-8
- Sajeevkumar B, Sudhakara K, Ashokan PK and Gopikumar, K '95. Seed dormancy and germination in *Allizia falcolarva* and *Allizia procera* - *J Crop Forest Sci.* 7 : 371-382.

Dileep M, Sudhakara K, Santhoshkumar AV, Nazeema KK and Ashokan PK '94. Effect of seed-size rooting medium and fertilizers on the growth of seedlings of *Ceiba Pentanfra* *Indian J. Forestry* 17: 293-300.

*College of Co-operation and Banking, Mannuthy*

**Papers published**

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Mohandas, M, 1994. Kerala Economy, Preference, problems and prospects in poverty in Kerala, Ed. Vol. by Prakash, BA (1994) Sage Publications India Ltd. pp. 78-95.

*Fisheries Research Station, Puduveypu*

**Publications**

Dr Purushan KS. An improved farming practice for sustainable shrimp production from traditional systems in Kerala — paper presented at the International Congress on Kerala Studies, AKG Centre for Research and Studies, Trivandrum, 27-29 August '94. Abstract Vol. IV.

Dr Purushan KS. Shrimp/prawn farming in India — An eco-friendly approach for rural development—Sea Food Export Journal, Vol. XXVI, No. 1, Jan. '95.

Dr Purushan KS. പരമ്പരാഗത മത്സ്യകൃഷി — അതിന്റെ പൊതുവകുപ്പം — Compendium issued by the Fisheries Station in connection with the farmers' training under the NWDB Project — Dec. '94.

Dr Purushan KS. ശാസ്ത്രീയ പെന്തിനീകൃഷി — Compendium Dec. '94.

Dr Purushan KS. മത്സ്യകൃഷി തയ്യാറെടുപ്പുകൾ — കൃഷിരീതികൾ — കേരള കർഷകൻ.

Dr Purushan KS. കണ്ടൽക്കാടുകളും പവിസ്മിതിസംരക്ഷണവും — വിശ്വകാത്തി, കൊച്ചി. Book 3 No. 9, Jan. '95.

Dr Elizabeth Joseph. സസ്യാഹാര മത്സ്യങ്ങളെ ഓരോ ജലത്തിൽ വളർത്തുവാനും. Compendium issued by the Fisheries Station in connection with the farmers' training under NWDB project, Dec. '94.

Dr Jose MM. ശുദ്ധജല വളർച്ചയ്ക്കു മത്സ്യങ്ങളിലെ പ്രേരിത പ്രജനനം — കേരള കർഷകൻ. June '94.

Dr Jose MM. Use of barbed wire against fish poaching — Fishing chimes — Sept. '94.

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Dr Jose MM. Observation on the gonadal maturity of *M.cephalus* reared in culture ponds — Sea Food Export Journal — December '94.

- Dr Jose MM. ലവണജല മത്സ്യകൃഷി -കുഞ്ഞുങ്ങളെ ശൈശവകൃഷി രീതികളും വിളവെടുപ്പും - Compendium issued by the Fisheries Station in connection with the farmers training under the NWDB Project. December '94.
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*College of Veterinary and Animal Sciences, Mannuthy*

**Scientific papers**

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- Sathyanesan V and Subramoniam H 1994. Comparative study on the efficacy of three newer anthelmintic with piperazine hydrate against different developmental stages of *Ascaridia galli* in chicken. *Kerala J. Vet. Science*, 24(1).
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- John Thomas, George KC, Jacob Thomas M and Reghunathan Nair G 1994. Prediction of egg production in Japanese Quail. *Indian J. Poultry Science* 29(1) 9-12.
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- Stephen M, Rai AV and Govindaiah MG '94. Body weights of birth and three months of Malabari goats and its crosses with Alpine and Saanen breeds. *Curr. Res.* 23 ;84-96.
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- Dr Sreeja Rajmohan Potassium Sorbati as an antimycotic agent in enhancing the keeping quality of dahi. *Cheiron* 23 (1).
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- Sisilamma George and Sreevastava RK. Kinetic parameters of fructose, 6 diphosphatase (FD) pase in ram semen. *Journal Vety. Animal Science* 24 (1) 8-12.
- Amir Abbas Farshid and Rajan A '93. Pathomorphological and histological observations on the lymphoid organs of Japanese quail in experimental ochratoxicosis *J. Vety. Animal Sciences* -24 (1) 28-33.
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- Ravindran Nair, S Sarada Amma T and Balagopalan TP '93. Agenesis of anus and rectum associated with prolapse of colon in a calf—a case report. *J. Vety. Animal Science*—24 (1) 80-82.
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George, PO, Rajankutty, K and Balagopalan, TP '94. Cervico vaginal prolapse in a rabbit—a case report. *J. Vety. Anim. Science*—24 (1) 84.

Abraham Varkey, C, Sarada Amma, T, Balagopalan TP and Devanand. CB '93. An unusual case of reapture of urethra in a kid. *J. Vety. Animal Science*—24 (1): 86.

**Popular articles & Radio talks**

Preparation of quality funds with locally available materials—  
Radio talk on 1.6.'94 by Dr Maggie, D, Menachery.

Indegenous cattle feed—Radio talk on 31.3.95 by Dr Thomas, CT.

Feeding and management of goats—Radio talk on 20.7.'94 by  
Dr Anil SS.

Role of Livestock and poultry in integrated farming system—  
Radio talk on 20.7.94 by Dr PS Pushkaran.

Various aspects of Duck farming—Radio talk on 15.10.'4 by  
Dr MR Subhadra.

Haemorrhagic septicemia—Radio talk on 5.12.94 by  
Dr PS Pushkaran.

Different grades of milk—Radio talk on 10.6.94 by Sreeja  
Rajmohan.

Ways to improve the keeping quality of milk—Radio talk on  
4.11.'94 by Dr Sreeja Rajmohan.

## Appendix VI

### LIST OF PROJECTS FINANCED BY OUTSIDE AGENCIES DURING 1994-'95

#### FACULTY OF AGRICULTURE

##### ICAR

- AICRP on Agroforestry (Functioning at LRS, Thiruvazhamkunnu)  
College of Forestry, Vellanikkara
- AICRP on Nematode Pests—NARP SR, Vellayani.
- AICRP on Agrl. Drainage—AICRP on Agrl. Drainage, Karumady.
- AICRP on Spices Research on Pepper—PRS, Panniyur.
- AICRP on Cashew Research on Cashew. (Madakkathara & Pilicode)—CRS, Madakkathara.
- AICS & CIP, Research on Cardamom—CRS, Pampadumpara.
- AIC Floriculture Improvement Project—College of Horticulture, Vellanikkara.
- AICRP on Fruits (Banana)—BRS, Kannara
- AICRIP Double Cropping Main Centre—RARS, Pattambi.
- AICRIP Double Crop Cropping Sub centre, ARS, Mannuthy.
- AICRIP, DHP & GSV Merger—RRS, Moncompu.
- AICRP on Arid Legumes (Guar)—RARS, Pattambi.
- AIC Vegetable Improvement Project—College of Horticulture, Vellanikkara.
- AICRP on Forage Crops—NARP SR, Vellayani.
- AICRP on BCCP—College of Horticulture, Vellanikkara
- AICRP on Sugarcane—SRS, Thiruvalla
- AICARP Project Directorate of Cropping Systems Research—  
Karamana & ECF Unit, Kayamkulam—CSRC, Karamana.
- AICRP on Water management—ARS, Chalakudy
- AICRP on Weed Control—AICRP on Medicinal & Aromatic  
Plants—College of Horticulture, Vellanikkara
- AICRP on Pesticide Residue—NARP SR Vellayani
- AICRP on oil seeds for groundnut and sesamum—RRS, Kayam-  
kulam

All India Network project on Agricultural Ornithology – College of Horticulture, Vellanikkara.

AICRP on Honey bee –NARP SR, Vellayani

ICAR Co-ordinated project (100%)

NSC Breeder Seed production Unit –RARS, Pattambi

**ICAR:ICAR Adhoc**

Survey, collection, evaluation, conservation and cataloguing of germplasm of certain under exploited perennial vegetables – College of Horticulture, Vellanikkara.

Crop weather models for Cashew –RARS, Pilicode

Homestead agro forestry systems of Kerala. Productivity of the extent homestead models and increasing the efficiency of the models –NARP SR, Vellayani.

Rainwater conservation in coconut-based agro forestry systems by water harvesting techniques and Standardisation of bareroot nursery techniques of some important tree species used for agroforestry planting in Kerala –College of Forestry, Vellanikkara.

Evaluation of cultivated and wild rice germplasm for biotic stresses –RRS, Moncompu.

Evaluation of tomato for summer season –College of Horticulture, Vellanikkara.

Epidemiology of honey bee disease in Kerala and its management. NARP SR, Vellayani.

Cytogenetic investigations of *Kaempferia galanga* L., *Piper longum*. and *Andra graphis paniculata* Drum. –College of Horticulture, Vellanikkara.

Collection, evaluation, cataloguing and genetic improvement to tailor better commercial varieties with export potential in *Anthrrium* spp. –NARP SR, Vellayani.

Species relationship in the genus *Piper* and the scope of related taxa in the improvement of *piper nigrum* L; Technology development for handling and utilization of common type of jack fruit of Kerala. –College of Horticulture, Vellanikkara.

An evaluation of group management techniques in Agriculture adopted to enhance production and productivity of paddy in Kerala. –College of C&B, Mannuthy.

Standardisation of agrotechnics in foliage plants; Triploid Breeding of Tetraploid Hybrids of Palayankodan (*Musa* AAB Mysore) x Pisang Lilin (*Musa* AA Pisang Lilin) for disease resistance. Studies on the influence of variety, maturity & storage of Cashew apple on the quality of fermented products (wine and liquor) Traditional and appropriate technologies for in situ rain water harvest under humid tropical situations. –College of Horticulture, Vellanikkara.

- Development of soya rice blended food recipes.—College of Agriculture, Vellayani.
- Evolving techniques for the invitro propagation of economically important mono and poly embryonic mango varieties of Kerala NARP SR, Vellayani.
- Nutritional studies on the availability of iron—College of Horticulture, Vellanikkara.
- Nutrient cycling in coconut based intensive multiple cropping systems.— College of Forestry, Vellanikkara.
- Breeding for resistance to mosaic viruses in chilli (*Capsicum annum* L.)—RARS, Pattambi.
- Survey, collection, evaluation, conservation and standardisation of vegetative propagation in five under-exploited minor fruits of Kerala.— College of Horticulture, Vellanikkara.
- Genetic factors affecting nutrient content in vegetable amaranthus.—EEC - KHDP Programme, Vellanikkara.
- Development of improved strains of oyster mushrooms and standardisation of techniques for their commercial cultivation in Kerala.—NARP SR, Vellayani.
- Survey, collection, conservation and utilisation of pickling type mangoes.—RARS, Pilicode.
- Soil chemical and radio ecological investigations of root wilt disease of coconut palm, Inter mat; Intra mat and crop competitive studies in banana (cv. palayankodan) using tracer techniques - College of Horticulture, Vellanikkara.
- Heterosis in chilli and brinjal associated with reference to bacterial wilt. KHDP Programme, Vellanikkara.
- Non-ICAR (100%): Cad India Ltd,*
- Cocoa research collaboration project between KAU and Hindustan Cocoa products Ltd. - College of Horticulture, Vellanikkara.
- Non-ICAR (100%): Central Silk Board*
- Standardising sericultural practices for the agroclimatic conditions of Kerala.—NARP SR, Vellayani.
- All India Co-ordinated experiments on sericulture at Ambalavayal - RARS, Ambalavayal.
- All India Co-ordinated experiments on sericulture at Vellanikkara centre at KAU. - College of Horticulture, Vellanikkara.
- Non-ICAR (100%): Central Silk Board*
- Climate and Coconut - RARS, Pilicode,
- Non ICAR (100%): Dept of Biotechnology (GOI)*
- Tissue culture research on cocoa - College of Horticulture, Vellanikkara.

Tissue culture research on Black pepper—College of Horticulture, Vellanikkara

Micropropagation of the tree spices in Kerala (Clove and Nutmeg); Management of root diseases of important spice crops of Kerala with VA mycorrhiza; Rhizobium pulses association development of efficient strains of Rhizobium suitable for acid soil conditions NARP SR, Vellayani.

Tissue culture research on humid tropical plantation crops and spices—Cadbury Cocoa Research Project, Vellanikkara.

*Non-ICAR (100%) Dept. of Agri. & Co-operation (GOI)*

Central sector scheme for integrated programme for the development of spices. (Panniyur, Ambalavayal, Mannuthy, Vellanikkara and Pilicode)—PRS, Panniyur.

Central scheme for development of medicinal and aromatic plants—AMPRS Odakkali and COH, Vellanikkara

Central sector scheme for the integrated Cashew development. Establishment of Madakkathara Centre - CRS, Madakkathara

Central sector scheme for the Integrated Cashew development. Establishment of Pilicode Centre, RARS, Pilicode.

*Non-ICAR (100%): Dept. of Science & Technology (GOI)*

Estt. of a National Centre for medium range weather forecasting on experimental basis at KAU main campus. College of Horticulture, Vellanikkara

Crop growth simulation models of rice—RARS, Pilicode.

*Non-ICAR (100%): Dept. of Atomic Energy, GOI*

Studies on coconut palm in coastal Quilon district of Kerala—College of Horticulture, Vellanikkara.

*Non-ICAR (100%): Directorate of Cocoa, Arecanut & Spices Dev.*  
Establishment of the Nursery for distribution of budded Cocoa plants and hybrid seedlings at the KAU

*Non-ICAR (100%): Directorate of Cocoa, Arecanut & Spices Dev;*  
Field testing of tissue culture plants & training in plant tissue culture (Operated - one centre at Vellayani & 3 centres at Vellanikkara)—College of Agriculture, Vellanikkara.

*Non-ICAR (100%): EEC*

Research & Development and breeder seed production programme of Kerala Horticulture Development Programme—EEC KHDP Programme, Vellanikkara-

*Non-ICAR (100%) ICSSR*

Organisational alteration for development. A study on the role of [Govtl & Non-Govtl] Organisations for rural development in Kerala. College of Co-operation & Banking, Mannuthy

*Non-ICAR (100%): Kerala Forest Development Fund.*

Clonal propagation of Rosewood through tissue culture;  
Standardisation of nursery techniques of selected tropical forest tree species - College of Forestry, Vellanikkara.

Viability of *Hopea parviflora* (Bedd.) seeds with reference to temperature, medium of storage and microencapsulation techniques - College of Forestry, Vellanikkara

*Non-ICAR (100%) Ministry of Health & Family Welfare (GOI)*

Central scheme for providing assistants for development and cultivation of medicinal plants - AMPRS, Odakkali

*Non-ICAR (100%): National Horticultural Board*

Pilot testing of technology of Papaya based projects; Transfer of technology in low cost nursery production and management technique - College of Horticulture, Vellanikkara.

*Non-ICAR (100%): Other Depts. (GOK)*

Habitat utilisation of animals and their parasitic burden with special reference to Elephants in Vazhachal Forest Division - College of Forestry, Vellanikkara.

Establishment of forage and seed production units through effective utilisation of waste lands - LRS, Thiruvazhamkunnu.

*Non-ICAR (100%): Potash Research Institute of India*

Standardisation of plant part as an Index of potassium status in banana, *Musa Nendran* - NARP SR, Vellayani.

*Non-ICAR (100%): Potash Research Institute of India*

Root activity studies on rubber using  $p^{32}$  as a tracer - College of Horticulture, Vellanikkara.

*Non-ICAR (100%): STEC/STED (GOK)*

Investigations on the diseases of bamboo seeds in Kerala - NARP SR, Vellayani.

Investigations on the changes in the physico chemical properties of coconut garden seeds due to continuous inter culture of fodder crops - NARP, SR, Vellayani.

Evaluation of Acidity parameters in wet land soils of Kerala in relation to nutrient availability - College of Agriculture, Vellayani.

Utility value of foldable solar dryer at household level/farm level standardisation studies - NARP SR, Vellayani

Bioecological studies on the odonata (Dragon flies) with special reference to their predatory potential in the biological control of important rice pests - College of Horticulture, Vellanikkara.

Monitoring of pesticide residues in milk and milk products in Kerala. Impact of sustainable farming practices on Soil properties and crop productivity. Potential of Bioagents (*Bacillus macerans* and *Bacillus circulans*) for the control of root knot nematode in the field. Identity of phytophthora affecting coconut and pepper and their bio control studies on pesticide residues in meat, body, fat, blood and various organs of animals slaughtered for meat purpose -NARP SR, Vellayani.

Pesticide induced histopathological changes in selected fresh water fishes of Kuttanad, Kerala -College of Fisheries, Panangad.

Monitoring of residues of insecticides in vegetables collected from the markets of Kerala.

Recycling of vegetable garbage by vermiculture biotechnology NARP, SR, Vellayani.

*Non-ICAR (100%) : USDA/ FERRO*

Light utilization and canopy nitrogen use efficiency of component crops in some selected agroforestry systems -College of Forestry, Vellanikkara.

*Non-ICAR (75% -25%) : International Soil Ref. & Info. Centre, N' lands*

Establishment of soil reference, collections for training, extension and restearch purposes at KAU -NARP SR, Vellayani.

#### FACULTY : AGRICULTURAL ENGINEERING

*ICAR: ICAR*

AICRP on Farm Implements and Machinery; AICRP on Energy requirements in Agriculture sector -KCAE & T, Tavanur.

*Non ICAR (75%-25%) CAPART*

CAPART Scheme Modification of 'Petty & Para' to improve its efficiency and economy. (Functioning at COH, Vellanikkara)

#### FACULTY : FISHERIES

*ICAR : ICAR Adhoc*

Seed resources and production potential of selected carnivorous fishes in the south west coast of India - Fisheries Station, Puduveyypu.

*Non-ICAR (100%) : Dep't. of Fisheries (GOK)*

Induced maturation and spawning penaeid prawns for commercial level seed production - College of Fisheries, Panangad.

*Non-ICAR (100%): Wasteland Development Board.*  
Demonstration and Training model for a fishery based farming system in Coastal Wasteland. Implemented at Fisheries Station, Puduveypu.

**FACULTY : VETERINARY & ANIMAL SCIENCES**

*ICAR : ICAR*

AICRP on Poultry College of Vety. and Ani. Sci., Mannuthy.

AICRP on Pigs - PBF, Mannuthy.

Field progeny testing project at Mannuthy; Network programme on micronutrients in Animal Nutrition and production Implementation; Network programme on embryo transfer, technology in animal production;

*ICAR : Co-ordinated Project (100%)*

Centre of advanced study in Veterinary Pathology;

*ICAR:ICAR Adhoc*

Utilization of elephant energy with enhanced system efficiency; Studies on blood groups and biochemical polymorphism in cattle; Conservation of germplasm of Vechur Cattle of the coastal area and dwarf cattle of the high range of Kerala - College of Vety. and Ani. Sci. Mannuthy.

Effect of Tannin rich feeds on bypass protein availability,

*Non ICAR (100%): Coconut Development Board*

Development and standardisation of Dairy foods incorporating coconut - College of Veterinary and Animal Sciences, Mannuthy.

*Non ICAR (100%): Dept. of Science and Technology (GOI)*

Introduction of cage system in egg production in the homesteads - AICRP on Poultry, Mannuthy.

*Non ICAR (100%): Dept. of Soil Conservation*

Survey to assess the economic loss due to aflatoxicosis in dairy cattle in Kerala. College of Vety. & Ani. Sci. Mannuthy

Investigations on mortality of ducks in Kuttanad, Kerala; Ascitic syndrome in poultry; Schistosomiasis in cattle, in buffaloes in Thrissur and Palakkad districts; A comparative study of the diagnostic techniques to evolve a simple rapid method for the diagnosis of rabies in domestic animals; Etiology, diagnosis and control of mastitis in crossbred cattle

**Kid Mortality**

*Non-ICAR (100%): STEC/STED (GOK)*

Assessment of the mortality pattern in livestock and poultry. College of Vety. & Ani. Sciences, Mannuthy



## Appendix VII

### STATUTE AMENDMENTS

Amendments to SRO No. 1065/79 issued vide Notification No. GA/E3/48893/91 dt. 14.9.94.

First statute SRO No. 340/95 for the post of Cook-cum-Caretaker issued vide GO(P) No.208/95/AD dt. 8.2.95.

First statute SRO No. 341/95 for the post of Fisherman issued vide G. O.(P) No. 209/95/AD dt. 8.2.95.

## Appendix VIII

### WORKS EXECUTED DURING THE YEAR 1994-95

#### Mannuthy

1. Construction of compound wall and gate to the Cattle shed at ULF, Mannuthy	— 4,88,512
2. Construction of additional class rooms at CVAS, Mannuthy	— 5,99,481
3. Construction of additional room for store and lab-cum treatment room at PBF, Mannuthy	— 2,59,547
4. Providing additional space for virology and toxicology	— 20,87,253
5. Construction and electrification of open pig styes and furrowing houses at PBF, Mannuthy	— 18,89,953

#### Vellanikkara

1. Construction and electrification of drying yard, seed store, labourers waiting shed, compound wall etc. at KHDP Main Campus, Vellanikkara and construction of Lab. Building for KHDP Main Campus, Vellanikkara	— 8,18,590
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#### KVK, Ambalavayal

1. Construction and electrification of class room and library at KVR, Ambalavayal and providing compound wall	— 4,78,404
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#### KCAET, Tavanur

1. Construction of Acad. Block—Construction of trainees hostel	— 16,48,099
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#### Fisheries College, Panangad

1. Construction of fish hatcheries (carp and prawn, construction of compound wall on either side at College of Fisheries, Panangad	— 3,42,715
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#### PRS, Panniyur

1. Construction of an approach road at PRS, Panniyur	— 5,26,668
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#### RARS, Pattambi

1. Renovation of pond for irrigation purpose and GL tank	— 2,93,601
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#### SRS, Thiruvalla

1. Providing water supply arrangements, formation of approach road to the newly constructed lab. building etc.	— 5,03,900
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