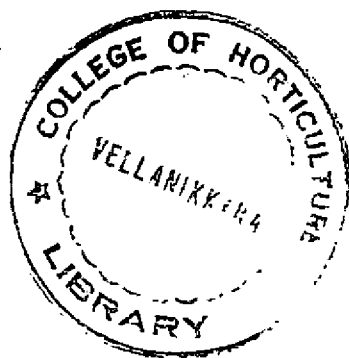
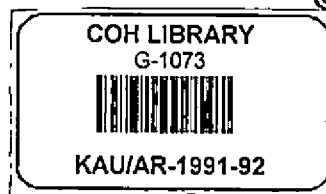


ANNUAL REPORT

1991-'92



Gr. 1073



KERALA AGRICULTURAL UNIVERSITY

English

ANNUAL REPORT

February 1993

Copies 500

Compiled and Edited by:

Publication Unit

Directorate of Extension

Kerala Agricultural University

Published by:

Dr. V. K. Sasidhar

Director of Extension i/c.

Kerala Agricultural University

Mannuthy, Thrissur

Printed at:

Kerala Agricultural University Press

Mannuthy 680 651

Thrissur, Kerala

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General Report

The Executive Committee of the Kerala Agricultural University presents to the General Council its Annual Administration report for the year 1991-92 (1-4-1991 to 31-3-1992).

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.

Dr. E. G. Silas continued as Vice-Chancellor of the University. He was on leave from 20-9-1991 to 26-10-1991 and Dr. C. Sreedharan, Dean, College of Agriculture, Vellayani discharged the duties of the Vice-Chancellor during the leave period. Sri James Varghese, IAS continued as the Registrar.

Officers of the University

Vice-Chancellor	: Dr. E. G. Silas
Registrar	: Sri James Varghese
Comptroller	: Sri P. M. Indramanian (upto 8-8-91) Sri Babu Jose (from 9-8-91)
Director of Research	: Dr. M. Aravindakshan
Director of Extension	: Dr. A. G. G. Menon (upto 5-9-91) Dr. G. Nirmalan i/c (from 6-9-91 to 19-12-91) Dr. A. G. G. Menon (from 20-12-91)
Director of Physical Plant	: Sri P. O. Thomas
Dean (Agriculture)	: Dr. C. Sreedharan
Dean (Vety. & Animal Sciences)	: Dr. G. Nirmalan i/c.

Dean (Fisheries) : Dr. D. M. Thampi i/c.
 Dean (Agrl. Engineering) : Prof. T. P. George i/c.

Other officers who officiated the different positions were as follows.

Assoc. Dean (Horticulture) : Dr. C. C. Abraham
 Assoc. Dean (Co-operation & Banking) : Dr. C. A. Jos i/c.
 Special Officer (Forestry) : Dr. C. C. Abraham i/c.
 Director (Veterinary Research & Education) : Dr. M. Krishnan Nair
 Director (Students Welfare) : Sri O. K. Paul i/c.

EDUCATION

The following 7 teaching institutions functioned under the University during the period. Various courses offered in these institutions are given below:

<i>Name of College</i>	<i>Courses offered</i>
College of Agriculture, Vellayani	: B.Sc (Ag), M.Sc (Ag), M.Sc (Hort) and Ph.D.
College of Horticulture, Vellanikkara	: B.Sc (Ag), M.Sc (Ag), M.Sc (Hort) and Ph.D.
College of Veterinary and Animal Sciences, Mannuthy	: B.V.Sc. & A.H, M.V.Sc. and Ph.D.
College of Fisheries, Panangad	: B.F.Sc and M.F.Sc.
Kelappaji College of Agrl. Engineering & Technology, Tavanur	: B.Tech and M. Tech (Ag 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)

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. During the period, 509 students were admitted to various courses. 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 are furnished below:

<i>Degree</i>	<i>No. admitted</i>	<i>No. passed out</i>
B.Sc. (Ag)	159	82
B.V.Sc. & AH	108	177
B.F.Sc.	25	10
B.Sc (C&B)	21	22
B.Sc (Forestry)	13	12
B.Tech. (Ag Engg)	19	22
M.Sc. (Ag)	61	12
M.Sc. (Hort)	14	1
M.Sc. (Ag Stat)	4	3
M.Sc. (C&B)	—	—
M.Sc. (Forestry)	6	1
M.Sc. (FS& N)	8	1
M.Sc. (Ag Eco)	3	—
M.Tech. (Ag Engg)	8	2
M.V.Sc.	27	3
M.F.Sc.	5	2
Ph.D. (Agriculture)	19	11
Ph.D. (Veterinary)	7	2
Ph.D. (Home Science)	2	—
Total	509	363

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

<i>Courses</i>	<i>Total No. of students</i>
a) U. G. Courses	
B. Sc. (Ag.)	680
B. V. Sc & A. H	576
B. F. Sc	86
B. Sc. (C&B)	67
B. Sc. (Forestry)	70
B. Tech. (Ag Engg)	99
b) P. G. Courses	
M. Sc. (Ag)	159
M. Sc. (Hort)	43
M. Sc. (Ag, Stat)	10
M. Sc. (C&B)	5
M. Sc. (Forestry)	13
M. Sc (F S & N)	21
M. Sc. (Agrl. Econ)	3
M. Tech. (Ag Engg)	19
M. V. Sc.	80
M. F. Sc.	29
Ph. D. (Agriculture)	66
Ph. D. (Vety. & AS)	24
Ph. D (Home Science)	5
Grand Total	2055

Extra curricular activities of the students and co-curricular activities were co-ordinated by the Directorate of Students Welfare through Physical Education Teachers and other teachers of the various colleges. The Directorate of Students Welfare organised inter-collegiate tournaments for various games and sports during the year. Students' Union activities were also implemented satisfactorily.

The 14th KAU Youth festival was conducted at the Main Campus from 10 th to 12 th February, 1992.

The KAU continued to be a member of the Association of Indian Universities.

RESEARCH

The research programmes of the University have been drawn out with emphasis on solving location specific, field oriented problems faced by the farmers of the State. In addition to the State funds, the University also received assistance from ICAR, World Bank, Department of Science & Technology, Department of Environment, Department of Electronics, FERRO, USDA, Hindustan Cocoa Products Ltd., Coffee Board and various other agencies.

Under the National Agricultural Research Project, five Regional Research Stations continued to function at Vellayani (Southern Region), Kumarakom (Region of Problem Areas), Pattambi (Central Region), Pilicode (Northern Region) and Ambalavayal (High Range Region). The technical and administrative control of these stations were vested with the respective Associate Directors under the overall control of the Director of Research. Farm Development programmes, civil works, procurement of equipment, implementation of technical programmes etc., progressed as per schedule.

The project co-ordination groups in all the faculties were re-constituted during the year 1990-91 based on the thrust areas of research in various fields identified. There were 22 project co-ordination groups in the Faculty of Agriculture, 8 in the Faculty of Veterinary & Animal Sciences and one each in the Faculty of Agricultural Engineering and Fisheries. The Faculty Research Committee of Agriculture met twice during the year and 188 projects/experiments were cleared for implementation. The Faculty Research Committee of Veterinary and Animal Sciences met once and approved 28 projects/experiments. The Faculty Research Committee of Fisheries met once and cleared 5 projects/experiments for implementation.

The Associate Directors from the Headquarters conducted Monitoring and Evaluation programmes of the different Stations as shown below:-

Assoc. Director of Research (Vety. & AS)

16-12-91 Rice Research Station, Vyttila and Fisheries Station, Puduveypu

Assoc. Director of Research (AR & T)

12-12-91 Banana Research Station, Kannara

19-12-91 Agronomic Research Station, Chalakudi

20-12-91 Aromatic & Medicinal Plants Research Station, Odakkali

Assoc. Director of Research (M&E)

5-4-91 Rice Research Station, Kayamkulam

10-4-91 Pineapple Research Centre, Vellanikkara

20-4-91 Rice Research Station, Vyttila

25-4-91 Rice Research Station, Moncompu

26-4-91 Sugarcane Research Station, Thiruvalla

30-4-91 Regional Agrl. Res. Station, Kumarakom

16-12-91 Rice Research Station, Vyttila

Associate Director of Research (Planning)

3-12-91 to Regional Agrl. Research Station, Ambalavayal

6-12-91

16-12-91 to Cardamom Research Station, Pampadumpara

18-12-91

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

- 1 NARP Review meeting (Quarterly)
- 2 Package of Practices Mini Workshop
- 3 Meeting of Crop Co-ordinators/Heads of Departments
- 4 Meeting with Dr. J. K. Kauffman of International Soil Reference and Information Centre, Netherlands
- 5 Meeting of Plan Progress Reviews
- 6 Meeting on Variety Evaluation Committee
- 7 FRC meeting
- 8 Wrap up meeting with World Bank Team
- 9 Meeting of EEC group on Coconut Research and Development
- 10 Meeting for Meat Production
- 11 Meeting for Kari land Development Scheme
- 12 Meeting of Pepper diseases
- 13 NARP Evaluation team meeting
- 14 Meeting on Network Scheme on Goats

The faculty-wise details of externally aided research projects/schemes implemented as on 31-3-1992 are given below:

Category	Faculty				Total
	Agri.	Ag. Engg.	Fishes	Veterinary	
ICAR Co-ordinated (75-25%)	22	1	—	5	28
ICAR Co-ordinated (100%)	1	—	—	—	1
ICAR Ad hoc	6	—	—	5	11
NARP (ICAR/World Bank)	5	—	—	—	5
Other Externally Aided (100%) (Non-ICAR)	25	—	1	2	28
Other Externally Aided (75-25%) (Non-ICAR)	—	1	—	—	1
Total	59	2	1	12	74

The NARP status reports for all the five zones have already been revised and published for NARP Phase-II based on the recommendations of ICAR. The Editorial Board meeting of Kerala Journal of Veterinary Science was held on 22-10-1991. One issue of the journal was brought out.

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

Region	Dates of workshop	Venue
Southern Region	26th to 28th Sep. 1991	RARS, Vellayani
Special Problem Region	September 1991	RARS, Kumarakom
Central Region	14th to 16th October, 1991	RARS, Pattambi
High Range Region	5th to 7th Sep.'91	RARS, Ambalavayal
Northern Region	August, 1991	RARS, Pilicode

Zone-wise Package of Practices recommendations were prepared for all the five zones, discussed in the respective zonal workshops and finalised based on the recommendation of ICAR/IDA Mission directives.

Dr. S. P. Ghosh, Project Director (NARP) and Dr. S. Gangopadhyay, Principal Scientist, NARP, ICAR visited the stations and reviewed the progress of work under NARP during August 1991 and March 1992. The ICAR/World Bank Mission also

visited the different research centres during October, 1991. All the above teams expressed their appreciation in the progress of implementation of the NARP Phase II in the KAU.

The Kerala State Seed Sub Committee approved the release of the following crop varieties.

Rice	— Aarathi (Culture-4)	— RRS, Moncompu/ College of Agri- culture, Vellayani-
"	— Nila (Pt-48)	— RARS, Pattambi
"	— Kayamkulam-4 (Cul.1358-2)	— RRS, Kayamkulam
Coconut	— Kerasree (PHC-4)	— RARS, Pilicode
Amaranthus	— Arun (S-8)	— College of Agri- culture, Vellayani
Cowpea	— Malika (ACV-1)	— College of Agri- culture, Vellayani
Sweet Potato	— Kanhangad	— College of Agri- culture, Vellayani
Sugarcane	— Thirumadhuram (Cul. COTL-577/84)	— SRS, Thiruvalla

Other salient findings of research conducted during the year are as follows:

Rice and rice based farming system

Experiments in cultivators' fields revealed the superiority of Matta Triveni in the Central zone and Annapoorna in Kole lands during summer season. In *virippu* season the new high yielding varieties Makam, Remya and Kanakam performed well in the Central Zone.

Grain and straw yields of rice in the reclaimed alluvial soil of Kuttanad could be significantly enhanced by providing sub-surface tile drainage.

Two high yielding short to medium duration rice cultures viz. Cul. 8754 and Cul. 8756 resistant to major diseases have been recommended for release and three promising cultures viz. Cul. 8770, Cul. 8772 and Cul. 8759 evaluated under farm trials from Regional Agricultural Research Station, Pattambi.

Two high yielding tall photosensitive varieties with good straw yield and suited for *mundakan* season viz. Cul. 87136 and Cul. 87117 have been evolved at the Regional Agricultural Research Station, Pattambi.

Pre-emergent application of Pendimethalin 1.5 kg ai/ha followed by 2,4-D application @ 0.6 kg ai/ha was found to be effective in controlling weeds and increasing yield of rice.

Experiments conducted at Regional Agricultural Research Station, Pattambi revealed that iron content in the plant as well as index leaves was far higher than the upper critical limit of the element and it is a major yield limiting component, in laterite soils. Study of nutrient absorption pattern in rice showed that surface deposition of iron in roots limits nutrient absorption resulting in low productivity.

Permanent manurial trials at Pattambi indicated that application of organic manure preferably in the form of FYM to supply 50% of the total nitrogen dose will maintain the high productivity of dwarf Indica genotypes in rice monoculture.

Application of Carbofuran 3 G @ 2 kg ai/ha in the nursery five days before up-rooting seedlings was found to be effective in controlling pest attack in the early stages of transplanted rice.

Trebon 10 EC @ 0.075 kg ai/ha was found to be effective in controlling rice leaf folder.

Dipping roots of rice seedlings in 0.22 per cent solution of Chlorpyrifos 20 EC for 12 hrs before planting was found to be highly effective in controlling gall midge.

Ptb-12 (Chitteni) was found to be a highly resistant donor for leaf folder resistance.

Seed dressing with Fungorene 50 WP @ 2 g/kg seed followed by foliar application of Bavistin (0.1%) at tillering and panicle initiation stages was found to be the best schedule for the control of blast disease in rice.

The pilot project on Onfarm Water Management at Mookkannoor village of Ernakulam District in a compact area of 45 ha of paddy field belonging to 200 farm families helped to convince the farmers, the advantage of adopting scientific technologies in increasing yield of paddy substantially.

One rice culture Odacheera 72 (mutant) tolerant to salinity was found suitable for cultivation in the northern districts of Kerala.

Rice culture 1727 proved to be a good variety for the main crop as well as ratoon crop in the northern zone.

Two local rice varieties Allikkannan and Thowan have been proposed for release from the Regional Agricultural Research Station, Pilicode.

Edavaka selection of rice has been found to be most promising for the 1st and 2nd crop seasons in High Ranges.

Coconut and Coconut based farming system

The superiority of Komadan coconut type over WCT and NCD was proved beyond doubt based on detailed studies conducted at Vellayani.

A new coconut hybrid viz. WCT x MYD has been proposed for release from the Regional Agricultural Research Station, Pilicode.

Trial on mulching coconut grown in laterite soils revealed the suitability of coconut leaves as a mulch with the highest mean nut yield of 103.9 followed by coir dust (101.2) and burying coconut husk in circular trench (87.9).

Hybrid coconuts viz. WCT x CGD, WCT x GB and COD x WCT were found to be tolerant to *Oryctes rhinoceros*.

For the control of stem bleeding disease in Coconut, soil drenching with Calixin at the rate of 25 ml in 25 litres of water was found to be effective.

Fruits and Floriculture

A fertilizer dose of 370:40:380 g of NPK/plant has been recommended for red banana in the southern districts of Kerala.

Rapid clonal propagation was standardised in pineapple through *in vitro* culture.

Evaluation of the tomato varieties for their procuring attributes showed that the line HW-208 F had excellent potential for ketchup making, while the variety Ohio 8129 and St 64 were good for paste making.

Two clones of Nendran collected from Muttathukonam and Puthur were found to be significantly superior to the other clones with respect to bunch weight, number of hands and number of fingers per hand.

Pineapple seedlings raised from the cross Valerameranda x Kew produced the largest fruit.

In banana var. Palayankodan sucker for ratooning can be retained at any stage of development of mother plant without affecting the yield of the latter,

Systemic chemicals viz. Phosphamidon, Monocrotophos, Carbofuran and Methyl demeton were equally effective in controlling the banana rhizome weevil.

Incidence of two new diseases of banana viz. rhizome rot and infectious chlorosis was noticed in Trichur and Palghat districts.

Bavistin injection (3 ml of 2% solution) into the rhizomes was found to be the best remedy for Panama wilt of Banana.

Processing studies revealed the superiority of Nendran banana for peel and rhizome pickles, Palayankodan for pseudostem and flower bud pickle as well as pseudostem Vattal and Robusta for jelly from the ripe fruit rind.

Epicotyl grafting in mango was found to be successful in Bennet Alphonso, (80% survival) followed by Kalappady x Himayuddin (75% survival) at Ambalavayal.

Research on cut flowers revealed that gladiolus varieties Happy end, Friendship, Summer pearl and Rinny Bay produced good quality spikes with more than 70 cm length.

The protocol for tissue culture of Anthurium was standardised and plantlets distributed to the Campus Development Project for field evaluation.

In gladiolus, treatment with gibberellic acid and calcium sulphate led to the production of more number of florets on elongated axes. The vase life of the florets was also extended under such treatments.

Among the nutrient solutions evaluated to promote optimum growth and flowering of *Cynibidium*, one per cent solution of the commercial fertilizer 17:17:17 was found to be superior.

Vegetables

Seven improved selections of bittergourd have been identified in the southern zone for further testing and selection.

In Brinjal the highest fruit yield of 9333 kg/ha was recorded by culture 11-5-2 followed by culture 11-1-2-1 (9332 kg/ha).

Improved vegetable cowpea selections 108 and 129 were identified for farm trials in Thiruvananthapuram district,

The watermelon variety 'Sugerbaby' was found to be highly suitable for riverbed cultivation in Palakkad district.

Ashgourd culture Ag-25 was found to have the least incidence of mosaic disease.

Arka Anamika variety of bhindi, free from mosaic disease was found suitable for riverbed cultivation.

Storage life of cucumber could be extended by the application of organic manures alone.

Among cabbage genotypes September and Cauliflower genotype Swathi recorded the highest yield at Ambalavayal.

Neem and Eupatorium leaf application at the rate of 15t/ha was effective in reducing the parasitic nematode population in the root zone of bhindi and cowpea.

Pulses and Oilseeds

The sesamum culture S-8 with a mean seed yield of 648kg/ha was found suitable for cultivation in the rice fallows of Onattukara.

The Gujarat variety of cowpea GC-82-7 gave the highest grain yield among cowpea varieties tested in the central and southern zones.

Seed coat treatment with sesamum/neem oil at 1.0ml/100 g. was found to be very effective in controlling infestation by the pulse beetle *Callosobruchus chinensis* in green gram and other pulse seeds.

Seed treatment of cowpea with the isolates A-15 and A-16 of *Brady rhizobium* promoted growth while treatments with the isolates A-17 and A-26 were promising in terms of nitrogen content of the plant.

Spices

Vegetative propagation technique in *Garcinea gambogia* has been standardised. Soft wood grafting and side grafting were found to be the two successful methods.

Among the various trees used as standards of pepper vine *Garuga pinnata* followed by *Tespesia populnea* recorded the maximum production of pepper at Thiruvazhamkundu.

In pepper seven promising cultures giving a mean yield of more than 10kg/vine have been identified.

Irrigating pepper gardens at IW/CPE of 0.25 was found to be highly beneficial for Panniyur-1 and Karimunda varieties.

Results of the trial on foot rot disease control in pepper indicated that the disease can be effectively managed by adoption of recommended cultural practices, phytosanitation, shade regulation, lime application (1 kg/vine), Bordeaux mixture application and copper oxychloride (0.2%) drenching (2 rounds).

Drenching and spraying of Validacin 0.2% gave best control of nursery diseases of pepper.

Among 36 ginger varieties Dharya recorded the maximum yield followed by PGS-35 and SG-639 at Ambalavayal.

Turmeric type PTS-9 recorded the highest yield followed by PTS-10.

The best season for rooting of laterals of black pepper under Wayanad conditions was found to be the last fortnight of June, followed by first fortnight of July.

Clove gave the maximum yield with the application of 400g N and 500g K₂O per plant.

A high yielding variety of cardamom evolved at CRS Pampadumpara was recommended for release.

The ginger cultivars Kuruppampady, Himachal, Maran and Amallur local were found to perform better under shade conditions than in open.

Tuber crops

In arrowroot when grown as a pure crop, maximum benefit: cost ratio and net return could be obtained by the application of 150 kg N, 75 kg P₂O₅ and 150kg K₂O/ha.

Among medium duration tapioca varieties Sel. 10 recorded the highest tuber yield of 18.0t/ha followed by Sel. 4 (17.3 t/ha) as compared to the popular variety M4 with a mean yield of 15.9 t/ha in the wet lands of the problem zone.

Investigations of mycorrhizal association of cassava revealed the enhanced uptake of P, K, Mg and Ca.

An early cassava cultivar (cul. 4/84) with a mean yield potential of 35-40 tons/ha in six months was identified for cultivation in the uplands of Kuttanad.

Aromatic and Medicinal Plants:

The optimum fertilizer requirement of Kacholam was worked out as 75kg each of N, P₂O₅ and K₂O per ha.

Cutting interval of 60 days and nitrogen dose of 75kg/ha was found to be optimum for maximum geraniol yield in OD-455.

The Indian long pepper *Piper longum* (Thippalli) and the essential oil yielding plant Patchouli have been found to be promising intercrops in coconut gardens.

Mushroom

A native strain of *Pleurotus petaloides* (oyster mushroom) was isolated and domesticated under Kerala conditions. Two hybrids of oyster mushroom with desirable characters have been developed by interstock breeding between the wild and the standard strains.

Effective control measures of mushroom flies were evolved and post-harvest technologies for preservation and processing of oyster mushrooms standardised.

Miscellaneous

The experiments under AICRP (Pesticide residues) revealed the contamination of milk, milk powder, rice grain and vegetables by using HCH (Organo chlorine insecticide).

Occurrence of cyst nematode, *Heterodera oryzicola* and rice root nematode *Hirschmanniella oryzae* was reported from Kerala.

It was observed that P availability was improved significantly by sodium silicate application in soils with high P fixing capacity.

Innocation of VAM significantly enhanced the growth and establishment of tissue culture generated Jack Plantlets. In nutmeg explants from 3-6 month old seedlings registered higher percentage of establishment in the culture. Differentiation and embryogenesis could be induced in cashew.

Among the tree species under trial *Acasia auriculiformis* recorded the maximum growth followed by *Paraserianthus falcataria* and *Casurina equisetifolia*.

Fodder crops grown along with casurina recorded the highest forage yield.

Agricultural Engineering

A lawn mower was fabricated and improved at Vellyani and is being tested for further improvement.

Improvement on the efficiency and economy of PETTI AND PARA pumps for dewatering in Kuttanad and Kole lands was made at the Kelappaji College of Agricultural Engineering and Technology, Tavanur and evaluated the performance under widely varying field conditions.

A computer simulation model was formulated and tested for the synthetic generation of stream flows,

A solar powered drip irrigation system was designed and successfully tested at the KCAET.

A low cost power thresher was also developed and tested with threshing efficiency of 98 per cent.

A 7.5 hp flow through type rasp bar paddy harvester had been evaluated in different farms and farmers fields at Alathur, Mathur and Ponnani areas. The unit complete entire threshing, winnowing and and cleaning operations of one hectare crop within three hours.

Veterinary and Animal Sciences

It was demonstrated that there was expression of GGT in neoplastic transformation of epithelial cells of the ethmoid mucosa and this was considered as an indirect proof of the involvement of aflatoxin in this carcinogenesis. Salmonellosis was identified in quails and role of stress was demonstrated in the pathogenesis of the condition. It was shown that colfibrate initiated pre-neoplastic changes in duck hepatic tissues.

Ochratoxin was demonstrated to inhibit lymphoid organogenesis in quail embryos.

Supplementation of water was demonstrated to cause immunosuppression in ducks and calves.

Studies on mastitis in goats showed the incidence of sub-clinical mastitis was 47% in goats. Test dipping was shown to be a better method for the control of mastitis.

16% crude protein with an energy level of 2500 K cal ME/kg from 0.72 weeks was identified as the optimum requirements for layer type-ILM 90 birds. This tends to suggest that this level can be made applicable to other high producing layers as well.

Prawn waste silage making was demonstrated at households of farmers and consumption of this silage was proved to cause optimum weight gain.

Prevalence of *Brucellosis* was identified at 5% among cattle, goats and pigs of Ernakulam, Thrissur and Palakkad Districts.

In vitro studies demonstrated that there was neutralisation of aflatoxin during the process of fermentation of milk.

For the first time in the country a disease syndrome resembling lumpy skin disease was identified, pathogenesis worked out and pathological features described.

Oxizolozanide at 7.5mg/kg orally—single dose—was found to be cent per cent effective against Amphotomiasis in elephant. A low cost incubator for hatching eggs operated with electricity or kerosene has been developed by one of the Faculty members. Equipment cost about Rs. 1,500/- and capacity is 45 eggs.

Fisheries:

Lowering of temperature of packing medium was found to be superior to application of sedatives for increasing survival during oxygen packed transport of *P. monodon* seed.

Clam meal was found as the best protein source for preparation of feed for *Chanos chanos* fry.

Extension

The Directorate of Extension provided technical expertise and support to the field extension personnel of various development departments in the State, disseminated scientific and technical information to the farmers through different media and offered technical assistance to voluntary service organisations and other educational institutions. These programmes were implemented through the Communication Centre, Farm Advisory Service Unit, Training Service Schemes, Krishi Vigyan Kendras, National Demonstration Scheme, Village Adoption programme, Scheduled Caste Area Research Centre, Tribal Area Research Centre, National Service Scheme, Central Training Institute, Advanced Centre of

training in Plantation crops etc. The Extension Education Programmes were implemented by staff attached to various institutions of the University. In addition, specific schemes were also functioning under the Directorate of Extension.

Feature articles, Agricultural Quiz, questions and answers, technical publications of different types, radio programmes, TV programmes, correspondance courses, Krishi Darsan Programme, exhibitions etc. constituted the information support programme of the Communication Centre.

The publication unit brought out twenty non-periodic technical publications which included three books, six booklets, two technical bulletins, eight primary leaflets and one course material on fresh water fish culture. The quarterly Malayalam Magazine Kalpadhenu and the English monthly KAU Newsletter were also brought out from the Centre during the period.

The Kerala Agricultural University Press at Mannuthy undertook the printing works of the University. This included the printing of scientific periodicals & non-periodicals, forms and registers required for administration, Research Reports, Annual Reports, Completion Reports, Invitation Cards, Greeting Cards, Coupons, Calendar etc. During the period 126 items of work were received in the Press out of which 105 items were completed.

The Exhibition and Graphic Service Unit conducted the All India Agricultural and Industrial Exhibition at Thrissur. Apart from this major exhibition the Unit organised three mini exhibitions conducted at Vellanikkara, Wynad and Nilambur. Colour transparencies, black and white prints, blow ups etc. required for instructional and public relation activities were also produced from this Unit.

The Farm Advisory Service Unit participated in 45 Agricultural Seminars organised in Thrissur, Palakkad, Malappuram, Kozhikode, Ernakulam and Kottayam Districts in which 5275 farmers were trained. Farm clinics were conducted at Manaloor and Velangannur and diagnostic farm visits were paid to the problem areas of Palakkad, Alapuzha and Thrissur districts for solving such problems. Consultancy service, organising extension lectures, operating a sales counter at Mannuthy were the other programmes taken up.

The Advanced Centre of Training in Plantation Crops conducted 3 training programmes for senior level officers on plantation crop productions. Thirty eight different training programmes on production oriented subjects were organised by the Central

Training Institute, in various campuses of the University for officers & field extension workers of the development departments.

The Krishi Vigyan Kendras at Pattambi, Ambalavayal and Manjeswar faired well by imparting on-campus and off-campus training programmes. The Tribal Area Research Centre, Amboori and AICP on Scheduled Caste Area Research Centre, Wandoor also discharged the activities satisfactorily. The National Demonstration scheme at Anandappally succeeded in disseminating farm technology through scientific demonstrations.

Works

The provision for the Engineering works for the year 1991-'92 was Rs. 184 lakhs under plan and Rs. 50 lakhs under non-plan. Works which were highly essential and inevitable for the Teaching, Research and Extension programme were only taken up during the period. The total expenditure incurred during the period was Rs. 240.5 lakhs.

KAU Estate

Out of the total area of 391.44 hectares of the Estate 213.30 hectares were allotted to other schemes. A total quantity of 7046.00 kg. of rubber was produced during the year. The total receipt and expenditure of the estate during the year were Rs. 2.20 lakhs and Rs. 28.77 lakhs respectively.

KAU School

A total number of 495 students were there in the roll during the period. The strength of teaching staff was 18 and that of the non-teaching staff 6. The parent-teachers association also functioned fairly.

Finance

The University had adopted a Budget of Rs. 3512 lakhs for operation for 1991-92 anticipating a grant-in-aid of Rs. 2500 lakhs (Rs. 1900 lakhs under Non-Plan and Rs. 600 lakhs under plan) from the State Government. ICAR assistance of Rs. 373 lakhs and University resources of Rs. 244 lakhs and assistance from other sources to the tune of Rs. 40 lakhs were also anticipated. The budget estimate was subsequently revised to Rs. 3781 lakhs. The expenditure during the period under report was Rs. 2684.10 lakhs against receipt of Rs. 3011.98 lakhs.

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CHAPTER I

General Administration

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

The Main Campus of the University at Vellanikkara is 13 km east of Thrissur town on the Thrissur-Palakkad highway (NH-47). The College of Horticulture and College of Forestry are located in the Main Campus. The University has five other teaching campuses, viz. College of Veterinary & Animal Sciences, Mannuthy; College of Co-operation & Banking, Mannuthy; College of Fisheries, Panangad; College of Agriculture, Vellayani and Kelappaji College of Agricultural Engineering and Technology, Tavanur. In addition to this the University has 23 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. Financial assistance was also received from outside agencies like the NARP, the Department of Science and Technology, The Department of Environment, Govt. of India, Department of Electronics, Govt. of India, FERRO, USDA, Coffee Board, ICSSR, Hindustan Cocoa limited etc.

Officers of the University and Administrative Set up:

The Officers of the University are the Chancellor of the University (Governor of Kerala), the Pro-Chancellor (Minister for 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, the Director of Extension, the Director of Physical Plant, the Registrar, the Comptroller and the Director of Students Welfare.

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

Authorities of the University.

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

General Council

The supreme authority of the University is the General Council. The Council is reconstituted every three years. Present General Council was constituted on 31-1-1992 with 68 members.

Ordinarily the Council meets once in four months. The General Council met six 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, Departments 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 11 meetings of the Executive Committee were held. The important decision taken by the Executive Committee includes the enhancement of Fellowship of the Ph.D students to Rs. 600/- per month with effect from 1/4/'92.

Academic Council

The Academic Council is responsible for the maintenance of standards of teaching in different faculties of the University. The Academic Council shall exercise such other powers and perform such other functions as may be conferred or imposed upon it by statutes (List of members appended). During the year 1991-92 four meetings (54th to 57th) were held. (The list of Academic Council members appended).

Important decisions taken by the Academic Council were the following.

i) A Sub-Committee was constituted to work out the modalities to be adopted for the conduct of entrance examination for admission to Masters Degree Programme.

ii) Approved the proposal to start Ph.D. programmes in the disciplines of Surgery and Pharmacology and Toxicology in the Faculty of Veterinary and Animal Sciences.

iii) Following Standing Committees of Academic Council were constituted as per SRO No. 529/72 dt. 23/10/72 in order to go deeply into the various activities.

- a) Committee to deal with research and extension.
- b) Committee to deal with appointment of paper setters, examiners, board of examiners and moderators.
- c) Committee on student discipline and welfare of students including hostel accommodation in colleges.

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: The term of the Committee expired on 30/1/'92. No Sub Committees from 31-1-'92 to 31-3-'92.

Sub Committees of General Council

i) Assurance Committee

Chairperson
Convenor

Smt C. G. Sethulakshmi.
Registrar.

<i>ii) Accounts Committee</i>		
Chairman		Sri G. Somasekharan Nair. (upto 6/91)
Convenor		Comptroller.
<i>iii) Statute Sub Committee.</i>		
Chairman		Dr. Abi Cheeran
Convenor		Registrar
Sub Committees of Executive Committee.		
<i>i) Establishment Committee</i>		
Chairman		Prof. N. Rajasekharan Nair
Convenor		Registrar
<i>ii) Research Review Committee.</i>		
Chairman		Vice-Chancellor.
Convenor		Director of Research.
<i>iii) Finance Committee</i>		
Chairman		Vice-Chancellor
Convenor		Comptroller
<i>iv) Planning and Development Committee.</i>		
Chairman		Vice-Chancellor.
Convenor		Director of Research.
<i>v) Students' Welfare Committee</i>		
Chairman		Not elected.
Convenor		Director of Students Welfare
<i>vi) Works Committee</i>		
Chairman		Vice-Chancellor.
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 institutes 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 examinations, 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 during 1991-1992

Dr. E. G. Silas, Vice-Chancellor chaired the meetings of different committees of the University including General Council, Academic Council, Executive Committee, Works Committee, Finance Committee, Planning and Development Committee, Research review Committee, extension advisory Council, Officers' Meeting, Faculty Research Committee, Students' Union Meeting, N. S. S Advisory Committee, P. G. Committee and Plan Review

Meetings. The Vice-Chancellor also chaired the NARP Phase II Review meeting. He has also chaired the Assessment Committee meetings.

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

Attended the Governing Council meeting of Salim Ali Centre for Ornithology and Natural History (SACON) on 15.4.91, 24.7.91, 8.11.91, 12.2.92 and 14.3.92. The Governing Body meeting of the Tropical Botanical Garden Thiruvananthapuram on 24.4.91 and 1.11.91. Chaired the Joint Training Committee meeting at the Directorate of Agriculture, Thiruvananthapuram, on 8.5.91. Attended the Conference of Officers to discuss various training programmes to be conducted at ACTPLANK at the Kerala Agricultural University Headquarters on 10.6.91. Attended the meeting for discussion on the ICAR Development assistance during VIII Plan period on 3.7.91. Chaired the meeting of Officers of Transfer of Technology Centres regarding the action plan on Transfer of Technology Projects for this year 91-92 at Kerala Agricultural University Headquarters on 9.7.91. Attended Dean's Core Committee meeting at ICAR, New Delhi on 16.7.91. He has also chaired the University Variety Evaluation Committee at Headquarters on 19.7.91. Attended the meeting on mosquito menace control of Fisheries Research Station, Puduveypu, at College of Fisheries, Panangad on 29.8.91 and 17.2.92. Participated in the Inter-University Consultative Committee meeting on 26.9.91. Attended the meeting of the Association of Indian Universities held at Kerala University on 8.10.91. Participated in the meeting of Vice-Chancellors and Pro-Chancellors of Kerala at Raj Bhavan, on 10.10.91. Discussion meeting of Agricultural Development Policy at Durbar Hall, Thiruvananthapuram on 29.10.91 and 30.10.91. First meeting of the reconstituted State Committee on Science, Technology and Environment at Thiruvananthapuram on 1.11.91 and 2.11.91 and 26.2.92. Discussion meeting on fish diseases at CIFT conducted by State Committee on Science and Technology on 22.11.91. Participated in the Indian Agricultural University Association Executive Committee meeting held at Krishi Bhavan, New Delhi on 11.12.91. Also attended the Plan discussion at Planning Commission, New Delhi. Attended the University Grant Committee meeting at Secretariat, Thiruvananthapuram on 13.2.92. Participated in the meeting on Biotechnology District Ernakulam on 17.3.92 at Kochi. Also attended the meeting of State Level Agricultural Research Organization at MPEDA Office, Ernakulam. Attended the Selection

Committee meeting of Cochin University of Science & Technology Thrikkakara. Attended the Governing Council meeting of Kerala Forest Research Institute, Peechi.

The Vice-Chancellor, participated in the inaugural function of the Indian Marine Sciences Association at the School of Marine Sciences, University of Science & Technology, Kochi on 2.5.91. Attended NCC Officer's meet at Kuttanallur on 21.5.91. Also attended the inaugural function of the Kerala Agricultural University Students Union 90-91 at V. J. T. Hall, Thiruvananthapuram on 5.7.91. Inaugurated the training programme of ACTPLANK on 4.9.91. Participated in the Diamond Jubilee Endowment Extension lecture series conducted at the Directorate of Extension, Kerala Agricultural University, Mannuthy, on 4.9.91. He has also attended the inaugural function of the NSS Women Camp organised by the Kerala Agricultural University at Aluva on 24.11.91. Participated in the International Symposium on Coconut Research and Development organized at CPCRI, Kasaragod on 26.11.91 and 28.11.91. Delivered Keynote address at the Informal Get together of the South Indian Cooperation on the theme "Biotechnological application for food security in development countries" at New Delhi on 6.12.91 and 7.12.91. Attended the Seminar on Wetland ecosystem at Nagarcoil, Kanyakumari District organized by the BNHS and Ministry of Environment and Forest, Government of India. Delivered a talk on conservation of the animal genetic diversity of Kanyakumari District with special reference to the aquatic fauna at the Seminar on 4.1.92. Participated in the National Symposium on application of Biotechnology in Medicine at the Medical College, Thrissur, on 11.1.92. Attended two day Seminar on "Strategies for Development of Fisheries in Andhra Pradesh organized by Andhra Pradesh Agricultural University on 29.1.92 and 30.1.92. Vice-Chancellor participated in the India Sea Food Trade Fair at Sea Food Exports Association of India Office premises, W. Island, Kochi on 7.2.92. Presided over the final session of the seminar on Progeny Testing of Bulls in Tropics organized by KLD & MM Board at Thiruvananthapuram on 22.2.92. Visited C. M. F. R. I Mandapom Camp to visit the crucide island and observe the pearl culture project on 23.2.92. Also participated as Guest of the Honour and delivered special address of inauguration of the National Symposium on "Prawn feeds" and "Impact of coastal aquaculture and environment" at Fisheries College, Tutucorin, on 24.2.92. Participated in the Kerala Science Congress held at Thrissur on 27.2.92 and 28.2.92. Attended the International Seminar on Goat held at New Delhi on 2.3.92. The Vice-Chancellor participated in the closing ceremony of Kissan Mela and the release of new varieties of crops and also

the release of "Krishi Panchangam" held at College of Agriculture, Vellayani on 17.3.92. Vice-Chancellor visited the I K. Bn. R & V Sqn. NCC Camp at Puthur on 31.8.91.

The Vice-Chancellor has met and held discussions with the Chancellor on 11.10.91 and Pro-Chancellor on 12.7.91. Met and held discussions with Smt. Padma Ramachandran, Chairperson, National seed Corporation of India on 19.12.91.

Dr. E. G. Silas, Vice-chancellor functioned as the Chairman, Board of Governors of Salim Ali Centre of Ornithology and Natural History Society (SACON). He also served as a member in the Governing Body of Kerala Forest Research Institute, Peechi, Centre for Water Resources Development and Management, Kozhikode, Science, Technology and Environment Committee, Thiruvananthapuram, Tropical Botanical Garden and Research Institute, Palode, Thiruvananthapuram and State Institute of Languages, Thiruvananthapuram.

Dr. E. G. Silas, functioned as Chairman of the ICAR Visiting Team to the following Universities; viz. Chandra Sekhar Azad University of Agrl. Technology, Kanpur, Narendra Dev University of Agrl. & Technology, Faizabad, and G. B. Pant University of Agrl. Technology, Pantnagar. He visited the above Universities during the period 4.8.91 to 10.8.91 and 20.8.91 to 24.8.91.

The Vice-Chancellor visited the Bombay Natural History Society, Bombay; Cochin University of Science and Technology, Thrikkakara, Forest Research Institute, Peechi, Central Institute of Fisheries Technology, Kochi, Tamil Nadu Vety. & Animal Science University, Madras, Tamil Nadu Agricultural University, Coimbatore Andhra Pradesh Agricultural University, MPEDA, Kochi, Salim Ali Centre for Ornithology and Natural History Society, Coimbatore, Central Marine Fisheries Research Institute, Mandapam Camp, College of Fisheries Tuticorin, Central Tuber Crops Research Institute, Sreekaryam and Botanical Garden and Research Institute, Palode.

He also inspected the College of Fisheries, Panangad, College of Agriculture, Vellayani, Banana Research Station, Kannara, College of Forestry, Vellanikkara, College of Horticulture, Vellanikkara, College of Vety. & Animal Sciences, Mannuthy, Coconut Research Station, Balaramapuram, Regional Agricultural Research Station, Kumarakom, Pilicode and Pattambi. Visited Fisheries Research Station, Puduveyppu, and other research stations under the Kerala Agricultural University.

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CHAPTER II

Education and Research

FACULTY OF AGRICULTURE

1.1 COLLEGE OF AGRICULTURE, VELLAYANI

College of Agriculture was established in the year 1955 at Vellayani, about 11 km from Thiruvananthapuram city on the shore of Vellayani lake. The College Campus has a total area of 243 hectares including 165 hectares of kayal land.

Dr. C. Sreedharan continued as the Dean of the Faculty of Agriculture and Head of the Institution during the year 1991-'92.

Departments

The College of Agriculture, continued to function with the following 14 Departments.

- Department of Agronomy
- Department of Agricultural Botany
- Department of Plant Breeding
- Department of Horticulture
- Department of Soil Science & Agrl. Chemistry
- Department of Plant Pathology
- Department of Agricultural Entomology
- Department of Agricultural Extension
- Department of Agricultural Statistics
- Department of Agricultural Economics
- Department of Agricultural Engineering
- Department of Animal Husbandry
- Department of Home Science
- Department of Physical Education

Department wise staff

Department-wise staff details are furnished separately in Appendix.

Changes in staff position

Dr. K. V. Mammen, joined duty as Professor of Entomology on 4-07-1991.

Professor K. P. Madhavan Nair, Head of the Department of Agronomy retired from service on superannuation on 22-01-1992.

Dr. R. S. Aiyer, Professor and Head, Department of Soil Science and Agricultural Chemistry retired from service on 1-10-1991 on superannuation.

Sri. P. C. Raveendran Pillai, Administrative Officer retired from service on 31-08-1991 and Sri. A. K. Sreenarayanan assumed charge as Administrative Officer, College of Agriculture, Vellayani on 30-09-1991.

Faculty improvement programme

Smt. P. Sukumari, Associate Professor (NC) of Agronomy joined for Ph. D programme in the University of Agricultural Sciences, Dharwad and was granted study leave to undergo the course.

Seminars/symposia/training programmes attended

Fourteen members of the scientific staff attended different symposia/seminars/workshops/Summer Institutes etc., in different centres of the country and abroad.

Academic programme

Strength of students under each course during 1991-'92.

1) U. G. Programme

I Year (1991 admission)	: 73
II Year (1990 admission)	: 55
III Year (1989 admission)	: 54
IV Year (1988 admission)	: 67

2) P. G. Programme

1990 admission	, 41
1991 admission	: 53

Degree/Diploma awarded

During the year under report 51 students have successfully completed the B. Sc (Ag.) course and secured their degrees.

During the period 22 M. Sc. students successfully completed the course and secured their degrees. Four Ph. D students also successfully completed their programme and secured Doctorate.

Details of scholarships, awards and other financial assistance to the students of College of the Agriculture, Vellayani

1	ICAR Senior Fellowship	—	2
2	ICAR Junior Fellowship	—	10
3	Aspee Senior Fellowship	—	2
4	KAU Merit Scholarship:		
	(i) 1987 Admission	—	7
	(ii) 1988 Admission	—	7
	(iii) 1989 Admission	—	7
	(iv) 1990 Admission	—	7
5	KAU Junior Fellows:		
	(i) 1989 Admission	—	20
	(ii) 1990 Admission	--	25
6	National Loan Scholarship	—	3
7	National Merit Scholarship	—	5
8	District Merit Scholarship	—	2
9	Scholarship under DGHS Scheme	--	1
10	Scholarship to students from Andaman and Nicobar islands	—	1
11	Educational concessions to the children of fishermen	—	4
12	Grant from Kerala State Labour Welfare Fund Commissioner	—	2
13	Stipend and Book Grant to the Village Level Workers	--	5
14	Educational concession to the Scheduled Tribe students	—	3
15	Educational concession to OEC students	—	4
16	Educational concession under KPCR	—	24
17	Educational concession to Scheduled Caste Students	--	24

Practical training programme

Under the work experience programme as part of the course curriculam, the undergraduate students raised major crops like rice, banana, tuber crops, vegetables and also maintained perenial crops, besides homestead farming.

The final year B. Sc (Ag) students have also been given training in Computer application as part of their work experience programme.

The final year B. Sc (Ag) students were provided practical training under field conditions in Krishibhavans of the State Department of Agriculture. The students were also given farm training in the various research stations under the Kerala Agricultural University.

Study tours

Sixty five students of the third B. Sc (Ag) accompanied by three staff members undertook an All India Study Tour and visited important Agricultural Universities and ICAR Institutions in South and North India.

Fifty four students of the II B. Sc (Ag) accompanied by three staff members visited the various Agricultural Universities and ICAR Institutes in Kerala, Tamil Nadu and Karnataka under the South Indian Study Tour.

Extra curricular activities

NSS Programme

An Agricultural seminar was organised at Punnamoodu. A poultry vaccination campaign, Animal sterility detection camp, cattle vaccination camp and anti-rabies vaccination camp were also organised.

A one day Agriculture and Animal Husbandry Mela was organised at Karikadamughal, Punchakkari in which experts handle classes on Agriculture and Animal Husbandry topics. In connection with the 'Mela', a cattle anti sterility camp, poultry vaccination and treatment camp were conducted.

In the NSS adopted Village at Palappur, selected farmers were supplied with coconut seedlings, vegetable seeds etc. The programme officers and student volunteers gave necessary technical advice in vegetable gardening.

A one day medical camp was organised for the benefit of the NSS adopted Village farmers at the College Campus in collaboration with Lions Club, Thiruvananthapuram chapter. Cancer detection, eye clinic, Diabetic clinic and general medical problems were covered in the camp. Seventeen medical experts examined the patients in the camp and more than 700 people were examined and treatment prescribed.

Gandhi Jayanthi celebration was conducted in a befitting manner under the auspices of NSS at Jawahar Nagar, TVM. Compost making, kitchen gardening and plant protection were demonstrated by the volunteers. A cleaning campaign was also organised. A demonstration on mushroom cooking was also conducted.

Special camp

A special camping programme was conducted in January 1992 for 5 days at Poovachal, in which 100 volunteers participated.

Sports & Games

Students from this institution participated in KAU Inter-collegiate tournaments. Three students from this Institution represented KAU in Football, two in Ball Badminton and one in Cricket in the inter-university tournaments.

The second phase of construction of the Indoor stadium has been taken up during the period.

Hostels

Dr. C. Sreedharan, Dean continued as the Warden of the three hostels in the campus. The following staff members were the Assistant Wardens as on 31-03-1992.

U. G. Hostel : Dr. V. B. Padmanabhan, Assoc. Professor (NC).

P. G. Hostel : Dr. S. K. Nair, Professor.

Ladies Hostel : Smt. Marykutty, Assoc. Professor (NC)

The strength of the three hostels was as follows during the period.

U. G. Hostel	: 60
P. G. Hostel	: 25
Ladies' Hostel	: 97

Library

Total number of books as on 31-03-1992 was 22456. Forty seven Indian Journals and 33 Foreign Journals were subscribed during the year.

Instructional farm

The Instructional Farm has 78 hectares of garden land and 165 hectares of *kayal* land. The farm provides all the physical amenities for imparting practical instructions to the students on modern trends in crop production. A farm development project costing Rs. 47.58 lakhs is being implemented by making use of loan assistance to the tune of Rs. 38.05 lakhs provided by the State Bank of Travancore. With the implementation of the Development Project there is steady increase in farm revenue. A large quantity of fruits, vegetables, vegetable seeds, planting materials, coconuts, coconut seedlings etc. have been produced and distributed as part of the developmental activities. During the year, there was a total revenue of Rs. 15,08,918/.

Livestock farm

The Department of Animal Husbandry is maintaining a Dairy Unit and also a Poultry Unit. During the period under report 33998 litres of milk was obtained and sold. From the Poultry unit 72128 eggs were also obtained.

In the Veterinary Hospital attached to the Department, 2468 cases have been treated and 250 birds were protected against R. D. About 347 pregnancy diagnosis and 86 artificial inseminations were also done. In addition, poultry vaccination camps, cattle sterility eradication camps etc. were also conducted.

Visitors

Sri. P. P. George, Hon'ble Minister for Agriculture, Kerala; Sri. Reghuchandra Bal, Hon'ble Minister for Excise, Kerala; Dr. M. R. Sethuraj, Director, Rubber Research Institute, Kottayam; Dr. C. R. Hazra, Project Co-ordinator, AICRP on Forage (ICAR); Dr. K. V. K. Nampoothiri, Head, CPCRI Regional Station, Palode; Dr. A. O. N. Panicker, Joint Director, RRI, Kottayam; Dr. M. Subramonian, Professor, Tamil Nadu Agricultural University, Madras; and Dr. Hari Eswaran, National Leader, World Soil Resources, Washington, U. S. A. visited the College during the period.

Research Programmes

The various Departments of the College carried out research on various aspects in the identified thrust areas.

Some of the salient findings of research carried out in different departments are summarised below:

It was observed that dry matter production and tuber bulking rate were maximum when potassium was applied at 100 kg/ha for sweet potato (var. Sreenandini). The tuber number, length of tuber, girth of tuber and tuber yield were also maximum at 100 kg/ha. Application of 100 kg K_2O /ha in two equal split doses, half basal and half top dressing, in combination with a planting depth of 5 cm was found to be more profitable under the agro-climatic condition prevailing in Thiruvananthapuram.

An experiment to determine the nutritional requirement of arrow root as a pure crop has revealed that maximum benefit-cost ratio and net return could be obtained by the application of 150 kg N/ha, 75 kg P_2O_5 /ha and 150 kg K_2O /ha.

Production potential of amaranthus under different irrigation and nitrogen levels has revealed that net income and benefit-cost ratio were maximum for red variety and these were increased by more frequent irrigations and nitrogen fertilization upto 125kg N/ha.

The sesamum culture, S-8 gave significantly higher yield in the summer trials conducted in the rice fallows of Onattukara. The thirteenth (Southern Region) regional workshop recommended S-8 for summer rice fallows of Onattukara region.

A maturity index was formulated in bunch groundnut and on its basis 63 types were grouped into three, namely extra early, early and medium. In the extra early group, 100 pod weight and 100 kernel weight; in the early and medium groups, number of mature pods/plant, shelling percentage and 100 kernel weight were the important components for pod yield. For oil yield in all the three groups, pod yield and shelling percentage were the important components. Chico was the best general combiner for earliness and TMV-2 was the best general combiner for pod yield.

The study for the comparison of the three Komadan generations with WCT and NCD clearly indicated the superiority of Komadan coconut type in relation to the economically important characters viz., nut yield per palm per year, weight of husked nut, weight of kernel, weight of copra and oil content.

For red banana, a fertilizer dose of 370:40:380 gm of NPK/plant has been recommended as adhoc dose based on the initial studies conducted.

Evaluation of seven water melon varieties showed that "Sugar Baby" and "Madhu" were found to be promising for the southern region of Kerala.

Study on the growth pattern of tissue cultured banana plants has revealed that tissue culture plants grow at a faster rate compared to suckers of the same age.

It was observed that most of the conventional methods of soil exchange capacity determinations using buffered electrolytes were found to give over estimations for CEC measurements. Compulsive exchange methods using unbuffered electrolytes (Barium chloride-magnesium sulphate) was found suitable for the combined estimation of CEC and AEC.

Based on morphological, physical and chemical properties of the soils and soil profiles, the major upland and low land soils of Kerala have been classified based on the latest system of soil taxonomy.

It was observed that phosphorus availability improved significantly due to sodium silicate application to highly weathered low activity clay soils in Kerala of high 'P' fixing capacity.

Analysis of soil samples to monitor the effect of crop sequence on the population of rice root *Hirschmaniella* spp indicated

that there is a slight decline in the population where vegetables are grown in the third crop season.

Survey on the pests of ornamental plants in Thiruvananthapuram District, indicated the incidence of mites and a jelly grub in the flower buds of orchids, mites, mealy bugs and aphids on the leaves of anthurium and bag worms, thrips and flower beetle feeding on the leaves and flowers of gladiolus.

Studies under sericulture revealed the incidence of a fungal pathogen *Aspergillus niger*, causing muscardine disease in silk worms.

Neem and Eupatorium leaf treatments @ 15 tons/ha were effective in reducing the parasitic nematode population in the root zone of bhindi and cowpea.

Ethanol extracts of the leaves and fruits of *Thevetia neriiifolia* showed very good antifeedant activity when treated with grubs of epilachna beetle.

Various plant extracts like bulbs of garlic, leaves of neem, oscimum, clerodendron etc. were found to have inhibitive action against the causal organisms of sheath blight and sheath rot of rice.

The incidence of cowpea mosaic was found to be inhibited by various plant extracts like that of *Phyllanthus niruri*, *Azadirachta indica*, *Vitex negundo* and *Clerodendron infortunatum*.

Spraying cowdung extract was found to be effective for the control of bacterial blight of rice, in addition to giving better yield.

A treatment schedule was developed for the effective management of common mushroom pests and contaminant fungi in mushroom beds.

Application of copper oxychloride preparation 50% (0.3% spray) at fortnightly intervals was found to be effective in controlling phomopsis fruit rot in brinjal.

A lawn mower was designed, fabricated and tested. Test results revealed that it is a promising type.

A total number of 52 research publications were brought out and the details are furnished in Appendix.

✓ Extension Programmes

Village Adoption

In the adopted village, in order to popularise new fodder variety, two demonstrations of 5 cents each with guinea grass var. Haritha were laid out. ✓

In order to highlight the advantages of high density planting of banana with vegetable as inter crop, two demonstrations of 5 cents each were laid out in the adopted village.

Along with the demonstrations, two training programmes on fodder cultivation and high density planting of banana were also conducted.

One training programme on embroidery and sewing was also organised for the benefit of women in the adopted village to enable them to generate extra income through self employment

A kissan mela and a campaign on diseases of coconut and their control measures were also organised in the adopted village.

Lab to-land Programme

Venganoor village in Neyyattinkara Taluk was selected for conducting the lab-to-land programme.

A one day training programme on rabbit rearing was conducted for the beneficiaries of lab to land programme and 27 farmers participated. Experts from the University and Department of Animal Husbandry handled classes.

T&V and KAEP activities

Scientific staff from the various departments of this institution served as resource personnel in the monthly T&V workshops and also in diagnostic team visits to investigate field problems. The scientists from different departments also attended the Zonal workshops arranged in the southern region.

Variety dedication programme

A one day function on 17th March, 1992 was organised in this campus for the dedication of 8 improved crop varieties to the farmers. In chilly, two varieties—*Jwalasakhi* and *Jwalamukhi*, bhindi one variety—*Kiran*, amaranthus one variety—*Arun*, vegetable cowpea one variety—*Malika*, sweet potato one variety—*Kanjangad*, rice one variety—*Arathi* and guinea grass one variety—*Haritha*, were dedicated to farmers by the Honourable Minister for Agriculture, Sri P. P. George. Seed samples of these new varieties were supplied to farmers and invitees in the function. A mini exhibition was also organised in connection with the function.

Training Programme

The following training programmes were conducted during the year under report.

- 1 Training on commercial Horticulture for Junior Agricultural Officers of the Department of Agriculture.
- 2 Training for co-operative society inspectors in Horticulture.

- 3 Training on tissue culture.
- 4 Training programme on Mushroom cultivation
- 5 Training programme on diagnosis of Tanjavor wilt in coconut.
- 6 Training on sericulture to Agricultural Officers of the Department of Agriculture.
- 7 Training on environmental pollution.
- 8 Training on "cooking and catering" for high school teachers.
- 9 Training on grasses and fodder crops for range officers.
- 10 Training on watershed planning and management for Assistant Conservators.

Correspondence course

The following correspondence courses were also conducted.

- 1 Correspondence course on infant feeding practices.
- 2 Correspondence course on child development.

State level workshop

A State level workshop on package of practices in pepper was conducted.

Publications and other mass media programmes

The members of the faculty belonging to various departments published a number of scientific papers and popular articles. Besides they have participated in 11 Radio talks & Doordarsan programme, the details of which are furnished in Appendix.

Apart from this, the proceedings of the National Symposium on Mushrooms was also published viz. 'INDIAN MUSHROOMS-1991', and the same was released in a function by the Vice-Chancellor giving the first copy to the Honourable Minister for Agriculture, Sri. P. P. George on 17.03.1992.

1.2 COLLEGE OF HORTICULTURE, VELLANIKKARA

Dr. C. C. Abraham continued as the Associate Dean during the year.

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 having an area of 95.35 ha, which is utilised for imparting on-hand practical training to students and also for undertaking research activities. The College library is having over 23,567 titles at present.

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 years 1977-78 with an intake of 50 students. The syllabi 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 and the six departments mentioned before were started. In addition, Master's programmes in Agricultural Economics and Agricultural Engineering 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 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. The Central Instrumentation Lab was established under the scheme in December, 1979.

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 664 students completed their B. Sc (Ag)/B. Sc. (Hort) programme during 1976-91. The students completing their Master's and Doctoral programmes during this period were 271 and 17 respectively. A total of 28 students completed their PG Diploma in Natural Rubber Production.

Faculty staff

Out of 130 sanctioned positions of faculty staff, 32 remained vacant as on 31-3-1992 (Table 1). Details of staff are given in Appendix I.

Table 1: Staff position in the

Department/Scheme	Assoc. Dean			Professor		
	S	P	V	S	P	V
Head of Institute & Supporting staff	1	1	—	—	—	—
Agronomy	—	—	—	1	1	—
AICRP on Weed Control	—	—	—	—	—	—
Agro Meteorology	—	—	—	1	1	—
Agricultural Botany	—	—	—	1	1	—
Agricultural Economics	—	—	—	1	1	—
Agricultural Entomology	—	—	—	1	1	—
AICRP on BCCPW	—	—	—	—	—	—
Agricultural Engineering	—	—	—	1	1	—
Agricultural Extension	—	—	—	—	—	—
Agricultural Statistics	—	—	—	1	1	—
Olericulture	—	—	—	1	—	1
Seed production Complex	—	—	—	—	—	—
AICVIP	—	—	—	—	—	—
Plantation Crops & Spices	—	—	—	1	1	—
Manpower Development Scheme (CB)	—	—	—	—	—	—
PG Dip. NRP (Rubber Board)	—	—	—	—	—	—
Cadbury Cocoa Research Project	—	—	—	1	1	—
AICRP on M&AP	—	—	—	—	—	—
Pomology & Floriculture	—	—	—	1	1	—
AICFIP	—	—	—	—	—	—
Processing Technology	—	—	—	1	—	1
Plant Pathology	—	—	—	1	1	—
Coc Nutrition & Phys. Disorders	—	—	—	1	1	—
Soil Science & Agrl. Chemistry	—	—	—	—	—	—
Coc Nutrition & Phys. Disorders	—	—	—	1	1	—
Radio Tracer Laboratory	—	—	—	1	1	—
Instrumentation Unit	—	—	—	—	—	—
Physical Education	—	—	—	—	—	—
Instructional Farm	—	—	—	1	1	—
Total	1	1	—	17	15	2

College of Horticulture as on 31-3-91

Assoc. Prof.			Asst. Prof.			Jr. Asst. Prof.			Total academic			Administrative/paratechnical/supporting staff		
S	P	V	S	P	V	S	P	V	S	P	V	S	P	V
—	—	—	—	—	—	—	—	—	1	1	—	54	52	2
1	—	1	3	2	1	2	2	—	7	5	2	3	3	—
—	—	—	1	1	—	1	1	—	2	2	—	3	3	—
—	—	—	2	1	1	—	—	—	3	2	1	2	2	—
—	—	—	3	2	1	2	1	1	6	4	2	1	1	—
1	1	—	3	3	—	1	1	—	6	6	—	1	1	—
1	1	—	3	3	—	1	1	—	6	6	—	2	2	—
1	1	—	—	—	—	2	1	1	3	2	1	3	3	—
—	—	—	2	1	1	2	—	2	5	2	3	2	2	—
1	1	—	3	2	1	1	1	—	5	4	1	—	—	—
1	1	—	5	4	1	3	2	2	10	7	3	2	2	—
2	2	—	—	—	—	3	1	2	6	3	3	6	6	—
—	—	—	1	1	—	1	2	—	2	2	—	—	—	—
—	—	—	3	3	—	—	—	—	3	3	—	2	2	—
—	—	—	2	2	—	5	3	2	8	6	2	3	3	—
—	—	—	1	1	—	—	—	—	1	1	—	—	—	—
—	—	—	1	1	—	—	—	—	1	1	—	1	1	—
2	2	—	—	—	—	—	—	—	3	3	—	5	5	—
1	1	—	2	2	—	—	—	—	3	3	—	6	6	—
—	—	—	2	2	—	5	3	2	8	6	2	3	3	—
1	1	—	—	—	—	1	1	—	2	2	—	2	2	—
—	—	—	3	3	—	3	1	2	7	4	3	2	1	1
3	3	—	2	2	—	3	1	2	9	7	2	3	3	—
—	—	—	2	—	2	—	—	—	3	1	2	—	—	—
3	3	—	4	3	1	—	—	—	7	6	1	4	4	—
—	—	—	2	1	1	—	—	—	3	2	1	3	3	—
1	1	—	1	1	—	—	—	—	3	3	1	—	—	—
1	1	—	—	—	—	—	—	—	1	1	1	—	—	—
—	—	—	2	2	—	—	—	—	2	2	—	—	—	—
—	—	—	2	—	2	1	—	1	4	1	3	13	13	—
20	19	1	55	43	12	37	20	17	130	98	32	126	123	3

Faculty improvement

Dr. R. Keshavachandran, Associate Professor rejoined the Department of Pomology and Floriculture on 26-9-1991 on completion of his Ph. D. programme.

Dr. V. K. Raju, Associate Professor, Department of Processing Technology was deputed for undergoing a training course on 'Post harvest Technology of Vegetables and Fruits', sponsored by the Asian Productivity Organisation. This training was held at the Taiwan Agricultural Research Institute, Taiwan, Republic of China from 9th to 27th September 1991.

Smt K. Ushakumary joined duty on 19-7-1991 on completion of her Doctoral Programme in Soil Science and Agricultural Chemistry at the IARI, Delhi.

Smt D. Geetha, Assistant Professor, entered on leave for undergoing Ph. D. Programme in Plant Pathology in Tamil Nadu Agricultural University, Coimbatore.

Mr C. Narayanankutty, Junior Assistant Professor, Department of Processing Technology and Smt M. R. Shylaja, Junior Assistant Professor entered on leave for undergoing the Doctoral Programmes in Horticulture at the IARI and KAU respectively.

Smt Tessy Joseph, and Smt M. T. Kanakamany of the Department of Agricultural Botany entered on leave for Ph. D. programmes in the College.

Smt P. S. Geethakutty, Assistant Professor joined duty on 27-3-1992 after study leave for the Doctoral Programme in Agricultural Extension.

Dr. N. Kishore Kumar, Jr. Assistant Professor joined the Department of Agricultural Extension on 23-9-1991 on expiry of his study leave for the doctoral programme in Agricultural Extension.

Scientists deputed to attend Summer Institutes/Short-Term Training Courses/Workshops/Seminars

Eight scientists of the College, working in different disciplines were deputed to attend Summer Institutes conducted in various institutions in the country and four for short term training courses conducted in and outside the State. Seven Scientists were deputed and sixteen scientists were given chance to attend workshops and seminars.

Administrative, Para-technical, Ministerial & Supporting staff position

Mr P. K. Ramachandran Nair continued as the Administrative Officer. Smt D. A. Syamala, Smt K. K. Beena, Smt A. Subhalakshmy

Ammal and Smt K. Thankam continued as the Section Officers. Mr V. Venugopalan continued upto 23-10-1991 as Section Officer.

The total number of sanctioned positions belonging to para-technical, ministerial and supporting staff positions in the various Departments and Schemes (Table 1) is 126 out of which only three were vacant as on 31-3-1992.

The staff positions sanctioned for the college office including staff in the hostels are 54 out of which two were vacant as on 31-3-1992. The cadre-wise details are as follows:

	S	P	V
Administrative Officer	1	1	—
Section Officer	6	4	2
Senior Office Supdt.	2	2	—
Office Assistant	18	18	—
Office Supdt.	3	3	—
Typist Sr. Grade	1	1	—
Typist Grade I	1	2	—
Typist Grade II	2	2	—
Duplicating Operator	2	2	—
Watchman	5	5	—
Driver LDV	1	1	—
Driver HDV	1	1	—
Bus Attendant	1	1	—
Steward	1	1	—
Matron	1	1	—
Peons	7	7	—
Total	54	52	2

Academic programmes

Undergraduate programmes

As on 31-3-1992 there were a total of 307 students on roll for the B. Sc. (Ag) programme (Table 2).

Table 2: No. of B. Sc. (Ag) students on roll

Year of admission	Men	Women	Total
Final year B. Sc. (Ag) 1988 admission	27	39	66
Third year B. Sc. (Ag) 1989 admission	38	38	76
Second year B. Sc. (Ag) 1990 admission	35	27	62
First year B. Sc. (Ag) 1991 admission	39	44	83
Make up course	5	1	6
Admission prior to 1988	7	7	14
Total	151	156	307

A total of 66 students completed their B. Sc. (Ag) programme during the year. The details are as follows:

Year of admission	Men	Women	Total
1987 admission	21	38	59
1986 admission	2	4	6
1984 admission	1	—	1
Total	24	42	66

The intake during the year for the B.Sc (Ag) programme was 89 (44 men and 45 women).

Post-graduate programmes

There were a total of 114 PG students on roll at the College in the year. The details are as under:

M.Sc (Ag)	58
M.Sc (Hort)	16
M.Sc (Ag. Stat)	7
Ph.D (Hort)	6
Ph.D (Agri)	12
M.Sc (Ag. Econ)	3
PG Dip. NRP	12
Total	114

During the year, 49 students have completed their Master's/ Doctoral Programmes as shown:

M.Sc (Ag)	25
M.Sc (Hort)	6
M.Sc (Ag. Stat)	2
Ph.D (Hort)	1
Ph.D (Agri)	3
M.Sc (Ag, Econ)	Nil
PG Dip NRP	12
Total	49

The intake during the year was 79 as shown:

M.Sc (Ag)	38
M.Sc (Hort)	11
M.Sc (Ag. Stat)	4
Ph.D (Hort)	3
Ph.D (Agri)	8
M.Sc (Ag. Econ)	3
PG Dip NRP	12
Total	79

Study Tour

The all Kerala and South Indian Study tour for the II year (1989 batch) was conducted during the period from 21-10-1991 to 28-10-1991 and from 6-11-1991 to 19-11-91. The premier institutions of agricultural and horticultural importance in the States of Kerala, Karnataka and Tamil Nadu were covered during the tour.

The All India study tour for the III year (1988 batch) was conducted during 21-10-1991 to 14-11-1991. They visited institutions concerned with research/teaching/development of Agriculture/Horticulture and relevant basic science areas located in Bombay, Dehra Dun, Mussorie, Sotan, Shimla, Hissar and Delhi.

Summer Institutes/Short term courses held in the College

A Summer Institute on the 'Production Technology of Tropical Vegetable Crops' was held in the Department of Olericulture during 29-7-1991 to 8-8-1991. A total of 28 scientists from all over the country attended this Summer Institute.

A short term course on Recent Advances in Tropical Vegetable Crop Production was held in the Department of Olericulture. In this, 30 officials from the Dept. of Agriculture participated.

A training on Herbicidal use in rice cultivation was held from 5th to 7th December 1991 by the Department of Agronomy under the auspices of the AICRP on Weed Control. Fourteen officials of the Department of Agriculture attended this training course.

A training programme on 'Alternative Energy Sources in Homesteads-Biogas' was conducted for the officers of the Department of Agriculture from 25-11-1991 to 27-11-91. Twelve officials of the Department of Agriculture attended this training.

A short term training course on 'Advances in Spice Production technology' was held between 3rd & 7th March 1992 for the field officials of the Spices Board.

College Library

As on 31-3-1992, there were a total of 23,567 titles in the library, the procurement for the year being 90 Nos. A total of 118 Indian Journals and 22 foreign Journals continued to be under subscription.

Hostels

Dr. P. S. John and Dr. S. Nirmala Devi continued as the Assistant Wardens of the Men's and Ladies' Hostels respectively. There were 228 inmates in the Men's Hostel as on 31-3-1992. In the Ladies' Hostel, there were a total of 204 inmates.

There were 15 hostel workers in the Men's Hostel and 14 in the Ladies' Hostel.

Student's Union Activities

The 18th Inter-Class arts festival was held from the 20th to 22nd June 1991. The first year B.Sc (Ag) batch emerged as the overall champions.

The Planning Forum conducted a nature study tour to Ooty on 9-6-1991 and a trekking camp at Vellanipacha. The Social Service League conducted a tree planting programme on 5th & 6th August 1991 and a nature study tour to Ambalavayal on 21st & 22nd September 1991. The Quiz Club conducted a "What is the good word" programme on 5-9-91. The Inter Class Quiz competition was held on 18-10-1991 in which the 11nd year B.Sc. (Ag) batch came up as the top scorers.

An Inter-collegiate quiz was held under the joint sponsorship of the Quiz Club and M/s: FACT on 19-12-91. The Medical College, Kozhikode came out as the top scorers in this competition. The Vice-Chancellor Dr. E. G. Silas distributed trophies and prizes to the teams.

The 18th Annual athletic meet of the College was held on 17th to 18th December 1991. The overall championship was bagged by the 1988 batch of B. Sc. (Ag.) students. Mr. Anil kumar K., Chettayil (1988) secured the individual championship for men and Ms. Molly Varghese (1991) got the individual championship among the girl students.

Mr Remi Chandran (1989) and Mr K. Aravind (1990) of the College represented the KAU in the sixth annual Indira Gandhi Memorial Inter University Debate Competition held at the Sapru House, New Delhi from 20th to 23rd December 1991 and got meri certificates for their performance.

The valedictory function of the College Union was held on 6-1-1992. Mr T. V. Chandra Mohan, MLA and member of the General Council was the Chief Guest of the day.

The Union for 1991-92 was inaugurated on 4-2-1992 by Professor Savithri Laxmanan, M. P.

RESEARCH

New Research Projects started

The ICAR Ad hoc scheme "Survey, collection, evaluation, conservation and cataloguing of germplasm of certain under-exploited perennial vegetable crops" was taken up for implementation from 28-8-1991.

The DBT funded scheme for Tissue Culture Research on pepper commenced functioning on 20-2-1992.

The KAU funded schemes for Coconut Nutrition and Nutritional Disorders was taken up for implementation from 1-4-1991.

The DST funded project on Agro Meteorological field unit started functioning on 24-8-1991.

Projects terminated

The Coconut Root Wilt Disease Project (CRWDP) was terminated on 31-3-1991 and the various staff positions attached to the scheme were re-deployed.

ICAR ad hoc Research Projects

Three ICAR ad hoc schemes were implemented in the College during the year.

Schemes	Principal Investigator
Estimation of damage due to pests, diseases, and drought to black pepper in the Kannur District.	Prof. P. V. Prabhakaran
Development of F1 hybrid seed in bittergourd, snakegourd and pumpkin	Dr. S. Rajan
Standardisation of agro techniques in lemongrass and palmarosa for maximising oil production	Dr. T. V. Viswanathan

Research Highlights

The Indian long pepper *Piper longum* (Thippali) and the essential oil yielding plant Patchouli have been found to be very promising intercrops for growing in coconut plantations. Among the *P. longum* varieties screened for their suitability for growing in such situations, 'Seema thippali' registered the highest dry spike yield of 430.6 kg/ha followed by the provenance from Pattambi which gave 355.2 kg of dry spike/ha. In the case of Patchouli, the varieties Singapore and Java were relatively more promising, the outturn of oil being 152.18 kg/ha.

Twenty four tissue culture derived plantlets of cocoa from explants of *in vitro* seedlings were field planted in June 1991.

Plantlets were successfully developed from somatic embryos of cocoa.

A method for top working in cocoa was standardized.

Thirty eight cocoa clones introduced from the Quarantine Station of the University of Reading, UK in 1990 and 1991 were field planted during the year.

The breeding programme in cocoa was advanced to the second stage with a total of 53 self incompatible parents. Progeny

testing of the hybrids of the first stage of breeding was continued in the year. Three polyclonal cocoa seed gardens were established for the production of superior seed material. So far a total of 4, 164 superior plants have been established in 13 seed gardens.

Rapid clonal propagation was standardised in pineapple through *in vitro* culture. Crown meristem was found to be the best explant and BA the best material for inducing maximum number of multiple shoots.

In *Dendrobium* sp. the axillary buds were found to be the most suitable explant for multiple shoot production. For somatic organogenesis through callus culture, root of the explant was most promising.

In *Garcinia cambogia* "(Kodumpuli)", promising results have been obtained with soft wood grafting and double grafting.

In *Gladiolus*, treatment with gibberellic acid and calcium sulphate led to the production of more number of florets on elongated axes. The vase life of the florets was also extended under such treatments.

Among the nutrient solutions evaluated to promote optimum growth and flowering of *Cymbidium*, 1 per cent solution of the commercial fertilizer 17:17:17 was found to be superior.

Modified Knudson C and Moral media were found to give good response in the meristem culture and embryo culture of orchids.

The cowpea lines VS-350, VS-438 and VS-452 were found to be resistant to the pea aphids. Physical admixtures of the cowpea, line VS-438 and Kanakamony gave maximum output of pods.

Among the F₁ hybrids of brinjal screened for their resistance to bacterial wilt and yield, the hybrid lines SM 6-2 x Pusa purple cluster gave the highest yield and a good level of disease resistance.

Evaluation of tomato varieties for their processing attributes showed that the line HW-208 F showed excellent potential for ketchup making, while the variety Ohio 8129 and St 64 were good for paste making.

The bacterial wilt resistance in the tomato line LE-79-5 was found to be relatively better. In this particular line, the fruits showed resistance to cracking on maturity.

In the snakegourd lines, the hybrids TA-87 x TA-30, TA-82 x TA-77, TA-41 x TA-55, and TA-89 x TA-41, were found to excel their

parents in productivity. In the *Capsicum* type Papri Mild, oleoresin content was found to be higher (28%), followed by CA-516 (24%) and CA-579 (24%).

In the bittergourd lines under evaluation, the type MC-84 excelled Priya in respect of the fruit yield and consumer preference.

The water melon variety MHW-6 was found to be promising from the point of view of fruit yield and TSS.

The ginger cultivars, Kuruppampady, Himachal, Maran and Amballur local were found to perform better under shade conditions than in the open and such varieties can therefore, be recommended for shaded conditions.

The performance of the turmeric cultivars PC-8, BSR-1, PCT-5, PTS-39 and PTS-9 was found to be better under shaded conditions than under open situations.

The fertility capability classification of 8 soil series in the Command area of Edamalayar Irrigation Project based on the morphological, physical and chemical characteristics of surface soils have been carried out.

The results of the experiment would provide data for site-specific fertilizer recommendations in the Command area.

Investigations carried out to assess the influence of various properties of clay on the potassium dynamics in soil following application of potassium fertiliser and its effect on the uptake of nutrients by rice showed a conspicuous positive effect of potassium application on the yield of paddy. The response varied with the textural composition of soil. In more clayey soils the requirement of potash is relatively higher.

Regular application of ammonium sulphate to coconut without proper liming showed undesirable effects on soil fertility parameters. Drastic reduction in soil pH and consequential dissolution of manganese caused erosion of manganese reserves in the coconut root zone.

Investigations on the changes in feeding activity, growth and development of the rice leaf folder *Cnaphalocrocis medinalis* on rice receiving Carbofuran at 0.5, 0.75 and 1.0 kg ai/ha at 20, 50 DAP showed that the residues/metabolites of Carbofuran in leaf promoted positive orientation of moths and improved the growth and development of the larvae on treated foliage.

A survey on the occurrence and association of bacterial pathogens on root-knot nematode *Meloidogyne incognita* infesting black pepper vines, five *Bacillus* species, namely, *B. subtilis*,

B. pumilus, *B. coagulans*, *B. macerans* and *B. circulans* were found naturally infesting the nematodes and they showed ovicidal and larvicidal effect of the nematode life stages.

Seed coat treatment with sesamum/neem oil at 1.0 ml/100g was found to be very effective in controlling infestation by the pulse beetle *Callosobruchus chinensis* in green gram and other pulse seeds.

Fortyfive F₁ hybrids from eight different intervarietal cross combinations of the black pepper along with their parents and 492 open pollinated seedling progenies from 35 cultivars/cultures were evaluated in respect of their extent and magnitude of variability. The path analysis revealed that number of spikes per vine, length of spike and number of developed berries per spike were the most important characters influencing final yield. Berry and spike characters recorded high positive correlation with yield. Some of the hybrids showed significant heterosis for number of spikes per vine, length of spike and number of developed berries per spike.

In studies on seed dormancy traits in groundnut, it was observed that the seed dormancy is primarily caused by the cotyledons with the support of the testa. Treatment of seeds with mercuric chloride at 1:1000 for five minutes was found to break dormancy. Seed dormancy in groundnut is found to be a quantitative character which is controlled by polygenes.

Soil solarization was found to be effective in controlling pre- and post emergence damping off caused by *Pythium aphanidermatum* in chillies. Nematode and weed population were also found to be reduced by solarization. Increased growth response of plants in solarized plots was significant over the control and yield increase up to 230% over the control was also obtained by solarization.

Variations in the varietal susceptibility to infestation by the powdery mildew were not detected in the pumpkin crop (*Cucurbita moschata*). Carbendazim and Tridemorph gave best control of the disease.

A total of 90 fungal diseases on 72 species of selected medicinal plants were studied. Out of 60 sp. of fungi, 39 were new host reports. A detailed study of anthracnose and die-back diseases of Chethikoduveli (*Plumbago indica*) caused by *Glomerella cingulata* (*Colletorichum gloeosporioides*) was carried out. Optimum condition for infection was found to be between 22°C and 26°C. The

pathogen was found to enter the host directly through the cuticle. Tender leaves were immune to infection and high phenolic contents conferred immunity.

Seed treatment of cowpea (Pusa Komal) with the isolates A-15 and A-16 of *Bradyrhizobium* sp. promoted growth, while treatment with the isolates A-17 and A-26 were promising in terms of the nitrogen content of the plant.

The *Azospirillum* isolates in conjunction with the B₁ isolate of *Bradyrhizobium* showed synergistic action in increasing the number of root nodules in the cowpea crop which received seed inoculation treatments.

In a study of the coconut based oil milling industries in the Kozhikode and Kannur districts, it was found that the capacity utilisation was low in the rotary and expeller units of Kannur District as compared to the trend in the Kozhikode District.

A provisional estimate of total yield loss in black pepper due to various biotic stresses for the Kannur District for 1991-92 was worked out to be 41%. The fungal pollu, pollu beetle and leaf infection of *Phytophthora* significantly contributed to partial yield loss in addition to plant mortality due to quick wilt and drought. About 12% of plants died due to stem infection of *Phytophthora* in the sample plots while the overall estimate of mortality due to drought was approximately 2%.

Research services

The Radio Tracer Laboratory provided gamma irradiation service to scientists and teachers of the Kerala Agricultural University, free of cost and to the agencies outside the University at a nominal cost. The materials irradiated include several lots of seeds of rice, sesamum and winged bean, rhizomes, cashew nuts, rose bud wood, nematode eggs etc.

The Radio Tracer Laboratory also provided the radio isotope facility to the institutions of the Kerala Agricultural University and to outside organisations for research pursuits.

Extension services

A total of 1.6 tons of vegetable seeds of various kinds of superior varieties were distributed during the year. Cocoa budded plants (5119 Nos) and seedlings (178 Nos. were sold during the year.

Pareuchaetus pseudoinsulata (16,000 larvae, 750 pupae and 200 moths) were released in several parts of the State against the Siam Weed *Chromolaena (Eupatorium) odorata*.

Mango grafts (453 Nos) and miscellaneous fruit plants were distributed from the Instructional Farm.

The Department of Processing Technology operated a revolving fund for the production of various fruit products. Mango squash, pineapple squash, orange squash, grape squash, cashew apple syrup, jack fruit jelly, pineapple jam and other fruit products valued at Rs. 88,701.00 were produced during the year. The opening balance of the revolving fund during the year was Rs. 39,645/- which increased to Rs. 72,047.65 at the end of the year.

Programmes through All India Radio

The Department of Olericulture provided very active support to the All India Radio in the conduct of a Farm School on AIR titled 'കായകറികൾ നൂറുദേശം'. This school consisting of 22 lessons was on the AIR from 18-5-1991 to 18-10-1991. Of these lessons, 13 were given by the faculty staff of the College. Thirteen radio talks on specific subjects were given by the faculty staff.

The members of the faculty gave extension lectures in farmers' meets held at various parts of the state and gave talks on plantation crops, spices, floriculture and plant protection.

The Agro Meteorological Field Unit (AMFU) was operated in the Department of Agro-meteorology. Medium range weather forecasts from NCMRWF, Delhi were monitored and analysed for validity. Medium range forecast services were rendered to farmers of Thrissur District on the basis of the forecasts from NCMRWF.

Publications

The faculty staff published four scientific books, one popular primer, 26 scientific papers and eleven popular articles during the period. The details are appended.

1.3 COLLEGE OF CO-OPERATION & BANKING, MANNUTHY

The Co-operation and Banking college 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 the Associate Dean, College of Horticulture. In May 1982, the venue of the College was shifted to the Directorate of Extension, Mannuthy, keeping the administrative control of the College still with the Associate Dean, College of Horticulture. From 1st April 1985, the College 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 1989 admission onwards the in-

take capacity was reduced to 25. At present the college is offering an under graduate programme and three post graduate programmes.

Dr. C. A. Jos, Professor held the full additional charge of the Associate Dean.

Staff

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
Associate Dean	1	—	1
Professor	3	1	2
Associate Professor	7	4	3
Asst. Professor	18	14	4
Jr. Asst. Professor	3	3	—
Administrative staff	18	17	1

Changes in staff position

Mr K. J. Sebastian, and Miss Vanaja Menon were appointed as Assistant Professors, provisionally during the period.

Faculty Improvement Programme

Mr Philip Sabu, Assistant Professor was deputed for undergoing Ph. D Programme in the school of Management Studies, Cochin University of Science and Technology. Mrs. Shaheena P. Junior Assistant Professor was granted LWA for undergoing the M. Phil Programme at the Centre for Development Studies, Trivandrum. Mr Philip Thomas, Junior Assistant Professor was granted study leave for Ph. D programme at the Cochin University of Science and Technology. Dr A. Sukumaran, Assistant Professor has completed the 8 months FDP Programme in Management at IIM Ahmedabad.

Academic Programmes

i) U. G. Programme

Strength of students

Year of Admission	Men	Women	Total
<i>BSc (C&B)</i>			
1986 batch	1	2	3
1987 "	15	10	25
1989 "	8	4	12
1990 "	11	7	18
1991 "	15	6	21
	50	29	79

ii) *P. G. programme*

MSc (C&B)

1989 Batch	1	—	1
1990 „	2	—	2
	3	—	3

Scholarship awards and aids to students

ICAR Junior Fellowship	—	1
KAU Junior Fellowship	—	2
KAU Merit Scholarship	—	7
Educational aid from Harijan Welfare Dept.	—	11
Total	—	21

Practical Training Programme

Under the U. G. regulations every student of BSc (C&B) Programme has to undergo one full semester under the placement and project work. Accordingly 23 students have undergone practical training in the Co-operative Department and reputed organisations in the co-operative sector.

Study tour

All India study tour for BSc (C&B) 1987 admission was conducted from 22.8.91 to 10.9.91. Some important institutions visited were Vaikunth Mehta National Institute of Co-operative Management, College of Agriculture of RBI, National Institute of Bank Management at Pune, NABARD, and RBI at Bombay, International Co-operative Alliance (ICA), NCDC, NCUI, NCCF, IARI etc. at Delhi, and NDRI, UAS at Bangalore.

Extra-curricular activities

Students union activities were in full swing. Quiz programmes, debates and discussions were conducted by the Quiz Club and Planning Forum.

Hostel

A separate hostel building was allotted to the students in the Veterinary Campus at Mannuthy. The 1991 batch students were accommodated in that hostel. All boys will be transferred to this hostel by next year.

College Library

The college library has 2538 books and subscribes to 37 periodicals.

Research

The college is mostly concerned with malady-remedy analysis of Agro-Rural industries and organisations thereof and evaluation studies of rural development programmes.

New project sanctioned

1. "Role of NGOs in Rural Development—A case study of voluntary agencies in Kerala"—funded by the Planning Commission of India.
2. "Supply and utilisation of long-term institutional credit—A case study of PADB's of Palghat district", funded by Kerala State Co-operative Bank

Ongoing projects

The work of 3 other externally funded research projects are in different stages of completion. The work of 3 M. Sc. projects are also in full swing.

Extension activities

a) *Training programmes*:- The college has conducted the following training programmes at the Central Training Institute, K. A. U.

Course	Participants
1 Institutional Financing of Horticultural crops	Asst. Directors of Agriculture
2 Performance Budgeting and Working capital Management	Officers of the State Co-operative Bank and District Co-operative Bank
3 Project Approach to Rural Lending	"

b) *Resource personnel*

The Scientists of the College have been identified as Resource personnel for the training programmes conducted by the Central Institute, Advanced Centre for Plantation Crops, Kerala Institute of Local Administration, Catholic Syrian Bank, District Co-operative Bank and some leading voluntary organisations.

c) *NSS programme*

The college NSS Unit celebrated International Labour Day on 5th May, 1991. Six volunteers of the unit participated in the Leadership Development camp held at Aluva from 24.11.91 to 28.11.91. Two of our volunteers attended the nature camp at Wynad during the year. The College NSS Unit conducted a Special Camp at Echippara Tribal Colony from 5.3.1992 to 9.3.1992 mainly for the tribals of Echippara and Kallichitra Colonies.

1.4 COLLEGE OF FORESTRY, VELLANIKKARA

The College of Forestry was formally inaugurated on 27th October 1986 along with the starting of four year B. Sc. (Forestry) programme. The college is now functioning at the KAU Headquarters campus at Vellanikkara. Dr. C. C. Abraham, Associate Dean, College of Horticulture was in-charge of the Special Officer, College of Forestry during the period.

Staff

Details of staff are as follows:

Category	Sanctioned	In position
<i>Scientific staff</i>		
Special Officer	1	—
Associate Professors	2	2
Associate Professors (NC)	4	4
Jr. Asst. Professor	4	3
<i>Paratechnical/Administrative & supporting staff.</i>		
Administrative Officer	1	1
Section Officer	1	1
Sr. Office Supdt.	1	1
Sr. Gr. Assistant	1	1
Gr. II Assistant	1	1
Typist Gr. II	1	1
H. D. V. Driver	1	1
Sr. Gr. Farm Assistant	1	1

Academic programmes*UG Programme*

Years of admission	Men	Women	Total
1986	2	—	2
1987	2	—	2
1988	15	—	15
1989	7	—	7
1990	6	—	6
1991	11	—	11
Total	43	—	43

P. G. Programmes

No. of students on roll as on 31-3-1992.

1991	6	—	6
Total	6	—	6

Students who completed the course during the period

Name of the course	Men	Women	Total
B. Sc. (Forestry)	13	—	13
M. Sc. (Forestry)	3	—	3
Total	16	—	16

Study tours

The final year (1987 admission) students were taken on All India study tour during the period from 16-3-91 to 6-4-91. They visited the Forest Research Institute, Dehra Dun, IARI, New Delhi, State Forest Service College, Dehra Dun, Bombay Natural History Society, Bombay; National Park, Bombay and several other Institutions of interest to forestry/education/research/management.

The 1988 and 1989 batches were taken to Mudumalai, Top Slip, Bandipur, Mysore, Parambikulam and Coimbatore forest areas from 28-10-91 to 3-11-91. They were also taken to Sholayar, Vazhachal and Thekkady forest areas on study trips.

Range training, Weapon training and First Aid training

The field training course FMT 501-Range training was offered in collaboration with the State Forest Department in selected forest ranges of Marayoor, Kumili, Vadasserikara, Thenmala, Palode and Chedalath. The First Aid training and the Weapon training were also offered to the final year B.Sc. (Forestry) batch at the Govt. Medical College, Thrissur and the Armed Police Training Centre of Ramavarnapuram respectively.

Faculty Improvement

Details of participation of scientists to seminars/workshops/training/symposia/summer Institute.

Name and Designation	Type of course	Venue	Period
Dr. K. Gopikumar Assoc. Professor (NC)	Indo-US workshop cum-training on agroforestry in the area of tree nursery technology and management.	College of Forestry, Vellankkara	6-5-91 to 18-5-91
Dr. B. Mohankumar, Assoc. Professor (NC)	Indo-US workshop-cum-training on agroforestry in the area of tree nursery technology and management.	College of Forestry, Vellankkara	6-5-91 to 18-5-91
Dr. K. Sudhakara, Assoc. Professor (NC)	"	"	"
Sri P. Premkumar, Jr. Asst. Professor	"	"	"
Sri Sonney George, Jr. Asst. Professor	"	"	"

Sri K. Vidyasagaran	1. Indo-US Workshop-cum-training on agroforestry system evaluation	Y. S. Parmar University of Horticulture and Forestry Solan	3-10-91 to 15-10-91
	2. Symposia on rare and endangered endemic plants	State Forest Department Trivandrum	30-8-91 to 31-8-91
Dr. Luckins C. Babu, Assoc. Professor	International Teak Symposium	Kerala State Forest Dept. Trivandrum	2-11-91 to 4-12-91
Dr. B. Mohankumar, Assoc. professor (NC)	All India Co-ordinated workshop on agroforestry	Punjab Krishi Vidyapeeth Akolea, Nagpur	4-3-92 to 6-3-92

Details of Training/Symposia/workshop conducted at the College

The Indo-US workshop on Tree Nursery Technology and Management was organised by the College of Forestry during 6th May to 18th May 1991. Twenty five participants representing various forest research institutes, Agricultural Universities and State Forest Departments all over the country attended the training.

A training on vegetative propagation by horticultural techniques was held for the Range Officers of the State Forest Department for a period of three days from 10th to 12th March, 1992. Fifteen ranges of the Forest Department attended this training.

College Library

Reading room furniture for the library was procured from the Govt. Wood Workshop, Kozhikode. A total of 10 foreign Journals and 10 Indian Journals were subscribed during the period and a total of 180 titles were added to the library.

Instructional Farm

An area of about 8 ha. of land in the "Kailasam" and "Kalindi" blocks of the Estate was allotted to establish the Instructional Farm for the College of Forestry. Fifty five species of tree seedlings were planted in the arboretum area of the Instructional Farm.

An area of about 12 ha. has been newly allotted in 1992 in "Azad", "Sabari" and "Kishkinda" blocks for extending the Instructional Farm. A detailed project for the establishment of an arboretum for testing the growth and suitability of various tree species has been prepared and submitted to the State Department of Science and Technology for funding.

Tree Crop Nursery

A tree crop nursery was established in the premises of the college. Seedlings were distributed for planting in the Main Campus of the University, Instructional Farm, Communication Centre, Pepper Research Scheme etc.

Research Projects

Five externally assisted projects were operated during the period. The project on "Seed viability and germination studies in elected tropical forest tree species" funded by the State Forest Department was newly taken up from 1/5/91.

Another project on "Inter-cropping of forest trees with nitrogen fixing trees" (ICFRE) was started on 1/4/91.

The project on "Exploitation of indigenous multipurpose tree species in selected agro-social forestry system" funded by the State Forest Department was continued during the year.

The STEC funded project on the 'Nutritional deficiency symptoms and foliar diagnosis in tree crops' was also continued.

The State Forest Department funded project entitled "Mineralisation of nitrogen in degraded forest soil, under *Eucalyptus tereticornis* and *Acacia auriculiformis* was taken up in November, 1991.

Outreach Programmes

N. S. S.

Under the auspices of the N. S. S. Unit, a tree planting programme was held. Eleven NSS volunteers donated blood for the patients. Eight volunteers attended the Nature camp organised by the Forest Department at Wynad from 13-12-'91 to 16-12-'91.

Exhibition

The college participated in the field exhibition arranged on 30-12-'91 at the premises of the College of Horticulture, in connection with the visit of the Hon'ble Minister of Agriculture, Sri. P. P. George,

Students Welfare and Union Activities

A film show was arranged on the "Folk Art" of Kerala on 4-6-'91. Under the auspices of the planning forum, the World Environmental Day was celebrated on 5/6/'91. The Inter class arts competition was held on 9/7/'91 and 10/7/'91. The arts club held a study- cum-discussion session on "Malayalam Short Stories" on 13-8-'91. On 1-9-'91, a talk on environmental conservation by Smt. Sugathakumari was held. A wildlife film show was arranged on 22/11/'91.

The students of this college participated in the Inter-collegiate tournaments in Table Tennis and Shuttle Badminton on 8/8/'91, Basket ball and Volley ball from 11-9-91 to 13-9-91 at Mannuthy and Foot ball and Ball Badminton from 28-9-'91 to 30-9-'91 at Vellayani.

1.5 RESEARCH

The research programmes in the Kerala Agricultural University were planned based on the needs of the state. This was achieved through the interaction between the beneficiary departments like Agriculture, Animal Husbandry, Dairy Development, Agro-Forestry etc. and the researchers of the University. With the implementation of the National Agricultural Research Project (NARP) emphasis continued to be on location specific and need based research programmes in the five agroclimatic zones identified in the state. These zones are the southern zone with headquarters at Vellayani, the special Zone of problem areas with headquarters at Kumarakom, the Central Zone with headquarters at Pattambi, the Northern Zone with headquarters at Pilicode and the High Range Zone with headquarters at Ambalavayal. Each zone has one Zonal Research Station under which sub-stations are functioning to tackle the specific problems pertaining to the specific areas of the zone. The reports of activities in the different zones are given hereunder.

1.5.1 Southern zone

The southern zone has its Regional Agricultural Research Station at Vellayani. Besides the N.A.R.P. (Phase I and Phase II), 14 externally assisted research projects (four All India Co-ordinated Research Projects, four ICAR *Ad hoc* projects, three projects funded by the Science, Technology and Environment Department of Kerala, one project funded by the FERRO (USDA), one project funded by the Central Silk Board and one funded by the Indian Council of Social Science Research, functioned at the Station during the period under report. Of these, ten were on-going projects while four (ICAR *Ad hoc* project on VAM, STED project on Coconut garden soils and ICSSR project on rural women

were sanctioned for implementation during the year. A two-year extension was granted to the FERRO project on tissue culture.

The Special Station at Kottarakkara, the Coconut Research Station at Balaramapuram and the Cropping Systems Research Centre at Karamana are the three satellite stations in the zone. The ECF (Experiments in Cultivators' Fields) unit of the AICARP functioning at Mannuthy was attached to the Cropping Systems Research Centre, Karamana.

The Laboratory Unit of the All India Co-ordinated Agronomic Research Project, which functioned in the Department of Soil Science & Agricultural Chemistry, College of Agriculture, Vellayani was shifted to the Cropping Systems Research Centre, Karamana during the period under report.

i. REGIONAL AGRICULTURAL RESEARCH STATION, VELLAYANI

Conduct of location-specific research on the field problems relating to tuber crops as well as development of suitable technology for the farming system (s) in the different agro-ecological situations of the project area and multitier cropping systems suited to different sized homesteads are the main research responsibilities of the sub-project in addition to testing and verification of research results on pulses, oil seeds, cereals (rice), coconut etc.

An area of 10 ha. garden land and 4.5 ha. wet land from the Instructional Farm, Vellayani has been made available to the station for laying out experiments. These sites have been developed, protected and provided with irrigation facilities.

Dr. N. Mohanakumaran continued as the Associate Director of the zone.

Category	Sancti- oned	In position	Vacant
1	2	3	4
Staff			
<i>Scientific</i>			
NARP Phase I			
Associate Director	1	1	—
Associate Professor	3	3	—
Assistant Professor	6	6	—
NARP Phase II			
Assistant Professor	5	5	—
AICRP (Nematode pests)			
Associate Professor	1	1	—
Assistant Professor	2	2	—

1	2	3	4
AICRP (Pesticide residues)			
Associate Professor	1	1	—
Assistant Professor	3	3	—
AICRP (Forage crops)			
Associate Professor	1	1	—
Assistant Professor	2	2	—
Jr. Asst. Professor	2	2	—
ICAR ad hoc scheme on monosomics and trisomics in cucumber			
Jr. Asst. Professor	1	1	—
Sr. Research Fellow	1	1	—
ICAR ad hoc Scheme on tropical mushrooms			
Research Associate	1	1	—
ICAR ad hoc scheme on nutritional studies on pulses			
Sr. Research Fellow	3	2	1
ICAR ad hoc scheme on VAM			
Research Associate	1	—	1
STED Project on changes in the physico-chemical properties of coconut garden soil due to cont. culture of Fodder crops			
Jr. Research Fellow	1	1	—
Ferro (USDA) Scheme on tissue culture			
Assistant Professor	1	1	—
Jr. Asst. Professor	1	1	—
Central Silk Board Scheme			
Assistant Professor	2	2	—
ICSSR Scheme on Nutritional Status of women workers			
Research Associate	1	—	1
Research Investigator	1	—	1

Category	Sancti- oned	In position	Vacant
1	2	3	4

ADMINISTRATIVE AND SUPPORTING

NARP Phase I

Administrative Officer	1	1	—
Section Officer	2	2	—
Sr. Office Supdt. (Spl. Grade)	1	1	—
Typist Grade I (Steno)	1	1	—
Typist Grade I	2	2	—
Selection Grade Typist	1	1	—
Assistant Grade I	1	1	—
Assistant Grade II	1	1	—
Farm Assistant (Agri.) Gr. I	3	3	—
Lab. Assistant Gr. I	1	—	1
Driver (LDV) Grade II	2	2	—
Photographer	1	1	—
Duplicator Operator	1	1	—
Peon	1	1	—

	1	2	3	4
NARP Phase II				
Assistant Grade I		1	1	—
Assistant Grade II		1	1	—
AICRP (Nematode Pests)				
Farm Assistant Grade II		1	1	—
Lab. Assistant Grade III		1	1	—
AICRP (Pesticide Residues)				
Lab. Assistant Grade III		2	2	—
AICRP (Oil Seeds)				
Farm Assistant Grade II		1	1	—
Lab. Assistant Grade III		1	1	—
AICRP (Forage Crops)				
Farm Assistant Grade I		1	2	—
Farm Assistant Grade II		2	1	—
Assistant Grade II		1	1	—
Typist Gr. II		1	1	—
Lab. Assistant Grade III		1	1	—
Peon		1	1	—
(FERRO) USDA SCHEME ON TISSUE CULTURE				
Typist Grade		1	1	—
Lab. Assistant Grade I		1	1	—
CENTRAL SILK BOARD SCHEME				
Farm Assistant Grade I		2	2	—
Lab. Assistant Grade III		2	2	—

Faculty Improvement Programme

Scientific staff on higher studies

Smt. S. Sobhana, Jr. Assistant Professor, N. A. R. P. (Phase II), Department of Agronomy.

Shri N. Mohan Babu, Assistant Professor of Horticulture, USDA Scheme on Tissue culture, Department of Horticulture.

Shri Sunny K. Oommen, Assistant Professor, Department of Plant Breeding, Smt. V. A. Celine, Assistant Professor, Department of Horticulture and Shri Arthur Jacob, Associate Professor (NC), Department of Entomology continued on deputation for higher studies.

Seminars/Symposia/Workshops/Training programmes attended

Seventeen members of the scientific staff attended different symposia/workshops/training programmes etc., conducted in and outside the State.

Involvement of staff in academic programmes

Scientists attached to the N. A. R. P. and other schemes handled UG and PG courses. They also guided P. G. students.

Research activities and achievements

Fifty three research projects/experiments were conducted during the period.

New Research Projects sanctioned & taken up during the period

ICAR *ad hoc* scheme on nutritional studies on pulses.

STED project on investigations on the changes in the physico-chemical properties of coconut garden soil due to continuous interculture of fodder crops.

Evaluation of VAM as biocontrol agent against the wilt disease of pepper.

ICSSR Scheme on Socio-economic and cultural determinants influencing the nutritional status of women workers of informal sector in Thiruvananthapuram district.

Major research achievements

Homestead models evolved

The Scientists of the Special Station at Kottarakkara evolved homestead models for the coastal uplands of South Kerala for rainfed and irrigated situations, and for the midlands that would optimise the objective function of net returns while meeting the requirements of a four-member (2+2) family.

They are essentially coconut-based mixed farming systems in which the crop-livestock components interact synergistically to ensure optimum on-farm resource utilization and productivity. The model for coastal uplands (0.20 ha.) under rainfed situation provides for a net income of Rs. 12,616 by fully utilising the land and ensures a benefit : cost ratio of Rs. 1.64 per rupee invested. The model for coastal uplands (0.20 ha.) under irrigated situation provides for net income of Rs. 17,513 by fully utilizing the land and ensures a benefit : cost ratio of Rs. 1.84 per rupee invested. The model for midlands (0.40 ha) under rainfed situation provides for a net income of Rs. 17,273 and a cost-benefit ratio of Rs. 1.80 per rupee invested. Efforts to develop models suitable for different holding sizes in the identified farming situations continued.

Analysis of area, production and productivity of crops

As suggested by the IDA Mission, Analysis of trends in area, production and productivity of major crops in Kerala was undertaken by the Scientists of NARP (SR). Area, production and

productivity trends during the period from 1956-57 to 1989-90 in respect of rice, coconut, banana, pepper, tapioca, ginger, turmeric, cardamom and rubber were analysed. .

Component analysis was conducted in paddy, tapioca, banana, coconut, rubber, pepper, cardamom, ginger and turmeric, and area effect, yield effect and area x yield interaction effect of these crops worked out. The interim report prepared based on this analysis, growth rates and trends of these crops was presented to the IDA Mission during October, 1991.

Homesteads surveyed

The survey of 80 coconut-based homesteads of Kollam district initiated during 1987-89 to study the existing cropping pattern, different aspects of cultivation and the soil fertility status was concluded during the period. The results revealed a high intensity of polycropping with coconut and intercrops like tapioca, banana, pepper, minor tubers, vegetables and multipurpose tree crops, in addition to agroforestry and livestock components. In general, the adoption level of package of practices recommendations was poor in the area. The results of this study were presented in the XIII Zonal Research Extension Advisory Committee meeting held at the College of Agriculture, Vellayani during 26th-28th September, 1991.

Other promising results

From the comparative yield trial with 14 selections, seven selections of bitter melon (Selections 13, 12, 10, 11, 2, 9 and 14) identified as top ranking (based on mean fruit yield over three seasons), were selected for further testing.

In the preliminary yield trial with eight brinjal cultures, the highest fruit yield was recorded by the culture 11-5-2 (9333 kg/ha), followed by the cultures 11-1-2-1 (9332 kg/ha), and 11-1-2-2 (8555 kg/ha).

The Zonal Workshop recommended the vegetable cowpea selections, Sel. 108 and Sel. 129 for testing under farm trials in Thiruvananthapuram district. Twelve farm trials were laid out in Thiruvananthapuram district during Summer '91.

Out of the 13 tapioca selections tested for their suitability as medium duration varieties for the wetlands, Selection 10 recorded the highest tuber yield of 18.0 t/ha, followed by Selection 4 with 17.3 t/ha. The presently popular variety M4 yielded 15.9 t/ha.

Investigations on the mycorrhizal association of cassava in enhancing nutrient availability revealed that the uptake of the nutrients P, K; Mg and Ca and tuber yield were considerably improved by VAM colonisation.

Studies aimed at standardising *ex vitro* establishment of tissue culture generated jack plantlets, continued. Inoculation with VAM significantly enhanced the growth and establishment of the tissue culture generated jack plantlets. In the case of nutmeg, explants from 3 to 6 month old seedlings registered higher percentage of establishment in the culture. Differentiation and embryogenesis could be induced in the case of cashew.

A native strain of *Pleurotus petaloides* (oyster mushroom) was isolated and domesticated under Kerala conditions. Two hybrids of oyster mushroom with desirable characters have been developed by interstock breeding between the wild and the standard strains.

Effective control measures of mushroom flies were evolved and post-harvest technologies for preservation and processing of oyster mushrooms standardised.

Rice-rice-bhindi sequence was found to be the most profitable crop sequence. Summer cropping of noncereal crops improved the grain yield of kharif rice. Rice-rice-green manure sequence registered the maximum grain yield, indicating the favourable influence of green manure incorporation.

High intensity cropping sequence had no influence on the disease incidence of rice.

Studies conducted under the AICRP (Forage Crops) showed that the soil physical properties were maintained at a stable state, on continuous grass cropping; but some of the chemical properties (N and K content) of the soil were affected. The content of P was not seen affected on continuous grass cropping.

In the varietal trials on guinea grass, PGG 163 recorded the maximum green fodder yield of 4.4 t/ha, followed by PGG 170 with 4.1 t/ha. In the IET on fodder bajra, L 90 recorded the maximum green fodder (12.2 t/ha) and ICMV 87111 the maximum dry fodder (4.2 t/ha) yields. In the AVT on fodder bajra, PCB 83-24 recorded the maximum green fodder yield (19.3 t/ha) and Comp-6, the maximum dry fodder yield (9.9 t/ha).

The experiments conducted under the AICRP (Pesticide-residues) revealed contamination of milk, milk powder, rice grain and vegetables with HCH (Organo chlorine insecticide).

Fifteen more collections of *Cucumis sativus* were made, maintained and catalogued as per the IBPGR descriptor for characterisation and preliminary evaluation.

Occurrence of cyst nematode *Heterodera oryzicola* and rice root nematode *Hirschmanniella oryzae* were reported from Kerala. Out of the 84 varieties of bhindi screened against root knot nematode, *Meloidogyne incognita*, eight were found to be resistant exhibiting no root galls.

The studies conducted under the CSB scheme on sericulture, revealed the incidence of *Aspergillus niger* on silkworm, causing muscardine disease.

Research on export-oriented cutflowers and vegetables was initiated during the period under report. Eighteen gladiolus varieties were tested under Vellayani conditions. The varieties "Happy End", "Friendship", "Summer Pearl" and "Rinny Bay" produced spikes above 70 cm. length and good quality. Production of cormels was satisfactory. A corm rot disease, suspected to be caused by *Fusarium oxysporum* f. sp. *gladioli* was high in the variety "Friendship" and "Vink's Glory".

An experiment to assess the performance of "Maggie Oei" orchid under varying light regimes, cultural methods and nutrition progressed.

The protocol for tissue culture of Anthurium was standardised and plantlets distributed to the Campus Development Project for field evaluation.

Under the ECF, the rice variety Matta Triveni was found to be better for the Central Zone and Annapoorna, for the Kole lands during summer season. In the virippu season, the new varieties such as Makam, Remya and Kanakam and the culture KAU-1727 were found out-yielding the other high yielding varieties.

Farm trials

The farm trials with the blackgram variety TAU-2 conducted during rabi '90-'91 in the uplands of Thiruvananthapuram district were concluded. The test variety gave a mean yield of 356 kg/ha against 263 kg/ha for the check variety T-9, indicating the superiority and adaptability of TAU-2. The XIII Zonal Workshop recommended TAU-2 for the rabi uplands of Thiruvananthapuram district.

The tapioca variety Sreeprakash was recommended for farm trials in Kottarakkara sub division during January, 1992 in summer rice fallow, based on CYT results at Vellayani.

In the farm trials with the vegetable cowpea selections 108 and 129, Sel. 108 gave an yield of 8.69 t/ha and Sel. 129 recorded 9.39 t/ha against Kurutholapayar (7.69 t/ha). The XIII (Southern Zone) Workshop recommended to repeat the farm trials. Two

separate sets of farm trials have to be conducted in Thiruvananthapuram district during summer 1992 (in rice fallows) and kharif 1992 (in uplands).

The XIII Zonal Workshop (Southern Zone) recommended farm trials with Charodi-1 and Kanakamony during summer 1992 in rice fallows, based on their superiority in CYTs.

To compare the bio-efficacy of Phorate and Carbofuran on the control of bunchy top disease of banana, farm trials were conducted in two locations at Vaikom and Vellayani (Instructional Farm).

The guinea grass trials (at 8 locations) started during kharif (1990) continued. In addition, six trials on guinea grass were conducted during the period. In the trials, the clones MC 14, MC 16 and Mackuenii were found to be superior in fodder yield.

Recommendations for inclusion in the Package of Practices Recommendations

The rice variety Remya (MO.10) was found to be suitable for kharif in the southern zone. The mini workshop held on 30-9-1991 recommended this variety to the Package Workshop.

The rice variety Aarathy was recommended for delayed sowing and late transplanting situations during kharif in the southern zone.

Two improved sweet potato clones, SPC-18 (10.21 t/ha) and Kanjangad Local (12.08 t/ha) were proposed for inclusion in the Package of Practices, based on the results of research work and farm trials undertaken during the period from 1983 to 1989. The XIII Zonal Workshop accepted the recommendation. The KAU Variety Evaluation Committee (19-7-91) examined the data and recommended the release of "Kanjangad" as improved variety for the southern zone.

The bhindi variety "Kiran" was accepted by the mini workshop (20-6-1991) as a recommended variety to the southern zone.

Based on the results of field experiments and farm trials conducted, the variety "Charodi-1" (351 kg/ha) was found to be suitable for the partially shaded conditions of coconut plantations. Charodi-1 (Gujarat Cowpea 2) was recommended by the XIII Zonal Workshop for inclusion in the Package of Practices Recommendations for Thiruvananthapuram district. "Charodi-1" has been recommended by the Mini Package Workshop (20-6-91) for inclusion in the Package of Practices Recommendations.

The results of the farm trials conducted during summer 1989-90 and 1990-91 in the rice fallows of *Onattukkara* were discussed by the XIII Zonal Workshop. It was decided to recommend the sesame entry S-8 (which gave the highest seed yield of 648 kg/ha) for cultivation in the rice fallows of *Onattukkara*.

The nutritional requirement of the long duration variety of banana (Red Banana, specific to the southern zone) was worked out as "basal dose of 10 kg organic matter and top dressing (in three splits at the 4th, 6th and 8th month after planting) of 370:40:380 g/plot NPK together with 10 kg FYM and 100 g groundnut cake along with the top dressings of the fertilizers". Since the TNAU recommendation was found to be significantly superior to the other treatments in the plant crop and ratoon, the XIII Zonal Workshop recommended that the same may be given to the Red Banana growers as *ad hoc* recommendation.

A mixture of sand, soil and cow dung in the ratio of 1:2:2 was found to be the best for raising of 1:2:2 was found to be the best for raising brinjal, bhindi and tomato in pots.

Varieties released

The KAU Variety Evaluation Committee (19-7-91) recommend Arun (Amaranth Sel. 8), Malika (Vegetable cowpea Sel. 7), Kanjangad (Sweet potato selection Kanjangad local) and Aarathy (Rice culture 4) for consideration of the State Seed Sub Committee.

The above varieties were approved by the Kerala State Seed Sub-Committee at its 16th meeting held on 28-2-1992.

These four varieties along with another four varieties approved during 1990-91 (Vegetable chillies—Jwalamukhi and Jwalasakhi, bhindi—Kiran and guinea grass—Haritha) were dedicated to the farmers of the southern zone of Kerala by the Hon'ble Minister for Agriculture, Kerala Shri. P. P. George, at a function held at Vellayani on 17-3-1992.

NARP (Phase II) Review

Dr. S. P. Ghosh, Project Director and Dr. S. Gangopadhyay, Principal Scientist, NARP, ICAR visited the RARS, Vellayani and the Special Station from 20th to 22nd August, 1991 and reviewed the progress of work under NARP (Phase I and Phase II).

The IDA Mission comprising Dr. M. Balasubramoniam of the World Bank and Dr. S. Gangopadhyay of the ICAR reviewed the Phase II progress during October 7-11, 1991.

The Vice-Chancellor reviewed the progress of implementation of NARP (Phase II) on 12th and 21st February, 1992.

Dr. S. P. Ghosh, Project Director and Dr. S. Gangopadhyay, Principal Scientist, NARP, ICAR visited the RARS, Vellayani and the Special Station from 9th to 12th March, 1992. On 9-3-1992, the Team visited the RARS (Vellayani), the Coconut Research Station (Balaramapuram), the Cropping Systems Research Centre (Karamana) and the guinea grass farm trial plot at Venpakal. On 10-3-1992, Dr. S. Gangopadhyay, visited the vegetable cowpea farm trial at Mannanthala and the Special Station at Kottarakkara. Dr. Ghosh visited the Rice Research Station, Kayamkulam and was joined by Dr. Gangopadhyay. The wrap up discussions were held at Vellanikkara on 12-3-1992.

Zonal and other workshops conducted

The XIII Zonal Workshop of the southern zone was held on 26th, 27th and 28th September, 1991 at the RARS, Vellayani.

As part of the workshop, the participants were exposed to a 'demonstration-cum-lecture session' on 'Computers in Agriculture' at the E. R. & D. C., Thiruvananthapuram.

The research results and the results of the farm trials/on-farm demonstrations conducted were presented in an exhibition arranged for the occasion. Working of the newly developed 'Mower' and 'Chilli Seed Extractor' was demonstrated to the participants by Sri V. Ganesan, Asst. Professor (Ag. Engg.).

Papers published

Details are appended.

Important Visitors

Dr. J. H. Kauffman, Co-ordinator, ISRIC, Wageningen, Netherlands; Dr. S. Nagarajan, ADG (PP), I. C. A. R., Dr. S. P. Ghosh, Project Co-ordinator, N. A. R. P; Dr. S. Gangopadhyay, Principal Scientist, N. A. R. P; Dr. S. N. Jha, Vice-Chancellor, RAU, Bihar, The High Commissioner of Nigeria, Dr. C. R. Hazra, Project Co-ordinator, A. I. C. R. P. on Forage Crops, IGFRI, Jhansi, Dr. Harieaswaran, National Leader, World Soil Resources, USDA, Washington and Dr. R. K. Dutta, Director, Central Sericulture Research and Training visited the campus during the period.

ii) SPECIAL STATION, SADANANDAPURAM, KOTTARAKKARA

The Special Station at Sadanandapuram, Kottarakkara was sanctioned by the National Agricultural Research Project. The acquisition of land required for establishing the station was completed on 26-4-86 and the station started functioning in a rented building with effect from 14-5-1986, and in the new building with effect from 23-4-1988.

On termination of the five year period of NARP Phase-I, the project continued as a plan scheme under KAU from 30-11-1988 onwards. The NARP Phase-II was sanctioned by the ICAR with effect from 20-4-1988.

The total area of the farm is 8.96 ha, mostly upland comprising of two plots separated by a distance of 252 m. Plot I, known as Kshetrakunnu, has 4.03 ha area and Plot II known as Chanthapurayidam, 4.93 ha.

The lead function of the station is research on homestead farming. The testing and verification functions include research on tapioca and other tubers, rice and coconut-based system.

Smt Kunjamma P. Mathew, Associate Professor (Ent) continued as the head of station till 26-6-91. Smt M. Meera Bai, Associate Professor (Agronomy) functioned as the head of station from 27-6-91 to 24-9-91. Smt R. S. Shehana, Associate Professor (Soil Science and Agrl. Chemistry) acted as the head of station from 25-9-91 to 31-3-92.

Staff

Sanctioned strength, in position and vacancy are given below:

Category	Sanctioned	In position	Vacant
1	2	3	4
<i>Scientific</i>			
Phase-I NARP			
Associate Professor	1	—	1
Horticulture			
Soil Science	1	1	—
Asst. Professor			
Entomology	1	—	1
Agronomy	2	1	1
Pathology	1	1	—
Agrl. Economics	1	1	—
Phase II NARP			
Asst. Professor			
Horticulture	1	1	—
Veterinary	1	—	1
Soil & Water Engg.	1	—	1

	1	2	3	4
<i>Administrative and Supporting</i>				
Phase I NARP				
Farm Asst. (Ag) Gr. I		2	2	-
Lab. Asst. Gr. III		1	1	-
Jeep Driver		1	1	-
Peon		1	1	-
Phase II NARP				
Administrative Asst.		1	1	-
Assistant Gr. I		1	1	-
Typist Gr. I		1	1	-
Farm Asst. (Ag) Gr. I		1	1	-
„ (Vety) Gr. I		1	1	-

Faculty Improvement Programme

Deputation of staff for higher studies

Dr. D. Sreekumar (Jr. Asst. Professor), Smt. M. Meera Bai, Associate Professor, Smt P. A. Valsala (Assoc. Professor, NC) and Smt V. K. Girija (Asst. Professor) continued on deputation for undergoing Ph. D. programmes.

Details of Seminars/Symposia/Training programmes attended

Five scientists attended various seminars/training programmes/symposia in different organisations.

Research activities and achievements

Eight experiments were conducted during the period. The salient results of the experiments conducted are given below:

The tapioca variety Sreeprakash was found to be suitable for the tract. For getting conclusive results this has been recommended for large scale farm trials in the Kottarakkara sub-division.

From the studies on the establishment of suitable homestead models for the midlands of South Kerala under rainfed and irrigated conditions with regard to productivity it was found that the visual effect of the irrigation treatments was very pronounced as compared to the rainfed model.

The homestead survey studies revealed that a high intensity of polycropping with coconut and intercrops like tapioca, banana, pepper, minor tubers, vegetables and multipurpose tree crops in addition to agroforestry and livestock components was predominant in this area.

Papers published

The details are given in Appendix under Regional Agril. Research Station, Vellayani.

Farm development Activities

A drip irrigation set and two submercible pump sets with accessories were installed.

Contour bunds were formed to prevent soil erosion. Budded rose plants, cashew layers, mango grafts and ornamental plants were produced and distributed to the farmers of the locality.

Important Visitors

Dr C. K. N. Nair, Former Director of Indian Rubber Research Institute, Kottayam and Former Dean, College of Agriculture, Vellayani and Dr K. K. Rao, University of London visited the station.

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). The ECF which functioned at Kollam till 1988 is operating at Thrissur from 1988-89 onwards.

The major thrust areas of research at the CSRC, Karamana include:

- Development of suitable rice-based crop sequences for the southern zone, working out of the economics of different rice-based crop sequences and their effect on soil fertility and crop productivity, evolving crop technology for optimum production under resource constraints and studying the long range effects of continuous cropping and manuring.

Sri V. Ramachandran Nair, Professor of Agronomy (Senior Agronomist of the AICARP) continued as the Head of station. The ECF unit of the AICARP at Mannuthy was headed by Sri I. Johnkutty, Associate Professor of Agronomy.

Staff

Sanctioned strength, in position and vacancy are shown below:

Category	Sanctioned	In position	Vacancy
<i>Scientific staff</i>			
AICARP			
Professor	1	1	—
Asst. Professor	3	1	2
Jr. Asst. Professor	1	1	—
Tech. Assistant (Stat. compiler)	1	—	1
Non-Plan			
Jr. Asst. Professor	2	2	—
ECF (On-farm) Research Unit, Mannuthy			
Assoc. Professor	1	1	—
Jr. Asst. Professor	1	—	1
<i>Administrative & Supporting</i>			
AICARP			
Farm Assistant	3	3	—
Assistant	1	1	—
Typist	1	1	—
Attendant	1	1	—
Lab. Attendant	1	1	—
Non-plan			
Administrative Assistant	1	1	—
Peon	2	2	—
Part-time sweeper	1	1	—
ECF Mannuthy			
Farm Assistant	8	8	—
Asst. Gr. II	1	1	—
Jeep Driver Gr. II	1	1	—
Watchman (Class IV)	1	1	—

Faculty Improvement Programme

Details of scientific staff deputed for higher studies

Two members of the scientific staff were deputed to undergo Ph.D. programme.

Seminar/symposia/training programme attended by the staff:

Two members of the scientific staff attended different workshops/seminars conducted.

Research activities and achievements

Ten experiments were conducted during the period.

Rice-rice-bhindi sequence was found to be the most profitable crop sequence. Summer cropping of non-cereal crops improved the grain yield of kharif rice. Rice-rice-green manure sequence registered the maximum grain yield indicating the favourable influence of green manure incorporation.

High intensity cropping sequence had no influence on the disease incidence of rice.

Under the ECF the rice variety Matta-Triveni was found to be better for the Central Zone and Annapoorna for the *kayal* lands during summer season. In the virippu season the new varieties such as Makam, Remya, Kanakam and the culture KAU 1727 were found out-yielding the other high yielding varieties.

Papers published

The details are given in appendix under RARS Vellayani.

Important visitors

Sri B. Vijayakumar, M.L.A., visited the station in connection with the Agricultural Seminar.

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 a 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 1972. 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 area of research is the manurial, agronomic and plant protection aspects relating to coconut in red loam soils.

Dr K Pushpangadan, Prof. of Agronomy continued as the head of station.

Staff

Sanctioned strength, in position and vacancies are shown below:

Category	Sanctioned	in position	Vacant
<i>Scientific</i>			
Professor	1	1	—
Asst. Professor (Path)	1	1	—
<i>Administrative & Supporting</i>			
Farm Supervisor Gr. I	2	2	—
Administrative Assistant	1	1	—
Assistant Sr. Gr.	2	2	—
Typist Gr. I	1	1	—
Peon Hr. Gr.	1	1	—
Watchman	2	2	—

Research activities and achievements

Three field experiments were conducted during the period.

These experiments though not concluded have given the following indications.

The effect of potassium was found to be significant on the yield of nuts. When potassium was applied at 450 g/palm/year there was an increase of 86 nuts when compared to no potassium application. A further increase of potassium from 450 to 900 g/palm/year resulted in an increase of 16 nuts over the 450 g level.

Seeds and nursery production

2827 WCT and 1574 T x YD coconut seedlings were produced for distribution to farmers.

Important visitors

Dr. R. P. S. Thyagi, Member, ASRB, New Delhi visited the station.

1.5.2. Special zone of problem areas

General characteristics of the zone

The special zone of problem areas is one of the agro-climatic zones demarcated to represent the geographical area where agriculture is risky, hazardous and exposed to the vagaries of nature. It lies in the coastal line of Kerala State, extending from Quilon

district in the south to Malappuram district in the north. The zone comprises parts of Alappuzha, Kottayam, Ernakulam, Thrissur and Malappuram districts covering an area of 5254 km². The zone lies below mean sea level and gets flooded during the south west monsoon. The whole area then forms a sheet of water dotted here and there by homesteads, coconut groves, and strips of garden lands. Connected to the sea, the area is subject to ingress of salinity. The salt water intrusion into the lands is regulated in Alappuzha and Kottayam districts by the Thanneermukkom barrage, Thottappally spill way, and Andhakaranazhi and in Thrissur district by the Enammakkal regulator, Kottankottu valavu and Karanchira lock. The zone in Alappuzha district is fed by four main rivers, Pampa, Meenachil, Manimala and Achencoil which drain into the vast expanse of water called Vembanad lake before merging with the Arabian sea. The zone is the most thickly populated area in the state. The rivers as well as the channel water are polluted by human and animal wastes and by agricultural drainage. The pollution is responsible for the prevalence of many gastro-intestinal diseases. Some of the pollutants such as pesticides and heavy metals find their way up the food chain of the aquatic environment resulting in high concentration of toxic residues, in the body of fishes in rivers.

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

Name of Research Station	Situation in which located	
R. A. R. S., Kumarakom	Karappadam	Kottayam district
R. R. S., Moncompu	Karappadam	Alappuzha district
R. R. S., Kayamkulam	Onattukara	Alappuzha district
R. R. S., Vytila	Pokkali	Ernakulam district
All India Co-ordinated Research Project on Agricultural Drainage, Karumadi	Kari	Alappuzha district
Sugarcane Research Station, Thiruvalla	Karappadam	Pathanamthitta district
Agrl. Research Station, Mannuthy	Kole	Thrissur district

The thrust areas identified for the zone are:

- Reclamation and management of problem soils
- Farm mechanisation
- Integrated farming involving crop livestock and fish
- Root (wilt) disease management
- Seed and nursery production
- Resistance breeding in rice
- Breeding of rice for salinity tolerance
- Improvement of rice under pokkali conditions
- Research on oil seeds, pulses and rice in Onattukara
- Rice and fish culture
- Sugarcane research
- Mangrove research conservation and management

i REGIONAL AGRICULTURAL RESEARCH STATION, KUMARAKOM

The Regional Agricultural Research Station is situated at 9.3 latitude and 76.3' longitude in the Kumarakom village of Kottayam district in the southern side of 'Kavanar', just 15 kms 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 Indian Central Coconut Committee. In 1968, 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

Details of scientific, para-technical and administrative staff are presented in Annexure-I

Summary table showing sanctioned strength of staff, in position and vacancies

Category	Sanctioned strength	In position	Vacant
(1)	(2)	(3)	(4)
<i>Scientists</i>			
Associate Director	1	1	—
Professor	6	5	1
Associate Professor	8	6	2
Assistant Professor	10	5	5
Junior Assistant Professor	4	2	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 (Very.)	1	1	—
Technician Grade I	1	1	—
Artist	1	—	1
Photographer	1	—	1
Driver Gr. II (HDV)	1	1	—
Driver Gr. II (LDV)	2	2	—
Duplicator Operator	1	1	—
Bus Attendant	1	1	—
Lab. Assistant Gr. II	2	2	—
Lab. Assistant Gr. III	4	3	1
Pump Operator	1	1	—
Boat Driver	1	—	1

(1)	(2)	(3)	(4)
Sarang	1	—	1
Tractor Driver	1	—	1
Peon (Hr. Gr.)	3	3	—
Watchman	3	3	—
Sweeper-cum-Attendant	1	1	—
Fisherman	3	—	3

**Faculty Improvement Programme
Posts shifted/abolished/redeployed**

Nil.

Deputation of staff for higher studies

Sri. K. J. Joseph, Associate Professor (NC) has been deputed to undergo Ph. D. programme at GKVK, Bangalore under Agrl. Economics.

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

All the scientists of this Station attended the XIII ZARC workshop held at RARS Kumarakom during 18-20th September, 1991.

Four Scientists from the station also attended different workshops and seminars.

Extension lectures/classes conducted

One day training class on Mushroom Cultivation was organised for the Agrl. Assistants twice during May 1991.

Dr. K. G. Padmakumar held one day training class to delegates on National Watershed Development Programme held at Chengannoor during May 1991.

One batch of final year B. Sc. (Ag) students was given two weeks field training during October 1991.

Dr. K.G. Padmakumar conducted 4 Nos. of extension lectures on fish diseases during October 1991.

A short term training on Mushroom Cultivation was conducted at this Station during 19-21 November 1991 and 48 candidates attended the class.

A practical training class for 3 days was conducted at this Station on Computer application by Sri Thomas Mathew of R. R. S. Kayamkulam.

Dr. K. G. Padmakumar held class on coastal aquaculture for participants of the environmental study programme organised by 'Nature Fraternity' a voluntary organisation during February 1992.

A one day class was conducted under lab-to-land programmes to fifty farmers during March 1992.

Research activities and achievements

A total of 29 research projects were in operation during the period. The scheme wise break up of the projects is given below:

Sl. No.	Name of funding agency	No. of projects/experiments
1	K. A. U.	: 18
2	N. A. R. P.	; 10
3	I. C. A. R.	: 1

Projects concluded during the year

Nil

Highlights on research results

An early harvestible cassava cultivar (Cul. 4/84) found promising for the reclaimed soils of Kuttanad, is recommended for inclusion in the Zonal package of practices recommendations. This has a mean yield potential of 35-40 t/ha in six months.

Vegetative propagation technique in *Garcinia cambogia* has been standardized. Soft wood grafting and side grafting were found to be the two successful methods.

A vegetable cowpea cultivar (VS-4) is identified as promising in farm trials as well as Station trial. This cultivar is being recommended for cultivation in the zone.

Palayamkudan variety of banana is proved to be the ideal cultivar for intercropping in coconut gardens. Among the culinary types 'Batheesa' variety is found to be the best.

Promising cultivars of *Dioscorea alata* (Dak 10/86) and *D. esculenta* (Dek 10/86) were identified.

Nutrient management studies on banana-cassava mixed cropping system have revealed that application of nutrients to cassava at the recommended dose influenced banana yield also. There is significant interaction between different levels of nutrients for banana and cassava.

Grain and straw yields of rice in the reclaimed alluvial soil of Kuttanad could be significantly enhanced by providing sub-surface tile drainage.

Chemotherapy on root (wilt) disease of coconut has indicated that Oxytetracycline is effective to suppress the disease development.

Seeds and planting materials distributed

Banana suckers	:	744 Nos.
Mushroom spawn	:	207 bottles
Paddy seed	:	4190 kg
Fish fingerlings	:	9675 Nos.
Glyricidia cuttings	;	2359 Nos.
Seeds produced under the Central Sector Scheme for Vegetable seed production	:	Cucumber-13.5 kg

Action taken for improving the farm

The eastern boundary of the farm was wire fenced, boundary of two fish ponds were protected by laterite bricks. The threshing floor has been reconstructed for effective seed processing. Six cows were newly purchased to strengthen the herdstock. Bananas were planted along the two sides of the farm roads.

Papers published

Details are appended.

ii) RICE RESEARCH STATION, MONCOMPU

Rice Research Station, Moncompu is located at Moncompu, Thekkekara of Champakulam Panchayat in Kuttanad Taluk of Alappuzha district. The Station was established in 1940 and brought under Kerala Agricultural University in February 1972.

The objectives of the Station were: (1) Evolving high yielding varieties of rice with multiple resistance to pests and diseases (2) Standardisation of management practices in rice crop so as to increase productivity. (3) To evolve integrated management practices to control weeds, pests and diseases and (4) Evolving low cost production technology for rice in Kuttanad.

Mandate of the station

To take up work on the location specific research needs of rice cultivation in Kuttanad.

Dr. C. A. Joseph, Professor (Plant Breeding) continued as the Head of the Station.

Staff

Summary table (Detailed statement appended)

Category	Sanctioned strength	In position	Vacant
<i>Scientific</i>			
Professors	5	5	—
Associate Professors	3	3	—
Assistant Professors	7	5	2
Junior Assistant Professors	6	2	4
Junior Statistician	1	1	—
<i>Para-technical</i>			
Farm Supervisor	2	2	—
Farm Assistant	2	2	—
Field Supervisor	1	1	—
<i>Administrative & Supporting</i>			
Administrative Assistant	1	1	—
Section Officer	1	1	—
Senior Grade Assistant	2	2	—
Assistant Grade I	2	2	—
Typist (Senior Grade)	1	1	—
Lab. Assistant Gr. III	5	5	—
Peon	2	1	—
Sweeper-cum-Attendent	1	—	1
Watchman	1	1	—
Boat Driver	2	1	1
Jeep Driver	1	1	—
Boat Helper	1	—	1
Boat Sarang	1	—	1

Faculty Improvement Programme

New post sanctioned/shifted/abolised : Nil

Details of seminars/training programmes attended by staff

All the scientists attended the ZREAC meeting at Kumarakom and the ORP consortium at Moncompu. Nine of them also attended other workshops and seminars conducted in different places.

Involvement of staff in the Academic programmes

Undergraduate level Nil

Post-graduate level

Dr. L. Rema Devi, Professor (PP) is functioning as the Chairman and as Advisory Committee member of two P. G. students

in Plant Pathology at the College of Horticulture, Vellanikkara. Dr P. V. Nair is also an advisory committee member of one P. G. student in Plant Pathology at College of Horticulture, Vellanikkara

Smt. P. R. Krishnakumari Amma took classes in Biostatistics to the M. Phil course students of S. D. College, Alappuzha.

Research Activities

The total number of projects/experiments taken up during the year under report in the station were 41, out of which 18 were under NARP/KAU; 22 under AICRIP, one under ICAR ad-hoc programme the details of which are given under:

Classification	NARP/ KAU	AICRIP	ICAR Adhoc	Total
Crop Improvement	8	3	—	11
Crop Management				
Agrl. Chemistry & Soil Science	1	2	—	3
Agronomy	1	5	—	6
Crop Protection :				
Entomology	2	6	—	8
Plant Pathology	4	6	—	10
Agrl. Extension/Statistics	2	—	—	2
ORP on integrated control of rice pests in Kuttanad	—	—	1	1
Total	18	22	1	41

Concluded projects

A total of 4 projects were concluded during the year, one under crop improvement, two under crop protection and one in Agricultural Statistics.

Results of the concluded projects are given below:

Crop improvement

Initial multiple resistant yield trial—irrigated mid early

The objective of this experiment was to evaluate relative performance of resistant varieties against biotic stresses.

It was conducted for four seasons with fresh sets of seeds every year. No entry was found suitable to the locality and hence not selected for further yield trials. Ten entries which were found to be highly resistant to gall midge were transferred to the germplasm.

Crop Protection

Entomology

Avoidable loss to rice crop at various growth stages due to infestation by insect pests

The experiment was conducted to identify the most vulnerable stages in the crop growth to pests and to assess the extent of crop losses due to major and minor pests of rice.

The results showed that the extent of avoidable yield loss due to pest incidence in Kuttanadu was 30.85 per cent during kharif season and 28.24 per cent during rabi season. The results also revealed that the most vulnerable stages of the crop are maximum tillering to panicle initiation when gall midge and stem borer are the major pests encountered in the cropping season.

Plant Pathology

Investigations on glume/grain discolouration

In this trial taken up to study the causal organisms, particularly fungi causing discolouration of glumes/grains of paddy, it is found that a number of fungi are associated with this malady both externally and internally. Among the fungi isolated, *Helminthosporium oryzae* and *Alternaria padwickii* were the most predominant. As a result of infection, germination is seen affected.

Agricultural Extension/Statistics

A study on the impact of agroclinics of the Rice Research Station, Moncompu

About 80 per cent of the farmers adopted the techniques for which advice was sought from agroclinics. It was observed that majority of farmers seeking advice were small farmers possessing less than 2 ha.

Research Highlights

Two blast resistant cultures viz., M-28-1-1 (MO 5/Improved Sona) and M 35-3-2 (MO 6/Improved Sona) from the project 'Evolution of blast resistant variety of rice' and two cultures viz., MO 1 10-8-1 (Mutant of MO 1) and MO 1) and MO 1 20-19-4 (Mutant of MO 1) from the project 'Improving the yield, quality and plant type of rice by induced mutation' were found to be promising based on the results of multilocational trials and they will be promoted for farm trial.

From the micronutrient studies conducted in three soil series of Kuttanad it has been found that the Karuvatta and Thottappally soil series are strongly acidic soils and have high organic carbon status with deficiency in the available Zn, Cu and Mn content. The Fe content is high but below the critical level for iron toxicity.

In the Pallippad soil series the soils are extremely acidic with low organic carbon status. The available Zn, Cu, and Mn content are adequate and available Fe content is high above the critical iron concentration for iron toxicity.

In evaluation trial with weedicides it is found that Anilophos + 2,4-DEE @ 0.3 + 0.4 and 0.4 + 0.53 kg ai/ha recorded very low weed dry weight and produced significantly higher grain yields comparable with weed free check where weeds were hand removed upto 45 days after transplanting.

The insecticides viz., Ethofenprox (Trebon 10 EC) at 0.075 kg ai/ha and Isazophos (Miral) 3 G 1.0 kg ai/ha were found to be effective against gall midge, stem borer and leaf folder.

The extent of avoidable loss due to pest incidence in paddy crop in Kuttanad was found to be 30.25% during kharif season and 28.24% during rabi season.

Disease management in rice by foliar application of fungicides reduced sheath blight and sheath rot severity. Susceptible variety responded well to disease management.

Ten pre-release rice cultures, found to be reasonably tolerant to sheath blight/sheath rot diseases under field conditions were selected for inclusion in various breeding programmes.

Various fungi were seen associated with glume/grain discoloration in rice among which *Helminthosporium oryzae* and *Alternaria padwickii* were found to be the predominant ones.

Sale of seeds, planting materials

Paddy seed	: 14143 kg
Banana suckers	: 10 Nos.

Papers published

Details are appended.

Other activities

Dr. P. V. Nair, Professor (Plant Pathology) participated in the Plant Pathology monitoring tour to evaluate the progress of the co-ordinated projects at various AICRIP centres in South India along with the Scientists of the Directorate of Rice Research, Hyderabad and other co-ordinating centres from 18-9-91 to 6-10-91.

Dr. C. A. Joseph, Professor (Plant Breeding) and Head of Office acted as a member of the AICRIP rice breeding monitoring team and he also visited the various AICRIP centres from 21-10-91 to 29-10-91. He took part in a discussion on various problems of kari lands in the farmers' meeting held at Alappuzha on 30-8-91 in which Honourable Minister of Agriculture, Director of Agriculture and Director of Research also participated.

A rice day and an agricultural seminar were conducted in the Station on 27-3-92. Dr. K. C. Joseph, M. L. A., Kuttanad inaugurated the seminar and Dr. A. G. G. Menon, Director of Extension addressed the farmers.

Dr. C. A. Joseph, Professor (Plant Breeding) and Head of Office participated in a discussion on 'Rice research in Kerala for the last two decades and its impact on productivity' which was broadcast on 22-6-91. He also took part in a discussion on 'Suggestions for a good *puncha* crop in Kuttanad' broadcast on 6-11-91. He also participated in an interview on 'various aspects of Additional crop in Kuttanad' broadcast on 14-3-91.

In the discussion on 'How to save rice cultivation in Kerala' which was telecast on 10-1-92 from Thiruvananthapuram Door-darshan. Dr. C. A. Joseph, Professor (Plant Breeding) and Head of Office was one among the participants.

Important visitors

Miss. Barbara R. Britto, Science Policy Analyst, U. S. Environmental Protection Agency, Washington, Dr. S. Venkataraman and Dr. Alin Ghosh, Scientists, D. R. R., Hyderabad, Dr. M. V. Rao, Sr. Pathologist. R. R. S., Maratem, Dr. Thangamoni Narayanaswamy, Sr. Pathologist, Paddy Breeding Station, Coimbatore, Dr. A. Chandrasekharan, Pathologist, R. R. 1., Aduthurai, Dr. Seshadri, Rice Pathologist, A. R. S., Pandya, Dr. J. Ramakrishna Rao and Dr. J. S. Bentur, Breeders, D. R. R., Hyderabad, Dr. S. Giridhar, RRI, Aduthurai, Dr. P. Vidyaratnam, T. N. A. U., Coimbatore, Dr. K. Gopalakrishna Rao, R. R. S., Mandya, Sri. K. C. Sankara Narayanan I. A. S. (Retd.), Member, Pamba Expedition Team, Dr. K. G. Pillai, Principal Scientist AICRIP, Hyderabad, Dr. Hari Eswaran, Scientist USDA, Dr. C. S. P. Iyer & Dr. M. Gopalakrishnan, R. R. L., Thiruvananthapuram, and Dr. John Bennett, Sr. Scientist, Plant Biology, International Centre for Genetic Engineering and Biotechnology, New Delhi visited the station.

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 erstwhile University of Travancore. It was subsequently transferred to the Department of Agriculture in 1958 and continued to function under the Department of Agriculture till 31-1-1972. With the formation of the Kerala Agricultural University, this Station has been taken over as a constituent unit with effect from 1-2-1972.

The mandate of the Station is to tackle problems of major crops in Onattukara situation. The lead function of the Station is research on annual oil seeds and pulses and verification function is research on rice.

The soil is acidic in reaction, with a pH of 5.6. Nitrogen and potash status are low, while that of phosphorus is medium.

Sri. K. Balakrishna Pillai, Professor (Ent.) continued as Head of the Station during the entire period.

Staff

Summary table is given hereunder (Details are given in Annexure).

Category	Sanctioned strength	In position	Vacant
<i>Scientific</i>			
Professor	3	3	—
Associate Professor	2	2	—
Assistant Professor	2	1	1
Junior Assistant Professor	3	1	2
<i>Para-technical</i>			
Farm Supervisor	1	1	—
Farm Assistant (Senior Gr.)	1	1	—
Farm Assistant Gr. II	2	2	—
Lab. Assistant	2	2	—
Regular Mazdoor	2	2	—
Tractor Driver	1	1	—
<i>Administrative</i>			
Administrative Asst.	1	1	—
Assistant (Senior Grade)	1	1	—
Assistant Grade I	1	1	—
Typist Grade I	1	1	—
Peon	1	1	—
Watchman	2	2	—
Jeep Driver	1	1	—
Part-time Sweeper	1	1	—

Faculty improvement programme

Dr. Thomas Mathew, Junior Assistant Professor has undergone a short course on computer application by I. C. A. R. and Winrock International, at New Delhi, for a period of two weeks.

Dr. S. Bhavani Devi, Associate Professor (PP) attended a group discussion with Research Scientists on mushrooms under the All India Co-ordinated Mushroom Improvement Project at TNAU, Coimbatore.

New posts sanctioned	:	Nil
Posts shifted	:	Nil
Scholarships awarded to staff members	:	Nil
Posts abolished	:	Nil
Deputation of staff to higher studies	:	Sri. Abraham Varghese Assoc. Professor is continuing his post graduate training.

Details of Seminars/Symposia/Training programmes attended by the staff

The scientists of the Station attended the NARP-KAEP workshop held at RARS Kumarakom in September 1991.

Five Agrl. seminars organised in Kollam and Alappuzha districts were attended by the scientists of the station who took classes on production technologies of various crops and mushroom.

A farmer's day and agricultural seminar organised under the village adoption programme were conducted at Thazhava and Pathiyoor, where scientists of the Station took classes on various aspects of Agriculture.

Involvement of staff in Academic programmes : Nil

Research activities and highlights

A total number of 21 projects were in operation during the year. The scheme-wise break up is presented below:

1) Externally aided projects (I. C. A. R.)	—	2
2) KAU Projects		
Rice and rice based cropping system	—	4
Soils and Agronomy	—	1
Pulses and Oil Seeds	—	5
Tubercrops	—	1
Vegetables	—	1
3) New projects sanctioned during the year		
Rice and rice based cropping system	—	2
Pulses and oil seeds	—	4
Beneficial micro-organisms and productive insects	—	1
Total	—	<u>19</u>

Research Highlights

The highlights of research are:

A high yielding photosensitive rice culture viz., Cul. 1358-2 (Jaya/Ptb. 4) has been approved by the State Seed Sub-Committee for release as a variety by name 'Dhanya' for general cultivation in Onattukara during second crop season.

Another promising line viz., Cul. 1336-3 a derivative of the cross Jaya/Ptb. 20 has also been identified for the eastern lateritic belt of Kollam and Pathanamthitta districts and recommended for farm trials.

For the orumundakan tract two promising awnless cultures by selection from local Oorumundakan cultivar were identified and they are in the different stages of testing and evaluation.

The cowpea cultivars viz., COV4 8456 and CO3 were identified as promising in the garden lands of Onattukara and these are in the pre-release testing stage.

Blackgram varieties were test cultivated in the rice fallows of Onattukara and COBG-307 and CO4 were found well suited to this tract.

For the 'Thara lands' (Nursery areas of Onattukara) various crops were tested and a short duration tapioca cultivar, 'Koombuvela' has been identified as promising with a mean tuber yield of 25-30 t/ha within a duration of six months.

Studies have confirmed that continuous application of chemical fertilisers alone is injurious to the sandy soils of Onattukara and that N requirement should be supplemented by organic matter to exploit maximum grain yield in rice.

Optimum spacing and fertiliser dose for cucumber grown in the garden lands of Onattukara have been standardised as 2 x 2 m spacing and NPK @ 70:25:25 kg/ha.

Seeds and planting materials distributed

Paddy (Seed + Bulk)	:	21528 kg
Sesamum (Seed + Bulk)	:	508.5 "
Bhindi	:	29.720 "
Amaranthus	:	3.505 "
Cucumber	:	25.000 "
Ashgourd	:	1.000 "
Cowpea	:	151.250 "

Papers published

Given in Appendix.

IV) RICE RESEARCH STATION, VYTTILA

Rice Research Station, Vyttila is situated in representative site in the centre of Pokkali region. Due to close proximity to Arabian sea the fields are subjected to tidal waves and periodical inundation by saline water. It is 7 kms east of Ernakulam Junction Railway station and 15 km away from Kochi Air port.

This station was started during the year 1958 on leased lands in Kunnara and later shifted to the present site in 1963. The station was taken over by the Kerala Agricultural University in 1974. The total area of the farm is 8.91 ha. Besides rice research in Pokkali area a separate wing for fisheries research was also started during 1976. An area of 4.25 ha is earmarked for field experiments and seed production programme of rice and 3.05 ha for fisheries research.

In March 1982, the station was made a sub centre under the National Agricultural Research Project of the Special Zone of problem areas.

A unique system of paddy cultivation is prevalent in the locality known as 'Pokkali cultivation'. The characteristic feature of pokkali tract is that the soil is 'Potential acid sulphate'. They are characterised by highly acidic and saline sulphidic soil materials that are waterlogged with saline tidal water. Extreme acidity, higher salinity, toxicity due to aluminium and iron and deficiency of phosphorus are the predominant soil factors limiting rice production in this tract.

Rice can be cultivated only during the low saline months ie. from May-June to mid October after which the fields are used for traditional prawn filtration.

The main objectives of this station are:

To evolve high yielding saline tolerant rice varieties suited for the low lying coastal areas and to standardise suitable agronomic practices for the cultivation of rice in this area.

To evolve cropping system practices by which the annual income per unit area from pokkali lands can be increased to the maximum by adopting integrated farming of rice, fish and prawn.

To evolve sustainable and ecologically viable cultural practices for fishes and prawns in brackish water ponds.

Professor K. M. George continued as the Head of Station.

Staff

Posts	Sanctioned	In position	Vacancies
<i>Scientific staff</i>			
Professor	2	1	Nil One post held by Assoc. Prof., Agronomy
Associate Professor	1	3	Nil
Assistant Professors	3	2	Nil One post of Asst. Prof. held by Assoc. Prof. Agrl. Chem.
<i>Paratechnical staff</i>			
Farm Supervisor Gr. II	1	1	Nil
" Gr. I	—	1	Nil One post of Sr. Gr. Farm Asst. held by F. S. Gr. I
Sr. Gr. Farm Asst.	1	—	
Farm Asst. Gr. I	1	1	Nil
Farm Asst. Gr. II	1	1	"
Lab. Asst. Gr. III	1	1	"
Fisherman cum Watchman	2	2	"
<i>Administrative staff</i>			
Administrative Asst.	1	1	"
Assistant Gr. I	1	1	"
Assistant Gr. II	1	1	"
Typist Gr. II	1	1	"
Peon (Hr. Gr.)	2	2	"
Watchman	1	1	"
Driver Gr. II	1	1	"
Pump Operator	1	1	"

(Detailed list of staff is appended)

Faculty improvement programme	Nil
New posts sanctioned/created/shifted/abolished	"
Detail of seminars/symposia/training programme attended by staff	"

Dr. M. Subramonia Iyer, Associate Professor (Agrl. Chem.) underwent a training on 'Methodologies for Diagnosis and Management of soils affected by salinity' at CSSRI, Karnal during November, 1991.

Involvement of staff in academic programme

Undergraduate programme — Nil

Post graduate programme

Dr. M. Subramonia Iyer continued to guide two M. Sc. (Ag) students of the College of Agriculture, Vellayani, as the major advisor.

Research activities & achievements

A total no. of 10 research projects were in operation during the period as detailed below:

AICARP	:	1
NARP	:	1
KAU	:	8
Concluded projects	;	Nil

Research Highlights

Three superior saline tolerant cultures obtained from the cross Chettivirippu x IR 4630-22-2-17 were significantly superior to the check varieties. The cultures 905 & 906 performed well in farm trials and in the National Saline Alkaline Screening Nursery and were included for Advanced Variety Trial during kharif 1992.

Another set of saline tolerant cultures viz., Cul. 852 & 857 of the cross combinations Vyttila 1 x IR 5, Vyttila 2 x IR 5 and Ponkuruka x IR 5 were recommended for farm trial.

The duration of the popular variety Mashoori could be reduced by a month by mutation breeding and the resultant Cul. 655 performed better than the check varieties in the comparative yield trial.

In the *in vitro* screening for salinity tolerance at seedling stage the Vyttila cultures 905, 906, 852, 857, 701, 708 and 709 recorded 90% survival percentage in the EC range of 10-12 ds/m².

In the long term fertilizer trials with Vyttila 1 as the test variety, application of nitrogenous fertilizers did not reveal to have any added effect in grain yield.

The integrated production trials with rice, fish and/or prawn as the components revealed that (1) Male tilapia (*Oreochromis mossambicus*) is an ideal species for rice cum fish culture. (2) Supplementary stocking of fast growing varieties of prawn seed in prawn filtration fields increases the income substantially due to the higher price obtained from quality prawns and (3) Selective stocking of fast growing varieties of prawns in prepared pokkali fields is giving high returns compared to the traditional prawn filtration.

The trials conducted to optimise factors to maximise prawn production indicated that (1) high salinity of more than 15 ppt is required for growth of prawn to larger size. Hence, a short term culture of 1½ to 2 months utilising the favourable period is to be envisaged in pokkali area. An increase in stocking density from 5/m² to 10/m² can substantially increase the yields.

Seeds and planting materials produced and distributed

Particulars	Produced (kg)	Sold (kg)
Paddy seeds	3285	2100
Vegetable seed		
Cowpea	52	51.5
Amaranthus	7.5	9.06
Ashgourd	1.29	1.10
Snakegourd	1.25	0.51
Ridge gourd	0.700	0.415
Brinjal	0.250	0.070
Cucumber	0.050	0.020
Bittergourd	0.050	0.280
Pumpkin	0.300	0.130
Bhindi	11.500	11.890
Rooted cuttings of hibiscus & bougainvillea	880	787

Action taken to enhance farm revenue

The paddy seed production during the year could be increased by 35 per cent compared to 1990-91. The coconut production was 16,552 as against 16,283 during the previous year.

The total income from the sale of various items showed a 12% increase from the 1990-91 level of Rs. 87,700 to Rs. 98,168/- during 1991-92.

Efforts were made to increase the income by managing the available resources of land and labour to the optimum level. Production of vegetables, vegetable seeds and ornamental plants under planting of coconut seedlings etc. were the works done in this line.

Publication by the staff : Nil

Other matters

Prof. K. M. George, Professor & Head continued to be the Chairman of the monthly KAEP workshop of Ernakulam district. He has also worked as a member of the diagnostic team.

Sri N. K. Sasidharan, Associate Professor (Agronomy) served as a resource person of the monthly KAEP workshop of Ernakulam district and the diagnostic team.

Important visitors

Important visitors were not there during the period.

v. SUGARCANE RESEARCH STATION, THIRUVALLA

The Sugarcane Research Station is located at Kallunkal in the Nedumpuram Village of Thiruvalla Taluk. It is situated at 9.6° N latitude, 76.5° longitude at an elevation of 25.15 M above MSL.

Research on Sugarcane under the Kerala Agricultural University was started in 1976 with complete assistance from the ICAR under the All India Co-ordinated Research Project on Sugarcane. Subsequently in 1979 the Kerala Agricultural University started supplementing the research programme under the scheme on Intensification of Sugarcane Research.

The research efforts on Sugarcane envisages to increase production and productivity of sugarcane in the command areas of Travancore Sugars and Chemicals, Thiruvalla, Mannam Sugar Mills, Pandalam and Co-operative Sugars, Chittoor, Menonpara by evolving high yielding high sugared red rot resistant varieties and formulating optimum crop management practices. Research on vegetables is also in progress in this station under NARP Phase II.

In the semiarid tracts of Palakkad district, the thrust areas identified on Sugarcane are identification of drought resistant varieties, formulation of water management techniques and control of weeds. Research in this line is in progress at Sugarcane Research Centre, Menonpara. The scientists from Sugarcane Research Station, Thiruvalla, collaborate with the scientist stationed at Menonpara.

Station Head

Sri. P. J. Ittyaverah, Professor	Up to 4-7-91
Dr. D. Alexander, Associate Prof.	From 5-7-91 to 5-3-92
Smt. S. Santhakumari, Professor	From 6-3-92 onwards.

Staff (Summary table)

Category	Scheme	Sanctioned strength	In position	Vacant
(1)	(2)	(3)	(4)	(5)
<i>Scientists</i>				
Professor	KAU	1	1	—
Assoc. Professor	AICRP	1	1	—
Assoc. Prof. (Bot.)	KAU	1	1	—
Jr. Asst. Professor	KAU	3	2	1
Jr. Asst. Prof.	AICRP	1	1	—
Asst. Professor	NARP	1	1	—

	1	2	3	3	4
<i>Paratechnical staff</i>					
Farm Supervisor		KAU	1	1	—
Farm Assistant Gr. II		KAU	1	1	—
Farm Asst. Gr. I		AICRP	1	1	—
<i>Administrative staff</i>					
Admn. Assistant			1	1	—
Assistant Gr. I			1	1	—
Assistant Gr. II			1	1	—
Typist Gr. I			1	1	—
Driver			1	1	—
Peon			2	2	—
Watchman			1	1	—

(Detailed statement of staff is given as Annexure.)

Faculty improvement programme : Nil

Details of seminars/symposia/training programme attended by staff

All scientists from the station, attended the XIII NARP-KAEP joint workshop held at RARS Kumarakom on 18th and 19th Sept., 1991. Sri. K. C. Chandy, Associate Professor attended the group meeting of AICRP on Sugarcane held at GSSBI Seoratu Deoria, U. P., in October, 1991.

The District level T & V monthly workshop of Pathanamthitta district was conducted. It was attended by Sri. P. J. Ittyaverah, Professor and Dr. D. Alexander as Chairmen and Sri. K. C. Chandy Associate Professor and Smt. Jessy M. Kuriakose, Assistant Professor as resource personnel. Diagnostic team visits to the pest and disease affected areas were also made by the team.

Smt. Jessy M. Kuriakose and Dr. D. Alexander took classes on Kitchen garden organized by YMCA, Kumbanad and Scientific method of rice cultivation for the farmers of Chennithala area respectively. A discussion on improved techniques of sugarcane cultivation organized by FACT at Travancore Sugars, Pulikeezhu was attended by Dr. D. Alexander, Associate Professor.

Involvement of staff in academic programme. — Nil

Research activities and achievements

Research projects in operation

(a) Externally aided	No. of experiments
i) NARP	
Vegetables	1
ii) All India Co-ordinated project	4
iii) Central Sector Scheme on vegetable seed production	1
(b) KAU projects	
Non Plan	
Commercial crops	10
Plan	
Commercial crops	1
Vegetables	1
Total	<u>18</u>

New Research Projects sanctioned

NARP (1) Spacing-cum-manurial trial in snakegourd.

AICRP (2) Zonal varietal trial for identifying early and mid late maturing varieties of sugarcane 1991-92.

KAU (3) Evaluation of sugarcane varieties for the different agro-climatic tracts of Kerala and fluff exchange programme 1991-series

Projects concluded during the year : Nil

Research highlights

The crop improvement programme for the evolution of high yielding high sugared varieties having built-in mechanism of disease resistance have yielded good dividend.

Culture 577/84 (Thirumadhuram) the 2nd variety from the station was accepted by the State Variety Release Committee for cultivation in the state. This variety is suitable for cultivation in the semi-arid tracts of Palakkad district and garden land situations with a cane yield of 134 and 104 tonnes respectively. The variety is moderately resistant to red rot pathogen.

Three clones ie. 85/85, 310/85 and 527/85 obtained from the hybridization programme of 1985, are being tested in farmers' field for ascertaining their adaptability.

Three promising clones of hybridization programme of 1986 series ie. 81/86, 519/86 and 536/86 and three clones of 87 series ie. 1150/87, 2604/87 and 2606/87 are being multiplied for testing their performance under farm trials.

An improved genotype of snakegourd ie. selection No. 2009, was evolved from the project 'Evaluation of snakegourd and bitter gourd for the acidic alluvial soils' (under NARP Phase II). This is a high yielding variety with an average yield of 50 t/ha.

Distribution of planting materials

83000 setts of newly released sugarcane variety 'Madhuri' were produced and distributed under the Seed Production programme in Sugarcane.

Measures taken to improve the farm

Barbed wire fencing is being carried out in the farm boundary.

Concrete lining of irrigation channel to a length of 175 m completed.

Publication by the staff: Nil

Important visitors

- (1) Dr. K. C. Alexander, Head, Division of Crop Production, Sugarcane Breeding Institute, Coimbatore
- (2) Dr. Gangopadhyay, Senior Scientist, NARP

vi) AICRP AGRIL. 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 sub-surface drainage system on the movement of soil liquids.

To study the pattern of hydrological cycle occurring in the watershed areas and its importance and influence on the drainage

To develop a feasible technology for the lay out of subsurface drainage system suitable to peak and muck soils.

To develop criteria for design parameters of surface drainage

To develop drainage pattern required for different crops.

To evaluate the feasibility of using the return flow from drainage for irrigation in relation to water quality rating.

To evaluate the socio-economic benefits accrued from the drainage projects.

Station Head

Sri E. K. Mathew, Assistant Professor (Agrl. Engg.)

Staff**Summary table**

Sanctioned post		In Sanctioned position	Vacant
<i>Scientific</i>			
Associate Professor (Ag. Engg.)	1	1	—
Assistant Professor (Agronomy)	1	1	—
Jr. Asst. Professor (Ag. Engg.)	1	1	—
<i>Para-technical</i>			
Farm Assistant (Sr. Gr.)	1	1	—
Farm Assistant Gr. II	2	2	—
Overseer (Civil)	1	1	—
Draughtsman	1	1	—
Lab. Assistant Gr. II	1	1	—
Technician Gr. II	2	1	1
<i>Administrative</i>			
Typist Gr. II	1	1	—
Assistant Gr. I	1	1	—
Peon	1	—	1
Watchman	2	2	—
Driver Gr. II	1	1	—
Section Officer	1	1	—

(Detailed statement of staff is given in Annexure)

Faculty Improvement programme : Nil**Details of Seminars/Symposia/Training Programmes attended by staff**

Sri. E. K. Mathew, Assistant Professor (Agrl. Engg.) attended group meeting of the co-ordinating centres of the AICRP on Agricultural Drainage held at Water Technology Centre, IARI, New Delhi from 21-1-92 to 22-1-92.

Involvement of staff in the academic programmes

Completely involved in research work.

Research activities and achievements

There were four experiments taken up under the co-ordinated project during the period under report. The highlights are as follows:

The hydraulic properties of the Kari soil were assessed. The study revealed that the average hydraulic conductivity of

kari soil is 0.245 m/day. The drains recorded consistent discharge rates at identical heads for the past five years showing that there is no deterioration in the drain performance. The replenishment from the adjoining water bodies to the tile outflow is substantial upto 60 m, after which such contribution practically ceases. Steady state condition of drainage was found to hold good only upto 60 m and non-steady state condition beyond that. This was confirmed as the observed drain discharge were close to the calculated drain discharges at corresponding hydraulic heads. Hence, for Kuttanad region, the sub surface drainage system is to be designed as interceptor drains upto 60 m from water bodies adopting steady state equations and as relief drains using non-steady state equations beyond 60 m.

The experiment 'Evaluation on drain tube filters' has given the inference that there is a distinct difference in the drain performance among replications which may probably be due to the specific nature of the respective locations. The statistical analysis of the data revealed that there is no significant difference between treatments indicating the ineffectiveness of the filters during the initial years. The study is being continued.

The mean grain yield in kg/ha for both the 15m spacing and 30 m spacing show that the treatments vary significantly in their effect on grain yield in the 15 m spacing trial. The grain yield in the control plot (T4) was significantly lower than those of the drainage area (T1 and T3). However, the treatment effect of T2 was found to be only on par with that of the control. All the drainage treatments T1, T2 and T3 were found to be equally effective. However, the treatment T1 has the highest grain yield.

In the 30 m spacing trial the treatments were found not to differ significantly from each other. Here also all the drainage treatments gave a higher grain yield compared to the control.

Papers published

Details are appended.

Other matters

The new methodology for improving the drainage of kari land developed by this Station has been accepted by the State Government and it has proposed to demonstrate it in one pada-sekharam of each Panchayat through the newly constituted Kari Lands Development Agency.

Important visitors:

Dr. K. N. Sukla, Head of Dept. of Agrl. Engg., G. B. Pant Agricultural University and Dr. A. K. Bhattacharya, Co-ordinator visited the station.

1.5.3 Central Zone

The Central Zone comprises of the major rice growing tract of Kerala. It consists of the three revenue districts of Palakkad, Thrissur and Ernakulam but excludes the high range (Attappadi and Nelliampathi hills of Palakkad District) and areas with special soil and physiographic conditions (Kole lands of Thrissur District and coastal saline or 'pokkali' areas of Ernakulam District). The region comprises of 17 taluks, 44 development blocks and 274 panchayats. It lies between 9° 47' and 11° 16' north latitude and between 75° 52' and 76° 50' east longitude.

The zone, situated in the windward side of the Western Ghats, receives torrential rains (about 75 per cent of the annual precipitation) during South-West monsoon. Among the districts, Ernakulam receives the highest average rainfall. Eruthiampathy and the adjoining areas in Palakkad District is a typical low rainfall area. Palakkad District experiences drought of varying magnitude from November to May. The mean maximum and minimum temperatures of the zone are 31.4°C and 21.1°C respectively. The average relative humidity is around 70 per cent. However in Palakkad, the humidity reaches as low as 40 per cent during December to March due to the blowing of hot air from Tamil Nadu through the Palakkad gap.

Soil is mainly laterite. Coastal alluvium, riverine alluvium and brown hydromorphic soils are found at the bottom of valleys. Hydromorphic saline soils and acid saline soils are found in the coastal tracts and black soils in the Chittoor Taluk.

The research centres of the central zone are:

- i) Regional Agricultural Research Station, Pattambi
- ii) NARP Sub Centre, Eruthiampathy
- iii) Cashew Research Station, Anakkayam
- iv) Operational Research project, Ozhalapathy
- v) AICRP on Agro-forestry, Thiruvazhamkunnu
- vi) Agricultural Research Station, Mannuthy
- vii) ECF Unit, Mannuthy
- viii) Cashew Research Station, Madakkathara
- ix) Banana Research Station, Kannara and Pineapple Research Centre, Vellanikkara
- x) Project on promotion of Agri. Electronics
- xi) Agronomic Research Station, Chalakkudy
- xiii) Aromatic and Medicinal Plants Research Station, Odakkali

i) REGIONAL AGRICULTURAL RESEARCH STATION, PATTAMBI

Regional Agricultural Research Station, Pattambi has lead functions on rice, pulses, oil seeds and rice based farming systems. It also functions as an advanced centre for studies on laterite soil management.

The total area of the station is 63.64 ha. It represents all the major paddy soils of Kerala viz., modan (rainfed upland), palliyals (single crop wet land) and double crop wet lands. It started functioning as Paddy Breeding Station, Pattambi during the year 1927 in an area of 33.28 ha with the objective of improving local paddies of erstwhile Madras Presidency. In 1930, it was renamed as Agricultural Research Station so as to take up research works on other crops like cotton, sugarcane, sesamum, pulses and oil seeds. An additional area of 30.36 ha was acquired in 1945. When the research set up of rice in Kerala was reorganised during 1972 the station was raised to the status of Central Rice Research Station for the state. The station was transferred to the Kerala Agricultural University with effect from 1st February, 1972. Consequent on the implementation of NARP in the year 1981, the station was elevated to the status of Regional Agricultural Research Station for the Central Zone.

A full fledged seed testing laboratory was established in 1966 which was later nominated as the State Seed Testing laboratory according to the provisions of the Seed Act, 1969. An agricultural meteorological laboratory was set up during 1948. A dairy unit is functioning here with 15 milch cows and 15 draft animals.

The soils of the farm are sandy loam and loam in texture. The pH of the soil ranges from 5.2 to 5.8. The entire area is rainfed. However, water from the wells and tanks in the low lying areas are used to irrigate paddy during the later part of the second crop season. The average annual rainfall is 2550 mm, of which 1675 mm is received during first crop season (June-September). 474 mm during second crop season (October-January) and 400 mm during third crop season (January-April).

The research activities of the station are spread over in seven disciplines viz., rice improvement, horticulture, pulses, agronomy, soil chemistry, entomology and plant pathology. So far 36 paddy strains have been released from this station by pureline and mass selection and 12 strains by hybridisation and selection. Two cowpea varieties viz., PTB-1 (Kanakamony) and PTB-2 (Krishnamony) have also been released.

Staff

Dr. G. R. Pillai continued as Head of Station upto 19-9-91 and thereafter Dr. K. M. Rajan took over the charge. The list of staff who worked in the station is given in Appendix 1. A summary table of staff strength (sanctioned and in position) is given below.

List of staff

Category of post	Sanc- tioned	In position	Vacant	Remarks
1	2	3	4	5
Non-Plan A				
<i>Scientific staff</i>				
Assoc. Professor	2	1	1	
Asst. Professor	2	—	2	
Jr. Asst. Professor	3	1	2	
<i>Administrative & supporting staff</i>				
Section Officer	3	3	—	
Sr. Grade Assistant	6	6	—	
Assistant Grade I	2	2	—	
Assistant Grade II	2	2	—	
Sr. Office Supdt.	2	2	—	
Typist Grade I	3	3	—	
Lab. Assistant	6	5	1	
Peon Hr. Grade	3	3	—	
Non-Plan B				
Sr. Gr. Farm Supervisor	1	1	—	
Farm Supervisor Gr. I	2	1	1	
Farm Supervisor Gr. II	2	2	—	
Sr. Gr. Farm Assistant	8	7	1	
Technician	2	2	—	
Tractor Driver	1	—	1	
Regular Mazdoor	8	8	—	
Class IV	6	6	—	
Watchman	4	4	—	
Non-Plan C (NARP Phase I)				
Professor	3	1	2	
Assoc. Professor	3	2	1	1 post filled for only two months
Asst. Professor	10	6	4	

	1	2	3	4	.5
<i>Administrative & Supporting staff</i>					
Administrative Officer		1	1	—	
Typist Gr. I		2	2	—	
Duplicator Operator		1	1	—	
Lab. Asst. Gr. III		1	1	—	
Driver (HDV)		1	1	—	
Driver (LDV)		1	1	—	
Photographer		1	—	1	
Tractor Driver		1	—	1	
NSP—BSP					
<i>Scientific staff</i>					
Asst. Professor		1	1	—	JAP working against the post
Technician Gr. II		1	1	—	
AICRIP (Rice)					
Assoc. Professor		4	4	—	
Asst. Professor		4	4	—	
<i>Supporting staff</i>					
Farm Assistant Gr. I		4	4	—	
Driver Gr. II		1	1	—	
Tractor-cum-Jeep Driver		1	—	1	
AICRP (Pulses)					
<i>Scientific staff</i>					
Assoc. Professor		2	2	—	
<i>Supporting staff</i>					
Farm Asst. Gr. II		2	1	1	
Assistant Gr. I		1	1	—	
Typist Gr. II		1	1	—	
Lab. Asst. Gr. III		1	1	—	
Peon		1	1	—	
NARP Phase II					
<i>Scientific staff</i>					
Asst. Professor		3	2	1	JAP working against one post 1 post filled for the period from 21-8-91 to 15-2-92
<i>Supporting staff</i>					
Farm Supervisor Gr. I (Vety.)		1	1	—	F. A. working against the post
Asst. Gr. II		1	1	—	
Technician		1	1	—	

Faculty improvement programme

New posts sanctioned/created/transferred/
shifted/abolished Nil

Higher studies

Sri. Baby P. Skaria, Associate Professor (Agrl. Entomology) has been awarded Ph. D. by the Kerala Agricultural University for his thesis entitled 'Resurgence potential of the rice leaf folder as influenced by the soil application of Carbofuran granules'.

Sri M. A. Hassan and Sri P Rajendran continued on study leave for undergoing doctoral programme and Smt Geetha C. Jayan for undergoing post-graduate programme.

Sri P. Ahamed and Smt P. Manju continued as part-time Ph. D. students.

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

Eighteen Scientists of the station attended various seminars/symposia/workshops etc. conducted at different institutions in and outside the state.

Involvement of staff in academic programmes

Dr. Jose Mathew and Dr. K. Anilakumar served as members of the advisory committee of one Agronomy and two Soil Science post-graduate students of the College of Horticulture, Vellanikkara respectively.

All the scientists of the station handled practical and theory classes for the field training of Final Year B.Sc. (Ag.) students from the College of Horticulture, Vellanikkara.

Research activities and achievements

A total of 64 experiments were under operation during the period under report.

Name of project	Crop Improvement	Crop Production	Crop Protection	Total
AICRP (Rice)	5	8	17	30
AICRP (Pulses)	9	—	—	9
NARP (Phase II)	4	—	—	4
KAU (Rice)	12	7	1	20
KAU (Pulses)	1	—	—	1
	31	15	18	64

The salient research findings are furnished here under.

A. RICE

Crop Improvement

The variety Nila (Ptb 48) was released during the period under report.

It is a cross between Triveni x Vellathi Kolappala x Co-25. Nila is specifically suited for the second crop season of Kerala. It is tall statured and hardy. It is having short, bold and red kernelled grains. Nila is tolerant to pest and diseases. It has excellent milling and cooking qualities. The average grain yield ranges from 3.5 to 4.0 t/ha and straw yield from 7.0 to 8.0 t/ha, under low fertilizer management situations.

Two cultures viz., Cul-8754 and Cul-8756 were recommended by the 13th NARP Zonal workshop for release in the state. The salient features of these cultures were:-

Cul-8754:- It is a red kernelled and short duration culture obtained from the cross between IR 35 and Jyothi. It had shown very good yield performance in the station, AICRIP and farm trials. The culture is resistant to blast and sheath blight. The high volume weight is another special feature of this culture.

Cul-8756:- It is a culture obtained from the cross between IR-36 and Pavizham. It is red kernelled with a duration of 110 to 120 days. It is a non-lodging culture with high yield potential and is resistant to major diseases.

The following advanced cultures were being evaluated under farm trials.

Cul-8770: It is a red riced culture with medium duration and medium stature. It is evolved from the cross BR 51 x 23332-2. It had shown multiple resistance to blast, sheath blight, sheath rot, RTV, BPH and WBPH. It has performed excellently in station, farm and AICRIP trials.

Cul-8772: It is a promising medium duration culture from the cross Jyothi x BR 51. It is medium in stature and duration and showed multiple resistance. It has recorded high ranks in most of the test locations in the AICRIP trial. The culture has performed well in the on-farm trials conducted by E.C.F. unit, Mannuthy in the Kole lands as well as in the farm trials.

Cul-8759: It is a short duration culture with about 100 days duration and red kernel. It is evolved from the cross IR-36 x Annapoorna. It has showed good performance in on-farm trials in the kole areas and under AICRIP trials,

Twenty new entries were added to the germplasm collection raising the total number to 220.

Promising lines which were resistant/tolerant to sheath blight were selected from the F4 and F5 populations of the cross Jyothy x 25331 and M2 x 25331.

Screening rice variety for resistance to iron toxicity indicated superior performance by tall indicas as compared to the hybrid derivatives and introduced varieties.

Seven promising progeny rows were isolated from the cross between Ptb 28 and M 210 for their suitability under dry sowing conditions. The results from another trial indicated the suitability of Cul-8755, Cul-8756, Jyothy and Cul-23332-2 and medium duration ones like Neeraja and Cul-8772 for dry sown situations.

In a programme to evolve a high yielding, tall, photosensitive variety with good straw yield specifically suited for mundakan season, two cultures viz., Cul-37136 and Cul-87117 were identified as the most promising.

Three advanced cultures from the IR-36 improvement programme viz., Cul-8754, Cul-8756 and Cul-8759 showed good performance in farm trials, AICRIP trials and MLTS and were hence recommended for release by the NARP nonal workshop.

Two promising medium duration cultures from the BR-51 improvement programme, namely, Cul-8770 and Cul-8772 were under farm trials, multilocation trials and AICRIP trials.

Six promising cultures were identified from the re-selection programmes of Mashuri for red kernel colour and blast tolerance. Out of these six Red Mashuri (RM) -1 and RM-7 showed good yield performance comparable to Mashuri. RM-1 was tolerant to blast, sheath blight and gall fly.

Crop Management

Pre-emergent application of pendimethalin @ 1.5 kg ai/ha followed by 2,4-D application @ 0.6 kg ai/ha was found to be very effective in controlling weeds and increasing the yield of semi-dry rice.

Analysis of weather variables during the reproductive and ripening stages of rice indicated that low sunshine hours during reproductive phase is a major constraint limiting rice productivity during first crop season.

A study on increasing the productivity of mundakan rice revealed that the content of iron in the plant as well as index leaves was far higher than the upper critical limit of the element and it is a major yield limiting component in laterite soils.

The traditional local varieties (Ptb 4 and Ptb 20) showed better adaptability in iron toxic soils than introduced varieties (IR 5 and Pankaj) and evolved hybrids (Aswathy and Red Triveni).

From a study on the nutrient absorption pattern in rice, it appeared that surface deposition of iron in roots limit the nutrient absorption through physical effects and contribute at least in part to low productivity.

Culture 1727 (Jayathy) followed by MRST (Multiple Resistant Screening Trial) cultures 83 and 84 were found suitable for single crop wet lands for high yield and good ratoon performance.

A study on the performance of urea forms in wet sown rice indicated the superiority of newer urea forms (mussorie rock phosphate coated urea, neem coated urea and large granule urea), particularly the neem coated urea, in increasing the grain yield of rice over prilled urea.

The results from the permanent manurial trial showed that exclusive and continuous use of glyricidia leaves will not be beneficial for maintaining long term rice productivity.

The high productivity of dwarf indica genotypes can be maintained in the rice monoculture system only through the application of large quantities of organic manures, preferably in the form of FYM, so as to supply 50% of the total nitrogen schedule, as indicated by the results of the permanent manurial trial.

Glyricidia leaves can be applied at the rate of 5t/ha even on the previous day of transplanting without any harmful effect on rice crop.

Crop Protection

Application of Carbofuran 3 G @ 2 kg ai/ha in the nursery, 5 days before uprooting was found effective in controlling pests, attack in the early stages of transplanted rice.

Application of Carbofuran 3 G @ 1.0 kg ai/ha in the main field was found to induce resurgence of rice leaf folder.

Spraying of Trebon 10 EC @ 0.075 kg ai/ha was found to effectively control rice leaf folder.

Dipping the roots of rice seedlings in 0.02 percent solution of Chlorpyrifos 20 EC for 12 hrs before planting was highly effective in the control of gall midge.

The rice cultures RP-2543-12874-286-1 and TNAULFR-842718 were found to be highly resistant to leaf folder. Ptb-12 (Chitteni) was a highly resistant donor for leaf folder resistance.

The light trap data obtained during the last few years revealed in increasing tendency in the population of yellow stem borer during the kharif and rabi seasons.

The culture-87135 has shown high levels of resistance against yellow stem borer followed by cultures RM-25 (Red Mashuri) and RM-1, which were developed at RARS, Pattambi.

KAU cultures 25315, 25316, 25331, 25333, 25335, 25337, 8754, 8756, 8770 and 8772 were found to exhibit multiple resistance to blast and sheath blight.

For effective control of blast disease, seed dressing with Fongorene 50 WP @ 2g/kg seed followed by foliar application of Bavistin (0.1%) at tillering and panicle initiation stages was found to be the best schedule.

Application of Coratop 2.5 G at tillering and panicle initiation stages was found to be effective in checking blast disease.

Validacin 3L, Chlorothalanil 75 WP and Rovrol 50 WP were found to be highly promising for sheath blight control.

B. HORTICULTURE

The variety Sugarbaby exhibited superior performance in the farm trials conducted in Palakkad district to evaluate the performance of water melon varieties for river bed cultivation.

The culture AG 25 recorded least incidence of mosaic and higher fruit yield among the ashgourd lines screened for mosaic resistance.

The variety Arka anamika (IIHR Sel. 10) recorded higher yields in the farm trials conducted for screening bhindi varieties suitable for river bed cultivation and it was found to be free from mosaic disease.

Application of organic manures alone to cucumber and ashgourd was found to extend the storage life of fruits for 3-5 months.

C. PULSES

In the cowpea advanced varietal trial, the Gujarat variety G C 82-7 gave the highest grain yield of 744 kg/ha, followed by V-322 (608 kg/ha). G C 82-7 has been consistently showing its superiority since 1986. In the different centres of South Zone, GC 82-7 along with V-240 showed the best performance.

Among the blackgrams variety AKU-4 and LBG 17 recorded the highest yield.

The varieties Pusa 9031 and CO-4 yielded the highest among the green grams varieties.

Other Activities

Exhibitions

The station participated in the All India Agricultural and Industrial Exhibition (Thrissur Pooram Exhibition) under the leadership of the Directorate of Extension. The station also organised an exhibition in connection with the Kisan Mela held on 6-12-1991.

Consultancy service

Advice on farming and farm technology were rendered to farmers and extension personnel in the form of field visits, office calls and through correspondence.

Seminars

The Scientists participated in the following seminars:
District level agricultural seminar at Malappuram
Farmers' Seminar at Manimooli
Karshaka Seminar at Edappalam
Karshaka Seminar at Koppam
Seminar jointly organised by the Department of Agriculture and FACT Ltd., at Vazhikkadavu
Seminar conducted by the KVK Pattambi
Farmers' seminar at Changaramkulam
Vegetable farmers' seminar at Anakara
Vegetable farmers' seminar at Koppam

Workshops

The XIII NARP Regional Workshop of the Central Zone was conducted from 14th to 16th October, 1991. The results of previous years research programmes and farm trials were presented and discussed.

Scientists of RARS Pattambi regularly attended the T&V monthly workshops of Malappuram and Palakkad districts as resource personnel. They also participated in the joint field visits and acted as members of diagnostic teams. Twelve workshops each for Malappuram and Palakkad districts were conducted during the period under report. These workshops served as valuable forms for interaction between the Kerala Agricultural University Scientists and Extension personnel of the Department of Agriculture.

Trainings

The State level training on Rice Production Technology was conducted from 17th to 19th September, 1991. Twenty four trainees from the State Department of Agriculture participated in the course.

Field training of two weeks duration was conducted for one batch of final year B. Sc. (Ag.) students deputed from the College of Horticulture, Vellanikkara. Field trainings of one day duration were imparted to visiting VHSC Students and trainees from the RATTC, Malampuzha.

Kisan Mela and Seminar

The Kisan mela and Silver Jubilee celebrations of the Seed Testing Laboratory, Pattambi, was conducted on December 6, 1991.

The new rice variety 'Nila' was formally released on the occasion. A book on seed technology entitled "Subeejam Sukshetre" was also released. An audience comprising of 400 farmers, scientists and extension personnel participated in the Agricultural Seminar. An agricultural exhibition and variety entertainment programmes were also arranged as a part of the mela.

ii. NARP SUB CENTRE, ERUTHIAMPATHY

The sub centre started functioning at the Integrated Seed Development Farm (ISD), Eruthiampathy from 1st June, 1985 onwards. An area of 1.75 ha of the ISD farm was placed at the disposal of the Kerala Agricultural University for the conduct of experiments by the centre. The administrative and technical control of the centre is vested with the Associate Director, Regional Agricultural Research Station, Pattambi.

The major objective of the centre was to assist the farmers of the drought prone area of Kozhinjampara in Palakkad District by way of (i) identifying and recommending better varieties of the crops grown in the locality, (ii) suggesting suitable agronomic management practices for such crops, in view of the moisture stress experienced during summer, and (iii), making available seeds and planting materials suited for the drought prone situations.

Staff

Prof. M R C Pillai, continued as the Head of station during the report year. The staff strength (sanctioned and in position) was as follows:-

Category	Sanct- ioned	In posi- tion	Vac- ant	Remarks
Professor (Agro.)	1	1	—	Head of Station
Asst. Prof. (Pl. Br.)	1	—	1	Vacant from the
Farm Asst. (Agri.)	2	1	1	very inception
Peon	1	1	—	of the centre.

iii) CASHEW RESEARCH STATION, ANAKKAYAM

Cashew Research Station, Anakkayam, was founded in 1963, under a scheme included in the third Five Year Plan. It is situated in Anakkayam Village in Ernad Taluk in Malappuram District. The station is located in the western side of the Malappuram-Manjeri Road at a distance of 9 km from Malappuram. The elevation of the station is 106.8M above MSL.

The station occupies an area of 9.92 ha. out of which 8 ha. are under cashew and 0.5 ha. are under coconut. Rest of the area is occupied by buildings and roads.

Soil in the station is red laterite. The land is slopy and of uneven terrain. The crops are rainfed and is mainly dependent on south-west monsoon. The south west monsoon usually starts by June-July and continues till August-September. A few showers are received during north-east monsoon, during the months of October-November. The average rainfall in the station for the last 10 years is 269 cm.

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

Staff

Prof. S. Santhakumari was the head of the station upto 3-3-92 and afterwards Mr. K C Chandy took the charge. The list of staff is given in Appendix I. The details of staff strength is furnished below.

Category	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
Associate Professors (Agro./Bot./Pl. Br.)	1	1	—
Junior Asst. Professor	1	1	—
<i>Administrative and Supporting staff</i>			
Farm Asst. (Agri.) Gr. I	1	1	—
Assistant Gr. II	1	1	—
Mali	1	1	—
Reg. Mazdoor	1	1	—
Peon	1	1	—
Full time sweeper	1	1	—

Faculty Improvement programmes

New post sanctioned/created/shifted/abolished:-

An additional post of Asst. Prof. (Hort.) was sanctioned under the VIII Plan Programme.

Scholarships awarded to the staff and deputation of staff for higher studies:-Nil

Details of seminars/symposia/training programme attended by the staff:- Nil

Involvement of staff in the academic programme: Nil

Research Activities and achievements

Four experiments were conducted in the station which were all KAU projects.

The salient findings are:-

Based on the yield data of 47 clonal and 43 seedling types during 1991-92 seven superior types were identified. They were

Clonal types (above 20 kg/tree):-

K-10-2, K-19-1, K-4-1, K-25-2, K-27-1

Seedling Types (Above 15 kg/tree):-

Anakkayam-1, BLA-273-1

216 hybrids evolved under 18 parental combinations were under evaluation. The yield data showed that the hybrid H-15-6 recorded the highest yield per tree (35.20 kg) followed by H-8-8 (26.30 kg).

Performance of clonal progenies of 16 promising selections of this station are evaluated. The yield data for 1991-92 showed significant difference among varieties. The highest yield per tree was recorded by K-19-1 (11.58 kg) followed by Anakkayam-1 (8.00kg).

Performance of clonal progenies of promising selections in the germplasm collection and the first set of hybrid planted during 1963-64 were under evaluation. The clonal types which recorded highest yield during the period under report are given below:

1967 planting		1968 planting		1975 planting	
Type	Yield (kg/ tree)	Type	Yield (kg/tree)	Type	Yield (kg/tree)
H-3-6	9.10	K-10-2	5.80	K-22-1	7.93
H-3-2	6.68	K-22-1	4.70		

A good number of germplasm (indigenous and exotic) containing both clonal and seedling types of cashew were introduced and maintained. As a result of selection and hybridisation, few promising types such as BLA-39-4, K-22-1, and NDR-2-1 were identified in the Centre.

From the germplasm collection, the following high yielding varieties have been identified by intensive selection:

K-19-1, K-4-1, K-25-2, K-27.1, K-26-1, K-16-1

Observation of yield data and other vegetative and floral characters of the hybrids revealed the following hybrids as promising:

H-14-5, H-18-8, H-11-6, H-17-9, H-11-4

Evaluation study of 31 clonal progenies revealed that the types H-3:6 and H-3:5 are high yielders.

iv OPERATIONAL RESEARCH PROJECT, OZHALAPATHY

The Operational Research Project for Resource Development on Watershed basis was started in 1984 as a pilot project. The Project was later incorporated to The National Watershed Development Programme implemented during 7th plan period. The development activities undertaken by the Department of Agriculture, under the programme was completed by 1990. As per the latest proposal, the watershed development activities were to be reorganised and implemented as National watershed Development Programme for Rainfed Areas, and the ORP's were to function under KVK's in the respective districts. Since the proposed reorganisation was delayed due to administrative reasons, status-quo was maintained during the period under report.

The main objective of ORP includes the optimisation of productivity of available resources by formulating production plan based on land capability and water resources. Introduction of high yielding varieties of crops and formulation of suitable cropping patterns based on field trials also formed an important area of activity.

Staff

Sri. K. C. Rajan, Associate Professor (Agron.) continued to be the Head of the project during the period under report.

The list of staff is presented in Appendix I. The details of sanctioned strength of staff and vacancies are given below:

Category	Sanctioned	In position	vacant
Associate Professor	1	1	—
Junior Asst. Prof.	4	2	2
Farm Assistant	2	1	1
Lab Assistant	1	1	—
Office Assistant	1	1	—
Class IV	1	1	—
LDV Driver	1	—	1

Research Activities and Achievements

From the varietal trials conducted in different crops, the following varieties yielded the highest.

- a. Chillies CA 586, Sel. 1, PKM
- b. Tomato Sakthi, Co. 1
- c. Cotton LRK 576, TCHB 213 (based on adaptive trial)
- d. Ground nut ICGV 86124, ICGV 86125, ICGV 86162

In the field demonstration, the following varieties yielded the highest.

a. Groundnut (kharif)	VR I
b. Groundnut (Summer)	VR I II
c. Blackgram (Rabi)	TMV-1
d. Ragi (Rabi)	CO 12

Other activities

The centre organised nine training programmes on various subjects in agriculture and veterinary, of which five were off-campus and four were on-campus. A total of 135 farmers participated in these trainings.

A part of the orchard demonstration/forestry programmes, seedlings/grafts of mango, pomegranate, teak, casuarina, bamboo, amla, jack and matti were distributed.

As part of the livestock development programme, forty Austrowhite chicks and two units of cross bred rabbits were distributed.

A survey to assess the impact of National Watershed Development programme indicated an increase of 5% in the net area irrigated and 6.5% in the household income. Twenty five percent of the beneficiaries had been benefitted through increased yield.

v. AICRP ON AGROFORESTRY, THIRUVAZHAMKUNNU

The All India Co-ordinated Research Project on Agroforestry was started functioning at Livestock Research Station, Thiruvazhamkunnu during December, 1983.

Staff

The details of staff are furnished below.

	Sanctioned	In position	Vacant	Dt. from which Vacant
<i>Scientific staff</i>				
Associate Professor	1	—	in-charge	12/1983
Assistant Professor (Agronomy/Hort/Soil conservation)	1	—	1	3.7.81
Junior Asst. Prof. (Hort.)	1	1	—	—
<i>Administrative</i>				
Assistant	1	1	—	—
<i>Paratechnical</i>				
Farm Asst. (Agri.)	2	2	—	—
Lab Asst. (Gr. III)	2	2	—	—
<i>Supporting</i>				
Peon	1	1	—	—
Driver	1	1	—	—

Research activities and achievements

There were three research projects under operation. The major highlights are furnished below :

The project entitled "Diagnostic survey and appraisal of existing Agro-forestry systems in Malappuram District" was continued during the period under report.

Collection and evaluation of promising species/cultivars of fodder, fuel and small timber trees indicated that *Acacia auriculiformis* consistently recorded the highest tree height, volume and annual increment closely followed by *Paraserianthus falcataria* and *Casuarina equisetifolia* at all stages of observations.

Compatibility of different component in agri-silviculture systems indicated that the growth rate and green fodder production of the grass species was significantly influenced by the tree species. The fodder crops grown along with *Casuarina equisetifolia* have recorded the highest forage yield. While the combination of fodder crops with *Acacia auriculiformis* has expressed significantly lesser values for all growth characters resulting in the reduction of forage production. The tree-fodder interaction was non-significant. Among the tree species *Acacia* recorded the maximum growth.

Evaluation of some fast growing trees raised from cuttings as pepper standards indicated that the performance of pepper vines trailed on live standards was statistically different. Among the standards, the pepper vines grown on *Garuga pinnata* followed by *Tespesia populenea* recorded the maximum production of dry pepper.

vi) AGRICULTURAL RESEARCH STATION, MANNUTHY

The station was established in 1957 as Rice Research Station to conduct research in rice in the middle lateritic region of Thrissur and Ernakulam Districts. The Headquarters of the rice specialist was shifted to Pattambi in 1963 and this station continued to function as a Regional Rice Research Station. With the formation of KAU, it was redesignated as Research Station and Instructional Farm under the College of Horticulture, Vellanikkara. The station was subsequently given an independent status and renamed as Agricultural Research Station, Mannuthy in 1983-84. Research projects of NARP and AICRIP are being implemented at this station besides KAU projects. The station also undertook production and distribution of quality seeds of paddy and vegetables and nursery plants which comprise the major source of revenue. The station occupies an area of 38.34 ha. The major are mango (12.13 ha), coconut (11.26 ha), rice (4.47 ha), cashew and others (3.62 ha) and nursery (2.75 ha),

Staff

Dr. K. Kumaran, Professor (Ag. Bot.) was the head of station upto 14-2-92. Dr. R. Gopinathan, Associate Professor was functioning as the Head of Office from 15-2-1992 onwards.

The details of staff strength, sanctioned and in position, are given below.

Category	Sancti- oned	In position	Vacant	Remarks
KAU (Non-Plan)				
<i>Scientific staff</i>				
Asst. Professor (Agron.)	1	1	—	
Jr. Asst. Professor	2	—	2	
<i>Administrative staff</i>				
Administrative Assistant	1	1	—	
Senior Gr. Assistant	1	1	—	
Assistant Grade II	1	1	—	
Assistant Grade I	1	1	—	
Typist	1	1	—	
Peon	2	2	—	
Jeep Driver	1	1	—	
Watchman	2	2	—	
<i>Para-technical staff</i>				
Sr. Farm Supervisor	1	1	—	
Farm Supervisor	3	3	—	
Farm Assistant	2	2	—	
Lab. Assistant	1	1	—	
Field Supervisor	1	1	—	Vacant from 30-6-91
Tractor Driver	1	—	1	
AICRIP Double Cropping Sub Centre (ICAR)				
<i>Scientific staff</i>				
Asst. Professor (Ag. Bot.)	1	1	—	
NARP Central Region, Sub Centre, Mannuthy				
<i>Scientific staff</i>				
Assoc. Prof. (Pl. Breeding)	1	1	—	Post upgraded to Professor
<i>Supporting staff</i>				
Lab. Assistant	1	1	—	Vacant from 14-10-91
Technician	2	2	—	One post vacant from 30-9-91
Workshop Attender	1	1	—	

The list of staff in position is given in Appendix.

Faculty Improvement programme

New posts sanctioned/created/shifted/abolished	—	Nil
Scholarships awarded to the staff/deputation of staff for higher studies	—	Nil
Details of Seminars/Symposia/Training programmes attended by staff	—	Nil

Involvement of staff in the academic programme

UG Programme

The work experience programme in paddy for B. Sc. (Ag.) third year students was conducted at this station.

Research activities and achievements

During the period under report there were 14 experiments at this station. Among these five were under AICRIP, one under NARP and eight under KAU.

The salient findings were:

Response of bittergourd to N fertilizer was worked out.

High yielding cultures developed from Pattambi and Mon-compu were identified for this location.

Best sequence of rice varieties in double cropping kole land is identified.

Extension activities

A large number of farmers visited the farm to consult about field problems and to purchase seeds and planting materials.

Participated in Agri-Hort Festival 1991 at Thrissur.

Important visitors

Trainees of "Indo-US workshop on Advanced Nursery Techniques in forest trees" in May 1991.

Monitoring team for plant breeding and physiology groups from AICRIP, Hyderabad.

vii) AICARP—E C F UNIT, MANNUTHY

The major goal of the ECF (Experiments in Cultivators' Fields) is to evaluate and refine/develop client oriented need based research under the existing bio-physical and socio-economic conditions of resource poor farmers. The extension workers-farmers participatory research is felt as an efficient tool for refining the technologies, extension and for better feed-back of constraints for further solutions. On-farm trials were being conducted by the Unit in the Central Zone of Kerala comprising the districts of Thrissur, Ernakulam and Palakkad since 1990.

Research achievements

The main results of the on-farm trials conducted during the year under report are summarised below:-

The varieties Makam, Remya, Karthika and KAU-1727 were found to be best suited for Virippu. For Mundakan, Remya was good but in drought prone areas short duration varieties like Matta Triveni performed better. During summer, in direct sown areas short duration varieties like Onam, Bhagya and Matta Triveni yielded well whereas in transplanted situations Cul-8756 was good. In double cropped Kole areas, short duration varieties like Onam, Bhagya, Cul-8772, Cul-8770 and Matta Triveni performed well. In single cropped kole areas Jyothy, Remya and Cul-8756 were the suitable varieties.

The existing recommendation of 70-35-35 kg NPK/ha was found to be optimum for Jyothi in sandy loam soils with low fertility. The variety however yielded higher in the organic rich kole lands with a higher fertilizer dose of 90-35-45 kg NPK/ha.

The fertilizer dose of 90-35-45 kg NPK/ha was found to be optimum for Matta Triveni for higher production.

The varieties Cul-24-20 (evolved from Mannuthy) and Kalinga, the two extra short duration varieties with 70-75 days duration were found to be suitable under specific situations.

KAU-8772, KAU-8770 and KAU-8759, the three promising short duration cultures from Pattambi performed well during third crop.

The three short duration cultures of cowpea viz., GC-82-7, V-16 and V-240 were found to be suitable for summer rice fallows.

The existing recommendation of 70-35-35 kg NPK/ha was found to be optimum for Makam in Virippu and Annapoorna in summer.

Staff

Sri. I. Johnkutty continued as the Head of Office during the period under report.

The staff pattern of the project is given below.

Designation	Sanctioned	In position	Vacant
Agronomist (Assoc. Professor)	1	1	--
Tech. Asst. (JAP)	1	--	(Vacant from 15-9-90 onwards)
Field men (Farm Asst. Agri.)	8	8	--
Clerk-cum-Typist (Asst. Gr. II)	1	1	--
Jeep Driver (Driver LDV)	1	1	--
Watchman (Class IV)	1	1	--

Faculty Improvement Programme

Nil.

Seminars/Symposia/Training Programmes attended

Sri. Johnkutty, Associate Professor attended the following programmes and presented papers.

One day workshop for Senior Agronomists and Agronomists on Cropping Systems Research at College of Agriculture, APAU, Rajendranagar, Hyderabad on 25th April, 1991.

Training on farming systems research at Directorate of Cropping Systems Research, Meerut from 17 to 22 February 1992.

The Associate Professor had regularly attended the T & V workshops at Thrissur, Palakkad and Ernakulam Districts and 6 farmers' training programmes organised.

viii) CASHEW RESEARCH STATION, MADAKKATHARA

The Cashew Research Station, Madakkathara was established on 1.5.1973. The All India Co-ordinated Cashew Improvement Project of the Indian Council of Agricultural Research is functioning in this station. The station is located in the western boundary of the Vellanikkara campus along the Mannuthy-Chirakkakode road about two kilometers from Mannuthy and eight kilometers from Thrissur town. The total area of the station is 18 hectares.

The thrust areas of research identified for this station are evolution of high yielding cashew varieties by introduction, selection and hybridisation, development of suitable agrotechniques for achieving higher production and productivity; standardisation of suitable vegetative propagation techniques for cashew and effective control measures against major pests of cashew.

Staff

Dr. M. Abdul Salam continued to be the Head of station till 25.9.91. Dr. S. Pathummal Beevi was in charge of the station for the rest of the period. Details of sanctioned post, in position and vacancies are given below:

Category	Sanc- tioned	In position	Vacant
Associate Professor (Agro./Hort.)	1	1 (Asst. Prof. (Agro.))	
Assistant Professor (Entomology)	1	1 (Assoc. Prof.) (Ent.)	
Senior Technical Assistant	1	1 (JAP)	
Farm Assistant Gr. II	1	1	
Assistant Grade I	1	1	

Faculty Improvement Programme

New posts sanctioned/created/shifted/ abolished Nil

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

Dr. M. Abdul Salam was deputed for availing the Common Wealth Academic staff Fellowship 1991-92 at U. K. for a period of 10 months from 26.9.91.

Details of seminars/symposia/training programmes attended by staff

Dr. S. Pathummal Beevi, Associate professor attended the summer institute on "Host plant resistance to insect pests and its application in insect pest management" at Tamil Nadu Agricultural University from 6th to 25th June, 1991.

Dr. M. Abdul Salam and Dr. S. Pathummal Beevi attended the National Group discussion of cashew research workers during 30th, 31st August and 1st September, 1991 at CPCRI, Kasaragod.

Dr. S. Pathummal Beevi and Sri. T. N. Jagadeesh Kumar attended the National Workshop on Integrated Development of Cashew held at Kannur during 1st and 2nd February, 1992.

Involvement of staff in the academic programme

Dr. M. Abdul Salam offered courses for M. Sc. (Ag.) Agronomy students during the period.

Research activities and achievements

A total of 12 experiments were continued during the year under the AICCIP.

Important visitors

Dr. Rajan, Honorary Secretary, Madras Naturalist Society and Editor, Black Buck magazine visited the station on 3.12.1991.

ix) BANANA RESEARCH STATION, KANNARA & PINEAPPLE RESEARCH CENTRE, VELLANIKKARA

The Banana Research Station at Marakkal was established during 1963 in an area of 17.3 ha to carry out research on Banana and Pineapple. In 1970, the Station was brought under the All India Co-ordinated Fruit Improvement Project of the ICAR to carry out research on Banana and Pineapple. In 1974, the venue of the Pineapple Research was shifted to KAU Main Campus, Vellanikkara in an area of 6.3 ha.

During 1988, NARP Phase-II was implemented at the station for strengthening research on banana, pineapple, cashew and post harvest handling of fruits and vegetables.

The main objectives of the station are: i) to collect, conserve and evaluate large genetic stocks of banana and pineapple, (ii) to recommend the popular and promising cultivars of banana and pineapple for large scale cultivation (iii) to standardise the agro-techniques for banana, pineapple and cashew, (iv) to formulate and recommend suitable control measures for pests and diseases of banana and pineapple and (v) to formulate post harvest processing techniques in banana and pineapple.

Staff

Dr. L. Rajamony served as the head of office upto 31-7-1991 and thereafter Sri. T. C. Radhakrishnan took charge.

The list of staff in position is given in Appendix I. The details of staff strength is furnished below:

Category	Sancti- oned	In position	Vacant	Rema- rks
<i>Scientific staff</i>				
AICFIP				
Associate Professor (Hort)	1	1	—	
Assistant Professor	4	4	—	
Junior Asst. Professor	2	1	1	
NARP Phase II				
Associate Professor	2	2	—	
Assistant Professor	4	2	2	one post vacant from 4-3-92
<i>Supporting staff</i>				
AICFIP				
Farm Asst. Gr. II	4	3	1	
Lab. Assistant Gr. II	1	1	—	
Mali	2	2	—	
Watchman	2	2	—	
KAU				
Farm Supervisor Gr. II	1	1	—	
Farm Assistant Gr. I	1	1	—	
<i>Administrative</i>				
Typist Grade II (AICFIP)	1	1	—	
Peon (AICFIP)	1	1	—	
Typist Grade II (NARP)	1	1	—	
KAU				
Administrative Assistant	1	1	—	
Assistant Grade II	1	1	—	
Driver Grade II	1	1	—	
Pump Operator	1	1	—	
Peon	1	1	—	
Watchman	1	1	—	

Faculty improvement programme

Details of posts sanctioned/created/
shifted/abolished . Nil

Scholarships awarded/deputation or
study leave granted Nil

Smt A. Suma, Junior Asst. Professor (Hort), was granted study leave for 3 years w. e. f. 5-3-92 to 4-3-95 for undergoing Ph. D. Programme at the College of Agriculture, Vellayani.

Details of Seminars/Symposia/Training Programme/Workshops attended by the staff

All the scientists of the station attended the ZREAC meeting (Zonal workshop) at Pattambi. Six of them also attended different workshops, group meetings and training programmes conducted in different parts of the country.

Involvement of scientific staff in the academic programme

Dr. Job Sathyakumar Charles, Associate Professor (NC), handled a course in "Nematode diseases of agricultural crops" for P. G. students of the College of Horticulture, Vellanikkara.

Research activities and achievements

During the period under report, 27 experiments in banana, 9 experiments in pineapple, 3 experiments in cashew and 1 experiment in jack were implemented. These experiments can be grouped into three schemes as given below:

Crop	AICFIP	NARP	KAU	Total
Banana	23	3	1	27
Pineapple	4	3	2	9
Cashew	—	3	—	3
Jack	—	—	1	1
Total	27	9	4	40

The highlights are furnished here under.

Crop improvement

A) BANANA

The station maintains a unique collection of 190 banana clones and cultivars. Out of this, 18 cultivars (table varieties and culinary varieties) were recommended for large scale cultivation in Kerala. The varieties Tongat, Sannachenkadali, Adukkam, Basrai, Matti, Valiakunnam, Malbhog, Chinia, Chinali and Sakkai were found promising with increased yield attributes. Among the culinary varieties, Ashy Bathees, Klue Teparod and Lambi were found to have good quality and yield characters.

The hybrids H₁ and H₂ were proved to be better than their parent varieties with respect to bunch weight, duration, plant height and other quality characters.

Two clones of Nendran (No. 35 collected from Muttathukonam and No. 123 from Puthur) were found significantly superior in terms of bunch weight, number of hands and number of fingers.

B) PINEAPPLE

A collection of 24 varieties was maintained at Vellanikkara. Out of this, Kew and Giant Kew recorded maximum fruit yield.

Pineapple seedlings raised from the cross Valera Meranda x Kew produced the largest fruits.

Crop management

A) BANANA

Spacing trials in Nendran banana indicated that planting at a closer of 1.2 x 1.2 x 2 m gave maximum net returns.

In banana var. Palayankodan, the sucker for ratooning can be retained at any stage of development of mother plant in a mat without affecting the yield of the latter.

The crop rotation studies in banana var. Nendran showed that the yield of banana in the fourth year was the maximum (25875 kg/ha) when Banana - Paddy - Cowpea - Elephant foot yam system was followed. The same system also gave the highest B/C ratio of 2.33.

Standardization of optimum dose and time of nitrogen application in banana var. Nendran showed that 160 g N + 50 g N (30, 75, 120, 165, 210, 255 and 300 days after planting) recorded maximum yield which mean that there is additional benefit in yield when the total quantity of 200 g N applied in 4+3 splits than in 4 splits. The banana var. Nendran required more nitrogen during vegetative and reproductive phases.

In the weed control studies in banana var. Nendran, the plots intercropped with cowpea recorded minimum weed growth indicating the long lasting effect of smothering the weeds coupled with the addition of nitrogen. The weedicides Grammaxone 1.8 kg ai/ha and Glyphosate 2 kg ai/ha can also be recommended for controlling almost all types of weeds in banana garden.

Traditional weeding practice i. e. weeding at the time of making irrigation channels and fertilizer application is the most economical weeding practice.

Crop protection

A) BANANA

The systemic chemicals viz., Phosphamidon, Monocrotophos, Carbofuran and Methyl demeton were equally effective in controlling the banana rhizome weevil, *Cosmopolites sordidus*.

Survey conducted in Thrissur and Palakkad districts during 1991 showed the incidence of two new diseases viz. rhizome rot (rainy season) and mosaic/infectious chlorosis (summer season).

In controlling Panama wilt of banana, Bavistin injection (3 ml of 2% solution) into the rhizome was found to be the best.

The sigatoka leaf spot disease of banana can be effectively controlled by spraying Bavistin (0.1%) or Calixin (0.05%). The spraying is to be given before the onset of monsoon or soon after the appearance of the initial symptoms of the disease. Depending on the severity or intensity of the disease, five to six sprayings at fortnightly intervals are to be given.

Varieties like Kunnan, Pisang Seribu, Poomkalli, Martaman, Karimkadali, Mottapoovan, Gauria and Adakkakunnan showed tolerance to the nematode, *Radopholus similis*.

Application of 2,4-D 20 ppm was found to reduce the intensity of pinkish streaks and necrotic symptoms in plants affected by kokkan disease. Application of 2,4-D 30 ppm was found to be effective in increasing the bunch weight.

Fluorescent microscopic studies to find out the etiology of kokkan disease of banana revealed that phloem was not disturbed whereas the number of mechanical tissues ie. xylem and fibres (sclerides) were more in diseased plant. The association of MLO's could be ruled out from this observation.

Processing technology

Different dishes could be prepared from all the edible parts of banana which are otherwise thrown off as waste. Byproducts like flower bud pickle and vattal and jelly from peel, fruit rind, pseudostem and rhizome of four varieties viz., Nendran, Palayankodan, Poovan and Robusta were developed. Sensory evaluation suggested the superiority of the variety Nendran for peel and rhizome pickles, Palayankodan for pseudostem and flowerbud pickle and pseudostem vattal and Robusta for jelly from the ripe fruit rind.

Other activities

Smt. P. K. Sudhadevi, Asst. Professor, took classes on "Cultivation and utilization of medicinal plants" and "Pineapple Cultivation" on 13.5.91 and 14.5.91 respectively to the trainees at KVK,

Pattambi. She took a class on pineapple cultivation and utilization in an agricultural seminar at Muvattupuzha.

One-day training was given to a team of Agricultural Officers deputed from RATTC, Vyttila during the month of August, 1991 by Dr. L. Rajamony, Associate Prof. (Hort.)

A practical training on "Banana Production Technology" was conducted for the trainees of FACT (Agricultural Officers) on 7.8.91 by Dr. L. Rajamony, Assoc. Professor (Hort.)

One day training was given to the students of SNVUP School on 9.11.91 by Sri. K. P. Pradeep, JAP

Dr. JSK Charles, Associate Professor and Sri. K. P. Pradeep, JAP, participated in a Karshaka Seminar at Marottichal and took classes on "Cultivation of Nendran banana" on 14.2.92.

Important visitors

Dr. V. N. Rao, Former Director of Research, APAU, Sri M. Abdulkalam, Director, Central State Farm, Aralam, Dr. P. K. Ray, Senior Scientist, Horticultural Research Station, Samastipur, Sri. R. Sundararama Raju, Agri-Horticulturist, The East Coast Coconut Hybrid Centre, Andhra Pradesh, Sri. N. Vijayakumar, Managing Director, Plantation Corporation of Kerala Ltd., Kottayam Dr. K. L. Chadha, Deputy Director General (Hort.), ICAR, New Delhi, Dr. Ramphal, ADG, ICAR, New Delhi, Two Journalists from Adika Patrike (Kannada Farm Journal) and a Karnataka farmer, Mr. V. J. Rajan, Hon. Secretary, Madras Naturalists Society, Sri. P. P. George, Hon. Minister of Agriculture for the State and Dr. H. P. Singh, Project Co-ordinator (Tropical Fruits), AICFIP visited the station.

x) PROJECT ON PROMOTION OF AGRI ELECTRONICS (PPAE)

The Agri-Electronics Project, formulated and funded by the Department of electronics and co-ordinated by the Indian Council of Agricultural Research was started in Kerala in June, 1987, mainly to spread the message of electronics to the farming community.

The operational area is spread over in 24 Panchayats in three blocks viz. Thrithala and Alathur in Palakkad district and Puzhakkal in Thrissur district.

Dr. V. K. Venugopal, Associate Professor (Soil Science & Agricultural Chemistry) continued to be the Head throughout the period under report.

Staff

Details are appended.

Faculty Improvement Programme

Smt. K. P. Visalakshi, Assistant Professor (Agrl. Engineering) was deputed for Ph. D. Programme at IARI, New Delhi w. e. f. 12.9.91.

Smt. K. P. Prameela, Jr. Asst. Professor (Agronomy) was relieved w. e. f. 13.3.1992 to join for Ph. D. programme at the College of Horticulture, Vellanikkara.

Details of seminar/symposia/training programme attended by staff

The Assistant Engineer (Electronics) was deputed to M/s. Innovative Instruments, Baroda from 24-26th February 1992 for a training programme on the calibration and maintenance of grain moisture meter.

Involvement of staff in Academic Programmes

The Project Leader handled one course for the Ph. D. programme in the Department of Soil Science & Agrl. Chemistry, College of Horticulture.

Activities of the Project

The Project staff made 262 visits to the blocks and contacted 2123 farmers.

Demonstration of Agricultural Electronic equipments

During the period 68 demonstration classes were held in the different blocks.

Soil testing

A total of 649 soil samples were tested and fertilizer recommendations given for various crops like Paddy, Tapioca, Coconut, Pepper, Ginger, Cashew, and Vegetables.

Water testing

Water in the operational area is of good quality as far as irrigation is concerned. A total of 450 water samples were tested mostly from areas in Puzhakkal block which are adjacent to the sea coast. Being a high rainfall area the problem is intense only during the summer months.

Milk testing

A total of 5006 milk samples were tested for fat percentage using the Electronic Milk Tester. The testing was done in the Milk Co-operative societies. In addition to testing of milk samples the officials of the societies were also trained in the actual operation of the Electronic Milk Tester.

Impact analysis of the Project

The analysis was carried out in collaboration with the College of Co-operation and Banking. The evaluation was done

based on the response from a sample of beneficiaries with the aid of a well structured and pre-tested interview schedule. The salient findings of the study are:-

A notable trend after PPAE soil testing is the enhanced application of lime in their paddy fields. This is in tune with PPAE recommendation. Farmers have increased the quantum of application almost by two fold after PPAE Service.

Except large farmers, all other farmer groups decreased the use of chemical fertilizers after PPAE service. The rate of decrease was high among the farmer groups whose size of holding is less. When all groups of farmers were combined there is a decline in the quantum of chemical fertilizer application at the rate of 2.84 per cent.

On the vital question of increasing the yield rates of crops, it is seen that PPAE service could not make any notable impact. However the groupwise analysis revealed that there was substantial improvement in the field rates among small and marginal farmers and agricultural labourers. The large and the medium farmers attributed the failure in enhancing yield to climatic factors.

The yield effect due to the PPAE service was positive in Thrithala and Alathur blocks while it was negative in Puzhakkal block. It may be concluded that the response of farmers to PPAE service in the intensive agricultural areas is generally positive and the farmers are comparatively eager to adopt the new technological innovation in their areas.

One of the areas in which PPAE service is widely appreciated is testing the quality of milk supplied to dairy co-operatives.

Important visitors

Sri. P. P. George, Hon'ble Minister for Agriculture visited the centre on 30.12.1991.

xi) AGRONOMIC RESEARCH STATION, CHALAKUDY

The station was originally established at Pariyaram in 1962 in two hectares of leased land by the Department of Agriculture, Kerala to carryout studies on water requirement of crops and cropping patterns for irrigated areas. In 1970, the scheme was terminated and in 1972 the research station was re-established at the present site in an area of 8.95 hectares. The station was taken over by the Kerala Agricultural University in 1973 for implementing the Co-ordinated Project for Research on Water Management sponsored by ICAR and the scheme started functioning in July 1974.

The phase I programme of NARP Sub project for water management studies in the Central Region of Kerala was concluded in April 1988 and Phase-II was started on 20th April, 1988.

A project 'On-farm water management studies—Pilot project' financed by Ministry of Water Resources, Government of India and Command Area Development Authority, Kerala started functioning at this station from 1.4.89. In addition to ICAR sponsored and other externally aided projects, agronomic studies relevant to irrigated farming have also been taken up as University projects.

The station is located at 10°20' North latitude and 76°20' East longitude at an altitude of 3.25 m above MSL, and is situated on the northern side of Chalakudy-Sholayar road about 400 m east of Anamalai junction in the Chalakudy town.

The total area of the farm is 8.95 hectares comprising of 7.05 hectares of wet land and 1.90 hectares of upland.

The area is characterised by the receipt of heavy South West monsoon, moderate North East monsoon and light summer showers. Of the total rainfall 78% is received from South West monsoon and 17% from North East monsoon. The uneven distribution of rainfall during the different periods in a year causes problems of both water logging and water scarcity in the same locality demanding intense water management studies.

The soil is mainly sandy loam in texture. The organic matter content of the soil is medium to low, available P_2O_5 status is low to medium and the available K_2O content is very low. The irrigation needs of the farm is met mainly from the Chalakudy Irrigation Project, one municipal pond and two wells in the farm. Water scarcity is experienced during summer months especially in March-April when canal irrigation is available only once in 5 days on account of the turn system of water distribution.

Thrust areas of research identified

1) Scheduling irrigation to crops (annual and perennial) under different agro-climatic zones. (2) Water use efficiency and drought management. (3) Storage, conservation and utilization of water. (4) Drainage of ill drained soils.

Staff

Prof. P. Chandrasekharan continued as Head of the Station during the period under report.

The list of staff in position is furnished in Appendix-I.

The sanctioned strength of staff in each category is given below:

Name of Project	Sanctioned	In position	Vacant	Remarks
ICAR				
<i>Scientific staff</i>				
Professor/Chief Scientist	1	1	—	
Associate Professor				
Agronomy	1	1	—	
Soil Physics	1	1	—	
Agrl. Engineering	1	—	1	
Assistant Professor				
Agronomy	2	2	—	JAP in position
Soil Physics	1	1	—	"
Agrl. Engineering	1	1	—	"
<i>Para technical staff</i>				
Farm Asst. Gr. I	1	1	—	
Farm Asst. Gr. II	2	2	—	
Lab. Asst. Gr. III	1	1	—	
<i>Administrative staff</i>				
Assistant Gr. I	1	1	—	
Driver Gr. II	1	1	—	
Peon	1	1	—	
NARP Phase I				
<i>Scientific staff</i>				
Assistant Professor				
Agronomy	2	1	1	Undergone studies.
Soil Physics	1	1	—	JAP in position
Agrl. Engineering	1	—	1	
<i>Para Technical staff</i>				
Farm Asst. Gr. I	3	2	1	
Lab Assistant	1	1	—	
<i>Administrative staff</i>				
Driver Gr. II	1	1	—	
Typist Gr. II	1	1	—	
NARP Phase II				
<i>Scientific staff</i>				
Asst. Professor (Agro.)	1	1	—	
Asst. Professor (Soil Physics)	1	1	—	
<i>Administrative staff</i>				
Typist Gr. I	1	1	—	
Non Plan (Station)				
<i>Administrative staff</i>				
Administrative Assistant	1	1	—	
Asst. Gr. II	1	1	—	
<i>Para Technical staff</i>				
Farm Supervisor	1	1	—	
Pump Operator	1	1	—	
Ploughman	1	1	—	

Faculty Improvement Programme

Dr. Lalitha Bai, Assistant Professor (Agronomy) was deputed for post doctoral fellowship at U. K.

Details of Seminars/Symposia/Training programmes attended by staff

Professor P. Chandrasekharan attended the workshop on 'Onfarm Water Management Research' at the Directorate of Water Management Research, Rahuri, Ahmed Nagar from March 17th to 22nd, 1992.

Involvement of staff in the academic programme : Nil.

Research activities and achievements

A total of eight experiments were conducted during the year under report. Out of this, six experiments came under Co-ordinated project and one under NARP. One project was financed by the Ministry of Water Resources, New Delhi.

Major research results

A four year experiment was conducted from 1988 to 1991 to find out the optimum water regime for wet sown rice in relation to nitrogen levels. The results revealed that during the second crop season under wet sown condition for short duration rice, irrigation can be prolonged even upto 5 days after the disappearance of ponded water provided the groundwater fluctuation is within one meter. Nitrogen at the rate of 100 kg/ha recorded the highest grain and straw yields.

An eight year study was conducted to identify an appropriate rice based cropping pattern under conditions of water scarcity. The result of the study indicated that there was no residual effect of crop sequence on the growth and yield of succeeding crops. During the second crop season irrigation to rice can be postponed even up to three days after the disappearance of ponded water without significant reduction in grain yield under conditions of low atmospheric evaporative demand and shallow ground water table. Irrigation to cowpea and ground nut during the third crop season can be scheduled at IW/CPE ratio of 0.6 (approximate interval of 15 days) and to sesamum at IW/CPE ratio of 0.3 (30 days interval) for getting higher economic returns. Bhindi needs irrigation at an IW/CPE ratio of 1.2 (approximate interval of 8-10 days) and rice is to be irrigated with 7 cm one day after the disappearance of ponded water. The maximum annual return was obtained in the Rice-Rice-Bhindi sequence which was on par with Rice-Rice-Groundnut sequence.

OTHER ACTIVITIES

Onfarm water management studies — Pilot project

The scheme was sanctioned by the Ministry of Water Resources for a period of three years from 1989-90. The study site is located in Mookkannur Village of Ernakulam District. The study area constitutes a compact block of 45 ha. of paddy fields coming under two padasekharams (Kadoopadam and Chanekkad) and the nearby upland areas, belonging to 200 farm families. A nearby area of about 15 ha. have been selected as the control block.

The grain yield obtained by adopting the improved recommendations of the University in the study area was compared with that of the local management practices in the control area. The farmers were convinced of the advantage of adopting scientific technologies in increasing paddy yields. Yield data obtained from 10 randomly selected plots under different water management practices and from the control plots of the ORP area revealed that grain yield is maximum under continuous flow submergence followed by continuous stagnant submergence of 5 ± 2 cm water.

Training camps and Seminars

An Agricultural Seminar was organised at Mookkannur (on-farm water management area) in which two hundred and thirteen farmers participated.

Important visitors

Sri E. V. Jagannathan, Senior Joint Commissioner, Ministry of Water Resources Command Area Development wing and Dr. R. K. Rajput, Project Director, Water Management Research, Rahuri visited the station during the period.

xii) AROMATIC AND MEDICINAL PLANTS RESEARCH STATION, ODAKKALI

The station was established in 1951 as 'Lemon grass Breeding Station' under the Department of Industries of the erstwhile Travancore-Cochin Government and it was handed over to the Department of Agriculture under the name 'Lemon grass Research Station' in 1954.

Consequent to the formation of the Kerala Agricultural University in 1972, the station was transferred to the University. Diversifying the activities of the station to cover other tropical aromatic and medicinal plants, the station was renamed as Aromatic and Medicinal Plants Research Station (AMPRS) in 1982. The station is located 27 km east of Aluva on the Aluva—Munnar road. It is 50 km away from Cochin, the main centre of essential

oil trade in the country. The station situated at an elevation of 60 m above MSL, represents the typical soil and agroclimatic conditions of the mid-lands of the state.

This institution is recognised as the lead centre for lemon-grass research at national and international level United Nations Industrial Development Organisation usually directs the entrepreneurs to this centre for advice. Ministry of Health and Family Welfare, Govt. of India, has recognised the station as a centre for development and cultivation of medicinal plants. Special emphasis has been given to post harvest technology of medicinal plants during the 8th plan period.

Staff

Dr. J. Thomas, Associate Professor (Agronomy) was the Head of the station during the period under report.

Details of staff strength (sanctioned and in position) are given below:

Category	Sanct- ioned	In posi- tion	Vacant
<i>Scientific staff</i>			
Associate Professor (Agronomy)	1	1	—
Assistant Professor	2	2	—
Junior Assistant Professor	1	1	—
<i>Administrative & supporting</i>			
Lab Assisfant (Graduate)	1	1	—
Lab Asst. (Non-graduate)	1	—	1
Lab Asst. Gr. III	1	—	1
Farm Supervisor	1	1	—
Farm Assistant	3	3	—
Administrative Assistant	1	1	—
Assistant	2	2	—
Typist	1	1	—
Peon	1	1	—
Sweeper-cum-Attender	1	1	—
Watchman	1	1	—
Permanent labourer/Class IV	2	2	—

(The list of personnel is given in Appendix)

Faculty improvement programme

New posts sanctioned/created/shifted/abolished — Nil

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

Mr K. P. Kuriakose, Asst. Professor attended the summer institute on 'Conservation and Management of plant genetic resources' at NBPGR, New Delhi.

Dr. J Thomas, Associate Professor was deputed to attend 'Wynad 92'—Seminar on spices at RARS, Ambalavayal. He also attended the 9th All India Workshop of ICAR Co-ordinated projects held at Gujarat Agrl. University, Anand and the Regional Seminar on Development of Essential Oil Industries organised by Madurai Small Scale Industries Association at Kodaikanal, Tamil Nadu.

Involvement of staff in Academic programmes — Nil

Research activities and achievements

A total of 5 research projects were in progress during the period under report - three under crop management and two under crop improvement.

The salient results are: (1) Morphological characterisation and cataloguing of germ plasm of lemongrass is underway. (2) Application of 75 kg each of N, P and K per ha enhanced the yield of rhizome and oil in Kacholam. (3) Cutting interval of 60 days and N application at the rate of 75kg/ha was found to be optimum for OD 455 for maximum geraniol yield. (4) Lemongrass was found to be not suitable for cultivation under coconut garden.

Other activities

Dr. J. Thomas, Associate Professor acted as resource person of KAEP Workshop of Idukki district. He was also nominated as a member of the committee constituted by the Govt. of Kerala to study the constraints and prospects of lemon grass production in the state. The committee has submitted its recommendations to the Govt. for consideration.

Important visitors

Mr Vincent Paul, President, EOAI, Bombay, Mr Ravi Philar, International Development Research Centre, Canada; Dr. P. Rathinam ADG (Plantation Crops), ICAR, New Delhi, Mr Subramanian, Chief Hydrologist, CGWB, Thiruvananthapuram; Mr R. Tathna Pal, Hydrologist Ground water Board Rajasthan; Dr. E. Velappan, Director, Directorate of Spices, Arecanut & Cocoa Dr. N. Vasudeva Sarma Jt. Director ISM Thiruvananthapuram; Mr Giridhar, Ministry of Health & Family Welfare, Govt. of India, New Delhi and Mr Babu, P. K., Managing Director, Tribal Development Society, Mathirappally visited the station during the year.

xiii) INSTRUCTIONAL FARM, VELLANIKKARA

The farm comprising an area of 95.35 hectares is an integral part of the College of Horticulture, as the farm is also utilised for the work experience programme of the students. Of the total area, 35.50 hectare were under Coconut, Mango, Clove,

Cocoa, Cinnamon, Sapota etc. Different types of vegetables were also raised for the production of quality seeds under central sector scheme for production of fruits and vegetables. Production of quality seeds of vegetables also continued under 'Certified vegetable seed production programme'.

Dr. Babu M. Philip, Associate Professor continued to be the Head of the Station. Though 2 posts of Associate Professors and one post of Junior Assistant Professor were sanctioned, hands were not posted.

The Head of Station attended the National Seminar on 'Biological control of pests of plantation crops' held at Kottayam during the year.

Establishment of Spices & Plantation farm.

The Establishment of a "Spices & Plantation Farm" has also been initiated during the year. Various plantation crops like Cocoa, Cashew, Oil Palm, Arecanut have been planted in the farm. The Spice crops such as clove, nutmeg, pepper varieties like Panniyur-1, Panniyur-2, Panniyur-3, Culture-239 and also varieties from NRCS, Sreekara and Subhakara, in addition to varieties, varieties like Mallikeswar, Kalluvally, Karimunda, Kottaram Kalpetta, TMB-6, Werayakody, Balankotta were also planted in the farm. An attempt has also been made for introducing the Orchid varieties in the nursery of the farm. Bee-keeping has also been started in a small scale. Action was also taken for installation of water supply lines in various blocks of the farm.

Service rendered to farmers

The following kinds of quality seeds and other planting materials were produced and distributed.

Bhindi	: 50 kg
Amaranthus	: 52 kg
Cowpea	: 250 kg
Ashgourd	: 9 kg
Brinjal	: 2 kg
Pumpkin	: 126 kg
Cucumber	: 9 kg
Snakegourd	: 19 kg
Mango grafts	: 458 nos
Sapota grafts	: 22 nos

In addition to the above farm advice was also imparted to the farmers and other agencies visited.

1.5.4 Northern zone

The Northern Zone consists of four northern districts of Kerala viz. Malappuram, Kozhikode, Kannur and Kasaragod. The zone

has a climate. It is also characterised by heavy rainfall tropical during June, July and August leading to floods, and water logging in low land area. Coconut, rice, cashew, pepper, rubber and vegetables are the important crops grown in the zone.

The Northern zone has three research centres viz. RARS Pilicode, PRS Panniyur and the Research Centre at the KCAET Tavanur.

i) REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

The main objective of RARS Pilicode is to conduct location specific production oriented research in the northern region of Kerala. This station is identified for lead functions of research in coconut and coconut based farming systems and act as the verification centre for rice, pulses, banana and vegetables. Recently rice and rice based farming system was also identified as a lead function for the station.

RARS Pilicode has two centres viz. Pilicode and Nileswar. The present area of Pilicode is 57.87 ha and that of Nileswar is 17.25 ha.

In addition to the crop research programme, animal science was also included under NARP Phase II to strengthen research on Malabari goats.

Dr K. M. Rajan continued as the Associate Director upto 15-8-91. From 16-8-91 onwards Dr N. Krishnan Nair continued as the Associate Director.

Staff

The details of staff sanctioned, in position and vacancies are given below:

Category	Sanctioned	In position	Vacant
1	2	3	4
<i>Scientific</i>			
NARP Phase-I			
Associate Director	1	1	—
Professor			
Soil Science & Ag. Chem	1	1	—
Agronomy	1	1	—
Plant Pathology	1	1	—
Oil Technology	1	1	—
Plant Breeding	1	—	1
Entomology	1	1	—

	1	2	3	4
Associate Professor				
Plant Breeding		1	—	1
Microbiology		1	1	—
Meteorology		1	1	—
Statistics		1	1	—
Plant Pathology		1	1	—
Horticulture		1	—	1
Agronomy		2	—	2
Economics		1	—	1
Irrigation Engg.		1	1	—
Agrostology		1	1	—
Plant Physiology		1	—	1
Asst. Professor				
Horticulture		1	1	—
Entomology		1	—	1
Economics		1	—	1
Agronomy		1	1	—
Non-Plan				
Professor (SS)		1	—	1
Asst. Professor (Plant Path)		1	—	1
Asst. Professor (Botany)		1	1	—
Jr. Asst. Professor		1	1	—
Training Scheme				
Asst. Professor (Agro)		1	—	1
Jr Asst. Professor		2	2	—
NARP Phase II				
Assoc. Professor (Ag. Engg.)		1	—	1
„ (Ani. Science)		1	—	1
Asst. Professor (Soil Science)				
and Agrl. Chem)		1	1	—
„ (Horticulture)		1	1	—
„ (Ag. Engg.)		1	—	1
„ (Microbiology)		1	1	—
DST Project				
Asst. Professor (Ag. Met)		1	—	1
Junior Research Fellow		2	2	—
Administrative & Supporting				
NARP Phase I				
Administrative Officer		1	1	—
Sr. Gr. Typist		2	2	—
Typist Gr. I		2	2	—
LDV Driver Gr. I		2	2	—
Tractor Driver		1	—	1

1	2	3	4
Photographer-cum-Artist	1	—	1
Peon	1	1	—
Farm Supervisor Gr. I	1	1	—
Farm Assistant Sr. Gr.	1	1	—
Farm Assistant Gr. I	2	2	—
Lab. Assistant Gr. I	1	—	1
Lab. Assistant Gr. II	6	3	3
Non-Plan			
Senior Farm Supervisor	1	1	—
Farm Supervisor Gr. II	3	3	—
Section Officer (Hr. Gr.)	1	1	—
Section Officer	3	3	—
Sr. Gr. Assistant	3	3	—
Assistant Gr. II	4	4	—
Office Supdt.	1	1	—
LDV Driver Hr. Gr.	1	1	—
Oil Engine Driver	1	1	—
Peon Hr. Gr.	3	3	—
Regular Mazdoor	21	21	—
Class IV	1	1	—
Sweeper-cum-sanitation worker	1	1	—
Watchman	1	—	1
Pump Operator	2	2	—
Cook-cum-caretaker	1	—	1
Training Scheme			
Farm Assistant (Ag.)	1	1	—
Senior Gr. Assistant	1	1	—
NARP Phase-II			
Farm Assistant (Vety.)	1	1	—
Mechanic	1	—	1
Computer Centre			
Junior Programmer	1	1	—
DST Project			
Farm Assistant	1	1	—

Faculty Improvement Programme—Nil

Seminars/symposia/training programmes attended by staff:

All the scientists of the station attended the 14th NARP workshop held during August, 1991 at Pilicode, Thirteen members of the scientific staff attended different seminars/workshop/symposia and other training programmes conducted in different parts of the country.

Involvement of staff in academic programme

Staff members of the station are involved in the academic programme of the University. They engage the students (Graduates and Post-graduates) of the College of Horticulture, Vellanikkara and College of Agriculture, Vellayani, when they camp at this station for undergoing field training. The VHSC students of Trikarapur are also engaged by the Scientific staff for short periods. The practical classes for their courses in plant protection are conducted by the staff members utilising the laboratory and the field facilities.

Research activities and achievements

Three coconut hybrids viz. Lakshaganga (LO x GB), Kera-ganga (WCT x GB) and Anandaganga (AO x GB) were released. They have been widely accepted for cultivation in Kerala.

To meet the great demand for the above hybrids, large scale planting of the parental palms was taken up in newly acquired area under the NARP.

Coconut hybrid viz. WCT x MYD is proposed to be released on the occasion of the Platinum Jubilee celebrations, scheduled for October/November, 1992.

A rice culture viz. Odacheera 72 (mutant) was found to be tolerant to salinity and suited to northern districts of Kerala.

Rice culture 1729 proved to be the best as main crop as well as ratoon.

Two local rice cultivars viz. Allikkannan and Thowan are proposed for release, as they outyielded all the high yielding varieties in northern parts of Kerala.

The lines PIL-MC-2 of bittergourd, PIL-TA-2 of snakegourd, PIL-CS-1 of cucumber and PIL-LA-1 of ridgegourd are well-accepted by the farmers, as proved under farm trials.

For the control of stem bleeding disease in coconut, soil drenching with Calixin at the rate of 25 ml. in 25 litres of water was found to be effective.

The station maintains thirtyfive exotic and forty indigenous coconut. Among the exotic collections, Philippines Ordinary, Cochin China and New Guinea were found to be superior. Of all the indigenous collections, Spicata, Laccadive Ordinary and Andaman Ordinary were the best.

Three coconut hybrids viz. Lakshaganga (LO x GB), Kera-ganga (WCT x GB) and Anandaganga (AO x GB) were released by the State Varietal Release Committee. In the project on evaluation

of crosses between Tall and different dwarf types, WCT x YD recorded the maximum mean annual nut yield (210.6) followed by WCT x BL (191.0), which can be recommended for release.

In order to multiply the mother palms of Lakshaganga (LO x GB), Keraganga (WCT x GB) and Anandaganga (AO x GB) efforts were made to utilise the space available at RARS Pilicode, Instructional Farm, Vellanikkara, KCAET, Tavanur and Special Zone Kottarakkara in a phased manner spread over a period of two years.

Twenty five per cent of K₂O can be substituted with Na₂O both in adult and young coconut palms which is economical.

In the irrigation-cum-fertilizer trial in WCT x GB hybrids grown in sandy loam soils, irrigating the palms with 600 litres of water once in four to five days and fertilizer application with a rate of 0.5:0.5:2.0 kg NPK per palm per year recorded the maximum nut yield.

In a trial to find out the most suitable method of moisture conservation for coconut grown in laterite soils, coconut leaves mulch produced the highest mean nut yield (103.9) followed by coir dust (101.2) and burying coconut husk in circular trench (87.9).

Hybrid coconuts viz. WCT x CGD, WCT x GB and COD x WCT were found to be tolerant to *Oryctes rhinoceros* while CGD x COD was highly susceptible to the pest. In biological control of *Oryctes rhinoceros* the predatory bugs (*Platymeris laevicollis*) reared in the laboratory were released in four year old plantation of Tall x Gangabondam crosses and the beetle attack was noted. The results indicated the predatory efficacy of the bugs.

For the control of stem bleeding disease of coconut single application of Calixin with Monocrotophos as root feeding both @ 25 ml in 25ml of water gave complete check, followed by Calixin alone @ 25 ml in 25 litres of water.

Among the fodder grasses *Panicum maximum* c. v. Makueni, *P. maximum* Riversdale and *P. maximum* c. v. Hamil and among fodder legumes *Stylosanthes guianensis* c. v. Schofield and *Stylosanthes scabra* c. v. Seca were found to be suitable for cultivation in coconut garden as inter crops under rainfed conditions of northern region of Kerala.

Among the six medicinal plants tried as intercrop in coconut gardens *Coleus vetivaroides* produced the highest economic yield followed by *Maranta arundinacea* and *Kaemferia galanga*.

Crop improvement in rice by pureline selection in Thowan (115-120 days) and Allikkannan (130-145 days) have reached multi-location trials in farmer's fields.

In the multilocational trial with Moncompu cultures, Cul. 304 gave the maximum grain yield of 4478 kg/ha.

In the project on assessing the fertilizer requirement of Cul.1727 it was found that the above cultures produced a yield of 4200 kg/ha at low fertility level of 50:25:25 kg/ha of NPK.

Cul. 1727 having been identified to possess ratooning capacity gave satisfactory grain yield of 720 kg/ha, when Nitrogen was applied at the rate of 20 kg/ha for the main crop.

Local rice cultivars are being collected for strengthening the germplasm collection in Northern parts of Kerala.

The varieties/cultures Bhadra, Rasi, Jamuna, Kalinga-II Cul. 1080 recorded minimum incidence of silvershoot. The rice varieties Ratna, Sakthi, Krishna, Jayanthi, Thowan, Allikkannan and Thottamkayama recorded minimum incidence of leaf roller during kharif season.

Paddy husk at the rate of 1 t/ha was found to be the best organic amendment in reducing brownspot disease (*Helminthosporium oryzae*) and increasing grain and straw yield.

Screening of cucurbitaceous vegetables suitable for summer rice fallows indicated that the lines PIL-MC-2 of Bittergourd, PIL-TA-2 of Snakegourd, PIL-SC-1 of Cucumber and PIL-LA-1 of Ridgegourd were superior and these lines have been put under farm trials in northern districts of Kerala.

The multilocational trial of ten promising hybrids and four recommended types showed cent per cent establishment in the hybrids (H.16-08, H. 16-10 and type K. 22-1). The hybrids H. 15-98 and H.8-17 expressed precocity. The hybrids showed an earliness in flowering and fruit setting.

Treating the affected portion and drenching with Heptox 10 ml per tree was found to be effective in the management of cashew stem borer.

An evaluation of vegetable cowpea, bittergourd, bhindi and amaranthus collected from local markets revealed that the pesticide residue (Carbofuran) was much above the tolerable limit (0.2 ppm).

The economics of tobacco cultivation in Kanhangad, revealed that application of high doses of farm yard manure and fish manure costs 46-50% of the total investment. The returns varied depending upon the supply demand position of the Mangalore market.

Details of planting materials produced and distributed

Paddy	9,348 kg.
Coconut seedlings—hybrids	5,439 nos.
" WCT	4,391 nos.
Horticultural crops worth Rs. 14,500/-	

Other activities

Conducted Krishi Darshan Programme and Agricultural Seminar on 19th December. Farmers were given information about the station, activities and achievements. In the Agricultural Seminar the Scientists of this station took classes on various aspects coconut cultivation and clarified their doubts.

Publication by staff

Given in Appendix.

Important visitors

Dr. Balasubramanian of IDA Mission and Dr. S. Gangothyay, Principal Scientist of ICAR visited the station.

ii) PEPPER RESEARCH STATION, PANNIYUR

The Pepper Research Station, Panniyur had its modest beginning as a small scheme which started in 1949 under the erstwhile Madras Department of Agriculture. The scheme for scientific aid to pepper industry in South India started functioning in Mattannur in Kannur district. Two years later, in 1950-51, the station was shifted to Agriculture Research Station, Taliparamba. The present Research Station at Panniyur was acquired in 1952-53 from which time, the station obtained the status of the Pepper Research Station. Consequent to the reorganisation of the states, the station was brought under the Department of Agriculture, Government of Kerala on 1-11-1956. Later with the formation of the Kerala Agricultural University it became one of the constituent Research Stations from 1-2-1972. The station is unique among all the Agricultural Research Stations in India, in that it is the only station solely devoted to the research in black pepper. The station was started with sole mandate to conduct research in various aspects of pepper industry in the country, so as to give it a firm footing and confidence to face competition from other pepper producing countries of the world. Research programmes of various aspects of the crop such as crop improvement, crop management and plant protection have always been the thrust areas of activities of the station right from the day of its inception.

AICSIP on Spices and NARP schemes are also working at this station. The area of the station is 26.13 ha.

Prof. V. Sukumara Pillai, continued as the Head of station.

Staff

The details of sanctioned, in position and vacancies of staff are given below:

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
Professor	1	1	—
Assistant Professor (Bot.)	1	—	1
Asst. Professor (Agro.)	1	—	1
Junior Assistant Professor	1	—	1
NARP			
Assistant Professor (Ent.)	1	—	1
AISCIP on Spices			
Associate Professor (Nematology/ Pathology)	1	1	—
Asst. Professor (Path.)	1	1	—
Asst. Professor (Agro.)	1	1	—
Asst. Professor (Bot.)	1	1	—
<i>Administrative and supporting</i>			
Administrative Asst.	1	1	—
Senior Grade Assistant	2	2	—
Typist Grade I	1	1	—
Peon (Hr. Gr.)	1	1	—
Watchman	2	2	—
Jeep Driver	1	1	—
Peon	1	1	—
Farm Supervisor	2	2	—
Farm Assistant (Sr. Gr)	1	1	—
Field Supervisor (Degraded to Class IV post)			
Estt. of Central Nursery for Hybrid Pepper			
Farm Assistant Gr.II	1	—	1
AISCIP on Spices			
Farm Assistant Gr. II	2	2	—
Lab. Assistant Gr. I	1	1	—
Peon	1	—	1

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

All the members of the scientific staff attended various workshops like the Spices Research Workers' Group meetings at Thiruvananthapuram NARP Regional Workshop at Pilicode, Integrated Development on Spices and Horticulture Crops at Ambalavayal etc.

Involvement of staff in academic programme

Staff members of the station are involved in academic programme of the students of the various colleges under Kerala Agricultural University when they visited the station.

Research activities and achievements

Altogether there are 13 nos. of ongoing projects the details of which are given below:

Germplasm collection and screening of pepper genotypes; Intervarietal hybridization and screening of pepper; MLT of black pepper cultivars; MLT of promising cultures of black pepper; CYT of pepper genotypes; Screening of germplasm collection and promising hybrid lines grown under shade for yield disease and pest tolerance; Evaluation of black pepper genotypes in coconut garden for yield and tolerance of pests and diseases; Trial with different tree standards for pepper; Irrigation-cum-fertilizer requirement in two black pepper cultivars; Field trial for the control of Quickwilt (Footrot) disease of pepper (Title changed as *Phytophthora* foot rot and nematode disease management in black pepper); Trial for the control of quick wilt disease of pepper; Field trial for the control of slow wilt disease of pepper; and studies on the control of nursery disease of pepper.

Seven cultures have yielded more than 10 kg over the past three seasons and these are to be advanced for further trials. These are:

Culture 1558 (Kalluvally OP); Culture 5834 (Irumanian OP); Culture 5128 (Cheriakaniyakadan); Culture 5293 (Karuvilanchi OP); Culture 5232 (Karuvilanchi OP); Culture 5705 (Uthirankotta OP) and Culture 5186 (Karimunda x Kuthiravali).

Results of irrigation experiment indicate that watering the plants at IW/CPE ratio of 0.25 is highly beneficial for both the varieties tried viz. Panniyur I and Karimunda.

Among the seven tree standards tried it was found that Pongalliam (*Ailanthus malabaricum*) was the best.

Data for the past one year shows that footrot disease can be effectively managed by adoption of all cultural practices, phytosanitation, shade regulation, application of neemcake 2 kg/vine, application of lime 1 kg/vine and Bordeaux mixture application and Copper oxychloride 0.2% drenching 2 rounds.

Nursery disease can be managed by controlling the shade and timely application of proper fungicides. Trial shows that application of Validacin 0.2% drenching and spraying gives the best control. It is generally recommended that the shade in the nursery may gradually be reduced to 25% after germination.

1.5.5 HIGH RANGE ZONE

The high range zone is a sub-region of Western Ghats lying at an elevation of 750 metres above MSL comprising of the hill districts of Wayanad, Idukki, Nelliampathy and Attappady ranges of Palakkad, Thannithode and Seethathode Panchayats of Pathanamthitta, Aryankavu, Kulathupuzha and Thenmala areas of Kollam district, Peringammala, Aryankavu, Vithura, Amboori and Kallikadu Panchayaths of Thiruvananthapuram district. The total geographical area of the zone is 1140.67 sq. km sharing 28.67 per cent of the total geographical area of the state.

The NARP Phase I sub project for this zone was launched in November 1983 and was completed in November 1988. The NARP Phase II project is in operation since 1988. 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 crops. 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 support agriculture in the colony areas and the whole district. With the formation of Kerala State it was brought under the Department of Agriculture. In 1966 it was upgraded to the status of a Central Horticultural Research Station and was brought under the control of Kerala Agricultural University in 1972. Later in 1983, it was elevated to the status of a Regional Agricultural Research Station under the National Agricultural Research Project with Cardamom Research Station, Pampadumpara as its sub-station.

The Regional Agricultural Research Station, Ambalavayal is located at an elevation of 974 meters above MSL in Sultan Battery Taluk of Wayanad district. It is about 96 km. east of Kozhikode.

Dr. P. Balakrishna Pillai continued as Associate Director till 24-2-92. Dr. K. Kumaran joined as Associate Director of High range zone on 24-2-92.

The lead functions allotted to this station are research on citrus (Mandarin Orange), Mango, Hill paddy and Paddy based cropping system. The verification functions include research on pepper, ginger, medicinal plants and essential oils.

Staff

Details of staff sanctioned, in position and vacant are given below :

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
KAU—Non Plan			
Assistant Professor	2	1	1
NARP Phase I			
Associate Director of Research	1	1	—
Associate Professor (Agronomy)	1	1	—
Assistant Professor	4	3	1
NARP Phase II			
Associate Professor	2	1	1
Assistant Professor	3	2	1
AICRP on Pepper			
Associate Professor	1	1	—
<i>Administrative & Supporting</i>			
NARP phase I			
Administrative Officer	1	1	—
Assistant Grade II	1	1	—
Stenographer	1	1	—
Typist Grade II	1	1	—
Driver Grade II	1	1	—
Farm Assistant	2	2	—
Lab Assistant	1	1	—
K. A. U.			
Section Officer	1	1	—
Senior Grade Assistant	1	1	—
Assistant Grade I	2	2	—
Assistant Grade II	1	—	1
Senior Grade Typist	1	—	1
Farm Supervisor Senior Grade	1	1	—
Farm Supervisor	4	4	—
Farm Assistant	3	3	—
Field Supervisor	1	1	—
Tractor Driver	1	1	—
Oil Engine Driver	1	1	—
Peon	3	3	—
Budder	1	1	—
Regular Mazdoor	11	11	—
Lab Assistant	2	2	—
Watchman	3	3	—

Faculty Improvement Programme

Nil.

New posts sanctioned/created/shifted

One post of Farm Assistant has been shifted from Central Sector Scheme, Vellanikkara to RARS, Ambalavayal under the Central Sector Scheme.

Details of Seminars/Symposia/Training programmes attended

Five members of the Scientific staff attended different workshops, symposia and other seminars.

Involvement of staff in academic programmes

The Associate Director of Research functioned as the major advisor for P.G. Programme of the K.A.U. and conducted field training for students of final year B.Sc. (Ag.), College of Horticulture, Vellanikkara from 14-10-91 to 25-10-91.

Research activities and achievements

Major achievements of the research projects during the period are given below:

Studies with 27 mango varieties available at the station revealed that Neelum (Flowering in February and harvesting in June) and Prior (Flowering in January and harvesting in May) are high yielders (above 75 kg/tree).

Epicotyl grafting was found to be successful in mango varieties Bennet Alphonso (80% of survival) followed by Kalappady x Himayuddin and Ammini (75% survival).

Italian lemon recorded the maximum yield among the lemon types and in lime, Coorg seedless produced the maximum yield.

Among the cabbage genotypes, September recorded the highest yield. Golden acre and Sriganesh were the early types.

Cauliflower type—Swathi recorded the highest yield. 74-6-C and 234-9 were the early genotypes.

Among the thirtysix ginger varieties Dharja recorded the maximum yield followed by PGS 35 and SG 639.

Turmeric type PTS-9 recorded the highest yield followed by PTS 10.

The best season for rooting of laterals of black pepper was found to be the last fortnight of June followed by first fortnight of July.

The trial conducted to evaluate the response of clove to different levels of N and K revealed that N at 400 g and K₂O at 500 g per plant gave the highest yield.

Performance evaluation of rice varieties showed that 'Edavaka' variety was superior with respect to yield of grain and straw. This variety was found to be suitable for cultivation both during first and second crop seasons in the high ranges.

Publication by staff

The details of publications are presented in Appendix.

Other matters

The ninth N. A. R. P; K. A. E. P. Zonal Workshop of the high range zone was held at R. A. R. S; Ambalavayal on 5th, 6th and 7th September 1991.

Workshop on Integrated Development of Spices and Horticultural crops, Wayanad 1991 was held at Regional Agricultural Research Station, Ambalavayal during 26th and 27th of October 1991.

The station participated in the flowershow organised by Agri. - Horticultural Society at Kalpetta from 10/1/92 to 13/1/92 and at Kozhikode from 19/2/92 to 26/2/92.

Important visitors

Sri G. Mukundan, Chief Conservator of Forests, Sri T. Krishnamurthy, I. F. S; Dr. S. Edison, Project Co-ordinator, N. R. C. S; Calicut, Sri E. Velappan, Director, DCASD, Calicut, Sri L. Natarajan, District Collector, Wayanad, Smt K. C. Rosakutty, MLA; S. Battery, Dr. Balasubramonian, Scientist, World Bank Team, Dr. S. Gangopadhyay, Principal Scientist, NARP, New Delhi, Sri Mullappally Rnmachandran, Hon'ble Union Minister of State for Agriculture, Sri K.K. Ramachandran, MLA, Kalpetta, Sri K. Raghavan Master, MLA; Mananthody and Sri M. S. Joseph, IAS, Secretary to Agriculture and Member of Executive Committee visited the Station.

ii. CARDAMOM RESEARCH STATION, PAMPADUMPARA

The Cardamom Research Station, Pampadumpara was started in the year 1956 to undertake research programmes on agronomical, botanical, entomological and phytopathological problems of cardamom cultivation. The station is situated in the high ranges of Kerala in Pampadumpara village, Udumbanchola taluk of Idukki district. The All India Co-ordinated Spices and Cashew-nut Improvement Project of the ICAR was initiated in the station during 1972.

The lead function of the station is research on cardamom. The verification functions include research on pepper and rice.

Sri A. Sukumara Varma, Associate Professor was the Head of the Station during the period under report.

Staff

Details of staff sanctioned, in position and vacancy are as follows:

Category	Sanctioned	In position	Vacancy
<i>Scientific</i>			
KAU			
Assistant Professor (Ent., Agrl. Chem., (Hort. and Pl. Pathology)	4	1	3 On study leave for Ph. D
NARP—Phase I			
Assistant Professor (Pl. Breeding and Agrl. Extn.)	2	1	1 On deputa- tion to Ph. D
ICAR Co-ordinated Project— Spices & Cashew			
Associate Professor (Pl. Patho., Agron.)	2	2	1 Assoc. Prof. (Agro.) on study leave for Ph. D
Assistant Professor (Ent.)	1	1	—
<i>Administrative & Supporting</i>			
KAU			
Administrative Assistant	1	—	1
Assistant Sr. Grade	1	1	—
Assistant Grade II	1	1	—
Typist Grade II	1	1	—
Driver Grade II	1	—	1
Watchman	4	4	—
Farm Supervisor Gr. II	1	1	—
Farm Assistant Gr. I	2	2	—
NARP—Phase I			
Farm Assistant Gr. I	2	2	—
Typist Gr. II	1	1	—
ICAR Co-ordinated Project			
Farm Assistant Gr. I	2	2	—
Lab. Assistant Gr. II	1	1	—
Peon Higher Gr.	1	1	—

Workshops/Training programmes/ Seminars attended

Sri A. Sukumara Varma and Smt Suma Paulose attended the group meeting of Research Workers of All India Co-ordinated Research Project on Spices and NARP Zonal Workshop.

Research activities and achievements

Five experiments were in progress at the station during the period. Salient achievements of research are the following:

A high yielding variety of cardamom evolved by pureline selection from Malabar type (PV-1) has exceeded all the cultivated varieties with regard to yield in the research station as well as in the farmers' fields. It is recommended for release.

Control measures of Azhukal disease of Cardamom have been worked out and included in the Package of Practices Recommendations of Kerala Agricultural University.

In the germplasm collection of 67 cultivated and 14 wild varieties PS-10, PV-1, PV-12 and PV-4 were found promising.

Other activities

The Scientists have visited farmers' fields whenever invited and gave necessary advice. Farm advisory meetings were held regularly to discuss about the developmental activities.

Important visitors

Dr S. Edison, Project Co-ordinator, N. R. C. S. Kozhikode visited the station.

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 to train sufficient veterinary personnel. For the first few years the institution was directly under the administrative control of the Kerala Government but later they were brought under the control of the Department of Animal Husbandry. The post graduate programmes leading to M. V. Sc. & Ph.D Degree were started in 1962 and 1965 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 in the campus. Two Veterinary Hospitals, one at Mannuthy and another at Kokkalai are also attached to the College.

In addition to teaching, a number of research projects are being operated at the college. Importance is given for the transfer of technology also.

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 18 Departments in the College of Veterinary & Animal Sciences viz.;

Department of Anatomy.

- “ Livestock Production Management.
- “ Animal Reproduction.
- “ Animal Breeding & Genetics.
- “ Clinical Medicine.
- “ Dairy Science.
- “ Extension.
- “ Microbiology.
- “ Nutrition.
- “ Parasitology.
- “ Pathology.
- “ Pharmacology & Toxicology.
- “ Physiology.
- “ Poultry Science.
- “ Preventive Medicine.
- “ Surgery.
- “ Veterinary Public Health and
- “ Statistics.

All the departments are offering post-graduate courses at Masters' level and all except Anatomy, Extension, Pharmacology and Toxicology, Preventive Medicine, Surgery, Veterinary Public Health and Statistics are offering Ph. D. programmes.

Dr. G. Nirmalan, Professor and Head, Department of Physiology continued to hold charge of the Dean, during the period.

Staff position

Detailed staff position is given in Appendix IX.

Change in academic staff

Dr. C. Pythal, Associate Professor, Department of Parasitology was transferred and posted in the Department of Parasitology from the College of Forestry from 21.1.1992.

Dr. Jacob V. Cheeran posted in the College of Forestry for handling classes on Wild Life is continuing on working arrangement.

ACADEMIC PROGRAMMES

Students' statistics

U. G. programme (on roll)

Year of admission	Men	Women	Foreign students	Total
1981	4	1	—	5
1982	4	—	—	4
1983	3	—	—	3
1984	16	3	—	19
1985	28	2	—	30
1986	69	28	—	97
1987	69	37	—	106
1988	76	42	—	118
1989	63	37	—	100
1990	58	24	—	82
1991	59	24	—	83
Total	499	198	—	647

P. G. programme (on roll)

1988	2	2	—	4
1989	8	—	—	8
1990	15	11	—	26
1991	18	8	—	26
Total	43	21	—	64

Ph. D. programme

1989	2	1	—	3
1990	5	3	—	8
1991	6	—	—	6
Total	13	4	—	17

No. of students passed out.

B. V. Sc.	61	26	—	87
M. V. Sc.	10	2	—	12
Ph. D	—	—	—	—

Dairy Diploma course was continued during the period.

Scholarships awards and Aids to students

Fee Concession under KPCR.

KAU Merit Scholarship.

ICAR Merit-cum-Means Scholarship.

Districtwise Merit Scholarship.

Kerala Labour Welfare Fund Scholarship.

KAU Junior Fellowship.

- ICAR Senior Fellowship.
- ICAR Junior Fellowship.
- Educational concession to Lakshadweep students.
- Educational concession to SC & ST students.
- Educational concession to OBC/X'ian convert students.
- National Merit Scholarship.

Faculty improvement

Dr. A. D. Joy, Associate Professor, Pharmacology, Dr. M. R. Saseendranath, Associate Professor, Preventive Medicine; Dr. P. C. Saseendran, Associate Professor, Animal Management; Dr. P. G. Baby, Assistant Professor, Clinical Medicine; Dr. P. C. Alex, Associate Professor, Clinical Medicine; and Dr. Francis Xavier, Associate Professor, Animal Management are continuing their higher studies on deputation. Dr. P. P. Balakrishnan, Associate Professor and Dr. V. Vijayakumar, Associate Professor, Animal Reproduction joined the Ph. D. course on deputation during the period under report. Dr. K. Venugopalan, Associate Professor, Preventive Medicine is continuing his post-doctoral Research work in U. K. during the period. Dr. B. Gangadharan and Dr. T. Leenadevi joined the Department after their higher studies on 2.7.'91. Dr. M. Gopalakrishnan Nair, Junior Assistant Professor was deputed to U. K. for higher studies from 22.8.91.

Proposal for starting Doctorate Degree programme in the Department of Surgery, Anatomy and Pharmacology has got approved by the Academic Council.

Seminar/Symposia/Training Programmes conducted in the college

Subject	Participants	Duration
Aflatoxin analysis	Field Veterinarians	12.8.91 to 19.8.91
Diagnosis of disease of poultry	"	9.9.91 to 20.9.91.
Disease Investigation	"	Sept. to Nov. 1991 Dec. to March, 91-92
Training programme in Livestock & Poultry Farming	Pre-release defence personnel	July, 1991 December, 1991.
Diagnosis and control of parasitic disease	Field Veterinarians	1.8.91 to 14.8.91.
Training in Abattoir Management	Officers in A.H. Department	10.12.91 to 24.12.91

Seminars/Symposia Attended

Sixty two Scientists of the College from different departments attended forty seminars/symposia/camps/training programmes etc. conducted in various parts of the country.

Practical Training Programme

The undergraduate and post graduate students had farm training in the various instructional farms.

Study Tours conducted

As in the previous year All India Study Tour, South India Study Tour and All Kerala Study Tours were conducted during the current year.

Library

No. of books procured during the period	:	32
No. of books as on 31-3-92	:	20118
No. of Indian and foreign journals subscribed during the period.	:	107

Hostels

Hostel	Warden	Asst. Warden	Steward/Matron	Strength
UG Main,	Dr. G. Nirmalan	Dr. Jose John	Mr. S. Raveendran	130
		Chungath		
UG Annex,	"	Dr. T. P. Bala-	Mr. M. M. Babu	143
		gopalan		
PG	"	Dr. V. S. Bala-	—	40
		krishnan,		
UG (Ladies)		Dr. Shyla Prakash	T. P. Sicily	190
		Total		503

Outreach Programme

NSS Activities

Organised a Blood Group Test Camp for newly admitted students of the College. A total of 120 persons were tested for the Blood group on 17.5.91. The first issue of the College NSS Bulletin was released by Dr. A.G.G. Menon, Director of Extension and Programme Co-ordinator.

On 18/7/'91 the Programme Co-ordinators attended an orientation training at Rajagiri College, Kalamassery.

From 9/8/'91 to 11/8/'91 the Programme Officers and the NSS volunteers attended a mini special came at Pulpully. Road repair, Agriculture and Animal Husbandry Seminar, Infertility Camp, Cultural Programme, Camp fire, vaccination programme against rinderpest and Cattle show were the activities.

On 3rd and 4th August, '91 an orientation class and campus cleaning programme were arranged in the college. Programme Officers and volunteers participated in the Special camp at the Little Flower College, Mammiyoor on 29/8/'91. Vaccination of birds and classes on Rabies were the main activities. The programme officers also took classes on Rabies in the special campaigning programme of the Vimala College at Kattilappovam.

A special camp was arranged at Meppadi from September 13 to 22, 1991. Fifteen volunteers participated in the camp. Repairing of roads, vaccination against Rinder pest, Infertility camp, seminar on animal diseases, animal husbandry and agricultural seminar and cultural programmes were the activities.

On 2.10.91 Gandhi Jayanthi was celebrated. The volunteers proceeded to Tribal hostel, Peechi and organised and conducted sports competition for the inmates of the hostel. Prizes were also distributed to the winners.

On 29/12/'91 a campus beautification programme was organised and conducted at the Thrissur Collectorate campus in collaboration with the Agri-Hort-Society.

On 8/3/'92 an Animal Health camp and vaccination programme was organised and conducted at Echippara in connection with the special camp of the College of Co-operation & Banking, Mannuthy.

On 9/8/'92 a propaganda and publicity programme in connection with the inauguration of the second phase of mass literacy programme in Madakkathara Panchayat was conducted.

Students' Welfare activities:

Sports and Games:

Interclass Ball Badminton and Table Tennis Competitions were conducted in July, 1991. Inter-class Basket Ball and Volley Ball competitions were conducted during September, 1991.

Students' Union Activities

The following were the Students' Union activities for the period under report.

- 21.5.91 Passing out function of B.V.Sc. & AH graduates. Vice-Chancellor presided over the function.
- 15.6.91 Interclass Quiz competition.
- 15.8.91 Independence Day Celebration. Social Service Work in SOS campus, Mullakkara.
- 12.8.91 Interclass "News Reading Competition."
- 19.8.91 Interclass 'Athappookalam Competition.'
- 21.8.91 Interclass competition of Skit, Group Music, Thiruvathirakali etc.

- 27.11.91 Freshers day was conducted, Director of Animal Husbandry, Dr. K. C. Chacko and ICAR Senior Scientist Dr. M. Aravindan participated.
- 1.12.91 'Meeting of parents' was conducted by Students Union.
- 20.12.91 Interclass 'Christmas Tree Competition'.
- 21.12.91 Campus Nite programmes were conducted.
- 21.1.92 Interclass dramatics were conducted.
- 26.1.92 Republic day was celebrated.
- 15.2.92 College day was celebrated.

Visitors

Hon'ble Governor of Kerala and the Chancellor Sri P. Rachaiah of the Kerala Agricultural University visited the Faculty on 11.10.91. A mini exhibition was arranged by various departments in the college. He visited the various farms and discussed with the staff members regarding various problems.

Hon'ble Minister for Agriculture and the Pro-Chancellor of the Kerala Agricultural University, Mr. P. P. George, visited the College and various farms on 30.12.'91.

Dr. Colin Mc Clung, Indian Co-ordinator, USAID Agricultural Support Service Project, New Delhi and Dr. Maharaj Singh, Indian Co-ordinator of the scheme visited the college on 6th May, 1991.

Dr. J. P. Frontenot (Animal Nutrition) USA Lead Consultant of Indo USAID Project, Dr. B. E. Rultin (Extension Specialist), Dr. T. A. Mc Casky (Microbiologist of the same project) visited the College on 29th September to 2nd October, 1991.

Dr. K. P. C. Nair, Toxicology Laboratory Michigan, U.S.A. visited the College and gave a talk on Pathology of Lab Animals on 21-2-'92.

Research programmes

New projects started

A total of 183 research projects are in operation during the period. The list of new research project started during the year is given here under:

Studies on glycogen storage in Japanese quail

Effect of floor density on production performance in Japanese quails reared in cages and deep litter.

Effect of weight at weaning and plane of feeding on the onset of puberty in gilts.

Identification of bacterial critical points and anti bacterial effect of lactic acid on beef carcass.

Study on the occurrence of Yersina in pork.

Effect of acetic acid and propionic acid on bacteriological quality of beef.

- Effect of electrical stimulation on beef quality.
- Effect of dried spleen as growth stimulator in kid rations.
- Effect of tannins in commonly fed fodders on nutrient availability in goats.
- Socio-economic aspect of goat production in different farm holdings.
- Conservation and evaluation of 'Malabari' breed of goats.
- Optimum Energy and protein requirements for growth in Broiler Rabbits.
- Prostaglandin therapy for Post Partum Clinical Endo metritis.
- Phosphorus and Trace element status of Anoestrus and Repeat breeder crossbred cows.
- Effect of administration of Prostaglandin in repeat breeding cows.
- Pathological conditions of ovary and Bursa in crossbred cattle.
- Ovarian response to Gonadotrophin releasing hormone administration in non-cyclic goats.
- Factors influencing calf growth and mortality in field and organised farms.
- Comparative draught capacity of cattle and buffaloes.
- Nutritive evaluation of prawn waste, paddy straw silage in cattle.
- Milk protein genetic variants in crossbred dairy cattle.
- Chromosome banding pattern and its association with reproductive disorders in crossbred cattle.
- Cytogenetic studies of crossbred cattle of Kerala.
- Tiletamine zolazepam anaesthesia with xylazine premedication and reversal with aminophylline in dogs.
- An assessment of the role of Aflatoxin in the aetiology of carcinoma of the mucosa of the ethmoid.
- Evaluation of blood constituents as diagnostic markers for ethomid carcinoma in cattle.
- Xylazine anaesthesia in calves with diazepam premedication.
- Antibacterial activity of isolates from selected plant extracts against bovine mastitis.
- Comparison of immune response of the indigenous and crossbred cattle of Kerala.
- Anaesthesia in pigeons and quails using Ketamine and Xylazine.
- Modified intra-dermal test for the diagnosis of paratuberculosis in goats.
- Diagnosis of Paratuberculosis in goats.

Research Highlights

It was demonstrated that there was expression of GGT in neoplastic transformation of epithelial cells of the ethmoid mucosa and this was considered as an indirect proof of the involvement of aflatoxin in this carcinogenesis.

There was significant reduction in serum, copper and zinc levels in cattle bearing ethmoid carcinoma.

Survey studies employing cytodiagnosis indicated that the incidence of ethmoid carcinoma was on the increase.

Salmonellosis was identified in quails, its pathogenesis was clarified by experimental studies and the pathological features were studied. It was demonstrated by experimental studies that stress has a significant role in the pathogenesis of the condition. The zoonotic importance was brought to light.

The carcinogenic potential of aflatoxin was clarified taking duck as a model. GGT expression was demonstrated to be a feature in neoplastic transformation of hepatocytes.

Clofibrate initiated preneoplastic changes in the duck hepatic tissue.

Ochratoxin was demonstrated to inhibit lymphoid organogenesis in the quail embryo.

By ultrastructural studies and employing various immune markers to assess the CMI and humoral immune response it was clarified that ochratoxin has sufficient biological effect on the immune system of adult quails.

Superchlorination of water was demonstrated to cause immunosuppression in ducks and calves.

Marek's disease was identified to be an important problem in quails. The need for undertaking prophylactic vaccination was stressed.

By experimental studies the adverse immunobiological effects of aflatoxin on the autogenesis of the immune system in duck embryo was clarified.

Studies on mastitis in goats showed the incidence of sub-clinical mastitis was 47% in goats. Test dipping was shown to be a better method for the control of mastitis.

Based on the nutritional trial conducted at AICRP on Poultry Nutrition of the Mannuthy centre, it was revealed that ILM90 birds, Layer type, developed at AICRP on Poultry breeding at Mannuthy, requires 16% crude protein with an energy level of 2500 Kcal ME/kg. from 0-72 weeks of age.

Studies on the prevalence of New Castle Disease virus in domestic and free flying birds revealed that N. D. V. is prevalent in some of the free flying birds such as crows, pigeons and tree ducks. Most of the isolates from these birds were pathogenic to chicken.

Research achievement

In the AICRP on Poultry Project the testing of the two pure strains for part year production and also the testing of the random birds belonging to IWN and IWP strains as well as the control population for annual production during the period were completed. The performance of the strains was found to be good. The test conducted at random sample poultry performance test centre, Bhubaneswar (Government of India) showed that *the strain from Mannuthy ILM-90 was the best among the entries from various parts of India*. It showed a hen-housed production of 275.34 eggs. Hen day production of 280.47 eggs, Feed conversion efficiency of 1.691 and returning Rs. 63.20 per bird over feed cost which was the maximum in the test.

It is found that in chicken ketamin hydrochloride @100mg/kg i/m giving more satisfactory general anaesthesia than ketamin; thiopentone combination whereas in ducks a combination of ketamin and thiopentone sodium is found more satisfactory.

Palatability and digestibility trials of prawn waste silage was conducted in cattle. The animals consumed the silage well and gained in weight during the trial period. The prawn waste silage making was demonstrated to farmers in their household and they have started feeding this to their cattle.

Studies on incidence of Brucellosis revealed that Brucellosis is prevalent below 5% among cattle, goats and pigs in Ernakulam, Thrissur and Palakkad districts.

It was demonstrated by *in vitro* studies that there was neutralisation of aflatoxin during the process of fermentation of milk.

It was demonstrated by experimental studies in the ducks that a copper deficient diet has significant pathological effects in the pancreatic tissue leading to biotransformation of cells.

Investigations were conducted on diseases of broiler rabbits, Pasteurellosis was identified to be the most important killer disease Therapeutic schedule was prescribed for the condition.

The pathological changes associated with Ranikhet disease infection in adult ducks were studied and it was concluded that adult ducks were relatively refractory.

Systematic investigation was conducted on embryomortality in quails. The magnitude and nature of embryopathies were identified and the abnormalities encountered were classified. The possible aetiological factors were suggested.

It was demonstrated by experimental studies taking duck as a model that carbofuran has an immunosuppressive effect on the immune system and this could lead to break down of immunity.

It was clarified by experimental studies taking duck as a model that super chlorination of water will lead to immunosuppression and hypothyroidism.

For the first time in the country a disease syndrome resembling lumpy skin disease was identified, the pathogenesis was worked out and pathological features were described.

Twenty eight blood typing reagents were produced after blood typing of 160 cross bred and Zebu cattle; in blood typing laboratory University of Bernd, Switzerland. Three reagents are adequate for establishing a parentage control programme.

First studies in quails showed that initial body weight has no significant effect on growth rate; for ascertaining the growth. Gompertz Curve has found most suitable and for ascertaining the egg production Quadratic function in log-scale was found most ideal.

Systematic screening of feed samples for aflatoxin was carried out. Aflatoxin contamination was detected in 62% of the samples examined. Level as high as 800ppb was encountered in 22% of the samples.

Investigation on diseases of quails revealed that hepatitis was common. There were also cases of Marek's disease.

Karyotype studies conducted in 54 buffaloes from four districts of Kerala revealed 3 different group of buffaloes with a chromosome complement of $2n=49$, $2n=50$, $2n=48$ the majority being $2n=50$.

Studies on crossbred breeds of goats has shown that Sanan Malabari cross was found to be the highest persistent one in milk production and for predicting the total yield from part record Limas hyperbolic function was found to be best.

Tranquilisation studies on Arnil Buffaloes in Kultis revealed that a dose of 0.93 mg xylazine + 0.37 mg ketamine per kg body weight was enough to immobilize it.

Oxielozanide at a dose of 7.5 mg/kg orally single dose was found to be cent per cent effective against Amphistomiasis in Elephant.

A low cost incubator for hatching eggs operated with electricity or kerosine has been developed and successfully put into use by Dr. Shyla Prakash. A maximum of 45 eggs can be hatched at the cost of 5 liters kerosene or 10 units electricity, the cost of the incubator is about Rs. 1,500/-.

It was demonstrated by experimental studies in ducks that carbofuran has immuno suppressive effect. Superchlorination of water will also lead to immuno suppression and hypothyroidism in ducks.

Studies on Honey bee disease, a virus cubical symmetry morphologically similar to see brood virus was demonstrated by direct EM examination of the infected honey bee larvae.

From divergent species of fishes affected by epizootic ulcerative syndrome (EUS) 23 strains of bacteria were isolated. Moreover a viral agent could also be isolated. Experimental infection of fishes with the viral isolates produced lesion similar to natural outbreaks.

Others

Dr. A. Ramakrishnan, Dr. A. K.K. Unni, Dr. P. A. Peethambaran, Dr. A. Jalaluddin, Dr. Leo Joseph, Dr. C. K. Venugopalan, Dr. Amritha Viswanath, Dr. Maggie D. Menachery, Dr. T. V. Viswanathan, Dr. M. R. Rajan, Dr. (Mrs.) Lalithakunjamma, Mrs. Laly John and Mrs. Grasamma Kurien was awarded with Takur Ram Avtar Singh Award for their outstanding contribution in the area of poultry breeding.

A number of scientists in the college, have participated in seminars, given technical guidance to small scale feed manufacturers, attended camps conducted by NSS Unit, and NOC Unit and conducted vaccination in Livestock and Poultry of the farmers during the period.

Extension Activities

The scientific staff of the college were also engaged in various extension programmes as detailed below:

Periodic household visits were conducted for the follow-up work of Lab-to Land programme. Besides 13 group discussions with farmers were conducted in various parts of Thrissur district on problems of Livestock rearing including goats. This was in addition to 3 farmers seminars conducted at Cherpu, Poolari and Panangad. Apart from this a two day method demonstration was also conducted at Kothamangalam on 'Scientific milking of cows'.

Feed supplements and essential medicines were distributed for the beneficiaries in order to maintain good health condition of the goats in the locality, under Village adoption programme.

During the period a total of 2200 visitors from 53 different institutions visited the campus. They were taken round and explained the various activities.

Other extension activities

Given technical advice to the members of Peoples Dairy Development Project, Kalady and Women Co-operative Society, Kothamangalam.

Acted as a co-ordinating agency for Samasthan Service Centre and Bethel Ashram, Thrissur.

Attended seminars organised by Dairy Development Department.

Conducted 4 exhibitions connected to Seminars and Melas.

Conducted 3 Radio talks on topics of livestock importance.

Exhibition

An exhibition was arranged in the College in connection with the visit of Hon'ble Governor of Kerala and the Chancellor of the University on October 11th, 1991. Another exhibition was arranged on 30th December, 1991 in connection with the visit of Hon'ble Minister for Agriculture and Pro-chancellor of the University.

Services rendered to farmers

Diagnostic service

Poultry autopsy diagnosis	:	18038
Large animal autopsy diagnosis	:	1235
Histopathology diagnosis	:	4604
Clinicopathology (Blood, Urine, Biopsy etc.)	:	1071
Rabies diagnosis	:	692
Feed samples analysed for		
Mycotoxycosis	:	478
Ethmoid tumour cases screened	:	822
Field visits	:	58

Microbiological examination

A total of 898 clinical specimens of various nature as detailed are examined by bacteriological/serological/virological/mycological tests and results communicated.

Milk samples—361, Blood smear—56, Urine/Blood/CSF for leptospira—10, Uterine discharge—30, Ailing birds for

RD/duck plague—36, Skin scrappings—24, Water 4, Pus—13, Urine—16, Serum for antibodies to (a) RD-171, (b) RP-21, (c) brucella-23, (d) IBR-8, tissues for antigens of (a) RP15, Parvo virus-27, Ascitic fluid-2, Ear swab-2, Faecal samples-14, Sputum-3, Nasal swab-1, Rectal pinch-7, Faecal smear-1, Bedding material-1, Fish-17, Materials for Johne's disease-9, Eye swab-5, Aborted foetus-5, Material from elephant-1, Auto vaccines-3, Salmonella-7, Bee larvae-3 sets. (Total 898)

Feed samples analysed

A total of 340 samples of compounded feed and feed ingredients and mineral supplements were analysed during the period for proximate principles.

No. of vaccinations done

Haemorrhagic septicaemia-577, Foot and mouth disease-534, Black quarter vaccination-19.

Cases treated in the Veterinary Hospital, Mannuthy

Equine-46, Bovine-6749, Others-4668 (Total 10,863).

Major surgical operation 63, Minor surgical operation-583 (Total 646), Vaccination done : RD-9025, Anti Rabic-19.

Details of X-rays taken

No. of X-rays taken-242, Revenue collected—1,960.

Small Animal Breeding Station

A total 473 mice, 1118 rats, 70 rabbits and 16 guinea pigs worth Rs. 22,505/- were given to various departments and private agencies.

Details of animals slaughtered

Cattle-25, Pigs-19, Quantity of meat produced 1,667.5 kg, Receipt by sale - Rs. 33,667/-.

Details of milk products produced in the Dairy Plant

A total of 72 samples of milk were analysed during the period. Four thousand nine hundred and ten litres (4910) of milk were converted into various products as follows:

Butter-128 kg, Flavoured skim milk-114 bottles, Gulab Jamun-116.8 kg, Ice Cream-1688 cups & 5.5 kg, Kera Cream-1,223 cups and 12.25 kg, Khoa-125.6 kg, Paneer-26 kg, Palpayasam-19 kg, Skim milk powder-44 kg, whey drinks-102 bottles, A total of Rupees 59,432.00 was collected from the sale of these.

Details of A. I. done

Total number of A. I. done and Revenue collected

	No. of A I done		
	Cow	Buffaloe	Goat
A. I. Centre, Kokkalai	603	30	52
A. I. Centre, Mannuthy	963	81	24
Total	1566	111	76

Details of parasitological examination

Faecal samples—1,024, Blood samples—67, Skin scrappings—29, Other parasitic materials—165. (Total—1,285)

Toxicological analysis

No. of water samples examined for various chemical constituents	: 20
Drug samples tested for purity and adulteration	: 6
Feeds and fodder examined for various poisons	: 6
Biological samples examined for various toxins	: 13
Mineral mixture examined for fluorine content.	: 14

Other items

Dr. Jacob V. Cheeran, Professor of Pharmacology was nominated as a non-official member to Central Zoo authority of India and he attended its meeting at New Delhi on 30/3/'92. He is also nominated as a member to the Faculty of Environment Studies, University of Cochin.

Dr. K. C. George, Department of Statistics is continuing as a member of the Advisory group of Economic Evaluation of the proposal for inter-basin transfers.

Dr. Jacob V. Cheeran visited the Kasirenga National Park for tranquilization of wild buffaloe from 7 to 11th March, 1992.

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 1-2-1972.

Dr. G. Raghunathan Nair, Associate Professor was in charge of the unit during the period.

Total eggs produced	:	1,77,836
Total chicks produced	:	65,907

Major objectives of the farm

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.

Staff

Details of staff sanctioned, in position and vacancies are given below:

Category	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
Associate Professor	1	1	—
Jr. Asst. Professor	2	1	1
<i>Administrative staff</i>			
Senior Farm Supervisor	1	1	—
Farm Supervisor Gr. II	2	2	—
Farm Assistant Gr. I	1	1	—
Farm Assistant Gr. II	1	1	—
Poultry Attendant	3	3	—
Administrative Assistant	1	1	—
Senior Gr. Assistant	1	1	—
Assistant Grade II	1	1	—
Peon Hr. Gr.	1	1	—
Watchman	1	1	—

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 4 hectares.

Dr. Kurian Thomas was the head of the station during the period.

Staff

The details of staff sanctioned, in position and vacant are furnished below:

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
Professor & Head	1	1	—
Assistant Professor	1	1	—
Jr. Asst. Professor	1	—	1
<i>Administrative and supporting</i>			
Administrative Assistant	1	1	—
Senior Grade Assistant	2	2	—
Senior Farm Supervisor	1	1	—
Farm Supervisor Hr. Gr.	1	1	—
Farm Supervisor Gr. I	1	1	—
Pump Operater	1	1	—
Peon Hr. Gr.	1	1	—
Pig Attendant	2	2	—
Watchman	1	1	—

The unit produced 1243 pigs out of which 1074 numbers were distributed to farmers. A few pigs were utilised for research studies also.

2.4 CENTRE OF 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, All India Co-ordinated Research Project in Poultry Nutrition and the All India Co-ordinated Research Project on Poultry Housing and Management.

Dr. A. Ramakrishnan, continued to be the Director of the Centre.

2.5 ALL INDIA CO-ORDINATED RESEARCH PROJECT ON POULTRY NUTRITION

A centre of the AICRP on Poultry Nutrition, an ICAR sponsored scheme was allotted to the Kerala Agricultural University during 1976. The objective of the centre is to establish nutrient requirements of elite flock of commercials developed by the AICRP on Poultry Breeding. Currently at the Mannuthy Centre the energy and protein requirements of the strain cross IWN x IWP raised both in cage system and deep litter system are being studied.

2.6 AICRP ON POULTRY BREEDING, MANNUTHY CENTRE

The poultry breeding centre continued to carry out selection and breeding activities on two elite strains of White Leghorns viz. IWN & IWP. The testing of the strains belonging to S_1 generation was carried out and as envisaged in the technical programme, selection was made and progenies belonging to S_1 generation were taken out.

The Senior Scientist of the Centre attended the annual workshop of the project held at the Project Directorate at Hyderabad in which the working of all the centres was critically evaluated. The progress made by this Centre was appreciated in the workshop. The Project Director presented the comparative performance of the entries from different centres along with that of the leading commercial layers.

This Centre had also participated in this testing programme and the comparative part-year production is provided hereunder :

Name of the Centre/ Entry	ASM	32 wk	40 wk	20 wk	280 days	
					40 wk	EP (No.)
Anand	163	55.89	58.24	1074	1608	100
CARI	149	51.30	52.68	1250	1685	115
Mannuthy	153	54.62	55.75	1257	1769	118
Hyderabad	147	54.43	56.25	1291	1759	110
PDP	159	50.16	51.81	1164	1727	103

The commercial layer evolved at this Centre viz. 'ILM-90' performed exceedingly well at the Bhubaneswar Centre of the Random Sample Performance Testing Programme of the Govt. of India.

Scientists working in this project were honoured by the Indian Poultry Science Association by awarding the prestigious 'Takur Ram Avtar Singh Award' for the meritorious performance in the area of Poultry Breeding in the country.

In addition to carrying out effectively the technical programme of the project, the centre has taken up the responsibility of catering to the requirements of the State Department of Animal Husbandry with respect to the present stocks of 'ILM-90'. The Regional Poultry farms under the Govt. of Kerala will be multiplying this hybrid layer to meet the increasing requirements of the farmers of the State.

Dr. A. K. K. Unni continued as Senior Scientist in charge of the project.

2.7 ALL INDIA CO-ORDINATED RESEARCH PROJECT ON POULTRY HOUSING AND MANAGEMENT

One of the centres of AICRP on Poultry Housing and Management was established during 1976 in the Kerala Agricultural University. The objective of the project is to survey the housing practices followed by farmers in this hot-humid part of our country and to identify designs of poultry houses which are economical and efficient under the climatic profile of Kerala. The project also envisages to evolve suitable managerial practices that are suitable for the hot-humid climate. This centre has already completed the survey and has completed three biological experiments relating to management. Presently different methods of managerial practices for alleviating summer stress is being studied.

2.8 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.

2.9 CENTRE OF EXCELLENCE IN PATHOLOGY

Department of Pathology in the College of Veterinary and Animal Sciences was upgraded to the status of Centre of 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.

The faculty members of the centre have attended 24 seminars/workshops and presented papers.

Salient research findings include the following:

Significance of aflatoxin in public health was brought to light.

Neutralisation of aflatoxin during fermentation of milk, was demonstrated.

Calcium hypochlorite and aluminium silicate were shown to be of value in neutralising aflatoxin.

Identified and recommended indigenous plant extracts and sardine oil for amelioration of biological effects of aflatoxin.

Clarified public health importance of Zealalenone.

Demonstrated pathological effects of copper deficient diet in ducks.

Demonstrated immunomodulatory effect of Furadan in small doses to ducks.

Confirmed beneficial effect of cyclophosphamide therapy on ethmoid carcinoma.

Demonstrated immunosuppressive effect of aflatoxin.

There were nine research publications and one popular article from the centre during the period.

2.10 VETERINARY COLLEGE HOSPITAL, MANNUTHY

The Hospital 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 inpatients and outpatients are attended categorywise under the supervision of specialists from clinical departments viz.,

Clinical Medicine, Preventive Medicine, Surgery and Animal Reproduction. In addition the hospital serves as a referral hospital to handle patients brought from different parts of the State and render expert advisory service to the farmers and field veterinarians.

Teaching and Technical staff

Scientific staff

Professor	:	1
Assoc. Professor	:	1

Supporting staff

Farm Assistant Gr. 1	:	1
Permanent Labourer	:	1

The details of the number of cases handled and treated in the Hospital during the period are as follows:

Cases treated	Number handled
Equine	46
Bovine	6749
Others	4668
Total	10863
Daily average attendance	29.75

Out of the above cases castration was done in 2 cases, major surgical operations done in 63 cases and minor surgical operations done in 63 cases and minor surgical operations done in 583 cases.

Besides 627 clinical samples were also analysed.

2.11 LIVESTOCK RESEARCH STATION, THIRUVAZHAMKUNNU

The Livestock Research Station, Thiruvazhamkunnu started in 1950 is located in Mannarghat Taluk of Palakkad Dist. The station has an area of 163.3 ha. Dr. V. R. Reghunandan Nair was in-charge till 8/7/91 and then Dr. Stephen Mathew continued to be in-charge during the period. In addition to livestock rearing & research, fodder is also grown in the farm area in large scale.

Staff

Details of staff sanctioned, in position and vacant are given below:

Category	Sanctioned	In position	Vacant
(1)	(2)	(3)	(4)
Scientific			
Assoc. Professor	2	2	—
Asst. Professor	2	1	1
Jr. Asst. Professor	3	3	—

	1	2	3	4
<i>Administrative & supporting</i>				
Farm Supervisor (Ag) Gr. II	1		1	—
Senior Farm Supervisor (Vety)	1		1	—
Farm Supervisor (V) Gr. I	1		1	—
Farm Asst. (V) Sr. Gr.	2		2	—
Farm Assistant Sr. Gr. (A)	1		1	—
Farm Asst. (Ag) Gr. I	2		2	—
Farm Asst. (Ag) Gr. II	2		—	2
Tractor Driver Gr. II	1		—	1
Technician Sr. Gr.	1		1	—
Field Supervisor/Class IV			1	—
Maistry	2		2	—
Mazdoor Hr. Gr.	4		2	2
Mazdoor	5		5	—
Pump Operator	2		2	—
Administrative Assistant	1		—	1
Sr. Gr. Asstistant	1		—	1
Assistant Gr. I	1		—	1
Assistant Gr. II	3		3	—
Sr. Gr. Typist	1		1	—
Driver Gr. I	1		1	—
Peon Spl. Gr.	1		1	—
Peon Hr. Gr.	1		1	—
Watchman	7		7	—

2.12 CATTLE BREEDING FARM, THUMBURMUZHI

Thumburmuzhy, 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 Thumburmuzhy. By the end of 1957, a Cattle Breeding Research Station was started at Thumburmuzhy with the financial assistance from the Indian Council of Agricultural Research. The dry cattle salvage farm was wound up in 1962. The ICAR scheme was continued upto 1969. Since then a livestock farm was started under the Animal Husbandry department. On 1-2-1972 this farm was taken over by the Kerala Agricultural University and is now functioning as a Cattle Breeding Farm.

The total area of the farm is 73.3 acres. Fifty acres of this area is utilised for fodder and coconut cultivation. The fodder varieties cultivated are guinea, hybrid napier, para and congo-signal. At present the farm has 540 bearing and 170 young coconut trees.

The main objectives of the farm are rearing the calves upto the first calving, selection and breeding of cross bred cattle and conducting applied research, conducting basic and applied research on cross-bred calves and heifers and to extend facilities of veterinary aid, artificial insemination of cattle and supply of improved varieties of fodder slips to the farmers of the surrounding area.

Staff

The details of staff sanctioned, in position and vacant are given below:

Category	Sancti- oned	In position	Vacant
<i>Scientific staff</i>			
Assoc. Professor	1	1	—
Jr. Asst. Professor	1	1	—
<i>Administrative & Supporting</i>			
Administrative Assistant	1	1	—
Assistant Grade I	1	1	—
Assistant Grade II	1	1	—
Peon Hr. Grade	1	1	—
Farm Supervisor Gr. I (Vety.)	1	1	—
Farm Supervisor(Ag.) Gr.I.	1	1	—
Farm Assistant (Vety.) Gr. I	2	2	—
Pump Operator	1	1	—
Herdsman (Spl. Gr.)	1	—	1
Herdsman	4	4	—
Pharmacist	1	1	—

Change of personnel

Dr. B. Nandakumar, Associate Professor, Animal Breeding and Genetics was the Head of the Station from April, 1991 to June, 1991. From 91 July to 92 January Dr. Sosamma Iype, Professor, Animal Breeding and Genetics was holding charge. From February, 1992 she is holding additional charge of the post.

The farm had been rearing calves upto the first calving. Earlier, during the year the farm started retaining milch animals and producing milk. The farm started using frozen semen from superior bulls as a beginning to produce breeding bulls. A small unit for conservation of germ plasm of Vechur cattle and other dwarf cattle of Kerala was started during the year.

2.13 CATTLE INFERTILITY SCHEME, VELLIMADUKUNNU, KOZHIKODE

The Cattle Infertility Scheme that had started functioning at the Veterinary Hospital, Calicut from 1-9-80 was shifted to a rented building at Vellimadukunnu in 1984.

The aim of the scheme is to conduct research on infertility and to find out the incidence, nature and magnitude of prevalence of infertility conditions among cross bred cattle of Kerala.

Under the regional centre at Calicut, 7 ICDP sub-centres and 3 veterinary hospitals were selected and regular monthly visits are conducted for screening of cattle for various infertility conditions. In addition, infertility camps organised by the Animal Husbandry Department and Dairy Departments were also attended by the technical staff of this scheme.

The various forms of infertility condition noticed during detailed investigation were Anoestrus, Endometritis, Repeat breeding, Metoestral bleeding, prolonged oestrus, silent oestrus and other miscellaneous conditions.

Dung examination, worm infestation and urine discharge examination for entrometritis cases were also done.

The scientific staff of this centre also attended several seminars and infertility camps organised by the State Department of Animal Husbandry, Dairy Development and Farm Information Bureau.

2.14 UNIVERSITY VETERINARY HOSPITAL, KOKKALAI

This referral Veterinary Hospital was started in the year 1928 in the Cochin State and is situated in the heart of Thrissur town with a campus area of 1.2 acres; this being the oldest of its kind was taken up by Kerala Agricultural University in the year 1972. This hospital has three speciality units viz. Medical Unit, Surgery Unit and Gynaecology (Animal Reproduction) unit with artificial insemination centre for cattle, buffaloes and goats. Residential quarters are being provided for the officers in order to attend the emergency cases brought outside the hospital hours. The clinical laboratory is also functioning in the campus. The staff position of this hospital is as follows:

Dr. K. Ramadas continued as the Professor & Head during the period.

Teaching and Technical staff

Professor & Head	: 1
Assistant Professor	: 1
Farm Assistants	: 2
Pharmacist (on working arrangement)	: 1

Administrative staff

Section Officer	: 1
Sr. Gr. Assistant	: 1

Supporting staff

Class IV employees	: 3
Sweeper-cum-Scavenger	: 1

Besides the above staff members, teachers from College departments like Medicine, Surgery, Animal Reproduction and Parasitology attend different speciality units for imparting clinical training to the undergraduate and post-graduate students.

Functions

This hospital imparts clinical training to the undergraduate students of 3rd, 4th & 5th year B.V.Sc. & AH course and 1st & 2nd year M.V.Sc. students of Clinical Medicine, Preventive Medicine, Surgery & Animal Reproduction.

Expert treatments to all types of animals are given hereby Professors of various teaching departments. Cases are attended to regularly from 8 A.M to 5 P.M and then during the other times by the resident officer.

A brief account of the cases treated during the year 1991-92 is shown below.

Total cases treated	: 26,840 (referred cases 1600)
P.A.R vaccination	: 405
R.D & Fowlpox vaccination	: 11,983
Castration	: 28
Operation (Major)	: 8
„ (Minor)	: 830
Clinical materials examined	: 3500 samples (Referred samples -1500)

Research

Various research schemes on diseases of the animals are also operated here. This includes clinical trials with newer drugs, studies on reproductive disorder of animals and cheaper techniques for treatments including surgery.

Other activities

Expert veterinary advices on disease problems are given to the farmers by the hospital.

Preventive vaccination/inoculation against various animal/bird diseases are being given at this hospital.

Clinical materials received from field veterinary centres are being analysed here and necessary advices are also given by the hospital.

2.15 UNIVERSITY LIVESTOCK FARM, MANNUTHY

The University Livestock Farm, Mannuthy, having a Livestock Section, a Fodder Section, a Farm Clinic and a Central Pool of labourers attached to it, is an instructional farm under the College of Veterinary and Animal Sciences having a total area of 69 hectares of land. This farm provides learning facilities both at under graduate and post-graduate levels and provides training facilities to farmers apart from serving the needs of farms for their fodder seeds and slips. It undertakes problem oriented research projects on livestock farming applicable to Kerala conditions.

Staff

Dr. P. A. Devassia, Professor, continued to be the Head of office. The detailed list of staff is appended.

Livestock section

Animals as on 3/92:

Milch cows	:	153
Dry animals including experimental animals	:	163
Bullocks	:	4
Calves	:	38
Total	:	<u>358</u>
Total annual milk production	:	1,61,298.4 kg

Labourers

Male	:	47
Female	:	19

Fodder section

Out of the total area of 69 hectares of land, 15 hectares are located in the plains and the rest in the hilly area of the farm. More area was brought under slurry and sprinkler irrigation during the period under report. There is no waste land in the farm.

Annual fodder production

Grass	:	2316.235 M. T.
Maize	:	100.850 M. T.
Silage	:	1194.400 M. T.
Total	:	<u>3611.485 M. T.</u>
No. of fodder slips distri- buted to public	:	1,22,700 ..

Labourers

Permanent Labourers

Male : 29

Female : 54

Casual Labourers

Male : 41

Female : 4

Total : 128

Farm clinic

Provides clinical training to both under-graduate and post-graduate students. Experts from all [disciplines of the college attend the farm clinic.

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 I. C.A.R. and the Government 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 four 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 25 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. D. M. Thampy, Professor (Aquaculture) was in Additiona charge of the Dean during the period under report.

Departments

The College of Fisheries continued to function with the following seven departments.

1. Department of Aquaculture.
2. Department of Fishery Biology.
3. Department of Fishery Hydrography.
4. Department of Fishing Technology'
5. Department of Fishery Engineering.
6. Department of Processing Technology.
7. Department of Management Studies.

Department wise staff

Dr. M. J. Sebastian, Dean (on leave)

Dr. D. M. Thampy, Dean-in-charge (full period)

Designation	Strength			Remarks
	S	P	V	
Professor	4	3	1	Prof., Fishery Biology, expired on 25.1.'92.
Associate Professor	12	11	1	Fish. Engg. vacant for full period. (2 posts Asst. Professors working)
Assistant Professor	20	14	6	In One post JAP working (One vacant from 1.8.'91, others vacant for full period)
Jr. Asst. Professor	14	4	10	One vacant from 1.8.91, others full period.
Sr. Administrative Officer	1	1	--	
Section Officer	3	3	--	
Asst. Librarian	1	1	--	Since 20-1-1992.
Reference Assistant	1	1	--	
Sr. Office Supdt.	2	3	--	One on working arrangement.
Office Supdt./Sr. Gr. Typist	4	4	--	
Sr. Gr. Assistant	6	6	--	
Assistant Gr. I	4	4	--	
Assistant Gr. II	2	1	1	Vacant from 19.3.'92
Lab. Assistant Gr. II	2	2	--	
Lab. Assistant Gr. III	3	3	--	
Clerical Assistant (Library)	1	1	--	
Technician Gr. I	1	1	--	
Steward	1	1	--	
Duplicator Operator	1	1	--	
Pump Operator	1	1	--	
Driver H. D. V	1	1	--	
Driver L. D. V.	3	3	--	
Bus Attendant	1	1	--	
Farm Assistant Gr. I	1	1	--	
Fieldman (Fisheries)	2	2	--	
Fisherman-cum-watchman	1	1	--	
Class IV	7	7	--	
Skipper	1	4	1	
Engineer i/c	1	--	1	
Gear Technician	1	--	1	
Deck hand	4	--	4	
Research Fellow	2	1	1	One vacant from 28/1/'91.

Changes in staff position

One post of Professor, Fish Processing has been shifted temporarily to the Department of Aquaculture.

Faculty Improvement programme

No scientific staff are deputed for higher studies during the period.

Seminars/Symposia/training programmes attended by scientific staff

Seventeen members of the Scientific staff attended fourteen Symposia/Seminars etc. in different centres of the country.

Academic programme

Department of Aquaculture

Courses under the UG and PG Programmes in the discipline of Aquaculture were offered by the department.

Department of Fishery Biology

Courses under the UG and PG programmes in Fishery Biology and in the minor fields of M. F. Sc. (Aquaculture) were offered.

Department of Fishery Hydrography

Courses under the UG programme in Fishery Hydrography and in the minor fields of M. F. Sc. (Aquaculture) were offered.

Department of Fishing Technology

Courses under Gear Technology I and II, Fishing methods, Onboard fishing experience, Navigation and Seamanship and Physical Education were offered for the UG programme.

Department 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.

Department 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 Aquaculture and Fishery Biology M. F. Sc. programmes.

Department of Management Studies

Courses like Statistics, Economics, Extension, Commerce, Management, Co-operation and Banking and related subjects were offered for the B. F. Sc. Courses under the minor fields of M. F. Sc. (Aquaculture & Fishery Biology) programmes were also offered.

U. G. Course**a) Strength of students as on 31/3/1992**

Batch	Men	Women	Total
1986	10	5	15
1987	7	7	14
1988	7	8	15
1989	11	2	13
1990	7	6	13
1991	16	9	25
Total	58	37	95

	Men	Women	Total
b) No. of outside students (One each from Lakshadweep, Manipur & West Bengal)	3	Nil	3
c) No. of students who obtained their degree during the year.	5	1	6

P. G. Programme**a) Strength of students as on 31.3.1991.**

Batch	Men	Women	Total
1990	1	2	3
1991	4	1	5
Total	5	3	8

b) No. of outside students	Nil		
c) No. of students who obtained their degree during the year.	Men	Women	Total
	4	4	8

Ph.D : Not offered

Details of Scholarships, awards and other financial assistance to the students

Name of Scholarship/Award	No. of Recipients
I.C.A.R. Jr. Fellowship for M.F.Sc.	4
K.A.U. Jr. Fellowship for M.F.Sc.	3
Educational Concession from Fisheries Department	9
-do- from Harijan Welfare Dept.	15
-do- from S. T.	1
Dr. N. Kunjan Pillai Memorial Endowment	2
Govt. of India Merit-cum-Means Scholarship	4
K.P.C.R.	2
KAU Merit Scholarship.	9
District Merit Scholarship.	1
Dr. Renji P. George Memorial Endowment	1

Practical Training Programme

Under "Earn while you Learn" programme, training in "Fish-livestock-crop" mixed farming was undertaken by the students. Work experience was given to the students in fish farms and processing plants. Under the practical training programme, fishing trips and field trips for operation of Oceanographic instruments were conducted for the students.

Study tour

No study tour was conducted during the period.

Extra/Co-Curricular Activities:

N.S.S. Programmes

Sri. T. M. Sankaran, Associate Professor attended the Refresher Course for Programme Officers from 23rd to 28th September, 1991 at the Training and Orientation Centre, Rajagiri College of Social Sciences, Kalamassery.

Sri. P. K. Mohammed, Training Co-ordinator, N.S.S., visited the College on 31st October, 1991 and addressed the Student Volunteers on Village Adoption.

Sri. T. M. Sankaran, Programme Officer and four girl volunteers attended the 'Leadership Development Camp' held at Aluva, from 24th to 28th November, 1991, organised by K.A.U. in connection with the observance of SAARC-Decade for Girl Child (1991-2000 AD).

Students Union Activities

Students Union was also very active during the period.

The Students Union 1991-92 was inaugurated by Sri V. J. Kurian, IAS, District Collector on 10-3-1992 in a function organised at the College. The Planning Forum was inaugurated in the function by Sri Kerala Varma, Member K.A.U. General Council. The Arts Club was inaugurated by noted writer Dr. Thonnakkal Narayanan, Advocate M. M. Abdul Aziz, Chairman, Bar Council, Kerala gave felicitations on the occasion.

Sri Alex P. Lukose, Reader (Industrial Psychology), School of Management Studies, Cochin University of Science & Technology gave a talk on "How to Succeed in an Interview" in a function organised at the College on 4/7/1991 under the auspices of the Students' Union.

Inter-Class Arts Competition was conducted at the College on 31st July, 1991.

Hostels

Name of Warden	: Dr. D. M. Thampy, Dean-in-charge,
Name of Asst. Warden	: Dr. I.S. Bright Singh, Asst. Prof. (upto 30/6/1991) Dr. P. M. Mathew, Professor. (from 1.7.1991).
Name of Steward	: Sri M. M. Babu
Hostel Strength:	
Boys	: 49
Girls	: 24

Library

The details of books & journals in the College Library are as follows:

	Books (including reports, Bulletins etc.)	Journals subscribed	
		Indian	Foreign
No. as on 1-4-1991	9711	49 titles	70 titles
No. as on 31-3-22	10449	49	70
Additions during the period	738	Nil	Nil

Instructional Farm

Out of the 30ha. proposed for the Campus only 28.49 are now in possession, of which approximately 10 ha. are wetland and the rest garden land. A significant portion of the garden land has been occupied by buildings, roads and playgrounds. In the remaining garden land Coconut is the main crop and there are 1252 nos. of yielding trees. Cultural and manurial operations were not done routinely as a large number of trees are to be cut and removed for construction purposes. The yield obtained during the period was 36. 128 nuts (approximately 29/tree/year).

Out of the Wetlands 5 ha. 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 brackish-water fish and prawn culture is practised.

Steps are being taken to increase the production of table fish, prawn, fish seed, freshwater prawn seed and aquarium fishes.

At Puduveypu Station adequate arrangements were made within the tide inundated areas to entrap more fish seed, coconut seedlings planted in additional areas; seasonal vegetable cultivation undertaken on pond bunds and manuring for coconut palms carried out.

RESEARCH PROGRAMMES

New Research Programmes approved

The Faculty Research Committee (Fisheries) met once during the period and approved the following Five Post-graduate projects for implementation :

Effects of various growth promoters in the diets of *Macrobrachium rosenbergii* post-larvae.

Conditions for oxygen packed transportation of *Peneaus indicus* seed.

Evaluation of different protein sources in the formulated feed for *Macrobrachium rosenbergii*.

Investigations on head drooping in head on processed prawns.

Studies on the effect of purging the Freshwater prawn—*Macrobrachium rosenbergii* in extending its ice storage life.

Ongoing Research Programmes

A total number of 10 Research Projects started earlier were also in progress during the period.

Research Highlights

Spirulina fusiformis culture has been developed using three different media, viz., Zarrouck's medium, CFTRI medium and medium containing rural water (1% cowdung and 1% cow urine). The protein level in *S. fusiformis* was found to be 60%. Feeding experiments using *Spirulina* as the sole source of protein for *Eetroplus suratensis* showed that 40% spirulina diet provides comparable growth with that of fish meal protein.

Studies conducted with detritus of plant origin as a food source for *Peneaus indicus* revealed that an exclusively detritus based diet is not suitable for *P. indicus* juveniles; but the plant detritus could be used to substitute upto 50% of the animal protein source in a standard prawn diet.

Work done to find out the effect of eyestalk ablation on growth and reproduction of *Macrobrachium equidons* showed that, while there was 68.75% survival rate in non-ablated prawns, only 40.63% survival was there in unilaterally ablated ones. Bilaterally ablated specimens showed 100% mortality.

Lowering of temperature of the packing medium, rather than applying sedatives, has been found as a suitable method for increasing the survival during oxygen packed transport of *P. monodon* seed.

Clam meal has been found as the best protein source for preparation of feed for *Chanos chanos fry*, as compared to fish

meal, squid meal, prawn head waste meal and soyabean meal. Protein from animal sources gave better growth rate in the fish than the protein from plant sources.

Rearing of fish fry using water filtered with 30 nylobolt could considerably reduce mortality level in earthen nurseries as against their heavy toll in the characteristic turbid water conditions prevailing at Puduveypu.

Arranging series of pits in suitable areas along mudflats could entrap commercial fish seed in large numbers during tidal inundation at Puduveypu.

Studies on the breeding biology of *Villorita cyprinoides* in relation to salinity gradients showed a positive correlation between the bottom salinity and the gonadal maturity and spawning of the clam. A correlation could also be observed between a predominantly brackishwater condition with moderate salinity and protracted spawning in *V. cyprinoides*.

In *Macrobrachium idella*, unilateral eyestalk ablation did not have any acceleration effect on ovarian maturation and ovulation. Absence of male for a prolonged period of time resulted in impaired ovarian maturation and ovulation in females. A male pheromons may play a significant role in reproduction in female *M. idella*.

Papers presented in Symposium/Conference

The Scientists of the College have presented the following research papers during the period.

1. K. V. Jayachandran and T. M. Jose. Effect of unilateral eyestalk ablation and male deprivation on ovarian maturation and ovulation in *Macrobrachium idella idella* during the post breeding season. XIII National Conference on Comparative Animal Physiology, 18–20 November, 1991, Thiruvananthapuram.
2. K. V. Jayachandran. Hydrographical features and prawn fauna of Aukulam lake, Thiruvananthapuram. Symposium on Coastal Management Problems of Kerala. CWRDM, 25 March, 1992, Kannur.

Extension programmes

Village adoption

The Scientists of the College of Fisheries have organised and participated in various Extension programmes as detailed below during the period.

The members of the Scientific staff participated in AIR Programmes and broadcast 7 talks & discussion on practical & scientific aspects of Fish Culture.

The scientific staff of the College rose to the occasion in giving awareness to the fish farmers & public about the epidemic disease of fish and its control by organising timely group discussions, training camps and publishing handouts in dailies.

A One day 'Matsyakarshaka Mela', organised jointly by FFDA, Ernakulam and Kerala Agricultural University was conducted at the College during the period. Seventy five farmers attended the Mela. An exhibition and film show were also arranged on the occasion.

The World Food Day, was celebrated in the college. A talk by Dr. M. K. Kandoran, Senior Scientist, C. I. F. T. on the topic 'Fish as a Source of Protein Food' was arranged in this connection. An exhibition depicting fishery products, byproducts and post harvest technology of fish was also arranged.

Malayalam week was celebrated by the college. Prof. M. K. Sanu delivered a talk on "Malayalam Language and Literature", on the occasion.

A talk by Prof. N. Appukuttan Menon on "Environmental Problems" was also arranged for the benefit of the staff and students.

The members of the staff of the College published three popular articles in the details for the dissemination of latest technology developed in the field of fish culture.

Apart from this, several training programmes were also conducted in the college for various agencies engaged in fish culture.

Training on 'Freshwater Prawn Hatchery Techniques' was offered to the Assistant Professors of the Fisheries College, Tuticorin

Training programmes on 'Intensive Rearing of Carp Seed. for a duration of 14 days was conducted for the research/extension' officers of the Department of Fisheries.

Training on 'Freshwater Fish Culture' organised jointly by the FFDA and KAU was conducted at the College for the fish farmers. The duration of the training programme was one week.

A One-Day Training programme on 'Fisheries Technology' was conducted for Agricultural Farm Assistants, sponsored by R.T.A.C.

Training programme on 'Biofertilisers' was organised and conducted for Farm Assistants sponsored by R.T.A.C.

Visitors

Dr. Osman Ozden, Associate Professor, Fisheries College, University of Aegean, IZMIR, Turkey; I.C.A.R. visiting team consisting of Dr. A. L. Choudhary, VC., Haryana Agricultural University; Dr. R. K. Grover, Emeritus Scientist, H. P. K. V. V., Palampur; Dr. I. V. Subba Rao, Director of Research, APAU; Dr. Sankar Manjhi, Principal Scientist, ICAR and Dr. Steven Ridgeway of Humber-side International Fisheries Institute, visited the College.

Besides students from the V.H.S.E. Schools at Kadamakkudy, Cheriazheekkal, Malampuzha; Zoology students from U.C. College, Aluva; St. Thomas College, Palai; students from Mandapam Regional Centre of CMFRI; Trainees from MPEDA and students sponsored by Scheduled Caste Development Directorate visited the college during the period.

3.2 FISHERIES STATION, PUDUVEYPU

An area covering 101.12 ha. belonging to the Revenue Department, Government of Kerala was handed over to Kerala Agricultural University on 16/7/1979 for establishment of an instructional farm for brackishwater fish and prawn culture. The farm is located at a distance of about 2 km to the west of Muri-kumpadom Road. Arabian sea in the west, Cochin barmouth in 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. Also there are 915 coconut palms including seedlings of which about 340 nos. are yielding.

Imparting practical training on brackishwater fish culture for B. F. Sc, & M. F. Sc. students, collection and distribution of cultivable varieties of shell fish and finish, conducting various experiments to develop appropriate fish 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.

Other scientific staff in position

Sri. M. M. Jose, Associate Professor (NC).

Though one post of Junior Assistant Professor was sanctioned, no posting was made during the period.

Details of staff are given in Appendix.

Seminars/symposia/workshops attended

Sri. K.S. Purushan, Associate Professor has attended two seminars and one workshop related to fish culture.

Involvement of staff in the academic programmes

Theory and practical training classes on different aspects of brackishwater fish and shrimp farming were imparted to the PG and UG students of the Fisheries College. The various techniques of fish seed collection and rearing were taught during the training programmes. Classes were also offered to B. Sc. (Ag.), M. Sc. & B. Sc. (Zoology) students on the significance mangrove conservation with special reference to fisheries.

Research programmes

Of the total four approved research projects, three are in different stages of progress. Remaining one is scheduled to be implemented very soon.

Ongoing projects

*FPV Ag 4/83: Mixed culture of *Lates calcarifer* and *Oreochromis mossambicus* in brackishwater ponds.*

In view to arrive at an optimum stocking ratio between *Lates calcarifer* and *Oreochromis mossambicus* 4 treatments in the ratios of 1:7, 1:10, 1:13 and 1:16 were begun during November '91. In all the four ponds uniform sized specimens in respect of each species were stocked altogether maintaining a stocking density of 5000 nos/ha. Periodic exchange and cowdung manuring @ 2000 kg/ha was done at monthly intervals.

Preliminary data upto March 92 indicated that the mean growth of *L. calcarifer* was increasing corresponding to the increase in the ratio of *O. mossambicus*. However, quantum increase was almost similar i.e. 1.8 tonnes more in the 1:13 and 1:16 ratio ponds than the lowest ratio of 1:7.

On the contrary, the mean growth of *O. mossambicus* was seen decreasing with increase in the stocking ratio. In all cases, considerably low values were always seen associated with females.

*FPV Ag 18/89: Development of broodstock and hatchery production of *Lates calcarifer*.*

Broodstock maintenance was continued retaining 2-5 year class specimens in separate grow outs. Regular night feeding with chopped trash fish and periodic exchange was done to promote faster growth.

So far gonadal maturity was not seen even in specimens above 5 kg. weight. Perhaps, the limitations in the brackish water

pond conditions might be hindering the gonad development. However, better management methods are being pursued to attain success.

FPV Ag 6/92: Studies on the reproductive biology and induced breeding of grey mullet.

Broodstock of *Mugil cephalus* is being developed in the culture ponds of the station. Specimens belonging to different year classes are kept separately at low stocking density. In addition to manuring, supplementary feed was also provided. Important physico-chemical and biological parameters of the ponds were studied at regular interval. Growth assessment and maturity studies were also carried out adopting *in vivo* method to ascertain apt season for undertaking induced breeding trials. Ova diameter studies on the representative brood fish samples did not show any appreciable advancement in the maturity of gonads during the report period.

Research highlights

The mean growth of *L. calcarifer* progressively increased corresponding to the increase in stocking ratio with *O. mossambicus*. However, a stocking ratio between 1:13 & 1:16 promoted better growth of the former. In contrast, the mean growth of the latter gradually decreased with increasing ratios.

The characteristic turbid conditions of the culture system at Puduveyppu do not seem to promote gonadal maturity of *L. calcarifer* and *O. mossambicus*.

Rearing of fish fry using water filtered with 30 nylobolt could considerably reduce mortality level in earthen nurseries against mud flats could entrap commercial fish seed in large numbers during tidal inundation.

Action taken for improving farm revenue

Adequate arrangements were made within the tide inundated campus areas to entrap more commercial fish seed.

Fish culture was done in all the ponds.

Seasonal vegetable cultivation on pond bunds was undertaken.

Timely manuring and fertilizing of coconut palms was carried out.

Coconut seedling was planted in additional areas.

Visitors

Post-graduate students from Bethene College, Calcutta, B.F.Sc. students and students of V.H.S.E from Arthungal visited the Station. Besides Dr. S. C. Thewari, Senior Scientific Officer,

Dr. K. V. Panikar, Deputy Director, Dr. Arunachalam, Officer i/c of Mosquito Control Project, Dr. Krishna Rao, Dr. Jose Stephen and Dr. K. M. Mukundan from CIFT, Dr. P. R. S. Thampi, Deputy Director General, ICAR, Dr. Sakthivel, Director and Dr. Krishnamoorthy, Deputy Director from MPEDA and Dr. K. H. Mohammed (Retd) Scientist from CMFRI also visited the station during the period.

Extension programmes

Village adoption programme

As part of KAU extension activity, Village adoption programme was implemented during the report period. Twenty five harijan families residing in a colony at Nayarambalam Panchayat were selected and provided them with critical puts as detailed below:

Item	Qty. distributed
Watering pots	25 nos
Feeding tray	25 nos
Vegetable seed	665 gm
Vegetable mixture	25 kg
Coconut mixture	69 kg

Publication of popular articles

With a view to attract more entrepreneurs into scientific fish farming activities, popular articles were published in leading national and regional news papers as well as in farm journals like 'Kalpadhenu' 'Kerala Karshakan' etc.

Radio talks

In order to disseminate information regarding shrimp and fish farming, radio talks were given and broadcast over Thiruvananthapuram, Thrissur and Kochi stations of All India Radio.

Technical guidance in fish farming

Information on viable techniques of brackishwater shrimp and fish farming were passed on to the enthusiastic farmers and pisciculturists by way of personal discussions and distribution of extension literature. Scientific fish farming was promoted by supplying 28,380 seed of commercially important varieties of fishes and shrimps.

4 FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY

4.1 KELAPPAJI COLLEGE OF AGRIL. ENGG. & 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 the former 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 and Technology on 2nd October 1985 and the Institute was upgraded and renamed as Kelappaji College of Agricultural Engineering and Technology after the famous Gandhian, Social worker and Sarvodaya Leader. The total area of the campus is 40 hectares.

Prof. T. P. George continued as Dean i/c. List of staff appended.

Departments

- Department of Supportive and Allied Courses (SAC)
- Department of Irrigation and Drainage Engineering (IDE)
- Department of Post Harvest Tech. and Agri. Processing (PHT and AP)
- Department of Land and Water Resources and Conservation Engineering (LWRCE)
- Department of Farm Power, Machinery and Energy (FPME)

Academic programmes

Strength of students under each programme during 1991-92

Name of course	Yr. of admn.	M	W	No.of outside students	Total
<i>Under graduate programme</i>					
B. Tech. (A.E)	1991 admn	11	7	—	18
-do-	1990 admn	9	11	—	20
-od-	1989 admn	17	14	—	31
-do-	1988 admn	21	14	1 (Ethiopia)	35
-do-	1987 admn	1	—	—	1
-do-	1986 admn	2	—	—	2
-do-	1985 admn	1	—	—	1
<i>Post graduate programme</i>					
M. Tech. (A.E)	1991-92	4	4	—	8
-do-	1990-91	4	5	—	9

No. of students who obtained their degree during the year

Name of course	Men	Women	Total
B. Tech. (Ag. Engg.)	17	5	22
M. Sc. (Ag. Engg.)	1	—	1

Practical training programme

The M. Tech. students were sent for training to the Department of Soil Conservation and KAMCO respectively during their semester break for a period of two weeks.

Study tour

The 1988 batch B. Tech. students were on All India Study Tour from the 1st to 26th, November 1991.

The 1989 batch B. Tech. students were sent for All Kerala Study Tour during September 1991.

Details of Scholarships, Awards to Students

KAU Merit Scholarship to the B. Tech. (Ag. Engg.) students

	No. of recipients
a) 1986 admn. students for the academic year 1989-90	3
b) 1987 admn. for the academic year 1989-90	3
c) 1988 admn. for the academic year 1989-90	3
d) 1987 admn. for the academic year 1990-91	3
e) 1988 admn. for the academic year 1990-91	3
f) 1989 admn. for the academic year 1990-91	3
National Merit Scholarship	3
District Merit Scholarship	1
NCERT National Talent Search Scholarship	1
Educational concessions to SC/ST students	10
Educational concessions to OEC students	1

Extra-curricular activities:

Students Union activities:

Students Union was very active during the year. The important activities are listed below:

Programme	Date
Inauguration	17-1-91
Elocution competition	14-4-91
Sameeksha inauguration	22-4-91
A class on Youth and Personality	22-4-91
Agro-Folk Horistics	29-4-91
Campus beautification	3-6-91
Talent-time 91	24-7-91 to 1-8-91
Film Fest 91	17-7-91 to 21-7-91
Medical aid camp	28-7-91
Leadership Training Workshop	3-8-91
Cross-country competition	4-8-91
UTSAV 91	16-9-91 to 23-9-91
Quiz competition	9-12-91
Merit Eve	20-12-91
College Magazine published	17-9-91

N. S. S. activities

The N. S. S. Unit of the College has a volunteer strength of 70 students for regular activities and 35 for special camping programme. Sri A. P. Gopalakrishnan, Research Assistant continued to function as the Programme Officer of the Unit for the year 1991-92.

The important activities undertaken by the N. S. S. Unit during the year are as follows:

Community centre

The community centre run by the Unit in the adopted village continued to function with facilities for reading news paper and periodicals. The centre was frequently visited by the N. S. S. volunteers and the villagers were provided with information on various aspects relating to Agriculture, Agricultural Engineering and Health Education. This frequent visits helped the volunteers maintain rapport with the farmers and youths in the local area and to understand the problems faced by them.

Mass Literacy Programme

The International Literacy Day was celebrated on September, 8, 1991 and about 50 volunteers took the pledge that they would sincerely involve in the programmes organised for the eradication of illiteracy. An orientation training was organised with the co-operation of Tavanur Saksharata Samiti to orient the volunteers to the various programmes of Second Phase of the State Saksharata Campaign. Their services were utilised for conducting the Literacy Survey on 5th June 1992. The volunteers also participated in all the convention and motivational programmes organised by the Saksharata Samiti.

Health programme

A group of 15 volunteers were trained in the promotion of education leading to community action for proper health practices with the help of Primary Health Centre, Tavanur and the socio-Economic Units, Kerala. Those trained volunteers conducted house visits on 6th and 7th July 1991 and demonstrated the proper storage and use of drinking water for better health and hygiene. All the volunteers participated in the Medical Camp organised by the Students Union of the College and seven volunteers donated blood to the patients in the Taluk Hospital, Ponnani.

National and International Day Celebrations

The Birth Centenary of Dr. Ambedkar was celebrated on 10th April 1991 with a talk on the 'Dreams and Accomplishments of

Dr. Ambedkar' by Prof. P. R. Nair, Editor, 'Dharma Kahalam'. An elocution competition was conducted and prizes distributed to the winners.

The World Environmental Day was celebrated on 5th June 1991 and 34 volunteers participated in the one-day camp for the beautification of the campus. In addition to this, Independence Day, Republic Day and Gandhi Jayanthi were also celebrated in a befitting manner.

Participation in camps

Three girl volunteers of the College attended the Leadership Development Camp organised in connection with the observance of the SAARC Decade of the girl child at the YMCA Camp Centre, Aluva from November 24th to 28th 1991. Two volunteers participated in the Nature Study Camp at Begur from 13th to 15th December 1991. One of the N. S. S. volunteers of the college took part in the 7th Inter-University Elocution Competition held on 1st February 1992 at the Bishop Moore College, Mavelikkara.

Special camping programme

The college level 5-day special camping programme was conducted at the Girijan Colony, Chokkad from 13th to 17th March 1992. Thirty N. S. S. volunteers, 2 teachers and 3 non-student youth from the locality participated in the camp. Road construction and cleaning and levelling the area for a public play ground were the two field works undertaken during the camp. Study of the problems of the tribals in the colony, nature study camp, organising competitions for the colony children and cultural programmes were the other features of the camp. Classes on topics relating to youth and social change, saksharata, health and sanitation, welfare of weaker section etc. were also arranged for the benefit of tribals as well as the volunteers of the camp.

Tournaments, Championships etc

The annual sports and games for the year 1991-92 were held during August 1991.

The college team participated in the KAU inter-collegiate tournaments and won the following places;

Volleyball	-- Women	-- 1st place
Table Tennis	-- Women	-- 1st place
Athletics	-- Women	-- 3rd place
Ball Badminton	-- Men	-- 1st place
Basketball	-- Men	-- 2nd place
Athletics	-- Men	-- 3rd place

Six students were selected to represent the University in the Inter-University tournaments in Ball Badminton, Table Tennis and Athletics.

The college women team won the District Championship in Table Tennis.

The college team participated in the Malappuram District Basketball, Volleyball and Athletics.

HOSTELS

Ladies hostel

Name of Warden	:	Prof. T. P. George
Name of Asst. Warden	:	Smt J. Renukakumari
Name of Matron	:	Smt K. K. Chandra
No. of teaching staff residing in the hostel	:	two
No. of non-teaching staff residing in the hostel	:	two
Total inmates in the hostel	:	55

Men's hostel

Name of Warden	:	Prof. T. P. George
Name of Asst. Warden	:	Dr. M. Sivaswami
Name of Steward	:	Sri M. Radhakrishnan
Total inmates	:	68

Faculty Improvement Programme

New post sanctioned/created/shifted/abolished : Nil

Deputation of staff for higher studies

Smt K. Nandini, Jr. Asst. Professor deputed for Ph. D. programme from 26-2-1991.

College Library

Books as on 1-4-91	:	16370 nos.
Books addition made upto 31-3-92	:	96 nos.
Journals—Foreign as on 1-4-91	:	32 nos.
Journals—Indian as on 1-4-91	:	35 nos.
Book Bank Scheme :		
Books purchased (from 30-3-91 to 23-11-91)	:	86 nos.

Instructional Farm

Sri P. Rajendran, Jr. Asst. Professor continued to be in charge of the Farm.

Labour strength as on 31-7-1992 :		
Permanent Men	:	23
Permanent Women	:	25
Casual Women	:	7

Cropping

Paddy

Season	Variety	Area (ha)	Seed	Bulk	Production (in kg)		
					half filled	Total	Average
I crop 1991	Red Triveni	5.6	11750	1638	718	14106	2529
	Jyothi	3.0	3600	1680	344	5624	1875
	Total	8.6	15350	3318	1062	19730	2290
II crop 1991	Red Triveni	2.9	5630	1645	195	7470	2576
	Jyothi	0.3	150	613	33	796	2653
	Total	3.2	5780	2258	228	8266	2583

Coconut

During the period 57897 nuts have been produced from about 900 palms. Good quality coconut seedlings (2073 Nos.) have been distributed to the public.

Vegetables

One hectare of land was cropped with vegetables and the production was 3705 kg vegetables and 26.25 kg vegetable seeds.

Banana

400 nendran suckers planted during the year and would be ready for harvest during the Onam season.

Others

1220 numbers of pepper vines and 75 numbers of coconut seedlings have been planted newly in the farm.

Farm Development

Underground pipe line has been newly installed for irrigating about 2 hectares of coconut plantation. Action has been initiated to extend the pipe line irrigation system to irrigate 2 more hectares of coconut during this year. Steps have been taken to instal a permanent irrigation cum drainage channel for efficient water management in the paddy fields and lowlying coconut garden. On completion of this, it would benefit about 10 hectares of farm land.

Research Programmes

Department-wise Research Projects

Department of Irrigation & Drainage Engineering (IDE)

A new project funded by the CAPART started functioning. The objective of the project is to improve the efficiency and economy of existing 'PETTI AND PARA' pumps used for dewatering in Kuttanad and Kole lands. Four research projects are in operation.

Research achievements—Evaluated the performance of 'PETTI AND PARA' under widely varying field conditions and controlled laboratory conditions. Regression equations were developed.

Department of Post Harvest Technology & Agri. Processing (PHT & APS)

- a. Design of Solar Cabinet Dryer for Plantation Crops.
- b. Development of a Solar Cooker and Study of its performance.
- c. Low cost passive water heater.
- d. Design, fabrication and testing of a foldable type drier.
- e. Development and performance evaluation of a low cost paddy thresher.

Department of Land & Water Resources and Conservation Engineering (LWRCE)

The following research projects were completed during the year:

- a) Effect of different tillage methods on percolation loss in rice fields were determined at the Instructional Farm of the College.
- b) Design, fabrication and testing of a rainfall simulator. The fabrication of the simulator was completed and further experiments with this equipments are in progress.
- c) A computer simulation model was formulated and tested for the synthetic generation of stream flows.
- d) A solar powered drip irrigation system was designed and successfully tested.
- e) A low cost passive water heating method was designed and tested as a B. Tech. project.
- f) Infiltration and water advance studies under surge flow furrow irrigation.
- g) Effect of land use on water yield from small agricultural watersheds of Western Ghats.
- h) Optimum farm planning—A systems approach.
- i) Development and evaluation of a pulsating microsprinkler irrigation system.

Department of Farm Power, Machinery & Energy (FPME)

Design, fabrication and performance evaluation of a low cost, hold-on type power paddy thresher.

A low cost power thresher was developed and tested. Its threshing efficiency was excellent and was 98%. But, cleaning efficiency was low. Modification under this aspect is going on.

Performance evaluation of selected tillage implements for paddy.

Under this, implements like desi plough, cage wheel and power tiller were tested and work is in progress.

M. Tech. Projects

Evaluation of spike tooth and rasp-bar type paddy threshers.

Development and testing of a manually operated paddy dibbler.

Development and performance evaluation of a low cost waterwheel for lifting water at low heads.

Optimum thresher parameters for high moist paddy.

Studies on tractor mounted paddy reaper.

Evaluation and modification of power tiller operated paddy reaper.

Design, development and testing of a cashewnut decorticator.

Design, development and testing of an arecanut dehusker.

B. Tech. Projects

Energy-inflow-out flow analysis of paddy cultivation with special reference to tillage treatments.

Design, fabrication and testing of a power operated groundnut decorticator.

Design and fabrication of a rotary maize dibbler.

Design and fabrication of a sieve for black pepper grading.

Externally Funded projects

AICRP on Farm Implements and Machinery:

One Assistant Professor, one Junior Assistant Professor, three Technicians and one Workshopmate were in position during the period.

Research Programme

The following research projects were implemented during the period

1. Evaluation of power tiller operated rice transplanter

An 8 to 10 hp power tiller has been purchased for operating the rice transplanter. ICAR supplied a rice transplanter free of cost. The work is in progress.

2 Evaluation of one meter vertical conveyor reaper-IRRI model (5 hp paddy harvester)

The unit was demonstrated in the farmer's fields at Palakkad Malappuram and Thrissur districts. The actual field capacity is 0.14 ha/hour. The farmers were satisfied with the performance.

3 Feasibility trials with raspbar and IEP-2 paddy thresher (paddy thresher with winnower)

A 7.5 hp flow through type raspbar paddy harvester had been evaluated at State Seed Farm, Tavanur, KCAET Farm and at farmer's fields at Athalur, Mathur and Ponnani area. The unit completes entire threshing, winnowing and cleaning operation of one ha crop within three hours. The average cleaned paddy out put is 10-15 kg/hour.

4 Feasibility trials on package of paddy equipments

Along with conventional tillage, tractor mounted rotary tiller was demonstrated at KCAET Farm. Detailed testing of paddy harvester and paddy thresher were undertaken during the year.

Extension activities

The following mass media programmes were organized/participated and conducted during the year under report for dissemination of latest technology developed in the field of agricultural engineering.

- 1 Tanur Education District Science Exhibition, Tanur on 23-10-91 and 24-10-91.
- 2 Training for Asst. Directors of Agriculture at Central Training Institute, Mannuthy on 26-11-1991.
- 3 Palakkad Agriculture Exhibition—1991
- 4 Thirunavaya Sarvodaya Mela Exhibition, Tavanur on 11-2-92 and 13-2-1992
- 5 Paddy Harvesting Mela-Manalur on 27-2-1992.

Seminars/Symposia/trainings attended/conducted

1 Dr M. Sivaswami, Asst. Professor attended the seminar conducted in connection with Palakkad Agriculture-1991 on 30-11-1991.

2 Training on agricultural machinery management was given to Agricultural Officers at C. T. I, Mannuthy.

3 Sri. V. R. Ramachandran, Jr. Asst. Professor and Sri Sathyajith Mathew, Jr. Asst. Professor attended the training on Research on Agricultural Implements and Machinery' organised by the C. I. A. E., Bhopal.

Publications

Prof. K. John Thomas had presented a paper on 'Development of a novel sand dredger' in the Kerala Science Congress held at Thrissur.

Sri Sathyajith Mathew, Jr. Asst. Professor presented a paper on 'Wind, a potential energy source for agricultural sector' in the Kerala Science Congress in 1991.

Book on floriculture industry in India co-authored by Sri Xavier K. Jacob, Asst. Professor of this College was published during the year.

5 K.A.U. SCHOOL, VELLANIKKARA

Kerala Agricultural University School was started in 1981 with a view to provide school education to the wards of University Employees in the Mannuthy and Vellanikkara campus. 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. The school secured 100% result in SSLC examination March '91 in its first attempt. Now it has become an attractive institution to the parents.

Staff

Eighteen staff under Teaching Section and 6 staff under non-teaching section worked in the KAU School during the period. Details are given in Appendix.

Strength of pupils during 91-92.

Std	Strength
LKG	40
UKG	46
I	41
II	52
III	38
IV	38
V	45
VI	48
VII	52
VIII	32
IX	35
X	28
Total	495

Extra curricular activities

A Science club and a Maths Club are functioning in the KAU School. During the academic year 91-92 the school lifted the first prize in 'working model' in the State Science Fair. Later it won the 2nd prize in the Southern Competition and was selected for the National Science Fair in 1992.

Parent Teacher Association

The Parent Teacher Association of the school is functioning properly. Shri N. K. Unnikrishnan, Section Officer, KAU Headquarters, Vellanikkara is the President of the Association.

CHAPTER III

Extension

The basic extension education role of the University is to make, useful information based on the findings of research available to the farmers and others through the Government departments concerned.

The Directorate of Extension is responsible for the Extension Education activities of the Kerala Agricultural University. These activities are undertaken through the Communication Centre, Farm Advisory Service, Training Service, Krishi Vigyan Kendras, Tribal Area Research Centre, National Demonstration Schemes, Scheduled Caste Area Research Centre, Lab-to-Land programmes and Village Adoption Programmes. In addition, the educational institutions and research stations under the University are also undertaking extension education programmes.

Dr. A. G. G. Menon continued as the Director of Extension.

Communication Centre

The major objectives of the Communication Centre is to provide information support to the Extension personnels of the State Development Departments and Voluntary Organisations. The Centre also acts as the connecting link between the Academic activities of the University and the progressive farmers in the state.

Dr. M. J. Thomas, Professor (Entomology) continued to be the Head of the Communication Centre.

Activities

A brief report of the activities of the Centre for the year 1991-92 is given under three major heads viz. (1) Publication Unit (2) Information Unit and (3) Farm Advisory Service.

Publication Unit

The following publications were brought out during the year:

(a) Periodicals :

- i) KAU Newsletter (English—Monthly) Vol. XVII (12); Vol. XVIII (1 to 12). Vol. XIX (1, 2).
- ii) "Kalpadhenu" (Malayalam quarterly). Vol. XVIII (1, 2, 3 & 4).

(b) Non-periodicals :

- i) Books :
 - 1. സസ്യശബ്ദാവലി
 - 2. കൃഷി പഞ്ചാംഗം
 - 3. Tips on vegetable seed production
- ii) Booklets
 - 1. KAU Today
 - 2. Rice Research Station, Vyttila
 - 3. സുബീജം സൂക്ഷ്മദ്രേ
 - 4. കശുമാവ്
 - 5. മിനോഷ്ണ മേഖലാ പഴവർഗ്ഗങ്ങളെ
- iii) Leaflets :
 - 1. കായ്കറികൾ — നൂറു മേനി
 - 2. കൃഷി കൃഷി
 - 3. ആഫ്രിക്കൻപായൽ — ജൈവനിയന്ത്രണം
 - 4. ഗ്രൂപ്പ് മാനേജ്മെന്റ് — ബെങ്ങുകൃഷിയിൽ
 - 5. ഹരിത — തെങ്ങിൻതോപ്പുകളിൽ ഇടവിളയായി വളർത്താൻ യോജിച്ച പുതിയ ഗിനിപ്പുല്ലിനം
 - 6. ജാലാമുഖി-ജാലാസഖി — മികച്ച രണ്ടു പച്ചമുളകിനങ്ങൾ
 - 7. കിരൺ — മികച്ചയിനം വെണ്ട
 - 8. V-26, ചറോടി 1 — മികച്ച രണ്ട് വൽപയനങ്ങളെ
 - 9. KVK Training Programme, Pattambi
- iv) Technical bulletins :
 - 1. Flush grafting in cashew
 - 2. Neoplasms in fish
- v) Course material : ഗുഡ് ധർമ്മ മൽസ്യകൃഷി

In addition to the above publications, sixteen other items were under various stages of preparation.

Information Unit

(a) KAU News through All India Radio:

Important items of news relating to the University and seasonal instructions to the farmers were gathered and broadcast regularly on every Friday through the All India Radio.

(b) Information support through print media:

Technical articles for the agricultural column in the leading Malayalam and English dailies were prepared and fed to the press. Seventy nine articles were published during the year under report.

(c) Agricultural quiz programme :

Five quiz programmes for the Vocational Higher Secondary School students were organised during the year.

(d) T. V. Programme :

In collaboration with the Doordarsan Kendra, Thiruvananthapuram a series of programmes on Crops and Animal Sciences were organised under the Nattinpuram programme. Proposals were also prepared for establishing a Video recording studio.

(e) Radio programme :

Talks and discussions on agricultural topics were arranged with the expert Scientists from the University.

(f) Exhibitions :

The University participated in the All India Agricultural and Industrial Exhibition organised in connection with the Thrissur Pooram Festival during April-May, 1991. Besides this major exhibition, University participated in three mini exhibitions conducted at Vellanikkara, Wayanad and Nilambur.

(g) Krishidarsan programme :

Seventeen Krishi darsan programmes were organised by this unit for various visiting groups.

(h) Graphic support :

The graphic section prepared 842 colour transparencies, 720 black and white prints and 93 colour blow ups for various stations/units in the University.

Farm Advisory Service

Seminars

Scientists in the Farm Advisory Service handled classes on various subjects in the following 45 Agricultural Seminars during the period. A total number of 5275 farmers were trained in these seminars.

Date	Place	District	No. of participants
3-4-91	Chiyaram	Thrissur	40
6-4-91	Kolazhi	"	200
9-4-91	Vilanganur	"	40
7-5-91	Vilanganur	"	30
18-6-91	Vilanganur	"	40
29-6-91	Nellikunnu	"	20
16-7-91	Vilanganur	"	40
24-7-91	Vilanganur	"	30
13-8-91	Vilanganur	"	40
31-8-91	Vilanganur	"	25
10-9-91	Vilanganur	"	25
1-10-91	Chalakudy	"	200
22-10-91	Vilanganur	"	30
26-10-91	Kannambra	Palakkad	120
26-10-91	Mannamangalam	Thrissur	100
26-11-91	Vilanganur	"	40
7-12-91	Thalicode	"	50
20-12-91	Vilanganur	"	20
26-12-91	Vettukadu	"	100
7-1-92	Kolazhi	"	200
7-1-92	Vilanganur	"	30
16-1-92	Ayyampuzha	Ernakulam	200
17-1-92	Mulamkunnathukavu	Thrissur	60
18-1-92	Karukathani	Malappuram	250
23-1-92	Manjapra	Ernakulam	200
3-2-92	Vilanganur	Thrissur	40
7-2-92	Thrissur	"	300
13-2-92	Mayannur	"	250
14-2-92	Kadangode	"	100
15-2-92	Killannur	"	120
16-2-92	Adivaram	Kozhikode	400
18-2-92	Vilanganur	Thrissur	94
26-2-92	Nedupuzha	"	212
29-2-92	Arimbur	"	200
4-3-92	Arimbur	"	84
7-3-92	Chittadi	Palakkad	60
7-3-92	Echippara	Thrissur	20
7-3-92	Kunnamkulam	"	150
10-3-92	Kanjoor	"	100
13-3-92	Velappaya	"	200
19-3-92	Kottayam	Kottayam	130
21-3-92	Ernakulam	Ernakulam	180
21-3-92	Thrissur	Thrissur	200
27-3-92	Moncompu	Kottayam	280
30-3-92	Vilanganur	Thrissur	25
(45 nos)		Total	5,275

Farm Clinics

Farm clinics were conducted by the scientists of Farm Advisory Service as details given below: These clinics served as nucleus points in transfer of technology process.

Date	Place	District	No. of farmers advised
2-5-91	Manaloor	Thrissur	18
30-5-91	Manaloor	"	15
27-6-91	Manaloor	"	25
14-11-91	Manaloor	"	20
28-11-91	Manaloor	"	21
20-12-91	Vilanganoor	"	59
8-1-92	Vilanganoor	"	32
Total			483

Diagnostic farm visits

Scientists in the Farm Advisory Service Unit conducted farm visits to solve field problems as detailed below:

Date	Place	Problem
4-1-92	Pananchery	Coconut disease
6-1-92	Manaloor	Rice pests & diseases
8-1-92	Thrissur	Coconut disease
13-1-92	Kollenkode	Coconut disease
20-1-92	Kaiparamba	Silk worm rearing
22-1-92	Kaiparamba	"
4-2-92	Alleppey	Rice pests & diseases

Consultancy Service

During the period under report 483 farmers visited the Communication Centre individually and consulted the scientists on problems related to Agriculture, Animal Sciences, Fisheries and Sericulture. Besides, 179 letters received from farmers on various problems were promptly replied by mailing the answers.

Extension Lecture

One extension lecture was organised on "Role of cooperation in Agricultural Development" in September, 1991.

Guiding visitors

Thirty-nine groups of farmers from different parts of the state who visited the University campuses were guided.

Sales counter

A sales counter at Mannuthy continued to operate on all working days for selling University publications. An amount of Rs. 29,632 was collected as Sales proceeds from the Counter during the year under report.

Staff position

Category	Sanctioned	In position	Vacant
Communication Centre			
<i>Scientific staff</i>			
Assistant Professor (Extn.)	2	2	—
Publication Unit			
Assoc. Professor	1	1	—
Asst. Professor (Extn.)	1	—	1
Assistant Professor (Ani. Science)	1	—	1
Assistant Professor (Fisheries)	1	1	—
Unit Total	4	2	2
Information Unit			
Associate Professor (Extn.)	1	—	1
Assoc. Professor (Fisheries)	1	1	—
Asst. Professor (Ani. Science)	1	—	1
Asst. Professor (Extn.)	2	—	2
Unit Total	5	1	4
Exhibition and & Graphic Service			
Assistant Professor	2	1	1
Unit Total	2	1	1
Farm Advisory Service			
Professor (Agronomy)	1	—	1
Professor (Plant Protection)	1	1	—
Assoc. Professor (Agronomy)	1	—	1
Assoc. Professor (Horticulture)	1	1*	—
Assoc. Professor (Plant Protection)	1	1	—
Assoc. Professor (Ani. Science)	1	1	—
Assoc. Professor (Poultry)	1	—	1
Asst. Professor (Fisheries)	1	—	1
Total	8	4	4
Grand Total	19	8	11
Para-Technical Staff			
Language Editor (Eng)	1	—	1
Language Editor (Mal.)	1	1	—
Farm Supervisor (Ag)	1	1	—
Chief Artist	1	—	1
Artist	1	—	1
Photographer	1	1	—
Audio visual Operator	1	1	—
Dark Room Assistant	1	—	1
Total	8	4	4

*On long leave.

	1	2	3	4
Administrative staff				
Administrative Assistant		1	1	—
Section Officer		1	1	—
Assistant		6	6	—
L. D. V. Driver		1	—	1
Typist		1	1	—
Total		10	9	1
Class IV Employees				
Peon		3	3	—
Sweeper-cum-Sanitary worker		1	1	—
Total		4	4	—

KAU Press

KAU Press is catering to the various printing requirements of the University. During the period under report 126 items of printing work were received out of which 105 works were completed.

Shri. K. Rajappan continued as the Press Manager.

Staff

Category	Sanctioned	In position	Vacant
Press Manager	1	1	—
General Foreman	1	1	—
Senior Foreman (H.G.)	1	1	—
Proof Reader (H.G.)	1	1	—
Proof Reader	1	1	—
Computer	1	1	—
Sr. Gr. Printer (H. G.)	2	2	—
Higher Gr. Printer	2	2	—
Lower Gr. Printer	2	2	—
Sr. Gr. Compositor	3	3	—
Hr. Gr. Compositor	2	2	—
L. G. Compositor	8	1	4
Sr. Gr. Binder	1	1	—
Hr. Gr. Binder	1	1	—
L. G. Binder	2	2	—
Copy Holder	2	—	2
Helper	1	1	—
Sweeper-cum-Attendant	1	1	—
Security/Class IV.	1	1	—
Peon.	1	1	—
Section Officer	1	1	—
Senior Gr. Asst.	3	3	—
Office Supdt.	1	1	—

Lab-to-Land Programme:

The lab to land programme of the ICAR was executed in the Kerala Agricultural University during the year 1991-'92 also. The programme was implemented in 8 centres under the University and a total of 300 farm families were adopted. The number of families allotted to each centre and the farm family break up are given below:

Name of the centre and number of families adopted

Sl. No.	Name of Centre	Name of village	No. of families adopted.
1	KVK, Ambalavayal	Kuppad,	22
		Thirunelli,	23
		Teloor	20
2	KVK, Pattambi	Vadanamkurisi	60
3	KVK, Manjeswar	Poyyathabayal	50
4	RARS, Pilicode	Pilicode,	15
		Nileshwar	10
5	RARS, Kumarakom	Arpookkara	25
6	College of Agriculture, Vellayani	Vengannoor	25
7	College of Vety. & Animal Sciences, Mannuthy	Vilvatton	25
8	Communication Centre, Mannuthy	Vilangannur	25

Farm Family break up,

Holding size/caste	SC	ST	OBC	Others	Total
Small (1-2 ha)	65	31	43	32	171
Marginal (Below 1 ha)	39	36	29	15	119
Landless	—	—	1	9	10
Total	104	67	73	56	300

Specific technologies transferred to the farmers during the period under report are as follows:

Crop production.

- 1 Integrated Nutrition management for paddy, coconut, vegetables etc.
- 2 Establishment of Nutrition garden.
- 3 Integrated pest management.
- 4 Intercropping vegetables in Banana.
- 5 Improved agricultural implements.
- 6 Fodder cultivation.
- 7 Rodent control.

Animal Husbandry

- 1 Scientific Goat rearing.
- 2 Broiler Rabbit rearing.
- 3 Backyard poultry rearing.
- 4 Vaccination, deworming and Animal health control

Home Science

- 1 Preservation of fruits and vegetables.
- 2 Fuel conservation using smokeless choolas.
- 3 Biscuit making.

Fisheries

- 1 Fish culture.

Major extension activities undertaken during the period are as follows.

Sl. No.	Name of programme	No. of programmes conducted	No. of participants.
1	Training	33	1203
2	Demonstration class	10	100
3	Field days	8	200
4	Kisan Melas	2	200
5	Seminars	7	370
6	Group discussions	38	530
7	Radio talk	4	—
8	Poultry vaccination camp	2	400 birds vaccinated.
9	Animal Health camp	4	120 animals treated.
10	Extension folders	7	—
11	Popular articles	26	—

Central Training Institute

The Central Training Institute, Kerala Agricultural University was established in 1986 with the following objectives.

- i) to co-ordinate all training programmes conducted for the benefit of Senior Level Extension personnel working under the T & V project in the state.

- ii) to organise specialised training programmes in Agricultural Journalism, Communication, media management, audio-visual and instructional technology, tropical horticultural medicinal plants, tribal agriculture etc. for extension personnel.
- iii) to strengthen training capabilities of research stations and educational institutions under KAU.
- iv) to act as nucleus unit for the spear head team, to identify training needs, to organise training programmes and to continuously monitor and evaluate training programmes for feedback generation and to take up follow up studies.

Staff position as on 31-3-92

Central Training Institute, Mannuthy

Designation	No. of posts sanctioned	Vacant
Professor (Extn.)	1	—
Asst. Professor (Hort.)	1	—
Asst. Professor (Plant Pathology)	1	—
Asst. Professor (Extn.)	1	—
Section Officer	1	—
Farm Supervisor	1	—
Typist	2	—
Assistant	2	—
Farm Assistant	1	—
Driver	2	—
Duplicator Operator	1	—
Peon	1	—

Training service scheme, Vellayani

Staff position as on 31-3-92

Designation	No. of posts sanctioned	Vacant
Associate Professor & Head	1	—
Assoc. Professor	1	—
Farm Asst. Gr. II	1	—
Farm Asst. Gr. I	1	—
Typist	1	—
Asst. Gr. I	1	—
Class IV	1	—

The following Training programmes were conducted during the year 1991-92

Name of the training programme	Category of training personnel	No. of batches	No. of trainees per batch	Duration (days)	Venue
1	2	3	4	5	6
Training on mushroom cultivation	Asst. Directors/Dy Directors of Agriculture	1	19	3	College of Agriculture Vellayani
Training on pest surveillance	"	1	9	2	R.R.S., Moncompu
Central Sector Scheme of minikit programme for rice including propagation of new technology	"	1	24	3	R.A.R.S., Pattambi
Advanced Training in use of AV aids for trainers of RATT Centres	Asst. Directors	1	17	3	College of Agriculture, Vellayani
State level workshop in group management in pepper	Officers of Agriculture department and scientists	1	34	2	"
Training on use of herbicides in rice cultivation	Asst. Directors/Dy. Directors	1	14	3	Central Training Institute, Mannuthy
Training on alternative energy conservation in homesteads (Bio gas)	"	1	12	3	"
Training on sericulture	"	1	12	4	College of Agriculture, Vellayani

1	2	3	4	5	6
Training on environmental pollution due to the adoption of modern scientific agricultural practices and its effect on eco-system	Asst.Directors of Agriculture	1	18	3	College of Agriculture Vellayani
Training programme on institutional financing of horticultural crops	Asst. Directors	1	5	5	Central Training Institute, Mannuthy
Training on diagnosis of Thanjavur wilt disease in Kerala	Officers from Agriculture Dept.	2	14	1	College of Agriculture, Vellayani
			21	1	Central Training Institute, Mannuthy.
Training on teaching methodology and subject matter for lectures in Agriculture	Lecturers of VHS	1	22	5	"
Training on diagnosis and control of parasitic diseases	Veterinary Surgeons	1	1	15	College of Vety. & Animal Sciences, Mannuthy
Training on disease investigation	"	1	5	90	"
Training on aflatoxin analysis	"	1	2	5	"
Training on diagnosis of poultry diseases	"	1	2	10	"
Training on special clinical diagnostic procedures	"	1	2	7	"
Training on management of abattoirs and meat inspection	Veterinary Officers	1	5	14	"

1	2	3	4	5	6
Training on intensive rearing of carp spawn	Research Officers	1	3	14	College of Fisheries Panangad, Cochin
Training on watershed planning and management	Range Officers/ Foresters	1	16	4	College of Agriculture, Vellayani
Training on vegetative propagation on Horticultural techniques	"	1	16	3	College of Forestry, Vellanikkara
Training on raising of grasses and fodder crops	Foresters	1	11	4	College of Agriculture, Vellayani
Training on importance of people participation in Social Forestry Programme	Range Officers	1	9	4	"
Training on Extension methods and AV aids	Foresters	1	7	4	"
Training on project approach on rural lending	Dairy Extension Officers	1	19	3	Central Training Institute, Mannuthy
Programme on performance budgeting and working capital management	Officers of District Co-operative Banks	1	12	6	"
Refresher training on Agriculture and allied subjects for Agricultural supervisors of primary Co-operative Banks	Officers of District Co-operative Banks & State Co-operative Banks	1	5	3	"
	Supervisors of Primary Co-operative Banks nominated by Kerala State Co-operative Agricultural and Rural Development Bank	1	15	15	College of Agriculture, Vellayani

1	2	3	4	5	6
Training programme in basic crop production techniques	Sale officers of FACT	1	24	5	Central Training Institute, Mannuthy
	Depot Officers of FACT	2	29 27	3 3	" "
Pre-release training programmes on dairying	Defence personnel	2	18	30	College of Veterinary and Animal Sciences
			18	30	"
Pre-release training on poultry management	"	1	22	"	"
Intensive training Programme on advances in cultivation techniques of spice crops (other than cardamom) including post harvest management	Field Officers	1	26	7	College Horticulture Vellanikkara
Training on Extension methods and AV aids	"	1	20	5	Central Training Institute, Mannuthy
Refresher training programme on Agriculture, Animal Husbandry, Fisheries and allied subjects	Rural Development Officers	1	17	12	"
National Workshop-cum-Seminar on Agricultural Journalism	Nominees from State depts. of Agriculture	1	17	14	"

	1	2	3	4	5	6
Training on fresh water prawn hatchery techniques	Assistant Professors of Fisheries College, Tuticorin, Tamil Nadu	1	2	12	College of Fisheries, Panangad	
Short term training on mushroom cultivation	Unemployed youths	2	11	3	College of Agriculture, Vellayani	
		2nd batch	17	3	"	
		1	48	3	RARS, Kumarakom	
		2	5	3	RARS, Pilicode	
		2nd batch	19	3	"	
Training programme on tissue culture	Staff from private organisations	1	3	60	College of Agriculture, Vellayani	
Training programme on cooking and catering	High school teachers	2	10	10	"	
		2nd batch	22	10	"	

OTHER WORKS

Extension Classes

The Scientists handled two classes on mushroom cultivation—one for Extension Officers at Extension Training Centre, Mannuthy on 27-2-'92 and the other for Rural Youth at Chuvannamannu on 27-3-'92.

Diagnostic Field Visit

Scientists of the Central Training Institute visited fields in Alathur to inspect coconut trees showing symptoms of Thanjavur Wilt disease. They served as Resource persons for farmers approaching the Communication Centre for advice on Mushroom cultivation and pathological problems.

Course work

The Scientists handled courses for B.Sc. (Forestry) students of the College of Forestry, Vellanikkara.

Advanced centre of training in plantation crops

The Advanced Centre of Training in Plantation Crops started functioning in May 1990 as the World Bank aided NAEP-III Project with a total allotment of Rs. 31.34 lakhs for five year period from the Directorate of Extension, Government of India.

Staff

Designation	Sanctioned	In position	Vacant
<i>Scientific</i>			
Co-ordinator	1	1	—
<i>Supporting</i>			
Asst. Gr. II	1	1	—
Typist Gr. II	1	1	—
AV Operator	1	1	—
LDV Driver	1	1	—

Training programmes organised during 1991-92

Specialised workshop

Sl. No.	Training Programme	Duration and period	Categories of participants
1	2	3	4
1.	Trg. on plantation crops production technology	3 days July 17-19, 1991	Jt./Dy. Directors of Agri./Hort., in Agri. and Sr. Scientists of SAUs.
2.	Trg. on plantation crops production and processing technology	3 days Aug. 7-9, 1991	SMs of Agri/Hort. of State Department and SAUs.

1	2	3	4
3.	National workshop on policy, planning and development of plantation crops and its industry	2 days Sept. 4-5, '91	Directors of Agri./ Hort., Directors of Re. of SAU, Managing Directors of Com. Bodies, Corporation and input agencies
4.	Post-harvest technology in plantation crops	3 days Oct. 22-24, 91.	Addl./Jt. Directors of State Dept, of Agri./Hort. and Sr. Scientists of SAUs.
5.	Training in planning, implementing and monitoring of plantation development programmes	3 days Jan. 21-23, '92	Sr. Officials of commodity boards, Directorates, corporation dealing in plantation crops production/industry

National workshops-cum-seminars

Title of workshop-cum-seminar	Duration and period	No. of participants
1. Plantation crop technology	8 days, 4th to 11 th Dec. '91	Fourteen. Kerala-6, Maharashtra-2, U. P.-2, Karnataka-4

KRISHI VIGYAN KENDRAS

The three Krishi Vigyan Kendras continued to function during the year.

Krishi Vigyan Kendra, Pattambi

The Krishi Vigyan Kendra, Pattambi was started in 1979. The Kendra is mainly imparting need based skill oriented training programmes for the practising farmers, home makers, farm youths etc. in Agriculture, Horticulture, Animal Husbandry, Fisheries and Home Science.

Dr. G. Balakrishna Pillai, Professor of Extension i/c was the head of station.

Staff Position

Designation	Sanct- ioned	In position	Vacant
<i>Scientific staff</i>			
Training Organiser (Professor)	1	1	—
Training Associates			
a) Agronomy	1	—	1
b) Horticulture	1	1	—
c) Animal Science (PS)	1	—	1
d) Home Science	1	1	—
Training Assistant (Asst. Professor)			
a) Agronomy	1	—	1
b) Horticulture	1	—	1
c) Poultry Science	1	1	—
d) Fisheries	1	1	—
e) Home Science	1	—	—
<i>Administrative staff</i>			
Section Officer	1	1	—
Assistant Gr. II	1	1	—
Typist Gr. II	1	1	—
<i>Para Technical staff</i>			
Farm Assistant Gr. II	2	2	—
Audio Visual Operator	1	1	—
<i>Supporting staff</i>			
Peon	1	1	—
Watchman	1	1	—
Cook-cum-caretaker	1	—	1
Hostel Attendant	1	1	—
<i>Auxiliary staff</i>			
Driver Gr. II	1	1	—

Trainings conducted during 1990-91.

Subject	Venue		No. of participants
	on- campus	off- campus	
Crop production	1	2	42
Horticulture	8	43	596
Animal Production	6	24	345
Fisheries	10	26	430
Home Science	6	36	694
Total	31	131	2107

A sum of Rs. 4600/- was collected as revenue from the demonstration plots on tapioca in vegetables. Rs. 5,709.75 worth of vegetable seeds were sold during the period under report.

Sixty demonstrations in vegetables, 25 demonstrations of fertilizer application to banana, 30 demonstrations of fertilizer application to coconut, 50 demonstrations on backyard poultry

rearing, one pond demonstration of fisheries, 60 demonstrations on improved variety of coconut and 60 demonstrations of Mango graft were conducted during the period under report.

Four one day seminars were conducted during the period under report. Eleven radio talks were given by the scientists of the station.

Krishi Vigyan Kendra, Ambalavayal

The KVK, Ambalavayal was started as a KAU project on 31-10-'82 in Wyanad district at the Regional Agricultural Research Station, Ambalavayal. The target group of this Kendra is mainly tribal people who constitute 20 per cent of the population of the district. The Kendra helps the tribal people by giving them need oriented vocational training in agriculture, horticulture, animal husbandry and home science. The Kendra has so far conducted 1107 training classes involving 18078 trainees. From 1989 onwards this Kendra is imparting training to non-tribals also. Dr. G. Raghavan Pillai, Professor, continued as the head of office till 30/6/'91. Dr. G. K. Balachandran Nair continued as the head from 19/7/1991.

Staff

Designation	Sanctioned	In position	Vacant
Scientific			
Professor (Agronomy/ Extension)	1	1	—
Associate Professor			
Agronomy	1	—	1
Animal Science	1	—	1
Home Science	1	1	—
Horticulture	1	—	1
Assistant Professor			
Extension	1	—	1
Engineering	1	—	1
Home Science	1	—	1
Animal Science	1	—	1
Horticulture	1	—	1
Plant Protection	1	—	1
Supporting/Technical/Ministerial			
Section Officer	1	1	—
Assistant Gr. II	1	1	—
Typist Gr. II	1	1	—
A. V. Operator	1	1	—
Driver (H. V)	1	1	—
Hostel attendant	1	1	—
Cook-cum-Care taker	1	1	—
Peon	1	1	—
Sweeper	1	1	—
Watchman	2	2	—

Training Programmes

Sl. No.	Subject	Number of courses	Number of persons
1)	Crop products	3	60
2)	Horticulture	23	422
3)	Home Science	84	1789
Total		110	2271

Besides training programmes 3 one day trainings on crop production, 23 one day trainings on Horticulture and 84 one day trainings on Home Science were conducted during the period under report. Five long duration programmes on Tailoring and Handicrafts were conducted in which 50 persons were trained.

Sixteen demonstrations on Agricultural Engineering were conducted in which 181 people participated.

'Women in agriculture-day' was celebrated on 4/12/'91 with the active participation of tribals from different colonies. Six radio talks were given by the Scientists of the station.

Krishi Vigyan Kendra, Manjeswar

Professor P. Ramachandran Nair continued as Head of the Kendra during the period.

Staff

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
Professor (Extension)	1	1	—
Assistant Professor (Agro.)	1	1	—
Jr. Assistant Professor	1	—	1
<i>Para technical staff</i>			
Farm Assistant (Vety.)	1	1	—
Farm Assistant (Agri.)	1	—	1
<i>Administrative</i>			
Assistant Grade II	1	1	—
Typist Grade II	1	1	—
Driver	1	—	1
Peon	1	1	—
Watchman	1	1	—
Field associates	1	1	—

During the year 53 one day training programmes were conducted in different localities in Manjeswar Block area on the following topics.

1. Fresh water fish farming.
2. Plant protection in cashew.
3. Soil and water conservation.
4. Manuring in paddy.
5. Manuring in coconut and arecanut.
6. Plant protection in arecanut.
7. Plant protection in paddy.
8. Vegetable cultivation.
9. Soil testing and fertilizer recommendations.
10. Water management in paddy.

A total number of 914 farmers participated in the training. Staff of the Centre made 37 farm visits during the year. Seventeen popular articles on agriculture and fish farming were published in the Kannada daily 'Hosadigandha'. Five extension folders were also published. Three radio talks were given by the scientists of the Centre.

Tribal Area Research Centre, Amboori

The Tribal Area Research Centre, Amboori, financed by ICAR, became operational in November 1983 as a multi-disciplinary research and development project for the upliftment of the Kanikkar tribes. Dr. K. Harikrishnan Nair, Associate Professor and Co-ordinator continued to be in charge of the Centre.

Staff

Category	Sanctioned	In position	Vacant
Senior Scientist/ Associate Professor	1	1	—
Specialists/Assistant Professors			
Agronomy/Soil Science	1	1	—
Horticulture	1	—	1
Animal Husbandry	1	1	—
Home Science	1	1	1
Health	1	—	1
Senior Research Assistant/ Jr. Asst. Professor			
Agronomy/Soil Science	1	1	—
Horticulture	1	—	1
Animal Husbandry	1	—	1
Home Science	1	1	—
Health	1	—	1
<i>Supporting /para technical</i>			
Home Science Helpers	3	3	—
Driver	1	1	—
<i>Administrative</i>			
Typist	1	1	—
Peon	1	1	—

Details of seminars/symposia/training programmes attended

One staff member attended the trainers' training programme at the Sugarcane Breeding Institute, Coimbatore and another member attended the refresher course at the Home Science University, Coimbatore.

Activities and achievements

A total of twelve projects in Agriculture, five projects in Animal husbandry and three projects in Home Science were implemented during the period under report:

Sweet potato varieties of Kanjangad Local, Sree Nandini and Sree Vardhane were planted in the project area for testing their suitability. Sree Nandini outyielded the other two varieties. Different varieties of colocasia were popularised among tribal farmers.

In the cultivation of ginger varieties Rio-de-Janeiro produced higher yield followed by Valluvanad and Jamaica.

Similarly in tumeric cultivation VK-55 and VK-142 were the highest yielders.

Among the pepper varieties "Karimunda" was found to be most ideal.

Farmers were given training on the correct method of planting and management of the coconut trees.

"Insitu" budding conducted an increase in latex yield.

Backyard poultry farming, pig rearing and broiler rabbit rearing were introduced to study the feasibility under tribal management conditions. A total of 247 veterinary cases were attended during the period under report.

Nine training programmes in Home Science were conducted during the period under report. Low cost water filters were distributed for the popularisation of safe drinking water. Ten special trainings were conducted during the period under report.

AICRP on Scheduled Caste Area Research, Wandoor.

The All India Co-ordinated Project on Scheduled Caste Area Research (AICP on SCAR) sponsored by the ICAR is being implemented at Wandoor Block, Malappuram District since April 1990.

Staff

Category	Sanctioned	In position	Vacant.
<i>Scientific</i>			
Senior Scientist	1	1	—
Specialist (Home Science)	1	1	—
Specialist (Animal Science)	1	—	1
Specialist (Small Scale Industries)	1	—	1
<i>Administrative and Supporting</i>			
Technical Assistant (Animal Science)	1	—	1
Technical Assistant (Agriculture)	1	1	—
Office Assistant	1	—	1
Typist	1	1	—
Driver	1	1	—

Eight adaptive trials in agriculture, six in animal husbandry, eight in home science and three in homestead vocation were conducted during the period under report.

Ten trainings in agriculture were conducted during the period under report.

The Centre participated in the Agri-Horticultural Flower show and exhibition at Malappuram.

Village Adoption programme

The Village Adoption programme was executed by 21 centres under the University during the year 1991-92. A brief report of the programme implemented by different centres are given below:

RARS, Pilicode

Two villages in Pilicode and Nileshtar were adopted. Under the programme 20 vegetable gardens were established with the help of school students. Two demonstration classes for 25 selected farmers on Mushroom cultivation and two training programmes on plant protection and nursery technique were also carried out.

RRS, Kayamkulam

The village Cheppad was adopted. Under the programme 14 demonstration Plots were established for popularising sesamum and pulses cultivation in summer rice fallows.

KAU Project Centre, Wandoor

The programme was implemented in Perumundassery Harijan colony. Popularising different varieties of fruit trees, poultry

rearing and rabbit rearing were the major activities. One training and one demonstration in home science were carried out. One Kissan Mela was organised and 42 farmers participated.

Communication Centre, Mannuthy

Vilangannur was the adopted village. As part of the programme inputs were supplied for the control of crop pests and diseases to 120 farmers. Animal health care service was imparted to 200 farmers. One poultry vaccination camp was organised and 200 birds vaccinated. Twenty five demonstration plots on vegetable cultivation were established by supplying improved varieties of seeds. One demonstration class for the preservation of fruits and vegetables was organised and 111 house wives participated. One agricultural seminar was organized in which 50 farmers participated.

Fisheries Station, Puduveypu

The village adopted was Nayarambalam. Inputs like vegetable seeds, vegetable mixture, coconut mixture and watering pots were supplied to twenty five beneficiaries.

CRS Balarampuram

Ten families having 40 bearing coconut palms were adopted for the programme. Twenty palms belonging to each of the farmers were manured with the recommended level of fertilizers for a year. The remaining 20 palm trees of each farmer were kept as control. This trial was taken up as a demonstration on the importance of fertilizer application.

KVK, Ambalavayal

Forty beneficiaries belonging to Edakkal Kuruma colony and Kidangal Kurumacolony of the Battery village were selected for the programme. Different fruit trees, spices, and pepper cuttings were supplied to the beneficiaries. Nineteen fuel efficient Gamini stoves were also supplied.

RRS, Vyttila

Vennala was the adopted village (St. Antoney's Farm and Don Bosco Cultural Centre). Under the programme two demonstrations on Aquaculture and Olericulture were organized in the premises of two social service organizations. Fingerlings, fish feeds, vegetable seeds, fertilizers and plant protection chemicals were supplied as inputs.

RRS, Monocompu

Ramankari was the adopted village. Thirty farm families were selected as beneficiaries. Two demonstrations on the effect of split application of phosphatic fertilizers to rice crop were

conducted. Improved vegetable seeds were supplied to the beneficiaries. One Agricultural seminar was organized in which 60 farmers participated.

CRS, Pampadumpara

Supply of one Rocker sprayer as community input and subscribing Kalpadhenu for 20 farmers were the activities undertaken under the programme.

TARC, Amboori

Under the programme 10 families in the tribal settlement at Amboori were selected as beneficiaries. They were given training in pig rearing and one two month old pigling was supplied to each of the beneficiaries.

College of Agriculture, Vellayani

Venniyoor was the adopted village. As part of the programme two demonstration plots each of Harita grass and banana were established. Demonstration plot on banana was to show the importance of high density planting. Four training programmes on fodder, banana, biscuit making and embroidery were conducted. One Kissan mela was also organized.

KCAE and T, Tavanur

Popularisation of IRRI self propelled Paddy Harvester and Rash-bar Paddy Trekker was carried out in the adopted village, Tavanur. Four extension demonstrations of paddy thresher and two demonstrations of paddy harvester were conducted. These machineries were also presented in 4 exhibitions.

SRS, Thiruvalla

Nedumpuram was the adopted village. Two demonstration plots were established in the farmers' premises to show the importance of sugarcane variety "Madhuri". Chicks were supplied to 39 beneficiaries.

RARS, Kumarakom

Aymanam village was adopted for the programme. Four frontline demonstrations on rice were laid out in farmers' field to high light the effectiveness and economics of the proven technologies. The farmers were supplied with critical inputs such as fertilizers, lime, weedicides and plant protection chemicals at appropriate time. The mean yield obtained from the 4 demonstration plots was 3175 kg/ha, while in the farmers practice in the nearby areas the average yield was 2790 kg/ha. A field day was also organised.

ARS, Chalakudy

As part of the village adoption programme one demonstration plot to show the advantages of drip irrigation system for vegetables during Summer was established in the Sacred Heart Convent School. The plot comprised of cowpea and bhindi. An additional yield of 10-15 kg/cent was obtained with the drip irrigation system. There was considerable saving in irrigation water and labour also.

KVK Pattambi

Edappalam was the adopted village. Four demonstration plots on banana cultivation were established in the farmers' premises. Improved varieties of banana suckers, fertilizers and plant protection chemicals were supplied to the farmers. Two training programmes on vegetable cultivation and poultry rearing were conducted. A one day agricultural seminar was organised in which 64 farmers participated. A farm science club was also organized at GMUP School, Vilayoor.

College of Fisheries, Panangad

Village Maradu was adopted. Ten poor families were chosen as the beneficiaries and inputs such as chicken, vegetable seeds and agricultural implements were supplied to them.

BRS, Kannara

Panancherry was the adopted village. Four demonstration plots on "Nendran" cultivation were established in farmers' premises to demonstrate the values of split application of fertilizer and also to show the importance of adopting package of practices recommendations.

NARP, Sadanandapuram

Ummannoor was the adopted village under the programme. 250 coconut seedlings were supplied to 50 farmers. One Agricultural Seminar was organized in which 39 farmers participated.

PRS, Panniyur

Cheppannool was the adopted village. Ninety chicks were supplied to ten families under the programme.

Other extension activities of different research stations/colleges/departments

Rice Research Station, Kayamkulam

A total of 15 frontline demonstrations in sesamum were conducted during the period under report with the full assistance of ICAR under AICRPO. A farmers' day and an agricultural seminar were conducted at Thazhava and Pathiyoor on 19/3/92

and 21/3/92 respectively. Three one day trainings on the production of rice, pulses and oil seeds were conducted for the officers of the department of Agriculture. A total number of 55 farmers who visited the station were given advice on farming of different crops.

RARS, Vellayani

Four major training programmes on various agricultural topics were conducted for officers from the Department of Agriculture, Forest Department and the Primary Agricultural Development Bank.

A training in NARP concepts and objectives was conducted for the scientists of the southern zone of KAU. Two field days and farmers' rallies were conducted under the AICRP (oil seeds).

The NARM Hyderabad has recognised RARS, Vellayani as a centre for offering the field experience training programmes of the ARS Scientists. During the period under report, 3 batches of ARS scientists underwent training at the station.

Scientists of the station imparted training to final year B. Sc students in their area of specialisation and on farm management aspects.

Eleven T&V monthly workshops were conducted for the Thiruvananthapuram district during the period.

A Kisan melâ, agricultural seminar, agricultural exhibition and visit to experimental/seed production plots were organised at the College of Agriculture.

Sri. Philip John of the Electronic Research and Development Centre took a special class on 'Dos commands'. Dr. R. K. Datta, Director, Central Sericultural Research and Training Institute delivered an extension lecture on 30th Jan. 1992.

Department of Home Science, College of Agriculture, Vellayani

Two correspondence courses—one on 'Infant feeding practices' and another on 'child development' were conducted from the centre. Training on low cost preservation of Horticultural produce was also conducted.

One training on 'cooking and catering' for high school teachers and another on 'pre-primary education' were conducted during the period under report.

AMPRS, Odakkali

About 395 kg of lemongrass seeds valued at Rs. 39,500/- were distributed from this research station during the period

under report. Training on various aspects of aromatic and medicinal plants cultivation as conducted for students and teachers of vocational higher secondary schools.

Sugarcane Research Station, Thiruvalla

A farmers' day was organised in the station during March 1992 with active co-operation and involvement of 75 farmers of this region.

Rice Research Station, Moncompu

A training programme on pest and disease surveillance, a farmers' training programme, a labourers' training programme and a training programme for farm women were conducted by the Station.

A 'rice day' and 'a women in Agriculture-day' were also conducted at the station. Two radio talks were given by the scientists of the Centre. A Doordarsan programme 'on problem of rice cultivation in Kerala' was also organised by the Station.

RARS, Pilicode

Radio talks on spraying against fungal diseases of coconut, major pests of second crop rice, answers to listeners' questions, soft-rot of ginger, selection and storage of seed rhizomes of ginger and turmeric and fertilizer application of second crop of rice, were given by the scientists of the station.

A Krishi Darshan programme and an agricultural seminar were also organised on December 19, 1991.

Rice Research Station, Vyttila

Scientists of the centre handled classes on various aspects of rice cultivation and aquaculture in the 14 seminars conducted during the period under report. They also undertook diagnostic team visits to farmer's fields.

Livestock Research Station, Thiruvazhamkunnu

Veterinary aid and technical advice with respect to feeding, management and treatment of animals were given to cattle owners of the locality. Three hundred and twelve artificial inseminations have been carried out to the animals belonging to farmers of the nearby villages. Six hundred animals were treated during the financial year.

Fisheries Station, Puduveypu

A total number of 23,380 fingerlings were supplied during the period under report.

Coconut Research Station, Balaramapuram

Farmers were given training on various cultural aspects of coconut cultivation. A Kisan mela was conducted on 28-3-1992.

RARS, Pattambi

The Scientists of the station participated in 9 agricultural seminars during the period under report. A Kisan mela was conducted on December 6, 1991. At the Silver Jubilee Celebrations of the Seed Testing Laboratory, conducted on December 6, 1991, the new rice variety 'Nila' was formally released. A book on seed technology entitled—'Subeejam Sukshetre' was also released on the occasion.

The XIII NARP Regional Workshop of the Central Zone was conducted from October 14 to 16, 1991. The station also participated in the All India Agricultural and Industrial Exhibition at Thrissur.

Scientists of the station rendered advisory service to farmers through correspondence and field visits. They also attended the T & V monthly workshops of Malappuram and Palakkad districts as resource personnel. Twelve T & V workshops each for Malappuram and Palakkad districts were conducted during the period under report.

Field trainings were conducted for final year B.Sc. (Ag.) students, VHSC students and also for trainees from RATTC, Malampuzha. A state level training on rice production technology-91 was conducted from 17th to 19th September 1991. Two popular articles and two books were published during the period under report.

RARS, Kumarakom

Four training programmes were conducted by the station during the period under report. A total of 13.5 kg. of foundation seed of cucumber was produced under the central sector scheme of seed production.

ORP, Ozhalapathy

The centre organised nine training programmes on various subjects in Agriculture and Veterinary Science, of which five were off-campus and four were oncampus. A total of 135 farmers participated in these trainings.

A survey to assess the impact of National Watershed Development programme indicated an increase of 5% in the net area irrigated and 6.5% in household income. 25% of the beneficiaries had been benefitted through increased yield.

NARP Special Station, Sadanandapuram, Kottarakkara

Scientists participated in nine agricultural seminars during the period under report and also gave necessary advice on scientific management of crops including pests and disease management to the farmers of Adoor and Kottarakkara areas. Scientists

of the station also took classes on mushroom cultivation and pests and diseases of rice and their management. Three popular articles were published by the Scientists of the station.

Banana Research Station, Kannara & Pineapple Research Centre, Vellanikkara

Scientists from these stations took classes on various agricultural topics such as 'cultivation and utilization of Medicinal plants' and 'Pineapple cultivation', 'Banana production technology' and 'cultivation of Nendran banana' for trainees at the various training programmes.

All the Scientists from these stations also visited the cultivators' fields and imparted technical know-how on various aspects of crop management. They also gave advice to farmers who visited the station.

ECF Unit, Mannuthy

Scientists of the unit participated in two one day agricultural seminars, two IPRD training programmes, the Karshakolsavam at RARS, Pattambi and the Rural Programme Advisory Committee meeting of the AIR, Thrissur.

The Associate Professor of the station regularly attended the monthly T & V workshops of Ernakulam, Thrissur and Palakkad districts wherein on-farm research programmes were finalised and seasonal reports presented.

College of Fisheries, Panangad

Five training programmes were conducted during the period under report. A Matsya Karshaka Mela was conducted at the College of Fisheries on 23-3-92. Advice on fish and prawn culture and aquarium fish rearing was given to a number of farmers. During the period under report 37,250 post larvae of *Macrobrachium rosenbergii*, 12,255 nos. of Mrigal fingerlings, 1,445 nos. of Fimbriatus and 4,475 nos. of Rohu were sold to the farmers. Scientists of the College actively participated in the Doordarshan programme on "Fish epidemic of Kuttanad" telecast on 11-10-91 and that broadcast by AIR, Kochi on 6-9-91. Scientists of the College gave 7 radio talks during the period under report.

Cashew Research Station, Anakkayam

Farmers were given advice on cashew cultivation. During the period under report 776 kg of cashew, 1710 nos. of cashew air layers, 11,000 nos. of cashew seedlings, and 509 cashew grafts were given to the farmers.

ARS, Chalakudy

A large number of farmers visited the station to seek advice in scientific cultivation of crops, water management and problems

related to pests and diseases. An agricultural seminar was organised at Mookkannur in which 250 farmers participated. The on farm water management study-a pilot project sanctioned by the Ministry of water resources for a period of 3 years from 1989-90 was conducted in Mookkannur village of the Ernakulam District. The study area comprised of 45 ha. of paddy fields and nearby upland area, belonging to 200 farm families. A nearby area of 15 ha. was selected as the control block. Yield obtained from 10 randomly selected plots under different water management practices and from the control plots revealed that grain yield was maximum under continuous flow submergence followed by continuous stagnant submergence to 5 ± 2 cm water.

Agricultural Research Station, Mannuthy

The station participated in the Agri-Horti Festival 1991 held at Thrissur. A large number of farmers visited the farm for advice on field problems and for purchase of seeds and planting materials.

Aromatic and Medicinal Plants Research Station, Odakkali

Dr. J. Thomas, Associate Professor acted as resource person of KAEP workshop of Idukki District. He was also nominated as a member of the Committee constituted by Government of Kerala to study the constraints and prospects of Lemongrass production in the state and the Committee has submitted its recommendations.

NSS Activities

Dr. A.G.G. Menon, Director of Extension continued to function as the part-time programme Co-ordinator of NSS during the period under report.

The enrolment details during the year are given below

Name of the College	Strength allocated	No. of units	Enrolment		Total
			Male	Female	
College of Agriculture Vellayani	280	2	173	107	280
College of Vety. & Animal Sciences, Mannuthy	300	2	111	181	292
College of Horticulture, Vellanikkara	300	2	147	140	287
College of fisheries, Panangad	110	1	48	26	74
College of C&B, Mannuthy	110	1	44	27	71
KCAE & T, Tavanur	70	1	31	39	70
College of Forestry, Vellanikkara	55	1	—	51	51
Total	1225	10	605	520	1125

Dr. Ambedkar Birth Centenary and World Environmental Day were celebrated on 10th April 1991 and 5th June 1991 respectively.

The University level Advisory Committee on NSS was constituted for a period of 3 years from 8/11/91.

A leadership training camp for 50 lady volunteers and 10 Programme Officers was conducted at YMCA, Aluva from 24th to 28th November 1991 under the joint auspices of the NSS and Directorate of Students' Welfare.

A nature study camp was conducted at Begur under the Wayanad Wild Life Sanctuary for 14 volunteers of the University from 13th to 15th December 1991.

A total of 97 students have been enrolled under mass Programme for functional literacy as detailed below:

Name of college	Male	Female	Total
College of Agriculture, Vellayani	15	10	25
College of Veterinary & Animal Sciences, Mannuthy	11	4	15
College of Horticulture, Vellanikkara	8	14	22
KCAE & T, Tavanur	17	18	35
Total	51	46	97

Kelappaji College of Agricultural Engineering & Technology, Tavanur

Shri A. P. Gopalakrishnan, Research Assistant continued to function as the Programme Officer of the NSS Unit which has a volunteer strength of 70 for regular activities.

The main activities undertaken by the unit during the year are as follows:

The Community Centre run by the Unit in the adopted area continued to function with facilities for reading newspaper and periodicals.

The International Literacy Day was celebrated on September 8th, 1991 in which about 50 volunteers took pledge.

A group of fifteen NSS Volunteers were given training in the promotion of education leading to community action for proper health practice at the Primary Health Centre, Tavanur and these trained volunteers conducted house visits on 6th and 7th July, 1991 and demonstrations in educating the families in the proper storage and use of drinking water for better health and hygiene.

The birth centenary of Dr. Ambedkar was celebrated on 10th April, 1991 with a talk on the 'Dreams and Accomplishments of Dr. Ambedkar' by Prof. P. R. Nair, Editor, 'Dharmakalam'. An elocution was held as part of the celebration and prizes were distributed to the winners.

Three girl volunteers—Sakkeena Beevi, Lija Varghese and Yamuna P. S. attended the 'Leadership Development Camp' organised in connection with the observance of the SAARC Decade of the Girl Child at the YMCA Camp Centre, Aluva from November 24 to 28, 1991.

The college level special camping programme was conducted at Girijan Colony, Chokkad from 13th to 17th March 1992 with the theme, "Youth for Development and Mass Literacy".

College of Forestry, Vellanikkara

The NSS Unit of the College of Forestry has a student strength of just 51.

Eight volunteers from the college attended nature camps organised by the forest department of Wayanad.

College of Veterinary & Animal Sciences, Mannuthy

A blood group test camp was organised and conducted for the first year students and other staff of the college on 17/5/'91.

The college NSS Bulletin was released by Dr. A. G. G. Menon in the meeting presided by Dr. G. Nirmalan the Dean i/c, on 7/6/'91.

The Training Co-ordinator and 32 Programme Officers from Rajagiri Institute, Kalamasseri visited the college on 18-7-91. A talk on 'Rabies and its control measures' was arranged for the visitors on 18/7/'91.

A mini camp was organised and conducted at Polpully from 9/8/'91 to 11/8/'91 in which 50 NSS volunteers from the college participated.

Dr. K. M. Ramachandran and 4 NSS volunteers participated in the special camping programme of the Little Flower College, conducted near Kunnamkulam and vaccinated 123 birds against R. D. on 23/8/'91.

A special camping programme was organised at Meppadi from 13.9.91 to 22.9.'91.

Dr. V. Raju, Programme Officer along with 15 NSS Volunteers visited the Tribal Hostel at Peechi and conducted the sports competitions for the inmates of the hostel and gave prizes to the winners on 28/10/'91.

A campus cleaning programme was organised at the Collectorate, Thrissur in collaboration with the Agri-Horti Society on 29/12/'91 in which 45 volunteers participated.

College of Fisheries, Panangad

The NSS Unit of the College of Fisheries is having a volunteer strength of 106 including 29 lady volunteers.

Sri P. K. Mohammed, Training Co-ordinator (NSS) took a class on the role of a volunteer in the rural development.

As part of the celebration of 1991-2000 AD as the SAARC decade for the girl child the University organised a five day leadership camp for girl volunteers at Aluva. The World Food Day was celebrated jointly with the college union on 16th October, by arranging a special talk on 'Fish as a Protein food'.

College of Agriculture, Vellayani

Sri. M. Mohammed Hussain, Associate Professor, Department of Agricultural Extension continued as the Programme Officer of NSS Unit I and Dr. R. Vijayan, Department of Animal Husbandry assumed charge as Programme Officer, Unit II of the College of Agriculture, Vellayani with effect from 1-5-1991 from Dr. Skariah Oommen, Professor, Department of Animal Husbandry.

The two community centres of NSS Units at Kakkemoola and Palappur continued to function with facilities for reading newspapers and Malayalam weeklies.

A training programme was conducted for unemployed rural women on preservation and canning of fruits and vegetables.

Soil testing programme was conducted with the help of Mobile Soil Testing Unit of the Department of Agriculture and 100 samples were analysed.

One Animal Husbandry Camp was organised in collaboration with KVK, Vellanadu and the Department of Animal Husbandry.

A poultry vaccination camp was also conducted.

The Literacy Day was celebrated with a literacy Jatha and a public meeting at two adopted villages on 8th September, 1991.

Alcohol and Drug addiction control day was celebrated in the campus on 26th June, 1991.

A blood group screening programme for the NSS volunteers was conducted on 20-2-1992 with the help of SCT Hospital, Thiruvananthapuram and 107 volunteers were screened.

A one day medical camp was conducted for the farmers of the NSS adopted village on 15-3-92 at the college premises from 9 am to 2 pm. in collaboration with Lions Club, Thiruvananthapuram Chapter.

Selected farmers of the adopted village were supplied with coconut seedlings and vegetable seeds.

NSS Volunteers arranged a poultry vaccination campaign at Punkulam with the help of farmers development and charitable Society, Punkulam 28-8-91.

Three NSS Volunteers and Programme Officers attended the Nature study camp at Wayanad Wild Life sanctuary from 13th to 15th December, 1991.

A special camping programme was conducted from 9th to 13th January 1992 at Dale View, Poovachal, Punalal. 100 volunteers participated in the camp.

College of Co-operation & Banking, Mannuthy

Sri Philip Thomas took charge as the NSS Programme Officer with effect from 1-4-1992.

The NSS Unit celebrated the International Labour Day on 5th May, 1991.

The NSS Unit conducted the second Dr. P. U. Surendran Memorial Inter-collegiate Quiz Competition on 19th June, 1992.

The NSS Unit celebrated Co-operative week in the second week of November, 1991.

The Special Camping Programme of the Unit was conducted at Echippara Tribal Colony from 5-3-92 to 9-3-92 (5 days) mainly concentrating the tribals of Echippara and Kallichira Colonies.

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CHAPTER IV

Students Welfare

Sri O. K. Paul, Deputy Director of Students Welfare in-charge of DSW, looked after the co-curricular and extra-curricular activities of the students of Kerala Agricultural University. During the year under report the following were the major activities.

Staff

Category	Sanctioned	In position	Vacant
Director of Students Welfare	1	—	1
Deputy Director of Students Welfare (Sports & Games)	1	1	—
Dy. Director of Students Welfare (Acad. & Counselling)	1	—	1
Junior Asst. Professor (Lady Phy. Education)	1	1	—
Section Officer	1	1	—
Assistants	2	2	—
Typist Gr. II	1	1	—
Peon	1	1	—

KAU Union Activities

The formal inauguration of the union by Smt Madhavikutty on 5th July 1991 at VJT Hall, Thiruvananthapuram raised the curtain of activities of the Union. Dr. Kannan, Scientist, CDS, Eminent writer P, Govindapillai and Sri Balagopal, Syndicate Member, Kerala University felicitated the occasion. The inauguration was followed by a colourful cultural programme staged by the students of KAU.

Campus survey

With the basic objective of analysing the social and economic background of our students, their attitude towards the various aspects of their curricular and extra curricular performances and how they react to the situations faced by them and to get suggestions

to improve the existing conditions, the union conducted a campus survey during the third week of August among all the students of the University.

Chess competition

With a view to create interest among the students, the union conducted an inter-collegiate Chess competition on 16th, 17th and 18th of August at College of Veterinary & Animal Sciences. The highlight of the programme was the demonstration of lightning chess by experts.

Study camp at Mannamangalam

A five day study camp was conducted at Mannamangalam to create awareness among the students regarding the importance of micro level planning in the development of a particular region and local resources in improving the economy of our country. Selected students and staff from the various colleges had active participation with the involvement of local people in this venture. The camp was inaugurated by Sri. V. V. Raman, President, District Council, Thrissur on 19th September 1991. Experts from various fields provided the guidelines by conducting field trips, study classes and demonstrations. They also delivered valuable talks on the scope and importance of microlevel planning in rural development.

"Agritech-'92"

Three-day study camp was conducted at Vattamkulam Panchayat near Edappal by the Union. The basic objective of camp was to provide the students of KAU with an overall idea on watershed management and related subjects. The District Council-Vice President (Malappuram) Mr. Kutty Alikutty inaugurated the camp on 22nd December, 1991.

Seminar at College of Forestry

The union conducted two day seminar on development of forestry at College of Forestry on 3rd and 4th January, 1992. Dr. E. G. Silas, the Vice-Chancellor of the University inaugurated the seminar and eminent scientists from Kerala Forest Research Institute, Kerala State Bamboo Corporation etc. presented papers which included Dr. S. Chandra Basha (IFS), Director, KFRI.

The KAU Youth Festival '92

The 14th KAU Youth Festival was held at Vellanikkara Main Campus on 10th, 11th and 12th of February, 1992. Students from all the faculties participated with true spirit. The College of Agriculture, Vellayani bagged the overall championship.

I (K) R&V SQN. N. C. C. ACTIVITIES

Parades

Regular parades and horse riding were conducted during the period.

Annual Training Camp

Seventy five NCC Cadets including 14 Girl cadets attended the Annual Training Camp at Govt. High School, Puthur from 22 August to 2 September '91.

Social Service Activities

Tree plantation

Two hundred and forty trees planted at the premises of Govt. High School, Puthur during the camp from 22 Aug. to 2 September '91.

Vaccination & Anti sterility campaign for cattle

Twenty animals were vaccinated against Haemorrhagic Septicaemia. Seventy two animals were examined for sterility at Vettukad and Kainoor, Thrissur District during the camp on 28 Aug. and 30 Aug. '91.

Blood donation

Fourteen NCC Cadets voluntarily donated 4200 ml blood to poor patients during the period.

Eye donation

The undermentioned NCC Cadets of this unit have given the declaration of gift of eyes to the nation.

- a) Thomas K. Thomas.
- b) Mohammed Navaz M.
- c) Rajeev T.
- d) Anand M.
- e) Gopakumar C.

The cadets of this Sqn. made collection through sale of Flag in connection with the Ex-Service-men Week '91.

Adventure Activities

A group of 15 NCC Cadets together with one PI Staff undertook a cycle expedition from Mannuthy to Ooty from 12th to 17th April '91. The party started from Veterinary College, Mannuthy on 12th April '91 and reached Mannuthy back on 17th April '91.

Other activities

One part time NCC Officer and 68 NCC Cadets participated in the parade of Independence Day on 15th August '91 at the College of Veterinary & Animal Sciences, Mannuthy.

Thirteen NCC Cadets and 7 horses participated in the 'NCC DAY' celebration on 24th November '91 at Thrissur, which included parade, horse jumping, trick riding etc.

Six NCC Cadets, including girl cadets participated in the Pre-Republic Day Camp at Thiruvananthapuram from 24th November to 26th November '91 and 26th December to 28th December '91 respectively.

Four NCC Cadets with mounted column participated in the 'Flag Day' celebration at Thrissur on 6th December '91.

Parades

Regular parades and horse riding were conducted during the period.

Republic Day Parade—1992

Four boy cadets and 2 girl cadets with 5 horses participated in the Republic Day Parade 1992 at New Delhi.

Social Service

A social service camp and Anti-Leprosy campaign were conducted at the Damien Institute, Mulayam on 26th January 92 from 10.30 hrs to 12.30 hrs. One Associate NCC Officer and 64 NCC Cadets participated. The cadets cleaned the premises of the Hospital and voluntarily donated clothes to the patients.

One Associate NCC Officer, 50 NCC Cadets and 6 horses participated in the NCC Seminar 1992 at Town Hall, Thrissur on 27th March '92.

Leadership development camp for girl volunteers 1991

Leadership camp for 50 girl students of KAU was organised jointly by the NSS Unit and the Directorate of Students' Welfare from 24th to 28th November 1991 at YMCA Camp site Aluva.

The camp was inaugurated by Shri P. P. George, Hon'ble Minister for Agriculture on 24-11-1991. Dr. E. G. Silas Vice-Chancellor, KAU, Sri K. Mohammed Ali, M. L. A., Sri D. M. Thampi, Dean i/c, College of Fisheries and Sri M.P. Suresh, President, Keezhumedu Panchayath were present on the occasion. The camp was organised based on the theme "*Observance of 1991-2000 as SAARC Decade of the Girl Child*"

Sixth annual Indira Gandhi memorial Inter-University debate competition

Sri Remichandran and Sri K. Aravind of the College of Horticulture, Vellanikkara represented our University in the Sixth Annual Indira Gandhi Memorial Inter-University Debate Competition held at New Delhi from 20th to 23rd December 1991.

Membership in the association of Indian Universities and Indian Agricultural Universities Association

The Kerala Agricultural University continued its memberships in the Association of Indian Universities and also in the Indian Agricultural Universities Association.

KAU employment information & guidance bureau

A full fledged Employment Information & Guidance Bureau continued to function at the Directorate of Extension of the University at Mannuthy. The bulletin released from the Bureau is being sent to all the Universities in the country.

The Bureau is gathering the up-to-date academic and employment information and transferring it to the required students.

KAU sports board

The KAU Sports Board meeting was held on 2-1-1992 at the University Headquarters, Vellanikkara. The Sports Board recommended to revise the rate eligible for sports uniforms for participants in Sports & Games and also the rate of officiating charge. The Sports Board also recommended to develop minimum sports facilities at various campuses to provide opportunities for the participation of the students.

Revision of refreshment allowance for participation in sports & games

The rate of refreshment allowance for the participation in sports & games was revised during the year of report.

S.A.I Field station

To impart specialised training, one coach in the discipline of Hockey, is coaching in the field station attached to the University by the Sports Authority of India.

Sports and games

The Kerala Agricultural University teams participated in the following Inter-University and Inter-Collegiate tournaments as detailed below :

Participation in the Inter-University tournaments

Sl. No.	Event	Venue
1	Football (Men)	Thrissur
2	Table Tennis (Women)	Madras
3	Ball Badminton (Men)	Madras
4	Cricket (Men)	Gulburga

KAU Inter-collegiate Programmes

Sl. No.	Event	Date & Venue	Result
1.	Table Tennis (Men)	Faculty Club, Mannuthy 8th, 9th & 10th Aug. 91	I Vety. College II Hort. College
2.	Table Tennis (Women)	"	I KCAET, Tavanur II Vety. College
3.	Shuttle Badminton (Men)	"	I Vety. College II C&B College
4.	Shuttle Badminton (Women)	"	I Vety. College II Hort. College
5.	Basketball (Men)	Veterinary College, 11th to 13th Sept. 91	I Vety. College II KCAET, Tavanur
6.	Basketball (Women)	Veterinary College, 11th to 13th Sept. '91	I Agri. College II Vety. College
7.	Volleyball (Men)	Vety. College 11th to 13th Sept. '91	I Vety. College II Hort. College
8.	Volleyball (Women)	"	I KCAET, Tavanur II Hort. College
9.	Athletics (Men)	Agriculture College 19th & 20th Sept. '91	I Vety. College II Agri. College
10.	Athletics (Women)	"	I Agri. College II Vety. College
11.	Ball Badminton (Men)	Agriculture College 27th to 29th Sept. '91	I KCAET, Tavanur II Agri. College
12.	Ball Badminton (Women)	"	I Agri. College II Vety. College
13.	Football (Men)	"	I C & B College II Vety. College
14.	Hockey	Veterinary College 17th, 18th & 19th Jan. 92.	I Forestry College II Agri. College
15.	Cricket	Vety. College, 27th Jan. to 1st Feb. '92	I Forestry College II Hort. College

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CHAPTER V

Engineering Wing

The Engineering Wing of Kerala Agricultural University consists of the Directorate of Physical Plant, Vellanikkara with one Division at Panangad and four Civil Sub Divisions, at Vellayani, Tavanur, Mannuthy, Vellanikkara and one Mechanical Sub-division at Vellanikkara. In addition to the above sub-division, two Electrical Sub-Divisions were constituted—one each at Vellayani and Vellanikkara during the year '91-'92. Construction and maintenance of buildings and roads, procurement of equipments and machineries, purchase of vehicles etc. are the important functions attributed to the Director of Physical Plant.

Sri P. O. Thomas, continued as the Director of Physical Plant during the year 1991-92. The details of staff worked during the period are appended.

The provision for the Engineering works for the year 1991-92 was Rs. 184 lakhs under plan and Rs. 50 lakhs under non-plan. Only works which were highly essential and inevitable for the Teaching, Research and Extension programmes of various faculties were taken up during the above period. The total expenditure incurred during the period was Rs. 240.5 lakhs. The details of Civil works executed during the year are appended.

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CHAPTER VI

Estate

The K.A.U. Estate was established in 1973 by acquiring an area of 379.56 ha. An area of 11.88 ha. was additionally acquired during 1977-81. The total area of the Estate was 391.44 ha.

The following officers were in charge of the Estate during 1991-92.

- 1 P. V. Gopalakrishnan Nair, Estate Officer (1.4.91 to 1.7.91)
- 2 O. Vinodakrishnan, Estate Officer (1.7.91 to 11.7.91)
- 3 P. M. Chandran, ,, (11.7.91 to 29.7.91)
- 4 O. Vinodakrishnan, ,, (1.8.91 to 5.2.92)
- 5 A. K. Sreenarayanan, ,, (5.2.92 to 16.5.92).

Out of the total area of 391.44 hectares, 213.30 hectares have been allotted to other schemes as detailed below:—

1 Botanical Garden	: 25.00 ha.
2 Instructional Farm	: 95.50 "
3 Cocoa	: 6.00 "
4 Olericulture & Medicinal Plant	: 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	: 9.00 "
11 Instructional farm of the College of Forestry	: 20.00 "
12 Water Management Unit	: 5.00 "
13 Cashew Research Station	: 5.50 "

Rubber is the major crop looked after in the estate and the total quantity of rubber produced during the year was 7,046,040 kg. No fresh planting was carried out during 1991-'92.

Total receipts of the station during 1991-92 is Rs. 2,20,186.89 and the expenditure is Rs. 28,77,149.76.

Campus Development

The Campus Development Scheme has been in operation since 1991 at the Kerala Agricultural University Headquarters to beautify the campus and to utilise the cultivable waste lands for crop production. The establishment of a plant propagation and nursery management unit; botanical garden and mango research unit are the added objectives.

Dr R. R. Nair, Associate Director, Regional Agrl. Research Station, Kumarakom continued to hold charge of the Special Officer (Campus Development).

Plant propagation and nursery management unit (Central Nursery)

A variety of ornamental and fruit plants were raised in the central nursery for the large scale production of planting materials. A germplasm of 285 roses was maintained. The collection of anthurium and orchids included very rare types. The production of planting materials of fruit plants was as follows.

Mango grafts	:	2189 Nos.
Guava layers	:	340 Nos.
Sapota grafts	;	15 Nos.
Other fruit plants (Garcinia, Bilimbi,		
Jambose, Star apple,		4900 Nos.
West Indian Cherry,		
Star Gooseberry etc		

Campus Development

The beautification programmes of the main campus was continued. Avenues and lawns were properly maintained.

Mango research Unit

A 15 ha. plot was cleared and trenching and platform formation carried out with the technical assistance of the Department of Soil Conservation. A total of 38 types of mango varieties/types were collected for experimental planting.

Botanical Garden

The Botanical garden was transferred from the College of Horticulture to the Campus Development Programme on 13/3/1992. The arboretum has 179 species,

CHAPTER VII

Finance and Accounts

Sri. P. M. Indramanian, Finance Officer Gr. 1 continued as Comptroller on deputation basis in the University upto 7-8-'91. On 8-8-'91, Sri. K. Babu Jose, Finance Officer Gr. I took charge as Comptroller. The three internal audit circles viz. Northern, Central & Southern functioned properly during the period under report.

Budget Estimate for 1991-92

The University had adopted a Budget of Rs. 3512 lakhs for operation for the year 1991-92 anticipating a grant-in-aid of Rs. 2500 lakhs (Rs. 1900 lakhs under Non-Plan and Rs. 600 lakhs under plan) from the State Government. ICAR assistance of 373 lakhs, University's resources of Rs. 244 lakhs and assistance from other sources to the tune of Rs. 40 lakhs were also anticipated. It was expected to meet the balance amount of Rs. 355 lakhs from the opening cash balance, loans and suspense, pension fund etc.

As against our anticipation of Rs. 1900 lakhs as Grant-in-aid from State Government, Government have provided only Rs. 1554.5 lakhs in the State Budget resulting in a short fall of Rs. 354.5 lakhs. Government have released the entire amount of Rs. 2154.50 lakhs (Rs. 1554.50 lakhs under Non-Plan and Rs. 600 lakhs under Plan) to the University in 1991-92. In addition to this an additional grant-in-aid of Rs. 347.11 lakhs (20% state share in implementing UGC/ICAR Scales of pay to teachers/scientists) has also been released by the Government for clearance of arrears upto March '90.

In order to accommodate the post Budget Commitments on

- i) Sanctioning 2 instalments of D. A. from 1-7-90 and 1-1-91.
- (ii) Revision of wages of labourers from 1-7-88 and the general cost escalation, University has revised the estimates to Rs. 2781 lakhs and the General Council has approved the same on 28-3-'92.

The details of receipts during 91-92 are as follows.

	<u>Rs. in lakhs.</u>
1) Annual State Block Grant-in-aid (Non-Plan)	1901.61
2) Annual State Block Grant-in-aid (Plan)	600.00
3) Grant-in-aid from ICAR & other external agencies	270.29
4) Internal receipt	190.08
Total	<u>3011.98</u>
Expenditure	
Non-Plan	1768.45
Plan (including State share on ICAR Co-ordinated projects NARP)	542.35
I. C. A. R.	291.49
Others	81.81
Total	<u>2684.10</u>

There were 15 sittings of the Accounts Committee during the period under report. The Finance Committee met on 5-3-'92 to finalise the Budget Estimate 92-93 and Revised Estimate 1991-92.

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Appendix I

MEMBERS OF THE STATUTORY AUTHORITIES

GENERAL COUNCIL (upto 30-1-1992)

EX-OFFICIO MEMBERS

- The Chancellor
- The Pro-Chancellor
- The Vice-Chancellor
- The Secretary to Government (Ag)
- 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, KAU.
- The Dean, Faculty of Fisheries, KAU
- The Dean, Faculty of Veterinary & Animal Sciences, KAU
- The Dean, Faculty of Basic Science & Humanities, KAU
- The Dean, Faculty of Agrl. Engg. & Technology, KAU
- The Director of Extension, KAU
- The Director of Research, KAU
- The Director of Students Welfare, KAU

ELECTED MEMBERS

Members of the Legislative Assembly (6 numbers 1 from
or ST)

- Mr K. P. Aravindakshan, MLA; Kaprasseri, Peruvanna Veedu,
P. O., Kunnankulam
- Mr. Joseph, MLA, Congress House, Sreekantapuram,
- Mr. Mani, MLA; Moolamattom House, Kalady P. O.,
ly

ouse, Thrissur-2
ara, Pallickal

S (2 numbers)
e of Horticulture.

f Agriculture,

octorate Degree

e, Vellayani

ate Courses

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terinary & Animal

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CAET, Tavanur

(other than Deans)

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lege of Veterinary

sheries, Panangad

o.)
ctorate of Physio

ats (4 nos)
Panchava

ann

Sri Raghavan Nair (RN Manazhi), President, Perinthalmanna Panchayat, Manazhi House, P. O. Perinthalmanna, Malappuram
Sri V. Narayanan, President, Payyannur Panchayat, P. O. Vellur, Kannur

Representatives of Mayors of Municipal Corporations and Chairman of Municipal Councils (1 no.)

Sri Karumalil Sukumaran, Municipal Chairman, Kollam

MEMBERS NOMINATED BY THE CHANCELLOR

Agri. Scientists (2 nos)

Dr. Abi Cheeran, Professor (Plant Pathology), College of Horticulture; Vellanikkara.

Dr. P. K. Gopalakrishnan, Associate Dean (Retd), 1/325, Vellanikkara.

Farmers (5 nos)

Sri K. T. Kumaran, Ex MLA, Pallipuram, Mundayad P. O; (via) Varram, Kannur.

Sri M. K. Bhaskaran, Muppattiyil Veedu, Idappallikotah P. O; Panmana, Kollam.

Sri K. Viswam, Chembakasserikalam, P. O. Palathulli, Thathamangalam, Palakkad.

Prof. P. A. Sreedharan Nair, Panthaplavellil, Parvathi Sadan, Chengannoor P. O; Alappuzha.

Sri C. K. Raghavan, Thundathil House, Maravancherry, Chengallur P. O; Thrissur.

Non-official respresentatives (3 nos)

Co-operation

Sri K. K. Kumara Pillai, Kamkoli House, Karumadi, Ambalapuzha, Alappuzha.

Fisheries

Sri V. V. Saseendran, Advocate, Karunagappally, Kollam.

Animal Husbandry

Sri K. Bappu, P. O. Vengara, Malappuram.

Non-official representatives of Plantation Industry (1 no)

Sri M. Venugopalakurup, Iringannur P. O; Nadapuram, Kozhikode.

Women (2 nos)

Smt C. G. Sethulakshmy, Kunnumpurath Needu, Near Deepika, Kottayam.

Smt Kallyani Teacher, Kottiyodi P. O; Pathayakunnu, Thalassery, Kannur.

Engineer who has specialised in Agriculture Engineering or Irrigation (2 nos.)

Sri Mani Usman, Bishera, Ambalamukku, Kowdiar P. O; Thiruvananthapuram.

Educationist (1 no.)

Prof. N. Rajasekharan Nair, Vadasseri Illam, Clappana P. O; Kollam.

Representative of Agrl. Labour (4 nos)

Sri M. K. Chathappan, Behind KKTM College, Pullur P. O; Kodungallur.

Sri C. P. Williams, Cherusseri House, P. O. Vaniampara, Thrissur.

Sri M. M. Antony, S. M. Colony, No. 91, Mampazhakari, Veliyanad P. O; Alappuzha.

Sri U. Sethumadhavan, Unikkat House, Puthiyankam, Alathur, Palakkad.

Representatives of SC and ST (2 SC and 1 ST among them one should be an MLA)

Sri Nanoo Master, MLA; Poikayil, Ayikunnam, Bharanikkavu, Poruvazhy P.O; Sasthamkotta, Kollam.

Sri V. Divakaran, Rajbhavan, Parakkadavu P. O; Sooranad, Kollam.

Sri A. P. Harilal, Ammancheril, Thenkkakkal P. O; Vandiperiyar.

Representatives of University Senates (3 nos)

University of Calicut

Smt M. P. Sarojini Amma, Principal, NSS Training College, Ottappalam.

University of Cochin

Sri P. K. Kamarudeen, Section Officer, Cochin University of Science & Technology, Kochi.

University of Kerala

Sri G. Somasekharan Nair, Desabhimani, P. B. No. 20 Thiruvananthapuram.

Representative of ICAR (1 no.)

Dr. M. Aravindan, Sr. Scientist (ASE), ICAR, New Delhi.

GENERAL COUNCIL (From 31-1-'92)

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 Agrl. University
 The Dean, Faculty of Fisheries, Kerala Agrl. University
 The Dean, Faculty of Vety. and Animal Sciences, Kerala Agrl. University
 The Dean, Faculty of Basic Sciences and Humanities, Kerala Agrl. University
 The Dean, Faculty of Agrl. Engineering and Technology, Kerala Agrl. University
 The Director of Extention, Kerala Agrl. University
 The Director of Research, Kerala Agrl. University
 The Director of Students Welfare, Kerala Agrl. University

ELECTED MEMBERS

Members of the Legislative Assembly (5 nos One from (SC or ST)

Sri M. P. Thampi, MLA (SC), Mangalamparambil House, Paruthoor P. O; (via) Pattambi, Pallipuram, Palakkad Dist.
 Sri T. V. Chandramohan, MLA, 14/587, 'Govind' Puzhakkal Road, Poonkunnam, Thrissur-2
 Sri K.C. Joseph, MLA, Congress House, Sreekantapuram:670631, Kannur.
 Sri P. Raghavan, MLA, Munnad P-O; (Via) Chengala, Kasaragod
 Sri K. M. Soopy, MLA, Firoz Manzil, Panoor P. O; Kannur-Pin:670 692.

Representatives of students of post-graduate courses (2 nos.)

Sri Ani S. Das (90-13-05), M.V.Sc. Student, College of Veterinary & Animal Sciences, Mannuthy P. O; Thrissur Dt.
 Sri George Joseph (90-11-19), M. Sc. (Agri.) Student, College of Agriculture, Vellayani P. O; Thiruvananthapuram

Representative of the Students of the Doctorate Degree Courses (1 no.)

Sri Abraham Varghese (90-21-01), Ph. D. Scholar, Department of Agronomy, College of Horticulture, Vellanikkara P. O; Thrissur.

**Representatives of the students of the Graduate Courses
(2 nos.)**

Sri Mohammed Shafy K, (89-03-61), B. V. Sc & A. H. Student,
College of Veterinary & Animal Sciences, Mannuthy P. O;
Thrissur

Sri Thomas K. Thomas (88-03-22), B. V. Sc & AH Student,
College of Veterinary & Animal Sciences, Mannuthy P. O.
Thrissur.

**Representative of the Students of Diploma Courses and
Certificate Courses (1 No.)**

Vacant.

**Representatives of Teachers of Faculties (other than Deans
(not more than 4—one from each faculty)**

Faculty of Agriculture

Sri Jose Joseph. Assistant Professor, Communication Centre,
Mannuthy P. O; Thrissur

Faculty of Veterinary and Animal Sciences

Dr. Manomohan C. B; Assistant Professor, College of
Veterinary and Animal Sciences, Mannuthy P. O; Thrissur.

Faculty of Fisheries

Sri Rajendran C. G; Associate Professor (Aquaculture), Rice
Research Station, Vyttila P. O; Kochi-19.

Faculty of Agrl. Engineering & Technology

Sri John Thomas K; Professor, Kelappaji College of Agri-
cultural Engineering and Technology, Tavanur.

Representative of Non-Teaching Staff (1 no)

Sri Skandakumar V. S; Senior Grade Assistant, KAU Head-
quarters Vellanikkara P. O; Thrissur.

**Representatives of Presidents of Panchayats in the State
(4 nos).**

Sri Astamoorthi Namboodiripad M. M; President, Elamkulam
Panchayat, Kunnakkavu P. O; (Via) Cherukara, Malappuram
Sri Chakkunny K. R., President, Ollukkara Panchayat, Mannuthy
P. O; Thrissur Dist.

Sri Remasan T. M., President, Thillenkery Panchayat,
Thillenkery P. O; Kannur Dist.

Sri Sivankutty V., President, Ulloor Panchayat, Medical
College P. O; Thiruvananthapuram.

Representative of Mayors of Municipal Corporations & Chairman of Municipal Councils in the State (1 No.)

Sri Kerala Varma P., Chairman, Thrippunithura Municipality, Thrippunithura, Ernakulam Dist.

MEMBERS NOMINATED BY THE CHANCELLOR

Agricultural Scientists (2 nos).

Prof. K. V. Peter, Director, National Research Centre for Spices, P. B. No. 1701, Marikunnu, P. O; Kozhikode : 673 012.

Dr. A. Jalaluddin, Assoc. Professor, AICRP on Poultry, Veterinary College, Mannuthy P. O; Thrissur District.

Farmers (5 nos) (one from SC/ST).

Sri D. Vijayakumar, Advocate, Chengannoor, Alappuzha District.

Sri Ahammed Bavappa, Munayamkunnu, Eravakadu P. O; Kumaranelloor : 679 552, Palakkad District.

Sri C. V. Narayanan, Chettakkulam House, Madakkathara P. O; Thrissur Dt.

Sri K. Janardhanan, 'Ambadi' Vazhuthacaud, Thycaud P. O; Thiruvananthapuram.

Sri K. Gopalan, Thazhathu Veedu, Makkada P. O; Kakkodi, Kozhikode, Kozhikode District.

Sri K. Gopalan is a member of the Scheduled Caste.

One non-official representative from each of the following:

Co-operation

Sri M. V. Kurien, Retired Block Development Officer, Ollur, Thrissur District.

Fisheries

Sri N. Prabhakaran, Advocate, Madappilly, Nadapuram Road, Vadakara, Kozhikkode District.

Animal Husbandry

Sri Prayar Gopalakrishnan, Prayar P. O; Oachira, Kollam District.

One non-official representative of the Plantation Industry in the State

Sri Johny Nelloor, MLA, House No. 8, Housing Colony, Moovattupuzha, Ernakulam District.

Two Women Members

Smt Saraswathy Kunjkrishnan, Kalangara House, Kollam, Kollam District.

Smt C. Dhanalekshmi, Advocate, Ezhuvamthuruthu, Ponnani P. O; Malappuram District

One Engineer specialised in Agricultural Engineering or Irrigation

Dr. A. M. Salim, Chief, Projects Division, State Planning Board, Pattom, Thiruvananthapuram

One Educationist

Dr. K. Ramadas, Professor, Kerala Agrl. University, Veterinary Hospital, Mannuthy, Thrissur District.

Four Members to represent Agricultural labour of whom, one shall be a member belonging to the S. C.

Sri C. N. Govindankutty, Cherpu P. O; Thrissur District.

Sri M. K. Purushothaman, Painavu P. O; Idukki District.

Sri Joseph Perumpilly, Chevvoor, (Via) Cherpu, Thrissur District.

Sri P. Narayanan Nair, Omassery P. O; Thamarassery, Kozhikode District.

Sri M. K. Purushothaman is a member of the Scheduled Caste.

One member to represent Plantation Labour

Sri V. V. Shoukkathali, Mannarkad P. O; Palakkad District

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 (Scheduled Tribe—MLA) Wayanad District.

Sri A. Thankappan, Advocate, Kovalam, Thiruvananthapuram Dist.

Sri V. Retnakaran, 'Vrindavanam' Near Toll Booth, Valapattanam, Kannur District.

Representative of University Senate of Calicut

Dr K. Unnikrishnan, Head of the Department of Botany, University of Calicut, Calicut University P. O; Pin 673 635

Representative of University Senate of Cochin

Sri Binoy Viswam, 333, Vikas Nagar, Kozhikode—673 006

Representative of University Senate of Kerala

Sri S. Subramonian Potti, T. C. 14/1680, Sanskrit College Road, Palayam, Thiruvananthapuram

Representative of Indian Council of Agrl. Research

Dr M. Aravindan, Principal Scientist (ASE), Indian Council of Agrl. Research, Krishi Anusandhan Bhavan, Dr K. S. Krishnan Marg, New Delhi: 110 012

EXECUTIVE COMMITTEE

The term of the members of the Executive Committee other than ex-officio members expired on 30/1/1992. From 31/1/1992 to 31/3/1992 the Executive Committee consisted of ex-officio members and ICAR representative only.

I EX-OFFICIO MEMBERS

The Vice-Chancellor, Kerala Agricultural University,
Vellanikkara, Thrissur

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—Member Representing ICAR

Dr M. Aravindan, Principal Scientist (A&E), ICAR,
Krishi Anusandhan Bhavan, Dr K. S. Krishnan Marg, New
Delhi-110 012

Elected Dean of Faculty

Dr C. Sreedharan, Dean, Faculty of Agriculture, College of
Agriculture, Vellayani P. O: Thiruvananthapuram 695 522

III ELECTED TEACHERS

Vacant

IV ELECTED NON-OFFICIAL MEMBERS

SC/ST Representative

Sri V. Divakaran, Raj Bhavan, Parakkadavu P. O; Sooranad
North, Kollam Dist.

Woman Representative

Smt Kallyani Teacher, Kottiyodi, Pathayakkunnu P. O;
Thalassery, Kannur Dist

Other elected Non-Official members

Sri A. M. Paraman, MLA; Ayyanivalappil House, Thrissur-2
(upto 6/91)

Professor N. Rajasekharan Nair, A. K. G. Centre,
Thiruvananthapuram

Sri M. M. Antony, S. M. Colony, No.91, Mampazhakari,
Veliyanad P. O; Kuttanad, Alappuzha (Dist)

V ELECTED STUDENT REPRESENTATIVE

Vacant

ACADEMIC COUNCIL MEMBERS

(from 28-12-90 to 27-12-'93)

The Vice Chancellor, Kerala Agricultural University,
Vellanikkara, Thrissur.

The Dean, Faculty of Agriculture, College of Agriculture,
Vellayani, Thiruvananthapuram.

The Dean, Faculty of Vety. and Animal Sciences, College of
Veterinary and Animal Sciences, Mannuthy, Thrissur (Dist.)

The Dean, Faculty of Fisheries, College of Fisheries,
Panangad, Ernakulam (Dist.)

The Dean, Faculty of Agrl. Engg. and Technology, Kelappaji
College of Agrl. Engg. and Technology, Tavanur,
Malappuram (Dist.)

The Director of Research, Directorate of Research, Kerala
Agricultural University, Vellanikkara, Thrissur (Dist.)

The Director of Extension, Directorate of Extension, Kerala
Agricultural University, Mannuthy, Thrissur.

The Director of Students Welfare, Directorate of Students
Welfare, Kerala Agricultural University, Vellanikkara,
Thrissur.

The Registrar, Kerala Agricultural University, Vellanikkara,
Thrissur.

The Director of Agriculture, Directorate of Agriculture, Vikas
Bhavan, Thiruvananthapuram.

The Director of Animal Husbandry, Directorate of Animal
Husbandry, Vikas Bhavan, Thiruvananthapuram.

MEMBERS NOMINATED BY THE CHANCELLOR

from among the Heads of Departments of the Faculties
(6 members)

Dr. M. Chandrasekharan Nair, Professor of Head, Dept. of
Plant Pathology, College of Agriculture, Vellayani P. O;
Thiruvananthapuram.

Dr. (Mrs.) S. Sulochana, Professor and Head, Department of
Microbiology, College of Veterinary and Animal Sciences,
Mannuthy, Thrissur.

Sri K. John Thomas, Professor and Head, Dept. of Irrigation
and Drainage Engineering, Kelappaji College of Agrl. Engg.
and Technology, Tavanur, Malappuram (Dist.)

Dr. A. Rajan, Director, Centre for Advanced studies in
Pathology, College of Veterinary and Animal Sciences,
Mannuthy P. O; Thrissur.

Sri T. S. Venkitesan, Professor and Head, Dept. of Agrl. Entomology, College of Horticulture, Vellanikkara P. O: Thrissur

Sri P. Radhakrishnan Nair, Professor, and Head, Dept. of Fishing Technology, College of Fishing Technology, College of Fisheries, Panangad, Ernakulam

MEMBERS NOMINATED BY THE CHANCELLOR,

from among the staff of the Research Station of the University (3 members)

Dr. J. Thomas, Associate Professor (NC), Aromatic and Medicinal Plants Research Station, Odakkali, Ernakulam (Dist.)

Dr. K. M. Rajan, Associate Director, Regional Agrl. Research Station, Pattambi, Palakkad Dist.

Dr. R. Raveendran Nair, Associate Director, Regional Agrl. Research Station, Kumarakom, Kottayam (Dist.)

MEMBERS NOMINATED BY THE CHANCELLOR

from among those connected with service in Agriculture, Animal Husbandry, Forestry, Fisheries, Dairy Development, Co-operation and Community Development, Departments (not more than 5 members).

Most. Rev. Benedict Mar Gregories, Arch Bishop of Thiruvananthapuram. Arch Bishop's House, Thiruvananthapuram

Sri E. Gopalakrishna Menon, Ex. MLA, Rohini, Poothole, Thrissur-4.

Dr. Abraham Mathew, Manager (Trg.), KLD Board Unit, Mattupetty-685 616

Dr. K. Sadasivan Nair, Director, Kerala Forest Research Institute, Peechi, Thrissur

Sri N. Lakshminarayanan Nair, Chief (Agricultural Division), State Planning Board Office, Pattom, Thiruvananthapuram.

MEMBERS NOMINATED BY THE CHANCELLOR

from among the Scientists from ICAR and/or its institution from other Universities in India or from among well-known Scientists in India (Not more than 5 members)

Dr. C. Chinnamani, Asst. Director General (Agro. Forestry), Indian Council of Agricultural Research, New Delhi

Dr. (Mrs.) Rajammal P. Devadas, Vice- Chancellor, Sree Avinasilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore.

Dr. M. K. Nair, Director, Central Plantation Crops Research Institute, Kasaragode

Sri Sakthi Velu, Director, Marine Project Export Development Authority, Kochi, Ernakulam

Dr. G. Soundrapandian, Dean, (Agriculture), Agrl. College & Res, Institute, Tamil Nadu G. D. Naidu Agricultural University, Madurai

ELECTED MEMBERS

Two members from among the Post-graduate students and one member from among the Research students of the University. Sri P. Muraleedharan (90-11-22), M. Sc. Ag. (Soil Science and Agrl. Chemistry), Collège of Horticulture, Vellanikkara P. O; Thrissur

Sri K. Happy Mathew (90-11-08), I. M. Sc. Ag. (Agronomy), College of Agriculture, Vellayani P. O; Thiruvananthapuram

Sri N. Purushothaman Nair, (89-21-02), Ph. D. student (Agronomy), College of Horticulture, Vellanikkara, Thrissur

ELECTED MEMBERS

one member elected by the Teachers (other than the Dean) of each Faculty from among themselves

Dr. D. Alexander, Associate Professor, Sugarcane Research Station, Thiruvalla. Pathanamthitta (Dist).

Dr. C. George Varghese, Professor, College of Veterinary and Animal Sciences, Mannuthy, Thrissur

Dr. K. V. Jayachandran, Asst. Professor, College of Fisheries, Panangad, Kochi, Ernakulam

Sri Jippu Jacob, Assoc. Professor, Kelappaji College of Agrl. Engg. and Technology, Tavanur, Malappuram (Dist.)

MEMBERS CO-OPTED (not more than 10) to secure adequate representation to different aspects of Agriculture

Dr. E. Nanu, Professor, Dept. of Veterinary Public Health, College of Veterinary and Animal Sciences, Mannuthy

Dr. M. Krishnan Nair, Director (Res. Co-ordination) College of Veterinary and Animal Sciences, Mannuthy, Thrissur

Dr. C. C. Abraham, Assoc. Dean, College of Horticulture, Vellanikkara, Thrissur

Dr. C. A. Jos, Associate Dean, College of Co-operation and Banking, Mannuthy, Thrissur

Dr D Manikantan Thampi, Professor and Head, Department of Aquaculture, College of Fisheries, Panangad, Ernakulam
 Dr. (Mrs) L Prema, Professor and Head, Department of Home Science, College of Agriculture, Vellayani, Thiruvananthapuram.

Sri G Mukundan, Principal Chief Conservator of Forests (GI), Vazhuthacaud, Thiruvananthapuram

Dr. S. Ramachandran Nair, Professor of Horticulture, Department of Horticulture, College of Agriculture, Vellayani, Thiruvananthapuram

Dr. U. Mohammed Kunju, Assoc. Director of Research (M & E), Directorate of Research, Kerala Agricultural University, Vellanikkara, Thrissur

BOARD OF STUDIES

i. FACULTY OF AGRICULTURE

Dean, Faculty of Agriculture, KAU	Chairman
Heads of Departments under the Faculty	Members
Agronomy	"
Agricultural Botany	"
Agricultural Entomology	"
Agricultural Economics	"
Agricultural Engineering	"
Agricultural Extension	"
Agricultural Statistics	"
Horticulture	"
Plant Pathology	"
Soil Science & Agrl. Chemistry	"
Plant Breeding	"
Plantation Crops	"
Pomology, Floriculture & Landscaping	"
Olericulture	"
Processing technology	"
Home Science	"

Two Specialists

Dr. S. Sankaran, Director, Centre for Soil & Crop Management, Tamil Nadu Agrl. University, Coimbatore

Dr. G. G. Nair, Director, Central Tuber Crops Research Institute, Sreekaryam, Thiruvananthapuram

Such other members

Dr. N. Mohandas, Professor (RC), College of Agriculture, Vellayani

Dr. N. Mohankumar, Associate Director, NARP (SR), College of Agriculture, Thiruvananthapuram

Student representative

Sri P. Muraleedharan (90-11-22) Ist M. Sc. (Ag.), Soil Science & Agrl. Chemistry, College of Horticulture, Vellanikkara

Sri K. Happy Mathew (90-11-08), Ist M. Sc. (Ag.) Agronomy, College of Agriculture, Vellayani

Sri N. Purushothaman Nair, Ph.D. Student (Agronomy), College of Horticulture, Vellanikkara

Special Invitees

Director of Agriculture, Thiruvananthapuram

Dean i/c, Kelappaji College of Agricultural Engineering & Technology, Tavanur.

The Associate Dean, College of Horticulture, Vellanikkara

The Associate Dean, College of Co-operation & Banking, Mannuthy

The Special Officer, College of Forestry, Vellanikkara

ii. FACULTY OF VETERINARY & ANIMAL SCIENCES

Dean, Faculty of Veterinary & Animal Sciences Chairman

Heads of Departments under the Faculty
of Veterinary & Animal Sciences Members

Anatomy	"
Physiology & Biochemistry	"
Livestock Production Management	"
Dairy Science	"
Microbiology	"
Parasitology	"
Poultry Science	"
Pharmacology	"
Animal Breeding & Genetics	"
Animal Reproduction	"
Extension	"
Nutrition	"
Pathology	"
Clinical Medicine	"
Veterinary Public Health	"
Preventive Medicine	"
Statistics	"
Surgery	"

Two Specialists

Dr. G. V. Raghavan, Professor & Head, Department of Animal Nutrition, College of Veterinary & Animal Sciences, Andhra Pradesh Agril. University, Rajendra Nagar, Hyderabad: 500 030
Dr. N. Natarajan, Dean i/c, Madras Veterinary College, Tamil Nadu University of Veterinary & Animal Science, Vepery, Madras

Such other members

Dr. M. Krishnan Nair, Director, Research Co-ordination, College of Veterinary and Animal Sciences, Mannuthy
Dr. R. Sabarinathan Nair, Professor, College of Veterinary and Animal Sciences, Mannuthy

Student representative

Nil

Special Invitees

Director of Animal Husbandry, Thiruvananthapuram
Director of Dairy Development, Thiruvananthapuram,

iii. FACULTY OF FISHERIES

Dean, Faculty of Fisheries, KAU	Chairman
Heads of Departments in the Faculty of Fisheries	Members
Aquaculture	"
Fishery Biology	"
Processing Technology	"
Fishery Engineering	"
Fishing Technology	"
Fishery Hydrography	"
Management Studies	"

Two Specialists

Dr. N. R. Menon, Head of Department of Marine Biology, School of Marine Sciences, Foreshore Road, Kochi-16.
Dr. Gopakumar, Joint Director, Central Institute of Fishery Technology, Kochi.

Such other members

Sri. P. M. Sherief, Assistant Professor (Biochemistry), Department of Processing Technology, College of Fisheries, Panangad.
Dr. B. Madhusoodana Kurup; Asst. Professor (Fishery Biology), College of Fisheries, Panangad.

Student representative

Nil

Special invitees

Director of Fisheries or his nominee.

General Manager, Matsyafed or his nominee.

iv. FACULTY OF AGRICULTURAL ENGINEERING & TECHNOLOGY

The Dean, Faculty of Agrl. Engg. & Technology

The Heads of Departments under the Faculty

(4 nos.)

Chairman
Members

Specialists

Sri. M. R. Vasudevan Pillai, State Agrl. Engineer, Department of Agriculture, Govt. of Kerala.

Sri. A. Abdul Majeed, Superintending Engineer, State Ground Water Department, Pattom, Thiruvananthapuram.

Two members from among the teachers of the University

Dr. M. Krishnan Nair, Director, Research Co-ordination, College of Veterinary and Animal Sciences, Mannuthy.

Dr. C. C. Abraham, Associate Dean, College of Horticulture, Vellanikkara.

Student representative

Nil

Special invitees

Dr. C. M. Jacob, Former Vice-Chancellor, KAU.

Dr. K. R. Swaminathan, Dean, College of Agrl. Engineering, Tamil Nadu Agricultural University, Coimbatore.

Dr. A. N. Remadevi, Department of Agricultural Engineering, College of Agriculture, Vellayani.

Sri. P. John Zachariah, Joint Commissioner (Retd.), Govt. of India, HOREB 12-Perissery, Chengannur.

□ □

Appendix II

SUB COMMITTEES

SUB COMMITTEES OF EXECUTIVE COMMITTEE

The term of the members of Sub Committees of Executive Committee expired on 30-1-1992. From 31-1-1992 there was no sub-committee.

Finance Committee

The Vice-Chancellor		Chairman
The Secretary (Finance)		Member
The Secretary (Agriculture)		"
Sri A. M. Paraman, MLA	(upto 6/91)	"
Sri V. Divakaran	(from 9/91)	"
The Comptroller		Member-Convenor

Planning and Development Committee

The Vice-Chancellor		Chairman
The Secretary to Govt. (Agriculture)		Member
Representative of the teacher in the Executive Committee		"
Representative of the student in the Executive Committee		"
Sri V. Divakaran		"
Sri M. M. Antony		"
Prof. N. Rajasekharan Nair		"
The Director of Research		Member-Convenor

Research Review Committee

The Vice-Chancellor		Chairman
Representative of the teacher in the Executive Committee		Member
Sri V. Divakaran		"
Sri M. M. Antony		"
Prof. N. Rajasekharan Nair		"
Smt. Kallyani Teacher		"
Director of Research		Member-Convenor

Establishment Committee

Prof. N. Rajasekharan Nair	Chairman
Sri A. M. Paraman, MLA (upto 6/91)	Member
Sri V. Divakaran	"
Sri M. M. Antony	"
Smt Kallyani Teacher	"
Dr. C. Sreedharan, Dean (Agri.)	"
Representative of the Teacher in the Executive Committee	"
Registrar	Member-Convenor

Students' Welfare Committee

Sri V. Divakaran	Member
Smt Kallyani Teacher	"
Sri M. M. Antony	"
Prof. N. Rajasekharan Nair	"
Representative of the student in the Executive Committee	"
Director of Student's Welfare	Member-Convenor

Works Committee

The Vice-Chancellor	Chairman
Sri V. Divakaran	Member
Sri M. M. Antony	"
Prof. N. Rajasekharan Nair	"
Representative of the Teacher in the Executive Committee	"
Director of Physical Plant	"

II. SUB COMMITTEES OF GENERAL COUNCIL

Assurance committee

Smt G. G. Sethulakshmi	Chairman
Sri V. Narayanan	Member
Sri C. P. Williams	"
Sri K. R. Chakkunny	"
Sri C. K. Raghavan	"
Sri K. Bappu	"
Sri Karumalil Sukumaran	"
Registrar	Member-Convenor

Accounts committee

Sri C. Somasekharan Nair	Chairman
Sri K. Viswom	Member
Sri V. Sivankutty	"
Sri K. T. Kumaran	"
Dr. P. K. Gopalakrishnan	"
Prof. P. A. Sreedharan Nair	"
Sri A. P. Harilal	"
Comptroller	Member-Convenor

Statute sub committee

Dr. Abi Cheeran	Chairman
Sri T. Nanoo Master, MLA	"
Sri V Kesavan, MLA	"
Sri A. M. Paraman, MLA	"
Prof. N. Rajasekharan Nair	"
Sri U. Mani	"
Sri V. V. Saseendran	"
Dr. K. Sabarinathan Nair	"
Dr. P. M Mathew	"
Dr. P. K. Rajeevan	"
Sri V. Balagopalan	"
Registrar	Member-Convenor

III 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 & Animal Sciences, KAU	
Dean, College of Fisheries, Panangad	
Dean, Kelappaji College of Agrl. 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 & Animal Sciences, Mannuthy	

Teacher Representative in the Executive Committee of KAU
Assoc. 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,
Kumarakôm

The Managing Editor, Kerala Journal of Veterinary Research,
College of Vety. and Animal Sciences, Mannuthy

The Managing Editor, Agrl. 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

Dr S Sinha, Director, Centre of Earth Sciences Studies,
Thiruvananthapuram

Director, Centre for Water Resources Development and
Management, Kozhikode

Dr. M. Sakthivel, Director, Marine Products Export Develop-
ment Authority, Kochi

Dr. Abraham Mathew, Director, Indo-Swiss Project, Mattupetty

Co-opted members (Non-official)

Sri. K. P. Aravindakshan, MLA, Kaprasseri Peruvanna Veedu,
Kecheri P. O; Kunnankulam

Sri A. M. Paraman, MLA, Ayyinivalappil House, Thrissur-2

Sri N. Rajasekharan Nair, AKG Centre, Azhikkodan Raghavan
Road, Thiruvananthapuram

Sri M. M. Antony, SM Colony No.91, Mambazhakari, Veliyanad P. O; Kuttanad, Alappuzha

Sri V. Divakaran, Raj Bhavan, Parakkadavu P.O; Sooranad North, Kollam District

Smt Kallyani Teacher, Kottiyodi P. O; Pathayakunnu, Thalasseri, Kannoor District

Sri E. G. Menon, Rohini, Poothole, Thrissur-4

Sri P. G. Nair, Emeritus Scientist, College of Veterinary and Animal Sciences, Mannuthy

Sri Joseph Alappat, Thoppil, Green Garden, Karanchira P. O; Thrissur District

Father Joseph Muttumana, Chairman, Peoples Dairy Development Project, Mattoor, Kaladi, Ernakulam Dist

Dr K. Unnikrishnan, Head (R&D), Tata Tea Limited, Munnar

Smt Leela Gulathi, Fellow, Centre for Development Studies, Ulloor, Thiruvananthapuram 14

FACULTY RESEARCH COMMITTEES

i. AGRICULTURE

Director of Research, KAU	Chairman
Director of Extension, KAU	Member
The Dean, College of Agriculture, Vellayani	"
The Assoc. Dean, College of Hort, Vellanikkara	"
Assoc. Director of Research (AR&T), Directorate of Research, KAU	"
Assoc. Director of Research (M and E), Directorate of Research, KAU	"
Assoc. Director of Research (Plg.), Directorate of Research, KAU	"
Assoc. Director, NARP High Range Region, Regional Agrl. Station, Ambalavayal	"
Assoc. Director, Regional Agrl. Res. Station, Pattambi	"
Assoc. Director, NARP (Southern Region), College of Agriculture, Vellayani	"
Assoc. Director, Regional Agrl. Research Station, Kumarakom	"
Assoc. Director, Regional Agrl. Research Station, Pilicode	"
Assoc. Dean, College of Co-operation and Banking, Mannuthy	"
Special Officer, College of Forestry, Vellanikkara	"

Project Co-ordinators

	Member
Dr. C. A. Joseph, Professor and Head, Rice Research Station, Moncompu	
Dr. R. R. Nair, Associate Director, Regional Agricultural Research Station, Kumarakom	"
Dr. K. V. Peter, Professor (Hort.) College of Horticulture, Vellanikkara	"
Dr. S. R. Nair, Professor (Hort.), College of Agriculture, Vellayani	"
Dr. C. Sreekantan Nair, Professor, College of Horticulture, Vellanikkara	"
Dr. K. M. N. Namboodiri, Professor (Bot.), College of Horticulture, Vellanikkara	"
Dr. R. Gopimony, Professor (PB), Communication Centre, Mannuthy	"
Dr. V. Muraleedharan Nair, Professor (Agro.), College of Agriculture, Vellayani	"
Dr. C. Raghavan Pillai, Professor (Agro.), College of Agriculture, Vellayani	"
Dr. T. V. Viswanathan, Associate Professor (P. B.), College of Hort., Vellanikkara	"
Dr. P. Padmaja, Professor (Chem.), College of Agriculture, Vellayani	"
Dr. M. C. Nair, Professor (Pl. Path.), College of Agriculture, Vellayani	"
Dr. N. Mohanakumaran, Associate Director, NARP (SR), College of Agriculture, Vellayani	"
Dr. L. Prema, Professor (Home Science), College of Agriculture, Vellayani	"
Dr. G. T. Nair, Professor (Extn.), College of Agriculture, Vellayani	"
Dr. S. K. Nair, Professor (Micro), College of Agriculture, Vellayani	"
Dr. V. K. Sasidhar, Professor (Agronomy), College of Agriculture, Vellayani	"
Dr. P. Balakrishna Pillai, Associate Director, Regional Agrl. Research Station, Ambalavayal	"
Dr. B. Mohankumar, Associate Professor (Agro), College of Forestry, Vellanikkara	"
Dr. K. C. Rajan, Associate Professor (Agro), ORP, Ozhalapathy	"
Dr. G. R. Pillai, Associate Director, Regional Agrl. Research Station, Pattambi	"
Dr. Padmaja, College of Agriculture, Vellayani	"

Heads of Departments other than Project Co-ordinators

Dr. R. S. Aiyer, Professor, Department of Soil Science and Agrl. Chemistry, College of Agriculture, Vellayani	Member
Prof. P. V. Prabhakaran, Professor (Ag. Stat.), College of Horticulture, Vellanikkara	"
Dr. A. M. Thampi, Professor, Dept. of Agrl. Extn., College of Agriculture, Vellayani	"
Dr. K. I. Wilson, Professor, Department of Plant Pathology, College of Agriculture, Vellayani (up to 6-5-1991)	"
Dr. L. Prema, Professor, Department of Home Science, College of Agriculture, Vellayani	"
Professor (Research Co-ordination), College of Agriculture, Vellayani	Secretary
ii. VETERINARY & ANIMAL SCIENCES (FRC)	
Director of Research, KAU	Chairman
Dean, Faculty of Vety. and Animal Sciences	Member
Director of Extension, KAU	"
Assoc. Director of Research (V&AS)	"
Heads of Departments in the Faculty of Veterinary and Animal Sciences	"
Professor (Farms)	"
Director, Veterinary Research and 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
Head, Department of Irrigation and Drainage, Engineering, KCAET	"
Head, Department of Supportive and Allied Course, KCAET.	"
Professor of Agricultural Engineering, College of Agriculture, Vellayani	"
Prof. Raghavan Nambiar, Head, Department of Civil Engineering, College of Engineering, Thrissur	"
Dr. A. N. Namboodiri, Director, TBGRI, Thiruvananthapuram	

iv. FISHERIES (FRC)	
Director of Research	Chairman
Dean, Fisheries	Member
Director of Extension, KAU	do
Professor (Fisheries Research)	do
Professor, Aquaculture	do
Professor, Fishery Biology	do
Head, Department of Fishery Hydrography, College of Fisheries, Panangad	do
Professor, Processing Technology, College of Fisheries, Panangad	do
Head, Department of Fishing Technology, College of Fisheries, Panangad	do
Head, Department of Fishery Engineering, College of Fisheries, Panangad	do
Head, Department of Management Studies, College of Fisheries, Panangad	do
Extension Advisory Committee	
Vice-Chancellor, Kerala Agricultural University, Vellanikkara	Chairman
Director of Extension, Kerala Agricultural University, Vellanikkara	Member-Convenor
<i>Non-officials from General Council and Executive Committee (Govt. State)</i>	
Sri A. M. Paraman, MLA, Ayyinivalappil House, Thrissur	Member
Sri N. Rajasekharan Nair, AKG Centre, Azhikoden Raghavan Road, Thiruvananthapuram	do
Smt Kallyani Teacher, Kottiyodi P. O; Pathayakunnu, Thalassery.	do
Sri M. M. Antony, S.M. Colony No. 91, Mambazhakari, Veliyanad P.O., Kuttanad, Alappuzha	do
Sri V. Divakaran, Raj Bhavan, Parakkadavu P O, Sooranad North, Kollam District	do
Sri K. S. Hirosh Kumar D.A.Sc. Student, Kelappaji College of Agricultural Engineering and Technology, Tavanur, Malappuram	do
Sri K. C. Joseph MLA, Congress House, Sreekandapuram, Kannur	do

Smt C. G. Sethulekshmi, Kunnumpurath Veedu, Near Deepika Office, Kottayam	Member
Sri K. Viswam, Chembakasserikalam, Palathulli P O, Thattamangalam, Palakkad District	do
Prof. P. A. Sreedharan Nair, Panthaplaveettil, Parvathy Sadan, Chengannur PO, Alappuzha District	do
Sri Mani Usman, Bishere, Ambalamukku, Kowdiar P O, Thiruvananthapuram	do
Sri T. J. Mathew, Thumbassery, Areepiachy-691 333, Via Punalur	do
Sri K. Aravindaksha Pillai, Member, Nanniyode Panchayat, Mannoor Veedu, Peringamala P O	do
Sri Joseph Alapat, Thoppil, Guru Gardens, Karanchira P O, Thrissur District	do

Govt. Officials — State

Development Commissioner, Govt. of Kerala, Thiruvananthapuram (Nominee—Smt Vilasini Ramachandran, Additional Commissioner for Rural Development Department, CSI Buildings, LMS Compound, Thiruvananthapuram)	do
Director of Agriculture, Vikas Bhavan, Thiruvananthapuram (Nominee—Additional Director of Agriculture (Extension), Vikas Bhavan, Thiruvananthapuram)	do
Director of Animal Husbandry, Vikas Bhavan, Thiruvananthapuram (or nominee)	do
Director of Dairy Development, Pattom, Thiruvananthapuram (or nominee)	do
Director of Fisheries, Vikas Bhavan, Thiruvananthapuram (Nominee—Smt Sarojini Devi, Additional Director Fisheries, Thiruvananthapuram)	do
Chief Conservator of Forests, Chief Forest Conservators Office, Thiruvananthapuram (Nominee—Sri C. M. Manoharan,	

Forest Conservator, Thrissur	Member
Registrar of Co-operative Societies. Vazhuthacaud, Thiruvananthapuram (Nominee—Additional Registrar (General), Office of the Registrar of Co-operative Societies, Thiruvananthapuram	"
Principal Information Officer, Farm Information Bureau, Thiruvananthapuram	"
<i>Other Science and Technology Organisations</i>	
Director, State Committee on Science, Technology and Environment (STEC), General Hospital Road, Thiruvananthapuram	"
<i>Mass Media</i>	
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 M. C. Varghese, Chief Editor, Mangalam Daily, P. B. No. 1, Kumaranalloor P. O., Kottayam	"
<i>Commodity Boards</i>	
Sri P. K. Narayanan, Joint Director, Publications and Public Relations, Rubber Board, Sastri Road, Kottayam	"
Sri Antony Cherian, Director, Spices Board, St. Cross Vincent Road, Kochi	"
<i>Voluntary Organisations</i>	
Fr. Joseph Muttumana, Peoples Dairy Development Project, Mattur, Kalady, Ernakulam District	"
<i>Kerala Agricultural University</i>	
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. K. C. George, IX/49, Karanchira, Vettikkal P. O., Ernakulam Dt. 682 313	Member
Sri M. K. Vijayaraghavan, Thrissur 680 007	"
Sri A. M. 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, Marikunnu P.O. Kozhikode or his nominee.	"
Director of Agriculture, Thiruvananthapuram or his nominee.	"
Head of Dept. of Agronomy, College of Hort. Vellanikkara	"
" Soil Science and Agri.	"
" Chemistry, College of Hort., Vellanikkara	"
" Plant Pathology, College of Agri., Vellayani	"
" Agril. Botany, College of Hort., Vellanikkara	"
" Agril. Entomology, College of Agri., Vellayani	"
" Agril. Economics, College of Hort., Vellanikkara	"
" Pl. Breeding, College of Agriculture, Vellayani	"
" Horticulture, College of Agri., Vellayani	"
" Plantation Crops, College of Hort., Vellanikkara	"
" Olericulture, College of Horticulture, Vellanikkara	"
" Pomology, College of Agriculture, Vellayani	"
Associate Director, Regional Agril. Research Station, Pilicode.	"
Associate Director, Regional Agril. Research Station, Pattambi.	"
Associate Director, Regional Agril. Research Station, Ambalavayal	"

Associate Director, Regional Agrl. Research Station, Kumarakom	Members
Associate Director (NARP-SR), College of Agriculture, Vellayani	"
Professor (RC), College of Agriculture, Vellayani	"
Associate Director of Research (M & E), KAU, Vellanikkara	"
Assoc. Director of Research (Plg.), KAU, Vellanikkara	"
Assoc. Director of Research (AR & T), KAU Vellanikkara	"
N. S. S. Advisory Committee upto 8-11-91	
Vice-Chancellor, Kerala Agrl. University	Chairman
Assistant Programme Advisor	
NSS Regional Centre, Thiruvananthapuram	Member
State Co-ordinator of NSS, Govt. of Kerala, Thiruvananthapuram	"
Co-ordinator, NSS Training and Orientation Centre, Kalamassery	"
Registrar, Kerala Agrl. University	"
Comptroller, KAU	"
All Deans/Associate Deans of the College having NSS, Units	"
Professor of Agricultural Extension, College of Agriculture, Vellayani	"
Professor of Extension, College of Veterinary and Animal Sciences, Mannuthy	"
One Programme Officer from each of the Colleges having NSS Units	"
Director of Students' Welfare, KAU	"
Programme Co-ordinators of traditional Universities in the State	"
One Social worker (to be nominated by Vice-Chancellor)	"
President, KAU Students' Union	"
Secretary, KAU Students' Union	"
Programme Co-ordinator (NSS) KAU	Member/Convenor
N. S. S. Advisory Committee (From 8-11-1991)	
Vice-Chancellor, Kerala Agricultural University	Chairman
District Collector, Thrissur	Member
Registrar, KAU	"
Agriculture Secretary, Govt. Secretariat, Thiruvananthapuram	"

Asst. Programme Adviser, NSS Regional Centre, Thiruvananthapuram	Member
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 in the KAU	"
President, KAU Students Union	"
Secretary	"
One Programme Officer from each of the Colleges 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

Postgraduate 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	"
Associate Dean, College Horticulture, Vellanikkara	"
Associate 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 the Constituent Colleges	"
Dy. Director of Students' Welfare i/c	Convenor & Secretary

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Appendix III

LIST OF STAFF AT HEADQUARTERS

Vice-Chancellor	:	Dr EG Silas
Vice-Chancellor's Office		
PS to VC	:	Sri CN Muralidharan Nair from 1-8-91 onwards
PA to VC	:	Sri K Sadasivan Nair
Sr Office Supdt.	:	Sri P Haridasan
Peons	:	Sri V Krishnan ,, EK Padmanabhan ,, P Thirumalai, Class IV ,, K J Jose, Class IV ,, A Ramachandra Bahadur from 13-1-92
Driver	:	Sri KA Jebbar upto 5-11-91 " CP Karunakaran Nair from 6-11-91
Registrar's Office		
Registrar	:	Sri James Varghese, IAS
Dy Registrar (Admn) I	:	Sri KA Appu Chettiar from 30-4-90 to 17-2-92 ,, Lourden Leord from 17-2-92 to 29-2-92 ,, KA Appu Chettiar from 29-2-92
Dy Registrar (Admn) II	:	Sri PM Chandran
Dy Registrar (Acad)	:	Sri PM Parameswaran Namboodiri from 20-12-91 to 10-1-92. ,, Lourden Leord from 10-1-92 to 16-2-92 ,, PM Parameswaran Namboodiri from 17-2-92
Asst. Registrar (Admn) I	:	Sri Lourden Leord up to 10-7-91 ,, CS Asok Kumar from 10-7-91 onwards

Asst. Registrar (Admn) II	:	Sri TN Sankunny upto 22-4-91 ,, PM Parameswaran Nambodiri from 22-4-91 to 1-1-92 ,, Lourden Leord from 1-1-92 to 1-2-92 Smt C Rajamma, from 1-2-92
Labour Officer	:	Sri C Sasikumaran Nair
Recruitment Officer	:	Smt K Subhashini
PA to Registrar	:	Sri VP Asokan
Section Officers	:	Smt PE Haleema Beevi Sri PX Francis ,, K Chandramohan Smt L Syamala ,, TA Zainaba Beevi Sri KI Chakkunny ,, KP Sreedharan Smt R Remadevi ,, PV Nalini Sri KR Dileep Kumar upto 4-4-91 Smt Vivian Jose from 4-4-91 to 8-7-91 Sri PJ John from 8-7-91 Smt AK Kamala Bai upto 29-2-92 ,, Meenakshikutty from 29-2-92 ,, KP Saramma Sri N Vijayakumar
Assistants	:	Smt MA Urmila Devi Sri Abdul Kareem Sri VA Achuthan Smt A Santhakumari Sri PV Sreedharan ,, K Haridasan Smt S Rajalekshmy Amma Sri KR Suresh Smt V Chellamma Sri GV Kumar ,, KC Joseph ,, KS Paul Smt PK Pushpaja Sri T Jagadeesan ,, ME Rajan Smt A Daisy Anto upto 30-11-91 ,, K Meera from 1-12-91 Sri P Krishna Prakash

Smt TB Latha
 „ KP Vasanthakumari
 Sri VR Padmanabhan
 „ PV Mohanan upto 30-6-91
 Smt KK Sunitha
 Sri VN Narayanan
 „ MW Wilson Raj
 Smt Mary Joseph
 Sri PV Asokan
 „ M Abdul Muthalavi
 Upto 26-9-91
 „ IA Liakath Alikhan
 from 27-9-91
 „ KM Akber Ali upto 8-7-91
 „ TJ Babychan from 8-7-91
 Smt KV Ammalukutty
 Sri K Pradeep
 „ MK Ajayakumar
 Smt Subaida Beevi upto 21-6-91
 Sri PK Mohanan from 19-7-91
 „ U Mukundan
 „ KN Radhakrishnan
 Smt PA Saraswathy
 Sri GO Davis
 Smt CK Mariya John
 Smt A Rajeswari
 Sri PV Xavier
 „ PN Ramesh
 Smt M Girija Upto 20-8-91
 Sri K Sreekumar from 21-6-91
 Smt Baby Saroja 5/91
 Sri KD James 9/91
 Smt KB Sudha from 1-7-91
 Pool Officer : Sri AK Abdul Kadir
 Sr. Office Superintendents : Sri TK Prabhakaran
 „ OU Chandran upto 29-2-92
 (Retired on 29-2-92)
 Smt PO Elsy
 „ KT Thanka
 Sri KK Ramachandran Nair
 „ VP Asokan (PA to Registrar)
 Smt PV Brizitha on working
 arrangement to Fisheries
 Station, Puduveypu
 Sri R Sadan
 Smt S Seemanthini 22-10-91

Smt PD Rosa
 „ KK Chandra
 „ TV Santha
 „ PV Devoo
 „ A Kochammu
 Sri KA Basheer
 Smt Parukutty
 Sri MK Vasudevan
 „ NV Santhosh Kumar
 from 13-3-92

HDV Driver : Sri VR Kochu
 „ VN Sankarankutty
 „ AJ Antony
 „ PM Yusuf (Retired on
 superannuation w.e.f. 31-8-91)
 „ IT Rappai (Transferred to
 College of Hort., Vellanikkara
 —relieved on 18-11-91)
 „ KV Kochappan (Transferred
 to KCAE&T, Tavanur—relieved
 on 19-6-91)
 „ TK Govindan (Transferred to
 College of V. & AS., Mannuthy
 relieved on 11-11-91)

LDV Driver : Sri PK Sasidharan
 „ CP Karunakaran Nair
 „ MS Kunju
 „ MV Karappan
 „ TM Chacko

Bus Attendants : Sri KA Abdul Rasheed
 „ Beer Bahadur Singh
 „ VV Vasu upto 13-11-91
 „ VA Ouseph from 13-11-91

Record Keeper : Smt AE Rahel
Binder : Sri R Vijayan
Cook-cum-Caretaker : Sri P Sankara Pillai
Sweepers : Smt M Lakshmikutty
 „ KK Nabeesa

Finance wing

Comptroller : Sri PM Indramonian upto 8-8-91
 „ Babu Jose from 8-8-91
PA to Comptroller : Smt VB Leelavathy Amma

Dy. Comptroller : Sri CN Muraleedharan Nair upto 1-8-91
 ,, M Nakulan 1-8-91 to 11-9-91
 ,, K Balakrishnan Nair 11-9-91 to 31-12-91
 ,, PV Gopalakrishnan Nair 1-1-92 onwards

Asst. Comptroller (LIA) : Smt V Chandrika upto 10-7-91
 Sri A Basil from 10-7-91 to 11-9-91
 ,, J Kochukunju from 11-9-91

Asst. Comptroller (CC) : Sri O Vinodakrishnan upto 1-7-91
 ,, Lourden Leord 1-7-91 to 23-10-91
 ,, S Bhaskara Pillai from 23-10-91

Asst. Comptroller IAC (CR) : Sri CS Asok Kumar upto 10-7-91
 Smt V Chandrika from 10-7-91

Section Officers ; Sri VR Sankaran Kutty
 ,, S Krishnan Nair upto 11-9-91
 Smt CC Rosily from 11-9-91
 Sri P Aliyar upto 23-7-91
 Smt MN Sreedevi 23-7-91 to 7-8-91
 ,, EK Prabhavathy 7-8-91 to 26-9-91
 ,, J Remadevi Amma from 26-9-91
 ,, PT Thankamany
 ,, VV Radhamma
 ,, VR Vijayamma
 ,, R Thankamony
 Sri KN Pushpangadan upto 2-8-91
 Smt KP Narayanikutty from 2-8-91
 Sri NK Unnikrishnan
 Smt Lillykutty Thomas
 ,, PA Lakshmy
 Sri MN Sasidharan
 ,, MN Vijayakumar
 Smt CV Santha
 ,, EK Prabhavathy upto 21-8-91
 Sri KM Vincent Pereira from 21-8-91
 Smt M Rugmini from 11-9-91

Assistants

: Sri PK Ajayakumar
,, PD Tony
,, PV Raveendran
Smt C Sobhanakumari
Sri Y Rajas
Smt KN Lalithamma
,, TK Ambika
,, C Usha
,, N Mary Joseph
Sri K Dineshan
,, NP Valsan
,, PL Tony
Smt MP Narmada
,, M Komalam (deputation)
Sri K Girindra Babu
Smt KN Sarojini upto 1-7-91
Sri Vijayachandra Babu
from 15-7-91
,, TC Jose
,, Boby Abraham
Smt MS Valsala Kumari
Sri C Kunhunny
,, PS Suresh Kumar
,, MA Mary
,, Hareendran Nair upto 19-6-91
,, PB Abdul Kader from 2-8-91
Smt PP Prema
,, EK Dalika
Sri V Unni
,, CP Raphi
,, V Mohandas
Smt Sophiamma Joseph
,, KN Leela
,, VK Beena
,, I Indira
Sri Iqbal Rowther upto 3-10-91
,, MA Ullas
Smt B Sulekha upto 21-6-91
Sri EX Antony Joseph
,, PB Anilkumar upto 30-6-91
Smt N Indiradevi from 8-7-91
,, Lucy Mary from 10-6-91
,, CC Sheela from
26-6-91 to 10-9-91
,, Satheedevi from 21-10-91

	Smt PA Geetha from 5/91
	.. M Lyla from 12-7-91
	Sri C Sivadasan from 18-6-91
	.. J Varghese Ollukkaran from 18-6-91
	.. M Babu Varghese from 26-6-91
	.. PM Suresh from 8-7-91 to 31-12-91
	Smt PM Sarada from 10-12-91
	.. Shylajadevi from 12-12-91
	Sri PK Kochu Pauk from 24-12-91
	Smt KK Sudharma from 10-2-92
	.. P Indiradevi upto 6-2-92
	.. NV Thankam
	Sri KN Murukes
	.. NK Mohankumar
	Smt AV Rathi Devi 27-9-91
	Sri KC Varghese from 15-7-91
	.. KV Prasad from 30-10-91
	.. Sri A Shah upto 3-10-91
LDV Driver	: Sri KO John Stephen
Peons	: Sri TR Raveendran
	.. CO Varunny
	Smt CP Kousalya
	.. K Santhakumari
	.. KK Madhavi
	Sri MN Vasu
	.. PE Thankappan

Directorate of Research

Director of Research	: Dr M Aravindakshan
Associate Director of Research (Plg.)	: Dr S Balakrishnan
Assoc. Director of Research (M and E)	: Dr U Mohammed kunju
Assoc. Director of Research (AR and T)	: Dr Abicheeran upto 29-7-91 Dr G Ravindran Pillai
Assoc. Director of Research (V&S)	: Dr MS Nair
Section Officers	: Sri T Aravindan .. V Viswambharan

Assistants	Sri K Subramonian Smt AK Valsala upto 30-6-91 Sri K Govindan from 17-7-91 Smt Sheela A. Attokkaran Sri VS Sathianesan .. K Harinath .. KF Mathew Smt VA Suprabha .. AR Sheela from 14-10-91.
Clerical Assistants	: Smt K Thankamony
Sr. Office Superintendent	: Smt KN Santhakumari
Office Superintendent	: Smt P Subhashini .. K Saraswathy Amma Sri Shanmugham
Typists	: Smt Fathima Beevi, (Typist Gr II) Sri PT Ajith Smt S Rose Mary upto 19-6-91 Sri KC Mohan kumar 7/91 onwards .. EV Poulouse 7/91 onwards Smt V Lalitha 3/92 onwards
Peon	: Sri VA Ittiara .. AP Manikkan Smt IR Vilasini
LDV Drivers	: Sri ES Chandran .. KP Jose .. MP Paul
Duplicator operator	: Sri IR Govindan
Directorate of Extension, Mannuthy	
Director of Extension	: Dr AGG Menon
Associate Director of Extension	: Dr E Sivaraman
Section Officers	: Sri KK Subramonian .. KV Sugunan
Assistants	: Smt P Sudha Sri K Girish Babu Smt TK Sarada Sri MN Chandrasekharan Smt B Sarasamma upto 18-6-91 .. V Chandrika from 8-7-91
Senior Office Superintendent	: Sri TD Jose
Office Supdt.	: Smt PP Rosy
Selection Grade Typist	: Sri KJ Lonan

Typist Grade II : Smt AC Mancy
 Driver : Sri NA Sukumaran
 Peon : Smt PD Annamma
 Sri C Mukundan Nair from 4-7-91

Directorate of Students Welfare

Deputy Director of Students : Sri OK Paul (i/c)

Welfare

Junior Assistant Professor : Dr PJ Manga

(Lady Phy. Education)

Section Officer : Sri PM Balakrishnan

Assistants : Sri VK Venugopalan

„ VS Skandakumar

Typist Grade II : Smt E Sathi devi

Peon : Sri C Govindan

Technical staff of constituent colleges (Physical education)

College of Veterinary & Animal Sciences, Mannuthy

Associate Professor (NC) : Sri OK Paul

Jr. Asst. Professor : Smt Molley Cherian

College of Agriculture, Vellayani

Associate Professor : Smt AC Marykutty

Jr. Asst. Professor : Sri Pazhania Pillai

College of Hort., Vellanikkara

Assoc. Professor : Smt Susy V John

Assoc. Professor : Sri E Soman

KCAET, Tavanur

Jr. Asst. Professor : Sri M Velayudhankutty

College of Fisheries, Panangad

Jr. Asst. Professor : Sri EU Rajan

Directorate of Physical Plant

Director of Physical Plant : Sri PO Thomas

PA to Director of Physical Plant : Sri TK Sugathan,

Assistant Exe. Engineer (M)

Financial Assistant : Sri Pius Fernandez upto 22-9-91

„ A Basil from 23-9-91

Section Officer : Sri V Balagopalan

„ K Ramachandran Nair

Smt KM Shylaja

Senior Grade Assistant : Smt S Valsala

Sri KK Sadeesan

„ KK Kuttappan

Assistant Grade I	:	Sri KM Akberali „ Abdul Muthalavi Smt VK Sobhana Sri PJ Thimose
Assistant Grade II H. G.	:	Smt Mabel Philip
Assistant Grade II	:	Smt PM Latha Sri AS Nasarudheen Thangal upto 28-9-91 „ TM Maheswaran
Senior Office Superintendent	:	Sri PI Ittoop
Office Superintendent	:	Smt S Radhamma
Senior Grade Typist	:	Smt Rosy K Francis „ B Leelabai Amma
Grade II Typist	:	Smt MK Parukutty „ MK Thankamani „ TM Meera
Blue Printer-cum-Stereo operator	:	Sri TT Ousephuny
Head Draftsman	:	Smt KV Ajitha
Draftsman	:	Smt PA Meerabai Sri B Mohammed Irshad „ KM Anilkumar „ CV Vivekanandan Smt CI Sali Sri B Lukose
Peon H. G.	:	Sri CV Vijayan Smt PI Kunjimol „ MO Kochannam Sri NP Chandran
Driver	:	Sri PK Sasi (LDV)
Engineering Sub-Division, Vellanikkara		
Assistant Executive Engineer (Civil)	:	Sri PR Govindan
Assistant Engineer (Civil)	:	Smt K Vijayakumari Sri Savy Joseph „ PM Vasudevan „ MV Chackochan
Overseer Grade I (Civil)	:	Sri B Mohammed Irshad „ CK Nasarudheen „ KP Baburaj
Typist Grade I	:	Smt PA Mumtaz
Overseer Grade II	:	Sri KK Anilan „ KG Ajithkumar

Assistants : Sri B Ajithkumar
 „ Naveen Narayan
 „ P Sreekumar
Smt NV Annie

Electrical Sub Division, Vellanikkara

Assistant Executive Engineer (Ele) : Sri PM James
Assistant Engineer (Ele) : Sri AJ Anto,
 „ B Lukose
Technical Supervisor Lineman Gr. II : Sri CA Varghese
 : Sri KV Ravi

Mechanical Sub Division, Vellanikkara

Asst. Executive Engineer (Mech) : Sri TK Sugathan
Section Officer : Sri KS Natarajan
Selection Grade Typist Assistant Gr. II : Smt PN Savithry
 : Sri TV Karthikeyan
 „ PN Mohanan
Peon : Sri VA Pareed
Road Roller Driver : Sri MK Bhaskaran
Overseer Gr. I (Civil) : Sri VR Girishkumar
Overseer Gr. II (Civil) : Sri KN Satees
Overseer Gr. II (Mech) : Vacant
Pump Operator : Sri VB Easaf
 „ TP Jose Mathew
 „ KK Francis
 „ A Narayanan
 „ KM Baby
 „ VK Ramachandran
 „ PV Kumaran
 „ KV John
 „ CM Prabhakaran

Engineering Sub Division, Mannuthy

Assistant Executive Engineer (Civil) : Vacant (Sri PM James, AEE (Ele.) holding additional charge)
Assistant Engineer (Civil) : Sri P Raman
 „ PM Mohammed Ismail
Overseer Grade I (Civil) : Sri PH Salim
 „ CA James
Overseer Grade II (Civil) : Sri Mathews M Kizhakoot
Fitter cum Mechanic : Sri Vijayan
Plumber Technician : Sri Govindan

Pump Operator	:	Sri MV Parameswaran „ VR Parameswaran „ TK Kesavan „ CR Kochu
Section Officer	:	Smt EK Bharathy
Office Superintendent	:	„ K Sathyavathi Bai
Senior Grade Assistant	:	„ AT Gracy
Assistant Grade II	:	Vacant
Peon (Hr. Gr.)	:	Smt V Saraswathi

Engineering Division, Panangad

Executive Engineer	:	Vacant (Sri PR Govindan, AEE holding additional charge)
Section Officer	:	Sri AA Kousalya
Assistant Engineer	:	Sri KV Ramanunny
Overseer Grade I (Civil)	:	Sri Satheesan „ Sabu Paul Mulerikkal „ PT Joy
Overseer Grade II (Civil)	:	Sri Saji Markose „ MK Devarajakurup „ M Sunni
Assistant (S. G.)	:	Smt VM Ammini
Assistant Grade I	:	Sri Sanalkumar
Typist	:	Smt KA Geetha
Peon	:	Sri K Sankuru
Driver	:	Sri Sukumara Marar

Engineering Sub Division, Tavanur

Assistant Executive Engineer	:	Vacant (Sri PM James, (Ele) Vellanikkara holding additional charge)
Assistant Engineer (Civil)	:	Sri KT Vasudevan „ K Abdulkader
Overseer Grade I (Civil)	:	Sri Suresh Babu „ Muhammad Abdul Kader
Overseer Grade II	:	Sri KH Abdul Rahiman „ V Unnikrishnan
Section Officer	:	Smt Leelamma
Assistant Grade II	:	Sri Jayakumar
Typist	:	Smt Jalaja
Peon	:	Sri K Divakara Panicker „ M Sundaran
Driver	:	Sri Abdul Kader

Engineering Sub Division, Vellayani

Asst. Executive Engineer (Civil)	:	Vacant
Asst. Executive Engineer	:	Sri EK Gokulan
Asst. Engineer (Civil)	:	Sri K Suresh Babu
Asst. Engineer (Ele.)	:	Sri R Raveendran Nair
Overseer Gr. I	:	Sri V Harikumar
Overseer Gr. II	:	Sri KN Sathees
Sr. Gr. Assistant	:	Smt C. Chandrika Kumari ,, N Ponnamma
Selection Grade Typist	:	Smt S Sudha Devi
Driver	:	Vacant
Peon	:	Sri J Thampikunjan

Engineering Sub-Division, Pattambi

Assistant Exe. Engineer	:	Vacant
Draftsman Gr. II	:	Sri AV Kesavan
Assistant	:	Smt A Sushama
Typist	:	Smt P Soumini Devi
Peon (Hr. Gr.)	:	Sri PK Aboo

Appendix IV

LIST OF STAFF IN VARIOUS CAMPUSES

College of Agriculture, Vellayani

- Dean : Dr C Sreedharan
Professor : Dr N Mohandas
(Research Co-ordinator)
Project Co-ordinator : Dr P Padmaja

Department of Agronomy

- Professor : Sri KP Madhavan Nair,
upto 22-1-1992
Dr V Thomas Alexander
Dr V Muraleedharan Nair
Dr M Oommen (KAU Scheme)
Assoc. Professor : Dr M Achuthan Nair
Assoc. Professor (NC) : Dr S Chandini
Dr VL Geethakumari
Dr R Pushpakumari

Department of Agrl. Botany

- Professor & Head : Dr N Krishnan Nair
upto 12-8-1991
Professor : Sri K Gopakumar
Dr PD Vijayagopal
(Plant Physiology)
Dr S Seshadrinath (Pl. Physiology)
Professor (KAU Scheme) : Dr ST Mercy
Associate Professor : Dr D Chandramony
Smt N Kamalam
Dr DS Radha Devi (N.C)

Department of Plant Breeding

- Professor & Head : Dr V Gopinathan Nair
Professor : Dr P Manikantan Nair
Associate Professor : Dr J Sreekumari Amma

Department of Soil Science & Agrl. Chemistry

- Professor & Head : Dr RS Aiyer up to 1-10-91

Professor : Dr P Padmaja
 (Project Coordinator,
 Soils & Agronomy)
 Professor : Thomas Varghese
 Sri Abdul Hameed
 Associate Professr : Dr S Pushkala
 Sri K Babukutty
 „ PA Korah
 „ P Rajendran (NC)
 Jr Asst. Professor : Sri Sam T Kurumthottikkal
 up.to 5-9-91
 Smt Usha Mathew

Department of Plant Pathology

Professor & Head : Dr KI Wilson up to 6-5-91
 Dr MC Nair
 Professor : Dr S Balakrishnan
 Sri PK Sathyarajan up to 21-3-92
 Dr P Karunakaran
 Professor (KAU Scheme) : Dr Sasikumar Nair
 Professor : Dr Susamma Philip
 Associate Professor : Dr B Rajagopal
 Dr M Suharban
 „ P Sivaprasad (NC)
 „ KK Sulochana
 „ P Santhakumari
 „ P Nazeema
 Assistant Professor : Sri PJ Joseph
 Dr Babu George
 Jr. Assistant Professor : Dr Lulu Das
 Smt KS Meenakumari

Department of Animal Husbandry

Professor : Dr Skariah Oommen
 Associate Professor : Dr MR Rajan
 Assistant Professor : Dr R Vijayan

Department of Entomology

Professor : Dr KV Mammen
 Dr G Madhavan Nair
 Dr K Sasidharan Pillai
 Dr George Koshy
 Sri KK Ravindran Nair
 Dr A Visalakshy
 Associate Professor : Dr Susamma Mathai
 Smt K Santhakumari

Professor (KAU Scheme) : Smt K S Remamony
 Dr PG Gopinathan
 Associate Professor (NC) : Sri P Reghunath
 Dr MS Sheela

Department of Agricultural Extension

Professor & Head : Dr GT Nair
 Professor : Dr B Babu
 Associate Professor : Sri M Mohammed Hussain
 Associate Professor (NC) : Dr S Bhaskaran
 Dr VB Padmanabhan
 Dr S Shylaja
 Jr Asst Professor : Smt B Seema
 Sri AK Sherif

Department of Horticulture

Professor & Head : Dr S Ramachandran Nair
 Associate Professor (NC) : Dr BK Jayachandran
 Dr CS Jayachandran Nair
 Dr K Vasanthakumar
 Jr Asst Professor : Smt PC Jessykutty

Department of Home Science

Professor and Head : Dr L Prema
 Associate Professor : Smt Mary Mathew
 Smt Mary Ukkru
 Dr V Usha
 Assistant Professor : Smt S Shyamakumari
 Jr Asst Professor : Smt Rari John
 „ C Nirmala
 „ Soffi Cherian
 „ B Prasannakumari
 „ Mumtaz Beegum

Department of Agri Economics

Professor : Sri ER Narayanan Nair
 Jr Asst Professor : Smt AM Santha
 „ Elsamma Job

Department of Agri. Engineering

Professor : Dr AN Remadevi
 Associate Professor : Sri P Jacob John

Department of Agri. Statistics

Assistant Professor : Smt Gracemma Kurian
 Jr Asst Professor : Smt Bright Joseph

Department of Physical Education

Associate Professor (NC) : Smt AC Marykutty
Jr Asst Professor : Sri S Pazhanian Pillai

Instructional Farm

Professor and Head : Dr VK Sasidhar
Associate Professor : Sri S Janardhanan Pillai
Associate Professor (NC) : Dr R Prakash
Sri C Nandakumar
Jr Asst Professor : Sri K Umamaheswaran
Sri Babu Mathew

Technical, Administrative & Supporting Staff

Junior Programmer : Sri CE Ajithkumar
Technical Assistant
(Statistics) : Smt P Saraswathy
Librarian i/c : Smt B Leela
Asst. Librarian : Sri P Sanjeev
Reference Assistant : Sri K Rajasekharan
Smt KR Sarala
Sri PR Raghavan Pillai
„ R Manohar
Assistant Chemist : Smt G Sushama
„ S Vasundhara Bai
Technical Assistant (HG) : Sri K Muraleedharan Nair
Farm Supervisor Gr.I (Agri.) : Sri K Gopinathan Nair
„ L Davy
Smt J Vimala
„ K Rosammal
„ S Kamala Bai
Sri NT George
Smt K Radhama Thankach
„ B Indira Bai Amma
„ JT Jasmin
Sri KC Retnakaran Nadar
Smt J Vimala Bai
„ A Belsi
Sri C Brigidson
Farm Supervisor (Vety.) : Sri R Ramachandran Nsir
Administrative Officer Gr.I : Sri PC Raveendran Pillai
up to 31-8-91
Sri AK Sreenarayanan
from 1-9-1991

Section Officer : Sri A Vincent Samuel
 „ PR Sasidharan Pillai
 „ K Ravikumar
 Smt VM Lalithakumari
 „ N Sujatha
 „ S Saraswathy Amma
 „ K Parukutty
 „ R Vasumathy
 „ P Jameela

Senior Office Superintendent : Smt L Lalitha
 (HG)

Sr. Office Superintendent : Sri MR Raveendran
 Sri A William
 Smt JA Emi Ammal
 „ S Valsala Devi

Instructional Farm, Vellayani

Administrative Officer : Sri R Rajendran Unnithan
 Section Officer : Smt MN Sreedevi
 „ JR Fatimma Malar

Sr. Gr. Farm Supervisor : Sri V Chakrapani
 (Agri.)

Fa.m Supervisor Gr. I (HG) : Smt S Thanka Bai
 Sri P Gopinathan Nair
 „ Govindan
 Smt D Subhadramma
 „ S Sacheedevi
 „ Smt S Icy

Farm Supervisor Gr. II : Sri G Raveendran Assari

College of Horticulture, Vellanikkara

Associate Dean : Dr CC Abraham

Department of Agronomy

Professor and Head : Dr E Tajudeen

Asst. Professor : Dr PV Balachandran
 (Associate Professor NC)
 upto 6-8-91 shifted to RTL
 thereafter

Dr PS John (Assoc. Prof. NC)
 One post vacant

Junior Asst. Professor : Dr KE Savithri
 (Associate Professor)

Dr Mercy George
 (Jr. Asst. Professor)

Farm Assistant Gr. I : Sri VD Thulasi Das
 Lab Assistant : Sri K Govindankutty
 Peon : Smt T Mariam

AICRP on Weed Control

Asst. Professor (Agron.) : Dr P Sreedevi
 (Associate Professor, NC)
 Jr. Assistant Professor : Sri C George Thomas
 Farm Assistant Gr. II : Sri PB Bashajan
 Assistant Gr. II : Smt C Rajalekshmy upto 20-6-91
 „ KB Jaya from 21-6-91
 LDV Driver : Sri VR Chandran

Department of Agrometeorology

Professor and Head : Dr P Balakrishna Pillai
 Assistant Professor : Dr A. V. R. Kesava Rao
 Farm Supervisor : Sri VM Mathew
 Lab Assistant Gr. II : Sri PK Velayudhan

Department of Agri. Botany

Professor and Head : Dr KM Narayanan Namboodiri
 Assistant Professor : Dr Achamma Oommen
 (Associate Professor NC)
 Dr DI Sumabai
 Smt Tessy Joseph upto 24-9-91
 Junior Assistant Professor : Smt MT Kanakamany upto 24-9-91
 „ K Arya
 Lab Assistant : Sri PK Anandan upto 3-7-91
 Smt Valsala from 28-7-91

Department of Agricultural Economics

Professor and Head : Dr V Radhakrishnan
 Associate Professor : Dr K Mukundan
 (Professor in upgraded post)
 Assistant Professor : Dr EK Thomas
 (Associate Professor NC)
 Sri KU Viswanathan
 (Jr. Asst. Professor)
 Smt K Jessy Thomas
 (Jr. Asst. Professor)
 Jr. Asst. Professor : Smt P Indira Devi
 Sr. Grade Typist : Smt S Geetha Bai

Agricultural Entomology

Professor of Entomology & : Vacant (Post restored to the
 Head Department)
 Professor of Nematology : Dr TS Venkitesan

Department of Olericulture

- Professor and Head : Dr KV Peter upto 19-11-91
Dr G Sreekandan Nair i/c.
from 19-11-91 to 29-2-92
- Assoc. Professor : Dr S Rajan i/c from 1-3-92
Dr TR Gopalakrishnan (NC)
Dr TE George, (NC)
from 26-9-91
- Jr. Asst. Professor : Smt N Mini Raj

Vegetable Seed Production Complex

- Assistant Professor : Smt P Meagle Joseph
(Jr. Asst. Professor)
- Jr. Asst. Professor : Sri CA Varghese
- Farm Supervisor : Smt KV Eliamma
- Farm Assistant : Smt H Rachel
(Farm Supervisor)
Smt PK Kallyani
(Farm Supervisor)
Smt L Radhammal
(Farm Assistant)
- Lab Assistant : Sri AP Augusty
- Typist : Smt PS Shylaja

All India Coordinated Vegetable Improvement Project

- Assistant Professor : Dr M Abdul Vahab
(Associate Professor NC)
Dr Salikutty Joseph
(Associate Professor NC)
- Asst. Professor : Dr Sally K Mathew
- Farm Assistant Gr. I : Sri K Vijayanarayanan
(Sr. Gr. Farm Asst.)
Sri PA Abdul Majeed
(FA Gr. I from 1-7-1991)

Department of Plantation Crops and Spices

- Professor and Head : Dr G Sreekandan Nair
- Asst. Professor : Dr Alice Kurien
(One post deployed to NRP)
Dr T Radha (from 28-6-91) on
working arrangement in
Campus Development cell
- Jr. Asst. Professor : Smt Lissamma Joseph
Dr VS Sujatha
Smt Asha Shankar
- Farm Assistant : Sri T Raveendran
- Lab Assistant : Sri K Sachinmayan
Smt PK Savithri

Manpower Development Scheme of Coffee Board

Asst. Professor : Dr PC Rajendran
(Associate Professor NC)

P.G. Diploma in NRP

Assistant Professor : Dr PA Nazeem
(Associate Professor NC)

Farm Assistant : Sri KS Thankappan

CCRP

Professor and Head : Dr R Vikraman Nair

Associate Professor (P/B) : Dr VK Mallika

Assoc. Professor (Pl. Path) : Dr Koshy Abraham

Farm Assistant Sr. Grade : Sri PK Haridas

Farm Asst. Grade I : Sri KV Natarajan

Office Asst. : Sri PV Mohanan

„ K Balakrishnan

LDV Driver : Sri KM Davy

AICRP ON M & AP

Assoc. Professor : Dr TV Viswanathan

Asst. Prof. (Ag. Bot) : Dr VV Radhakrishnan

upto 22-2-92

Smt KT Prasannakumary

from 22-2-92

Asst. Prof. (Biochem) : Dr Sosamma Cheriyan

Tech. Assistant (FA Grade I) : Smt Padma Narayana Pillai

(upto 18-6-91)

Sri Shahul Hameed from 18-6-91

„ CA Mathew

Lab Assistant : Smt KV Padmavathy

Beldar (Class IV/Mali) : Sri TE Abdul Muthaleef

„ CC Babu

„ TN Sasi

Department of Pomology and Floriculture

Professor and Head : Prof. MK Mammen

Asst. Professor : Dr K Lila Mathew

Dr TE George

(Assoc. Professor NC) upto 25.9.91

Dr Keshava Chandran

from 26.9.91

Jr. Asst. Professor : Dr CK Geetha

Dr Sara T George

Dr S Nirmala Devi

Farm Supervisor : Sri V Kunchu

Farm Assistant : Sri CB Sugathan
(Farm Supervisor)
Lab Assistant : Sri KR Prabhakaran

AICFIP

Associate Professor : Dr PK Rajeevan
Jr. Asst' Professor : Smt A Sobhana
Mali : Sri Kunhi Krishnan
,, K Krishnankutty

Department of Processing Technology

Professor and Head : Dr KV Peter i/c upto 19.11.91
Prof. MK Mammen i/c
20.11.91 to 22.2.92
Sri VK Raju (Assoc. Prof. NC)
(in full addl. charge from 22.2.92)
Asst. Professor (P/T) : Sri VK Raju
(Associate Prof. NC)
Asst. Professor (Nutrition) : Smt KA Girija
(Associate Professor NC)
Smt S Subaida Beevi
(Jr. Asst. Professor)
Jr. Asst. Professor (Pro. Tech) : Sri C Narayankutty upto 6.9.91
(Nutrition) : Smt C Norma Xavier
Lab. Asst. : Sri KG Krishnan

Department of Plant Pathology

Professor and Head : Post shifted temporarily to COA,
Vellayani
Professor : Sri CK Ramakrishnan
Assoc. Professor : Prof. PC Jose
(Professor upgraded post)
Dr L Rema Devi,
(Professor upgraded post)
Dr CK Peethambaran
Asst. Professor : Smt K Anitha Cherian
(Jr. Asst. Professor)
Asst. Professor : Dr MV Rajendran Pillai
(Microbiology) (Assoc. Professor NC)
Jr. Asst. Professor : Smt TN Vilasini (on study leave)
Smt D Geetha
(on study leave from 10.4.91)
Smt S Beena
Farm Supervisor Gr. II : Smt NJ Eliamma
Lab Asst. Gr. III : Sri Nandakumar
Lab. Asst. Gr. II : Sri KM George

Scheme for Coconut Nutrition & Physiological Disorders

Professor (P/P)	:	Dr James Mathew
Department of Soil Science & Agri. Chemistry		
Assoc. Professor	:	Prof K Leela Dr NP Chinnamma Prof. PA Korah
Asst. Professor	:	Dr KA Mariam (Assoc. Professor NC) Dr PK Sushama (Assoc. Professor NC) Smt Betty Bastin (Jr. Asst Professor)
Lab Asst. Gr. II	:	Sri PK Narayanan Sri P Unnikrishnan ,, KK Prabhakaran
Peon	:	Smt MV Eliamma

Coconut nutrition and Physiological Disorders

Professor (SS and AC)	:	Dr AI Jose
Asst. Professor (SS and AC)	:	Smt Susan Varghese
Lab Asst. Gr.II	:	Smt KV Ruckiya
Typist Gr.II	:	Smt A Lalitha upto 21-6-91 ,, KP Padmavathy from 22-6-91
LDV Driver	:	Sri M Mukundan

Radio Tracer lab

Professor (Radio Tracer)	:	Dr P. Abdul Wahid
Assoc. Professor (Safety Officer)	:	Smt NV Kamalam
Asst. Professor (Agron) (Post shifted from Agronomy Dept.)	:	Dr PV Balachandran (Assoc. Professor) (NC) from 6-8-91

Instrumentation wing

Assoc. Professor (Instrumentation)	:	Sri K Madhavan Nair
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Department of Physical Education

Asst. Professor	:	Smt Sucey V John (Assoc. Professor (NC) Sri E. Soman (Assoc. Professor (NC)
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Instructional farm, Vellanikkara

Professor	:	Dr Babu M Philip (Assoc. Professor holding charg
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Admn. Asst.	:	Sri KA Mohammed
Asst. Grade II	:	Sri UP Davis Sri PR Murali,
Typist Grade II	:	Smt MK Sajany,
LDV Driver Gr. II	:	Sri MS Sabarinathan,
Sr. Grade Farm Supervisor	:	Sri SM Jainulabdeen
Farm Supervisor Gr. I	:	Sri S Krishnan Chettiar Sri MP George (on working arrangement at CRS)
Farm Supervisor Gr. II	:	Smt B Radha
Farm Asst. Sr. Grade	:	Sri VV Gopi
Technician Gr. I	:	Sri KO Porinchu

College of Veterinary and Animal Sciences, Mannuthy

Dean : Dr G Nirmalan (i/c.)

Department of Anatomy

Professor and Head	:	Dr PA Oommer
Professor	:	Dr Lucy Paily
Assoc. Professor	:	Dr KR Harshan (NC) Dr Jose John Chungath. (NC) Dr CKS Unni (NC)
Jr. Asst. Professor	:	Dr N Asok (On study leave) Dr Shyla Prakash
Farm Asst. Gr. II	:	Sri M Narayanankutty
Permanent Labourer	:	„ C Achuthan

Department of Animal Reproduction

Professor and Head	:	Dr CP Neelakanta Iyer
Professor	:	Dr K Prabhakaran Nair Dr E Madhavan Dr E Mathai Dr V Sudarsanan
Assoc. Professor	:	Dr T Sreekumar (NC) Dr V Vijayakumar (NC) (on deputatio
Asst. Professor	:	Dr SP Suresh Nair
Jr. Asst. Professor	:	Dr Metilda Joseph
Farm Assistants	:	Sri MK Rajendran Nair „ V Gopalakrishnan „ VM Jacob
Driver	:	Sri TG Mohanan
Class IV	:	Sri M Divakaran „ PK Anthappan

Scheme—Incidence, Nature and Magnitude of prevalence of Infertility conditions in crossbred cattle

- Assoc. Professor : Dr PP Balakrishnan (at Calicut on deputation)
Asst. Professor : Dr K Ramachandran (at Thiruvazhamkunnu)

Centre of Excellence in Genetics and Breeding

- Director (Professor and Head) : Dr G Mukundan
Professor : Dr Sosamma Iype
Dr C Rajagopala Raja
(Geneticist, ICAR Net work Project on Goats)
Associate Professor : Dr KV Raghunandan (NC)
Dr B Nandakumar (NC)
Dr P Nandakumar (on study leave)
Dr CR Girija (on study leave)
Junior Asst. Professor : Dr AP Usha
Dr J Radhakrishnan
(on study leave)
Dr TV Aravindakshan
(on study leave)
Farm Supervisor : Sri K Vijayamony
Technician (Fur and Meat Technology) : Sri C Ramadasan
Farm Assistants : Sri Surendran
(ICAR Progeny Testing Scheme)
" S Rajeev
Smt CP Mariamma
Sri KK Kuttan
" M Sukumaran
Sweeper-cum-Attendant : Sri KP Balakrishnan
Senior Research Fellow : Smt AV Vijayalakshmi
(ICAR Adhoc Scheme on Blood Groups) : Smt CG Rema

Department of Animal Management

- Professor and Head : Dr TG Rajagopalan
Professor : Dr CK Thomas
Dr Kurian Thomas
(Pig Breeding Farm)
Assistant Professors : Dr Francis Xavier
Assoc. Prof. (NC) (on deputation)
Dr CS Sebastian Assoc. Prof. (NC)
(Pig Breeding Farm)
Jr. Asst. Professors : Dr K Leena (on study leave)

Farm Supervisor Gr. II : Smt M Lalithamma
Class IV : Smt K Saroja

Department of Animal Production Economics

Professor : Dr T Prabhakaran

Department of Clinical Medicine

Professor and Head : Dr KM Alikutty
Professor : Dr NM Aleyas
Associate Professor : Dr VS Balakrishnan
Dr PC Alex (NC) (on deputation)
Assistant Professor : Dr (Mrs) Usha Narayana Pillai
Dr KM Jayakumar
Dr PG Baby
Farm Assistant : Sri KL Jose

Department of Dairy Science

Professor and Head : Dr K Pavithran
Professor : Dr MV Sukumaran
Dr UT Francis
Associate Professor : Sri R Rajendrakumar
Dr V Prasad (NC)
Dr PI Geevarghese (NC)
Dr M Mukundan (NC)
Jr Assistant Professor : Dr Sreeja Ramachandran
(on study leave)
Farm Assistant : Sri KT Sivasankaran
Technician : Sri Chellappan Mooppan
Attendant : Sri C Mukundan Nair upto 3-7-91
Sri MN Vasu upto 18-3-92
„ PV Prabhakaran

Department of Extension

Professor and Head : Dr PS Pushkaran
Associate Professor : Dr V Raju (NC)
Dr MR Subhadra (NC) (on leave)
Jr. Asst. Professor : Dr S Ramkumar (on leave)

Department of Microbiology

Professor and Head : Dr S Sulochana
Professor : Dr KT Punnoose (upgraded)
Dr PC James (upgraded)
Associate Professor : Dr V Jayaprakasan (NC)
Dr R Madhusoodanan Pillai (NC)
Dr G Krishnan Nair (NC)

Assistant Professor : Dr D Sudharma (upgraded)
 Jr. Asst. Professor : Dr ES Mathew
 Technical Staff (F. A. Vety) : Sri OK Sukumaran
 Supporting staff (Class IV) : Smt TK Mariam
 " K Chellamma
 Permanent labourer : Smt MD Mary

Department of Animal Nutrition

Professor & Head : Dr P Ramachandran upto 3-3-'92
 Dr CT Thomas from 3-3-'92
 Professors : Dr N Kunjukutty
 Dr CS James
 Associate Professor : Dr TV Viswanathan (NC)
 Dr AD Mercy (NC)
 Dr M Nandakumar (Chemist)
 Assistant Professor : Dr P Gangadevi (ICAR Scheme)
 Jr. Assistant Professor : Dr Annamma Kurian
 (Higher Grade)
 Research Assistant : Smt Annamma Chacko
 Class IV : Sri CC Sajeiv Kumar

Small Animal Breeding Station

Research Assistant : Smt Mariamma Kurian
 Farm Assistant : Sri VM Jacob upto 1-4-'91
 Smt KG Kamalamma from 4-8-91
 (Farm Supervisor)
 " Ammini

ICAR Adhoc Project on Subabool

Farm Assistant : Sri CN Soman
 Class IV : Sri KK Gopalan

Adhoc Project on Nutrient requirement of Broller Rabbits

Res. Associate : Smt. A Indiradevi
 Res. Fellow : Smt Asha Mathew

AICRP on Agricultural Byproduct

Scientist : Dr P Ramachandran (Professor)
 Asst. Scientist : Dr George Mathen (Assoc. Prof.)
 Lab. Technician : Sri Kumaran
 Livestock Asst. (Vety.) : Sri K Chacko
 " KR Sasidharan
 " K Radhakrishnan
 Technician : Sri KP Sudarsanakumar
 Lab. Attendant : Sri PV Sreedharan
 Livestock Attendant : Smt MV Rosily
 Assistant Gr. II : Smt TD Annie upto 4-7-'91
 Sri TA Sadanandan as on 5-7-91

Department of Pharmacology & Toxicology

Prof. and Head	:	Dr MK Rajagopalan
Professor	:	Dr Zacharias Cherian
		Dr Jacob V Cheeran (on working arrangement from ULF)
		Dr P Marykutty
Assoc. Professor	:	Dr N Gopakumar
		Dr AM Chandrasekharan Nair (NC)
		Sri VR Raghunandan (Chemist)
		Dr CM Aravindakshan (NC), on working arrangement at ULF
Asst. Professor	:	Dr K Venugopalan
Jr. Asst. Professor	:	Dr PTA Usha
Farm Assistant Gr. II	:	Smt PN Madhavi (on deputation)
Attendant	:	Sri V Vasunny from 3-8-'90
		„ Somasundaram

Department of Pathology

Professor and Head (Director)	:	Dr A Rajan
Professor	:	Dr KM Ramachandran (Diagnostic Pathology)
Associate Professor	:	Dr CS Manomohan (NC)
		Dr KV Valsala
		Dr T Sreekumaran
		Dr PK Ismail (ICAR Mycotoxicosis)
Asst Professor	:	Dr N Divakaran Nair from 1-10-90
Jr Asst Professors	:	Dr N Vijayan
		Dr M Gopalakrishnan Nair (on leave)
		Dr Koshy Varghese (study leave)
		Dr D Gangadharan
		Dr T Leena Devi

USDA Project on Ethmoid carcinoma

Professor	:	Dr KI Maryamma
Assoc. Professor	:	Dr M Mini (JAP)
Research Associate	:	Dr V Radhakrishnan
Assistant Professor	:	Dr Mammen J Abraham (JAP i/c)
Supporting staff		
Farm Supervisor Gr 1	:	Smt PC Mary
		„ PC Lilly

AICRP on Poultry Nutrition

Associate Professor	:	Dr A Jalaludeen
Farm Asst	:	Sri MG Vasu
Driver	:	Sri PS Kabeer
Peon	:	Sri PT Varghese
Poultry Attendant	:	Smt CO Mercy

Department of Physiology

Professor and Head	:	Dr G Nirmalan (Dean i/c)
Professor	:	Dr MG Ramakrishna Pillai Dr KP Sadanandan Dr KP Surendranathan
Asst Professor	:	Dr PT Philomina (Assoc. NC)
Jr. Asst Professor	:	Dr KP Sreekumar Dr Sisilamma George
Farm Supervisor	:	Smt MC Anni
Class IV	:	Sri AG Rajendran .. PK Subran

Department of Parasitology

Professor and Head	:	Dr K Rajamohan
Professor	:	Dr K Chandrasekharan Dr V Sathyanesan Dr George Varghese Dr K Madhavan Pillai Dr C Pythal
Associate Professor	:	Dr H Subramonian (NC)
Jr. Asst. Professor	:	Dr (Mrs) Lucy Jacob Dr (Mrs) R Devada (working arrangement in Medicine)
Farm Supervisor	:	Sri T K Abdulrahiman
Class IV	:	Sri A I Thomas

Department of Preventive Medicine

Professor and Head i/c	:	Dr K Baby (upgraded)
Professor	:	Dr PT Georgekutty
Jr. Asst. Professor	:	Dr K Vijayakumar (on study leave)
Farm Asst. Gr. II	:	Smt VK Gracy
Class IV	:	Smt OG Santha

Department of Surgery

Professor & Head	:	Dr PO George
Professor	:	Dr KN Muraleedharan Nair (norms promotion)
	:	Dr AM Jalaluddin (norms promotion)
	:	Dr C Abraham Varkey (norms promotion)

Associate Professor : Dr S Raveendran Nair
 : Dr T Saradamma (NC)
 : Dr K Rajankutty (NC)
 Jr. Asst. Professor : Dr TP Balagopalan
 : Dr N Padmakumar (on leave)
 : Dr CB Devanand
 Livestock Assistant : On leave
 Radiographer : On leave

Department of Veterinary Public Health

Professor and Head : Dr R Padmanabha Iyer
 Professor : Dr M Soman
 : Dr P Prabhakaran
 : Dr E Nanu
 Associate Professor : Dr P Kuttynarayanan (NC)
 : Dr MT Jose (NC)
 on leave 18-9-91
 Assistant Professor : Dr George T. Oommen
 (study leave)
 Jr. Assistant Professor : Dr V Kumarasubramoniam
 (on leave)
 Farm Supervisor : Smt P Remany
 Class IV : Sri K Karuppan

Department of Statistics

Professor and Head : Dr KC George
 Associate Professor : Sri MP Abdulrasak (from 25-5-90)
 Assistant Professor : Sri Jacob Thomas
 : P Gangadharan
 (Associate Professor NC)
 : Smt TK Indirabai
 Jr. Asst. Professor : Sri Mathew Sebastian
 Technical Assistant : Sri KU Prasad
 Jr. Programmer : Smt KP Santha Bai
 Sweeper-cum-Attendant : Smt TP Rosily

Veterinary Hospital, Mannuthy

Associate Professor : Dr Santha E. George
 : Dr AD Joy (on deputation NC)
 Farm Assistant : Sri CC Narayanan
 Permanent Labourer : Sri B Mohanan

Centre of Excellence for Animal Disease

Associate Professor : Dr J Abraham
 Physical Education
 Associate Professor (NC) : Sri OK Paul
 Jr. Asst. Professor : Smt Molly Cherian

Veterinary Research & Education

- Director : Dr M Krishnan Nair (Professor)
- Administrative Staff*
- Administrative Officer : Sri TP Ponnann upto 30-6-91
Smt KM Mary, i/c. 1-7-91 to 2-7-91
Sri PV Gopalakrishnan Nair,
2-7-91 to 31-12-91
Smt. KM Mary i/c.
31-12-91 to 6-2-92.
Sri O. Vinodakrishnan
6-2-92 onwards
- Section Officer : Sri KS Natarajan upto 26-6-91
,, PK Manikutty from 26-6-91
Smt CM Omana
Sri PV Sreekumar
Smt PN Sudhadevi upto 2-7-91 FN
,, Vivian Jose 2-7-91 to 17-2-92
,, CP Padmakumari
17-2-92 to 30-4-92
,, VM Sarada
,, KM Mary
- Sr. Gr. Assistant : Smt Jeslet Mercy upto June 91
,, TA Mridulakumari from 30-8-91
,, D Sreekumari
,, KS Nirmala
,, EN Savithri upto June 91
Sri Abdul Najum from 8-7-91
Smt PR Sreedevikutty
,, Mercy John upto June 91
Sri KG Somanath from 1-7-91
Smt M Giriya from 18-6-91
- Assistant : Sri KV Jayasankar upto June 91.
Smt KV Alamelu from 3-7-91
- Assistant Gr. I : Smt P Mohini
Sri P Sreejith
,, Unnikrishnan Nair
from 13-2-92
- Asst. Gr. II : Sri VN Sreekumar
Smt Anitha Venugopal
Sri C Raveendranathan
Smt R Usha
Sri CT William
,, TM Asokan
Smt TC Sheela upto June 91

Sr. Office Superintendent	: Smt H Razia Beevi ,, MK Jainuva Sri KK Damodaran
Office Superintendent	: Smt Reetha Joseph ,, K Leela
Selection Grade Typist	: Smt S Akhileswary ,, B Kumary Sathya Bhama
Typist Gr. II	: Smt Manjula Mercy Patric Sri V Mohandas
Duplicator Operator	: Sri CD Jose upto 7/91 ,, AV Poulouse from 7/91
Clerical Assistant	: Sri KK Balakrishnan Smt CP Reetha
HDV Driver	: Sri VR Kochu ,, TK Govirdan
LDV Driver	: Sri M Sooria Narayanan
Watchman	: Sri Man Bahadur
Permanent Labourer	: Sri TV Gangadharan ,, P Krishnankutty Smt RV Thanka
Class IV	: Smt AK Janaky Sri Monsy James Kakkassery
Bus Attendant	: Sri TG Radhakrishnan
Sweeper-cum-Attendant	: Smt Jolly D Karerakkattil Smt P Santhakumary
Attendant	: Smt MO Kochannam Sri M Narabahadur ,, VK Narayanan Smt KN Saraswathy ,, VS Bhargavi Sri I Govindankutty Smt KA Mathiri ,, V Ammini Amma

College of Fisheries, Panangad

Dean	: Dr MJ Sebastian (on long leave) Dr DM Thampy, Professor Officiated as Dean-in-charge
------	--

Department of Aquaculture

Professor & Head	: Dr DM Thampy
Associate Professor	: Dr Susheela Jose Dr K Jayasree Vadhyar
Asst Professor (Algology)	: Dr Thresiamma James
do (Fish Pathology)	: Dr C Thankappan Pillai
do (Fish Breeding)	: Dr C Mohanakumaran Nair

Department of Management Studies

Assoc Prof. & Head : Sri TM Sankaran
(Fish. Stat)
Asst. Professor (Business Mgt) : Sri RV Sadanandan
Asst. Professor (Stat.) : Smt Alphi Korath
(Jr. Asst. Prof posted against)
Asst. Professor (Economics) : Sri MS Raju
Jr. Asst. Professor (Stat.) : Smt V Malika
do (Commerce) : Sri KM Mathew
do (Phy. Education) : Sri EU Rajan

Fisheries Research

Professor (Fishery Research) : Dr PM Mathew
Lab. Assistant Gr. III : Sri MS Moni

Administrative staff

Administrative Officer Gr. I : Sri K Viswambharan
Section Officer : Smt MS Zulaikha Beevi
Sri MA Alikutty
Smt L Syamala Devi from 16.9.91
Asst Librarian : Sri EK Mohanan from 20.1.92
(Provisional hand)
Reference Assistant : Sri TA Joseph
Sr. Officer Supdts. : Sri K Paul Sextus upto 29.2.92
Smt MI Balamoni
Smt KT Thanka from 6.8.91
Smt R Sarada Devi
on working arrangement
Office Superintendent : Smt HK Khadeeja Beevi
from 23.10.91
Sr. Gr. Typist : Smt HK Khadeeja Beevi
upto. 22.10.91
„ Salomi Silas
„ P Sarojini Ammal
„ Lillykutty Sebastian
Sr. Gr. Assistants : Smt C Suchetha
„ KR Santha
„ Vinaya Bai
Sri Vincent Pereira upto 12.8.91
Smt B Bhanumathy
„ Lucy Mary upto 5.4.91
Sri PU Kesavan upto 23.9.91
Assistant Gr. I : Sri AS George
„ Venugopal Nair
„ KP Sajan
„ KA Pius
„ Annamma Scaria upto 31-3-92

Assistant Gr. II : Sri TM Iqbal Rawther
 14-10-91 to 19-3-92
 Steward : Sri MM Babu
 Lab. Assistant Gr. II : Sri P Madhavankutty
 Technician Gr. I : Sri KP Sreedharan Nair
 Farm Assistant Gr. I : Sri PN Sadasivan
 from 17-4-91 to 1-7-91
 .. MC Sachidanandan
 from 1-7-91
 Driver H. D. V. : Sri P Moideen
 Driver L. D. V. : Sri MJ Joseph
 1-4-91 to 8-7-91
 .. J Joy
 .. AS Sukumara Marar
 from 9-7-91
 .. AM Abdul Khader
 Bus Attendant : Sri KK Raghavan
 Duplicator Operator : Sri Rajendra Babu Pillai
 Pump Operator : Sri M Gopalan
 Class IV : Sri R Gopal Singh (Hr. Gr.)
 .. TK Abdul Majeed
 Smt KM Khadeeja
 Sri John Mendez
 Smt E Leelamani
 from 10-9-91
 .. PB Nabeesa
 from 10-9-91
 Research Fellow : Sri Sebastian Xavier
 from 28-6-91

**Kelappaji College of Agrl. Engineering & Technology,
Tavanur**

Dean : Prof. TP George i/c.

Department of LWRC

Assistant Professor : Sri Xavier K Jacob
 .. Smt J Renuka Kumari (JAP)

Department of IDE

Professor and Head : Sri K John Thomas
 Assistant Professor : Sri Alexander Seth
 Jr. Asst. Prof. (Civil Engg.) : Smt KR Sheela
 (Agrl. Engg.) : Sri EK Kurien

Department of FPME

- Associate Professor : Sri Jippu Jacob
 Junior Asst. Professor : Sri Hamza Mollakkadavath
 (Mechanical Engineering) Sri VR Ramachandran

Department of PHT

- Assistant Professor : Smt Santhi Mary Mathew
 Sri Joby V Paul
 „ George Mathew JAP

Department of SAC

- Professor and Head : Dr KI Koshy
 Assoc. Professor : Dr P C Antony
 (Agrl. Chem)
 Assistant Professor (Chem) : Dr E Komala Amma
 Jr. Asst. Professor (Maths.) : Smt Lakshnikutty
 Jr. Asst. Professor : Dr G Girish Varma
 (Vety. and A. S.)
 Jr. Assistant Professor : Sri M Velayudhankutty
 (Physical Education)

Instructional Farm

- Jr. Assistant Professor : Sri V Sreekumar
 (Agronomy) (Assoc. Prof. (NC))
 Jr. Assistant Professor (Hort.) : Sri P Rajendran

ICAR Scheme on FIM

- Associate Professor : Dr M Sivaswami
 Junior Assistant Professor : Sri Sathyajith Mathew
 (Agrl. Engineering)

Administrative and Supporting

- Administrative Officer Grade 1 : Sri K Kurhoosa
 Section Officer (Higher Grade) : Sri C Assainar
 Section Officer : Sri C Arumughan
 „ P Unnikrishnan
 Smt KU Prabhavathy
 Senior Office Superintendent : Smt R Sarada Devi
 Office Superintendent : Sri KP Abdurahiman
 Senior Grade Assistant : Sri P Janardhanan
 „ KV Purushothaman Nambia-
 thiri

Senior Grade Assistant	Sri KJ Kuruvilla
	Smt S Ushadevi
Assistant Grade II	: Sri K Philip George
	.. C Gopi
	.. P Sivaprasad
	Smt P Radha Gopan
	.. Treesamma Titus
Typist Grade II	: Sri R Balasubramanian
	Smt TG Jalaja
	Sri AK Basheer
	Smt VS Laila Kumari
Assistant Agrl. Engineer (Maint)	: Sri D Sathyanandan
Research Assistant	: Sri AP Gopalakrishnan
Reference Assistant	: Sri KP Sathyan
Draftsman (Civil) Gr. I	: Sri P Manoj
Trade Assistant (Carpentry)	: Sri AK Padmanabhan
Trade Assistant (Smithy)	: Sri VP Kannan
Trade Assistant (Fittings)	: Sri CS Krishnan
Technical Supervisor	: Sri C Velayudhan
Technical Supervisor (Mech.)	: Sri TP Aboobacker
Trade Assistant (Mech.)	: Sri PJ Michael (Provi.)
Trade Assistant (Welding)	: Sri A Sudarsanan (Provi.)
Trade Assistant (Plumbing)	: Sri MK Balakrishnan
Trade Assistant (Ref. and AC)	: Sri P Sudhakaran (Provi.)
Technician Grade I	: Sri VK Asokan
Technician Grade II	: Sri CP Thomas (Provi.)
	.. MP George (Provi.)
	.. Joseph Chacko (Provi.)
	.. V Ganesan (Provi.)
Pump Operator	: Sri E Parameswaran Nair
	.. TP Vijayan
Driver (HDV)	: Sri TK Govindan
Driver (LDV) Gr I	: Sri NV Krishnan
Driver (LDV)	: Sri MV Ramachandran
Bus Attendant	: Sri CR Velayudhan
Steward	: Sri M Radhakrishnan
Matror.	: Smt KK Chandra

Lab. Asst. Gr. I	:	Sri P Krishnakutty Nair
Lab. Asst. Gr. III	:	Sri PK Chandran ,, KK Subramanian
Peon	:	Sri P Krishnan
Peon (Higher Grade)	:	Sri P Kunhikutta Menon
Peon (Hr. Gr.)	:	Smt C Ponna
Peon	:	Smt P Amina Sri AP Ayyappan ,, C Narayanan ,, KP Ayyappan ,, KV Moideenkutty
Watchman	:	Sri CP Damodaran ,, K Kuttykrishnan
Sweeper (Hr. Gr.)	:	Smt K Ammukurupathiar Sri K Ravunni
Sweeper-cum-Marker	:	Sri K Kunhan
Sweeper-cum-Attendant	:	Sri K Kunhumon
Scavenger	:	Sri A Burhauddin
Instructional Farm		
Farm Supervisor (Gr. I)	:	Smt RV Balamani
Farm Supervisor (Gr. II)	:	Sri P Bhaskaran ,, MV Raveendran ,, K Sethumadhavan
Farm Supervisor (Vety.) Gr. I	:	Sri P Balakrishnan
Sr. Gr. Farm Asst. (Vety.)	:	Sri C Ramachandran
Farm Asst. (Vety.) Gr. I	:	Sri T Venu
Gardener (Hr. Gr.)	:	Sri K Marumikutty
DASc.		
Lab. Asst. Gr. III	:	Sri PV Kumaran
AICRP on Farm Implements and Machinery (ICAR)		
Technician Gr. II	:	Sri K Aravindan
Technician (Ag. Mech.)	:	Sri N Narayanan
Technician (Tractor)	:	Sri KT Ramachandran
Workshopmate	:	Sri TN Balan
Assistant Gr. II	:	Sri Muraleedharan
NARP (Tavanur centre)		
Sr. Gr. Technician	:	Sri Ramesh Chandran

College of Forestry, Vellanikkara

Special Officer	:	Dr CC Abraham (Associate Dean, College of Horticulture held full additional charge w. e. f. 19-2-90)
Associate Professor	:	Dr Luckins C Babu Dr NK Vijayakumar
Associate Professor (NC)	:	Dr B Mohankumar Dr K Sudhakara Dr K Gopikumar Dr PK Ashokan
Jr. Assistant Professor	:	Sri K Vidyasagaran ,, Sonney George ,, T Premkumar ,, Noel Thomas (1-4-91 to 10-9-91)
Administrative Officer	:	Sri K Balakrishnan Nair (1-4-91 to 11-9-91) Smt B Sreedhari Amma (11-9-91 to 31-3-92)
Section Officer	:	Smt KK Gauthamy
Sr. Office Supdt.	:	Sri KG Balakrishnan
Sr. Gr. Assistant	:	Smt VR Santhakumari
Assistant Gr. II	:	Sri PV Babu (1-4-91 to 23-7-91) Sri N Radhakrishnan (22-10-91 to 31-3-92)
Typist Gr. II	:	Smt Mariyamma Mathew
H.D.V. Driver	:	Sri A Krishnan
Farm Asst. Sr. Grade	:	Sri TC Sidharthan

College of Co-operation & Banking, Mannuthy

Associate Dean	:	Dr CA Jos i/c.
Associate Professor	:	
Economics	:	Dr M Mohandas
Commerce	:	Dr N Rajan Nair
Quantitative methods	:	Sri N Ravindranathan
Management	:	Sri PC Mathew
Assistant Professor	:	
Economics	:	Dr U Ramachandran Dr KA Suresh Smt P Shaheena, JAP
Commerce	:	Sri M Mohanan ,, Philip Sabu

Asst. Prof. Co-operation	:	Sri T Paranjothi ,, AM Jose, JAP ,, Philip Thomas JAP ,, K Ramesh, JAP
,, Management	:	Dr KP Mani Dr A Sukumaran
,, Banking	:	Smt Molly Joseph JAP ,, Jaya S Anand JAP
,, Statistics	:	Smt KS Sujatha
Jr. Asst. Professor		
Commerce	:	Smt EVK Padmini
Co-operation	:	Sri E Vinaikumar
Banking	:	,, KM George
Administrative Officer	:	Sri Pius Fernandez
Section Officer	:	Sri KP Dileep Kumar Smt Shirly Bai George
Senior Office Superintendent	:	Sri VT Kurien
Assistant Sr. Grade	:	Smt G Santhakumari Smt T Vijayalekshmi ,, KS Vijayalekshmi
Assistant Grade I	:	Smt KN Sarojini ,, K Indira Devi Sri KV Suresh Babu
Selection Grade Typist	:	Smt VC Mariyamma
Typist Sr. Gr.	:	Smt TK Sukumari
Typist Gr. I	:	Smt K Radhamony
Duplicator Operator	:	Sri PA Francis
Driver	:	Sri V Gopalakrishnan
Peon	:	Sri PB Abdul Rahiman ,, TK Ismail

Regional Agricultural Research Station, Vellayani

NARP Phase I

Assoc. Director	:	Dr N Mohanakumaran (Professor HG.)
Assoc. Professor (Pl. Br.)	:	N Ramachandran Nair
Assoc. Professor (Stat.)	:	Dr P Saraswathi (Assoc. Prof. HG.)
Assoc. Professor (Soil Sci.)	:	Dr PR Ramasubramanian (Professor)
Asst. Professor (Pl. Br.)	:	Vacant till 30-6-91 Smt P. Manju from 1-7-91 (Assoc. Prof.)
(Soil Sci.)	:	Dr N Saifudeen (Assoc. Prof. NC)
(Ent.)	:	Dr T Nalinakumari (Assoc. Prof. NC)

Asst. Professor (Extn.)	:	Dr C Bhaskaran (Assoc. Prof. NC)
„ (Stat.)	:	Sri R Balakrishnan Asan (Assoc. Prof. NC)
„ (Hort.)	:	Smt GR Sulekha from 30-3-92 (Assoc. Prof. NC)
Admn. Officer	:	Sri Salahudeen 1-4-91 to 31-8-91 Vacant 1-9-91 to 2-10-91 Smt Lalitha Bai from 3-10-91
Section Officer	:	Smt B Rugmini Amma (Section Officer HG.) Smt G Joice
Typist Gr. I (Steno)	:	Smt P Radha (Office Supdt.)
Typist Gr. I	:	Sri S Raghavan (Selec. Gr. Typist) Sri K Gopikuttan Nair
Senior Office Supdt.	:	Sri K Velappan 1-4-91 to 31-12-91 Vacant 1-1-92 to 15-1-92 Sri N Somarajan from 16-1-92
Asst. Gr. I	:	Smt V Chandrika 1-4-91 to 26-6-91 „ Anithakumary from 27-6-91 (Asst. Gr. II)
Asst. Gr. II	:	Smt Sathee Devi 1-4-91 to 30-6-91 „ Sulekha from 1-7-91
Farm Asst. (Agri)	:	Sri D Sulochanan (Sr. Gr Farm Asst.) Sri CS Vijayakumar (1-4-91 to 30-11-91) Smt K Padmakshy (Farm Supervisor Grade I) Sri Jones Charles (Farm Assistant Grade I)
Driver (LDV) Gr. II	:	Sri K Vikraman Nair Driver LDV (HG) „ PS Vijayakumaran Nair
Photographer	:	Sri Kuriakose 1-4-91 to 22-2-92 „ Sulaimankutty from 23-2-92
Duplicator Operator Class IV	:	Sri C Madhusoodanan Nair Sri S Manikantan
NARP Phase II		
Asst. Professor (Agro.)	:	Smt P Sukumari 1-4-91 to 23-6-91 Sri SM Shahul Hameed from 24-6-91 (Assoc Prof (NC))

Asst Professor (Ent.) : Sri R Krishnakumar
1-4-91 to 16-5-91
Smt KS Pramila from 17-5-91
(Jr Asst. Prof.)

.. (Pl. Path.) : Sri PJ Joseph Assoc. Prof. (NC)
.. (Hort.) : Vacant 1-4-91 to 15-7-91
Sri KN Satheesan from 16-7-91
(Jr. Asst. Prof)

.. (Ag. Engg.) : Sri V Ganesan

Asst. Gr. I : Smt S Vasanthakumari
1-4-91 to 26-6-91
.. R Vasumathy
27-6-91 to 11-9-91
.. Anamma Philip from 27-9-91

Asst. Gr. II : Sri AK Shajikumar

AICRP on Forage Crops

Associate Professor : Dr GK Balachandran Nair
1-4-91 to 9-7-91
Dr G Raghavan Pillai
(Professor) from 10-7-91

Assistant Professor : Smt L Girija Devi JAP
: Sri SG Sreekumar
(Assoc. Prof. NC)

Junior Asst. Professor : Sri AS Anilkumar
1-4-91 to 29-4-91
Smt Kumari O Swadija, JAP
from 30-4-91

Junior Asst. Professor : Smt Mereen Abraham, JA P

Farm Asst. Gr. I (Agri) : Smt S Sujatha

Farm Asst. Gr. II : Sri K Justin 1-4-91 to 8-7-91
Sri David Dharmakumar
(Farm Asst. Gr. I) from 9-7-91
Sri H Gopinathan
(Farm Asst. Gr. I)

Asst. Gr. II : Smt P Krishnakumari

Typist Gr. II : Sri K Chandrakumar
1-4-91 to 26-6-91
Smt B Savitha devi from 27-6-91

Lab. Asst. Gr. III : Sri G Appu

Peon : Sri N Nagappan

AICRP on Nematodes

Assoc. Professor : Dr K John Kurien
(Professor)

Asst. Professor : Smt T Jiji
 (Jr. Asst. Professor)
 Smt J Mercy Nedumpara
 (Jr. Asst. Professor)

Farm Asst. Gr. II : Sri D Sivaprasad
 Lab. Asst. Gr. III : Sri N Sreekumaran

AICRP on Pesticide Residues

Assoc. Professor : Dr D Dale
 (Assoc. Prof. HG)

Asst. Prof. : Dr S Naseema Beevi
 (Assoc. Professor (NC))
 Sri PA Rajan Asari
 (Assoc. Professor (NC))
 Dr Thomas Biju Mathew
 (Jr. Asst. Professor)

Lab. Asst. Gr. III : Sri M Maniyan
 „ Johnson 1-4-91 to 3-10-91
 „ R Raveendran Nair
 from 4-10-91

AICRP on Oil Seeds

Asst. Professor (Pl. Br.) : Sri DI Wilson (Jr. Asst. Prof.)
 (Agro.) Vacant from 1-4-91 to 4-10-91
 Smt P Sukumari 5-10-91 to 31-10-91

Farm Asst. Gr. II : Sri L Mohandas 1-4-91 to 31-7-91
 Vacant 1-8-91 to 30-11-91
 Sri CS Vijayakumar FA Gr. I
 1-12-91 to 31-3-92

Lab. Asst. Gr. III : Sri J David

USDA Scheme on Tissue Culture

Asst. Professor : Smt Sreelathakumari
 29-4-91 to 26-3-92

Jr. Asst. Professor : Dr Sajan Kuriyan

Sr. Gr. Typist : Sri G Hareendran

Lab Asst. Gr. I : Sri L Samkutty
 (LA Gr. II)

Adhoc Scheme on Cucumber

Jr. Asst. Professor : Smt D Lekha Rani

Research Fellow : Smt V Manorama
 28-11-91 to 31-3-92

CSB Scheme on Sericulture

Asst. Professor : Sri AS Anilkumar from 30-4-91
 (Jr. Asst. Professor from 4-2-91)
 Sri R Krishnakumar from 17-5-91
 (Jr. Asst. Professor)

Sr. Res. Fellow : Vacant
 Farm Asst. Gr. I : Sri MS Krishnakumar from 10-7-91
 .. M Rajaretnam from 30-9-91
 (FS Gr. I)
 Lab. Asst. Gr III : Sri R Gopalakrishnan from 30-9-91
 .. P Thankappan from 10-8-91

Nutritional studies on Pulses

Research Fellow : Smt MS Karuna from 20-12-91
 .. Jessy Philip from 23-12-91

ICSSR Scheme—Socio-economic and cultural determinants influencing nutritional status of women workers

Research Investigator : Smt N Asha from 30-3-92
 Research Associate : Smt Leena P Joseph from 30-3-92

STED project—Investigations on changes in physio-chemical properties of cococunt garden soils

Research Fellow : Sri PI Ashok 31-8-91

Coconut Research Station, Balaramapuram

Assoc. Professor of Agronomy & Head : Dr K Pushpangdan
 (Professor and Head) from 16-10-90
 Asst. Professor of Plant Pathology : Dr G Padmakumari
 (Professor Plant Path) from 28-5-90
 Farm Supervisor Gr. II : Sri KC Chellappan from 7-6-86
 (Farm Supervisor Gr. I)
 Farm Supervisor Gr. II : Sri N Madhavan Nair
 (Farm Supervisor Gr. I)
 from 27-12-90
 Administrative Asst. : Smt R Kamala Bai from 1-9-91
 Sr. Gr. Assistant : Sri Mohammed Hamsa
 (Asst. Gr. I) from 21-5-90
 Sri MS Noble from 1-6-90
 (Asst. Gr. II)
 Sr. Gr. Typist : Smt S Radhamma from 4-5-92
 (Office Supdt.)
 Peon : Sri K Mohanan from 9-3-92
 Watchman : Sri N Prabhakaran Nair
 from 1-3-91
 Smt S Lalitha from 9-3-92,
 (Class IV)

Special Station, Sadanandapuram

Associate Professor (Hort)	:	Smt PA Valsala
(SS & AC)	:	Smt RS Shehana
Asst. Professor (Agri)	:	Smt M Meera Bai
		from 1-4-90 to 24-9-91
		Dr Kuruvila Varghese
		from 28-9-91
Asst. Professor (Ent)	:	Kunjamma P Mathew
		from 1-5-90 to 26-6-91
(Pl. Path)	:	Dr C Gokulapalan from 15-10-90
(Econ)	:	Sri K Satheesh Babu
Farm Asst. (Sr. Gr.)	:	Sri D Vighrahanadhan
		Sri Sankutty from 12-7-91
Lab. Asst. (Gr. III)	:	Sri S Haneefa from 16-7-91
Driver (Gr. II)	:	Sri P Vijayakumar
		from 2-1-91 to 17-7-91
		.. V Sasidharan Nair
		from 14-10-91
Peon	:	Sri N Krishnan Nair
		24-2-92 onwards shifted from
		College of Agri. Vellayani
Associate Professor (Hort)	:	Smt Darley Jose from 16-8-91
(Vety.)	:	Vacant
(Engg.)	:	Smt Parvathy
		from 3-9-91 to 28-2-92
		Vacant from 29-2-92
Farm Asst. (Agri.)	:	Sri EN Raveendran Nair
		(Farm Assistant Sr. Gr.)
Farm Asst. (Vety)	:	Smt A Sarojam
		(Farm Assistant Gr. I)
Administrative Asst.	:	Sri M Abdul Salam
Assistant Grade I	:	Sri Balachandran Nair
		from 20-8-90 to 13-2-92
Typist Grade II	:	Smt P Vasanthakumari

Cropping Systems Research Centre, Karamana

Professor & Head	:	Sri Ramachandran Nair
Asst. Professor (Stat.)	:	Sri Vijayaraghavakumar
		1-4-91 to 5-9-91
		Vacant from 6-9-91
Asst. Professor (Chem.)	:	Smt C Sudharmai devi
		1-4-91 to 25-9-91 (Jr. Asst. Prof.)
.. (Agron.)	:	Sri Jayakrishnakumar
		(Jr. Asst. Prof.)

Jr. Asst. Prof. (Agron.)	: Dr (Mrs.) K Ushakumary	3-8-91 to 31-3-92
Farm Asst. (Agri.) (SG.)	: Sri SR Rajeevan	
	.. KS Ajayakumar	
	.. M Ravikumar (Grade I)	
Lab Asst. Grade III	: Sri T Enose	
Assistant Grade I	: Sri Philip John (Asst. Gr. II)	
Typist	: Smt Sobhanakumari	1-4-91 to 25-6-91
	.. B Retnavalli Amma	26-6-91 to 31-3-92
Messenger	: Sri K Pappachan	
Jr. Asst. Prof. (Pl. Path.)	: Dr S Ravi (Asst. Professor)	
.. (Ent.)	: Sri S Devanesan (Asst. Professor)	
Administrative Assistant	: Sri Gilbert	1-4-91 to 4-7-91
	.. S Bhaskara Pillai	5-7-91 to 12-8-91
	.. M Aboobacker Khan	16-8-91 to 19-3-91
	.. P Govinathan	from 20-2-92
Peon	: Sri PK Sukumaran Nair	
Chowkidar	: Sri R Raghavan Pillai	
Part-time Sweeper	: Smt P Bharathi	

Regional Agricultural Research Station, Kumarakom

Assoc. Director	: Dr R Ravindran Nair
Professor (Agri. Bot.)	: Sri PA Varkey
(Ag. Ento.)	: Sri B Thomas
(Pl. Path.)	: Sri A Sreedharan
	.. G Mathai
(Ag. Chem.)	: Sri K Chandrasekharan Nair
Associate Prof. (Hort.)	: Dr Joseph Philip
(Aqua.)	: Dr KG Padmakumar
	Dr Anuradha Krishnan
(Ag. Engg.)	: Sri MS Thomas
(Agronomy)	: Sri CK Prabhakaran Thampi
Assistant Prof. (Weed Sci.)	: Sri PH Lathif
(Micro.)	: Dr M Vijayan
(Bio. Ch.)	: Dr Jacob John
(Pl. Br.)	: Sri KA Inasi
(Pl. Phy.)	: Smt Alice Antony
(Pl. Path.)	: Dr AV Mathew
Jr. Asst. Prof. (Agro.)	: Smt K Geetha
Administrative Officer	: Smt B Lalitha Bai upto 23-9-91
	Sri D Gilbert from 24-9-91

Section Officer	:	Smt Maryamma Eapen upto 12-9-91 Sri MP Govinda Pillai from 18-4-91 Smt D Vijayamma from 13-9-91
Senior Grade Assistant	:	Sri KP Rajan upto 10-7-91 Smt D Vijayamma upto 12-9-91
Assistant Gr. I	:	Smt PE Jasmine Beevi upto 24-7-91 Sri CP Jayakumar ,, PD Radhakrishnan Nair , K Saji Jacob from 10-7-91
Assistant Gr. II	:	Sri KP Gopinathan from 27-6-91 ,, Varkey Abraham ,, Anil G Nair from 16-10-91
Sr. Office Supdt.	:	Sri KV Kurien ,, KK Gopikuttan Nair
Office Superintendent	:	Sri MC Jayakumar
Typist Sr. Gr.	:	Smt TK Ponnamma
Typist Gr. I	:	Sri NA Raju Smt KR Nirmala
Peon H. G.	:	Sri T K Sreedharan Sri M Easo ,, N Purandaran ,, KK Thankappan
Senior Farm Supervisor	:	Smt VV Mariamkutty
Farm Supervisor Gr I	:	Sri KK Viswanathan Smt N Kamalamma
Farm Assistant Sr. Gr.	:	Sri PV Reghunathan
Farm Assistant Gr. I	:	Sri KC Varghese ,, MV Sasidharan ,, K Gopalakrishnan Nair
Farm Asst. (Vety)	:	Sri M Sukumaran upto 2-7-91 ,, KK Viswambharan from 15-7-91
Technician Gr. I	:	Sri Thomas Scaria
Artist	:	Sri V Chandranandan
Driver Gr. II (HDV)	:	Sri PC Kurien
Driver Gr. II (LDV)	:	Sri MG Sankaranarayanan Nair ,, OR Sasidharan from 9-7-91 ,, PS Babu upto 8.7.91
Bus Attendent	:	Sri PM Varghese
Duplicator Operator	:	Sri CG Mohanan
Lab Assistant Gr. II	:	Sri VK Vasu Smt PS Retnam
Lab Asst. Gr. III	:	Smt Mary Sebastian Sri G Vasudevan ,, MG Thomas upto 30-6-92 ,, N Padmakaran Pillai from 1-7-91

Pump Operator (Hr. Gr.) : Sri CC Punnen
 Watchman : Sri TP James
 „ MR Sudhakaran
 „ EP Sasidharan
 Sweeper-Cum-Attendent : Smt AP Meenakshi

Rice Research Station, Moncompu

Professor and Head : Dr CA Joseph

Research on Rice, Moncompu

Associate Professor (Agro) : Sri PJ Ittyaverah from 15-7-91
 Assistant Professor (Ento) : Dr KP Vasudevan Nair
 Assistant Professor (Chem.) : Smt M Indira,
 (Jr. Asst. Professor)
 Assistant Professor (Botany) : Smt R Devika,
 (Assoc. Professor NC)

AICRP Centre, Moncompu

Assistant Professor (Botony) : Dr N Remabai,
 (Assoc. Professor)
 Assistant Professor (Agro) : Smt Elizabeth K Syriac,
 (Jr. Asst. Prof.)
 Assistant Professor (Ento.) : Smt Ambika Devi, form 33-92
 „Reena Mathew,
 (Jr. Asst. Prof. from 7-1-92)

O. R. P.

Assistant Professor (Ento.) : Sri D Joseph, (Professor)
 Assistant Professor (Pl. Path.) : Smt Kamala Nair
 Jr. Asst. Professor (Pl. Path.) : Smt D Giriya JAP from 1-7-88
 Jr. Statistician : Smt PR Krishnakumari Amma

N. A. R. P.

Professor of Plant Breeding : Dr CA Joseph
 Associate Professor (Ento.) : Dr K Saradamma
 Asst. Professor (Pl. Path.) : Dr P Varadarajan Nair (Professor)
 Sri MG Vasavan
 (Assoc. Professor)
 „ (P. B.) : Smt Ahemd Regina,
 (Jr. Asst. Professor)
 „ (Ag. Chen) : Smt Annie Koruth
 Farm Supervisor Gr. I : Sri CN Raghavan
 „ AK Ayyappan Pillai
 Farm Assistant (Sr. Gr.) : Sri S Sukumaran Nair
 „ Gr.I : Sri TJ Mathew
 Field Supervisor : Sri V Thankappan
 Administrative Asst. : Smt K Rajamma upto 1-9-91
 Sri VC Bharathan Pillai from 2-9-91

Section Officer	: Smt K Rajamma from 2-9-91
Senior Grade Assistant	: Smt B Sarasamma from 28-6-91
	: Sri V Govindarajan
Gr. I Assistant	: Smt PV Amminikutty
	: Sri S Gopakumar from 11-6-90
Senior Grade Typist	: Smt KK Mary from 18-8-90
Lab Assistant Gr. III	: Sri Joseph Peter
Peon	: Sri George A. Murikken
	: Smt Lalitha from 28-8-91
Sweeper-cum-Attendant	: Sri A Santhoshkumar
	: from 28-8-91 to 2-12-91
Watchman	: Sri EP Sasidharan upto 3-3-92
O. R. P.	
Boat Driver	: Sri MD Janardhanan
Jeep Driver	: Sri CC Chacko
N. A. R. P.	
Lab Assistant Gr. III	: Sri N Prakasan
	: „ V Viswanathan
	: „ PG Balakrishnan upto 11-7-91
	: „ N Mohammed Haneef

Rice Research Station, Kayamkulam

Professor and Head (Ent.)	: Sri K Balakrishna Pillai
Professor (Bot.)	: Sri S Sukumaran Nair
	: Dr K Sivan Pillai
Assoc. Professor (Pl. Path.)	: Sri KP Jagan Mohan
	: Dr S Bhavani Devi
Jr. Asst. Prof. (Agronomy)	: Sri Thomas Mathew from 15-7-91
„ (Ent.)	: Smt G Suja
Asst. Prof. (Hort.)	: Dr Shyam S. Kurup
Administrative Assistant	: Sri KP Rajendra Prasad
Sr. Gr. Assistant	: Sri K Govindan upto 6-7-91
	: Smt AK Valsala
	: Asst. Gr. I from 7-7-91
Assistant Gr. I	: Sri Vijayachandra Babu
	: upto 4-7-91
	: Smt K Sujatha Bhai
	: Asst. Gr. II from 5-7-91
Typist Gr. I	: Smt K Sobhana upto 30-6-91
	: „ S Kaladevi from 1-7-91
Peon	: Sri T Balakrishnan
Watchman	: Sri K Bhaskaran
	: „ K Sankaran upto 10-2-92
Jeep Driver	: Sri G Balachandran Nair
Part-time-Sweeper	: Smt N Rajamma upto 17-9-91

Full-time-Sweeper	:	Smt N Rajamma from 18-9-91
Laboratory Asst. Gr. I	:	Sri N Sivadasan upto 7-7-91
	:	„ MG Thomas (Gr. III) from 8-7-91)
Lab. Assistant Gr. III	:	Sri S Haneefa upto 8-7-91
Farm Supervisor Gr. I	:	Sri A Mohammed Kunju
Farm Assistant Sr. Grade	:	Sri R Satheesan from 24-7-91
Farm Assistant Gr. II	:	Sri KGMuraleedharan upto 3-7-91
	:	„ D Prasannakumar (Gr. I)
	:	„ VJ Rajmohan (Gr. I) from 16-9-91)
Regular Mazdoor	:	Sri N Viswanathan
	:	„ N Raveendran
Tractor Driver	:	Sri R Thankappan

Rice Research Station, Vyttila

Professor (Agrl. Botany)	:	Sri KM George
Assoc. Professor (Agron.)	:	Sri NK Sasidharan from 7-6-90
(Aqua.)	:	Sri CG Rajendran Dr MV Mohan
(S. S.)	:	Dr M Subramonia Iyer
(„)	:	Smt Sumam George (Study leave)
(Pl. Br.)	:	Smt KS Shylaraj from 7-2-91
Farm Supervisor Gr. I	:	Smt MJ Annakutty from 12-7-91
Gr. II	:	Sri Haridas
Farm Asst. Gr. I	:	Sri PK Kumaran from 9-7-91
Gr. II	:	Sri PC Girijavallabhan up to 26-6-91 Smt Padma Narayana Pillai from 27-6-91
	:	Sri PA Abdul Majeed upto 9-7-91
Sr. Gr.	:	Sri George Puravath upto 8-7-91
Fisherman cum Watchman	:	Sri KG Gopi „ P Viswanathan from 4-12-91
Lab. Assistant Grade III	:	Sri PM Gopi
Admn. Assistant	:	Sri L Syamaladevi upto 9-9-91
	:	„ A Kuriakose from 9-9-91
Assistant Gr. I	:	Smt MD Kunjamma
Gr. II	:	Sri CS Baburaj
Typist Gr. II	:	Smt MP Rajani
Driver Gr. II	:	Sri K Uthaman
Pump Operator	:	Sri KK Francis upto 22-6-91
	:	„ VB Easaf from 8-7-91
Peon (Hr. Gr.)	:	Sri N Vasu
	:	„ NS Reghunandan
Watchman	:	Sri MA Sebastian

Sugarcane Research Station, Thiruvalla

K. A. U.

- Associate Professor : Sri KC Chandy upto 24-2-92
Jr. Asst. Professor : Smt Gracy Mathew upto 30-6-91
Sri R Illangovan from 23-9-91

AICRP

- Associate Profesor : Dr D Alexander (Head of Office)
from 5-7-91 to 6-3-92
and from 6-3-92
Jr. Asst. Professor : Smt KC Manorama Thampatty
upto 30-6-91

NARP

- Assistant Professor : Smt Jessy M Kuriakose

KAU

- Farm Supervisor : Sri CO Mathai
Farm Asst. Gr. I : Sri Rajmohan upto 30-6-91
„ TK Omanakuttan from 1-7-91

AICRP

- Farm Asst. Gr. I : Sri EK Sukumaran upto 30-6-91
„ KG Muraleedharan Pillai
from 1-7-91
Admn. Assistant : Sri TV Rajasekharan Nair
upto 30-6-91
Smt B Thakamani from 15-7-91
Sr. Grade Assistant : Smt S Ushadevi upto 24-6-91
Gr. I Assistant : Sri PS Hareendran Nair
from 24-6-91
Assistant Gr. I : Sri VP Raveendran upto 29-4-91
Gr. II : Sri PB Anilkumar from 8-7-91
Grade I Typist : Smt AK Indiradeviamma
Driver : Sri OR Sasidharan upto 30-6-91
Peon : Sri CA Chacko from 5-7-91
„ K Kunjumon upto 1-7-91
„ K Lalu from 15-7-91
Watchman : Sri P Narayana Pillai from 15-7-91

AICRP on Agrl. Drainage, Karumady

- Assoc. Prof. (Ag. Engg.) : Sri EK Mathew,
Asst. Professor (Ag. Engg.)
Asst. Prof. (Agron.) : Sri Madhusudanan Nair
upto 9-3-92
Assoc. Prof. (NC)
Asst. Prof. (Ag. Engg.) : Sri TD Raju
Jr. Asst. Prof. (Ag. Engg.)

Farm Asst. (Sr.Gr.)	: Sri VCM Das,
Farm Asst. (Gr. I)	: Sri G Udayakumar
Farm Asst. (Gr. II)	: Sri KO Shahul Hameed upto 8-4-91 Smt I Krishnakumari from 9-4-91
Overseer Gr. I (Civil)	: Sri PT Joy from 30-12-91
Draughtsman Gr. II	: Sri MY Sunny upto 9-12-91 ,, CV Ambujan from 9-12-91
Lab. Asst. Gr. II	: K Kunju Pillai
Technician (Sr. Grade)	: Sri N Sambasivan Nair ,, BS Suresh from 16-8-91 to 31-1-92
Typist Gr. I	: Smt S Kaladevi upto 24-6-91
Typist Sr. Gr	: Smt PK Sreedeviamma, from 25-6-91
Assistant Sr. Gr	: Sri M Mohamed Basheer up to 28-6-91
,, Gr I	: Sri NV Unnikrishnan 28-6-91 to 4-2-92
,, Gr II	: Smt EV Ambily, from 4-2-92
Watchman	: Sri MT Ponnappan ,, S Sasi
Driver Hr. Gr	: Sri TM Francis
KAU post	
Section Officer	: Smt B Thankamani upto 8-7-91 Sri TV Rajasekharan Nair

Regional Agricultural Research Station, Pattambi

Non-plan-- A

Associate Professor (Agrl. Chem.)	: Dr KC Marykutty
Jr. Asst. Professor (Agrl.Bot.)	: Sri E Sreenivasan
Section Officer	: Sri K Rangaswamy ,, MP Ahammed ,, MG Rajendra Babu
Sr. Gr. Assistant	: Smt P Meenakshikutty from 1-4-91 to 21-2-92 ,, KP Kalliani ,, NV Thankamani ,, A Mary Philomina from 20-6-91 to 31-3-92 Sri TV Ravindramohan ,, AV Sreenivasa Raghavan

Class IV	:	Sri Beg Bahadoor ,, C Ramakrishnan ,, T Gangadharan ,, MP Mohanan Smt P Kunhilakshmi ,, N Saffia
Watchman	:	Sri KC Surya Bahadoor ,, P Mohammed ,, Mohammedkutty ,, A Unnikrishnan
Non-plan (C)—NARP Phase I		
Professor	:	Dr GR Pillai upto 19-8-91 Dr KM Rajan from 19-8-91
Associate Professor	:	Dr D Alexander upto 27-6-91 Dr N Neelakantan Potti
Ast Professor	:	Sri MA Hassan (study leave) ,, K Anilakumar ,, P Rajendran (study leave) ,, P Ahammed Smt KK Santha Sri Baby P Skaria from 15-7-91
Administrative Officer	:	Sri PM Parameswaran Namboodiri upto 17-4-91 ,, KP Koyamu from 1-9-1991 to 16-1-92 ,, K Sivanandan from 28-2-92
Typist Sr. Gr.	:	Smt S Majida Beevi from 17-4-91 to 18-6-91
Typist Gr. I	:	Smt V Santhakumari
Typist Gr. II	:	Smt K Vijayalakshmi from 19-7-91
Duplicator Operator	:	Sri C Kunhan
Lab Asst. Gr. II (Hr. Gr.)	:	Sri VP Balasubramanian
Driver HDV	:	Sri A Krishnan upto 11-11-91 ,, K Parameswaran
NSP/BSP (ICAR)		
Jr Asst Professor	:	Smt T Girija
Technician Gr. I	:	Sri P Surendran
AICRP (Rice)		
Professor (Pl. Path)	:	Sri VP Sukumara Dev
Associate Professor	:	
(Agron)	:	Dr Jose Mathew
(Ento)	:	Sri Baby P Skaria upto 14-7-91 Dr Abraham Jacob from 15-7-91
(Agrl. Bot)	:	Dr K Pushkaran

Assistant Professor (Pl. Br.)	:	Smt CA Rosamma
Jr. Assistant Professor		
(Agro)	:	Smt TK Bridgit
(Pl. Path)	:	.. Rehumath Niza
(Ag. Bot)	:	.. CR Elsy
Farm Asst. (Agri.) Gr. I	:	Sri VP Ramakrishnan
		.. PK Rajasekharan
		.. MJ Joseph
		.. C Subramanian upto 21-6-91
		.. PG Ajayakumar from 21-6-91
Driver Gr. II	:	Sri MV Arumugan
AICRP (Pulses)		
Associate Professor (Agron)	:	Sri Shahul Hameed upto 22-6-91
		Smt Sukumari
		from 3-7-91 to 3-10-91
(Pl. Br.)	:	Smt P Manju upto 29-6-91
Farm Assistant Gr. I	:	Sri Gopalakrishnan Nair
		upto 22-6-91
		.. C Subramanian from 3-7-91
Assistant Gr. II	:	Sri P Ramadasan from 1-7-91
Assistant Gr. I	:	Sri O Sethumadhavankutty
		upto 30-6-91
Typist Gr. I	:	Smt K Krishnakumari
Lab Assistant	:	Sri V Ponnappan upto 30-9-91
		.. T Ramakrishnan from 1-10-91
Peon	:	Sri A Mammoo
NARP Phase II		
Jr. Asst. Professor	:	Kum. ML Jyothi
(Vety.)	:	Smt Geetha C Jayan (Study leave)
Assistant Professor	:	Sri Shaji P James
		from 21-8-91 to 15-2-92
Farm Asst. Gr. I (Vety.)	:	Sri K Velayudhan
		from 1-4-91 to 30-9-91
Farm Asst. Gr. II (Vety.)	:	Sri KV Mohanan from 1-10-91
Technician Gr. I	:	Sri E Abdul Hakkim
Assistant Gr. II	:	Sri V Mohammed Kunhi
NARP Sub Centre, Eruthiampathy		
Professor	:	Sri MRC Pillai
Farm Assistant Gr. I	:	Sri NR Rajan
Class IV	:	Sri P Rayankutty

Cashew Research Station, Anakayam

Head of Station (Prof./Assoc. Prof. of Bot.)	: Smt S Santhakumari upto 3-3-92
Prof./Assoc. Prof. (Bot)	: Sri KC Chandy from 3-3-92
Assistant Professor	: Smt PV Nalini (on study leave w.e.f. 1-3-92)
	: „ PB Pushpalatha from 1-2-92
Farm Assistant (Agri)	: Sri A Abdurahiman
Mali	: Sri KV Balakrishnan
Regular Mazdoor	: Sri EU Kunhimoideen
Assistant Gr. II	: Sri C Rajagopal
Peon	: Sri C Muhammed
Full Time Sweeper	: Smt KP Kadiyumma

Operational Research Project, Ozhalapathy

Associate Professor (Agro)	: Sri KC Rajan
Jr. Assistant Professor	
Horticulture	: Sri MC Narayanankutty
Ag. Economics	: Sri T Selvin Jebaraj Norman
Farm Assistant	: Sri TK Omanakuttan upto 22-6-91
	: „ VJ Rajmohan 10-7-91 to 5-9-91
	: „ EK Sukumaran from 23-7-91
Lab Assistant	: Sri KK Velayudhan
	: „ 9-7-90 to 26-6-91
	: „ TR Balakrishnan from 23-10-91
Assistant Gr. II	: Sri NS Salim kumar
	: „ 23-10-90 to 6-12-91
	: „ TF Ignatius from 10-12-91
LDV Driver	: Sri CA Chacko upto 30-6-91
Class IV	: Sri K. Mohanan Nair upto 6-9-91

Agricultural Research Station, Mannuthy

Professor (Pl Breeding)	: Dr K Kumaran upto 15-2-91
	: „ (Head of station)
Assoc. Professor (Agron.)	: Dr R Gopinathan from 17.6.91
	: „ (Head of Station)
Jr Assistant Professor (Agron)	: Smt KE Usha
Assistant Professor (Ag. Bot.)	: Smt Prasannakumari upto 22-2-92
	: Dr VV Radhakrishnan
	: „ from 24-2-92
Administrative Assistant	: Sri PK Nataraja Pillai
	: „ upto 18.2.92
	: Smt Vivian Jose from 18.2.92
Assistant Gr. I	: Smt CK Prabhavathy

Assistant Gr.II	:	Sri KP Gopi Smt Joicy T John upto 31.10.91 Sri TP Baburaj from 10.12.91
Typist Gr II	:	Smt T Sudha upto 9.4.91
Sr. Gr. Typist	:	Sri R Noel from 11.4.91
Peon (Hr. Gr.)	:	Smt I Parukutty Sri RG Babu From 1.1.92 ,, CR Velayudhan upto 31.10.91
Jeep Driver (LDV)	:	Sri KK Padmanabhan upto 30.6.91 ,, KV Koya from 10.7.91
Watchman	:	Sri E Abu ,, S Pradeep kumar
Sr. Gr. Farm Supervisor	:	Smt PK Vijayalekshmi from 27.6.91 Sri CK Vijayan upto 27.6.91
Farm Supervisor Gr. I	:	Sri TK Mithran Smt PG Yamuna ,, A Belsi
Sr. Gr. Farm Assistant	:	Sri John David ,, U Divakar
Farm Assistant Gr. II	:	Sri I Gershon
Lab Assistant	:	Smt P Meenakshy
Field Supervisor	:	Sri T Raman Nair
Lab Assistant	:	Sri TR Balakrishnan upto 14/10/91
Sr. Gr. Technician	:	Sri TR Viswambharan
Technician Gr. I	:	Sri KV Johnny
Workshop Attender	:	Sri CJ Joseph
ECF unit, Mannuthy		
Agronomist	:	Sri I Johnkutty
Technical Assistant	:	Vacant
Sr. Gr. Farm Assistant	:	Sri G Shaji Sri R Satheesan upto 15-7-91
Sr. Gr. Farm Assistant	:	Sri V John George ,, George Puravath from 9-7-91
Farm Assistant Gr. I	:	Sri PR Sathian ,, AA Abdulla Smt TA Vasanthy
Farm Assistant Gr. II	:	Smt Valsamma George Sri AX George
Assistant Gr. II	:	Sri C Pradeep upto 31-8-91
Assistant Gr. I	:	Smt IC Sheela from 11-9-91
Jeep Driver	:	Sri Mathai Kurian
Watchman	:	Sri EV George

Banana Research Station, Kannara & Pineapple Research
Centre, Vellanikkara

AICFIP

Associate Professor (Hort)	:	Dr L Rajamony
Assistant Professor (Hort)	:	Smt Premalatha, JAP
(Pl. Physio.)	:	Sri Gregory Zachariah
(Pl. Path)	:	Smt S Estelitta, JAP
(Ento)	:	Smt N Anitha, JAP
Jr Asst. Professor	:	Smt K Krishnakumari

NARP

Associate Professor (PP)	:	Sri TC Radhakrishnan	from 1-8-91
Associate Professor (Nemat.)	:	Dr Job Sathyakumar Charles	
Assistant Professor (Hort)	:	Smt PK Sudhadevi	
		Smt A Suma, JAP	upto 4-3-92
(Agron)	:	Sri KP Pradeep, JAP	
(Proc. Tech)	:	Smt Omana Pavunny, JAP	

AICFIP

Farm Assistant Gr. II	:	Sri MN Pavithran	
		Smt R Jayanthi	
Farm Assistant Gr. II	:	Sri E Eswarachandran	
Lab Assistant Gr. II	:	Sri KR Gopalakrishnan	from 9-9-91
Oil Engine Driver	:	Sri KA Narayanan	
Mali	:	Smt P Subhadra	
		Sri P Christy John	
Watchman	:	Sri T Bhaskaran	upto 1-7-91
		„ K Kunjumon	from 9-7-91
		„ S Asokan	30-9-91 to 13-1-92
		„ A Sathyan	24-1-92 to 31-3-92

KAU

Farm Supervisor Gr. II	:	Sri N Vasudevan	from 12-7-91
Farm Assistant Gr. I	:	Sri PM Poulouse	

AICFIP

Typist Gr. II	:	Sri KK Parameswaran
Peon	:	Smt K Sarada

NARP

Typist Gr. II	:	Smt KU Selmath	upto 17-6-91
		„ TC Ajitha	upto 31-5-92

KAU

Administrative Assistant	:	Smt AD Omana	16-2-92 to 20-2-92
		„ AK Kamala Bai	from 24-2-92

Assistant Gr. II	:	Smt KK Valsa
Driver Gr. II	:	Sri PI Rappai
Pump Operator	:	Sri CM Prabhakaran upto 8-7-91 ,, KA George from 8-7-91
Peon	:	Sri RK Dhirjan Bahadur Singh
Watchman	:	Sri Raghavan Pillai upto 16-9-91

Agronomic Research Station, Chalakudy

ICAR

Professor/Chief Scientist	:	Sri P Chandrasekharan from 3-6-88 to 18-4-92
Associate Professor (Agron)	:	Dr Annamma George
Associate Professor (Agrl. Chem. & Soil Phys.)	:	Smt G Santhakumari
Asst. Prof. (Agronomy)	:	Smt Reena Mathew upto 6-1-92 Sri MA Peter from 6-1-92 Smt Gracy Mathew from 9-7-91
,, (Soil Physics)	:	Smt Durga Devi
,, (Agrl. Engg.)	:	Smt K Susan Cherian
Farm Assistant Sr. Grade	:	Sri V Unnikrishnan ,, NM Mohanan upto 9-7-91 ,, MT Varghese from 9-7-91
Farm Assistant Gr. II	:	Sri PK Reghu
Lab Assistant Gr. III	:	Sri TK Velayudhan
Assistant Gr. I	:	Smt MA Sujatha
Driver Gr. I	:	Sri VK Karunakaran
Driver Gr. I	:	Sri KK Padmanabhan from 27-4-92
Peon	:	Sri K Radhakrishnan

NARP Phase I

Asst. Professor (Agron.)	:	Dr Lalitha Bai (Undergoing higher studies) Sri Madhusudhanan Nair (Undergoing higher studies)
(Soil Physics)	:	Smt KC Manorama Thampatti from 8-7-91
Farm Assistant Gr. I	:	Sri PS Sanal kumar ,, V James from 5-7-91
Lab Assistant Gr. II	:	Sri TV Parameswaran upto 11-7-91 ,, PK Anandan from 11-7-91
Driver Gr. II	:	Sri KK Padmanabhan
Typist Gr. II	:	Smt PK Sara

NARP Phase II

Asst. Professor (Agron.) : Sri V Sreekumaran (NC)
 " (Soil Phys.) : Sri CS Gopi
 (Associate Professor NC)
 Typist Gr. I : Smt KD Rosily

Non-Plan (Station)

Administrative Assistant : Smt AK Lyla
 Assistant Gr. I : Smt PV Ramani
 Farm Supervisor : Smt MJ Annakutty upto 4-7-91
 Sri NM Mohanan
 (Sr.Gr.FA-F.S.i/c) from 9-7-91
 Pump Operator : Sri KA Subran
 Ploughman : Sri KC Mathew

Aromatic and Medicinal Plants Research Station, Odakkali

Associate Professor and Head : Dr J Thomas
 (Agronomy)
 Asst. Professor (SS & AC) : Dr Samuel Mathew from 27-4-92
 Jr. Asst. Professor (Pl. Br.) : Sri KP Kuriakose
 (Assistant Professor)
 " (Agron.) : Sri PP Joy
 Graduate Lab Assistant : Smt KK Santhakumari Amma
 Farm Supervisor : Smt P Jayamony
 Sri EN Sudhakaran Nair
 Farm Assistant Sr. Gr. : Sri EN Sudhakaran Nair
 " V James
 Farm Assistant Gr. II : Sri KG Mohandas
 " R Raghu
 Administrative Assistant : Smt PK Elsy
 Assistant Sr. Gr. : Smt KP Premakumari
 Assistant Gr. I : Sri KC Varghese
 Assistant Gr II : Sri PV Yeldose
 Typist Gr. I : Sri ER Vilasini
 Typist Gr. II : Smt KU Selmath
 Peon Hr. Gr. : Sri MM Poulose
 Sweeper-cum-Attender : Sri KB Sivarama Kurup
 " TN Sasi
 " PV Ayyappankutty
 Watchman : Sri PI Kalidasan
 Permanent Labourer (Class IV): Sri I Veeran
 Smt KA Ponnamma

Regional Agricultural Research Station, Pilicode**NARP Phase I**

Assoc. Director : Dr KM Rajan 1-4-91 to 15-8-91
 Dr NK Nair from 16-8-91

Professor (Agro)	:	Sri IP Sreedharan Nambiar from 1-4-91
" (P. P.)	:	Dr Susamma Philip
" (Ento.)	:	" Sumangala S Nambiar
Associate Professor (Micro)	:	Sri KP Mammooty from 4-7-91
" (Ag. Met)	:	Dr GSLHV Prasada Rao
" (Stat.)	:	Sri KL Sunny
" (Ag. Eco.)	:	Sri K Ravi
Asst. Professor (Ento)	:	Dr PC Balakrishnan
" (Ag. Eco.)	:	Smt Latha Bastine (On study leave)
" (Agron.)	:	Dr PA Joseph from 2-8-91
Farm Supervisor Gr. II	:	Sri KN Rajendran
Farm Asst. Sr. Gr.	:	Sri A Sasidharan
" Gr. I	:	Sri KA Kurian
" Gr. II	:	Sri A Ramakrishnan
Lab. Assistant	:	Sri V Narayanan " T Raghavan " KK Velayudhan
Administrative Officer	:	Sri K Sivanandan Smt Mariamma Eapen
Typist Sr. Gr.	:	Sri K Raveendran Smt VP Shyamala
" Gr. II	:	Smt P Sarasu " Ithamma Joseph
L. D. V. Driver Gr. II	:	Sri AV Kunhikrishnan
Peon	:	Sri A Raman
Non plan		
Asst. Professor (Oct)	:	Smt VP Neema
" (Micro)	:	Sri M Govindan (On study leave)
Sr. Farm Supervisor	:	Sri R Nelson
Farm Supervisor Gr. II	:	Sri Basil Rodrigues Smt K Rugmini Amma 1-4-91 31-3-92
Section Officer Hr. Gr.	:	Sri K Prabhakaran Nadar
Section Officer	:	Smt S Droupadi Sri K Balachandran " P. M. F. Babu
Sr. Gr. Assistant	:	Smt Lakshmikutty Sri EV Sasidharan " VV Kunhambu
Asst. Gr. II	:	Sri KV Dinesan " P Vijayakumar " Thomas Mathew " KM Joseph " PJ Jose

Office Supdt.	:	Smt P Radha
L. D. V. Driver Hr. Gr.	:	Sri TM Sukumaran
Oil Engine Driver	:	Sri PK Sadanandan
Peon Hr. Gr.	:	Sri P Raghavan
		„ P Narayanan
		„ Elat Ambu
Regular Mazdoor	:	Sri P Cheriyakannan
		„ Cheriyaambady
		„ P Kariambu
		„ P Raghavan
		„ K Chandran
		„ P Appu
		„ Vellayi Ambu
		„ P Pokkan
		„ K Cheriyaambu
		„ K Ambadi
		„ KV Narayanan
		„ KV Ambu
		„ P Kumaran
		„ P Appukuttan
		„ T Damodaran
		„ V Chirukandan
		„ KV Damodaran
		„ KV Kunhiraman
		„ R Krishnan
Class IV	:	Sri TP Balakrishnan Nair
		„ AT Mohammed
		„ KP Mukundan
		„ K Pokkan
Sweeper-cum-Sanitation worker	:	Sri MV Radhakrishnan
Pump Operator	:	Sri Zainudheen
		„ TK Chandran
Training Scheme		
Asst. Professor (Agro.)	:	Dr T Radha
		Dr A Anilkumar
Farm Supervisor Gr. II	:	Sri MM Sankaran
Assistant Sr. Gr.	:	Smt Suma Varghese
NARP-Phase II		
Assoc. Professor (Ani. Sci.)	:	Dr KC Raghavan from 2-4-92
Asst. Professor (Soil Sci.)	:	Dr C Sundareshan Nair
		(Horti.) : Sri A Rajagopalan
		(Micro) : Sri T Premanathan (on study leave)
Farm Assistant (Vety.)	:	Sri C Kunhiraman

Computer Centre

Jr. Programmer	:	Sri TP Abdul Jabbar (On L. W. A.)
DST Project	:	
Farm Asst. Gr. II	:	Sri MV Premarajan
Res. Associate	:	Sri CS Gopakumar
Jr. Res. Fellow	:	Sri Sibi Sebastian

Pepper Research Station, Panniyur**Non-Plan**

Professor (Agrl. Chem.)	:	Sri V Sukumarapillai
Administrative Assistant	:	Smt Merly Sarojini
Assistant Sr. Gr.	:	Sri V Narayanan Smt M Leela Sri KK Assooty
Typist Gr. I	:	Smt K Pushpavally
Peon	:	Sri Chindan
Jeep Driver Gr. II	:	Sri EP Narayanan
Watchman	:	Sri V Kunhiraman
Peon	:	Smt P Janaki
Farm Supervisor Gr. I	:	Sri NP Raghavan
Farm Assistant Sr. Gr.	:	Sri PJ Joseph
Watchman	:	Sri T Kunhiraman

AICS Scheme

Professor (P. P.)	:	Sri S Sasikumar
Assoc. Prof. (P. P.)	:	Sri KP Mammootty upto 3.7.91 ,, PKUK Nair from 4.7.91
Asst. Prof. (P. B.)	:	Sri KK Ibrahim from 10.4.91
(Agro.)	:	Sri TN Jagadishkumar
Lab Asst. Gr. I	:	Sri V Achuthan
Farm Asst. Gr. II	:	Sri T Mohammed Haneefa ,, K Lakshmanan
Peon	:	Sri MP Narayanan

Regional Agricultural Research Station, Ambalavayal**KAU—Non-plan**

Asst. Professor (Ent)	:	Sri CM George
,, (Agronomy)	:	Shifted to College of Horticulture, Vellanikkara

NARP (State plan)

Assoc. Professor (Agron)	:	Sri KC Aipe
,, (Hort)	:	Sri MP Giridharan (Leave for study purpose)
,, (Pl. Brg)	:	Smt Susamma P George
,, (Ag. Econ)	:	Sri C Viju Ipe upto 15-7-91 (Leave for study purpose)

NARP Phase II

Assoc. Professor (A. H.)	:	Dr PC Saseendran (Leave for study purpose)
Professor (Hort)	:	Dr EV Nybe
Asst. Professor (Hort)	:	Sri CA Varghese
Professor (Pl. Path.)	:	Smt S Beena (on loss of pay leave)
.. (F. M.)	:	Smt EVN Sheela (Provisional) 1-4-91 to 27-2-92

AICSIP (Pepper)

Assoc. Director	:	Dr P Balakrishna Pillai upto 24-2-92 Dr K Kumaran from 24-2-92
Assoc. Professor (Pl. Brg)	:	Smt P Mayadevi
Administrative Officer	:	Sri KP Koyamu 1-4-91 to 4-4-91 .. A Basil 17-4-91 to 6-7-91 .. D Gilbert 1-8-91 to 16-9-91 .. S Krishnan Nair 20-9-91 to 10-2-92 .. M Abubakker Khan from 20-2-92
Section Officer	:	Sri E George
Sr. Grade Assistant	:	Smt P Sulochana
Asst. Grade II	:	Sri KK Assooty .. E Jamalkoya upto 4-7-91 .. PJ Simon .. M Manjunathan from 11-12-91 .. N Gopinathan Kartha .. TA Tilakaraj from 21-2-92
Typist Grade II	:	Sri AK Basheer upto 4-7-91 Smt NK Vijayalakshmi
Stenographer Gr. II	:	Sri PT Roshan
Driver (LDV)	:	Sri KP Pakkarkutty
Peon Hr. Grade	:	Sri K Raman .. KR Chandrasekharan .. P Moosa
Sr. Farm Supervisor	:	Smt PK Vijayalakshmi
Farm Supervisor Gr. II	:	Sri KM Vijayakumaran .. VK Kumaran Smt P Padmavathy Sri K Aboobacker
Farm Asst. Sr. Grade	:	Sri Imbichi Ali
Farm Asst. Gr. I	:	Sri A Kunhimohammed
Farm Asst. Gr. II	:	Sri CT Jacob
Field Supervisor	:	Sri K Raghavan

Administrative Assistant	: Sri S Bhaskara Pillai	upto 25-6-91
	.. j Kochukunju	upto 11-9-91
	.. PU Kesavan	from 3-10-91 to 4-12-91
Senior Grade Assistant	: Sri MR Ramachandran	
Assistant Gr. II	: Sri EO Manohar	
Driver (LDV)	: Sri PS Babu	from 10-7-91
Field Supervisor	: Sri KN Raghavan	
Watchman	: Sri K Raghavan Pillai	
	.. K Alikutty	
	.. MT Antony	
	.. Poulouse Mathew	
Farm Supervisor Gr. II	: Smt K Devaky	
Farm Assistant Gr. I	: Sri TV Kuttiachan	

KAU School, Vellanikkara

Teaching Staff

Headmaster	: Sri AJ Abraham	
Teacher (Eng. Med.)	: Smt KP Thressiamma	
	.. Deborah Cyril	
	.. Letha Balaraman	
	.. AJ Lilly	
	.. KS Indiradevi	
U. P. School Asst. (Mal. Med.)	: Smt TJ Maggy	
	.. Najeema Unnikkam	
	.. KS Leena	
	(Hindi) : Smt K Narayani	
L. P. School Asst. (Mal. Med.)	: Sri V Sasidharan	
	.. PK Bhaskaran	
	Smt MA Alli	
	.. MV Mary	
	.. MK Mallika	
Pre-Primary School Asst.	: Smt P Devika	
	.. DV Shylaja	
	.. R Kamala	

Non-Teaching Staff

Sr. Grade Assistant	: Smt N Usha Rani	
Ayah	: Smt KR Sumithra	
	.. M Soudamini	
Class IV	: Sri VA Mathew	
	Smt Parukutty	
	.. T Kunjukutty	

Communication Centre

Information Unit

Associate Professor	:	Dr AD Antony
Asst. Professor	:	Sri Jose Joseph
	:	Dr Joy Mathew

Publication Unit

Professor	:	Sri KC Varghese
Asst. Professor (Aqua.)	:	Dr Elizabeth Joseph

Exhibition Unit

Jr. Asst. Professor	:	Sri AK Sherif
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Farm Advisory Unit

Professor and Head	:	Dr MJ Thomas
Professor (Botany)	:	Dr R Gopimony
Assoc. Professor	:	Dr Joseph Mathew Dr MK Sheila
Section Officer	:	Smt KP Narayanikutty ,, Susy Mathew
Sr. Grade Assistant	:	Smt Sherine V Thomas ,, Sherley Mathew ,, Prema B Nair
Assistant Gr. II	:	Smt Preleema Peter Sri A Pradeep ,, KR Jayan
Selection Grade Typist	:	Smt KM Mary
Language Editor (Mal.)	:	Smt K Mrudula Devi
Farm Supervisor	:	Sri CV Thomas Smt KP Ambika
Sr. Gr. Farm Assistant	:	Sri MT Varghese
Audio Visual Operator	:	Sri MR Gopinathan
Photographer	:	Sri VV Satheesan
Artist	:	Sri PK Surendran (on leave)
LDV Driver	:	Sri MA Joseph
Peon	:	Sri MK Ramakrishnan Smt PK Kamalakshy ,, MS Ammini
Sweeper	:	Smt PJ Thankom

Central Training Institute, Mannuthy

Professor and Head	:	Sri KP Ramachandran Nair
Associate Professor (Hort)	:	Dr NK Parameswaran (on working arrangement a ACTPLANC from 15-7-91)
Assistant Professor	:	Smt T Sheela Paul

Jr. Asst. Professor	:	Sri Alexander Georg (from 15-6-90)
Farm Supervisor	:	Sri MJ Kochappan
Farm Assistant	:	Sri VJ Paul
Section Officer	:	Sri KK Radhakrishnan upto 15-2-92
Asst. Gr. II	:	Sri ME Saleel upto 20-6-91 Smt MN Jayanthi from 22-2-92 Sri S Ravindranath upto 15-2-92 Sri Samson J Kolady from 15-2-92
Sr. Gr. Typist	:	Smt ML Sosannam
Typist Gr. II	:	Smt T Santha upto 15-2-92
Typist Gr. I	:	Smt ER Vilasini from 6-3-92
Driver HDV	:	Sri PK Devassy
Driver LDV	:	Sri VN Dasan
Duplicator Operator	:	Sri CA Divakaran upto 31-8-91 ,, M Gopinathan from 2-9-92
Peon	:	Sri ML Devassy

Advanced Centre of Training in Plantation crops, Vellanikkara

Co-ordinator	:	Dr AM Tampi
Associate Professor	:	Dr NK Parameswaran
Assistant Gr. II	:	Sri KN Murukesh
Typist Gr. II	:	Sri CR Sasidharan
Audiovisual Operator	:	Sri Eugene G Varghese upto 31-8-91 Sri Polson Varghese from 2-9-91
LDV Driver	:	Sri KM Subramonian
Assistant Gr. II	:	Sri TR Raju from 10-1-92

Training Service Scheme, Vellayani

Associate Professor and Head	:	Dr O Abdul Rahman
Associate Professor (NC)	:	Dr C Bhaskaran upto 12-7-'91 Dr G Sobhana from 12-7-'91
Farm Supervisor	:	Smt Leela Bai
Assistant Gr. II	:	Sri TK Mohanan upto 20-7-91 Smt TA Subaida Beevi from 20-7-'91
Typist (Sr. Grade)	:	Smt P Padmavathi
Peon	:	Sri Arjunan

Krishi Vigyan Kendra, Pattambi

Professor of Extension	:	Dr G Balakrishna Pillai
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Associate Professor	
(Agronomy)	: Sri CK Prabharan Thampi
(Horticulture)	: Dr PK Valsalakumari
(Home Science)	: Smt NK Vimalakumari
Assistant Professor	
(Horticulture)	: Smt KB Sheela
(Poultry Science)	: Dr OJ George
(Fisheries)	: Dr Girija Sankaranarayanan
(Home Science)	: Smt B Prasannakumari
Section Officer	: Sri PM Cherukutty
Assistant Gr. II	: Sri AW Kishore
Typist Gr. II	: Smt P Soumini Devi
	Sri E Gopinathan
Farm Assistant Gr II	: Sri T Velayudhan
	.. M Rajendran
AV Operator	: Sri KP Koran
Driver	: Sri TR Sasidharan
Peon	: Sri C Gopalakrishnan
Watchman	: Sri R Kumaran
Hostel Attendant	: Sri PK Govindan

Krishi Vigyan Kendra, Ambalavayal.

Professor	: Dr G Raghavan Pillai
Associate Professor	: Dr A Radhamma Pillai
	Smt V Indira
	Dr Valsamma Mathew
	Smt K Abdul Kareem
Assistant Professor (Agri)	: Smt PV Nandini
	Sri KN Satheesan
	.. TP Manomohandas
Section Officer	: Smt M. Leela
Assistant Gr. II	: Sri N Sethuram
Typist Gr. II	: Smt K Renuka Devi
	.. P Thankamani
Audiovisual Aid Operator	: Sri M Abdulrazak
Driver Gr. II	: Sri MP Unnikrishnan
Hostel Attendant	: Sri K Bapputty
Cook-cum-care taker	: Sri O Ashokan
Peon	: Sri Silak Bahadur
Sweeper-cum-Attendant	: Sri T Saidalavi
Watchman	: Sri K Koya
	: .. MC Krishnan

Krishi Vigyan Kendra, Manjeswar

Professor	:	Dr P Ramachandran Nair
Assistant Professor	:	Sri Shanta Ram
Assistant Gr. II	:	Sri K Muhammed Jaffer
		from 28.6.91
Farm Assistant (Vety.)	:	Sri P Sasidharan Nair
Typist Grade II	:	Sri A Sudhakaran from 11-3-92
Peon	:	Sri N Chandu
Watchman	:	Sri KK Ramakrishnan

National Demonstration Scheme, Anandappally

Associate Professor (PP)	:	Dr KV Mammen
Assistant Professor (SS)	:	Sri Raveendran Nair
	:	(Hort.) Dr K Sverup John
	:	(Agro) Smt S Lakshmi
Farm Assistant (Agri.) Gr. II	:	Sri KC Sanuprasad
		Smt S Nazeema
LDV Driver (Gr. I)	:	Sri K Sukumara Pillai
Assistant (Gr. II)	:	Sri K Mohanan

AICP on Scheduled Caste Area Research Centre, Wandoor

Associate Professor	:	Smt S Shilaja
Jr. Assistant Professor	:	Smt Jasmine Zachariah
Farm Asst. (Agri.) Sr. Gr.	:	Sri K Mohammedali
(Vety.) Gr. II	:	Sri MK Vijayakumar
Typist Gr. I	:	Sri KT Vijayalakshmi
Assistant Gr. II	:	Sri T Rajan
Driver	:	Sri PK Kunhiraman

Tribal area Research Centre, Amboori

Senior Scientist/Assoc. Professor & Co-ordinator	:	Dr K Harikrishnan Nair
Assistant Professor	:	Dr Lekha Sreekantan
		Dr MO Kurian
		Smt M Rajini
Junior Asst. Professor	:	Smt Sansamma George
		.. P Geetha
Clerk-cum-Typist	:	Sri M Abdul Azeez
Driver	:	Sri P Reghunathan Nair
Peon	:	Smt K Kunji
Home Science Helpers	:	Smt C Jayakumari
		.. P Chinnamma
		.. B Vasanthakumari

KAU Press

Press Manager	:	Sri K Rajappan
Section Officer	:	Sri A Basil upto 2/4/91 Smt C Rajamma from 2/4/91 to 31/1/92 Sri PK Nataraja Pillai from 17/2/92 onwards
Senior Gr. Assistant	:	Sri V Jacob Simon Smt C Mercy John from 1.7.91 onwards
Assistant Gr. I	:	Sri PA Jacob Joe
Assistant Gr. II	:	Sri KP Gopinathan upto 17.6.91
Selection Grade Typist	:	Smt PK Kousallia
Peon Hr. Gr.	:	Sri M Somasekharan
Sweeper-cum-Attendant	:	Smt KS Prema
Watchman	:	Sri PB Anilkumar
General Foreman	:	Sri G Narayana Pillai
Sr. Foreman	:	Sri PI Lonappan
Sr. Gr. Printer (HG)	:	Sri TP Joseph ,, VR Kumaran
Hr. Gr. Printer	:	Sri C Viswanathan ,, P Prabhakaran (entered on LWA for 5 years w.e.f. 1/10/91) ,, NJ Samuel
L. G. Printer	:	Sri PR Aravindakshan
Sr. Gr. Compositor	:	Sri V Subramanian Smt KM Thankamma ,, PA Elsy
Hr. Gr. Compositor	:	Sri V Rajendran Smt K Leela
LG Compositor	:	Smt PM Santha
Sr. Gr. Binder	:	Sri KR Vijayan
Hr. Gr. Binder	:	Smt PT Annie
LG Binder	:	Smt M Kamalamma ,, G Parvathy Ammal
Helper	:	Sri VN Hassan
Compositor (LG)	:	Smt OM Geetha (Provisional hand from 4/11/91 to 30/4/92) Sri MO Kuriakose (Provisional hand from 11/11/91 to 7/5/92)
Hr. Gr. Proof Reader	:	Smt Sherly Sam
Proof Reader	:	Sri KK Sadasivan
Computer	:	Smt K Santhakumari

Cattle Breeding Farm, Thumburmuzhi

Associate Professor	:	Dr B Nandakumaran 1.4.91 to 30.6.91 Dr Sosamma lype (Professor from 1.7.91 to 30.4.92)
Jr. Asst. Professor	:	Dr Sreeja Ramachandran (Leave without allowance for study purpose for undergoing M. V. Sc. programme)
Administrative Assistant	:	Smt PK Elsy from 1.4.91 to 22.6.91 Smt VK Pathumma 9-7-91 to 30-4-92
Assistant Grade I	:	Sri CC George
Assistant Gr. II	:	Sri A Radhakrishnan
Peon Higher Grade	:	Sri KV Bhaskaran
Farm Supervisor (Vety.) Gr.II	:	Sri AM Sreedharan (F. S. (Vety.) Grade I)
Farm Assistant (Vety.) Gr. I	:	Sri V Sukumaran Nair FS (Vety.) Gr. I ,, P Mohanan Nair FA (Vety.) Gr. II (1.7.91 to 30.4.92 ,, K Sivasankaran FA (Vety.) (Gr.I 1.4.91 to 22.6.91)
Farm Supervisor Gr. II (Agri.)	:	Sri K Sasidharan FS (Agri.) Gr. II from 27-6-91 to 30-4-92) ,, V James FA (Agri.)Senior Grade 1.4.91 to 26.6.91
Pump Operator	:	Sri MP Joseph
Herdsmen Special Grade	:	Sri PK Velayudhan (Hr. Grade)
Herdsmen	:	Sri TK Thomas (Hr. Grade) ,, KP Jose (Hr. Grade) Smt ES Yesodha Sri TN Sasi
Pharmacist	:	Sri CK Aleas

Livestock Research Station, Thiruvazhamkundu

Assistant Professor (Animal Nutrition)	:	Dr K Ramachandran
(Genetics)	:	Dr Stephen Mathew (Associate Professor NC)
Jr. Asst. Professor	:	Dr Mammen J Abraham (on leave) Dr CT Sathian from 1.3.92

AICRP on Agroforestry, Thiruvazhamkunnü

Jr. Asst. Professor (Hort.)	:	Dr KV Suresh Babu
Assistant Gr. I	:	Sri PV Chamunni
Farm Assistant (Agri)	:	Sri Thomas Chirakandathil ,, CP Nandakumar
Lab Asst. Gr. III	:	Sri P Bharathan ,, AN Reghu
Peon	:	Sri K Narayanan
Driver	:	Sri T Moidu

Centre of Advanced Studies in Poultry Science, Mannuthy

Director	:	Dr A Ramakrishnan
Assoc. Professor	:	Dr PA Peethambaran upto 1.8.91 Dr VK Elizabeth from 1.3.92 Dr A Jalaludeen Dr K Narayanankutty Dr Leo Joseph upto 1.3.92
Farm Assistant	:	Sri MG Vasu Smt P Valsalakumari

Poultry and Duck farm, Mannuthy

Assoc. Professor	:	Dr G Reghunathan Nair
Junior Asst. Professor	:	Dr P Anitha
Sr. Farm Supervisor	:	Sri UT Dominic
Sr. Gr. Farm Assistant	:	Sri MV Chandran Sri N Sugathan
Farm Assistant (Gr. I)	:	Smt KV Rosily
Farm Assistant (Gr. II)	:	Sri KA Chackochan
Administrative Asst.	:	Sri KR Mohanan
Assistant (Sr. Grade)	:	Smt E Hymavathy
Assistant (Gr. I)	:	Smt TK Thankamma
Peon (Higher Grade)	:	Smt TK Saleena
Watchman	:	Smt N Rugmini
Class IV	:	Sri MB Chandran ,, KN Somasekharan ,, KK Gopi

AICRP on Poultry, Mannuthy

Senior Scientist	:	Dr AKK Unni
Farm Manager (Asst. Prof.)	:	Dr CR Lalithakunjamma upto 31.7.91 Dr PA Peethambaran upto 29.2.92 Dr Leo Joseph from 1.3.92
Jr. Poultry Pathologist	:	Dr CR Lalithakunjamma

Sr. Research Assistants	: Dr B Lokanatha Reddy upto 17.7.91 Dr A Sreekumar Smt C Laly John
Electrician (Sr. Gr. Tech.)	: Sri E T Paul
Farm Assistant (Sr. Gr.)	: Smt V Indira
Farm Assistant (Gr. II)	: Sri N Gopinathan gmt PP Sarada
Driver (Grade II)	: Sri PS Kabeer
Section Officer	: Sri PJ John upto 2.7.91 Smt N Sudha Devi from 3.7.91
Assistant (Gr. I)	: Smt PV Ambika
Typist (Gr. I)	: Smt VG Girija
Peon	: Sri PT Varghese
Poultry Attender	: Smt CO Mary

University Pig Breeding Farm, Mannuthy

Professor	: Dr Kurian Thomas
Associate Professor	: Dr KS Sebastian
Administrative Assistant	: Smt VJ Rosily
Assistant Sr. G.	: Sri P Vijayakumar Smt VR Chandrika
Farm Supervisor	: Smt VK Radha Sri AS Kurunakaran ,, KK Sasidharan Nair
Pump Operator	: Sri MS Mohanan
Peon Hr. Gr.	: Smt KK Karthiayani
Pig Attendant	: Sri PB Velayudhan ,, N Pushpangadhan
Watchman	: Sri PV Balakrishnan

University Livestock Farm, Mannuthy

Professor & Head	: Dr PA Devassia
Professor	: Dr Jacob V Cheeran (Working arrangements to College of Forestry)
Associate Professor	: Dr CM Aravindakshan (Working arrangement from College of Veterinary and Animal Sciences) Dr TV Viswanathan (Fodder Research Officer i/c.) from 25-9-91 Dr KN Aravinda Ghosh, (Fodder Res. Officer upto 25-9-91)

Farm Supervisor (Vety.)	:	Sri PP Sankaran
		.. KP George
		.. KV Balan
		.. K Krishnankutty
		.. VS Bhaskaran
		Smt MK Chandramathy
Farm Assistant (Agri.)	:	Sri KV Louise
		.. KK Gangadharan from 10-7-91
		Smt A Leela from 1-4-91
		.. PG Thankom
		Sri Ci Surendran
		.. KS Prasannakumar
		from 29-2-92
		.. KM George upto 29-2-92
		Smt KK Pushpa
Administrative Assistant (Vety.)	:	Sri P Gopinathan upto 18-6-91
		.. P Aliyar from 18-6-91
Section Officer	:	Smt KP Mary
Assistant Gr. II	:	Smt PP Annamma
		.. TD Annie from 5-7-91
		Sri KG Somanath upto 5-7-91
		.. PG Madhusoodanan
		Smt KP Baby
Typist Gr. II	:	Sri MK Muraleedhara Karnavar
		Smt S Indira Amma from 8-7-91
		.. K Lilly Bai upto 17-6-91
Permanent Servant	:	Sri M Krishnankutty
		Smt CP Leya
Class IV	:	Sri E Narayanankutty
		Smt MK Mukami
		.. KV Rosa
Watchman	:	Sri C Kumaran Nair
University Veterinary Hospital, Kokkalai		
Professor and Head	:	Dr K Ramdas
Assistant Professor	:	Dr KM Jayakumar
Farm Assistant	:	Sri TK Narayanan
		.. KR Sivaraman
Pharmacist	:	Sri CK Alias
		(on working arrangement)
Section Officer	:	Smt M Baby
Assistant Sr. Gr.	:	Smt A Daisy Anto
Class IV	:	Sri KO Varghese
		.. MK Sheik Abdul Rehiman
		.. KS Radhakrishnan
Sweeper-cum-Scavenger	:	Smt Thankamani Nagaparambu

Veterinary College Hospital, Mannuthy

Professor	:	Dr NM Aleyas
Associate Professor	:	Dr Santha E. George
Farm Supervisor Gr. I	:	Sri CC Narayanan
Permanent Labourer	:	Sri KB Mohanan

Fisheries Station, Puduveypu

Assoc. Professor (Aq)	:	Sri KS Purushan
Asst. Professor (Aq)	:	Sri MM Jose
		Associate Professor (NC)
Assistant Gr. I	:	Smt P Annamma Scaria
		Asst Gr. II upto 31-8-91
		Sri C Pradeep
Assistant Gr. II	:	Sri PA George
Farm Assistant Gr. II	:	Sri PA Moni
		Farm Asst. Gr. I upto 9-7-91
		Sri PN Sadasivan
		Farm Assistant Gr. I
Fieldman (Fisheries)	:	Sri KK Reghu
Pump Operator	:	Sri EI Anthrew
Lab Asst. Gr. III	:	Sri AN Reghu
Typist Gr. II	:	Smt VK Rema
Senior Office Supdt.	:	Smt PV Brizitha upto 24-6-91
		(on working arrangement)
Driver	:	Sri AR Chacko
		(on working arrangement)

KAU Estate, Vellanikkara

Estate Officer	:	Sri PV Gopalakrishnan Nair
		upto 1-7-91
		„ O Vinodakrishnan
		upto 11-7-91
		„ PM Chandran upto 29-7-91
		„ O Vinodakrishnan
		upto 5-2-92
		„ AK Sreenarayanan
		from 5-2-92
Section Officer	:	Sri K Kuttappan Achary
Sr. Farm Supervisor	:	Sri KC Kochumon
Office Superintendent	:	Smt PR Sarojini
Assistant Sr. Gr.	:	Sri PG Sreekantha Pai
		Smt M Jaseentha
Farm Assistant Sr. Gr.	:	Sri MK Vijayan
		(9-4-91 to 1-6-92)
		„ KS Thankappan
		(1.4.91 to 30.11.91)

Driver LDV	:	Sri KC Chinnan
Peon	:	Sri P Kunjunny
Watchman	:	Sri MO Daniel upto 25.7.91
		„ NV Vasu
		„ VS Muhammed kutty
		„ KM Ponnunon
		„ KK Ramankutty
Plantation Staff		
Asst. Section Officer	:	Sri MA Jose
Field Officer	:	Sri P Unni
Peon	:	Smt Saleena Devassy
Field Supervisor	:	Sri PK Sankarankutty upto 3.7.92
		Sri MK Vasu
Campus Development Scheme, Vellanikkara		
Special Officer i/c. (Campus Development)	:	Dr RR Nair
Assoc. Professor (Hort.)	:	Dr K Aravindakshan Dr T Radha (on working arrangement from the Dept. of Plantation Crops, College of Horticulture) from 1-7-91
Asst. Professor (Bio Chem.)	:	Sri A Augustin from 1-4-91 to 31-3-92 (on study leave upto 11-3-91)
Farm Assistant Gr. I	:	Sri Mohan Das from 9-8-91 „ KJ Loveson upto 22-11-91
Farm Assistant Gr. II	:	Sri KO Shahul Hameed from 18-5-91 to 15-7-91
Farm Assistant Sr. Gr.	:	Sri S Sukumaran Nair from 2-5-91 to 17-6-91
Office Superintendent	:	Smt S Seemanthini from 1-4-91 to 22-11-91
Typist Gr. II	:	Smt Baby from 1-4-91 (on working arrangement at IF, Vellayani)

□ □

Appendix V

LIST OF PUBLICATIONS/RADIO TALKS, TV PROGRAMMES ATTENDED

College of Agriculture, Vellayani

Research papers published

- Abdulsalam, Sreekumar, D, Mammen, MK, Rágeena, S, Meera Bai M and Jayachandran, BK 1991. Structural and functional analysis of homestead farming systems in Kerala homesteads in uplands involving mixed farming. *Farming Systems*, 7 (1 & 2): 52-57
- Bai, NR, Devika, R, Regina, A, Kumari SL, Radha Devi DS and Joseph CA 1991. Aruna (MO-8), a high yielding rice variety with seed dormancy and brown plant hopper (BPH) resistance from Kerala, India. *International Rice Research News Letter*. 16 (6): 15.
- Bai, NR, Regina, A, Devika, R, Leenakumary, S. Radhadevi, DS and Joseph, CA 1991. Grain quality of some red rice genotypes. *International Rice Research News letter* 16 (6): 6-7.
- Balakrishnan; S 1991. Transmission and host range of viruses causing mosaic disease of pumpkin in Kerala. *International conference on Virology for the Tropics*. Lucknow, Dec. 2-6, 1991.
- Dale, D 1992. An allomane in rice plant against system borer. *Proc. first National System. Allelopathy in agro-ecosystems. Ind. Soc. of Allelopathy*. HAU: 171-174.
- Dale, D 1992. Common insect pests seen in Cashew plantations and storage; their identification. destructive phases and usage of pesticides. Paper presented in the All India Seminar on Pesticide residues in Cashew kernels. 36th November, 1991. Kollam, Kerala, India.
- Devika, R and Radhadevi DS 1992. Yield and yield attributes of four varteties of rice under irrigation and pre-sowing treatments. *Geobios News Reports*. II (i): 45-47.

- Geethakumari, VL, Sivasankar, K and Bagyaraj DJ 1990. Effect of organic amendments in conjunction with Mycorrhiza on Finger millet. J. of soil biology and ecology. 10 (2): 57-60.
- Gopinathan, PB 1991. Survey on natural occurrence of cytoplasmic polyhedrosis virus of red palm weevil in Kerala. Paper presented in the International Seminar on Coconut Research and Development. II. Kasargod. November, 1991.
- Joseph, CA, Remabai, N, Devika, R, Ahmed Regina and Radhadevi DS 1991. Rice Breeding. Published in Five Decades of Rice Research in Kuttanad KAU 9-26.
- Kavitha, K, Mydeen, Gopinathan Nair V, Sethuraj MR Saraswathi P and Panicker, ADN 1992. Genetic divergence in rubber (*Hevea braziliensis*). Presented at the 4th International natural rubber conference held at Bangalore, 5th to 8th February, 1992.
- Krishnakumar R, and Visalakshi A, 1992. Persistent toxicity of insecticides in rice bug *Leptocorisa acuta*. Ibid: 108-109.
- Kuruville Varghese, Jose Mathew, Pillai GR, and Santha Kumari G, 1992. Impact of group management on the productivity, water use and the economics of rice cultivation in Kerala. 4th session of Kerala Science Congress held at Thrissur. State Committee on Science, Technology and Environment: 98-99.
- Mathew, TB, and Mohandas, N, 1992. Effect of insecticides on the population build up of the predator fauna of BPH in the rice crop ecosystem Ibid: 80-81.
- Menon AGG, Sreedharan, C, and Bhaskaran, C, 1991. Extension strategy for promoting rainfed agricultural techniques for promoting coconut cultivation in Kerala. Proc of the International conference in Extension Strategy for minimising mela in rainfed agriculture, New Delhi.
- Mercy ST, 1991. Androgenic haploids in rice. Paper presented in the Gregor Mendel birth day lecture series and symposium. 22nd July, 1991 held at University of Calicut, Kerala.
- Mohandas, N, and Remony, KS, 1991. Emerging pest problems in coconut and their control. Paper presented in the International Symposium on coconut research and development II. Kasargod, November, 1991. Abstract of papers: 6.
- Motilal Nehru, A, and Sushama, NP, 1991. Impact of special employment programme in agriculture. Proceedings of the third Kerala Science Congress.
- Nair, SR, and Jyothi, ML, 1991. Propagation of bread fruit (*Artocarpus attilis*). Part) by rooted cuttings. The Orissa J. Hort. XIX (1&2).

- Nair, SR, and Jyothi, ML, 1991. Influence of juvenility in layering of bread fruit (*Artocarpus attilis* park). The Orissa J. Hort. XX (1 & 2).
- Naseema Beevi, S, Mathew, TB, Visalakshi, A, Asari, P A R, and Dale D. Organochlorine insecticide residues in milk and milk products. Paper presented in the National Seminar on Surveillance, Prevention and control of food contaminants. 3-5 December, 1991. CFTRI Mysore, India.
- Naseema Beevi, S, and Visalakshi, A, 1992. Effect of phorate on the predatory fauna of Brown plant hopper (*Nilaparvata lugens*) of rice. Ibid. 48.
- Naseema, A, Alice, KJ, and Wilson, KI, 1991. A new leaf spot of *Gardinia gumnifera* from Kerala. Geobios New Reporter, 10:52.
- Naseema, A, Girija, VK, and Wilson, KI, 1991. A new tuber rot of *Dioscoria esculenta* from India. Indian phytopath 44:4.
- Naseema, A, and Wilson, KI, 1991. Control of fungal deterioration of oilcakes. National Symposium on Surveillance, Prevention and control of food contaminants. December, 3-5, 1991. CFTRI, Mysore.
- Nalinakumari, T, Mammen, KV, and Das, V M 1992. Seasonal occurrence and longivity of ham beetle *Necrobia rufipes* in copra. Ibid: 277-278.
- Padmanabhan, VB, 1991. A study of the non-formal education centre for farm labourers. CAEE Research Bulletin: 17-18.
- Padma kumari, G, and Balakrishnan, S, 1991. Control of sheath blight of rice using organic soil amendments. Geobios New Reports. 10:80-83.
- Prakash, R, Nair, GT, and Saraswathi, P 1992. Constraint analysis in rice production in the southern region of Kerala. Paper presented at the fourth session of Kerala Science Congress held at Thrissur from 27th to 29th February, 1992.
- Rajagopalan, B, Reghunath, P, and Sulochana, KK, 1991. Kalluvazha, a variety resistant to bunchy top disease. Geobios New Reports 10: 74-75.
- Rajan Asari, PA, 1991. Staphylinid beetle, a pest on *Oyster* mushrooms. Paper presented at the National Symposium on mushrooms. Trivandrum.
- Rajendran, P, and Aiyer, RS, 1992. Low cost agrotechnology for correcting Zinc deficiency in wetland rice culture. Proc. IV Kerala Science Congress. February, 1992. Thrissur.
- Reghunath P, Bhaskaran C, Krishnakumar R and George Koshy 1992. Efficacy of control measures on the major pests of vegetable crops. Ind. J. Hort. (in press).

- Rekha, VR, Manikantan Nair, P, Sreekumar, SG, Balakrishnan Asan R and Pillai, M R C 1991. Path analysis of yield components in few cassava cultivars. *J. Root Crops*. 17 (1): 35-38.
- Remabai, N, Devika, R, Joseph, CA, Ahmed Regina, Leenakumari, S Radha Devi, DS, 1991. MO-11 – A promising semi tall rice variety tolerant to brown plant hopper. Paper presented in the National Symposium on Rice in wetland ecosystem, Kottayam KAU.
- Remabai, N, Devika, R, Ahmed Regina, Leenakumari, S, Joseph, CA and Radha Devi, DS, 1992. Remya – A medium duration Brown Plant Hopper (BPH) resistant variety. Proc. Fourth Kerala Science Congress. February, 1992. Thrissur 70-71.
- Saji T, Abraham, Reghu, CI, Jayasree Madhavan. George, PJ, Potty, SN and Saraswathi, P, 1991. Preliminary observations on the variation in a few genotypes on Hevea belonging to the 1981 JRRDB. Germplasm collection. Paper presented at the 4th International Natural rubber conference held at Bangalore from 5th to 8th February, 1992.
- Sanjeev Chandran, Prakash, R and Suma, B 1991. Impact of development programme in promoting pepper production in Kerala. Proc. Third Kerala Science Congress.
- Santha, AM, Shylaja, S and Balakrishnan Asan, R 1991. Adoption of seedling practices in coconut – extent and constraints – Ind. Coc. J. 22 (8): 14-16.
- Sheela, MS and Venkitesan, TS 1992. Bacterial pathogens associated with the root knot nematode in Kerala – Their occurrence and status. Proceedings of the IV Kerala Science Congress February, 1992: 231-233.
- Sudharma, K, Susamma Mathai and Padmakumari G 1991. *Curvularia lunata* (Walker) an entomogenous fungus infecting rice skipper: *Pelopidas mathias*. Geobios New Reports 10: 178-179.
- Suma Bai, DI, Chandramony, D and Nayar, NK 1991. Analysis on character association in Chillies (*Capsicum annum L.*) Agri. Science Digest. 11 (2): 81-83.
- Susamma Mathai, Geetha D and Das, NM 1992. Use of different locally available cheaper substrates for the mass multiplication of *F. pallidroseum* cook. an effective fungal pathogen against pea aphid. New trends in biotechnology. Ed. Rao, NS, Balagopal, C and Ramakrishna SV. Oxford & IBH Publishing Co. Pvt. Ltd. 249-252.
- Susamma Mathai, Padmakumari, G, Nalinakumari, T and Hebsy Bai 1991. *Mucor circinelloids*, an entomogenous fungus of the banana aphid: *Pentalonia nigronervosa* Coq. (Aphididae).

- Susamma Mathai, Sasidharan Pillai, K, Padmakumari. G and Jigi, T 1991. New record of fungal pathogen *Aspergillus niger* var. Ticghous on mulberry silk worm *Bobyx mori*. Geobios New Reports 10.
- Tessy P Mathew and Saraswathy, P 1992. Factor analysis in sesame. Paper presented at the IV session of Kerala Science Congress held at Thrissur from 27th to 29th February, 1992.
- Thampan, C, Rahiman, OA and Bhaskaran, C 1991. Training strategy for the farmers of Kasaragod District. Proc. III Kerala Science Congress.
- Thomas Varghese 1992. Laterite soils of India and their management. Paper presented at the International Workshop on correction of Laterites (CORLAT), FAO UNESCO, held at Wageningen. The Netherlands, 16th to 21st March, 1992.
- Thomas Varghese, Unnikrishnan, S and Usha, PB 1992. Characteristics and management of acid sulphate soils of India. Paper presented at the IV International Symposium on Acid Sulphate Soils held at Vietnam. March 2nd to 6th, 1992.
- Vijayan Nair, K, Reghunath, P and Visalakshi, A 1992. Control of *Syrotrips dorsalis* in rose. Ento. 16 (4): 227-229.
- Visalakshi, A 1991. Pesticide pollution, bioaccumulation and biomagnification. Paper presented in the National Seminar on fish diseases in backwaters of Kerala, Thiruvananthapuram November 1991.
- Visalakshi, A, Thomas Biju Mathew and Naseema Beevi, S 1992. Pesticide residue problems in the Indian environment. Paper presented in the National Seminar on judicious use of pesticides and prevention of hazards. 9th March, 1991. Thiruvananthapuram

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- Reghunath, P, 1991. 'Eliye Kollan' Malayala Manorama Daily dt. 16.11.1991.
- Reghunath, P, 1992. Chazhiyum Brown Hopperum Sathru Pakshathu, Mangalam Daily dt. 22.1.'92
- Reghunath, P, 1992. Prudent use of insecticides. Hindu Daily dt. 99.1-'92.

Radio Talk and Doordarsan Programme

- 1 Talk on tissue culture of : Dr. SR Nair,
Nendran Banana Professor & Head,
Horticulture

- | | | | |
|----|--|---|--|
| 2 | Talk on cultivation of Anthurium | : | Dr. SR Nair,
Professor & Head,
Horticulture |
| 3 | Talk on cultivation of tamarind. | : | Dr. BK Jayachandran,
Associate Professor,
Horticulture. |
| 4 | Control of pollu beetle of pepper. | : | Dr. S Nazeema Beevi,
Associate Professor,
Entomology |
| 5 | Pests on second crop paddy. | : | Sri P Reghunath,
Associate Professor,
Entomology. |
| 6 | Pesticide poisoning | : | Dr. S. Nazeema Beevi,
Associate Professor,
Entomology. |
| 7 | Pests of late Mundakan | : | Sri P Reghunath,
Associate Professor,
Entomology. |
| 8 | Pesticide use | : | Dr. Thomas Varghese,
Professor,
Soil Science & Agri. Chemistry |
| 9 | Role of micro-nutrients on rice growth | : | Dr. PR Ramasubramonian
: Professor,
Soil Science & Agricultural
Chemistry. |
| 10 | Talk on cultivation of Mango ginger. | : | Dr. BK Jayachandran.
Associate Professor,
Horticulture. |
| 11 | "Sustainable Agriculture" | : | Doordasan interview
Dr. Thomas Varghese,
Associate Professor.
Horticulture. |

College of Horticulture, Vellanikkara

Publications

Books

Scientific

Coconut Breeding and Management Ed.Silas, EG, Aravindakshan, M, Jose, AI, Kerala Agri. Univ. 1991. 376 pp.

Recent Advances in Tropical Vegetable production—A compendium

Peter, KV, Salikutty Joseph and Indira, P, 1991. 731 pp.

Review of Research on vegetables and tuber crops Amaranthus, 1991. Devadas, VS, and Mallika, VK, 60 pp.

Tips on vegetable Seed Production, 1991, Rajan, S, 71 pp.

Popular books

'നെൽക്കൃഷിക്കാർക്കായു വഴികാട്ടി' (Abdul Salam & Tajudeen, E.)

Scientific papers

Ajitha, TK, and Prabhakaran, PV, 1991. A comparison of the relative efficiencies of different yield forecasting models for paddy using weather variables. Proceedings of the third Kerala Science Congress, pp 316-317.

Chandrabhanu, P, and Thomas, EK, 1991. Supply behaviour of sesame and groundnut in Kerala. *Agri Situation in India*, Aug. 1991.

George, TE, Anand, N, and Deshpande, A, A, 1992. Isolation of sources of resistance to potato virus Y-in chilli. Paper presented in the IV Science Congress held in February 1992. P 74-76.

Indira Devi, P, Radhakrishnan, V, and Thomas, EK, 1991. Fertilizer Consumption and Agricultural Productivity in Kerala. *Ag. Econ. Res. Rev.* 4(2):119.

Indira Devi, P, Thomas, E, K, and Jessy Thoms, K, 1991. Conversion of Paddy lands and its impact on land market--An experience in Thrissur District, Kerala State. *Ind. J. Agri. Econ.* 46 (3):384.

Joy, PJ 1991. Biological suppression of weeds--Achievements and future prospects. Paper presented at the National Seminar on Biological Control in Plantation Crops. June 28, 1991 RRII, Kottayam.

Jose, AI, Krishnakumar, N and Gopi, CS, 1991. Yield production in coconut, based on foliar nutrient levels. *Coconut Breeding and Management*. Kerala Agricultural University, Thrissur, P-212-217.

Lila Mathew, Krishnan, R and Chandravada, MV, 1992. Yield performance of eutetraploids and aneuploids in *Solanum viarum* Dunel. *Indian Drugs*. 29(10):424-427.

Lyla, KR and Joy, PJ, 1992. Biology of *Aphis spiraecolosa* Patch infesting *Chromolaena odorata* in Kerala (India). *Chromolaena odorata Newsletter* 5:2-3.

Nirmala Devi, S and Peter KV 1991. Studies on compatibility between *Abelmoschus esculentus* and *A. manihot* var Ghana *South Indian Hort.* 39 (2):71-76.

Prabhakaran, PV 1991. Factor analysis in turmeric. *Ann agric. Res.* 12 (2): 151-155.

- Prabhakaran, PV 1991. A markov chain model for the study of the occurrence of rainfall at Pattambi, Kerala. *Ann agric. Res.* 12 (3) 273-275.
- Prabhakaran, PV, Nair, GKB, Padmanathan Thampi, A, Sivasankara Pillai, R, Ramachandran Nair, V, Madhavan Nair, G, Pushpangadhan, K, Sukumaran, KM, Raghava Pillai, G and Paili, EP 1991. Fertilizer requirements of WCT Coconut palms in red loam soils—An alternate approach based on the principle of game theory. Paper presented at the National symposium on coconut breeding and management at Vellanikara; Proceedings of the symposium. pp. 247-251.
- Prabhakaran, PV and Nair GKB, Padmanabhan Thampi, A, Sivasankara Pillai, K, Ramachandran Nair, V, Madhavan Nair, G, Pushpangadhan, R, Sukumaran, KM, Raghavan Pillai, G and Paili, EP 1991. Forecasting of coconut yield using biometric characters of young palms. Paper presented at the National Symposium on coconut breeding and management, held at Vellanikkara 23-26th Nov. 1988. Proceedings of the symposium. pp. 243-247.
- Prabhakaran, PV, and Raji John, V, 1992. An alternate approach for the interpretation of data from long term trials. Paper presented at the Kerala Science Congress held at Thrissur. *Proceedings of the 4th Kerala Science Congress.* pp. 56-57.
- Radhakrishnan, VV, Sadankumar, PG and Achamma Oommen, 1991. Non-destructive method of leaf area determination in ash gourd. *Benincasa hispida*. *Indian J. Agric. Sci.* 61 (1): 59.
- Radhakrishnan, VV, Viswanathan, TV, Sosamma Cheriyan and Reghunath, BR (1991). Shade tolerance studies on patchouli. *South Indian Horticulture* 39 (6): 387-388.
- Ranjith, AM and Mohana Sundaram, M. A new method for rapid leaf screening of cotton germ plasm against white fly *Bemisia tabaci* Genn. (Accepted for publication by *Madras Agrl. Journal*).
- Ranjith, AM, Pillay, VS, Sasikumaran, S and Mammooty, KP 1991. Record of *Pterolophia griseovaria* Brevning as a pest on Pepper (*Piper nigrum* L) *Entomon*, 16 (4): 323-325.
- Ranjith, AM, Mammooty, KP, Sasikumaran, S and Pillay, VS 1992. Biology of *Cyclopelta sicifolia* Westwood (Dinidoridae: Hemiptera) on *Erythrina standards* in pepper gardens. *Spice India*, V (2): 9-10.
- Ranjith, AM, Pillay, VS, Sasikumaran, S and Mammooty, KP 1992. New Record of Whitefly *Bemisia tabaci* on black pepper (*Piper nigrum* L.) *Indian J. Agric. Sciences*, 62 (2): 166-168.

- Santhosh, K and Prabhakaran, PV 1991. Characterisation of the pattern of rainfall on northern Kerala. *Agri. Res. J. Kerala*. 26 (2): 266-276.
- Sunanda, C, George, KC and Krishnan, S 1991. Prediction of body weight through shark length in White pekin ducklings. *Indian Vet. J.* 68: 885-886.
- Thomas, EK, Jessy Thomas, K and Indira Devi, P 1991. Growth and output response of tapioca in Kerala. *Agri. Sit in India XLV* (4): July 1991.
- Venkitesan, TS, Velayudhan, KC and Muraleedharan, VK 1991. Reaction of *Coleus parviflorus* collections against root knot nematode *Meloidogyne incognita* infection. *Ind. J. Nematology* 19 (2): 281-282.
- Viswananthan, KU and Radhakrishnan, V 1991. Income and Employment potentialities of planned financing of very small farms in Kerala. *Agri. Econ. Res. Rev.* 4 (2): 95-105.

Popular articles

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- Abdul Wahab, M 1991. അർക്ക ഗരിമ—പച്ചപയറിനങ്ങളിൽ ഒന്നാമൻ മാതൃഭൂമി. 11-6-91,
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Appendix VI

LIST OF PROJECTS FINANCED BY OUTSIDE AGENCIES DURING 1991-92

All India Co-ordinated Research Projects

<i>Project details</i>	<i>Location</i>
FACULTY OF AGRICULTURE	
AICRP on Agroforestry	LRS, Thiruvazhamkunnu
AICRP on Nematode pests	College of Agriculture, Vellayani
AICRP on Agrl. Drainage	AICRP on Agricultural Drainage, Karumady
AICRP on Spices Research on Pepper	PRS, Panniyur
AICRP on Cashew Res- earch on Cashew	CRS, Madakkathara
AICS & CIP Research on Cardamom	CRS, Pampadumpara
AIC Floriculture Impro- vement Project	College of Horticulture, Vellanikkara
AICRP on Fruits (Banana)	BRS, Kannara
AICRIP — Double Crop- ping Main Centre	RARS, Pattambi
AICRIP — Double Crop- ping Sub-Centre.	ARS, Mannuthy
AICRIP — BHP & GSV Merger Sub-Centre	RRS, Moncompu
AIC Pulses Improve- ment Project	RARS, Pattambi
AIC Vegetable Improve- ment Project	College of Horticulture, Vellanikkara
AICRP on Forage Crops	College of Agriculture, Vellayani
AICRP on BCCP	College of Horticulture, Vellanikkara

AICRP on Sugarcane	SRS, Thiruvalla
AICRP on Water Management	ARS, Chalakudy
AICRP on Weed Control in Plantation Crops	College of Horticulture, Vellanikkara
AICRP on Medicinal & Aromatic plants	College of Horticulture, Vellanikkara
AICRP on Pesticide Residues	College of Agriculture, Vellayani
AICRP on Oilseeds for groundnut and sesamum	-do-
AICARP—CSRC Karamana and ECF Unit	CSRC, Karamana and ARS, Mannuthy
NSC—Breeder Seed production unit	RARS, Pattambi
<i>ICAR—Adhoc.</i>	
Development of F1 hybrid seed in bittergourd, snakegourd and pumpkin	College of Horticulture, Vellanikkara
Estimation of damage due to pests, disease and drought in black pepper in the Kannur district of Kerala	-do-
Standardisation of techniques for the cultivation of tropical species of mushrooms	College of Agriculture, Vellayani
Developing monosomics and trisomics in cucumber (<i>C. sativus</i> L) and locating genes in chromosomes	-do-
Standardisation of agro-techniques in lemongrass and palmarosa for maximising oil production	College of Horticulture: Vellanikkara
Nutritional studies on pulses	College of Agriculture, Vellayani
Survey, collection, evaluation conservation and cataloguing of germplasm of certain under exploited perennial vegetables	College of Horticulture, Vellanikkara

Evaluation of vesicular arbuscular mycorrhiza as bio-control agent against wilt diseases of pepper
College of Agriculture, Vellayani

Tissue culture Research on black pepper
College of Horticulture, Vellanikkara

Evaluation of acidity parameters in wet land soils of Kerala in relation to nutrient availability
College of Agriculture, Vellayani

Mineralisation on nitrogen in degraded forest soils under *Eucalyptus teriticornis* and *Acacia auriculiformis*
College of Forestry, Vellanikkara

ICAR-NARP

NARP Southern Zone Vellayani and Kottarakkara
College of Agriculture, Vellayani

NARP Problem Zone (Kumarakom, Vyttila, Thiruvalla, Kayamkulam and Moncompu)
RARS, Kumarakom

NARP Central Zone (Pattambi Kannara and Chalakudy)
RARS, Pattambi

NARP Northern Zone (Pilicode and Panniyur)
RARS, Pilicode

NARP High Range Zone (Ambalavayal and Pampadumpara)
RARS, Ambalavayal

Non-ICAR

Cocoa research collaboration project between KAU and Hindustan Cocoa Products Ltd.
College of Horticulture, Vellanikkara

Standardising sericultural practices for the agroclimatic conditions of Kerala
College of Agriculture, Vellayani

Tissue Culture research on cocoa
College of Horticulture, Vellanikkara

Central Sector scheme on integrated programme for the Development of spices	PRS Panniyur and RARS, Ambalavayal
Central sector scheme—production of fruits and vegetables	College of Horticulture, Vellanikkara
Project for promotion of Agricultural Electronics	Agri. Electronics Scheme Vellanikkara
Agrometeorology of coconut based farming systems of Kerala	RARS, Pilicode
Starting AMFU at KAU Main Campus	College of Horticulture, Vellanikkara
Studies on intercropping of forest trees with fast growing nitrogen fixing tree species.	-do-
Socio-economic and cultural determinants influencing the nutritional status of women workers of informal sector in Thiruvananthapuram Dt.	College of Agriculture, Vellayani
Central scheme for providing assistance for development and cultivation of medicinal plants	AMRPS, Odakkali
Pilot project on farm water management studies	ARS, Chalakudy
Role of non-governmental organisation in Rural Development—a case study of voluntary agencies involved in development activities in Kerala	College of Co-operation and Banking, Mannuthy
Impact of new settlers in the western ghat region in the socio-economic conditions of the tribal population—The case of Waynad district in Kerala	-do-

Trials on large scale cultivation of edible species of mushroom pleurotes under the agroclimatic conditions of Kerala	College of Agriculture, Vellayani
Investigations on the diseases of bamboo seeds in Kerala	RARS, Kumarakom
Nutritional deficiency symptoms and foliar diagnosis in tree crops	College of Forestry, Vellanikkara
Investigations on the occurrence of recombinants/hybrids in phytophthora and their role in the intensity of phytophthora diseases in plantation crops	College of Agriculture, Vellayani
Investigations on the changes in the physico-chemical properties of coconut garden seeds due to continuous interculture of fodder crops	-do-
Exploitation of indigenous multipurpose tree species in agrosocial forestry system	College of Forestry, Vellanikkara
Seed viability and germination studies in selected tropical forest tree species	-do-
Studies on preservation and quality improvement of toddy	College of Horticulture, Vellanikkara
Standardisation of tissue/apical meristem culture techniques in horticultural crops of Kerala	College of Agriculture, Vellayani
Biosystematics and behavioural ecology of Eumened varps	College of Horticulture, Vellanikkara

FACULTY OF AGRICULTURAL ENGINEERING

All India Coordinated Research Project

AICRP on Farm imple-
ments and machinery

KCAET, Tavanur

Non-ICAR

CAPART Scheme-Modification of Petty and para to improve its efficiency and economy

College of Horticulture,
Vellanikkara

FACULTY OF FISHERIES

Non-ICAR

Vibrionaceae associated with the larvae and larval rearing system of *Macrobrachium rosenbergii* Systematics and Pathogenicity

College of Fisheries, Panangad

Vibrionaceae associated with the larvae of *Penaeus indicus* Systematics and pathogenicity

College of Fisheries, Panangad.
Transferred to Cochin University
on 20-12-91

FACULTY OF VETERINARY & ANIMAL SCIENCES

ICAR Co ordinated Project

AICRP on Poultry

College of Veterinary & Animal
Sciences, Mannuthy

AICRP on Poultry Nutrition

-do-

Establishment of a Centre on Poultry Housing and Management

-do-

Continuance of AICRP on Goats as Net work Project on Goats

-do-

Progeny testing procedures in cross bred cattle utilizing information from both large and very small herds

-do-

AICRP on Agricultural Bye-products

-do-

ICAR Adhoc

Enzyme kinetic studies in Indian Elephants

-do-

Utilization of elephant energy with enhanced system efficiency

-do-

Studies on blood groups and biochemical polymorphism in cattle	College of Veterinary & Animal Sciences Mannuthy
Nutrient requirements of broiler rabbits	-do-

Non-ICAR

Genetic studies of wild buffaloes of north-eastern region of India	:do-
Etiology and pathobiology of the carcinoma of the mucosa of the ethmoid in domestic animals	-do-

Extension Projects

Nutritional status of tribal communities of Kerala	College of Agriculture, Vellayani
Central Training Institute/ Training Services	Vellayani, Mannuthy
Centre for advanced training in plantation crops	Vellanikkara
National Demonstration Scheme	Anandappilly
SC/OBC, Nilambur	Wandoor
KVK, Pattambi	RARS, Pattambi
AICRP on tribals, Amboori	Amboori
KVK, Ambalavayal	RARS, Ambalavayal
Manpower development Scheme	Vellayani, Vellanikkara
ICAR Golden Jubilee celebration—Lab-to-land programme	Mannuthy
ICSSR Project — transfer of Agrl. Technology evolved by KAU	-do-
Popularising solar cookers	Vellayani
Trysem project on rabbit fur processing	Mannuthy
Organisation of short course on recent advances in tropical vegetable production	Vellanikkara

KSCB Diamond Jubilee Endowment — Economic viability of Primary Agricultural Credit Co-operations in Kerala	Mannuthy
KSCB Diamond Jubilee Endowment — Project 'Supply and utilisation of long term institutional credit—A study with reference to primary Agrl. Development Banks of Palakkad Dt.	Mannuthy
KSCB Diamond Jubilee Endowment 'Viability of co-operative credit — An analysis of crop loan in Thrissur Dt.	Mannuthy
KSCB Diamond Jubilee Endowment—'A study of Farmers Service Societies and Primary Agrl. Credit Societies in Kerala	Mannuthy
ORP on Watershed basis	ORP, Ozhalapathy
ORP on integrated control of rice pests—Kuttanad	RRS, Moncompu

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Appendix VII

STATUTE AMENDMENTS ISSUED DURING THE PERIOD 1991-92

- 1 GA/E3/21010/90 dt. 9-9-1991.
(Amendment to SRO No. 678/74).
- 2 GA/E3/44876/88 dt. 9-9-1991.
(Amendment to SRO No. 668/73).
- 3 GA/E3/13840/89(i) dt. 8-10-1991.
(Amendment to SRO No. 1479/82).
- 4 GA/E3/13840/89 (ii) dt. 8-10-1991.
(Amendment to SRO No. 1486/82.)

New Statute

SRO No. 1629/91 issued vide Government Notification
G. O. MS. No. 330/91/AD dated 16-11-1991. Investment
and administration of the KAU Foundation Fund.

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Appendix VIII

DETAILS OF WORKS EXECUTED DURING THE YEAR 1991-92

Name of work	Stage of work	Expenditure
1	2	3
College of Agriculture, Vellayani		
Construction of Lab. and Library building	Work entrusted with CPWD	6,830
Maintenance and repairs to Ladies Hostel Building (Old and New)	Work completed	1,19,068
Maintenance and repairs--UG Hostel	do	1,62,318
Providing a new 160 mm new sewage line	do	26,795
Rewiring to the existing electrification/installation and providing additional facilities to type 'S' Quarters	do	1,39,358
Construction of Green House	Work in progress	82,526
Renovation of pump house in Western side of Agrl. College	Work completed	20,322
Providing yard light, extending generator supply to Conference Hall	do	23,458
Maintenance and repairs yard light fitting in the Road Main gate to College	do	33,490
Maintenance and repairs of existing electrical installation in the Ladies Hostel and Trainees Hostel	do	18,701

1	2	3
N A R P, Kottarakkara		
Construction of Retaining wall	Work completed	90,045
Providing fencing and compound gate	do	63,021
Construction of Training Hall	Work in progress	12,759
Construction of Type II Quarters	do	21,106
Construction of Type IV Quarters	do	45,077
Construction of Trainees Hostel	do	3,37,644
Construction of Seminar Hall	do	73,231
Construction of Green House	do	6,460
RRS, Moncompu		
Construction of Glass House	do	612
Construction of small insect proof net house	Work completed	1,49,218
Water supply arrangements to Residential Quarters	do	35,141
Construction of a waiting shed	Work in progress	500
CRS, Pampadumpara		
Construction of Drying Yard	Work completed	81,917
Construction of Canteen and Recreation Room	Work in progress	656
Providing barbed wire fencing around boundaries	Work completed	19,324
Providing electrification to the Cardamom Curing Shed	do	64,009
Fisheries College, Panangad		
Providing water supply connection from KWA to Fisheries College	do	40,419
Construction of building for Dormitory and store room	do	2,70,287
Erection of 15 KVA Generator to semi permanent shed to Library and P. G. Class	do	19,900

1	2	3
Construction of 6 nos. ROC for Brood stock	Work completed	1,45,340
Construction of Building for Lab. and Machine room	Work in progress	1,62,510
Basement for hatchery fabrication in fibre glass	do	6,840
Semi grouting of approach road to staff quarters	do	9,800
Mannuthy		
Construction of Flat type quarters	Work completed	56,742
Construction of UG Hostel	Nearing completion	4,83,818
Reconstruction of the retaining wall near the newly built flat type quarters	Work completed	82,108
Re-electrification of 'C' type quarters	do	1,07,380
Electrification to labourers waiting shed	do	11,381
Construction of compound wall for the protection of nursery	do	72,554
Maintenance of feed store, labourers waiting shed, water supply pig sties in Pig Breeding Farm	Work arranged	570
Installation of computer in the Nutrition building for College and Banking	Work completed	34,820
Construction of Rabbit shed	do	1,27,949
Modification of computer room in the Nutrition Building	do	10,304
Vellanikkara		
Construction of road leading to the Vegetable Research plot	do	33,605
Semi grouting and side protection of 'B' road (Balance work)	do	1,71,768
Construction of two sub stations for bulk power supply	do	35,000
Providing street light along the road leading to type V and VI Quarters	Work arranged	1,117

1	2	3
Annual electrification in Academic Block No. I	Work completed	29,465
Construction of 5 lakh litre capacity GI tank	do	2,07,468
Laying pipe line from the pump house near KAU School	do	93,235
Providing wind tiles to the existing roof of the Creche building	do	14,000
Construction of Creche building	do	1,06,728
Electrification to Potting shed	do	25,275
Deepening the pond at eastern side of the Main gate	do	28,786
Construction of Staff Club	Work in progress	2,85,663
Providing toilet facilities to the Forestry College	Work completed	58,395
Construction of compound wall at AB & C block at Pineapple Research Centre	do	85,280
Construction of yard in the near side of Academic Block	do	39,075
Providing compound wall and wire fencing along the north-western boundary	do	3,44,591
Construction of waiting shed for pump operation	do	18,151
Construction of building block No. 2 for KAU School	do	8,04,876
Construction of wall attached to Main Gate	do	1,91,997
Providing electrification to type II Qtrs	Work arranged	1,160
Construction of Trainees Hostel	Work in progress	2,37,724
KCAE & T Tavanur		
Improvements in electrification to Machine shop	Work completed	1,23,149
Construction of work shop	do	2,39,457
Construction of flat type III Quarters	do	20,22,278
Construction of type IV Quarters	do	3,34,148
Construction of vehicle shed	do	52,890

1	2	3
Re-electrification of old quarters	Work arranged	1,152
Construction of farm Machinery yard	do	2,020
Construction of Pump house	Work completed	23,697
Banana Research Station, Kannara		
Electrification to seed store	Work completed	20,532
Construction of pilot pepper plant	Work arranged	836
Providing street light facilities	Work completed	71,744
Providing compound wall	do	1,97,102
Construction of compound wall along the boundary of CRS Madakkathara	do	1,42,823
Providing electrification to type II Quarters	do	7,633
RARS Pattambi		
Deepening and widening of Irrigation tank	Work completed	1,22,837
Construction of pond for irrigation in Block No.5	Work arranged	1,142
Providing drainage cum irrigation channel	Work completed	1,09,720
Installation of Generator set	do	31,140
Construction of compound wall for block No. 9	do	87,500
Construction of Trainees Hostel and Seminar hall	do	2,97,304
Providing electrification to cattle shed	do	13,167
PRS Panniyur		
Type V quarters	Work completed	23,372
Providing electrification to office and lab.	do	25,751
Construction of Labourers waiting shed	do	58,942
Construction of Green House	do	74,290

1	2	3
RARS Ambalavayal		
Construction of type IV quarters	do	49,997
Construction of Training Hall	do	25,505
Construction of type II quarters	Completed	13,252
Providing electrification to type V quarters	do	17,005
Construction of rabbit shed	do	14,024
Construction of work shop	do	37,968
Construction of O.H. tank	do	1,27,868
Construction of bathroom & toilet to Trainees Hostel	do	59,540
Construction of threshing floor	Work in progress	6,827
Construction of waiting shed for labourers	Work completed	21,996
Construction of store building	Work arranged	570
Coconut Research Station, Nileswar		
Construction of waiting shed	Work arranged	864
Construction of compound wall	Completed	32,221
Providing wire fencing	do	20,010
Regional Agricultural Research Station, Pilicode		
Construction of type V quarters	Completed	91,033
Construction of type IV (duplex)	do	1,03,983
Construction of training hall	do	36,957
Providing draining water supply arrangement	do	1,47,403
Construction of workshop	Completed	1,31,194
Construction of goat shed	do	96,048

1	2	3
Livestock Research Station, Thiruvazhamkundu		
Providing street light	Completed	83,658
Providing electrification to lab building	do	17,202
Construction of slurry tank	do	1,27,889
Rewiring cattle barns	do	58,310
AMPRS, Odakkali		
Construction of a pump house to the borewell	Completed	12,590
Construction of phytochemical lab	do	5,91,987
Electrification to labourers waiting shed	do	10,073
Electrification to distillation shed	do	13,421
Construction of G. L. tank	do	87,271
Construction of store building	do	43,757
Rice Research Station, Kayamkulam		
Construction of type IV quarters	Completed	17,608
Erection and installation of 25 HP electric motor	do	20,471
Providing electrification to labourers waiting shed	do	88,688
Threshing floor construction	do	2,39,554
Electrification to jeep and tractors shed	do	76,827
Sugarcane Research Station, Thiruvalla		
Construction of type I quarters	Completed	41,552
Construction of type II quarters	do	7,869
Providing concrete line for irrigation channel	do	41,493
Construction of barbed wire fencing	do	99,822

1	2	3
Regional Agricultural Research Station, Kumarakom		
Construction of type II quarters	Completed	82,690
Construction of type V quarters	do	2,05,480
Construction of type IV quarters	do	1,79,261
Rewiring watchmans' quarters	do	10,600
Providing barbed wire fencing	do	2,39,611
Construction of farm road	do	17,679
Agronomic Research Station, Chalakudy		
Construction of O. H. tank	Completed	1,09,616
Construction of labourers waiting shed	do	48,513
Providing yard light	do	34,548
Cashew Research Station, Anakayam		
Construction of compound wall	Completed	1,42,203
Construction of field lab	do	1,73,379
Construction of seed store	do	69,056
Construction of drying yard	Work arranged	442
Construction of labourers waiting shed	do	742
Cattle Breeding Farm, Thumburmuzhi		
Special maintenance and repairs to residential quarters	Completed	1,17,121
Construction of collection shed	Work arranged	142
Coconut Research Station, Balaramapuram		
Providing fencing and compound wall	Completed	61,659
Construction of labourers waiting shed	do	79,036
Special maintenance and repairs to office building quarters and store building	do	53,912



College Magazine Students' Union 2007- 08

Staff editor : Dr. Jayasree Krishnankutty

Student editor : Anuja A.R.

Editorial members : Sreevidhya M.K, Nikhil V.M., Renjith P.S., Renjini V.R., Anand V.P., Lakshmi Priya,
Divya Sasidharan, Nithin K., Aswathi Vijayan, Shamna N.

Type setting & Printing : Karuna Offset, Muvattupuzha

Printer's Name : Dr. Jayasree Krishnankutty, Professor & Staff editor (2007- 08)
Dept. of Agricultural Extension, CoH, Vellanikkara

Publisher's name : Anuja A.R., Student editor, 2007- 08

Published under the authority of Magazine Committee, 2007- 08

Declaration

I, Anuja A.R. hereby declare that the particulars given above are true to the best of my knowledge and belief.

Anuja A.R.

അസോസിയേറ്റ് ഡീൻ എഴുതുന്നു...



മറക്കുക വല്ലപ്പോഴും...

ബോധപൂർവ്വമാണെങ്കിലും അല്ലെങ്കിലും
എന്തൊക്കെയാണോ, എവിടെയാണോ
നാം മറന്നുവെക്കുന്നുണ്ട്.

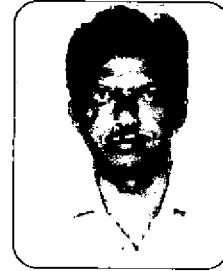
ഒരു കാര്യം പൂർണ്ണമായി മറന്നുപോകുന്നത്
അത് മറക്കാൻ ആഗ്രഹിച്ചതുതന്നെയാണോ?
അതോ മറന്നുവെച്ചതെന്നു കരുതി
തീരിച്ചെടുക്കാനോ?

ഓർമ്മപുസ്തകത്തിലെ ഉരുൾവീണ താളുകളിൽ പരത്നാത്
ഓർക്കാനാഗ്രഹിക്കുന്ന എന്തിനോഭവേണ്ടിയെല്ലാ
എന്ന മറക്കുക എന്നുപറയുന്നതിൽ
ഒരിക്കലും മറക്കരുതെ എന്ന ഓചനയുള്ളതുപോലെ,
പിരിഞ്ഞ് എന്തെങ്കിലും കണ്ടുപിടിക്കുമ്പോൾ
ചിരിയിൽ പടരുന്ന മനോന്വരം പോലെ
എന്തോ ഒന്ന്.

ശീവിയംതന്നെ ശീവിക്കാനുള്ള ഉപാധിയാക്കി മറന്നുവെക്കും
മറവി എന്ന വാക്ക് ഓർമ്മകൾ തുറക്കാനുള്ള ഒരു താക്കോലാക്കിത്തീരുന്നു.
അതിനാൽ ആഹ്ലാദത്തോടെ പറയട്ടെ -
'മറന്നുവെച്ചത്' എന്ന പേര് വളരെ ഉചിതമാക്കി.
ഓർമ്മകളുണ്ടാക്കിയിരിക്കണം എന്നുകൂടി
അതു നമ്മെ ഓർമ്മിപ്പിക്കുന്നുണ്ട്.

വളരെ ശോഭനയോടെ, ചുരുക്കമല്ല മനസ്സോടെ
ഈ മറന്നുവെച്ചതെല്ലാം ഓരോ പേരും തയ്യാറാക്കിയ
സ്റ്റുഡന്റ് എഡിറ്റർ അനുഷ,
സ്റ്റാഫ് എഡിറ്റർ ഡോ.ശബരീ കൃഷ്ണൻകുട്ടി,
മറന്നുവെച്ചതെല്ലാം നീവിൽ, ശ്രീവിദ്യ, രഞ്ജിത്ത്, രഞ്ജിനി,
ആനന്ദ്, ലക്ഷ്മിപ്രിയ, ദിവ്യ, നിതിൻ, രഞ്ജിതി, എന്നിവരെയും
അസോസിയേറ്റ് പ്രൊഫസർ ഡോ.സി.ടി.ആന്റണിയെയും
നമുക്ക് അഭിനന്ദിക്കാം.
അവരെ നമുക്ക് മറക്കാതിരിക്കാം.

സ്വസ്തം.
രാജീവൻ



From Associate Patron...

The college magazine, "Marannu vachathu" is an illustrated year book on the important events and achievements during the past year. It is also a reflection of the social, cultural, academic and extra curricular life of the campus and a venue for expressing the literary talents of students and the faculty. The Editorial committee had given a meaningful title for the magazine. The untiring efforts taken by the Editorial team, under the leadership of the talented student editor Miss Anuja and the able guidance of the staff editor Dr. Jayasree Krishnankutty, succeeded in shaping this magazine as an invaluable gift to the Horticos family. Congratulations. You have excelled our expectations and proved that the limited strength of the College is not a constraint for bringing out a standard magazine. I wish that this magazine would be a treasure to be preserved as a guide for re-living the faded, but unforgettable moments of the College life.

Dr. C.T. Abraham