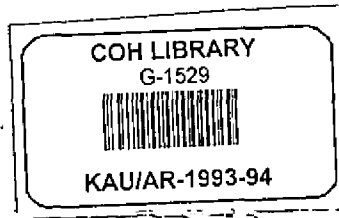


ANNUAL REPORT

1993-'94

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**KERALA
AGRICULTURAL
UNIVERSITY**

English

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1993-'94

March 1995

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Kerala Agricultural University

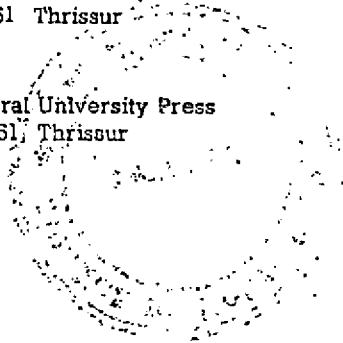
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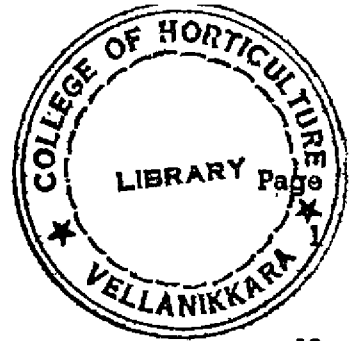
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CONTENTS



GENERAL REPORT

Chapter I.

GENERAL ADMINISTRATION

19

Chapter II

EDUCATION AND RESEARCH

1. Faculty of Agriculture

1.1	College of Agriculture, Vellayani	28
1.2	College of Horticulture, Vellanikkara	43
1.3	College of Co-operation and Banking, Mannuthy	61
1.4	College of Forestry, Vellanikkara	65
1.5.1	Southern Zone	69
	i) Regional Agricultural Research Station, Vellayani	69
	ii) Farming Systems Research Station, Kottarakkara	87
	iii) Cropping Systems Research Centre, Karamana	93
	iv) Coconut Research Station, Balaramapuram	97
1.5.2	Special Zone of problem areas	100
	i) Regional Agricultural Research Station, Kumarakom	101
	ii) Rice Research Station, Moncompu	105
	iii) Rice Research Station, Kayamkulam	109
	iv) Rice Research Station, Vyttila	112
	v) Sugarcane Research Station, Thiruvalla	114
	vi) All India Co-ordinated Research Project on Agricultural Drainage, Karumady	116
	vii) E. C. F. Unit—Kayamkulam	118

	Page
1.5.3 Central Zone	120
i) Regional Agricultural Research Station, Pattambi	121
ii) Cashew Research Station, Anakayam	130
iii) Agricultural Research Station, Mannuthy	131
iv) Cashew Research Station, Madakkathara	133
v) Banana Research Station, Kannara and Pineapple Research Centre, Vellanikkara	134
vi) Agronomic Research Station, Chalakudy	137
vii) Aromatic and Medicinal Plants Research Station, Odakkali	140
1.5.4 Northern Zone	142
i) Regional Agricultural Research Station, Pilicode	142
ii) Pepper Research Station, Panniyur	148
1.5.5 High Range Zone	150
i) Regional Agricultural Research Station, Ambalavayal	151
ii) Cardamom Research Station, Pampadumpara	156
1.5.6 Kerala Horticultural Development Programme	158
2. Faculty of Veterinary and Animal Sciences	
2.1 College of Veterinary and Animal Sciences, Mannuthy	159
2.2 Poultry and Duck Farm, Mannuthy	177
2.3 University Pig-Breeding Farm, Mannuthy	178
2.4 Centre of Advanced Studies in Poultry Science	179
2.5 AICRP on Poultry Breeding	179
2.6 Centre for Advanced Studies in Animal Genetics and Breeding	179
2.7 Centre of Excellence in Pathology	182
2.8 Veterinary College Hospital, Mannuthy	184
2.9 Livestock Research Station, Thiruvazhamkunnu	184
2.10 Cattle Breeding Farm, Thumburmuzhi	186
2.11 Cattle Infertility Scheme, Vellimadukunnu, Kozhikode	188
2.12 University Veterinary Hospital, Kokkalai	190
2.13 University Livestock Farm & Fodder research and development scheme, Mannuthy	192

	Page
3. Faculty of Fisheries	
3.1 College of Fisheries, Panangad	193
3.2 Fisheries Station, Puthuveypu	201
4. Faculty of Agricultural Engineering & Technology	
4.1 Kelappaji College of Agricultural Engineering and Technology, Tavanur	206
5. KAU School, Vellanikkara	212
Chapter III	
EXTENSION	214
Chapter IV	
STUDENTS WELFARE	262
Chapter V	
ENGINEERING WING	271
Chapter VI	
ESTATE	272
Chapter VII	
FINANCE AND ACCOUNTS	275
APPENDICES	
I — Members of the Statutory Authorities	1
II — Sub Committees	12
III — List of Staff at Headquarters	25
IV — List of Staff in Various Campuses	35
V — List of Publications/Radio talks/ T. V. Programmes attended	104
VI — List of Projects financed by outside agencies during 1993-94	138
VII — Details of Statute Amendment issued	148
VIII — Details of works executed during the year 1993-'94	149

General Report

The Executive Committee of Kerala Agricultural University presents to the General Council its Annual Administration report for the year 1993-94 (1-4-1993 to 31-3-1994).

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

Officers of the University

1	Vice-Chancellor	Dr. A. M. Michael	29-7-92 onwards
2	Registrar	Sri. P. N. Kanakambaran Dr. U. Mohammed Kunju Sri. E. K. Majhi, IAS	20-8-92 to 6-5-93 6-5-93 to 25-8-93 25-8-93 onwards
3	Comptroller	Smt. Elizabeth John	8-3-93 onwards
4	Director of Research	Dr. M. Aravindakshan i/c.	throughout
5	Director of Extension	Dr. V. K. Sasidhar i/c.	-do-
6	Director of Physical Plant	Sri. P. O. Thomas	-do-
7	Dean (Agri.)	Dr. C. Sreedharan	-do-
8	Dean (Vety.)	Dr. M. Krishnan Nair i/c. Dr. A. Rajan i/c.	21-2-93 to 19-4-93 19-4-93 onwards
9	Dean, (Agrl. Engg.)	Sri. T. P. George Dr. K. John Thomas i/c.	upto 28-9-93 28-9-93 onwards
10	Dean, Fisheries	Dr. M. J. Sebastian i/c.	Throughout
11	Director of Students Welfare	Dr. T. G. Rajagopalan i/c.	Throughout
12	Associate Dean (Hort.)	Dr. C. C. Abraham	-do-
13	Associate Dean (C&B)	Sri. M. Mohandas i/c.	-do-
14	Special Officer (Forestry)	Dr. C. C. Abraham i/c. Sri. D. Nagesh Prabhu IFS.	19-2-90 to 16-8-93 16-8-93 to 20-4-94

EDUCATION

The following 7 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. Semester system of instruction continued in all the colleges.

The number of students admitted for the different courses and the number passed out from the University during the period under report are furnished below:

<i>Degree</i>	<i>No. admitted</i>	<i>No. passed out</i>
B.Sc. (Ag).	169	126
B.V.Sc. & A.H.	117	110
B.F.Sc.	37	15
B. Sc. (C&B)	31	13
B. Sc. (Forestry)	16	24
B. Tech. (Ag. Engg.)	27	33
M. Sc.(Ag.)	71	52
M. Sc. (Hort.)	21	7

M. Sc. (Ag. Stat.)	4	0
M. Sc. (Forestry)	6	5
M. Sc. (C&B)	—	1
M. Sc. (FS & N)	8	3
M. Tech. (Ag. Engg.)	8	11
M. V. Sc.	30	16
M. F. Sc.	5	3
Ph. D. (Agriculture)	23	11
Ph. D. (Veterinary)	7	4
Ph. D. (Home Science)	—	2
Total	580	436

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

<i>Course</i>	<i>Total No. of students</i>
<i>a) U. G. Courses</i>	
B. Sc. (Ag)	883
B. V. Sc. & A. H.	701
B. F. Sc.	94
B. Sc. (C & B)	81
B. Sc. (Forestry)	64
B. Tech. (Ag. Engg.)	88
B. Sc. (D. Sc. & Tech) (New course)	21
<i>b) PG. Courses</i>	
M. Sc. (Ag.)	197
M. Sc. (Hort.)	50
M. Sc. (Ag. Stat.)	15
M. Sc. (C & B)	5
M. Sc. (Forestry)	14
M. Sc. (FS & N)	27
M. Tech. (Ag. Engg.)	19
M. V. Sc.	91
M. F. Sc.	19
Ph. D. (Agriculture)	91
Ph. D. (Vety. & AS.)	27
Ph. D. (Home Science)	4

In addition to the above, 12 candidates were admitted to Diploma in Natural Rubber Production and 25 for Diploma in Dairying.

Extra curricular activities of the students and cocurricular 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. Student's Union activities were also implemented satisfactorily.

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 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 1991-92 based on the thrust areas of research in various fields identified. There were 22 project co-ordination groups in the Faculty of Agriculture, eight in the Faculty of Veterinary and Animal Sciences, one each in the Faculty of Agricultural Engineering and Fisheries. The Faculty Research Committee of Agriculture met thrice during the year and 203 projects/experiments were cleared for implementation. The Faculty Research Committee of Vety. and Animal Sciences met once and approved 23 projects/experiments. The Faculty Research Committee of Fisheries met once and cleared 7 projects/experiments for implementation. The FRC on Agricultural Engineering met once and approved 11 projects/experiments.

The Associate Directors from the Headquarters conducted Monitoring and Evaluation programme of the different stations as shown below:

Associate Director of Research (AR&T)

3-8-1993	Banana Research Station, Kannara
19-8-1993	Cashew Research Station, Anakayam
13-9-1994	Regional Agrl. Res. Station, Pattambi
20-11-1993	
22-11-1993	Aromatic & Medicinal Plants Research Station, Odakkali
26-11-1993	Agronomic Research Station, Chalakudy
4-12-1993	AICRP on Agroforestry, Thiruvazhamkunnu.

Assoc. Director of Research (M&E)

10-10-1993	Pepper Research Station, Panniyur
26-2-1994	Regional Agrl. Res. Station, Pilicode

Assoc. Director of Research (V&AS)

9-7-1993	Regional Agrl. Res. Station, Kumarakom
9-12-1993	Fisheries Station, Puduveypu

Assoc. Director of Research (Plg)

19-7-1993	AICRP on Agrl. Drainage, Karumady
25-8-1993	Cardamom Research Station, Pampadumpara
9-11-1993	Regional Agrl. Res. Station, Kumarakom
10-11-1993	Sugarcane Research Station, Thiruvalla
28-12-1993	Cashew Research Station, Anakayam
13-1-1994	Cardamom Research Station, Pampadumpara
18-2-1994	Sugarcane Research Station, Thiruvalla
17-3-1994	Regional Agrl. Res. Station, Kumarakom

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

1. E. E. C. meeting
2. Meeting with Dr. A. V. Balakrishna of Central Silk Board, Bangalore
3. Meeting of All Assoc. Directors of Research and Director of Research with NARP Evaluation team
4. Meeting to discuss the formulation of Operational Research Project on Integrated Farming at Kollam District.
5. Plan Review Meeting
6. Meeting on Land Resource Management
7. Research Council Meeting
8. Meeting of Technical Committee (Coconut seed farm)

9. Meeting to discuss the seed production programme
10. Meeting to discuss the vegetable seed production
11. Meeting of the committee for computerisation of Academic forms and details.
12. Technical Committee meeting of Central Computer Facility
13. Meeting of the sub committee for preparing computer programme for academic wing of Colleges.
14. Labour Norms fixation Committee meeting
15. Planning and Development Committee meeting
16. Meeting of the Associate Directors
17. Meeting to Remote Sensing Project
18. Technical Committee meeting of the DSP Farm, Vellanikkara
19. Peer Group meeting
20. Cashew Development Scheme meeting

The faculty-wise details of externally aided research projects/schemes implemented as on 31-3-1994 are given below

Category	Faculty				Total
	Agri.	Ag.	Fish	Vety.	
Co-ordinated (75%-25%)	23	2	0	3	28
Co-ordinated (100%)	1	0	0	0	1
Ad-hoc	13	0	0	5	18
NARP	0	0	0	0	0
External aided (100%)	40	0	1	9	50
External aided (75%-25%)	1	1	0	0	2
Total	78	3	1	17	99

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

Region	Dates of workshop	Venue
Southern Region	10-11 may, 1993	Vellayani
Special Problem Region	16-17 April 1993	Kumarakom
Central Region	4-5 May, 1993	Pattambi
Northern Region	23-24 April 1993	Pilicode
High Range Region	26-27 April 1993	Ambalavayal

Dr. C. R. Hazra, Project Co-ordinator, AICRP on Forage Crops and Dr. P.M. Mathur, Sr. Scientist, NBPGR; Dr. S. Jayaraj, Former VC, TNAU, Dr. S. Gangopadhyay, Principal Scientist, NARP; Dr. S.P. Ghosh, Project Director NARP and Dr. S.N. Saha, Sr. Scientist, NAARM; Dr. A.K. Raheja, ADG, ICAR; Dr. O.P. Dubay Principal Scientist, ICAR; Dr. R.C. Mishra, Project Co-ordinator (HB), ICAR; Dr. K. L. Chadha, Dy. Director General (Hort), ICAR. Sri. P.S. Thomas, Member Secretary, Central Silk Board; Sri. Raja Urs, Joint Director, Central Silk Board; Dr. A. Appa Rao, Ex-Vice-Chancellor, APAU; Dr. U.S. Shukla, Project Co-ordinator (Sugarcane), IISR; Dr. K.C. Alexander, Principal Scientist, SBI, Coimbatore; Dr. (Mrs) Susan Kortz, Scientist, USDA; Dr. Varghese Abraham, Scientist, Nuclear Agrl. Division, BARC, Trombay; Dr. K.G. Pillai, DRRI, Hyderabad; Prof. S.N. Saha, Member, NARP Phase-II; Dr. Suizii Politano (KHDP); Dr. C.P. Sukumaran Nair, Deputy Director of Agriculture, RATTC, Malampuzha; Mr. K.V. George, DDA, RATTC, Vyttila; Mr. Muraleedharan, Principal Scientific Officer i/c., NBPGR, Thrissur; Dr. C.J. Thampi, Land Use Commissioner, Land Use Board, Thiruvananthapuram; Dr. A.K. Sadanandan, Project Co-ordinator (Spices), NRCS, Calicut; Dr. H. P. Singh, Project Co-ordinator, AICFIP; Mr. Auke Neilson, Consultant, SIDA Project, Madras; Dr. K.S. Sehgal, Director, NBSS & LUP, Nagpur; Sri. P.P. Thankachan, Speaker, Kerala Legislative Assembly; Technical Director, Indo-American Exports; Sri. P. John Zacharia, Formerly Joint Commissioner (Machy.), Govt. of India and Member of Advisory Panel of Mechanisation of FAO, Rome; Dr. M.V. Rao, VC, APAU; Dr. P.C. Sivaraman Nair, Chairman of the ORT on Spices; Mr. Abraham Varghese, Project Evaluation Officer, Planning Commissioner; Sri. C.J. B. Netto, Chief Engineer (Thermal), KSEB; Dr. B.J. Prasad, Environmental Engineer, NTPC, Lodi Road, New Delhi etc. were visited various stations under the University.

New high yielding varieties/cultures proposed for evaluation and release

Crop	Culture/selections	Evolved at	Remarks
1	2	3	4
Rice	RM-1 (IET No. 14083) (Mangala Mashuri)	RARS Pattambi	Suited to illdrained and temporarily flooded area. Average yield 4554 kg/ha.

1	2	3	4
Rice	Cul-10-1-1 (Ahalya)	ARS, Mannuthy	Shorter duration, high milling per- centage, and bet- ter quality. Tole- rant to moisture stress. Average yield 5502 kg/ha.
Cashew	PTR-1-1 (Mrudhula)	CRS, Anakkayam	Type without CNSL. Specially suited to home- stead. Average yield 3.31 kg/tree/ year.
Cashew	H-3-17 (Dharashree)	CRS, Anakkayam	High yield, high shelling percent- age. bold nut size and superior grade kernels. Average yield 15.02 kg/tree/year.
Cashew	K-10-2	CRS, Anakkayam	High yield, bold nut size and supe- rior grade kernels Average yield 23.34 kg/tree/year.
Cowpea	V-240 (Amruthamany)	RARS, Pattambi	Dual purpose va- riety.
Cowpea	GC-3 (Indumany)	RARS, Pattambi	Grain type variety. Average yield 1150 kg/ha.
Cowpea	V-16 (Sindooramany)	RARS, Pattambi	Dual purpose va- riety
Cowpea	Cul. 9 (Pavizhamany)	RARS, Pattambi	Grains type vari- ety. Average yield 1445 kg/ha.
Cowpea	V.S.4 (Manjari Red Plain) (KM-V)	RARS, Kumarakom	Suitable as an intercrop in coco- nut garden and as a pure crop in Kuttanad. Mean yield 1358 kg/ha.

1	2	3	4
Bitter-gourd	Selection-1010	SRS, Thiruvalla	High yield, attractive appearance and less bitterness. Recommended for acidic alluvial soils. Average yield 29.31 tonnes/ha.
Bitter gourd	MC-84 (Preethi)	College of Horticulture Vellankkara	High yielding variety highly acceptable owing to its medium long fruits. Mean yield 20 tonnes/ha.
Pepper	Culture-239 (Panniyur-5)	PRS, Panniyur	Good performance under mono cropping and companion cropping in arecanut garden. Average yield 3076 kg/ha.

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

Rice and Rice based Cropping system

The investigation "Economising nitrogen in rice production with *Sesbania rostrata*" to assess the influence of *in situ* growing and incorporation of *S. rostrata* has revealed that 50% of fertilizer nitrogen can be substituted by *in situ* growing and incorporation of *Sesbania rostrata* and the yield obtained was comparable with that of package of practices recommendation.

A study on the effect of time of sowing on the performance of dry sown rainfed rice showed that grain and straw yield of onam variety was maximum with sowing on 23rd May. The combination of butachlor with hand weeding resulted in higher weed control efficiency than butachlor with 2, 4-D.

Pulses and Oilseeds

For the cowpea variety C-152, a combination of 22.5 kg P₂O₅ per hectare with 1.5 gm sodium molybdate per kg of seed gave maximum yield and maximum profit. Based on the dose response relationship, economic optimum dose for phosphorus was found to be 21 kg P₂O₅/ha and that of molybdenum 1.37 g. sodium molybdate per kg of seed.

Study on 'Sulphur and Boron nutrition of groundnut' revealed favourable influence of sulphur on all yield attributing characters and consequently pod yield. Boron also had favourable influence on yield. The oil content also increased with increasing levels of sulphur and boron.

Vegetable Crops

From an experiment 'Standardisation of fertilizer schedule for export oriented production of Bhindi' it was observed that higher levels of nutrients significantly increased the number of fruits per plant, fruit yield per plant and total fruit yield. Higher levels of nutrients significantly decreased the crude fibre content of fruits and the application of nutrients in two equal splits significantly increased the crude fibre contents. Net profit and benefit-cost ratio was maximum with the fertilizer dose of 110 kg N, 57 kg P₂O₅ and 73 kg K₂O per hectare.

The new tomato line LE-79-5 developed in the Department of Olericulture was recommended in the XIII Group meeting of All India Co-ordinated Research Project on Vegetables held at the JNKVV, Jabalpur during 15-11 December 1993 for cultivation in Karnataka, Orissa, Maharashtra, Himachal Pradesh and Kerala. This variety having an yield potential of 43 t/ha is resistant to bacterial wilt and possesses resistance to field cracking. Determinate to growth habit and uniform fruit ripening are other desirable attributes of this variety.

The bittergourd variety MC-84 consistently outyielded (25-30 t/ha) Priya over several locations tested under the AICVIP. This variety is having medium long, white spiny fruits having excellent consumer preference in Kerala.

A total of 104 genotypes of *Capsicum* spp. were screened for Oleoresin, Capsacin and extractable colour. Papri mild, CA-516, CA-599 and CA-219 gave maximum oleoresin content of 24-28%. The extractable colour units and capsacin content were maximum in CA-219. There was minimum wilting incidence in CA-219.

Tuber crops

An investigation on 'Nutrient management for intercropping *Colocasia esculenta* var. Thamarakannan' revealed that the yield attributes, corm yield per plant and harvest index gave maximum values when Nitrogen @ 60 kg per hectare and K₂O @ 160 kg per hectare were applied under open condition.

Study on nutrient management for intercropped *Colocasia esculenta* revealed that the nitrogen dose could be reduced to 1/3

under shaded condition of coconut garden as compared to 60 kg/ha in the open. The K_2O level must be maintained at 160 kg/ha. under both the situations for higher yield.

Agroforestry

Study conducted with 'Rhizobium' inoculation and nutrient levels on nodulation and seedling growth in tree legumes' has indicated that (1) exotic isolates, TAL 1068 and TAL 45 were the best among rhizobial isolates for *Acacia* and *Albisia* sp. respectively with respect to growth and nodulation characteristics as compared to the local strains. Nitrogen application along with inoculation significantly influenced growth characters. Phosphorus application also increased shoot and root dry weight and number of nodules. From the study it can be concluded that nitrogen and phosphorus application along with Rhizobium inoculation using specific strains is essential for better growth and nodulation of leguminous tree species.

Integrated farming system and increasing productivity of homesteads

Study on the Agronomic resource inventory of south zone of Kerala showed that in a homestead of 0.2 ha better crop diversification would be obtained through intercropping tree crops. Under the integrated farming system, a broiler chicken component is an effective way of utilization of resources. The annual litre addition by the major tree components in the homestead amounted to 936 kg and the nutrient input was to the tune of 8.5, 2.0 and 6.4 kg NPK respectively. The nutrient status and the organic matter content recorded a higher value in the homestead soil. The population of fungi, bacteria and actinomycetes were much higher in homestead soil. The nutrient status and the organic matter content recorded a higher value in homestead soil. The soil temperature in the homestead was found to record a lower value while the relative humidity was higher in the ecoclimate of tree crops. Maximum light interception was by jack canopies and the least by coconut canopies. Maximum net return was obtained from broiler chicken farm. Family labour provided a saving of Rs. 5025/- to the homestead. The net benefit from the homestead system was Rs. 28,095 and the benefit-cost ratio of the farming activities as a whole was 1.60.

Coconut and coconut based cropping system

Simple correlation studies on 'Relationship between leaf nutrients and yield in coconut', revealed that the coconut yield was significantly and positively correlated with N, P, K, and Cl contents of the 10th leaf whereas the secondary nutrients, viz.,

Calcium and Magnesium had a negative impact on yield. The effects of sodium and sulphur were not consistent. The leaf nutrient yield correlations were much pronounced in the first to fifth harvest. Better yields were associated with high sulphur content in the leaves whereas calcium content was same in high as well as low yielders. Magnesium content did not vary between the yield groups. The N, P, K content in the 10 leaf for maximum yield is predicted as 1.91, 0.12 and 1.33 percent respectively for the yielding palms. The optimum time for foliar diagnosis is suggested between April and July.

Light infiltration studies in coconut based homestead showed that the relationship of average crown diameter and average number of leaves with light infiltration were negative whereas with east-west distance of planting and area occupied by a palm the relationship was positive.

Studies on the fertility of coconut root zone influenced by long term inorganic fertilizers have indicated that application of ammonium sulphate increased exchangeable aluminium and exchange acidity in different soil layers. Application of muriate of potash decreased the exchange acidity and exchangeable aluminium to a depth of 75 cm. Highly significant correlations were obtained between Al-P, Fe-P and C-P.

Commercial crops

A study on the inter relationship of applied nutrients on growth, productivity and latex flow characteristics of *Hevea brasiliensis* was undertaken in three locations representing the major rubber growing region in South India. In the case of yield of rubber, 40 kg nitrogen and 30 kg P_2O_5 per hectare were found to be optimum in all locations (Kulasekharam, Thodupuzha and Balussery). The 40 kg level of K_2O was sufficient at Kulasekharam and Thodupuzha while the 80 kg gave the highest yield at Balussery. At Thodupuzha and Balussery application of Mg was beneficial while it reduced the yield at Kulasekharam. The yield of rubber was positively correlated with girth increment, rate of bark renewal, initial flow rate, total volume and dry rubber content of latex and negatively with plugging index. Yield was also positively correlated with the available N, P, K and Ca contents of soil and Ca contents of leaf and P and K contents of latex and negatively correlated with Mg contents of soil and leaf. The strongest correlations with yield are given by soil N, latex P and K and leaf Ca. An overall evaluation of the economic analysis indicated that 40 kg N, 30 kg P_2O_5 and 40 kg K_2O per hectare were the optimum doses in all the three locations. Application of Mg was profitable only at Thodupuzha.

Soils and Agronomy

Out of the four extractants used for the determination of available sulphur, Morgan's reagent proved to be the best followed by neutral normal ammonium acetate, normal HCl and water.

Two species of compost producing exogenic earth worms were compared with local worms for their efficiency in composting.

Partial substitution of Muriate of Potash by common salt for tapioca were evaluated at RARS Pattambi, Pilicode, Nileswar and Instructional Farm, Vellayani.

Representative samples of wet land soils of the state were classified as per soil taxonomy to the family level to serve as a tool for agrotechnology transfer. Similarly upland soils of KAU stations were classified as per soil taxonomy.

The effects of the industrial atmospheric pollutant, sulphur dioxide on tree crop in the Veli area surrounding Travancore Titanium Products Factory was studied. Higher concentration of sulphur in cocount palms were noticed near the Titanium Factory which reduced the uptake of nitrogen, phosphorus, potassium and calcium. Similarly it reduced boron content while increased iron and copper. It reduced the ascorbic acid and glucose contents and plant pigments. Copra and oil contents drastically reduced. The above effects of increase in sulphur dioxide content in the atmosphere were high upto 1 km from the source and then decreased with no effect at 5 km.

Investigations on physiochemical properties of coconut garden soils inter cropped with fodder, showed that the moisture percentage increased in plots grown with guinea and congosignal grasses. Fodder crops decreased the bulk density of the soil. Water holding capacity, hydraulic conductivity and infiltration rates were influenced by fodder cultivation in coconut garden. Significant reduction in soil temperature observed especially at 14-30 hours was noted in the fodder cultivated plate. The reduction in soil temperature varied from 7 to 9°C for the different varieties of fodder crops tried. ;

Plant protection

Samples of bittergourd, cowpea, bhindi etc. collected from farmers' fields at Palappur area contained residues of monocrotophos and Phosphamidon above maximum residue limits (MRL). However, brinjal and snakegourd fruits had considerably less amount of residues.

Techniques for the analysis of Carbofuran in cowpea pods were standardised.

Beneficial micro-organisms

Mass culture technique for V. A. Mycorrhizae has been perfected. Standardisation techniques for cultivation of native strains of pleurotus has been perfected. A new variety of pleurotus has been evolved. Eight indigenous V. A. mycorrhizal fungi have been isolated from pepper rhizosphere.

Fruits and Floriculture

In mango, polyembryonic and monoembryonic root stocks differed significantly with respect to the initial success, survival and further growth of soft-wood grafts. Maximum percentage of success was obtained when polyembryonic varieties Muvandan and Chandrakaran root stocks were grafted with Neelum in the month of June.

The Gerbera cultivar Presley produced the highest number of flowers when treated with growth regulators CCC 750 ppm and GA 100 ppm.

Soft wood grafting in sapota using five months old kirni seedlings as root-stock recorded 75 percent success.

Adenine as medium supplement was found to be the best for the production of more number of multiple shoots and the healthy growth of plants in culture.

Medicinal and Aromatic plants

Collection, cataloguing and evaluation of *Rauwolfia* spp. revealed that *R. serpentina* occurred widely in Kerala while *R. tetraphylla* occurred sparsely in non-forest locations. *R. beddomei* and *R. densiflora* were in a state of extinction. The chlorophyll content of aerial parts was negatively correlated with the total root alkaloid content and thus root alkaloid content could be reliably predicted on the basis of leaf chlorophyll content.

The cytogenetic analysis of *Kaempferia galanga* (Katcholam) showed that the species is a pentaploid ($2n=5x155$). Based on meiotic studies, *K. galanga* is found to be a segmental allopolyploid with five sets of genomes designated as $A_1 A_2 A_2 A_1 A_2$.

Seedlessness in the crop is due to incompatibility factors in the style and stigma.

The Cheemathippali variety of *Pippa longum* continued to excel others in multilocational trials conducted in irrigated coconut gardens with a dry spike yield of over 500 kg/ha from the third year of planting. Proposals for release of this variety have been submitted to the forthcoming workshop of the All India Coordinated Medicinal Plants.

Evaluation of five types of Katcholam showed that in respect of rhizome output the entry from Thodupuzha was promising, while in respect of oil output the accession from Palakkad was superior to others.

Biotechnology

Cotyledons and embryonic axis of immature embryos when incubated of MS basal semi-solid medium supplemented with NAA 2mg/l, treamine 1 mg/l, caseinhydrolysate 0.2 per cent w/v and coconut water 15 percent (v/v) under dark for seven days resulted in high frequency of embryogenesis in cocoa. Fully mature embryos germinated in hormone free liquid medium consisting of half the salt concentration of MS and 5 percent sucrose incubated at 3000 lux for 2 weeks.

In cocoa, multiple shoot production could be induced by raising the concentration of zip to more than 2ppm. The leaf drying of cocoa was found to be partly due to bacterial contamination which could be controlled by culturing the explants in media containing streptopenicillin at 200 ppm for 10 days.

Multiple shoots were obtained (10-20) in all the high yielding varieties of pepper under *in vitro* culture. Sixty to 80 percent success could be achieved by *ex vitro* rooting of multiple shoots developed in pepper.

Farm Economics—Statistics

Following the methods suggested by Freeman (1963) using serial correlations, the proportion of genetic variability in important perennial crops was estimated. The genetic component of varieties in coconut was as large as 83 percent while that in cashew was 78 percent.

The optimum dose of NPK of black pepper was estimated by using the decision theory approach. Application of N, P, K at 50g, 150 g, and 150 g/vine/year was found to be the best for maximizing net returns.

Compound growth rate 86.87 percent, 0.24 percent and 6.61 percent were registered in respect of area, productivity and production of sugarcane in Chittur area of Palakkad district.

VETERINARY AND ANIMAL SCIENCES

Studies on pathology of aflatoxicosis in ducks revealed reduction in various cell counts, body weight and sequential damage to liver.

A killed formalinised vaccine prepared from *Pasteurella anatipestifor*, isolated from ducks was found to give satisfactory protection to duck pasteurellosis.

The combination of Xylazine (1 mg/kg) and Tiletamine—Zolazepaus (1.25 mg/kg i/v) could be used to produce satisfactory short term anaesthesia in dogs.

Aminophylline at a dose rate of mg/kg i/v could be used to reverse anaesthesia produced by Tiletamine—Zolazepaus—Zylazine combination in dogs.

Studies revealed more disease resistance in Vechur cattle.

Common metabolic diseases among cross bred cattle in Kerala are found to be hypocalcaeriat ketosis, Downer cow syndrome.

No correlation between chromosome status and reproductive disorders was noticed in goats.

FISHERIES

Studies on development of brood stock and hatchery production of *Lates Calcarifer* revealed substantial difference in the growth rate after third and fourth year (338, g/37.5 mm and 145 g./11.8 mm. respectively) clearly indicating the impact of aging on growth.

Studies on the effect of turbidity on growth and production of brackish water fishes indicated some correlation between fish production and sediment load in the culture system. Judicious water management could control silt load in treatment ponds, resulting in higher survival and production of *C. chanos*.

AGRICULTURAL ENGINEERING

Developed and tested the following implements successfully under field conditions.

Power tiller operated rice transplanter Self-propelled vertical conveyor reaper. Power tiller mounted paddy harvester, Tractor mounted paddy harvester, Rasp-bar paddy thresher cum-Winnewer, Tractor mounted rotovator, Tractor operated pit digger.

EXTENSION

The Directorate of Extension is responsible for the extension education activities of the Kerala Agricultural University. The Communication Centre, the Farm Advisory Service and the Central

Training Institute which form the main constituents of the Directorate of Extension spearhead the first line extension activities of the University and implement by themselves and through constituent research stations and educational Institutions under KAU.

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

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

The Farm Advisory Service Unit participated in 40 Agricultural Seminars organised at Thrissur Palakkad, Kozhikode, Idukki, Alappuzha and Thiruvananthapuram district in which 3519 farmers were trained. Five hundred and fifty farmers were given advice in person in various problems confronted by them in the field of agriculture, animal husbandry and fish culture. Replies were also sent to 271 letters seeking information on agriculture and allied subjects through mail. Besides 35 diagnostic field visits were also conducted during the period under report.

The Publication unit brought out 26 non-periodical technical publications which included five booklets and 13 leaflets. Kalpadenu—the quarterly Malayalam magazine and KAU Newsletter were also brought out from the centre during the period under report.

The Exhibition and Graphic unit conducted five exhibitions in and around Thrissur District. Colour transparencies photographs and blow-ups were also prepared by the unit, Besides, Five video cassettes were produced on cashew, poultry science and underground irrigation system.

WORKS

The provision for the Engineering works for the year 1993-94 was Rs. 423.71 lakhs under plan and Rs. 48 lakhs under non-plan. The total expenditure incurred during the period under report was Rs. 325.47 lakhs under plan and 79.73 lakhs under non-plan respectively.

KAU ESTATE

Out of the total area of 391.44 hectares of the Estate, 233.30 ha were allotted to other schemes. A total quantity of 47329.36 kg of rubber was produced during the year. The total receipt and expenditure during the year were Rs. 14,55,826.82 and Rs. 3,43,9358.15 respectively.

KAU SCHOOL

A total number of 667 students were in the roll during the period. The strength of teaching staff was 17 and that of the non-teaching staff 6. The school secured 100% result in SSLC examination 1994, and lifted the 1st prize in science and maths exhibition in Thrissur Educational district during the school year 1993-94.

FINANCE

The University had adopted a budget of Rs. 5227 lakhs for operation for 1993-94 anticipating a grant in aid of Rs. 3795 lakhs (Rs. 3000 lakhs under Non-Plan and Rs. 795 lakhs under plan) from the Government, ICAR assistance of Rs. 367 lakhs, Rs. 79 lakhs from other agencies (DBT, DST, Commodity Boards etc.) and internal resources of Rs. 372 lakhs were also anticipated. The expenditure during the period under report for various functions of the University was Rs. 4150.76 lakhs against actual receipt of Rs. 3905.49 lakhs.

CHAPTER I

General Administration

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

The Main Campus of the University at Vellanikkara is 13 km east of Thrissur town on the Thrissur-Palakkad highway (NH 47). The College of Horticulture and College of Forestry are located in the Main Campus. The University has five other teaching campuses, viz. College of Veterinary and Animal Sciences, Mannuthy; College of Co-operation and Banking, Mannuthy; College of Fisheries, Panangad; College of Agriculture, Vellayani and Kelappaji College of Agricultural Engineering and Technology, Tavanur. In addition to this the University has 28 major research stations distributed throughout 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 University and Administrative set up

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

The Vice-Chancellor is also the ex-officio Chairman of the General Council, Executive Committee and Academic Council. The Vice-Chancellor is a full time officer of the University and has the immediate overall control of the University. The other officers of the University are the Deans of Faculty, the Director of Research, Director of Extension, the Director of Physical Plant, the Registrar, the Comptroller and the Director of Students Welfare.

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

Authorities of the University

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

General Council

The supreme authority of the University is the General Council. The Council is reconstituted every three years. Present General Council was constituted on 31.1.1992 with 68 members.

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

The Executive Committee

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

During the report period, 12 meetings of the Executive Committee were held.

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 1993-94, three meetings (61-63rd) were held.

Important decisions taken by the Academic Council were the following.

1. Decided to recognise the National Research Centre for Spice, Kozhikode, Central Tuber Crops Research Institute, Sreekaryam, Thiruvananthapuram, Indian Institute of Horticultural Research, Bangalore as approved centres for Post-Graduate Research.
2. Approved the proposal to start M.Sc. (Ag) programme in Agricultural Meteorology.
3. Approved the proposal to start a degree programme in Dairy Science and Technology in the College of Veterinary and Animal Sciences, Mannuthy.
4. Approved the proposal to establish a Feed Processing and Technology Unit in the Department of Nutrition in the College of Veterinary and Animal Sciences.

Sub Committees

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

Sub Committees of General Council

i) Assurance Committee

Chairman	Sri. K. Gopalan
Convenor	Registrar

ii) Accounts Committee

Chairman	Sri. D. Vijayakumar
Convenor	Comptroller

iii) Statute Sub Committee

Chairman	Sri. M. V. Kurien
Convenor	Registrar

Sub Committees of Executive Committee

i) Establishment Committee

Chairperson	Smt. Saraswathy Kunjukrishnan
Convenor	Registrar

ii) **Research Review Committee**

Chairman	Sri. K. M. Soopy M. L. A.
Convenor	Director of Research

iii) **Finance Committee**

Chairman	Vice-Chancellor
Convenor	Comptroller

iv) **Planning and Development Committee**

Chairman	Sri. Johny Nelloor M.L.A.
Convenor	Director of Research

v) **Students' Welfare Committee**

Chairman	Sri. Johny Nelloor M.L.A.
Convenor	Director of Students Welfare

vi) **Works Committee**

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

Research Council

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

Extension Advisory Committee

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

Faculty Research Committee

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

Co-ordination Groups

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

Faculty Improvement

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

Students' Admission

Admission for undergraduate courses in the University was made on the basis of a common entrance examination conducted by the Government of Kerala. Admission to the various post-graduate courses was given on the basis of marks obtained in the qualifying 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, Kerala Agricultural University during 1993-1994.

Dr. A. M. Michael continued as Vice-Chancellor of the University during the period of report. He was on leave for the period from 11-10-1993 to 20-11-1993. Dr. C. Sreedharan, Dean, College of Agriculture, Vellayani, was holding charge of the post during the leave period.

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

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

Attended the subject matter sub committee meeting at Secretariat on 5-4-93. Attended the meeting fixed with the visiting team from the Department of Water and Land Development and District Collector, Palakkad at Attappady on 2-4-93. Participated in the discussion meeting on EEC Project on 22-5-93, 8-7-93, 6-10-93 and 7-3-94. Attended the Editorial Board meeting of Kerala Journal of Veterinary Science at Veterinary College, Mannuthy on 10-6-93. Participated in the Kerala Horticulture Development Programme Steering Committee at Secretariat on 18-6-93 and 26-11-93. Chaired the Joint Training Committee meeting at Directorate of Agriculture, Thiruvananthapuram on 20-4-93. Attended the Thrissur District Planning Council Sub-Committee meeting on Agriculture on 29-7-93 at KAU Headquarters. Vice-Chancellor participated in the discussion meeting at Secretariat, Thiruvananthapuram, regarding the implementation of UGC/ICAR pay scales to teachers on 5-7-93, 6-7-93, 12-7-93, 9-8-93, 13-8-93. Participated in the discussion on fisheries policy at the Directorate of Fisheries on 14-5-93. Attended the meeting on State level paddy development programme at Secretariat, Thiruvananthapuram on 28-1-94. Vice-Chancellor attended the Planning and Development Committee on 3-2-94. He attended the meeting of the committee for fixation of grant of Universities at Chief Secretary's room on 22-2-94. Attended the judging committee meeting of the award of Malayala Manorama "Karshakasree" on 11-3-95. Attended the Project Steering Committee for Water Management at ICAR, Krishi Bhavan, New Delhi on 20-7-93. Attended the Selection Committee meeting at University of Agricultural Sciences, Hebbal, Bangalore, on 2-5-93, 30-6-93, 31-8-93 and 1-9-93. Vice-Chancellor participated in the Scientific Panel meeting on Soils, Agronomy and Agroforestry at ICAR on 24-5-93. Participated in the Selection Committee meeting held at Agricultural Scientists Recruitment Board, New Delhi on 8-9-93, 4-10-93, 16-12-93 24-1-94, 21-3-94. Attended the STEC Committee meeting on 25-8-93 and 24-12-93. Attended the working group meeting of Indian Scientists and IRRI Scientists at Ernakulam on 3-3-93. Participated in the Group meeting on Agriculture Development of Island Ecosystem of Andaman Islands at Port Blair, Andaman on 12-1-94 and 13-1-95.

Dr. A. M. Michael, Vice-Chancellor, visited Stockholm, Sweden from 26-5-93 to 28-5-93. He visited Asian Institute of Technology, Bangkok, Thailand, from 11-10-93 to 20-11-93. He also visited Port Blair, Andaman Islands from 12-1-94 to 13-1-94.

Vice-Chancellor presided over the seminar on education and Human resources Development in India at St. Thomas College,

Thrissur, on 2-3-93. Attended the ISCO Conference Organizing Committee meeting at ICAR on 29-6-93. Participated in the Poultry Seminar held on 16-7-93 at the Veterinary College, Mannuthy. Attended and delivered the key note Address at Kottayam on "Karshika Rangam Anniversary" of Mathrubhoomi daily on 8-5-93.

Dr. A. M. Michael, Vice-Chancellor, attended the Engineers meet at Palakkad and delivered a lecture on Agricultural Production on 5-8-93.

Inaugurated the workshop on Biodiversity conservation and sustainable agriculture on 15-4-93. Attended the Integrated waste land Development Project workshop at Thiruvananthapuram on 21-4-93. Inaugurated the Summer Institute on Advances in Agricultural Economics at College of Co-operation & Banking, Mannuthy on 7-6-93. Attended the 12th Annual workshop on AICRP on spices at Horticultural College, Vellanikkara on 26-7-93. Attended the inauguration of the valedictory function of one month training programme for the Revenue Inspectors and Superintendent of Panchayats at KILA, Mulamkunnathukavu, Thrissur on 27-7-93. Attended and presided over the farmers day celebrations conducted at Banana Research Station, Kannara on 23-9-93. Presided over the concluding session of the farmers arts club function at Kandasankadavu on 1-1-94. Participated in the agricultural seminar and exhibition conducted at Thodupuzha on 5-1-94. Attended and delivered the keynote address on the AICRP on Medicinal Plants workshops, at Horticultural College, Vellanikkara on 17-1-94. Inaugurated the Karshikotsav and Farmers Fair at Palakkad on 30-1-94. Inaugurated the Trichur cut flower society at Sahitya Academy Hall, Thrissur on 12-2-94. Participated in the function of awarding of Karshikasree awards of Government of Kerala on 13-2-94.

The Vice-Chancellor also participated and presided over in the 7th annual day programme of NRCS, Calicut on 1-4-93. Participated in the inaugural function of the KAU Pavilion in the Thrissur Pooram Exhibition 1993 on 23-4-93. Attended the P.G day celebrations of the College of Horticulture, Vellanikkara on 10-5-93. Participated in the function of the inauguration of the agro clinic by the Horticulture College Students Union 17-8-93 at Information and Sales Centre, Mannuthy. Vice-Chancellor attended the College day celebrations on 27-8-93. Participated in the inauguration of Dairy Science Course at Veterinary College on 7-12-93. Participated in the annual day function of the Lourd Matha English Medium High School, Cherpu on 4-2-94. He was the Chief Guest of the St. Mary's College day functions at Thrissur on 20-2-94.

Participated in the foundation stone laying ceremony of the University Central Library by Hon'ble Chief Minister of Kerala on 16-7-93. Also attended the inaugural function of Information and Sales Centre at Mannuthy on 16-7-93. Participated in the foundation stone laying ceremony of the University Auditorium on 27-9-93 by His Excellency the Governor of Kerala. Vice-Chancellor attended the NCC day celebrations on 28-11-93. Attended the foundation stone laying ceremony of Fisheries College Womens Hostel by Hon'ble Minister for Fisheries at Panangad on 23-12-93. Attended the inaugural function of the Lab building and exhibition conducted at AMPRS, Odakkali on 31-12-93.

Dr. A.M. Michael attended and delivered the lectures in International Training Programme on Water Resources Development and Management in Arid and Semi Arid Regions at Lund, Sweden, from 27.5.93 and 28.5.93.

Dr. A.M. Michael, Vice-Chancellor offered special lectures on selected topics in the Drainage Engineering at Asian Institute of Technology, Bangkok, Thailand during the period from October 11, 1993 to November 21, 1993. He also attended the International Conference on Environment on ground water resource utilization from November 1 to 11, 1993, sponsored by Asian Institute of Technology, Thailand. Vice-Chancellor attended the International Workshop on Training Course on sustainable Irrigation Management—Policy Issues and Operational Implications" from November 12-16, 1993 at Asian Institute of Technology, Thailand and presented lead papers.

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

The Vice-Chancellor visited Indian Council of Agricultural Research, New Delhi, in connection with University work on 19.5.93 to 24.5.93, 30.5.93, 31.5.93, 28.6.93, 23.7.93, 24.7.93, 8.9.93, 21.11.93, 22.11.93, 13.12.93 to 16.12.93, 25.1.94, 22.3.94 and 23.3.94. Held discussions with the Director General, Deputy Director Generals and other officials of the ICAR, combining the work with sponsored tours in most cases.

Vice-Chancellor visited the Tamil Nadu Agricultural University, Coimbatore, University of Agricultural Sciences, Hebbal.

Bangalore, Tamil Nadu Veterinary & Animal Science University, Madras, College of Fisheries, Tutucorin, Madras, Centre for Water Resources Development & Management, Kozhikode, National Research Centre for Spices, Calicut, Central Plantation Crops Research Institute, Kasaragod, and Sub Centre at Kayamkulam. He visited the Indian Horticultural Research Institute, Bangalore. He visited the Peerumade Development Society, Peerumade.

Dr. A.M. Michael also visited and inspected the College of Agriculture, Vellayani, College of Fisheries, Panangad, College of Agricultural Engineering, Tavanur, College of Vety. & Animal Sciences, Mannuthy, College of Forestry, Vellanikkara, College of Co-operation and Banking, Mannuthy, College of Horticulture, Vellanikkara, Regional Agricultural Research Station, Pilicode, Pattambi, Kumarakom, and Ambalavayal, University Dairy Plant, Meat Plant, University Pig Breeding Farm, University Poultry Farm Mannuthy, Livestock Farm, Mannuthy, Livestock Research Station Thiruvazhankunnu, Agronomic Research Station, Chalakudy, Aromatic & Medicinal Plants Research Station, Odakkali, Cardamom Research Station, Pampadumpara, Central Training Institute, Mannuthy, Communication Centre, Mannuthy, Directorate of Extension, Mannuthy, Tissue Culture Lab, Radio Tracer Lab, Agricultural Research Station, Mannuthy, Cashew Research Station, Madakkathara and Anakkayam, Pepper Research Station, Panniyur Fisheries Research Station, Puduveipu, University Rubber Estate, Vellanikkara, Rice Research Station, Kayamkulam and Vytila, Cardamom Research Station, Pampadumpara, Mango Farm at Vellanikkara, Banana Research Station, Kannara, Krishi Vigyan Kendra, Pattambi, Ambalavayal, Manjeswar, and Veterinary Hospital, Kokkalai and other research stations and schemes under the Kerala Agricultural University.

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CHAPTER II

Education and Research

1. FACULTY OF AGRICULTURE

1.1 COLLEGE OF AGRICULTURE, VELLAYANI

College of Agriculture was established in the year 1955 at Vellayani, about 12 km south of Government Secretariat, Thiruvananthapuram on the banks of Vellayani lake. College Campus has a total area of 243 hectares including 165 hectares of 'kayal' land.

Dr. C. Sreedharan continued as Dean of the Faculty of Agriculture and Head of the Institution till 4-1-1994 when he completed his tenure of appointment as Dean. From 5-1-1994, he was put in charge of the Dean, Faculty of Agriculture and Head of this Institution.

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

Department of Agronomy

- „ Agricultural Botany with a separate section
- „ Plant Physiology
- „ Plant Breeding
- „ Horticulture
- „ Soil Science & Agri. Chemistry
- „ Plant Pathology
- „ Agricultural Entomology
- „ Agricultural Extension
- „ Home Science
- „ Agricultural Economics
- „ Agricultural Statistics
- „ Animal Husbandry
- „ Agricultural Engineering
- „ Physical Education

Staff:

Department-wise staff details are furnished separately in Appendix-IV

Changes in staff position

Dr. K. V. Mammen, Professor of Entomology was transferred to Rice Research Station, Moncompu. Dr. S. Ramachandran Nair, Professor of Horticulture was transferred to Vellanikkara as General Co-ordinator, Kerala Horticultural Development Project. Sri. P. A. Korah, Professor (Soil Science & Agricultural Chemistry) joined duty in the Department of Soil Science on transfer from College of Horticulture, Vellanikkara.

Dr. M. Achuthan Nair, Associate Professor (Agronomy), Dr. L. Rajamony, Associate Prof. (Hort)., Smt. N. K. Vimalakumari, Associate Professor (Home Science) and Dr. S. Bhavani Devi, Associate Professor (Plant Pathology) have joined duty in this College during the period under report.

Dr. V. Thomas Alexander, Professor of Agronomy and Dr. V. Gopinathan Nair, Professor of Plant Breeding retired from service on superannuation on 26-9-1993 and 6-12-1993 respectively.

Staff attainments

Dr. V. Gopinathan Nair, Professor & Head, Plant Breeding (Retired) was nominated by Government of Kerala for the 'Krishi Vigyan Award' (the best Farm Scientist Award) for his contribution in increasing agricultural production in the State.

Faculty Improvement programme

Smt. Kamala Nair, Assistant Professor, Dr. R. Vijayan, Assistant Professor (AH) and Smt. K. S. Meenakumari, Sri. A. K. Sherief and Smt. Seema B, Assistant Professors were granted study leave to undergo Ph. D. programme in different Universities.

Seminars/Symposia/Training programme/Workshops attended/organised by Scientific staff

<i>Name and Designation of Staff</i>	<i>Name of programme attended</i>
1	2
1 Dr. V. Muraleedharan Nair Professor of Agronomy	International Tuber Crops symposium at Thiruvananthapuram

1	2
2 Dr. R. Pushpa kumari Assoc. Professor (NC)	International T u b e r Crops symposium at Thiruvananthapuram
3 Smt. Brijit Joseph Asst. Professor (stat)	-do-
4 Smt. S. Chellammal Asst. Professor (Home Sci.)	-do-
5 Dr. V. M. Nair Professor of Agronomy	State level workshop on rice production at Thiruvananthapuram
6 Dr. P. Karunakaran Professor (Pl. Pathology)	-do-
7 Dr. Lulu Das	-do-
8 Dr. Thomas Varghese Professor (SS & AC)	Managing red & lateritic soils for sustainable agriculture at Bangalore
9 Dr. M. S. Iyer Assoc. Professor (SS & AC)	-do-
10 Dr. P. Rajendran	-do-
11 Dr. Prabhakumari Asst. Professor	-do-
12 Dr. N. Saifudeen Associate Professor	-do-
13 Dr. P. Padmaja Professor & Head (SS & AC)	Farmers Seminar at Laksha- dweep on 29th Sept. 1993.
14 Dr. D. Wilson Asst. Professor (P. B.)	Research techniques for analys- ing silvipastoral system in ecosystem context at IG FRI Jhansi.
15 Dr. M. C. Nair Professor (PP) & Head	Seminar on management of ecosystem and sustainable uti- lisation of biological resources
16 Dr. Susamma Philip Professor (PP)	-do-
17 Dr. C. K. Peethambaran Assoc. Professor (PP)	-do-
18 Dr. Lulu Das Asst. Professor (PP)	-do-

- | | | |
|----|---|---|
| 19 | Dr. V. B. Padmanabhan
Assoc. Prof. (Extn.) | Summer Institute on extension
management at TNAU
Coimbatore |
| 20 | Dr. S. Shylaja
Assoc. Professor (Extn.) | -do- |
| 21 | Dr. Kishore kumar
Asst. Professor (Extn.) | -do- |
| 22 | Smt. B. Seema
Asst. Professor (Agron.) | -do- |
| 23 | Dr. Kuruvila Varghese
Assoc. Professor (Agron.) | National symposium on inte-
grated input management for
efficient crop production at
TNAU, Coimbatore. |
| 24 | Sri. Ravi Raman
Asst. Professor (Agrl. Econ.) | Advances in Agrl. Economics
with special reference to
marketing management at
Mannuthy |
| 25 | Dr. C. S. Jayachandran Nair
Assoc. Professor (Hort.) | Summer Institute on advances
in fruit production at IHR
Bangalore |
| 26 | Dr. K. Rajmohan
Assoc. Professor (Hort.) | National Seminar on Anthurium
at Thiruvananthapuram |
| 27 | Smt. N. K. Vimalakumari
Assoc. Professor (H. Sc.) | Review meeting of DST funded
project at New Delhi |
| 28 | -do- | Symposium on coconut and
coconut oil in Human nutrition
at Kochi |
| 29 | Dr. Mary Ukkru
Assoc. Professor (H. Sc.) | Symposium on new develop-
ment in carbohydrate and
related natural products. |
| 30 | Smt. S. Chellammal
Asst. Professor (H. Sc.) | -do- |
| 31 | Smt. S. Chellammal
Asst. Professor (H. Sc.) | USC/ICAR refresher course
sponsored by
Sri. Avinashilingam Institute of
Home Science and Higher
Education, Coimbatore |
| 32 | Smt. M. Rajany
Asst. Professor (H. Sc.) | XX Biennial Conference of
HSAI at Coimbatore |

Academic Programme

Student strength under each course during 1993-'94.

1. U. G. Programme

	No. of students
I Year (1993 admission)	61
II Year (1992 admission)	61
III Year (1991 admission)	60
IV Year (1990 admission)	58

2. P. G. Programme

1992 admission: M. Sc. (Ag)	27
M. Sc. (Horticulture)	4
M. Sc. (Home Science)	8
Ph. D.	10
1993 admission: M. Sc. (Ag)	35
M. Sc. (Horticulture)	6
M. Sc. (Home Science)	6
Ph. D.	10

a) Degree/Diploma awarded

During the year under report 53 students have successfully completed the B. Sc. (Ag) Course and secured the degree.

During the same period 34 M. Sc. (Ag) students, 3 M. Sc. (Hort) Students and 3 M. Sc. (H. Sc.) students' successfully completed their requirements and secured their degree.

During the period under report 8 Ph. D. Scholars also secured doctorate from the Faculty of Agriculture after successfully completing their course and research programmes in this Institution.

b) Details of Scholarships, Awards and other financial assistance to the Students of College of Agriculture, Vellayani

1 ICAR Senior Fellowship	4
2 ICAR Junior Fellowship	14
3 KAU Merit Scholarship:	
a) 1990 Admission	8
b) 1991 "	9
c) 1992 "	9
d) 1993 "	5
4 KAU Junior Fellowship;	
a) 1991 Admission	31
b) 1992 "	34

5	National Loan Scholarship	2
6	Potash and Phosphate India Fellowship	1
7	AVT Merit Scholarship	2
8	National Merit Scholarship	2
9	District Merit Scholarship	2
10	Educational concession to children of Fishermen	4
11	Grant from KSLWFC	2
12	Stipend and Book Grant to Village Level Workers	4
13	Educational concession to Scheduled Tribe Students	2
14	Educational Concession to OEC Students	3
15	Educational Concession to Kumara Pillai Commission Report Students	20
16	Educational Concession to Scheduled Caste Students	13

Practical Training Programme

As a part of the Course Curriculum, work experience programme was implemented for the under graduate students and they have raised major crops like rice, tuber crops, banana and vegetables and pulses. They have also undertaken plant propagation and nursery techniques, processing of fruits and vegetables, plant protection, soil testing etc. The final year B. Sc (Ag) students have also been given training in Computer applications.

The final year 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 Research Stations under Kerala Agricultural University.

Study Tours

Sixty students of the II Year B. Sc.(Ag) Class were taken on South Indian Study tour during the period under report. Four staff members of the teaching faculty accompanied the students. They visited important research stations of Tamil Nadu Agricultural University at Coimbatore and University of Agrl. Sciences (UAS), Bangalore. They also visited the important research stations of Kerala Agricultural University and acquainted with the activities of the stations and Main Campus, Vellanikkara.

Karshikom 1993

A Seminar-cum-exhibition was organised by the final year B. Sc (Ag) students at Perumpazhuthoor, Neyyattinkara on 13-6-'93 in connection with their course Ag. Ext. 406 Programme Planning.

Extra curricular activities

A. NSS Programme

Dr. M. M. Hussain, Associate Professor (Extn.) Dr. D. Wilson, Assistant Professor (Plant Breeding) functioned as NSS Programme Officers.

The NSS student strength allotted to this College was 280 and 280 students were enrolled in two units.

B) Students Union Activities

The Students' Union activities were inaugurated by Prof. O- N. V. Kurup on 2nd April, 1993. The activities of the Arts Club were inaugurated by Prof. Nabeesa Ummal. Felicitations were offered by Sri. Kaniyapuram Ramachandran. The function was followed by the 'All Kerala Inter Collegiate Meesan Memorial Drama Festival which has by now become one of the most prestigious drama festivals of Kerala. Teams from different Colleges took part in the drama competition. "Poulose Enna Verum Poulse"—the drama enacted by the S. N. College, Chempazhanthi was adjudged the best drama.

A one day Seminar on the "Impact of the new economic policies on Indian Agricultural Sector" was organised and the same was inaugurated by Dr. I.S. Gulathi.

The Union organised an "Environment Seminar" on the "World Environment Day". The Seminar was inaugurated by Holy Bishop Rt. Rev. Dr. Mar Gregorious.

The interclass Arts Festival "Harsham 93" was conducted for 3 days in October, 1993 with great enthusiasm and high spirit.

Under the auspices of the Planning Forum, Dr. K. A. Chindia Deputy Director General, ICAR delivered a talk on "Importance of Horticulture in Indian Agriculture", on 6.11.93. Another guest lecture was given by Dr. Hari Easwaran, National Leader, World Soil Resources on "Challenges of Sustainable Agriculture in India".

A "Kaviyarangu" was organised on 31.1.94 in which M/s. Ezacheri Ramachandran, Pazhavila Remesan, Kureepuzha Sree-kumar, Kilimanoor Madhu, Prabha Varma and C. S. Jayachandran presented their poems.

A "Horticultural Therapy" Programme was conducted by S. S. League at the Cheshire Home, Thiruvananthapuram.

A study tour was arranged to Doordarsan Kendra, Kudappanakunnu, under the auspices of Camera Club to enlighten the students on different aspects of film making and allied aspects.

C. Sports & Games

Interclass competitions were held in all major games.

The College teams participated in various Inter-Collegiate tournaments conducted during the year.

Practice matches were conducted in Basket ball, Volley ball, Ball badminton (Men and Women) and Hockey (Men).

ICAR Games and Athletic Meet was conducted in the College grounds from 7th to 11th December, 1993 using the facilities available in the Physical Education Department of this College.

One of the Cricket tests—India—Australia Youth Cricket—was held in the Agricultural College grounds from 2nd to 5th March, 1994.

The multipurpose Indoor Stadium constructed in the Campus was formally opened and many of the indoor games are being held in this Stadium.

Hostels

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

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

U.G. Hostel	—	Dr. L. Rajamony, Associate Professor (Hort.)
P.G. Hostel	—	Sri. N. Ramachandran Nair, Associate Professor (Plant Breeding)
Ladies Hostel	—	Dr. S. Shylaja, Assoc. Professor (Extn.)

The strength of inmates in the hostels were as follows:

U. G. Hostel (Men)	—	57
P. G. Hostel (Men	—	14
only)		
Ladies Hostel	—	157

College Library

In the College Library there were 23,444 books at the end of the year. Forty five Indian Journals and thirty four Foreign journals were subscribed during the year.

Instructional Farm, Vellayani

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

As a part of the farm development programme with the ultimate goal of increasing production and farm revenue, irrigation facilities were extended to all the blocks and intensive cultivation

of banana and vegetables (for seed purpose) was undertaken. One lakh 'Chandrakalpa' seed nuts (Coconut) were procured from Laccadives production of good quality seedlings and distribution to farmers.

Vegetable seeds, planting materials of fruit plants and ornamental plants were produced in large quantities and supplied to Department of Agriculture for distribution to farmers throughout the State. Coconuts, vegetables, Vegetable seed, Coconut seedlings of West Coast Tall and Komadan varieties, planting materials of other crop varieties produced in the farm were also sold directly to farmers who visited the farm.

Livestock Farm

The Department of Animal Husbandry is maintaining a Dairy Unit and a Poultry Unit in the Campus. During the year, 37928.50 litres of milk was obtained from the dairy animals and sold to the inmates of the hostels and residents in the Campus. A total number of 30860 eggs obtained from Poultry Unit were also sold to the students in the hostels and to the staff members.

In the Veterinary Hospital attached to the College under Animal Husbandry Department, 1245 cases were treated and 300 birds were vaccinated against R. D. About 198 pregnancy diagnosis and 28 artificial inseminations were also done.

Research

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

The salient research findings are summarised and given below.

Results of the experiment 'effect of time of sowing and weed management on the performance of dry sown rainfed rice' showed that the best time for dry sowing of rice was third week of May and effective control of weeds could be obtained through the application of butachlor followed by one hand weeding.

In a study on nutrient management for intercropped *Colocasia esculenta* revealed that the nitrogen dose could be reduced to 1/3 under shaded condition of coconut garden as compared to 60 kg/ha in the open. The K_2O level must be maintained at 160 kg/ha under both the situations for higher yield.

Study on the agronomic resource inventory in Southern Zone of Kerala, showed that in a homestead of 0.2 hectare, better crop

diversification would be obtained through intercropping tree crops. Under the integrated farming systems, a broiler chicken component is an effective way of utilisation of resources.

Agronomic evaluation of rice cultivars for rainfed conditions of Kerala, revealed the suitability of varieties like Jaya, Thulasi and Rasi for rainfed first crop season of Kerala. The NPK dose can be reduced by 25% during the first crop season without any adverse effect on yield. Pre-sowing treatment with water, 2.5% KCl and triazole improved the grain yield and net income in rainfed rice.

By incorporating Azospirillum, at least 25% of fertilizer nitrogen could be saved in rice culture.

Representative wet land and uplands of the State including Kerala Agricultural University Research Stations were classified as per soil taxonomy.

Efficiency of rock phosphate in the acid soils were evaluated. Similarly, the Potassium behaviour in the selected soil series of Thiruvananthapuram District were studied. Clay mineralogy of Thiruvananthapuram, Nedumangad and Palode series were identified and quantified.

Investigations on the effect of the industrial atmospheric pollutant Sulphurdioxide on tree crops in Veli area surrounding the Factory Travancore Titanium Products showed higher concentration of Sulphur in coconut palms near the Factory which reduced the uptake of Nitrogen, Phosphorus, Potassium and Calcium. It reduced the uptake of boron while increased the iron and copper. It reduced the ascorbic acid and glucose contents of plant pigments. Copra content and oil content were drastically reduced. The adverse effects of increased Sulphur dioxide in the atmosphere was high upto 1 Km from the source and gradually decreased with no effect at 5 Kms.

Investigations on the physico-chemical properties of coconut garden soils intercropped with fodder revealed that the moisture percentage increased in plots grown with guinea and congosignal grasses. Fodder crops decreased the bulk density of soils. Hydraulic characteristics like water holding capacity, hydraulic conductivity and infiltration rate were influenced by fodder cultivation in coconut garden. Significantly reduction in soil temperature observed especially at 14-30 hrs. was noted in the fodder cultivated plots which varied from 6 to 9°C for the various varieties of fodder tried.

Two species of compost producing exogenic earthworms were compared with local worms for their efficiency in composting.

Standardised a simple technology for composting biowastes of farm market and kitchen wastes using earth-worms.

The finding 'Partial substitution of muriate of potash by by common-salt' for coconut is being evaluated at Regional Agricultural Research Station, Pattambi, Pilicode and Instructional Farm, Vellayani.

In a study involving interspecific crosses in the genus *Abelmoschus*, all the four hybrids exhibited field resistance to yellow vein mosaic disease.

The screening of 59 cowpea varieties through sap inoculations for cowpea aphid borne mosaic disease resistance under field conditions showed that two varieties viz., V. 317 and V. 276 were highly resistant.

Studies on the morphological effects of EMS and Gamma rays on winged bean revealed greater variability by gamma rays than EMS in the M₁ generation. Gamma rays caused a stimulatory effect at its lowest dose.

In the IET with 30 selected types of grain cowpea, the highest mean seed yield was recorded by the variety COVU-85020 (973 kg/ha) followed by COVU-358 (944 kg/ha). Culture-9 recorded the highest fresh haulms yield (6666 kg/ha).

Evaluation of different varieties of gladiolus showed that 'Vink's Glory' and 'Oscar' were suitable for the Southern Zone of Kerala. Variety 'Her Majesty' was found to be highly susceptible to Fusarium wilt. Varieties 'Friendship', 'Happy End' and 'Tropic Sees' were found to be suitable for cut flowers.

Evaluation of the performance of water melon varieties has shown that 'Sugar Baby' and 'Arkajyothi' are very promising for cultivation in Southern regions of Kerala.

Two lepidopteran pests of Vallipala (*Tylophora asthmatica*) were identified. They are *Dichromia arosia* and *Danaida aglea*.

Mancozeb residues in fresh pepper were determined; initial deposit of 9.80 mg/kg (0.2% concentration) and 13.46 mg/kg (0.4% concentration) dissipated to 97.84 and 99.8% respectively within 28 days after treatment.

A neem based insecticide Neemax at 0.2% caused antifeedant action, against *Spodoptera litura* larvae and *Epilachna beetle* grubs.

The agent responsible for the Honey bee disease was identified as "Thai-sac brood virus".

Samples of bitter gourd, cowpea and bhindi collected from farmers' field at Palappur area contained residues of monocrotophos and phosphamidon above MRL.

The incidence of bittergourd mosaic was found to be inhibited by various plant extracts including that of Nochi.

The extracts of Neem, Henna and Occimum were found to be inhibitory to *Colletotrichum fusarium* and *Rhizoctonia* the fungal pathogens of sowpea.

Mass culture technique for *V. A. mycorrhizae* has been perfected.

Standardisation of techniques for cultivation of native strains of *Pleurotus* has been perfected.

An analysis of selected development programmes for promoting coconut production in Kerala revealed that beneficiary farmers awareness, attitude, knowledge and adoption of recommended practices though partial in some aspects, were significantly influenced by coconut development programme.

A study on the linkage between Department of Agriculture and Soil conservation Unit in the implementation of soil and water conservation programmes in Kerala revealed that majority of Agrl. Officers and 50% of Principal Agrl. Officers had low perception about their roles and majority of Senior Soil Conservation Officers had high role perception. Linkage between officials of Department of Agriculture and Soil conservation is only medium.

Majority of the Agricultural Labourers under the Kerala Agricultural Workers Pension Scheme and Kerala Agricultural Workers Welfare Fund Scheme had high awareness about the *Modus operandi* of the schemes and had favourable attitude, towards it.

Frying banana chips in coconut oil and groundnut oil was found to affect the physico-chemical properties like smoke point, boiling point, iodine number, saponification number and acid value of the oils. Toxicological evaluation of retreated oil huted

upto 12 hours, conducted both in bacterial system and through animal experiments gave negative results.

A survey conducted among hundred atherosclerotic patients in the age group of 41-60 years revealed that normal blood sugar level was noted only among 35 per cent of the patients. Diabetes mellitus, obesity and hypertension were also found to be associated with atherosclerosis. Smoking and alcoholism were also prevalent among 28 to 35 per cent of the patients. A direct relationship between their habits and blood cholesterol level was observed. Pulses were the major items in the dietaries of 30 per cent patients.

In a study to improve the nutritional quality of bread, maida and soya flour mixture with fermenting time of 1½ hours was selected as the best combination based on baking characteristics, nutritional composition, organoleptic qualities and short life studies.

EXTENSION ACTIVITIES

Village adoption programme:—

Village adoption programme was implemented in Venganoor and Nellivila.

Two farmers were identified and training was given on mushroom spawn production and pesticide application procedure so as to develop self employment avenues in the adopted village.

Interested group of farmers for starting sericulture was also identified for imparting training in sericulture.

Group discussions were conducted in the farmers' field rendering advice for collection of soil samples from the field.

Proper guidance and advice was rendered to the educated youth of the area regarding the initiation of self employment programmes making use of the resources available at their disposal.

One day training was conducted for the leaders of potential farmers in the adopted villages on improved farming techniques.

One demonstration was conducted at Venniyoor on the safe use of pesticides in vegetable cultivation.

T&V activities

Scientists from the different departments of the College served as resource personnel in the monthly T&V Workshops and also served in the diagnostic team and made field visits to investigate field problems. The scientific staff from different departments also attended the zonal workshop in the Southern region.

Training Programme

A training on biotechnology was conducted for the benefit of the Assistant Directors of Department of Agriculture.

A training programme for rural women on low cost processing of fruits and vegetables was conducted for two batches of 15 women each.

A training on utility bag making as an income generating activity was conducted in two batches for women.

Correspondence course on "Child Development" was completed during the period and 236 candidates registered for the course have been benefitted.

The academic staff members also handled classes for the field staff and Agricultural Officers of the Department of Agriculture in RATT at Kazhakkuttom.

Exhibition

The College departments and Instructional Farm participated in the Karshikamela organised by the Mathrubhoomi at Kottayam and exhibited various items of interest to farmers. A large number of seedlings of fruit and ornamental plants and vegetable seeds were sold in the mela.

The Home Science department of this College exhibited 60 recipes made out of root and tuber crops in connection with the International symposium on Tropical Tuber Crops held at Thiruvananthapuram

One day Agrl. Seminar

A one day agricultural seminar was organised in the College on 18th March 1994. Fifty farmers from adopted village and nearby areas participated in the programme. Seminar topics were sericulture and sustainable agriculture. The farmers were taken round the farm and to the various departments in the college and the activities were explained to them.

Spawn production and cultivation mushrooms

Quality spawn of Oyster mushroom was produced and distributed to mushroom growers. Cultivation techniques were demonstrated to a number of visitors interested in mushroom cultivation.

Imported planting material inspection authority

The Professor and Head of the Department of Plant Pathology functioned as the Designated Inspection Authority of the state and issued certificates after inspection of imported plants/planting materials from time to time.

Farm Advisory Service

Pests and disease affected plant samples brought by farmers and field staff from Department of Agriculture were examined and proper control measures suggested. Farmers were also given necessary advice on crop management aspects to increase production as and when they visited the Department of Agronomy, Soil Science, Horticulture, Entomology and Plant Pathology. Necessary advice to the livestock farmers was also rendered by the scientists of the Animal Husbandry Department. A large number of farmers, school children and students from Higher Secondary Schools visited this Institution.

Publications

The members of the faculty belonging to various disciplines published a number of scientific articles and popular articles during the period. Details furnished in Annexure-V.

Radio talk and Doordarsan Programme

Scientists from different disciplines did broadcast on the radio and telecasted on Doordarsan on various aspects of modern farming and technological advances.

Guest Lectures

- 1 Dr. Sivaprasad, Scientist, Department of Biochemistry, University of Adelaide, South Australia delivered a talk on Molecular Biology 'Transgenesis and agriculture for breeding the world beyond 2000 A. D.'
- 2 Dr. S. Hegde, Professor, Agricultural Microbiology, UAS, Bangalore gave a talk on 'Recent advances in biofertilizers'.
- 3 Dr. M. R. G. K. Nair talked on 'Swadesi Science Movement'

Important visitors

Distinguishing personalities who visited this Institution include:

- 1 Dr. S. Sankaran, Vice-Chancellor,
Tamil Nadu Agricultural University, Coimbatore
- 2 Dr. K. A. Chadha, Deputy Director General, ICAR
- 3 Dr. M. R. Sethuraj, Director,
Rubber Research Institute of India, Kottayam
- 4 Dr. C. R. Hazra, Co-ordinator,
AICRP on Forage Crops, ICAR.
- 5 Dr. Hari Easwaran, National Leader,
World Soil Resources, Washington, DC
- 6 Dr. S. Purushothaman, Dean,
Agricultural College and Research Institute, Madurai.
- 7 Dr. G. D. Reddar, Director of Research,
University of Agricultural Sciences, Dharward.
- 8 Dr. J. H. Kauffman (ISRIC)
- 9 Dr. A. B. Bose (ISRIC)

1.2 COLLEGE OF HORTICULTURE,, VELLANIKKARA

Dr. C. C. Abraham continued as the Associate Dean upto 4.1.94 AN and thereafter as Associate Dean i/c for the rest of the period.

The College of Horticulture was established in the Mannuthy campus on 28-10-1972. The College was shifted to the main campus in November 1977. The College has an Instructional Farm having an area of 95.35 ha, which is utilised for imparting practical training to students and also for undertaking faculty research activities.

To start with, only 20 students were admitted for the four year B. Sc (Hort) degree programme (12 trimesters). The number of student admissions for this programme was increased to 30 from 1976-77 and again to 40 from 1979-80. The B. Sc (Ag) programme was introduced from the academic year 1977-78 with an intake of 50 students. The curricula of the B. Sc (Ag) and B. Sc (Hort) programmes were unified in 1980-81 and the latter course discontinued. The intake for the B. Sc (Ag) programme was consequently increased to 75. The Master's degree programme was

started in 1976-77 in six disciplines, namely, Horticulture, Agronomy, Agricultural Botany, Agricultural Chemistry, Agricultural Entomology and Plant Pathology. From 1979-80, Ph. D programmes in Horticulture in these six departments were started. In addition, Masters' programmes in Agricultural Economics and Agricultural Engineering were also commenced during this year. The P. G. Diploma course in Natural Rubber Production was started in 1979-80 and offered up to 1982-83. After a break of 7 years, the programme was revived in 1990-91. The M. Sc (Ag. Stat) was started during the year 1978-'79. A programme for M. Sc. in Agri. Economics was commenced during 1991-92. The M. Sc programme in Food Science & Nutrition was started during the year and two students were admitted. The World Bank funded Kerala Agricultural Development Project was launched in April, 1977 to conduct fundamental, applied and adaptive research in coconut, cashew, cocoa and pepper. This project was terminated in March 1986. The Radio Tracer Laboratory came into existence in June, 1982 under the KADP.

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

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

A total of 792 students completed their B. Sc (Ag) /B. Sc (Hort) programme during the period from 1976 to March 1994. The students completing their undergraduate programme during this period were 61. A total of 52 students completed their PG Diploma in Natural Rubber Production so far. A total of 22 students completed their PG programmes during the year.

Teaching and non-teaching staff

Out of 134 sanctioned positions of faculty staff, 21 remained vacant as on 31-3-1994 (Table 1). The total number of sanctioned positions belonging to the administrative, paratechnical, ministerial and supporting staff positions in the various Departments/Schemes and the College Office (Table 1) as on 31-3-1994 was 123 out of which only 15 remained vacant. Out of a total of 49 staff positions

attached to the College Office and College Library, 7 were vacant. The cadre wise details of these 49 positions are as follows:

	S	P	V
<i>College Office</i>			
Administrative Officer	1	1	—
Section Officer	6	5	1
Sr. Office Superintendent	1	1	—
Office superintendent	2	2	—
Office Assistant	14	14	—
Selection Grade Typist	—	—	—
Senior Grade Typist	—	—	—
Grade I Typist	2	2	—
Grade II Typist	2	1	1
Peon Higher Grade	1	—	1
Peon	5	5	1
Watchman	2	2	—
Driver HDV	1	1	—
Driver LDV	2	1	1
Bus Attendant	1	1	—
Duplicator Operator	1	1	—
Hostel Manager	2	2	—
Total	43	39	4
<i>College Library</i>			
Librarian	1	—	1
Asst. Librarian	1	1	—
Reference Assistant	3	1	2
Asst. Grade I	1	1	—
	6	3	3
Grand Total for College office/Library	49	42	7

Faculty upgradation

Smt. Jessy K. Thomas was relieved to undergo the Ph. D. programme in Agrl. Economics at the TNAU, Coimbatore.

Dr. P. C. Rajendran, Assistant Professor i/c, MPDS of Coffee Board was deputed to avail of the National Associateship in Bio Technology at II Sci. Bangalore for a period of one year from 10-8-1993.

Dr. T. P. Murali joined as Assistant Professor in the Dept. of Pomology & Floriculture after post-doctoral training in the University of West Indies, Trinidad and Tobago on 18-2-1994 FN.

Staff position in the

Department/Scheme	Associate Dean			Professor		
	S	P	V	S	P	V
Head of Institute and supporting staff	1	1	—	—	—	—
Agronomy	—	—	—	1	1	—
AICRP on Weed Control	—	—	—	—	—	—
Agro. Meteorology	—	—	—	1	1	—
Agri. Botany	—	—	—	1	1	—
Agri. Economics	—	—	—	1	1	—
Agri. Economics (Basic Science)	—	—	—	—	—	—
Agri. Entomology	—	—	—	2	2	—
AICRP on BCCP & W	—	—	—	—	—	—
Agri. Engineering	—	—	—	1	—	1
Agri. Extension	—	—	—	—	—	—
Home Science Unit	—	—	—	—	—	—
Agri. Statistics	—	—	—	1	1	—
Olericulture	—	—	—	1	1	—
Seed Production	—	—	—	—	—	—
AICVIP	—	—	—	—	—	—
Plantation Crops and Spices	—	—	—	1	—	1
Man Power Dev. Scheme (Coffee Board)	—	—	—	—	—	—
PG Diploma NRP(Rubber Board)	—	—	—	—	—	—
Cadbury Cocoa Res. Project	—	—	—	1	1	—
AICRP on M & AP	—	—	—	—	—	—
Pomology & Floriculture	—	—	—	1	—	1
AICFIP	—	—	—	—	—	—
Processing Technology	—	—	—	1	—	1
Plant Pathology	—	—	—	1	1	—
Soil Science and Agrl. Chemistry	—	—	—	1	1	—
Coconut Nutritional Phys. Disorders	—	—	—	—	—	—
Radio Tracer Laboratory	—	—	—	1	1	—
Instrumentation Unit	—	—	—	—	—	—
Physical Education	—	—	—	—	—	—
Instructional Farm	—	—	—	1	1	—
Total	1	1	—	17	13	4

College of Horticulture

Associate Professor			Assistant Professor			Total Academic			Administrative/ Paratechnical/ Supporting staff		
S	P	V	S	P	V	S	P	V	S	P	V
—	—	—	—	—	—	1	1	—	49	42	7
1	1	—	5	5	—	7	7	—	3	3	—
—	—	—	3	3	—	3	3	—	4	4	—
—	—	—	2	1	1	3	2	1	2	2	—
—	—	—	5	5	—	6	6	—	1	1	—
1	1	—	5	1	4	7	3	4	—	—	—
—	—	—	2	1	1	2	1	1	1	1	—
1	1	—	4	4	—	7	7	—	2	1	1
1	1	—	1	1	—	2	2	—	3	3	—
—	—	—	2	2	—	3	2	1	2	2	—
1	1	—	4	3	1	5	4	1	—	—	—
—	—	—	4	3	1	4	3	1	—	—	—
1	1	—	8	6	2	10	8	2	2	1	1
1	1	—	5	5	—	7	7	—	6	5	1
—	—	—	2	1	1	2	1	1	—	—	—
—	—	—	3	3	—	3	3	—	2	2	—
—	—	—	7	7	—	8	7	1	2	2	—
—	—	—	1	1	—	1	1	—	—	—	—
—	—	—	1	1	—	1	1	—	1	1	—
2	2	—	—	—	—	3	3	—	5	5	—
1	1	—	2	2	—	3	3	—	6	6	—
—	—	—	7	7	—	8	7	1	3	2	1
—	—	—	3	3	—	3	3	—	3	2	1
—	—	—	3	3	—	4	3	1	2	2	—
4	3	1	5	4	1	10	8	2	3	3	—
3	3	—	3	3	—	7	7	—	6	6	—
1	—	1	2	2	—	3	2	1	3	2	1
3	3	—	1	1	—	5	5	—	1	1	—
1	1	—	—	—	—	1	1	—	—	—	—
—	—	—	2	1	1	2	1	1	1	—	1
—	—	—	2	—	2	3	1	2	10	9	1
22	20	2	94	79	15	134	113	21	123	108	15

**Details of participation of Scientists in Seminars/workshops/
training/symposia/summer institutes**

<i>Name and Designation</i>	<i>Course Details</i>	<i>Venue-Period</i>
Ms. Mini Raj, N Assistant Professor Dept. of Olericulture	Short course on 'Recent Advances in nutrition physiology	Agriculture College, Bapatla APAU 10.19, May 1994
Dr. S. Nirmala Devi Smt. N. Mini Raj Assistant Professors, Olericulture	Summer Institute on Recent advances in Nutrition physiology	Bapatla 10.5.1993 to 21.5.1993
Dr. G. Sreekantan Nair Prof. & Head, Pln. Crops & Spices	National Seminar on Post harvest Technology of Spices	NRL Trivandrum 13, May 1993 to 14, May 1993
Mr. M. C. Narayanan-kutty, Asst. Professor	"	"
Dr. D. Seetharama Rao Assoc. Professor (N/C)	Summer Institute on the IPM of Oil Seed and Pulse Crop pests	APAU, Rajendra Nagar 17.5.93 to 05,6.1993
Dr. P. K. Rajeevan Professor i/c Pom. and 12 faculty members from Horti. Discipline	Golden Jubilee Symp. Horti Res.	Bangalore 24.28 May 1993
Mr. M. C. Narayanan-kutty Asst. Professor	Summer Institute on Trends and Techniques of Hr. Agrl. Edn.	Coimbatore 26.5.1993 to 4.6,1993
Dr. E. K. Thomas Assoc. Professor (N/C)	Summer Institute in Advances in Agri. Economics with special reference to marketing	College of C & B Mannuthy 7.6.1993 to 26.6.1993
Mr. K. Sathees Babu	"	"
Dr. N. P. Kumari Sushama Assoc. Professor (N/C)	Summer Institute on Agrl. Extension Management Advances in Soil Science with special reference to soil & nutrient management for maintenance of soil health	Coimbatore 7.6.1993 to 26.6.1993
Mr. M. A. Hassan Assoc. Professor (N/C)	Advances in Soil Science with special reference to soil & nutrient management for maintenance of soil health	PAU, Ludhiana 14, June to 3, July, 1993

Dr. P. V. Balachandran Associate Professor (N/C) RTL	Safety aspects in the research app- lication of ionis- ing radiation	BARC, Bombay 2.8.93 to 10.8.93
Dr. E. V. Nybe, Pro- fessor i/c Dept. of Pln. Crops and Spices	Training on Co- conut Production Technology & co- cont based farm- ing system	CPCRI Kasaragod 19-25, Aug. 1993
Mr. A. Augustin Assistant Professor (Biochem)	International Food Convention	CFTRI, Mysore 7.9.93 to 12.9. '93
Dr. V. K. Venugopal Associate Professor (SS & AC) RTL	International Se- minar on Mana- gement of Red and Laterite soils for Sustainable agriculture	Bangalore 24.9.93 to 28.9.93
Dr. A.I. Jose Professor & Head	International Se- minar on Mana- gement of red and laterite soils for sustainable agri- culture	UAS Bangalore 24,23 Sept. 1993
Dr. P. J. Joy, Professor Entomology	Third Bio-control workers' Group Meeting IVRI, Bangalore	19-21 October 1993
Smt. Gracemma Kurien, Asst. Professor (Stat)	Refresher Course in Statistics	Cochin University of Science & Techno- logy 5.10.93 to 29.10.93
Smt. V. Indira Assoc. Professor	Training progr- amme on mush- room culture, processing, pre- servation and its export prospects	Madras 25-26, October 1993
Dr. A. V. R. Kesava Rao, Asst. Professor (Agromet)	2nd DST sponso- red IARI-ISRO Winter School on Remote Sen- sing of Crop Environment	IARI, New Delhi 2.11.93 to 27.11.93

Dr. N.K. Parameswaran Assoc. Professor	Training course in banana	IHR, Bangalore 9-12. Nov. 1993
Mr. V. K. Raju Assoc. Professor & Head i/c, Proc. Tech	V.R.N. Memorial National Seminar on Export Oriented Horticultural Production	Nagpur 5-6 Dec. 1993
Sri. A. Augustin Asst. Professor	Training Progr- amme on Afla- toxin	Central Food Lab. Calcutta 5.12.93 to 16.12.93
Smt. K. A. Mercy Smt. T. K. Ajitha Asst. Professors (Stat)	Refresher Course in Statistics	Cochin University of Science and Tech. 6.12.93 to 31.12.1993
Mr. M.C. Narayanan- kutty, Assistant Pro- fessor	Training on Post Harvest Techno- logy of Horticu- lture Crops	Bangalore 9.12.93 to 21.12.93
Smt. P.S. Geethakutty Asst. Professor Dr. P.A. Wahid Professor, RTL	Seminar on Fami- lies in Transition DAE. BRNS Sym- posium on Nuclear application in Agriculture. Chai- red a technical session on soil fertility	MS University Baroda 29-31 March 94 IARI, New Delhi 16-18, March 1994
Dr. (Mrs.) P. Sreedevi Associate Professor (Agron.)	Attended the In- ternational Sym- posium on inte- grated weed management for sustainable agri- culture and group meeting of the PI's of different centres of AICRP on weed control.	HAU, Hissar. 18-21 November '93

Academic Programmes

Student Statistics:

Undergraduate programmes:

As on 31.3.1994 there were a total of 278 students on rolls for the B.Sc (Ag) programme.

Year of admission	Men	Women	Total
Final year B.Sc (Ag) 1990 admission	35	27	62
Third year B.Sc (Ag) 1991 admission	31	34	65
Second year B.Sc (Ag) 1992 admission	38	31	69
First year B.Sc (Ag) 1993 admission	41	32	73
Make up course (1993 admn)	5	--	5
Admission prior to 1990	2	2	4
Total	152	126	278

A total of 61 students completed their B.Sc (Ag) programme during the year. The details are as follows:

Year of admission	Men	Women	Total
1989 admission	23	29	52
1988 admission	3	3	6
1987 admission	--	1	1
1986 admission	--	2	2
Total	26	35	61

Post-graduate programmes:

There were a total of 161 PG students on rolls at the College of the year. The details are as under:

M.Sc (Ag)	80
M.Sc (Hort)	24
M.Sc (Ag. Stat)	10
Ph.D (Hort)	10
Ph.D (Agri)	23
PG Dip. NRP	12
M.Sc (FS & N)	2
Total	161

During the year, 32 students have completed their Master's/ Doctoral programmes as shown:

M.Sc (Ag)	15
M.Sc (Hort)	5
M.Sc (Ag. Stat)	1
Ph.D (Hort)	—
Ph.D (Agri)	1
M.Sc (Ag. Econ.)	—
PG Dip NRP	10
Total	32

Study tour programmes

The III year B. Sc. (Ag) batch (54 students) was taken on All India tour during the period from 23.10.1993 to 16.11.1993. They visited premier Institutions of Agricultural Research/Education at Hyderabad, Trombay, Solan, New Delhi, Cuttack and Bhubaneswar. The centres visited were ICRISAT, Patancheru; CCNB, Hyderabad; BARC, Trombay; IARI, Delhi; NMRT- Solan; NPL, Delhi; NRL, Delhi CRRI, Cuttack, OUAT, Bhubaneswar, etc.

The South Indian tour for the 2nd year B.Sc (Ag) batch of students was conducted in two legs first from 2.11.1993 to 9.11.1993 covering South Kerala, Madurai, Kanyakumari and the 2nd leg from 9.12.1993 to 19.12.1993 covering Coimbatore, Ooty, Mysore, Bangalore, Hessarghata, Vittal, Kasaragod, Pilicode, Panniyur, Taliparamba, Ambalavayal and the NRCS, Peruvannamuzhi.

Students Union Activities

The Students' Union 1992-93 was inaugurated by Mr. T. Nandakumar, IAS, Chairman, Spices Board on 3.4.1993. Mr. A. Ananthapadmanabhan, AIR Artist inaugurated the Arts' Club.

The interclass arts festival 'Ashadom' was held on 7-8 July 1993. The second year B. Sc. (Ag) students won the overall trophy. A team of students participated in the Inter-professional Arts festival 'Crescendo 1993' held at the TKM College of Engineering, Kollam during 15-18 July 1993 and the team bagged 21 points in all.

The activity of the Magazine Committee included the release of a little magazine 'Aurora', conduct of interclass literary competition on 24-25 June 1993 and the release of a wall magazine 'Darpanam' on 27.8.'93. The Quiz Club conducted in interclass Quiz competition and a word spectrum programme. The Planning Forum conducted a debate on Dunkel Draft Treaty.

The inter-class annual athletic meet was held on 16-17, February 1994.

Library

As on 31.3.1994, there were 23739 books in the College Library. A total of 220 Indian Journals and 21 foreign journals were subscribed during the year.

Hostels

Dr. S. Nirmala Devi, Assistant Professor continued as Asst. Warden of the Ladies' Hostel upto 1.4.94. Dr. N. P. Chinnamma, Professor took over on 2.4.1994 and continued during the rest of the year. There were a total of 212 inmates in the Ladies' Hostel as on 31.3.1994.

Dr. V. S. Deva Das continued as Assistant Warden of the Men's Hostel on 15.10.1993 and continued to be in that position until 31.3.1994.

Instructional Farm

Dr. M. Abdul Salam, Associate Professor, Dept. of Agronomy continued to hold full additional charge up to 31.1.1994. Dr. K. K. Ibrahim, Assistant Professor took over on 1.2.1994 and continued for the rest of the year.

A total of 73.3kg of vegetable seeds of various kinds was produced during the year. Fruit plants, spices and ornamentals valued at Rs. 0.52 lakh were sold from the IF during the report year.

Irrigation pipelines were extended in 'B' block for length of 300 metres. Microsprinkler system was installed in the nursery.

Workshops and Training programmes held

The National Group meeting of research workers of AICRP on Spices was held in the College during 26-28 July 1993. A total of 135 scientists from all over India attended this workshop.

The 10th Workshop of the AICRP on Medicinal and Aromatic plants was held in the College during 17-20 January 1994.

Ten training programmes were held during the year for the officials of the Dept. of Agriculture, Scientists of RRRI, Kottayam and unemployed youth. The details of the various courses are as follows:

Details of Training Courses	Period	Details of participants
Nursery Techniques and cultivation practices of major medicinal plants	20-22 July 1993	Assistant Directors of Agri. (20 persons)
Training in Soil Science and Agricultural Chemistry	26-6-93 to 15-10-93	Scientists of RRII, Kottayem (4 persons)
Use of herbicides in rice cultivation	29-31 July 1993	Asst. Directors of Agri. (15 persons)
Recent Advances in commercial vegetable production	12-15 October 1993	Asst. Directors of Agri. (14 persons)
Commercial Floriculture	16-18 November 1993	Asst. Directors of the Dept. of Agri. Govt. of Kerala (12 persons)
Vegetable seed production	8-12 December 1993	Asst. and Deputy Directors of Agri.
Commercial Floriculture	2-5 March 94	Unemployed youth (18 persons)
Vegetable cultivation	24-3-1994	Farmer trainees sponsored by the Canara Bank (22 persons)
Plant propagation and Nursery Management	16-19 March 1994	Unemployed Youth (22 persons)
Orchid cultivation	24-26 Aug. 93 27-29 Oct. 93 5-7 Jan. 94 13-15 Feb. 94	Unemployed youth (110 persons)

RESEARCH

Externally funded Research projects newly started

The ICAR ad hoc project on 'Species relationship in Piper and scope of using related taxa in the improvement of *P. nigrum*' was started on 1-6-1994. This project is having an outlay of Rs. 6.09 lakhs plus salaries for a total period of 3 years.

The Central Sector (Government of India) scheme 'Establishment of nursery for the production of budded Cocoa plants and hybrid seedlings' started functioning from 13-9-1993. This project is sanctioned for a period of 5 years at a total cost of 11.18 lakhs. Work on large scale production of budlings of elite plants and hybrid seedlings of cocoa has been taken up during the period.

The Silk Board (GOI) has sanctioned a centre under the All India Co-ordinated Project on Sericulture (3 yrs: Rs. 5.229 lakhs) for operation in the Dept. of Entomology and this started functioning on 22-7-1993.

The Board of Research on Nuclear Sciences, Dept. of Atomic Energy, Government of India sanctioned the scheme on Radio-ecological effects on coconut palms in high radiation areas of Kerala for implementation in the RTL (PI Dr. P. V. Balachandran) for a period of 3 years at a cost of Rs.5.15 lakhs. This scheme was started on 2-6-1993.

A new Central Sector Scheme (GOI) for the development of Medicinal and Aromatic Plants (Rs. 8.05 lakhs) was taken up for implementation (PI Dr. T. V. Viswanathan) during the year, from 1-4-1993. Katcholam, Thippali and Patchouli crops were raised in sizeable areas for the production of planting materials.

Sanction for the implementation of an adaptive research project for evolving recommendation for major crop soils (1.15 lakhs) with the collaboration of the soil survey wing of the State Agri. Dept. was received during the period. Work on the project was started during the year. The ICAR adhoc scheme on 'Cytogenetic investigations on *Kaempferia galanga* and *Piper longum* and *Andrographis paniculata* (PI Dr. T. V. Viswanathan), was sanctioned for implementation for 3 years at an overall cost of Rs. 4.80 lakhs. This scheme was started on 1-9-1993.

The ICAR adhoc scheme 'Evaluation of tomato for the summer season was sanctioned for implementation (PI Dr. S. Rajan, Professor in-charge Olericulture) for 3 years at a cost of Rs.2.093 lakhs. This scheme commenced functioning on 11-10-93.

Research project implementation

Including 53 projects started during the year, there were 156 projects under implementation during the year. Twenty nine projects were terminated during the year.

Major Research achievements

Coconut and coconut based farming systems

Studies on light infiltration in coconut based homesteads showed that the relationship of average crown diameter and average number of leaves with light infiltration were negative, whereas with east-west distance of planting and area occupied by a palm, the relationship was positive.

Studies conducted on the fertility of coconut root zone as influenced by long term inorganic fertilizers have indicated that application of ammonium sulphate increased exchangeable Aluminium and exchange acidity in different soil layers. Application of muriate of potash decreased the exchange acidity and exchangeable Aluminium to a depth of 75 cm. Highly significant correlations were obtained between Al-P, Fe-P and Ca-P.

Vegetable Crops

The new tomato line LE-79-5 developed in the Department of Olericulture was recommended in the XIII Group meeting of All India Co-ordinated Research Project on vegetables held at the JNKVV, Jabalpur during 15-18 December 1993 for cultivation in the Karnataka, Orissa, Maharashtra, Himachal Pradesh and Kerala States. This variety having an yield potential of 43 t/ha is resistant to bacterial wilt and possesses field resistance to fruit cracking. Determinate growth habit and uniform fruit ripening are other desirable attributes of this variety.

The bittergourd variety MC-84 consistently outyielded (25-30 t/ha) Priya over several locations tested under the AICVIP. This variety is having medium long, white spiny fruits having excellent consumer preference in Kerala.

A total of 104 genotypes of *Capsicum* spp were screened for Oleoresin, Capsicin and extractable colour. Papri mild, CA-516, CA 599 and CA-219 gave maximum oleoresin content of 24-28%. The extractable colour units and capsicin content were maximum in CA. 219. There was minimum wilting incidence in CA.219.

The chilly culture CA-219, the brinjal line SM-6-6 and the bittergourd line MC-84 were proposed for release during the year. CA.219 has clustered dark green fruits and is resistant to bacterial wilt.

Ripe red fruits of CA-219 are deep red and highly pungent. The mean yield of fruits per plant is 713.90 g. Another advantage of the variety is that the extractable colourants and capsaicin are higher than in other cluster fruited varieties. SM-6-6 is the first bacterial wilt resistant variety possessing white long fruits. Average yield per plant is 1.42 kg. Earliness is another desirable trait of this line.

Fruits and Floriculture

In mango, polyembryonic and monoembryonic root stocks differed significantly with respect to the initial success, survival.

and further growth of soft-wood grafts. Maximum percentage of success was obtained when polyembryonic varieties Muvandan and Chandrakaran rootstocks were grafted with Neelum in the month of June.

Among the varieties of *Gerbera jamesonii*, 'Presley' was found to be superior to others in respect of growth, number of flowers and earliness in flowering. GA at 50 ppm and GA 100ppm hastened flowering and increased the number of blooms and longevity of blooms in the field. CCC 750 ppm and GA 50 ppm showed a significant positive influence on flower diameter.

In four selected varieties of gladiolus (Agnirekha: American Beauty: Mansoever: Red Friendship), pulsed treatments with 15% sucrose in combination with 8 hydroxy quinone sulphate (8-hqs) were found to be the best for extending the vase-life.

Spices

Two promising types VK-47 and VK-82 of turmeric were advanced to multilocational tests. VK-47 registered yield potential of 36 t/ha of fresh tubers with driage of 20.15%. In VK-82 the mean yield of rhizomes was 29.88 t/ha the driage being 19.28%.

In situ budding on hard trunk of three year old nutmeg plants was found to be the best method for top working in this crop. Stumping the plants two months after budding was found to be most effective for quicker and vigorous bud-burst.

Forage crops

The highest seed yield (167 kg) was obtained from guinea grass when transplanted at a spacing of 60 x 60 cm, fertilized with 100 kg N, 80 kg P₂O₅ and 60 kg K₂O/ha and left without cutting till flowering during the first season and one subsequent seed harvest in the second season. The ideal stage of harvest of seed is 10-15 days after panicle emergence. The seed output decreases with delayed harvest.

Aromatic and medicinal plants

Evaluation of *Kaempferia galanga* entries at varying field population levels showed that a closer spacing at 20 x 20 cm is better in realising higher rhizome yield.

In 'adapathiyam' *Holostemma annulare*, a steady increase in tuber yield was recorded up to 17 months.

In vetiver, the entry Hyb-3 showed the highest oil content (0.5%). In lemongrass, the oil content of the entries ranged from 0.4 to 0.6%. The accession of lemongrass from Perinthalmanna gave the best quality oil with 89.9% citral content.

Collection, cataloguing and evaluation of *Rauwolfia* spp. revealed that *R. serpentina* occurred widely in Kerala while *R. tetraphylla* occurred sparsely in non-forest locations. *R. beddomei* and *R. densiflora* were in a state of extinction. The chlorophyll content of aerial parts was negatively correlated with the total root alkaloid content and thus root alkaloid content could be reliably predicted on the basis of leaf chlorophyll contents.

The cytogenetic analysis of *Kaempferia galanga* (Katcholam) showed that the species is a pentaploid ($2n=5x=55$). Based on mitotic and meiotic studies, *K. galanga* is found to be a segmental allopolyploid with five sets of genomes designated as $A_1A_2A_1A_2A_2$. Seedlessness in the crop is due to incompatibility factors in the style and stigma.

The 'Cheemathippali' variety of *Piper longum* continued to excel others in multilocal trials conducted in irrigated coconut gardens, giving a dry spike yield of over 500 kg/ha from the third year of planting. Proposals for release of this variety have been submitted to the forthcoming workshop of the All India Coordinated Medicinal plants.

Biotchnology

Cotyledons and embryonic axis of immature embryos when incubated on MS basal semi-solid medium supplemented with NAA 2 mg/l, treamine 1mg/l, caseinhydrolysate 0.2 percent w/v and coconut water 15 per cent (v/v) under dark for seven days resulted in high frequency of embryogenesis in cocoa. Fully mature embryos germinated in hormone free liquid medium consisting of half the salt concentration of MS and 5 per cent sucrose when incubated at 3000 lux for 2 weeks.

In cocoa, multiple shoot production could be induced by raising the concentration of 2 ip to more than 2 ppm. The leaf drying of cocoa was found to be partly due to bacterial contamination which could be controlled by culturing the explants in media containing streptenicillin at 200 ppm for 10 days.

Multiple shoots were obtained (10-20) in all the high yielding varieties of pepper under *in vitro* culture. Sixty to 80 per cent success could be achieved by ex-vitro rooting of multiple shoots developed in pepper.

The leaf explants of ginger produced profuse callusing in MS medium supplemented with 2,4-D. Shoot and root organogenesis were also achieved from the leaf derived calluses. Successful seed-set was achieved in ginger following *in vitro* pollination.

In vitro media requirements for embryo culture of *Epidendrum radicans* and *E. scanthium* were standardised.

Among the various explants of *Musa* sp. scalp and embryonic leaves recorded maximum response for callus initiation. Continuous sub-culturing at two weeks intervals resulted in increase of axillary shoots per explant.

Post Harvest Technology

Cashew apple fruit could be stored by keeping them soaked in water containing 1500 ppm KMS. Recovery of clarified juice was maximum when the fruits were pulped in a pulper and pressed in ordinary basket press.

Technology transfer and Rural Development & Statistics

Compound growth rates of 6.87 percent, 0.24 per cent and 6.61 per cent were registered in respect of area, productivity and production of sugarcane in Chittur area of the Palakkad district.

Following the methods suggested by Freeman (1963) using serial correlations, the proportion of genetic variability in important perennial crops was estimated. The genetic component of variations in coconut was as large as 83 per cent, while that in cashew was 78 per cent.

The optimum dose of NPK of black pepper was estimated by using the decision theory approach. Application of N, P, K at 50g, 150g and 150 g/vine/year was found to be the best dose for maximising net returns.

Basic Research

Studies on the behaviour of P in the different soil types of Kerala showed that dominant inorganic fractions in laterite and black soils was Ca-P while in coastal alluvium, brown hydromorphic and Kuttanad alluvium, the dominant fraction was Fe-P.

Among the plant derived materials tested, cashew shell showed distinct advantage over other materials including neem cake as nitrification inhibitor.

Extension activities

Large scale production of seeds, planting materials of crops, mushroom spawn, processed products

Infrastructure for large scale production of planting materials of crops and mushroom spawn was developed during the year

and work on the production of these materials started. Mango grafts (1000 Nos); Lemon rooted cuttings (1000 Nos); Papaya seedlings (500 Nos); *Garcinia cambogea* grafts (500 Nos); Sapota grafts (750 Nos); Guava layers (500 Nos); Indian gooseberry grafts (500 Nos); Jack grafts (150 Nos.); West Indian cherry (500 Nos); Karonda (100 Nos.); miscellaneous ornamentals (1000 Nos); and black pepper rooted cuttings (6000 Nos) were produced and sold to farmers through the Information and Sales Centre Mannuthy.

Budded plants of cocoa (25000 Nos) and cocoa seedlings (20000 Nos) were produced in the CCRP and Central Sector Scheme on cocoa.

The medicinal plants distributed during the year include *Piper longum* rooted cuttings (2980 Nos); *Kaempferia galanga* rhizomes (96 kg); *Indigofera tinctoria* seeds 3 kg; and miscellaneous plants (1120 Nos.)

Mushroom spawn production was started in November 1993 and during the year, a total of 4000 Nos. of spawn packets each of 250g was distributed through the Information & Sales Centre, Mannuthy.

Vegetable seeds of various kinds totalling 1366.6 kg were sold to farmers during the report period.

Processed fruit products valued at Rs. 1.99 lakhs were produced and sold during the year. The products include Mango squash (1016 Nos); Orange squash (961 Nos); Grape squash (784 Nos.); Pineapple squash (1461 Nos); Cashew apple syrup (399 Nos); Pineapple jam (1003 Nos); mixed fruit jam (1034 Nos); Ivy gourd and Lime Pickles (1328 Nos); and 7662 Nos. of Ready to Serve beverages (RTS).

Agro Meteorological field unit

As part of the Agro Advisory Centre, weekly Agro Advisory bulletins were prepared based on the medium range forecasts received from the super computer center, New Delhi. Thirty five such bulletins were prepared during the period for the farmers of the Panancherry, Ollukara, Cherpu and Kaiparamba Krishibhavan.

T & V monthly workshops

The members of the faculty provided active support to the Department of Agriculture as resource personnel for the T & V workshops of the Palakkad, Thrissur and Ernakulam Districts.

Important visitors

The visitors to the College of Horticulture during the period include Dr. Byron Mook, Mr. John Groudel, Dr. K. V. Raman, Dr. S. S. Prasad and Dr. A. Venkitesam of the ISNAR (5-5-93); Dr. Dharmadhikari, Director, Dept. of Rural Electronics, Government of India (6.5.93); Dr. K. S. Chauhan, Vice-Chancellor (Now Chairman, ASRB), Rajendra Agri University, Pusa (21.5.1993); Dr. Karen. K. Tanino, Environment Stress Physiologist, Dept. of Horticulture, Saskatchewan, Canada (26.5.'93) Dr. K. L. Chadha, Dy Director General, ICAR and Dr. P. Rethinam, Asst. Director General ICAR (26-28 July 93); Dr. G. Kailo, Project Director (Vegetables) Varanasi (31.5.'93); Dr. K. Gopalakrishna Pillai, Dr. K. Krishnaiah and Dr. APK Reddy, Scientists of the Project Directorate of Rice, Rajendra Nagar, Hyderabad (31.5.'93); Dr. S. Palaniappan, Director, Centre for Soil and Crop Management Studies (31.7.'93); Dr. Rober Lewin, Scientific Director, Kibuts Gino Sar DN Israel, (25.10.'93) and Dr. KVA Bavappa, FAO Consultant and Chairman, QRT on Cashew, Dr. K. G. Shanmugha Velu, Retd. Dean (Horti), TNAU (18.12.93).

Publications

During the year the members of the faculty published three books, 101 scientific articles and 26 popular articles. The details are furnished in Appendix V.

1.3 COLLEGE OF CO-OPERATION & BANKING, MANNUTHY

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

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

Staff**Academic**

Cadre	Sancti- oned	In position	Vacant	Remarks
Associate Dean	1*	Nil	1	*Dr. M. Mohan Das Associate Professor of Economics holding charge of Associate Dean
Professor	3	Nil	3	
Associate Professor	7**	4	3	
Asst. Professor	21	14	7***	
Others	—	—	—	

** Dr. N. Rajan Nair, Associate Professor was promoted as Professor through assessment

***Two Assistant Professors, selected on temporary basis through employment exchange are working

Administrative staff

Name of post	Sanctioned	In position	Vacant
Admn. Officer	1	1	—
Section Officer	2	2	—
Sr. Office Supdt.	1	1	—
Assistants	6	5	1
Typist	3	3	—
Duplicator Operator	1	1	—
Driver	1	1	—
Class IV	2	2	—
Others (Ref. Assistant)	1	1	—

Changes in Faculty position

Sri: M. Mohanan, Mrs. Molly Joseph, Assistant Professors re-joined the College after deputation and leave for higher studies respectively. Mr. Satheesh Babu, Asst. Professor was transferred to Directorate of Extension, Mr. T. Paranjothi and Mr. K. Ramesha resigned from the college in order to join Institute of Co-operative Management and National Centre for Co-operative Management respectively.

Faculty improvement**a) Details of Scientific staff deputed for higher studies**

Sri. Philip Sabu continued to be under deputation during the report period.

b) *Details of Scientific staff participated in Seminars/Workshops/ Summer Institute/Symposia*

Name of Scientist	Seminar/Symposia	Period of deputation
EVK Padmini	Summar Institute held at the	3 weeks
E. Vinaikumar	College of Co-operation and	
K. M. George	Banking	
Sujatha, K. S.	Cochin University of Science and Technology (refresher course)	3 weeks
Dr. P. C. Mathew	12th National Conference of Institute of Personnel Management, Cochin	3 days

c) *Details of Seminar/Workshop/Symposia etc. conducted.*

Particulars	Total number of Scientists
ICAR sponsored All India Summer Institute on Agricultural Economics with special reference to Marketing management	30

Research projects in operation

a) *Externally aided projects*

- 1 Role of non-Governmental organisations in rural development—A case study of Voluntary agencies in Kerala—Planning Commission of India.

b) *KAU Projects*

- 1 Input management in dairy co-operatives of Ollukkara block.
- 2 Impact of promotional strategies for consumer non-durables on rural markets
- 3 Marketing hospital services by non-Governmental organisation.
- 4 Marketing practices in co-operative banks—A case study of Trichur District Co-operative Bank.
- 5 Marketing practices of fruits and vegetables processing Industries—A case study of Thrissur district.

New Research projects sanctioned

- 1 'An evaluation of group management techniques in Agriculture adopted to enhance production and productivity of paddy in Kerala, - ICAR.
- 2 Impact of promotional strategies for consumer non-durables on rural markets.

- 3 Marketing hospital services by non-Governmental organisation.
- 4 Marketing in Co-operative banks—A case study of Thrissur District Co-operative Bank.
- 5 Marketing practices of fruits and vegetables processing Industries—A case study of Thrissur district.

Projects terminated during the period

- 1 Supply and utilisation of long term institutional credit—A study with reference to PADBS of Palakkad District.
- 2 Economic viability of PACS in Kerala.
- 3 Impact of New settlers in the west ghat region on the socio-economic conditions of tribal populations—case of Wynad district in Kerala.
- 4 Resource management in Urban Co-operative banks in Thrissur district.

Major research achievements

- 1 The disproportionate growth of equity and debts of urban banks intensified the risk exposure of funds portfolio. A proper risk-return-trade-off is lacking in majority of the urban banks. Credit-deposit ratio of the Urban banks was below the desirable level and this affected the profitability adversely.
- 2 The degree of non-viability in PACs increased from 12% in 1971, to 41% in 1982. District-wise analysis judged by the viability index revealed that PACs in only 5 districts are viable. It was also found that the correlation of economic and organisational viability was positive. PACs in Kerala are superior than their counterparts in rest of India in many respects.
- 3 Though the supply of credit by the PADB was sufficient to cover the cost of cultivation, the low yield from coconut resulted in the non-repayment of loan property.
- 4 The major impacts of the immigration of new settlers in the Wynad district are:
 - 1) alienation of substantial part of the tribal land and
 - 2) reduction of the tribal self-cultivated households to the status of wage labour.

Those with nominal and marginal holdings were the main victims of land alienation. Tribal households with land holdings above 10 acres also lost substantial portion of their land.

Although the Act enacted for restoration of the alienated tribal land only very negligible number of cases have been approved for restoration. However their restoration has been prevented by organisational opposition of settlers.

Construction works	: Nil
Infrastructural facilities developed;	
a) laboratory equipments	: Nil
b) farm implements	: Nil
c) Library: books added	: 534
periodicals	: 57
d) Others	: Nil
Measures taken to increase	
farm revenue	: Not applicable
Seed and Nursery programme	: Not applicable

Extension activities

The scientists of the college have been identified as resource personnel for the training programmes conducted by the CTI, Advanced Centre for training in plantation crops, Kerala Institute of local administration, Extension training centre, ICDP Palakkad, SISI entrepreneurial development programme and orientation training programme organised by Calicut University, district planning council, Technical advisory committee in the paddy processing and marketing society. The faculty members are also honoured at the all Indian level by entrusting them with the work of preparation of course curriculum, text book and work book for the vocational higher secondary course in Co-operation in Karnataka State by the Government of India, consulting agency.

Important visitors

- 1 Dr. N. Ranganathan, Director, School of Management Studies, Cochin University.
- 2 Dr. M. K. Sukumaran Nair, Department of Applied Economics, Cochin University.
- 3 Dr. K. Ramachandran Nair, Professor of Economics, Kerala University.
- 4 Dr. N. Varadarajan, Professor, Tamil Nadu Agricultural University.
- 5 Dr. Narayana, Centre for development Studies, Thiruvananthapuram.
- 6 Dr. K. P. G. Menon, Exe. Director, Spices Board
- 7 Dr. George Jacob, Secretary, Rubber Board.
- 8 Dr. K. Syam Sundaram, F.A.O. Consultant.
- 9 Graham W. Mumby, Marketing specialist, Kerala Horticulture Development programme.

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 upto 15-8-93. Sri. Nagesh Prabhu took charge as Special Officer on 16-8-93 and continued during the year.

Staff

Academic

Designation	Sanct- ioned	In position	Vacant	Name of the incumbent
Special Officer	1	1	—	Dr. C. C. Abraham (till 15-8-93) Sri.Nagesh Prabhu (from 16-8-93 to 20-4-94)
Assoc. Professors	2	2	—	Dr. Luckins C. Babu Dr. N. K. Vijayakumar
Assoc.Professors(NC)	4	4	—	Dr. B. Mohankumar Dr. K. Sudhakara Dr. K. Gopikumar Dr. P. K. Ashokan
Asst. Professors	3	3	—	Sri. K. Vidyasagaran Sri. Sonney George Sri. T. Premkumar

Para technical/ Administrative/ Ministerial

Name of the post	Sanct- ioned	In position	Vacant	Name of incumbent
Administrative Officer	1	1	—	Sri.V.Venugopalan
Section Officer	1	1	—	Smt.Merly Sarojini
Senior Office Supdt.	1	1	—	Sri. K. G.Balakrishnan
Grade I Assistant	1	1	—	Sri.N.Radhakrishnan
Typist Grade II	1	1	—	Sri.K.Gopikuttan Nair

Academic Programmes

a) Student Statistics

i) UG Students on the rolls as on 31-3-1994

Year of admission	Men	Women	Total
1986	2	—	2
1989	0	—	0
1990	5	—	5
1991	9	—	9
1992	9	—	9
1993	9	2	11
Total	34	2	36

ii) PG Students on the rolls as on 31-3-94

Year of admission	Men	Women	Total
1991	2	—	2
1992	6	—	6
1993	6	—	6
Total	14	—	14

b) Students who completed the course during the period

Name of course	Men	Women	Total
B. Sc. (Forestry)	—	—	—
M. Sc. (Forestry)	4	—	4

c) Study tour

The first and second year B. Sc. (Forestry) students were taken to Chimmany and Peechi forest areas during October 1993. These students were also taken to Agali and Kanchikode during November, 93. The third year students were taken to ICAR stations at Ootty and Mettupalayam as a part of the courses soil and water conservation. As a part of the course silviculture, the students were taken and explained the activities of Munnar forest Range, Chinnar Wildlife Sanctuary and also Rajamalai Sanctuary.

d) Range training, Weapon training and First Aid Training

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

Students Union activities

The activities of the Students Union was formally inaugurated on 28th March, 1994 by Sri. N. Krishna Murthy, DSP of Thrissur. Under the auspices of planning forum, a film show on Environment and Wildlife was conducted during February. Campus planting and campus beautification was also conducted by the students union. The students of this college also participated in shuttle badminton, cricket and table tennis. The students also took part in Inter-collegiate arts festival. Trekking programme to inside of the forest was also conducted by the students.

Faculty Improvement

Details of participation of Scientists to Seminar/Workshop/training etc.

Sri. K. Vidyasagaran, Assistant Professor had attended a workshop on Wasteland development with special reference to hill areas at Thiruvananthapuram from 24-25th of April, 1993. He has also attended a National seminar on forest produces to Coimbatore from 15-16th of October, 1993.

Dr. K. Gopikumar, Associate Professor attended International symposium on 50 years of Horticultural Research held at Bangalore from 24-28th May 1993.

Dr. B. Mohankumar, Associate Professor attended biennial workshop on All India Co-ordinated Research Project on Agroforestry, organised at Tamilnadu Agrl. University, Coimbatore during 16-19 of March, 1994.

College Library

A total of 24 foreign journals and 12 Indian journals were subscribed during the period and total of 169 titles were added to the library. All the titles were properly catalogued.

Instructional Farm

The area allotted to college is subdivided into three blocks, block A (for wood lots), block B (for asexually propagated materials) and block C (for rare and endangered species). Planting of this area was almost completed.

Trees planted in arboretum block I and II were also properly maintained.

Research Projects

The following externally assisted projects were operated during the period.

- 1) Standardisation of nursery techniques of selected tropical forest tree species (funded by State Forest Department).
- 2) Rain Water Conservation in Coconut based agroforestry systems by water harvesting techniques (funded by ICAR).
- 3) Nutrient Cycling in coconut based intensive multiple cropping systems (funded by ICAR).
- 4) Mineralisation of nitrogen in degraded forest soils under *Eucalyptus tereticornis* and *Acacia auriculiformis* (funded by State Forest Department).

- 5) Light utilization and canopy nitrogen use efficiency of component crops in some selected agroforestry systems (funded by USDA).
- 6) Clonal propagation of rosewood (funded by State Forest Department).

The All India Co-ordinated research project on Agroforestry was implemented at the Thiruvazhamkunnu centre of University. The technical control of the project continued to be exercised by the faculty staff of the college.

Tree crop nursery

A tree nursery was established in the premises of the College. Seedlings of more than 80 species were maintained in the nursery for instructional purpose. Seedlings raised in college nursery and also those raised by students through 'Earn While You Learn' programme were sold to farmers. Seedlings were also used for campus planting.

1. 5. 1 Southern zone

i) REGIONAL AGRICULTURAL RESEARCH STATION, VELLAYANI

The Regional Agricultural Research Station for the Southern Zone has been functioning at Vellayani since February 1982. Apart from the continuing research activities under the NARP Phase I and Phase II (and the re-prioritised thrust areas), the station implemented 25 externally aided research projects comprising four All India Co-ordinated Research Projects, six ICAR *ad hoc* schemes, seven STED projects, one Central Silk Board Scheme, one ICSSR scheme, three DBT projects, one international project on soil reference collection aided by ISRIC, Wageningen, one Potash Research Institute Project, one Emeritus Scientist scheme (ICAR) and one Young Scientist's Award scheme (STED).

The Special Station at Kottarakkara (renamed as the Farming Systems Research Station with effect from 13.10.93), the Cropping Systems Research Centre at Karamana and the Coconut Research Station at Balaramapuram continued as the three satellite stations in the zone. The ECF (Experiments in Cultivators' Fields) unit of the AICARP Centre at Karamana which functioned at Mannuthy was shifted to the Rice Research Station, Kayamkulam with effect from 1.6.93. Dr. N. Mohanakumaran continued as Associate Director.

Mandate

Conduct of location-specific research on the field problems relating to tuber crops as well as development of suitable technology for the farming system (s) in the different agro-ecological

situations of the zone and multitier cropping systems suited to the different sized homesteads were the main research responsibilities, in addition to testing and verification of research results on pulses, oil seeds, cereals (rice), coconut, banana, pepper etc.

Lead functions

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

Verification function

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

Staff

Changes during the period

Smt. Valsala, K was appointed Research Associate in the DBT project on "Micropropagation of tree spices of Kerala" w. e. f. 29.4.93. Sri. L. Sankutty was posted (during Nov., 1993) as Lab. Asst. with retrospective effect from 20.2.1993.

Dr. D. Dale, Prof. of Entomology (AICRP on Pesticide Residues) and Dr. T. Nalinakumari, Assoc. Prof. of Entomology [NARP (Phase I)] were mutually transferred w. e. f. 31.7.1993. Sri. P. A. Rajan Asari, Assoc. Prof. of Entomology, AICRP (PR) and Smt. K. Sudharma, Assoc. Prof. of Entomology, College of Agri. were mutually transferred w. e. f. 31.7.93.

Smt. M. Meena Kumari joined the DBT Scheme on Rhizobium-pulses association and Smt. Neelofar Illiaskutty joined the ICAR *ad hoc* scheme on Nutritional studies on pulses, as Jr. Res. Fellows w. e. f. 17.11.93 and 8.10.93, respectively.

Dr. Lekha Sreekantan, Assoc. Prof. of Agronomy, AICRP (F. C.) was deputed to the State Planning Board on 1.12.93. Smt. K. R. Sheela, Asst. Prof. of Agronomy joined the resultant vacancy.

Sri. S. M. Shahul Hameed, Asst. Prof. of Agronomy [NARP (Ph. II)] was transferred to the KHDP-Vellayani Unit along with the post w. e. f. 1.2.1994.

Dr. Abraham Jacob joined the AICRP (Honey Bees) as Professor of Entomology on 1.3.94.

Smt. Anitha, N. Asst. Prof. (Ent.), CSB Scheme on Sericulture was transferred and posted as Asst. Prof. (Ent.) in the AICRP (Nematode pests), vice Smt. Jiji, T. granted study leave for Ph. D. course from 21.3.1994. Sri. Krishnakumar, R., completing his Research Fellowship, was posted as Asst. Prof. (Ent.) in the CSB Scheme on Sericulture on 21.3.1994.

Smt. Leena P. Joseph who worked in the ICSSR scheme (Women workers) as Research Associate (till 29.3.94) was relieved consequent on the termination of the scheme.

Staff position

a) Scientists

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

b) *Administrative/supporting/para-technical*

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

Additional duties assigned to scientists

Scientist	Additional duties
Dr N Mohanakumaran Assoc. Director	Project Coordinator (Biotechnology) Member, Governing Board Centre for Management Devt.
Dr D Dale Professor of Entomology	Staff Editor of the College Magazine
Dr P Saraswathy Associate Professor (HG)	Head of the Department of Ag. Statistics
Sri N Ramachandran Nair Assoc. Prof. (Pl Breed.)	Assistant warden of the PG Men's Hostel and i/c College Guest House
Dr L Rajamony Assoc. Prof. (Hort.)	Assistant Warden UG Men's Hostel
Dr G Raghavan Pillai Prof. of Agron. AICRP (Forage)	Officer i/c vehicles Proj. Co-ordr. (F. C.) Member State-level Fodder Development Committee
Sri P Sreekumar Office Assistant	i/c EDPIC

Details of participation of scientists in seminars, workshops, Summer Institutes, Symposia etc.

Name & Designation	Details of Seminar/ workshops/Symposia	Date and venue
1	2	3
Dr G Raghavan Pillai Professor AICRP (Forage)	XVII Ann. workshop on Forage Crops orgnsd. by AICRP (FC)	15 & 16 April, 93 Pune
Dr P R Ramasubra- monian, Professor (Soil Sci.)	XV Zonal workshop (Problem Area Zone)	16 & 17 April, 93 Kumarakom
Dr P R Ramasubra- monian, Professor (Soil Sci.)	XV zonal workshop (Central zone)	4 & 5 May, 93 Pattambi
Smt N Anitha, Asst. Prof. (Ent.)	Trg. on Silkworm grainage & cocoon reeling	18 to 25 May, 93 SSPC & CSTR1, Palakkad
Sri S M Shahul Hameed Asst. Prof. (Agronomy)	Summer Institute Adv- ances in Agronomy	6 to 21 June, 93 Raipur

1	2	3
Dr Thomas Varghese, Principal Coordinator Dr M Subramonia Iyer Dr N Saifudeen, Assoc. Co-coordinators of the USREC Project	Workshop on Biodiversity. Organised by State Committee on Science, Technology and Environment	19.6.1993 TBGRI, Palode
Dr M S Sheela & Smt Hebsy Bai, Assoc. Prof. (Ent.)	8 th Biennial workshop on AICRP (Nematodes) & National Symp. on Recent Approaches in Integrated Nematode Management of Agrl. crops	2 to 7 Aug., 93 Hissar
Dr P Manju Assoc. Prof. (Pl. Br.)	Seminar on Molecular Biology & Biotechnology New Recipes to Feed the World beyond 2000 AD	14.9.93 Vellayani
Dr Thomas Varghese Principal Coordinator Dr M Subramonia Iyer Dr N Saifudeen, Assoc. Co-coordinators of the USREC Project	International Seminar on managing red & lateritic soils for sustainable agriculture in India. Organised jointly by NBSS & LUP (ICAR), Nagpur and Indian Soc. Soil Science	24 to 28 Sept., 93 Bangalore
Dr N Mohanakumaran Associate Director	Seminar on Floods organised by CWRDM	30.9.93 Thiruvananthapuram
Dr D Dale Prof. of Entomology	Ecc-friendly Agro-input Seminar by Ecomax Agro-systems Ltd. & Aspinwal & Co. Ltd.	10.10.93 Thiruvananthapuram
Dr D Dale Prof. of Entomology	Seminar on Recent Advances in HPLC Instrumentation organised by Waters (India), Bangalore	21-10-93 Thiruvananthapuram
Dr M Subramonia Iyer Assoc. Prof. (Soil Sci) Organised by DOR	Training on Reflex Management	25 to 29 Oct. 1993 Computer Centre VKA

1	2	3
Dr N Mohanakumaran Associate Director	Workshop on Intensive Paddy Cultivation, organised by DoA	28 & 29 Jan. 94 Thiruvanantha- puram
Dr N Mohanakumaran, Associate Director; Dr P R Rama- subramonian, Professor; Dr M Subramonia Iyer, Associate Professor Dr P R Rama- subramonian, Prof. (Soil Science)	Guest lecture on Challenges to Sustainable Agri- culture in 2000 AD by Dr Hari Eswaran, Director, World Soil Resources, USA, Symp. on Soil mapping for Resource Planning organised by Dept. of Soil Survey & NBSS & LUB (ICAR) Nagpur	7-2-94 Vellayani 1-3-94 Thiruvanantha- puram
All Scientists	Farmer's Seminar organised by CoA, Vellayani	18-3-94 Vellayani
Dr G Raghavan Pillai, Professor of Agronomy	District Dairy Seminar organised by the Dept. of Dairy Devt. at Urriakode, (Ksheerolsavam)	19-3-94 Urriakode
Dr N Mohanakumaran, Assoc. Director; Dr P R Rama- subramonian Professor and Dr M Subramonia Iyer, Assoc. Professor Dr G Raghavan Pillai Professor of Agronomy	Farmer's Seminar organised by FSRs, KTRA & RARS. VLY	28-3-94 Kottarakkara
	State-level workshop on Rice Production organised by DoA.	28 and 29 March, 94 Parottukonam

Details of Seminars/Workshops/Symposia conducted at the Station

Particulars	No. of participants	Period and venue
1	2	3
AICRP Workshop on Honeybee	AICRP delegates from different centres	27-29 May, 93 Thiruvanantha- puram

1	2	3
XIV Zonal Workshop of the Southern Zone	102 participants from DoA (36), KAU (48) CTCRI (2), CPCRI (3), Soil Cons., Soil Survey, FIB, Forestry, Fisheries (13)	4-5 June, 93 Vellayani
Sericulture Training programme	Dy. Dirs. & Officers of Social forestry dept. (17 participants)	22-25 Sept., 93
Workshop on 'Communication through radio' under the auspices of the Magazine Committee of the College of Agri., organised by Dr D Dale Prof. of Ent.	Students of the College of Agriculture, Vellayani	24-25 Oct., 93 Vellayani
One week training in computer operation (Text processing) for 6 batches of ten scientists each	Scientists of the College of Agriculture Vellayani (60)	18-10-93 to 20-11-93 (Total 6 weeks)
Farmer's Seminar on (1) Sericulture and (2) Sustainable Agri. organised by CoA & RARS, Vellayani	98 farmers in each session	18-3-94 Vellayani

Involvement of staff in academic programmes

All the scientists attached to the NARP and other schemes took classes for UG and PG students. Some of them guided post-graduate students. 15 UG courses and 23 PG courses were handled by the scientists attached to this station.

RESEARCH

Project sanctioned/extended during the period

Scheme/Project	Principal Investigator	Date of Implementation
1	2	3
DBT project on Rhizobium-pulses association: Development of efficient strains of <i>Rhizobium</i> suitable for acid soil condition	Dr S K Nair Professor (Pl. Path.)	12-5-93

1	2	3
Young Scientist's Award Scheme (STED) on Potential of bio-agents in the control of root-knot nematode in the field	Dr M S Sheela Assoc. Professor (Nematology)	2-6-93
ICAR <i>ad hoc</i> scheme on Epidemiology of honeybee diseases in Kerala	Dr Abraham Jacob Professor (Entomology)	1-3-93
ICAR <i>ad hoc</i> scheme on agro-forestry systems of Kerala	Dr M Achuthan Nair Assoc. Prof. (Agr.)	1-8-93
STED project on the utility value of foldable solar dryers	Smt Mary Ukkuru Assoc. Prof. (Home Science)	Terminated on 30-11-93 Six months extension granted Jan., 94
AICRP on Honeybee	Dr Abraham Jacob Prof. (Ent.)	
PRI scheme on standardisation of plant part in banana as an index of potassium availability	Dr P Padmaja Prof. (S S & A C)	
STED project on identity of <i>Phytophthora</i> affecting coconut and pepper and its biological control	Dr C K Peethambaran, Associate Professor (Plant Pathology)	15-09-93
ICAR <i>ad hoc</i> scheme on nutritional studies on pulses	Dr L Prema Prof. and Head (H. Sc.)	Terminated on 22-1-94 Six months extension granted
CSB scheme on Sericulture	Dr K S Pillai Professor of Entomology	Terminated on 3-2-94 One year extension granted

Major research achievements

Coconut: Root application of Monocrotophos gave 85.5% mortality of red palm weevil.

The percentage of nut infestation by *Paradasynus rostratus* was positively correlated with rainfall and humidity and negatively with temperature.

Pulses and Oil seeds

Cowpea: Under the project on genetic improvement of grain cowpea for the region, evaluation of germplasm was followed by IET, CYT and farm trials. Among the varieties evaluated for high, yield, tolerance to pests/diseases, synchronous maturity and suitability to kharif upland/summer rice fallow, the variety CoVU-810 gave the highest seed yield (940 kg/ha), followed by DPLC-210 (799 kg/ha) and CoVU-358 (705/kg/ha). The earliest was CoVU-869 (58 days).

Groundnut: IET with 18 varieties/types of groundnut conducted in summer 1993 indicated that the variety VGE-55-1 recorded the highest mean dry pod yield of 0.7 t/ha followed by TMV-2(0.66t/ha). The maximum mean 'fresh haulm yield was given by ISKD-8802. (8.3 t/ha) followed by NRCGE (3.2 t/ha).

Vegetable Crops

Bhindi; Bhindi varieties (62) were multiplied and maintained for estimating combining ability.

Among the different varieties of bhindi screened for tolerance resistance to yellow vein mosaic, *Abelmoschus moschatus*, *A. ficulneus*, *A. tetraphyllus* ssp. *tetraphyllus*, *A. manihot* ssp. *manihot* and an unidentified species of *Abelmoschus* (collected from a private nursery), were found either resistant or tolerant to the virus. In addition, the cultivated accessions 94-4, 94-5, 94-280, 94-290 and 94-296 were also found symptom-less, especially upto the stage of 15th harvest. In general, collections with small and green fruits were either more resistant or tolerant compared to the collections with long and white fruits.

Screening of 56 varieties of okra for resistance to root-knot nematode *M. incognita* revealed that the varieties NBPGR-19, 67,809 and 944 were highly resistant. Varieties NBPGR-20 and NBPGR-809 were resistant NBPGR-36, 255,810 and 864; AE-102, 118, 166,180,190,193,194,195,196,198,201 and 203; Anakomban Vella and Kiran were highly susceptible. NBPGR-789, 790,845,865,881 and 888 failed to germinate. The rating followed was no galls and no egg mass-highly resistant; 1-10 galls resistant; 11-30 galls-moderately resistant; 31-130 galls susceptible and 100 & above—highly susceptible.

Watermelon: In the screening of watermelon varieties suited to the southern zone, the varieties Madhu and Sugar Baby were found promising. Evaluation of the performance of nine watermelon varieties during the third crop season, 1993-94 revealed the superiority of the variety Sugar Baby in terms of earliness of

female flower production, number of fruits per plant, lowest rind thickness, total crop duration and TSS.

Snakegourd: The bait-trap using ripe banana fruits applied with carbofuran at the cut ends was found effective in trapping adult fruit flies in snakegourd.

Pesticide residues

Cardamom: Residues of quinalphos in fresh cardamom reached below the Maximum Residue Limit (MRL) of 0.25 ppm (FAO, WHO, 1973) within 23 and 24 days when applied at 0.05% and 0.10% respectively, while the corresponding figures for cured cardamom were less (20 and 21 days).

In the case of monocrotophos, the waiting periods fixed for fresh cardamom were 22 and 23 days when applied at 0.05% and 0.10% respectively, while for cured cardamom, it was 23 days for both the doses tested.

Assessment of the residue of mancozeb in cardamom pod, revealed that the mean initial deposit of 7.07 (0.2% concentration) and 14.76 mg/kg (0.4% concentration) dissipated below the MRL of 3 ppm within 12 and 19 days respectively. When the capsules were subjected to rigorous washing with water, the residues could be brought down to the tune of 37 to 82% and the waiting periods could be reduced to 0 to 2 days for the lower and higher doses.

Pepper: From the studies on the degradation of mancozeb residues in pepper, the initial residues in fresh pepper revealed that when applied @ 0.2 and 0.4 per cent waiting periods of mancozeb in fresh and dry pepper were 15 days, 19 days and 20 days and 22 days for the lower and higher doses respectively for fresh and dry pepper.

Vegetables: Contamination of fresh vegetables with organo-phosphate insecticide residues often reach beyond the maximum permissible residue limits. The residue levels of monocrotophos and Phosphamidon detected was upto seven times MRL fixed.

The waiting period calculated for quinalphos in brinjal fruits was 11 days for both the doses tested.

In amaranthus, a waiting period of 28 and 30 days was fixed for carbofuran in the lower and higher doses, respectively.

Cowpea: Waiting periods of 4 and 8 days were fixed for the recommended and double the recommended dose respectively. Washing of green pods could remove upto 39% of the initial deposit and washing followed by cooking could remove upto 59% of the deposit.

The peak level of carbofuran was detected at seven days after treatment in vegetable cowpea (0.637 ppm and 1.085 ppm) which dissipated to 0.105 ppm and 0.150 ppm in the lower and higher doses respectively at 28 days after the application.

Animal Feed: Monitoring of pesticide residues in animal feed, feed concentrates, green fodder and straw from different locations in Thiruvananthapuram district indicated HCH residue contamination ranging from 0.141 to 0.409 ppm. Green fodder and straw were free from any HCH or DDT residues.

Milk and milk powder: Monitoring of organo-chloride residues in bovine milk collected from 23 panchayats in Thiruvananthapuram district revealed that all samples collected contained residues of HCH. Out of this, the samples from 10 panchayats contained gamma HCH residues above MRL.

Two out of the ten samples of breast milk collected from the Taluk Hospital, Nedumangad contained HCH residues in traces.

Pesticide residue analysis in milk samples collected from 53 Milk Producer's Co-operative Societies in Thiruvananthapuram district revealed the presence of HCH residues in all the samples. None contained DDT residues. Samples from 25 Primary Milk Marketing Societies contained gamma HCH residues above the MRL of 0.2 ppm on fat basis.

Six brands of milk powder marketed in Thiruvananthapuram showed the presence of HCH residues in the range 0.106 to 0.315 ppm. The gamma HCH level was below the MRL.

Fodder grass: Guinea grass varieties (45) were maintained in the germplasm. They are being catalogued with the help of a descriptor. Eight varieties of stylosanthes were maintained in the germplasm.

One guinea grass variety Marathakom was found to be the best seed yielder among the 17 clones of fodder grass evaluated. The fodder bajra variety RFB-1 recorded the maximum green forage and dry matter yield.

Study on the influence of biofertilisers on fodder yield of maize indicated that azospirillum inoculation produced an yield increase of 14.5% of green fodder and 14.1% of dry fodder over the un-inoculated control.

Nitrogen requirement of guinea grass planted in the alleys of subabul was found to be half the normal recommendation of 200:50:50 kg NPK per ha.

Intercultivation of fodder grass in coconut gardens increased the WHC at the sub-surface layers. The bulk density values reduced. The porosity and soil structure were indirectly influenced by grass roots. The hydraulic conductivity and infiltration rates were increased by growing fodder crops compared to the plots without fodder crops.

An ICRISAT-NBPGR-KAU collaborative programme on collection, conservation, evaluation and utilisation of the germ-plasm of ICRISAT's mandate crops, is undertaken by the AICRP (Forage) at Vellayani Centre. About 3000 lines of sorghum and minor millets were maintained and observations taken periodically.

Beneficial microorganisms and productive insects

Sericulture: Mealy bugs, scales, grass hoppers and a new species of white flies were found attacking mulberry plants.

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

VAM: Microbial inoculation (VAM/*Rhizobium*) gave higher green and dry fodder yield of stylosanthes under an intercropping system with cassava.

Ten native VAM fungi have been isolated for black pepper. Isolate No. 4 developed from cultivar Kuthiravali was found better than the other isolates and standard cultures, *E. fasciculatum* and *G. etunicatum*, in stimulating plant growth.

Artificial inoculation of tissue culture plantlets of rose with VAM fungi significantly increased their growth and establishment.

Honey bee: The disease infecting the honey bees has been identified as the Thaisac Brood caused by a virus.

Survival of the Italian bees under the Kerala conditions is satisfactory and so far, no disease has been observed in these colonies.

Mushrooms: Two efficient native strains of *Pleurotus* species namely, *P. petaloides* and *P. sepidus* were brought into pure culture and these species were domesticated.

An efficient hybrid (white) of *Pleurotus* was developed with the interstock hybridisation of *P. petaloides*. This hybrid was found most suited to the varying agroclimatic situations in Kerala.

Effective method for pest management in *Pleurotus* species has been developed. Technologies have been developed and standardised for both spawn production and cultivation of *Pleurotus* spp.

Fruits and Floriculture

Banana: For Red Banana, the superiority of the fertilizer treatment @ NPK 370:40:360 g per plant in terms of high yield was revealed.

Benfurocarb and Carbofuran granules each at 16.6g per plant could decrease the nematode in Njalipoovan banana and improve the plant stand when observed 150 days after treatment.

Significant reduction in nematode infestation on banana suckers and yield increase could be recorded by hot water treatment of the suckers + neem cake + carbofuran application.

Anthurium: Mature plants of eight commercial varieties of anthurium were collected and evaluated for their variability in growth, production and spathe characteristics.

Solrite and coarse sand were found to be good for planting tissue cultured plantlets of *Anthurium*.

Orchids: Survey and identification attempted on the pests and diseases of ornamental plants (Orchids, Anthurium and Gladiolus) in the nurseries in Thiruvananthapuram district revealed that orchids were infested mainly by the *Chysomelid* grubs of *Lema sp.* feeding on the flower buds and flowers. Application of Nuvacron @ 0.03% spray at regular intervals could control the infestation.

Gladiolus: Varieties Oscar, Her Majesty and Winks Glory have been found as promising *gladiolus* varieties for the southern zone. A leaf caterpillar *Plusia sp.* was found damaging the young plants considerably.

Biotechnology

Nutrag: A media formulation which can induce 6x multiplication of axillary shoots has been standardised. These shoots could be rooted *in vitro*.

Clove: Clove has proved to be highly recalcitrant to *in vitro* culture. However, single shoots could be induced from nodal region of single noded or two-noded explants. Callus could also be induced by culturing root meristem in cytokinin rich medium in presence of potent auxins like 2,4-D.

Anthurium: Protocol has been developed for the large scale production of the pink variety of anthurium.

VAM Va. *in vitro* propagation: Inoculation of VAM fungus *Glomus etunicatum* to tissue culture plantlets of jack increased the survival rate to 100% as against 31.25% for non-mycorrhizal (control) plants.

Plant protection: *Rhizopus stolonifer* isolated from red cotton bug *Dysdercus cingulatus* was found to be a potent pathogen against crop pests like rice bug, coreid bug, mealy bug and pod bug.

Post-harvest technology: Dehydrated products of tapioca, bittergourd, field beans, pine apple and banana were standardised using solar drier and compared with sun drying.

Other activities

NARP (Phase II) Evaluation

The physical, financial and technical achievements under Phase II were evaluated during May 1993 (26th to 31st), by a High Powered Evaluation Team comprising Dr. S. Jayaraj (Former Vice-Chancellor, TNAU), Dr. S. P. Ghosh (Project Director, NARP, ICAR), Dr. S. N. Saha (Scientist, NAARM) and Dr. S. Gangopadhyay (Principal Scientists, Project Unit, ICAR).

Zonal and other workshops conducted

The XV zonal workshop of the southern zone was held on 4th and 5th June, 1993 at the RARS, Vellayani.

The research results and the results of the farm trials conducted were presented at an exhibition arranged for the occasion. There were 102 participants classified as below:

Zonal workshop	No. of participants			
	DOA	SAU Stations	ICAR/CSIR Institutions	Other Departments/ Organisations
XV	36	48	5 (CTCRI 2 CPCRI 3)	13 (Soil conv. 4 Soil Survey 6 FIB 1 Forestry 1 Fisheries 1)

EXTENSION

Sericulture training programme

A sericulture training programme was arranged for the benefit of the Deputy Directors of Agriculture and Officers of the Social Forestry Department, from 22 to 25 September, 1993. The programme was inaugurated by Sri. P. S. S. Thomas, Member Secretary, Central Silk Board. Dr. N. Mohanakumaran, Associate Director and the scientists of the CSB Scheme were actively involved in the programme.

T & V Monthly Workshop

The T & V Monthly Workshops for the Thiruvananthapuram Dist. were held at Vellayani on 16-4-93, 7-5-93, 9-7-93, 13-8-93, 16-9-93, 8-10-93, 12-11-93, 10-12-93, 7-1-94 and 11-2-94. Dr. N. Mohanakumaran, Associate Director continued to function as the Chairman of the Workshop. Dr. V. Muraleedharan Nair was the Chairman of the Diagnostic Team. Dr. A. Visalakshi, Professor of Entomology, Dr. P. Karunakaran, Professor of Plant Pathology and Dr. P. Manikantan Nair, Professor of Plant Breeding were the resource persons.

Field Experience Training Programme

The NAARM, Hyderabad has recognised the RARS, Vellayani as a Centre for offering the Field experience Training Programme to the ARS Scientist Trainees.

During the period under report, the following scientist trainees underwent the training.

Name of trainee	Period of training	
	From	To
Chandran, K. and Saji, K. V. Suja, G. Asha, K. I., Anithakumari, P., Rasheed Sulaiman, P;	2-06-1993	13-7-1993
	6-11-1993	18-12-1993

Workshop on Communication through radio

Dr. D. Dale, Professor of Entomology organised a two-day workshop on 'Communication through radio' under the auspices of the Magazine Committee of the College, on 24 and 25 October, 1993.

Farm Advisory Service rendered

Necessary advice was rendered to the visiting farmers by the Scientists. Muttacaud & Kalliyoor continued to be the adopted villages of the RARS/COA, Vellayani.

Projects concluded during the period

The STED project on 'Changes in physico-chemical properties of coconut garden soils due to continuous intercropping of fodder grass' (Dr. S.Pushkala, Assoc. Professor of Soil Science) terminated on 30-8-93. Extension was granted till 31-12-93 by the STED.

The STED project on 'Investigations on the occurrence of recombinants/hybrids in *Phytophthora* and their role in the incidence of diseases in plantation crops' (Dr. P. Santhakumari, Assoc. Professor of Pl. Pathology) terminated on 17-10-93.

The ICSSR scheme on 'Nutritional status of women 'workers' terminated on 29-3-94.

Seed and nursery programme (Qty/number produced/ expenditure/receipt etc.)

Breeder seeds of the crop varieties released/recommended for the zone were maintained by the Department of Plant Breeding.

Chillies	—	Jwalamukhi, Jwalasakhi
Rice	—	Aarathy, Remya
Cowpea	—	Chharodi-1, V-26
Blackgram	—	TAU-2
Veg. Cowpea	—	Malika, Sharika
Guinea grass	—	Haritha, Marathakom
Sweet Potato	—	Kanjhangad
Amaranth	—	Arun
Bhindi	—	Kiran
Sesame	—	Soma, Surya, Tilak
Groundnut	—	TG-3, TG-14. Spanish improved

The seed multiplication was done by the Instructional Farm.

Revenue (Progressive) Rs. 45,607
Awards/prizes

Sri.R. Balakrishnan Asan, Assoc.Prof,(Stat.)and Sri.P.Sreekumar Assistant of the Regional Station, Vellayani received appreciation letters from the Vice Chancellor and Smt. P. Radha, Smt. B. Savitha and Sri. S. Raghavan, Typists, Good Service Entries, in recognition for the services rendered by them in connection with the PG Entrance Examination 1992.

Important Visitors

Name and Address	Purpose	Date
IDA Mission Dr. S. Jayaraj, Dr. S. Gangopadhyay, Prof. S. N. Saha & Dr. S. P. Ghosh	ICAR/IDA Mission for the evaluation for the evaluation of NARP Phase II progress	26 to 30 May 93, Vellayani
Dr. A. K. Raheja ADG (Ent.), ICAR Dr. O. P. Dubey Pri. Sci. (Ent.) & Dr. R. C. Mishra Proj. Coord. (HB)	Monitoring progress of research on ICAR ad hoc scheme on Honey bee diseases and to attend AICRP Workshop	27 to 30 May 93, Vellayani

1	2	3
Smt. Saraswathy Kunjukrishnan, Member Executive Committee	For selection of Res. Fellow (ICAR <i>ad hoc</i> scheme on pulses)	18-6-93 Vellayani
Dr. C. R. Hazra, P. C. (Forage crops), Dr. P. M. Mathur, NBPGR, Jhansi	Monitoring the progress of work under AICRP (Forage Crops)	7 to 9 July 93 Vellayani
Sri. P. S. Thomas, Member-Secretary Central Silk Board	To inaugurate the "Sericulture Training" programme	22-9-93 Vellayani
Dr. K. L. Chadha Dy. Director General (Hort.), ICAR Krishi Bhavan New Delhi	Review of the progress of research under ICAR schemes functioning at Vellayani	4-11-93 Vellayani
	Addressed the scientists of the Regional Station	5-11-93 Vellayani
Dr. S. P. Ghosh Proj. Dir., NARP ICAR, New Delhi	Monitoring progress of work under NARP (Phase II)	5-11-93 Vellayani
Tanzanian team (25 agriculturists and officials)	Visit Vellayani	12-11-93
Dr. P. M. Mathur Senior Scientist NBPGR, Delhi	Monitoring the progress of NBPGR-KAU-ICRISAT collaboration programme	4-1-94 & 5-1-94 Vellayani
Dr. K. Singh, IGFRI, Jhansi Dr. S. B. Tripathi, IGFRI, Jhansi	Monitoring the progress of work under the AICRP (Forage)	19-1-94 & 20-1-94 Vellayani
Dr. Amrithadevarathinam TNAU, Coimbatore		
Dr. Hari Eswaran, Director, World Soil Resources, USA	Visit and Guest lecture	7-2-94 Vellayani
Sri. Johny Nelloor, Sri. M. P. Thami, Sri. K. C. Joseph, Smt. Saraswathy Kunjukrishnan, Members, Executive Committee	For participation in the valedictory function of the Farmers' seminar and to release books published by the KAU to the farmers	18-3-94 Vellayani

II) FARMING SYSTEMS RESEARCH STATION, KOTTARAKKARA

The Special Station, Sadanandapuram, Kottarakkara was established under the National Agricultural Research Project as per the recommendations of the Research Review Committee of the ICAR for NARP (1979). The acquisition of land required for establishing the station was completed on 26.4.1986 and the Station started functioning in rented building with effect from 14.5.1986. Till then, the scientists of the Special Station, Kottarakkara worked at the RARS, Vellayani. The major items of civil works completed at the newly acquired site at Sadanandapuram included an Office-cum-Laboratory, a Trainees Hostel and four quarters for staff members. The station started functioning in the new building with effect from 23.4.1988. In October 1993, the station was renamed as Farming Systems Research Station.

Sadanandapuram is situated 5.0 km South East of Kottarakkara town along the Main Central Road (State Highway) in Vettikkavala village, Vettikkavala panchayath, Kottarakkara taluk, Kollam district. The total area is 8.96 ha, comprising two plots separated by a distance of 250 m. The Plot 1 known as Kshetrakkunnu, has an area of 4.03 ha and the Plot 2, known as Chanthapurayidam, 4.93 ha.

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

Mandate: The lead function of the station is research on homestead farming. The testing and verification functions include research on cassava and other tubers, rice, coconut based systems and vegetable improvement.

Research on various aspects of homestead farming system is the major thrust area. Other thrust areas include studies on water use efficiency and the drought management, improvement of the local rice variety Cheradi and standardisation of agrotechniques for increasing the yield of rice under Koottumundakan system of rice cultivation.

Staff

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

Changes during the period

Cadre	Name	Reason for the change
Assoc. Prof. (Soil Science)	Smt. Sumam George	Joined duty on 12-7-93
Asst. Prof. (Agronomy)	Smt. S Lakshmy	Joined duty on 9-3-94
Asst. Prof. (Ag. Engg.)	Smt. Gomathy Sarojam	From 4.9.93 to 10.2.94 and From 15.2.94 (Prov. appnt.)
Assistant Gr. I	Sri. Mohanan	Upto 27.5.93 Transfer
Typist Gr. I	Smt. N. Ponnamma	From 27.5.93
	Smt. S. Indiramma Smt. R. Usha	Upto 31.5.93 Transfer From 31.5.93
Driver Gr. II	P. S. Anilkumar	Upto 20.6.93
	K. O. Pappachan	From 13.7.93 to 7.1.94
	B. Sasidharan Nair	From 2.2.94 (Prov. appnt.)

a) Scientists

Cadre	Sanctioned	In position	Vacant
NARP Phase I			
Associate Professor			
Horticulture	1	1	—
Soil Science	1	1	—
Assistant Professor			
Entomology	1	1	—
Pathology	1	1	—
Agronomy	2	2	—
Economics	1	1	—
NARP Phase II			
Assistant Professor			
Horticulture	1	1	—
Veterinary	1	1	—
Soil and Water Engg.	1	1	—
Total	10	10	—

b) Administrative/supporting/para-technical/ministerial

Cadre	Sanctioned	In position	Vacant
NARP Phase I			
Farm Assistant (Agri.)	2	2	—
Lab Assistant (Gr. III)	1	—	1
Jeep Driver	1	1	—
Peon	1	1	—

	1	2	3	4
NARP Phase II				
Administrative Assistant		1	1	—
Assistant (Gr. I)		2*	2	—
Typist (Gr. I)		1	1	—
Farm Assistant (Agri.) Sr. Gr.		1	1	—
Farm Assistant (Vety) Gr. I		1	1	—
Total		11	10	—

* One post shifted from ND Scheme, Anandapally as per order No. GA/II/46179/92 dt. 17.12.92

Progress of works

The construction of a Fertilizer-cum-Pesticide store was taken up by the Director of Physical Plant during the period.

Additional duties assigned to the Scientists and carried out

Scientists	Additional duties
Dr. E. Vasanthakumar	Member, Text Book Committee of VHSE
Smt. Kunjamma P. Mathew	Resource person for T & V monthly workshop of Pathanamthitta district
Dr. S. Chandini	Farm activities
Dr. K. K. Sulochana	Mushroom Production Unit
Smt. Suman George	Purchase, repair and maintenance of equipment
Dr. M. O. Kurien	Farm Advisory Clinic (Vety.)
Dr. S. Rageena	Library; Vegetable seed production programme; PG classes at Vellayani
Smt. Darley Jose	Training programmes; Resource person for T & V monthly workshop of Idukki district
Smt. S. Lakshmy	Seed and nursery programme
Smt. Gomathy Sarojam	Soil and water conservation measures; design and erection of fertilizer store; plant propagation chambers, landscape design and installing drip irrigation system

Details of participation of scientists in Seminars, Symposia, Training programmes etc.

Name and Designation	Details of Seminars/ Workshops/Symposia	Date and Venue
Smt. Darley Jose	International workshop on sustainable farming and environment	27 to 30 April 93 Cochin
Smt. Darley Jose	Seminar on women and biodiversity	26-5-93 Valakom

Name and Designation	Details of Seminars/ Workshops/Symposia	Date and Venue
Smt. Darley Jose	Seminar on species diversity protection conservation and sustainable management of homegarden agroforestry system	KFRI and MSS Foundation Madras
All Scientists	Zonal Workshop (Southern Zone)	4th and 5th June 93 Vellayani
Smt. Kunjamma P. Mathew	T & V monthly workshop	8-6-93
Smt. Darley Jose	Pathanamthitta Seminar on environmental awareness	DOA 27-6-93 Karickam
All Scientists	Training programme on nursery management	27th & 28th Sept., 93 Sadananda-puram
All Scientists	Training programme on vegetable production	16th Oct., 93 Sadananda-puram
All Scientists	Training on principles and practices of homestead farming	22nd to 24th Nov., 93 Sadananda-puram
All Scientists	Training programme on nursery techniques in cashew and ornamental plants	4th to 7th Jan., 94 Sadananda-puram
All Scientists	Training on propagation of horticultural crops	1st to 11th Feb., 94 Sadananda-puram
All Scientists	Training on cultivation of vegetables, ornamental plants, flowering plants, mushrooms and storage of seeds	17th to 28th Feb., 94 Sadananda-puram
All Scientists	Training on pest and disease control of major cultivated crops; and maintenance of plant protection instruments	16th & 26th March 94 Sadananda-puram
Dr. S. Chandini, Dr. K. K. Sulochana, Dr. M. O. Kurien, Smt. S. Lekshmi	Karshika seminar on sericulture and agriculture	18-3-94 Vellayani
All Scientists	Karshika seminar	28th March, 94 Sadananda-puram

**Details of Seminars, Symposia, Training programmes
conducted at the Station**

Particulars	Number of participants	Period and venue
Training programme on nursery management	21	27th and 28th Sept., 93
Training programme on vegetable production	23	16th October, 93
Training on principles and practices of homestead farming	14	22nd to 24th Nov., 93
Training on nursery management	18	30th to 31st Dec., 93
Training programme on nursery techniques in cashew and ornamental plants	15	4th to 7th Jan., 94
Training on propagation of horticultural crops	43	1st to 11th Feb., 94
Training on cultivation of vegetables, ornamental plants, flowering plants, mushrooms and seed storage	41	17th to 28th Feb., 94
Training on pest and disease control of major cultivated crops and maintenance of plant protection instruments	40	16th and 26th March, 94
Karshika seminar		28th Mar. 94

Major Research Achievements

Integrated farming system: Under the project "Comparative economics of homestead farming with and without livestock in and around Sadanandapuram". The following results were obtained.

Average family size of the sample was 4.25. Nineteen respondents in the category "raising crops alone" and 26 respondents in the 'crop+livestock' category depended on agriculture as the main source of income.

The average area owned by a sample household was 0.6 ha, the first group owning 0.61 ha and the second group 0.58 ha. The net operational area was 0.59 ha.

The cropping pattern was dominated by perennial crops and the sample had a very high cropping intensity of 168%.

The average milk production per day was 3.25 l for the local breeds and 5.00 l for the cross breeds. Average lactation period was 272 days and 327 days, respectively for the two breeds.

Spices: The objective of the project "Standardisation of pots and potting mixture for bush pepper" (SPC-05-00-05/93 KTR(1) KAU) was to standardise optimum pot size and potting mixture for growing bush pepper in the homesteads. The pot size 45 x 30 cm was found to be best. The potting mixture M3 (1:2:2) was the best.

Rice: Among the 144 Cheradi types, there exhibited a wide range of variation for plant height, tiller number, panicle length and yield of grain (and straw). The grain yield ranged from 123 to 608 g/m² and straw yield, from 150g to 1389 g/m². The standard Cheradi gave a grain yield of 344 g/m² and straw yield of 854 g/m².

Extent of participation of research staff in teaching and extension activities

Dr. K. Vasanthakumar, Dr. K. K. Sulochana and Dr.S.Regeena gave guidance to PG students at the College of Agriculture, Vellayani. Dr. S. Regeena handled classes for the PG students on Agricultural Economics. As a member of the Advisory Committee, Dr. S. Chandini gave guidance to one Ph. D. student.

Projects sanctioned/extended during the period

1. Investigations on factors of excessive chaffness in rice
Work on this project at this location was started during July, 1993.
2. Performance evaluation of goat rearing under homestead farming system in Kollam district.

The project was sanctioned earlier; but could not be implemented at that time since the Principal Investigator was transferred. It was revalidated and work was initiated during this period.

Seed and nursery programme

(Qty/number produced, expenditure, receipt etc.)

Crop	Qty./number produced
Coconut seedlings (WCT)	4000
Arecanut seedlings (Mangala, Sumangala, Sreemangala)	4500
Cashew grafts	2800
Pepper cuttings (cv Karimunda)	12000
Mango grafts	255
Jack grafts	171
Ornamentals/fruit plants/miscellaneous plants	3600
Vegetable seeds	12kg
Total Expenditure 1,64,471	Receipts 1,08,989

Farm Revenue (Progressive) Rs. 1,08,969.00

Meetings attended

Dr. K. Vasanthakumar participated in the meeting on Watershed Research Programme (NWDPR) at Anchal on 12.4.93 and at Kadakkamon on 19.4.93. Smt. Darley Jose attended meetings on Watershed Research Programme (NWDPR) Kadakkamon on 20.4.93 and 21.4.93. The research proposals were formulated based on the discussions.

Important visitors

Name and address	Purpose	Date
A panel of three scientists from ICAR along with Associate Director of Research, NARP (SR)	Review & Examination of the station area for the proposed Krishi Vijnan Kendra	10.10.93
Smt. Lida Jacob District Collector, Kollam	For the valedictory session of a training on plant propagation for SC/ST youth as part of the special component plan programme	28.2.94
Sri. Baburaj, Superintendent of Police, Pathanamthitta	For the valedictory session of a training on plant protection for SC/ST youth as part of the Special Component Plan programme	26.3.94
Smt. Saraswathi- Kunjukrishnan, Member Executive Committee &	For attending the one day seminar organised by KAU and Land Use Board on "Land utilization, Conservation & management"	29.3.94
Dr. C. J. Thampi, Commissioner, Land Use Board	for selected farmers of Kollam district	

iii) CROPPING SYSTEMS RESEARCH CENTRE, KARAMANA

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

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

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

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

Staff

Changes during the period

Cadre	Name	In position		Reason for the change
		From	To	
Assistant (Gr. II)	Philip John		upto May, 1993	Transfer
	N. Valsan		30.7.93 to 6.09.93	Transfer
	S. Viswakumaran Nair		from 13.09.93	Transfer
Peon	P. K. Sukumaran Nair		upto 30.10.93	Retired
	R. Raghavan Pillai		from 1.12.93	Transfer
Chowkidar	R. Raghavan Pillai		upto 30.11.93	Transfer
	A. Anil Kumar		from 9.12.93	Transfer

a) Staff position (Scientists)

Cadre	Sanctioned	In position	Vacant
Non-plan			
Professor (Ag. Bot.)	1	1	—
Asst. Professor	2	1	1
AICARP (ICAR)			
Professor (Agron.)	1	1	—
Asst. Professor			
Soil Sci.	1	1	—
Statistics	1	1	—
Total	6	5	1

b) Staff position (Administrative/supporting/paratechnical ministerial)

Name of post	Sanctioned	In position	Vacant
Non-plan			
Administrative Assistant	1	1	—
Senior Grade Assistant	1	1	—
Lab. Assistant	1	1	—
Peon (Hr. Gr.)	1	1	—
Chowkidar	1	1	—
Part-time Sweeper	1	1	—
AICARP (ICAR)			
Technical Assistant	2	—	2
Farm Assistant (Sr. Gr.)	2	2	—
Typist	1	1	—
Messenger (Class IV)	1	1	—
Total	12	10	2

Major research achievements

Under the project "Evaluation of component vegetable crops in rice-based cropping system", raising bhindi (than other vegetables) during the third crop season was found to be profitable. The treatment rice-rice-bhindi recorded the highest grain yield (of rice).

The permanent plot experiment on integrated nutrient supply system in a cereal-based crop sequence revealed that combined application of organics and inorganics in kharif had "carry over effect" during the rabi also. Application of 50 per cent N through F. Y. M. during kharif was found to be highly beneficial for obtaining increased grain production.

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

The study of different doses of N, P & K in relation to the incidence of rice diseases indicated that the higher doses of N increased the incidence, while the higher doses of K decreased the incidence of diseases.

Additional duties assigned to scientists

Sri. V. Ramachandran Nair, Professor of Agronomy, CSRC, Karamana continued to guide two PG students in Agronomy in their thesis work.

Smt. V. Narayanikutty, Asst. Professor of Statistics, continued to handle one regular UG course (Ag. Stat. 101.) at the College of Agriculture, Vellayani.

Details of participation of scientists in Seminars, Workshops, Summer Institutes, Symposia etc.

Name & Designation	Details of Seminar/ Workshops/Symposia	Date and Venue
Dr. C. Sundaresan Nair Assoc. Prof. (Soil Sci.)	Zonal Workshop (Southern Zone)	4th & 5th June, 1993 Vellayani
Dr. S. Ravi Asst. Prof. (Pl. Path.)	Zonal Workshop (Southern Zone)	4th & 5th June, 1993 Vellayani

Details of Seminars/Workshop/Symposia conducted at the Station

Village adoption programme

The Scientists of the Station selected ten vegetable demonstration plots (in farmers' fields) and provided the farmers with improved seed material and recommended fertilisers, besides rendering technical advice on plant protection aspects.

Farm advisory service

The Scientists of the Station visited farmers' fields on their request to investigate upon the problems and to suggest remedial measures.

The techniques of "*Pleurotus*" cultivation was demonstrated to the farmers of the locality.

**Seed and nursery programme (Qty/number produced/
expenditure/receipt etc)**

Item	Qty. (kg)/Number distributed
Paddy seed	1822
Consumption paddy	15220
Paddy straw	9515
Vegetables	2550
Tapioca	1473
Banana (Ordinary)	93
Banana (Red Banana)	176
Banana (Nendran)	55
Banana (Other varieties)	24
Papaya	7
Jack fruit	34
Mango	4
Mushroom	2
Coconut	2549 No.
Arecanut	200 No.
Ceiba cotton	500 No.

Revenue (Progressive) Rs 1,32,367

Important visitors

Name & Address	Purpose	Date
Scientists of the Project Directorate, AICARP, Modipuram	Monitoring	12.7.93
Members, Assurance Committee of the General Council, KAU	Meeting	24.9.93
Members, Statutes Sub-Committee of the General Council, KAU	Meeting	20.10.93
Members, Work Committee of the General Council, KAU	Meeting	8.3.94
Members, Establishment Committee of the General Council	Meeting	23-9-93
Agri. Officers from Tamil Nadu, Karnataka & Andamans	Visit	14-1-94
Members, Accounts Committee of the General Council	Meeting	22-1-94

iv) COCONUT RESEARCH STATION, BALARAMAPURAM

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

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

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

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

Staff

Dr. K. Pushpangadan functioned as Professor & Head upto 22-9-93 and Dr. G. Padmakumari from 23-9-93 to 24-10-93. Dr. G. K. Balachandran, Professor was the Head of Office during the remaining period.

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

Major Research Achievements

Coconut: In the 'NPK fertiliser experiment starting from young seedlings', the yield per palm increased significantly with N, P and K. The main effect of K alone was significant. When K was applied at 450 g/p/y, the yield of nuts increased from 32 to 122 (Two-year block analysis of 1988* 1989). The yield increased further to 153 nuts when K was increased to 900 g/p/y. PK interaction was found to be significant. The highest yield of 79 nuts/p/y was recorded by P_2K_2 .

The experiment 'Management practices for a coconut-based multistoried cropping system in the red loam soils of Kerala', laid out during 1992, progressed.

Details of participation of Scientists in Seminars, Workshops, Summer Institute, Symposia etc.

Name & Designation	Details of	
	Seminar/Workshops/ Symposia	Date and Venue
All Scientists	XVI Workshop (Southern zone)	Vellayani 18-5-93

Details of Seminars/Workshops/Symposia conducted at the Station

Nil

Extent of participation of research staff in teaching & extension activities

TEACHING

Dr. G. Padmakumari functioned as the Major Advisor for one M. Sc. (Ag.) student in Plant Pathology and served as member of the Advisory Committee of another PG student in the College of Agriculture.

Two M. Sc. (Ag.) students of the College of Agriculture did their thesis research in the Station.

EXTENSION

Village adoption Programme

The programme started during 1990-91 was continued as per the approved programme

Farm Advisory Service

A group of five farmers of the influence area of the Coconut Research Station, Balaramapuram was taken to the Farming Systems Research Station, Kottarakkara to participate in the 'Seminar on Land Resources Conservation and Utilisation' held on 28-3-1994.

The farmers of the nearby area who visited the Station were given advice on the scientific methods of cultivation of coconut, the plant protection aspects, inter-cropping etc.

Seed and nursery programme (Qty/number produced/ expenditure/receipt etc.)

W. C. T. (9600 nuts) and T x YD (2750 nuts) sown during 1993 were ready for distribution by May-June 1994. The target for the year was increased to 20,000.

Action was taken to raise 1500 rooted pepper cuttings of variety Panniyoor-1, against the target 5000 proposed.

Banana (2000 suckers of Njalipoovan) planting was done for raising 4000 suckers for distribution to the farmers. From the planting, 2000 bunches also are expected.

Material	Quantity/No. distributed
Coconuts	194490
WCT seedlings	3284
T x YD seedlings	740
Pepper rooted cutting	252
Banana suckers	2333
Banana leaves	3365
Cudjans	30353
Mango fruits	Rs. 300
Tapioca	Rs. 3160
Grass	Rs .5583
Nendran bunches	42 kg
Red Banana	36 kg
Njalipoovan	2756 kg
Ordinary banana bunches	600 kg
Pineapple fruits	250 kg
Glyricidia cutting	500
Revenue (Progressive)	Rs. 8, 37,356

1.5.2. Special zone of problem areas

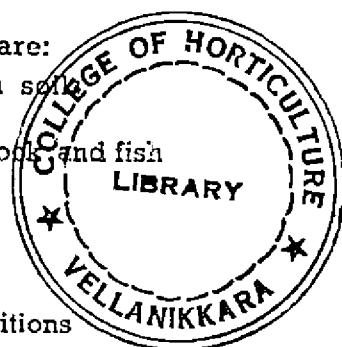
The special zone of problem areas is one of the agroclimatic zones demarkated to represent the geographical area where agriculture is risky, hazardous and exposed to the vagaries of nature. It lies in the coastal line of Kerala State, extending from Kollam district in the south to Malappuram district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

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

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

The thrust areas identified for the zone are:

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



A total of 111 research projects were in operation during the period for the entire zone. A scheme wise break up of experiments is furnished below:

Name of Station	Kuma- rakom	Mon- compu	Kay- amku- lam	Vytt- ila	Thiru- valla	Karu- mady	Total
<i>Funding Agency</i>							
KAU	24	21	14	9	11	0	79
NARP	—	—	—	—	—	—	—
ICAR (AICRP)	1	21	4	1	1	4	32

i) REGIONAL AGRICULTURAL RESEARCH STATION, KUMARAKOM

The Regional Agricultural Research Station is situated at 9°3' latitude and 76°3' longitude in the Kumarakom Village of Kottayam district in the southern side of 'Kavanar', 15 kms north of Kottayam town. The history of R.A.R.S., Kumarakom dates back to the year 1947, when the station was established by the Department of Agriculture with the financial support of the then Indian Central Coconut Committee. In 1958, the station was taken over by the State Department of Agriculture and from 1972 onwards the station is functioning under the Kerala Agricultural University. The station was upgraded as a Regional Research Station for the special zone of problem areas of Kerala in 1982. The land area of the farm, in the beginning, was 23.28 ha. During 1980, an additional area of 21.49 ha of land was transferred to Kerala Agricultural University making the total area of the Station 44.72 ha. The main objective of the station was originally to conduct research on coconut and coconut based farming system with special reference to coconut diseases. However, with the implementation of NARP,

the station became the lead station to conduct problem oriented location specific research on all crops in the special zone of problem areas of Kerala State. The main mandates of the station are research on coconut and coconut based farming systems, integrated farming and coconut root (wilt) disease.

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

Staff

Category	Sanctioned strength	In position	Vacant ^t
<i>Scientists</i>			
Associate Director	1	1	—
Professor	3	3	—
Associate Professor	8	3	5
Assistant Professor	10	8	2
<i>Administrative</i>			
Administrative Officer	1	1	—
Section Officer	2	2	—
Senior Office	2	2	—
Superintendent			
Office Superintendent	1	1	—
Senior Grade Assistant	2	2	—
Senior Grade Typist	1	1	—
Assistant Grade I	1	1	—
Typist Grade I	1	1	—
Assistant Grade II	3	3	—
Typist Grade II	1	1	—
<i>Para-technical and supporting</i>			
Senior Farm Supervisor	1	1	—
Farm Supervisor Grade I	1	1	—
Farm Assistant (Agri.)	7	5	2
Farm Assistant (Vety.)	1	1	—
Technician Grade I	1	1	—
Artist	1	—	1
Driver Gr. I (HDV)	1	1	—
Driver Gr. II (LDV)	2	2	—
Duplicator Operator	1	1	—
Bus Attendant	1	1	—
Lab. Assistant Gr. I	1	1	—
Lab. Assistant Gr. II	1	1	—
Lab. Assistant Gr. III	4	3	1
Pump Operator	1	1	—
Boat Driver	1	—	1
Sarang	1	—	1
Tractor Driver	1	—	1
Peon (Hr. Gr.)	3	3	—
Watchman	3	3	—
Sweeper-cum-Attendant	1	1	—
Fisherman	3	—	3

Faculty Improvement Programme

- a) Posts shifted/abolished/redeployed Nil
b) Deputation of staff to higher studies

Sri. K.J. Joseph, Associate Professor (Agrl. Economics) is undergoing Ph. D. Programme at GKVK Bangalore on deputation.

Smt. K. Geetha, Assistant Professor (Agronomy) is undergoing Ph. D. programme at College of Agriculture, Vellayani.

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

- G. Mathai, Professor attended agricultural seminar held at N.S.S. High School, Kottayam on 16-5-93.
- G. Mathai, Professor and Dr. A.V. Mathew, Assistant Professor attended Agrl. seminar held at service Co-operative Bank, Koorali on 30-6-93.
- G. Mathai, Professor and Dr. A. V. Mathew, Assistant Professor attended agrl. seminar held at Madona Rural Development Society, Mazreth, Kumarakom south on 1-7-93.
- G. Mathai, Professor and Dr. M. Suharban, Associate Professor attended agrl. seminar organised by Manjoor Village Development Samithy at Govt. H. S., Manjoor on 17-7-93.
- Dr. M. Suharban, Associate Professor attended agrl. seminar held at Darsana Auditorium, Kottayam on 10-12-93.
- Dr. A. V. Mathew, Asst. Professor attended agrl. seminar held at Kanakkary on 15-01-94.
- G. Mathai, Professor attended agrl. seminar organised by the Vikas Volunteer Vahini Farmers Club held at YMCA Auditorium, Mundakayam on 19-02-94.
- Dr. Anuradha Krishnan, Assistant Professor attended seminar on sustainable farming and environment held at Ernakulam on 28 to 30 April, 1993.

Major Research achievements

Trial with different sizes of daughter corm of Elephant foot yam indicated that planting of finger corm of 60 g size at a closer spacing of 45 x 45 cm was the optimum for maximum yield. The cost benefit ratio was also high in this case.

Different alternate substrate for Oyster mushroom cultivation were tested at this station. The results revealed that *Eliocharis plantogena*, a common aquatic weed of Kuttanad can effectively be used as a substrate for profitable oyster mushroom cultivation. *Eliocharis* was found to give 50 per cent more mushroom yield

when compared to paddy straw. The results of the study is presently more important in the light of the high cost of paddy straw.

A short duration tapioca variety suitable for growing as an intercrop in coconut garden has been evolved by the R.A.R.S., Kumarakom. This cultivar has been found to be very promising for cultivation in the special zone of problem areas. The KAU Variety Evaluation Committee approved this as a variety and the same is now pending approval of the State Variety Release Sub-Committee.

A new fungal pathogen causing leaf blight disease of *Amaranthus* has been identified for the first time at Kumarakom. The studies indicated that spraying with Dithane M 45 was most effective for its control.

In a study on nutrient management in banana cassava intercropping system it was seen that when banana and cassava are grown mixed, only 75% fertilisers for banana and 75% for cassava is required to produce higher yields under Kuttanad condition.

In another study it was found that Nitrogen had significant effect on the yield of amorphophallus grown as intercrop in coconut gardens of Kuttanad. N 120 kg/ha recorded the highest yield of corm and it was on par with N 80 kg/ha. Effect of K was not significant.

The results of another study revealed that early planting of elephant foot yam by the middle of February resulted in the maximum yield of corm. A delay in time of planting beyond the middle of April significantly reduced the growth and yield.

Experiments undertaken to study the suitability of various mangrove species under the fresh water situation of Kumarakom revealed that three species viz., *Rhizophora apiculata*, *R. mucronata* and *Avicerria alba* are the best.

In a study conducted in garcinia it was revealed that softwood grafting and side grafting are the two economically viable methods of vegetative propagation that can be popularised for garcinia multiplication.

It was also seen that processed seeds when sown after removing seed coat, started sprouting 15 DAS.

Results of the study on screening of banana varieties for partial shade have shown that 'Palayamkodan' is the best table type cultivar suited for intercropping in coconut gardens since it gives the highest bunch weight and maximum net profit when both plant crop and ratoon crop were taken into consideration.

'Booditha Bantha Batheesa and Monthan' were identified as the promising 'culinary type cultivars that can be recommended for intercropping in coconut gardens.

Studies on fish epizootic ulcerative syndrome conducted the centre have indicated that the disease can be controlled under experimental conditions by application of Povidone Iodine, a cheap anti-microbial agent. The drug has been shown to be equally effective as 'Cifax' a combination of underclosed ingredients. In the light of the elusive etiology of the disease, the chemotherapeutic agent identified is of practical significance.

Fazra Revenue

a) Expenditure (Rs. in lakhs)	50.041
b) Receipts	6.075
c) Seed and planting material distributed	
i) Paddy seed	5391 kg
ii) Banana suckers	937 Nos.
iii) Garcinia graft	175 "
iv) Mushroom spawn	558 "
v) Fish fingerlings	250 "
vi) Tapioca stumps	50 "

Important Visitors

RARS

Dr. S. Jayaraj, Ex. Vice Chancellor, TNAU	28.5.93
A group of 12 scientists, ICAR-IRRI working group	5.9.93
A group of 50 farmers from Coconut Development Board	21.1.94
A group of 20 delegates, State level farm feature workshop 94	3.3.'94
Sri. Johny Nellore, M.L.A	4.3.'94
Sri. K C Joseph, MLA	4.3.'94
Dr. C.J Thampi, Commissioner, Kerala Land Use Board	4.3.'94
Sri. PP George, Hon. Minister for Agriculture	7.3.'94
Dr. AM Michael, Hon. Vice Chancellor, KAU	8.3.'94

ii. RICE RESEARCH STATION, MONCOMPU

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

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

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

Standardisation of management practices so as to increase productivity.

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

Dr. C. A. Joseph continued as Professor and Head during 1993-94.

Staff

Category	Sanctioned	No. of posts In position	Vacant
<i>Scientific staff</i>			
<i>Research on Rice</i>			
Assoc. Professor (Agronomy)	1	1	—
Asst. Professor (Entomology)	1	1	—
Asst. Professor (Chemistry)	1	1	—
Asst. Professor (Botany)	1	1	—
Jr. Statistician	1	1	—
<i>AICRIP Centre, Moncompu</i>			
Asst. Professor (Botany)	1	1	—
Asst. Professor (Agronomy)	3	2	1
Asst. Professor (Entomology)	1	1	—
<i>N. A. P. P.</i>			
<i>Prof. of Plant Breeding</i>			
Assoc. Professor (Entomology)	1	1	—
Asst. Professor (Plant Pathology)	2	2	—
Asst. Professor (Plant Breeding)	1	1	—
Asst. Professor (Plant Phy.)	1	—	1
Asst. Professor (Ag. Chemistry)	1	1	—
<i>Paratechnical staff</i>			
Farm Supervisor (Grade I)	2	2	—
Farm Assistant (Grade II)	2	2	—
<i>Administrative and supporting</i>			
Admn. Assistant	1	1	—
Section Officer	1	1	—
Sr. Gr. Asst.	3	3	—
Asst. Grade I	1	1	—
Sr. Gr. Typist	1	1	—
Lab. Asst. Gr. III	1	1	—
Sweeper-cum-Attender	2	1	1
Watchman	1	1	—
Jeep Driver	1	1	—
Boat Driver	1	1	—
Lab. Asst. Gr. I	1	1	—
Lab. Asst. Gr. III	3	3	—
Boat Syrang	1	—	1

Faculty Improvement programme

- a) New posts sanctioned/ created/shifted/abolished — Nil
- b) Scholarships awarded to the staff and deputation of staff for higher studies — Nil

Seminars/Workshops attended

Name of person	Name of seminar/ workshop	Location	Date
1. Dr. N. Remabai	Monitoring tour of AICRIP for kharif 1993		October 1993
2. Dr. C. A. Joseph	Work group meeting of ICAR and IARI collaborative research on salt tolerance in rice	Cochin	3rd September
3. Dr. C. A. Joseph Dr. P. Varadarajan Nair	All India Workshop	Raipur	16-3-94 to 25-3-94
4. Dr. C. A. Joseph	State level workshop on augmenting rice production programme	Thiruvananthapuram	28-29 January 1994
5. Dr. P. V. Nair	Group meeting of ad hoc project on evaluation of rice germplasm	DRR, Hyderabad	12-6-93 to 18-6-94
6. Dr. C. A. Joseph	FRC meeting	Vellankkara	4-5 Feb. 1994

Research

The total number of projects/experiments taken up during the year under report in the station, Moncompu is 37. The break-up is given below :

Classification	NARP/ KAU	AICRIP	ICAR ad hoc	Total
1. Crop improvement	8	3		11
2. Crop management				
Agrl. Chem. and S. S.	2	2		4
Agronomy	2	5		7
3. Crop protection				
Entomology	1	6		7
Plant Pathology	4	3	1	8
Total	16	22	1	37

Concluded projects : Nil

Major research achievements

From the project "Evolution of blast resistant varieties of rice" one promising culture M-28-1-1 (Mo 5/Improved Sona) was proposed for release in the Variety Evaluation Committee of the KAU.

Culture 200, 204, 168, 304 and 310 were advanced to farm trial. Two promising mutant cultures viz., Mo 1-20-19-4 and Mo-1-20-3-1 were advanced to farm trial. 10 promising cultures with iron toxicity tolerance suited to kari lands of Kuttanad are now in the advanced stage of research.

In transplanted rice, the herbicides Pretilachlor, at 1.0 kg ai/ha, Anilophos + 2,4-DEE (0.3 + 0.4 and 0.4 + 0.53 kg ai/ha) and Butachlor + 2,4-D (1.0+0.4 kg ai/ha) recorded low weed dry weight, high weed control efficiency and higher grain yield statistically on par with weed free check and hand weeding twice.

Use of herbicides Butachlor 50 EC (1.0 kg ai/ha), Anilophos 30 EC (0.4 kg ai/ha) and Anilophos + 2, 4-DEE 32 EC (0.3+0.4 kg ai/ha) followed by one hand weeding at 20 DAS was found to control weeds upto flowering in direct sown rice.

Application of 33% extra dose of fertilisers produced higher grain and straw yields in transplanted rice compared to normal dose of fertilisers.

In situations where application of Nitrogen in splits is not possible, Nitrogen can be applied as a single basal dose using modified and coated urea materials. Fixation studies conducted for the different soil series of Kuttanad revealed an inverse relationship between 'K' and 'P'. When K fixation was higher the per cent 'P' fixation was low.

The long term study on zinc management in rice indicated that response to Zn application could be obtained only in Zn deficient soils. Residual as well as cumulative effect was observed in the Zn applied plots.

Two thousand nine hundred and seventy accessions of germ-plasm were screened for sheath blight and sheath rot diseases. Out of these, 70 numbers exhibited multiple resistance/tolerance to both the diseases.

While screening 54 advanced cultures of the Station against different diseases, 7 cultures viz., H 23, 26, 28, 30, 31 and 34 and K 16 were found to be tolerant to sheath blight and sheath rot diseases consecutively for 2 seasons.

Evaluation of new fungicidal formulations for sheath blight control revealed that atemi, contaf and bavistin granules were on par with validacin in checking the incidence and spread of the disease.

Expenditure	: Rs. 30.87 lakh
Farm revenue	: Rs. 1.85 lakh

Important visitors

Name	Date	Purpose
Dr. K. Gopalakrishna Pillai Project Director.	4-7-93	Review of work and preparing proposal for new programme
Dr. APK Reddy, Plant Pathologist.		
Dr. E. Krishnaiah, Entomologist, Directorate of Rice Research, Hyderabad		

iii) RICE RESEARCH STATION, KAYAMKULAM

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

The station was established in the year 1937 under the erst-while University of Travancore. It was subsequently transferred to the Department of Agriculture in 1953 and continued to function under the Department of Agriculture till 31-1-1972. With the formation of Kerala Agricultural University, this station has become one of its constituent units with effect from 7-2-1972. The major objectives of the station are given below.

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

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

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

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

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

Staff

Sri. S. Sukumaran Nair, Professor functioned as Head of Office from 1-4-93 to 31-5-93 and from 1-12-93 to 22-3-94. Dr. K. Sivan Pillai was holding full additional charge as Professor and Head from 1-6-93 to 30-11-93 and 23-3-94 to 31-3-94.

Designation	Sanctioned	In position	Vacant
<i>Scientists</i>			
Research on rice			
Professor	2	2	—
Professor (Ent.)	1	1	—
Assoc. Professor (Pl. Path.)	2	1	1
Asst. Professor (Agron.)	1	1	—
Asst. Professor (Ent.)	1	1	—
Asst. Professor (SS & AC)	1	1	—
NARP—II			
Assoc. Professor (Hort.)	1	1	—
AICRP on Oil Seeds			
Asst. Professor (Pl. Br.)	1	1	—
Asst. Professor (Agron.)	1	1	—
Total	11	10	1
<i>Administrative and Supporting staff</i>			
Research on rice			
Admn. Asst.	1	1	—
Sr. Gr. Asst.	1	1	—
Assistant Gr. I	1	1	—
Typist Grade I	1	1	—
Peon	1	1	—
Watchman	2	2	—
Driver (LDV)	1	1	—
Full-time Sweeper	1	1	—
Lab. Assistant Gr. III	2	1	1
Farm Supervisor Gr. I	1	1	—
Farm Asst. Sr. Grade	1	1	—
Farm Assistant	2	2	—
Regular Mazdoor	2	2	—
AICRP on Oil Seeds			
Lab. Asst. Grade II	1	1	—
Farm Assistant Gr. I	1	1	—
NARP Phase II			
Tractor Driver	1	1	—
Total	20	19	1

Major Research Achievements

Rice: A total of 10 promising lines were selected from the crosses involving M2 x 25331-1; M2 x 25331-3; M 210 x Ptb-28-2 and M 210 x Ptb-28-3. These cultures are under comparative yield trial stage. Culture/cultures of better performance are expected from this programme.

Mutation breeding programme was undertaken to refine the popular varieties of this locality, viz, Ptb-20 and Lekshmi. The promising mutants obtained were compared with their parents. The mutant of Ptb-20 (irradiated at 22 kr) was found to be promising over its parent. The culture P-22 was, therefore, selected and proposed for farm trial during 1994-95. The proposal was accepted by the NARP workshop held at Kumarakom on 7-5-1994.

From the hybrid progenies of the crosses involving Ptb-20 x Mashoori, the Cul-8781 was identified as most suited to this region. The culture was therefore proposed for farm trial and accepted by the Workshop held at R. A. R. S., Kumarakom on 7.5.1994.

Pulses: The project on identification of high yielding greengram varieties adapted to summer rice fallow of Onattukara through varietal screening was in progress. The results indicated that the variety Pusa-8973 is the highest yielder followed by the variety M3. These varieties will be proposed for farm trials.

The research project for evaluation of high yielding early maturing groundnut varieties for summer rice fallow resulted in the selection of two high yielding early maturing groundnut cultures, viz., Cul-614 (MK374 x Checks) Cul-608 (TMV-2 x Checks). These cultures were supplied for multi locational trials at Menonpara, Pilicode and Pattambi as decided in the XVI Zonal Workshop for problem zone held at R. A. R. S., Kumarakom during April 1993.

A field experiment to control the major pests of cowpea revealed that Malathion and tobacco decoction were equally effective against stemfly. Garlic extract applied at 500 g/5 l water was rated as the best against leaf weber.

Vegetables: In a trial to manipulate the frequency and quantity of irrigation using triazole in cucumber (*Cucumis melo* L), it was found that the triazole derivative, triadimefon, at 30 ppm could be effectively utilized for reducing the frequency of irrigation. This was confirmed by carrying out extensive studies on ultra structural studies in cell organelles.

Important Visitors

Dr. Mrs. Susan Kortz, Scientist, USDA
Dr. Varghese and Abraham, Scientists,
Nuclear Agrl. Dn; BARC, Trombay

iv) RICE RESEARCH STATION, VYTTILA

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

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

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

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

Staff

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

Faculty improvement programme

a) **New posts sanctioned/created/shifted/abolished** Nil

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

The scientific staff attended to the Zonal Research Advisory Council Meeting held at RARS, Kumarakom on 15th, 16th and 17th April 1993. Prof. K. M. George attended to the 28th and 29th Annual Rice Group meeting held at DORR, Hyderabad from 6th to 8th April, 1993 and 20th to 22nd March, 1994 held at IGKV, Raipur, respectively. Prof. K. M. George also attended to the INGER Problem soils monitoring programme sponsored by the International Rice Research Institute from 16th to 30th June 1993 in Thailand and Indonesia. Prof. K. M. George and Smt. K. S. Shylaraj, Asst. Professor attended to the ICAR-IRRI Working Group meeting on Soil salinity research during 3rd-5th September 1993 at Kochi. Sri. N. K. Sasidharan, Assoc. Professor (Agronomy) and Dr. M. V. Mohan, Asst. Professor (Aqua.) attended to a training course on indigenous instrumentation for agriculture and fisheries investigations at Central Institute of Fisheries Technology from 17th September to 3rd October 1993.

Involvement of staff in academic programme: Nil

RESEARCH

A total number of 14 research projects were in operation.

Major Research Achievements

The saline tolerant rice culture 655 evolved by gamma ray irradiation of the popular rice variety Mashuri, was proposed for release in pokkali rice tract. It is shorter than the parent Mashuri by thirty days.

Two high yielding, semi tall rice lines with tolerance to salinity and suitable to pokkali tract could be located from the International Rice Saline Alkaline Tolerant Observational Nursery. The cultures were promoted for advanced trials.

The cul. 708, an induced mutant of H4, was found to withstand salinity levels upto 12 m mhos/cm and hence selected for farm trials in the higher saline areas.

The results of the long term trials revealed that the present cropping system of the pokkali tract is a sustainable one. It balances with the fertility status of the soil. Rice yield levels upto 3.5 to 4.0 t/ha can be realised from pokkali fields without the application of chemical fertilizers. The results indicate the suitability of the pokkali fields for organic farming.

The brackishwater ponds, where low salinity prevails, carps can be successfully cultured along with milkfish.

Single stocking at 5000 Nos/ha and multiple harvesting of milkfish *Chanos chanos* gave yields of 2 tons/ha/year in brackish-water ponds.

Important visitors

Dr. D. Senadhira, Plant Breeder, IRRI, Manila
 Dr. T. L. Setter, Plant Physiologist, IRRI, Manil
 Dr. N. T. Singh, Director, CSSRI, Karnala
 Dr. B. Mishra, CSSRI, Karnal
 Dr. S. K. Sharma, Project Director, Cropping system
 Research, Modipuram

v) SURGARCANE RESEARCH STATION, THIRUVALLA

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

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

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

Staff

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

Faculty Improvement Programme

Smt. Leenakumari, Asst. Professor completed Ph. D. course at Bangalore.

Details of Seminars, Symposia, Training programme attended by staff

Dr. D. Alexander, Associate Professor and Sri. Thomas Mathew, Assistant Professor attended the All India workshop cum group meeting of AICRP on Sugarcane held at Lucknow from 24-25th October, 1993.

Smt. Jessy, M. Kuriakose, Assistant Professor, Sri. K. Sree-kumar, Assistant Professor and Sri. Thomas Mathew, Assistant Professor attended the NARP workshop held at Regional Agricultural Research Station, Kumarakom for the special zone on 7th May, 1994.

Major Research Achievements

The Kerala Agricultural University released two high yielding sugarcane varieties from the elite clones produced in this station. 'Madhuri'—Cul. 750/83 is now a popular variety among sugarcane cultivators. Madhuri is a high yielding (116 MT to 124 MT per ha), midlate manuring variety (12 months), moderately resistant to red rot disease and is suitable for flood prone and garden land situation. The variety 'Thirumadhuram'—Cul No. 577/84 is a midlate maturing high yielding variety with an average yield of 104 ton and 133 ton respectively in the garden land situation of South Kerala and semi arid tracts of Palakkad district.

The research efforts for the evolution of sugarcane varieties for different agro climatic tracts of Kerala and fluff exchange programme during the years 1985, 1986 and 1987 has resulted in the evolution of following clones which are under farm trials—85/85, 310/85, 527/85, 81/86, 519/86, 536/86 and 1150/87, 2604/87 and 2606/87.

Cul. 527/85 was identified as a superior sugarcane cultivar, in the farm trials. The culture has out yielded Madhuri in quality characters. Hence, proposed for release. Studies on suitability of varieties for jaggery production revealed that Co. 88121 and Co. 88017 have got high jaggery recovery compared to other released varieties of KAU and Co varieties.

Results of weedicidal trials conducted at Menonpara proved that, weed growth in sugarcane could be controlled by two applications of weedicide one with Atrazine or 2-4-D immediately after planting and another with economic advantage.

An improved genotype of snakegourd 'Kaumudi' was approved by University Variety Evaluation committee. The variety

gives an average yield of 50t/ha. It's white colour with thick flesh and less fibre content. It has got great acceptance among farmers. In bittergourd, selection 1010 is proposed as a variety, since this has outyielded the Priya and MC.84.

Publication by staff : Nil

Distribution of seed/planting materials

Sugarcane setts	--	4,24,592 (4.25 lakhs)
Banana suckers	--	836
Vegetable seeds	--	
Snakegourd	--	14.5 kg
Bittergourd	--	500 g

Important visitors

Dr. Sreenivasan, Senior Scientist and Head of Department of Plant breeding, Coimbatore visited the station on 13.1.94.

Dr. U. S. Shukla, Project Co-ordinator (Sugarcane), IISR, Lucknow 28.5.93

Dr. K. C. Alexander, principal Scientist & Head Dn. of Crop Protection, Sugarcane Breeding station, Coimbatore 28.5.93

Expenditure -- Rs. 17.69 lakh

Receipts -- Rs. 2.43 lakh

vi) AICRP ON AGRICULTURAL DRAINAGE, KARUMADY

The project viz., All India Co-ordinated Research Project on Agricultural Drainage under Actual Farming Conditions on Watershed basis is being implemented in 'Kavil Thekkumpuram Pada-sekharam', a part of Kuttanad situated in Ambalapuzha village and taluk of Alappuzha district. The scheme has come into effect from 1-12-1961 and was sanctioned for the 6th, 7th and 8th plan period.

The objectives and thrust areas of research are given below:

- i) To comprehend the effect of a surface and sub-surface drainage system on the movement of soil liquids
- ii) To study the pattern of hydrological cycle occurring in the watershed areas and its importance and influence on the drainage.
- iii) To develop a feasible technology for the lay out of sub-surface drainage system suitable to peak and muck soils.
- iv) To develop criteria for design parameters of surface drainage.
- v) To develop drainage pattern requirement for different crops.

- vi) To evaluate the feasibility of using the return flow from drainage for irrigation in relation to water quality rating.
- vii) To evaluate the socio-economic benefits accrued from the drainage projects.

Staff

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

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

Faculty improvement programme

Sri. E. K. Mathew, Assistant Professor has been selected for deputation to undergo Ph. D. programme for the year 1992-93 in the discipline of Soil and Water Engineering.

Details of seminars/symposia/training programme attended by staff

Sri. E. K. Mathew, Assistant Professor attended the 32nd International Training on Land Drainage held at ILRI Wageningen. The Netherlands from 16th August 1993 to 26th November 1993.

Sri. T. D. Raju, Assistant Professor attended the National Training on 'Field Drainage for the control of Ground Water table and Soil Salinity in Irrigated Agricultural Lands' held at CSSRI, Karnal, Haryana for a period of one month from 7th to 11th March, 1994.

Sri. Madhusudan Nair, Assoc. Professor and Sri T. D. Raju, Assistant Professor attended the South Zone CBIP workshop held IWS, Tharamani, Madras from 14 to 15 December 1993 and presented a paper entitled 'Role of sub surface drainage in the acid-saline rice fields of Kuttanad'.

Involvement of staff in the academic programme

Completely involved in research work.

RESEARCH

There were four experiments taken up under the coordinated project during the period under report.

Major Research Achievements

From the data collected since 1985 till date it is inferred that the average hydraulic conductivity is 0.231 m/day and the transmissivity is 0.334 m²/day. The above values can be used for future large scale adoption of sub surface drainage in this area.

There was significant difference in crop parameters between the sub surface drained area and control where farmers adopted only surface drainage according to their local practice. Although the plant population was much higher in the control, the number of panicles/m² was found to be not significantly superior. The panicle length, 100 grain weight and straw yield were also not much influenced by the adoption of sub surface drainage. In all the other parameters viz., height at maturity, number of grains/panicle, chaff % and grain yield, the sub surface drainage had significant effect over the control.

The results so far generated show that there is an increase of grain yield to an extent of 40 per cent by the adoption of sub surface drainage in Kari lands of Kuttanad.

The results of soil and leachate analyses revealed the following.

- 1) A moderate increase in pH (stabilised pH) indicating a decrease in acidity.
- 2) Total soluble salts have come down both in soil as well as in leachate over a period of eight years.

The data collected during 1992-93 from the experiment on evaluation of drain tube filters showed no significant difference among the treatments whichever the hydraulic head be. This reveals that no filter is as good as, any of the other filters tried. This confirms the previous years results.

Investigation on the feasibility of wider than so far adopted drain spacings and its economic advantages is in progress. The site comprising an area of 8 ha for the lay out of this new experiment has been selected at the farmers field of "Valiyathuruth Padasekharam", Karumady. The survey work has already been made. The required materials have been procured for this experiment. The tile drains could not be laid as the fields were under water fallow just after the harvest of the crop.

Farm revenue	: Nil
Expenditure	: Rs. 7.10 lakh

Publication

- a) Booklet entitled "Drainage and Rice Productivity"
- b) Role of sub surface drainage in the acid-saline rice fields of Kuttanad, presented at CBIP south zone workshop held at I. W. S., Taramani, Madras.

Other matters : Nil

Important visitors : Nil

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

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

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

Staff

Designation	No. of posts		
	Sanctioned	In position	Vacant
Assoc. Prof. (Agron.)	1	1	--
Farm Assistants	8	8	--
Assistant Gr. II	1	1	--
Driver	1	1	--
Watchman	1	1	--

The following on-farm trials were in progress during the report period.

1. Standardisation of rice varieties for different farming situations in the central zone for two crop and three crop rice sequences in normal situations.
2. Standardisation of rice varieties for kole land farming situations.
3. Performance of two extra short duration rice varieties 'Cul. 24-20' and 'Kalinga' in normal lands and kole lands.
4. Management technologies for Cul. 24-20.
 - a. Method of sowing.
 - b. Optimum seed rate.
 - c. Fertilizer management.

- 5, Nutrient requirement of 'Matta Triveni' in summer season for higher production in normal paddy lands and kole lands.
6. Nutrient requirement of Jayathy (KAU. 1727) and Remya (MO. 10) under irrigated/rainfed conditions for maximised productions.
7. Identification of suitable grain cowpea varieties for summer rice fallows.

1.5.3. Central zone

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

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

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

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

- 1 Regional Agricultural Research Station, Pattambi
- 2 Cashew Research Station, Anakayam
- 3 Agricultural Research Station, Mannuthy

- 4 Cashew Research Station, Madakkathara
- 5 Banana Research Station, Kannara and Pineapple Research Centre, Vellanikkara
- 6 Agronomic Research Station, Chalakudy.
- 7 Aromatic and Medicinal Plants Research Station, Odakkali

1. REGIONAL AGRICULTURAL RESEARCH STATION, PATTAMBI

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

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

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

A seed testing laboratory was established under the station in 1966 which was later nominated as the State Seed Testing Laboratory according to the provisions of the Seed Act, 1969. An A class Agricultural Meteorological Observatory, started in 1948, is functioning as a part of this station. The dairy unit of the station contains 12 milch cows, 6 draft animals and 10 calves and growing stock.

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

The station has so far released 52 rice varieties. Of this, 36 strains were evolved through pureline and mass selection and the remaining through hybridisation and selection. The two high yielding cowpea varieties released by the station are Ptb 1 (Kanakamany) and Ptb 2 (Krishnamany).

Staff

Dr. K. M. Rajan, who took charge as the Associate Director of the Central Zone on 19-8-91, continued as the Head of Station during the report period.

Staff position

Scheme	Sanctioned	In position	Vacant
1	2	3	4
Non Plan—A			
Associate Professor	2	0	2
Assistant Professor	2	1	1
JAP	4	0	4
Section officer	3	3	0
Assistants	9	9	0
S.O.S.	1	1	0
Typist	2	2	0
Lab. Assistant	5	5	0
Driver (LDV)	1	1	0
Driver (HDV)	1	1	0
Peon	3	2	1
Non Plan—B.			
Senior Farm Supervisor	1	1	0
Farm Supervisor	2	1	1
Farm Assistants	7	7	0
Technicians	1	1	0
Tractor Driver	1	—	1
Regular mazdoor	6	6	0
Class IV	7	7	0
Watchman	4	4	0
NARP I			
Professor	3	1	2
Associate Professor	4	0	4
Assistant Professor	10	4	6
Administrative Officer	1	1	0
Typist	2	2	0
Duplicator Operator	1	1	0
Lab Assistant Gr. II	1	1	0
Lab Assistant Gr. III	1	0	1

	1	2	3	4
Driver (LDV)		1	1	0
Tractor Driver		1	1	0
NARP II (Non-plan)				
Assistant Professor		3	2	1
Farm Supervisor (V)		1	1	0
Technician		1	1	0
Assistant Gr. II		1	1	0
AICRP				
<i>Scientific</i>				
Associate Professor (Pl. Br.)	1		—	1
" (Agron.)	1		1	—
" (Path.)	1		1 (Prof.)	—
" (Ento.)	1		1 (Prof.)	—
Assistant Professor (Pl. Br.)	2		1	1
Associate Professor (Agron.)	1		1	—
Assistant Professor (Path.)	1		—	1
<i>Supporting</i>				
Farm Assistant Gr. I	4		4	—
Driver	2		1	1
Tractor cum Jeep Driver	1		1	0
AICRIP on Guar (Arid Legumes)				
Associate Professor	2		1	1
Farm Assistant (Agri) Gr. II	2		2	0
Assistant Gr. I	1		1	0
Typist Gr. II	1		1	0
Lab Assistant Gr. II	1		1	0
Peon	1		1	0
NSP-BSP				
Assistant Professor	1		1	0
Technician Gr. II	1		1	0

Faculty Improvement Programme

- a) New posts sanctioned/created/transferred/shifted/abolished—
Nil
- b) Higher Studies: Smt. Rahmath Niza, Smt. C. A. Rosamma and Sri. E. Sreenivasan were on study leave for undergoing doctoral programme

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

Prof. V. P. Sukumara Dev. Dr. Abraham Jacob, Dr. Jose Mathew and Mrs. C. A. Rosamma attended the 28th All India Annual Rice Group Meetings held at Directorate of Rice Research, Hyderabad from 5-8 April 1993.

Dr. Jose Mathew and Mrs. Gracy Mathew attended the 13th National Symposium on "Integrated Input Management for Efficient Crop Production" held at TNAU, Coimbatore during 22-25 February 1994.

Dr. Jose Mathew attended the Farm Feature Workshop organised by Farm Information Bureau during 7-9 March 1994 at Sophia Centre, Kottayam.

Dr. Jose Mathew, Dr. K. Anilakumar, Mrs. Elsy, C. R., Mrs. Gracy Mathew, Mr. E. Sreenivasan and Mr. Shaji James, P. attended the Third Swadeshi Science Congress held at Palakkad during 5-7 November 1993.

Dr. K. M. Rajan, Dr. Jose Mathew, Mrs. C. A. Rosamma and Mrs. C. R. Elsy attended the Sixth Kerala Science Congress held at Thiruvananthapuram during 27-29 January 1994.

Prof. V. P. S. Dev, Dr. Jose Mathew and Mrs. C. R. Elsy attended the 29th Annual Rice Group Meeting held at IGVV, Raipur during 19-22 March 1994.

Miss. M. L. Jyothi attended a Summer Institute on "Advances in fruit research" at IHR, Bangalore during 25 August to 9 September 1993.

Involvement of staff in Academic programme

Fifteen final year B. Sc. (Ag.) students from the College of Horticulture, Vellanikkara were given two weeks field training from 18-30 October 1993.

Research

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

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

Major Research Achievements

Rice

Rice improvement: The advanced culture of Red Mashuri (RM 1) has been proposed for release as variety with the name 'Mangala Mashuri'.

In a trial on comparative performance of 68 cultures in the irrigated mid-early group, MTV 1001 recorded the highest grain yield.

IET 12875 recorded the maximum yield in the advanced yield trial with irrigated mid-early genotypes.

Attempts to evolve lodging resistant rice cultivars suitable for dry sown condition resulted in the selection of four promising high yielding advanced lines.

Ten promising advanced cultures were selected from the cross BR 52 x Edavaka and are under yield testing.

In an evaluation for sheath blight resistance, two promising progeny rows were selected from the cross Jyothi x Cul-25331.

Two photosensitive cultures viz., Cul-87117 and Cul-87136 were identified on promising with medium duration and high grain and straw yield and are under farm trial in Palakkad and Ernakulam districts.

In the programme for evolving semi-tall or dwarf indica rice varieties through mutation, 11 single plants selected from the cross 20-D/BR-51 and 20-D/BR-52 were evaluated in progeny rows and five cultures from the cross M2/M210 were evaluated under replicated trials.

Rice Agronomy and Soil Science: Studies to find ways for organic manure application in rice indicated that cowpea can be raised as an intercrop in dry seeded lowland (semi-dry) rice by sowing 12.5 kg seeds/ha along with the sowing of rice to serve as a source of green manure for rice.

Studies in direct seeded puddled lowland rice revealed that application of urea after coating with nimin (contains neem triterpens) at one percent (w/w) and allowing to dry under shade for one to one and a half hours increases N use efficiency.

Trials on weed management in direct seeded puddled rice showed that application of pendimethalin (1.5kg ai/ha), anilophos (0.4kg ai/ha) or anilophos + 2,4-DEE (0.3 + 0.4 kg ai/ha) are very effective in the control of weeds and in increasing the grain yield.

In an experiment on the control of weeds in dry sown low land (semi-dry) rice, pretilachlor @ 1.00 kg ai/ha was identified as an efficient broadspectrum pre-emergent herbicide.

Applying butachlor @ 1.5 kg ai/ha was found to be superior in terms of higher grain yield, lower weed control cost, higher net income and increased cost: benefit ratio, as revealed from the results of a study on the economic evaluation of various weed control measures in semi-dry rice.

A study on genotypic variation in rice, when planted with seedling of 25 to 70 days old, indicated the superiority of the culture IET 5914. Planting the crop latest by August 5 gave fairly consistent grain yields, beyond which grain yield reduction was significant.

Results from permanent manurial trials indicated that the productivity of dwarf indica genotypes can be sustained at a higher level through organic manuring to supply at least 50% of the total N schedule.

Seeds obtained from well manured (both mineral and organic) plots were found to be good quality and the crops raised from them gave higher grain yield.

N loss through ammonia volatilization was found to be more under basal application of urea.

Split application of urea was found to reduce the N loss through ammonia volatilization significantly.

From a study on the fertilizer requirement for different yield targets of paddy, a fertilizer prescription equation has been developed for 'Vadanamkurussi' soil series.

Rice Entomology: In multiple resistant screening trials 63 entries were evaluated for resistance to major pests. Culture ST 127 showed tolerance to stem borer and leaf folder. Among RM series, RM-7 showed tolerance to stem borer and leaf folder.

Evaluation of newer insecticides for rice pests control indicated that Isazophos 3G @ 0.75 kg ai/ha and Triazophos 40 EC @ 0.25 kg ai/ha reduces the pest attack and maximum yield of 5106 kg/ha was realised in Isazophos treated plots.

Rice pest monitoring with light trap indicated that the yellow stem borer was showing a peak during January and declined in May. Rice bug incidence was also similar. The population of white jassids, green jassids and gall midge were found to be very low in this period.

Rice Pathology: The rice variety Aathira (IET 1288) showed broad spectrum of resistance to leaf blast at All India level.

RM-1 (Selection from Mashuri) recorded the lowest susceptibility index for leaf blast and RM-7 and RM-15 to sheath blight at national level.

Among the new fungicides tested against blast, Baycor 25 WP and Beam 75 WP were found superior in checking leaf and neck blast incidence.

Of the new fungicidal formulations evaluated against sheath blight, Contaf 5 EC and Baycor 25 WP were superior in reducing the incidence.

Horticulture

Experiments conducted to study the effect of sowing time on mosaic incidence in pumpkin showed that crops raised during the months of September and October were comparatively free from mosaic and the yields were high.

Screening of ashgourd germplasm for mosaic resistance resulted in the identification of three accessions tolerant to mosaic.

Application of more organic manures and less inorganic fertilizers increased the shelf life and seed viability of ashgourd and cucumber.

Among the five accessions of Chinese potato, Cu-II and Cul-2 recorded the highest yields.

Among the turmeric types evaluated under a multi-locational trial, maximum yield was obtained from VK-47 followed by VK-55.

Extension activities

Workshops

The Officers of the State Department of Agriculture above the rank of Assistant Directors from Palakkad and Malappuram districts and the scientists of RARS, Pattambi met regularly at the monthly T & V workshops. It served as an effective forum for the transfer of technology and for feed back from the field. Dr. K. M. Rajan, Prof. V. P. S. Dev, Dr. Jose Mathew, Dr. Baby P. Skaria, Dr. (Mrs.) Salikutty Joseph and Mrs. C. A. Rosamma regularly participated in these workshops either as Chairman or as resource persons.

Regional Agricultural Research Station, Pattambi organized the 15th Zonal Research and Extension Advisory Committee meeting at Pattambi on 4-5 May 1993. All the scientist of the region and Sub-stations of Central Zone and officers from the State Department of Agriculture from the districts of Ernakulam, Thrissur and Palakkad above the rank of Deputy Directors attended the workshop. The new research findings available from the Research Station, results of farm trials and serious field problems experienced in the Central Zone were discussed by the forum.

Training

The station organised a state level training on "Rice production technology" for the officers of the State Department of Agriculture during 11-13 January, 1994.

The training programme on "Production of quality seeds" for the Agricultural Officers of the State Seed Farms was organised during 14-16 December, 1993.

Four ARS trainees from NAARM, Hyderabad were given one month field training at this centre.

Resource persons for trainings and seminars

Almost all the scientists of RARS, Pattambi took classes for the training programmes on "Rice production technology", "Production of quality seeds" and "Field training for B.Sc. (Ag.) students" organised at this centre on 11-13 January, 1994, 14-16 December 1993 and 18-30 October 1993 respectively.

Dr. Jose Mathew handled classes for the Development Officers of Rubber Board in the trainers' training programme on "Water Management in rubber plantations" held at Kottayam. (19.4.93), Moovattupuzha (20.4.93) and Punalur (21.4.93).

Dr. Jose Mathew handled two classes on "selectivity and safe use of herbicides in rice" and "weed management of upland and semi-dry rice" on 30.7.93 at CTI, Mannuthy for Assistant Directors of Agriculture.

Prof. V. P. S. Dev and Dr. K. Anilakumar took classes in the agricultural seminar at Chalavara on 15.1.1994.

Dr. Jose Mathew, Dr. K. Anilakumar and Mrs. C. A. Rosamma took classes in the farmers' seminar at ALP School, Vilathur organised by Thiruvegappura Krishi Bhavan on 22.1.94.

Prof. V. P. S. Dev attended the District Agricultural Seminar organised by District Co-operative Bank at Kozhikkode.

Dr. K. Anilakumar took a class on "Fertilizer management in rice" in the Agricultural seminar at Koppam on 30.10.93.

Dr. Jose Mathew (21.7.93 and 23.7.93), Dr. K. Anilakumar (19.7.93 and 22.7.93) and scientists from Horticulture Division took classes in the training programmes organised under NWDRA at KVK, Pattambi for Mitra Kisans of Palakkad and Malappuram districts.

Dr. Jose Mathew handled a class on "Recent trends in rice farming" at the state level farmers meet organized by the State Department of Agriculture in connection with the celebration of Chingam I as "Karshakadinam" at BEM Girls High School, Kozhikkode on 17 August 1993.

Dr. Jose Mathew, Dr. K. Anilakumar and scientists from Horticulture Division took classes in the training programme for tribal youths organised by KIRTADS at KVK, Pattambi on 3.11.93 and 5.11.93, respectively.

Dr. Jose Mathew took a class on "Scientific production strategies for rice" in the district level farmers' seminar at Quilandy, Kozhikkode on 3.3.94.

Dr. Jose Mathew took a class on "Crop production in the homesteads" in the two days training on "Mixed farming and fodder production" organised at KVK, Pattambi for the farm youths belonging to Palakkad district.

Prof. V.P.S. Dev, Dr. Jose Mathew and Mrs. Elsy, C.R. took classes for the visiting students from Sree Krishna College, Guruvayur (19.8.93) and Syed Memorial College, Taliparamba.

Dr. K. M. Rajan, Prof. V. P. S. Dev, Dr. Jose Mathew and Dr. K. Anilakumar attended the district level workshops on Intensive paddy development at Malappuram and Palakkad on 8.2.94 and 19.2.94 respectively.

Dr. K. Anilakumar attended the block level debate on "Constraints in rice production and it's solution" at Pattambi on 17.2.94.

Dr. K.M. Rajan, Prof. V.P.S. Dev and Dr. Jose Mathew attended the meeting of Mitra Kisans and team leaders to formulate farmer —participating research in the different watersheds of Palakkad and Malappuram districts under NWDRA on 4.12.93 at Palakkad and 9.12.93 and 17.1.94 at Pattambi respectively.

Dr. K.M. Rajan, Prof. V.P.S. Dev and Dr. Jose Mathew attended the state level meeting on Quality rice seed production convened by Honourable Minister for Agriculture on 23.2.94 at Secretariat, Thiruvananthapuram.

Dr. Jose Mathew and Dr. K. Anilakumar served as member of the district level committee of Malappuram and Palakkad districts respectively for selection of farmers for giving awards and prizes under the State Agricultural Development Policy.

Prof. V.P.S. Dev conducted a "Production oriented survey on rice" in Palakkad district in collaboration with AICRIP scientists of other disciplines of the station and officers of the State Department of Agriculture and the results were published in the All India Report published by Directorate of Rice Research, Hyderabad.

Important visitors

Prof. S. N. Saha, Member of the NARP Phase II final evaluation team visited the station on 28.5.93.

The high power team from Directorate of Rice Research Hyderabad headed by Dr. K. G. Pillai visited the station on 6.7.93 as part of their visit to strengthen rice research in Kerala.

The monitoring team from Directorate of Rice Research, Hyderabad consisting of plant breeders, Dr. Krishnamoorthy (Agronomist) and Dr. M. Narayana Reddy (Soil Scientist) visited the station on 12.10.1993.

ii) CASHEW RESEARCH STATION, ANAKKAYAM

Cashew Research Station, Anakkayam was started in 1963, under a scheme included in the IIIrd Five Year Plan. It is situated in Anakkayam Village in Ernad Taluk in Malappuram District. It is located in western side of Malappuram Manjeri Road 9 Km away from Malappuram.

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

Improvement programme

- a) New post sanctioned/created/shifted/abolished : Nil
- b) Scholarships awarded to the staff and deputation of staff for higher studies.

Smt. P. V. Nalini, Asst. Professor was undergoing part-time Ph. D. Programme.

Details of Seminars, Symposia, Training programme attended by staff

Smt. P. V. Nalini attended the training programme on 'Post harvest technology of Tropical Horticultural crops' held at Indian Institute of Horticultural Research, Bangalore from 8-23 December, 1993.

Staff

Sri. K. C. Chandy, Associate Professor functioned as head of office.

Category	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientific</i>			
Associate Professor	1	1	—
Assistant Professor	1	1	—
Jr. Asst. Professor	1	1	—
<i>Administrative & Supporting</i>			
Farm Assistant	2	2	—
Mali	1	1	—
Regular Mazdoor	1	1	—
Assistant	1	1	—
Typist	1	1	—
Peon	1	1	—
Full time Sweeper	1	1	—

Major Research Achievements

Among the 47 clonal and 43 seedlings types of cashew evaluated, K-10-2, K-19-1 and K-30-1 were identified as the top yielding clonal types and Anakkayam-1 and BLA-139-3 as the top yielding seedling types.

The hybrids H-15-6, H-3-9 and H-4-7 recorded the highest yields, among the 215 progenies evolved under 18 parental combinations. Thirty seven types were prominent with their large nut and kernel size.

The comparative yield trial with 16 promising types showed K-22-1 as the highest yielder followed by K-10-2 and H-4-7.

Yield data of the clonal progenies during 1967 and 1968 showed the superiority of H-3-9 and K-10-2 in the respective plantings.

Two cashew types viz., K-10-2 and H-3-17 were recommended by the Zonal Workshop held at Pattambi on 4.5.93 for release as varieties. K-10-2 is a promising variety with good economic characters and high kernel quality with an average yield of 21.6 kg and is proposed to be released in the name 'Sulabha'. H-3-17 is a progeny of the cross between an indigenous type (Tree 30) and an exotic type (Brazil 18). The type is high yielding and possess many qualities with an average yield of 17.1 kg.

A unique variety of Cashew without nut oil (PTR-1) is being promoted by the station as a special purpose variety. This variety was accepted for release by the Zonal Research and Extension Advisory Committee meeting held at Pattambi on 4th and 5th May 1993.

From among the type collections maintained at this Station, a type K-30-1 is having a nut weight of 14 grams. It is the largest size ever recorded at the Station.

Farm Revenue

a) Expenditure (Rs.)	: 9,36,530
b) Receipts (Rs.)	: 4,00,203

Planting Materials distributed

Name of materials	Quantity (Kg.)	Amount (Rs.)
Cashew seeds	1390	55,600
Cashew seedlings	3518	1,14,072
Cashew grafts	22524	2,70,288

iii) AGRICULTURAL RESEARCH STATION, MANNUTHY

The station was started during 1957 as Rice Research Station, Mannuthy in the then Central Farm Ollukkara, with the administrative control vested with Rice Specialist. Consequent to the

shifting of Head Quarters of the Rice Specialist to Pattambi in 1963, the station was renamed as Regional Rice Research Station. During 1972, the Station was transferred to the Kerala Agricultural University. In the year 1976, Rice Research Station and Agricultural Research Station, Mannuthy were merged and Research Station and Instructional farm were formed. A part of the station was then functioned as Instructional Farm, Vellanikkara, in the newly acquired estate. The Research Station and Instructional Farm, Mannuthy was again renamed as Agricultural Research Station, Mannuthy since 1-9-1983. Instructional Farm, Vellanikkara was delinked from Agricultural Research Station, Mannuthy with effect from 1.2.1988. The total area of the farm is 30.02 ha.

Dr. U. Jayakumar functioned as the Head of Office during the period.

Category	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientists</i>			
<i>KAU</i>			
Assistant Professor (Agronomy)	1	1	—
Jr. Asst. Professor (Agron)	1	1	—
Junior Asst. Professor (Bot)	1	1	—
<i>AICRIP Sub Centre</i>			
Asst. Professor (Bot)	1	1	—
<i>NARP I (Central Zone)</i>			
Assoc. Professor (Pl. Br.)	1	—	1
Asst. Professor (Agron)	1	1	—
<i>NARP I (Special Zone)</i>			
Asst. Professor (Ag. Bot.)	1	1	—
<i>Administrative Staff</i>			
Administrative Asst.	1	1	—
Senior Grade Assistant	1	1	—
Assistant Gr. II	1	1	—
Assistant Gr. I.	1	1	—
Typist	1	1	—
Peon	2	2	—
Jeep Driver	1	1	—
Watchman	2	2	—
<i>Para technical staff</i>			
Senior Farm Supervisor	1	1	—
Farm Supervisor			—
Farm Assistant	2	2	—
Lab Assistant	1	1	—
Tractor Driver	1	—	1
Technician	1	1	—
Workshop Attender	1	1	—

Faculty improvement programme

Scholarship awarded to the staff/deputation of staff

Junior Assistant Professor (Agron) is on study leave for Ph. D. at IARI, New Delhi.

Major Research Achievements

The first extra short duration variety of rice of the state having the duration of 70-80 days evolved at this station was released as "HRASWA" at the function on 16-7-1993 by Hon'ble Chief Minister of Kerala. The culture 10-1-1 having short duration and suitability for cultivation in kole land was recommended for the release by the Varietal Release Committee.

iv) CASHEW RESEARCH STATION, MADAKKATHARA

The Cashew Research Station, Madakkathara was established on 1-5-1973. The station was earlier working as one of the four research centres under the All India Co-ordinated Spices and Cashewnut Improvement Project (AICCIP) of the ICAR. The World Bank aided Multi-State Cashew Research Project was implemented at the station from 15-2-1982 to 3-9-1986. One centre of the All India Co-ordinated Cashew Improvement Project is functioning at this centre presently.

The station is located in Madakkathara Village (9 km away from Thrissur town) of Thrissur taluk in Thrissur district. The station is situated at a distance of 1.5 km away from Mannuthy on the left side of Mannuthy-Chirakkakode road.

The total area of the farm is 22.75 ha (22.25 ha planted with cashew and 0.5 ha under building and roads). The soil contains 0.72 to 1.01% organic carbon, 6.0 to 12.6 kg/ha available P₂O₅ and 186 to 345 kg/ha available K₂O. The normal rainfall is 317 cm per annum. The maximum and minimum temperatures varied from 29.1 to 36.5°C and 21.2 to 25.1°C, respectively. The average relative humidity is 68.9%.

Staff

Dr. S. Pathummal Beevi continued to be in charge of the station for the period under report. Details of sanctioned post, in position and vacancies are given below :

Category	No. of posts		
	Sanctioned	In position	Vacant
Assoc. Prof. (Agron/Hort.)	1	1	—
Asst. Professor (Ent.)	1	1	—
Asst. Professor (Hort.)	2	2	—
Farm Supervisor	1	1	—
Farm Assistant Gr. II	1	1	—
Assistant Gr. I	1	1	—
Lab. Assistant	1	1	—
Class IV (Mali)	2	2	—
Driver	1	1	—

Major research achievements

A total of 14 experiments, 11 under AICCIP and 3 under NARP, were conducted during the report period.

Preliminary studies on control of stem borer indicated that application of neem products on tree trunk and exposed roots are effective in preventing infestation of this for 2 months. Sevidol granules @ 50 g/tree basin prevented infestation for three months.

Studies on pruning and training in cashew indicated that nut yield/tree was highest when canopy volume was reduced by 20% with maximum height restricted to 3m.

v) BANANA RESEARCH STATION, KANNARA AND PINEAPPLE RESEARCH CENTRE, VELLANIKKARA

The Banana Research Station at Marakkal, Kannara was established during the year 1963 in an area of 17.3 ha by the Department of Agriculture 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. When KAU was established in 1972, this station was brought under it. In 1974, research on pineapple was shifted to KAU Main Campus, Vellanikkara in an area of 6.3 ha. During 1988, NARP Phase II was implemented at this station to strengthen research on banana, pineapple, cashew and post harvest handling of fruits and vegetables. Research on banana and pineapple is only carried out at this station presently. Sri. T. C. Radhakrishnan, Associate Professor continued as the Head of Office.

During the period under report, 22 experiments in banana and 7 experiments in pineapple were carried out.

Staff

Category	Sanctioned	In position	Vacant
1	2	3	4
<i>Scientific Staff</i>			
AICFIP			
Assoc. Professor (Hort.)	1	1	—
Asst. Professor (Hort.)	1	1	—
Asst. Professor (Pl. Path.)	1	1	—
Asst. Professor (Ento.)	1	1	—
NARP			
Assoc. Professor (Nemat.)	1	1	—
Assoc. Professor (P. P.)	1	1	—
Asst. Professor (Hort.)	2	2	—
Asst. Professor (Agron.)	1	1	—

	1	2	3	4
<i>Technical Staff</i>				
AICFIP				
Farm Assistant Gr. I		3	3	—
Lab Asst. Gr. I		1	1	—
Oil Engine Driver		1	1	—
Mali		1	1	—
Watchman		2	2	—
NARP				
Farm Supervisor Gr. II		1	1	—
Farm Assistant Gr. I		1	1	—
<i>Administrative and Supporting Staff</i>				
AICFIP				
Typist Gr. II		1	1	—
Peon		1	1	—
NARP				
Typist Gr. I		1	1	—
Administrative Assistant		1	1	—
Assistant Gr. II		1	1	—
Driver Gr. II		1	1	—
Pump Operator		1	1	—
Peon		1	1	—
Watchman		1	1	—

Major Research Achievements

Crop Improvement

Banana: One hundred and ninety six accessions of banana were maintained and evaluated under the project 'Collection, conservation and evaluation of banana germplasm'. One hundred accessions have been described using the revised banana descriptor.

Pineapple: Pineapple Research Centre, Vellanikkara maintain a total of 24 varieties of pineapple for evaluation. Out of this, Kew, Giant Kew and Mauritius are recommended for large scale cultivation.

Based on the clonal variation studies in Pineapple four clones viz, 1/81, 1/82, 5/82 and 6/82 were found promising with respect to their yield and quality.

The hybrid H7, resulting from the cross between Kew and Ripley Queen was found to possess desirable yield and quality attributes.

Crop management

Banana: Plant spacing of 1.2 x 1.5 x 2m (4762 plants/ha) was found to be optimum for Nendran banana.

Irrigation at 20 mm CPE was found to be optimum for maximum yields of banana.

Application of 150 g of N at vegetative period (30, 75, 120 and 162 days after planting) and 50 g of N at reproductive period (210, 225 and 240 days after planting) was optimum for banana.

Application of 200g of K at vegetable period (75 and 165 days after planting) and 100g of K at reproductive period (210 and 240 days after planting) was optimum for banana var. Nendran.

Standardisation of organic and inorganic fertilizer requirements in banana var. Nendran revealed the best organic source as neemcake or farm yard manure plus green manure applied into the pit and the optimum ratio of organic manures to inorganic N is 1:3.

In weed control studies in banana var. Nendran, the plots intercropped with cowpea and plots treated with gramaxone 1.81 /ha showed minimum weed infestation.

Weeding during the first six months of crop growth was critical in Nendran for obtaining higher yield. Crop duration got prolonged by 38 days in unweeded plots compared to frequently weeded plots.

Crop Protection

Banana: The sigatoka leaf spot disease of banana could be effectively controlled by spraying Bavistin (0.1%) and Calixin (0.05%) + Bavistin (0.1%).

Out of 17 banana cultivars screened for resistance to burrowing nematode, *Radopholus similis*, 7 cultures viz., Sapurnal anamalu, Manoranjitham, Palayankodan, Matti, Erachivazhai, Monthan and Pisanglilin were found to be resistant to *Radopholus similis*.

Important visitors

- 1) Dr. Zuizi Politano (Kerala Horticultural Development project) visited the Station and experimental plots on 9-7-93.
- 2) Sri. C. P. Sreekumaran Nair, Deputy Director of Agriculture Malampuzha along with 20 Agrl. Field Assistants visited on 25-8-93.
- 3) Sri. K. V. George, Deputy Director of Agriculture, Vyttila visited during August, 93 along with 20 Agrl. Field Assistants.

- 4) Dr. K. P. S. Chandel, Joint Director, NBPGR, New Delhi and Mr. Muraleedharan, Principal Scientific Officer, NBPGR, Thrissur visited on 4-8-93.
- 5) Dr. C. J. Thampi, Land Use Commissioner, Land Use Board, visited the field and experimental plots on 20-8-93.
- 6) Dr. A. K. Sadanandan, Project Coordinator, (Spices), NRCS, Calicut, visited on 20-8-93.
- 7) Dr. N. P. Singh, Project Coordinator, AICRP (Tropical Fruits) visited the Station on 18th and 19th November, 93.

vi) **AGRONOMIC RESEARCH STATION, CHALAKUDY**

The station which was established in 1962, has been engaged in the conduct of experiments under the Co-ordinated Project for Research on water management of the ICAR, apart from the NARP Phase I and NARP Phase II which was completed in 1988 and 1992 respectively. A project 'Onfarm Water management studies—Pilot Project' financed by Ministry of Water Resources, Government of India and Command Area Development Authority, Government of Kerala was started functioning at this station from 1-4-89. Apart from these projects, Agronomic studies relevant to irrigated farming have been taken up as University Projects.

The station consists of an area of 8.95 ha. of which 7.05 ha is wet land and 1.90 ha upland. Of the total rainfall, 78% is contributed by South West Monsoon and 17% by North East Monsoon. The uneven distribution of rainfall during the different periods in a year causes problems of water logging and water scarcity in the same locality and demands efficient water management practices. The station is situated on the northern side of Chalakudy Sholayar road, about 400 meters east of Anamalai Junction in Chalakudy town. The soil of the area is sandy loam with organic matter content ranging from medium to low, available P_2O_5 low to medium and available K_2O very low.

Staff

Smt. G. Santhakumari, Associate Professnr (Soil Physics) has been in charge of the station from 23-6-92 and continued during the period under report.

- a) **Faculty Improvement Programme** — Nil
- b) **Details of seminars/symposium/training attended by staff**
 - 1) 17-8-93— Smt. G. Santhakumari, Associate Professor attended at Mookkanoor village organised by the Department of Agriculture and Kerafed.
 - 2) The Scientists of the centre attended the NARP seminar from 3 to 6 May, 1994.

- 3) Smt. G. Santhakumari, Associate Professor attended the Chief Scientists meeting of Rahuri from 3 to 6 June 1994.
- 4) Also attended the Steering Committee meeting of ORP at Ministry of Water Resources, New Delhi on 25-6-93.

Involvement of staff in the academic programme — Nil
Staff position

Designation	No. of posts		
	Sanctioned	In position	Vacant
ICAR			
Professor/Chief Scientist	1	—	1
Assoc. Professor (Agronomy)	1	1	—
" (Agrl. Chemistry)			
" (Soil Physics)	1	1	—
" (Agrl. Engg.)	1	—	1
Asst. Professor (Agronomy)	2	1	1
" (Soil Physics)	1	1	—
" (Agrl. Engg.)	1	1	—
Farm Assistants Gr. I	2	2	—
Farm Assistant Gr. II	1	1	—
Lab Assistant Gr. III	1	1	—
Assistant Gr. I	1	1	—
Driver Gr. I	1	1	—
Peon	1	1	—
Non-plan			
Administrative Assistant	1	1	—
Assistant Gr. II	1	1	—
Farm Supervisor	1	1	—
Pump Operator	1	1	—
Ploughman	1	1	—
Assistant Gr. I	—	—	—
NARP Phase I			
Asst. Professor (Agronomy)	1	1	—
" (Soil Phy.)	1	—	1
" (Agrl. Engg.)	1	1	—
Farm Asst. Grade I	3	1	2
Lab Assistant Grade II	1	1	—
Typist Grade II	1	1	—
NARP Phase II			
Assistant Professor (Agron)	1	—	1
" (Soil Phy)	1	—	1
Typist Gr. I	1	1	—

Major research achievements

Studies on the response of banana cv Nendran to graded doses of N and K under different water management practices revealed that the highest yield of 11.71 kg was obtained when 5 cm irrigation was given at 20 mm CPE (at 3-4 days interval). The present recommended dose of 190 g N and 300 g K₂O per plant was found to be sufficient under irrigated conditions.

The results of the pilot project on "Onfarm Water Management" conducted at Mookkannoor village under the Chalakudy irrigation command indicated that during summer season, where there is scarcity of water, irrigation to rice can be prolonged upto 3 days after the disappearance of ponded water without much yield reduction. The results from Rabi 1993-94 revealed that in treatments where controlled irrigation was given and scientific cultivation was practised, the yield was almost doubled compared to the control plot.

Studies on the effect of various mulches on the growth and yield of banana cv Palayankodan grown under irrigated and rainfed conditions revealed that the highest yield was obtained when 4 cm irrigation was given at 30 mm CPE (at 6-7 days interval). Among the various mulches, mulching with dried leaves was found to be superior to polythene sheet.

The preliminary results of the experiment on the "Comparative study of drip and basin methods of irrigation in Coconut" indicated that the palms which received irrigation at 100% ET given through drip system gave recorded the maximum number of leaves, nuts and the trees came to flowering earlier than those in the rest of the treatments.

Studies on the ill effects of iron in paddy soils of Chalakudy revealed that lime applied at the rate of 600 kg/ha in one single application resulted the highest grain and straw yields.

A new method of irrigation developed at this centre (Bubbler Irrigation) is being successfully practised in vegetable cultivation and is found to be labour saving and different in water use.

Important visitors

Name of Visitor	Purpose	Date
Dr. R. K. Rajput, Project Director, Water Management Centre, ICAR.	Evaluation of the water Management projects of the Station.	28.3.94 to 30.3.94

vii) AROMATIC & MEDICINAL PLANTS RESEARCH STATION,
ODAKKALI

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

Dr. J. Thomas continued as the Head of the station.

Staff position

Category	No. of Posts		
	Sanctioned	In position	Vacant
1	2	3	4
<i>Scientists</i>			
Associate Professor	1	1	—
Assistant Professor (Agrl. Chem)	1	1	—
Asst. Professor (Agrl. Bot)	1	1	—
Jr. Asst. Prof. (Agrl. Chem)	1	1	—
<i>Para-technical staff</i>			
Lab Assistant (Graduate)	1	1	—
Lab Assistant (Non Graduate)	1	—	1
Lab Assistant Gr. III	1	—	1
Farm Supervisor	1	1	—
Farm Assistant	3	3	—
<i>Administrative Staff</i>			
Administrative Assistant	1	1	—
Assistant	2	2	—
Typist	1	1	—
Peon	1	1	—
Gardener	1	1	—
Watchman	2	2	—
Sweeper-cum-Attendant	1	1	—

Major research achievements

The morphological description of the 450 accessions of lemongrass in the germplasm was undertaken.

Screening of 450 accessions of lemongrass available in the germplasm indicated that 20 types are superior in respect of herb yield, oil recovery and citral content. Twenty five successions were identified for the presence of other aroma compounds to be characterised for their economic importance.

Screening of 250 cinnamon types available in the station indicated that five types are superior in respect of leaf yield, oil yield and oil recovery and eugenol content.

Application of 30 t/ha of farm yard manure has given significantly higher rhizome yield in kacholam compared to the application of NPK fertilisers at different ratios, levels and time. Oil recovery and oil yield were not affected by the treatments.

Important Visitors

- 6-4-93 Mr. M. S. K. Manickarajender, Managing Director, Sree Sunthari Dye Chem, Illupalayam, Siramugai, Coimbatore—641 302.
- 7-4-93 Dr. P. Rangaswamy, Professor & Head, TNAU, Horticultural Research Station, Yercaud, Salem-2.
- 6-5-93 Mr. Ake Nielson, Project Coordinator, Swedish Development Agencies, Madras.
- 24-5-93 Dr. A. Doraipandian, Prof. & Head, Department of Horticulture. Agrl. College & Research Institute, Killikulam, Vellanad—627 282.
- 25-5-93 Mr. Sathyanarayana Rao, Scientist, Central Ground Water Board, Trivandrum.
- 24-8-93 Dr. M. Aravindakshan, Director of Research, Kerala Agrl. University, Vellanikkara, Thrissur.
Dr. M. J. Thomas, Associate Director of Research, KAU.
- 3-9-93 Mr. R. Balasubramanian, Seasan Services (P) Ltd., Chamber Building, 84-B, South Raja Street Tuticorin.
- 10-9-90 Mr. Ake Nelison and Associate, SIDA Project, Madras.
- 29-9-93 Dr. Sebastian Luckose, Professor of Paediatrics, Medical College, Kottayam.
- 2-11-93 Dr. K. C. Chacko, & Dr. George Mathew, KFRI, Thrissur.
- 7-12-93 A team of 3 experts from NABARD, Thiruvananthapuram.
- 21-12-93 Dr. M. Aravindakshan, Director of Research

- 31-12-93 Sri. P. P. Thankachan, Hon. Speaker, Sri. Johny Nelloor, MLA; Dr. A. M. Michael, Dr. M. Aravindakshan, M. P. Thami, MLA; Sri. E. V. Mathew, Dist. Council Member, Sri. V. P. Saseendran, Asamannoor Panchayat President.
- 16-2-94 Mr. E. Velappan, Director, Cocoa, Arecanut and Spices Development, Kozhikode
- 17-2-94 Mr. Sathyanarayana, Director (R&D), Tata Tea Ltd., Munnar—685 012.
- 28-2-94 Managing Director, R. R. Aromatics. Coimbatore-4.

1.5.4 Northern Zone

i) REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

The Pioneer research efforts on coconut improvement were started as early in 1916 with the establishment of four Research Stations Nileshtar I (Pilicode), Nileshtar II, Nileshtar III and Kasaragod under varying soil conditions. Nileshtar II and Pilicode were transferred to Kerala Agricultural University with the Headquarters at Pilicode, when the KAU came into being in 1972.

The National Agricultural Research Project (NARP) was launched in the early 1980 s to strengthen the research capabilities of the State Agricultural Universities. The development of the Regional Research Stations in the different Agroclimatic zones in terms of research manpower and infrastructure facilities was the essential feature of the NARP. The Northern region consisting of four districts viz. Kasaragod, Kannur, Kozhikode and Malappuram have been divided into nine agroecological situations.

The main objective is to conduct location specific, production oriented research in the Northern Region of Kerala. In continuation of NARP Phase I a sub-project was launched in 1983 under Phase II.

The Regional Agricultural Research Station, Pilicode has the lead functions in research on coconut and coconut based farming systems and to act as the testing and verification centre for rice, pulses, banana and vegetables. The research on Pepper is conducted at Pepper Research Station, Panniyur. The research activities at PRS Panniyur and Tavanur centres are supervised and guided by RARS, Pilicode. The present area of Pilicode station is 57.87 ha and that of Nileshtar is 17.25 ha.

Thrust area of research identified in the Northern Region include improvement of Coconut based farming system, Rice-based farming system and Pepper.

In addition to the agricultural research programmes, Animal Science was also included in NARP Phase II to strengthen research on Malabari Goats".

The Transfer of Technology programme of this station mainly consists of Training programmes for farmers, unemployed youth, SC/ST, farm women, Extension personnel of various Departments and students. Monthly workshop under T&V Programmes. Exhibition etc are being arranged in addition to the extension activities like Village Adoption Programme.

Staff

Dr. N. Krishnan Nair continued as the Assoc. Director of the station.

Designation	No. of posts		
	Sanctioned	In position	Vacant
1	2	3	4
NARP Phase II			
Associate Director	1	1	--
Professor	5	3	2
Associate Professor	2	2	--
Assistant Professor	3	--	3
<i>Para-Technical Staff</i>			
Farm Supervisor			
Sr. Gr. Farm Assistant	5	5	--
Farm Asst. Gr. II			
Lab Asst. Gr. II			
Lab Asst. Gr. III	3	3	--
<i>Administrative Staff</i>			
Admn. Officer	1	1	--
Sr. Gr. Typist	2	2	--
Typist Gr. I	1	1	--
Typist Gr. II	1	1	--
LDV Driver	2	2	--
Tractor Driver	1	--	1
Peon	1	1	--
Non-Plan			
Professor	1	--	1
Assistant Professor	6	1	5
<i>Para-Technical Staff</i>			
Farm Supervisor Gr. I	2	2	--
Farm Asst. Gr. II	2	2	--
Farm Asst' (Vety;)	1	1	--

	1	2	3	4
<i>DST Project on Rice:</i>				
Research Associate		1	1	—
Junior Research Fellow		1	1	—
Agromet Observer (Farm Assistant)		1	1	—
<i>ICAR Adhoc Scheme on Cashew:</i>				
Research Associate		1	1	—
<i>Administrative Staff:</i>				
Section Officer		4	4	—
Sr. Gr. Assistant		4	3	1
Assistant Gr. II		2	2	—
Office Superintendent		1	1	—
LDV Driver Hr. Gr.		1	—	1
Oil Engine Driver		1	1	—
Peon Hr. Gr.		3	3	1
Pump Operator		2	1	1
Watchman		1	—	—
Regular Mazdoor Class IV		17	17	—
Sweeper-cum- Sanitation Worker		4	4	—
Cook-cum-Caretaker		1	1	—
<i>Training Scheme:</i>				
Assistant Professor		1	1	—
Sr. Gr. Assistant		1	1	—
<i>Para Technical:</i>				
Farm Supervisor Gr. II		1	1	—
<i>NARP Phase II</i>				
Associate Professor		2	1	1
Assistant Professor		4	3	1
<i>Para Technical Staff:</i>				
Farm Asst. (Vety.)		1	1	—
Mechanic (Techn. Gr. II)		1	—	1
<i>Computer Centre:</i>				
Junior Programmer		1	—	1
Research Associate (Agro.)		1	1	—
Research Associate (Horti.)		2	2	—
Research Associate (Soil Science)		1	1	—

Faculty Improvement Programme

a) New posts sanctioned/created/shifted/abolished: Nil
 Deputation of Staff

Name of Scientist and Designation	Details of Deputation	Name of University to which deputed
1) Premanathan, Asst. Professor	Deputed for Ph.D. Programme	T.N.A.U., Coimbatore
2) V. P. Neema Asst. Professor	"	"

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

Name of Scientist	Seminars/Symposia and venue	Period
Dr. N. Krishnan Nair	Group meeting on Central Sector Scheme for Plantation Crops held at APAU, Hyderabad	9-10 Nov. 1993
"	Research Council meeting of NRCC, Puthur, Mangalore	11-12 May 1993
Dr. GSLHV Prasada Rao	2nd Group Monitoring Workshop on Agro-meteorology held at Andhra University	2-3 June 1993
"	Remote Sensing Crop Environment held at IARI, New Delhi	2-11-93 to 27-11-93
"	Research Council Meeting of NRCC, Puthur, Mangalore	11-12 May 1993
Dr. P. C. Balakrishnan	Summer Institute on Trends and techniques in Higher Agri. Education for the future	26th May to 4th June 1993
Dr. B. Jayaprakash Naik	Research Council Meeting of NRCC, Puthur, Mangalore	11-12-th May 1993
"	XI Biennial Workshop of the All India Co-ordinated Projects on Cashew held at UAS, Bangalore	18-20 Aug. 1993

Anilkumar, A.	Summer Institute on Agricultural Extension Management held at TNAU, Coimbatore	6-27 June 1993
K. P. Mammooty	XII National Workshop of AICRP on Spices at the College of Horticulture, Vellanikkara	26-28 July 1993
"	State level Workshop on quickwilt disease of Pepper at Thiruvananthapuram	3rd Nov. 1993
Dr. N. Krishnan Nair Prof. Sumangala S. Nambiar Prof. V. Sukumara Pillai Smt. V. P. Neema Dr. P. A. Joseph Dr. P. C. Balakrishnan	Monthly Workshops under T & V programmes for Kannur, Kasaragod and Kozhikode Districts	

Involvement of staff in Academic Programme:

Scientists of this station are involved in the Academic Programme of the University. They are engaging students of both Graduate and Post-graduate courses of the College of Agriculture, Vellayani and College of Horticulture, Vellanikkara when they are undergoing field training. The VHSC students of Trikaripur and Karaduka are also engaged here for practical training in Plant protection and Horticulture utilising the Laboratory and field facilities.

Staff members of pepper Research Station Panniyur are also involved in the Academic programme for the students of various colleges under the KAU during their visit to the station.

Research

Twenty one Research projects are in operation. In addition to this 24 observational trials and 4 multilocational trials were conducted during the year.

A Central sector scheme for the development of Model clonal cashew garden was also in operation. Under this scheme 33 Cashew demonstration plots were laid out in Kannur and Kasaragod Districts. The major research projects are listed below:

Major Research Achievements

Coconut: The hybrid coconut variety "Kerasowbhagya" (WCT X SSA) was released by the State Variety Release Committee met on

7-4-1993 at Thiruvananthapuram. The average nut production recorded by Kerasowbhagya is 130 nuts/palm/year. Altogether five Coconut varieties were released viz., Lakshaganga, Keraganga, Arandaganga, Kerasree and Kerasowbhagya.

The nut yield in coconut was not affected when irrigation was provided at the rate of 450 litres/palm/week during summer.

Among the germplasm collection, coconut cultivars Kudat and St. Vincent are the top yielders.

The hybrid coconut variety "Kerasree" accorded two fold increase over West Coast Tall.

Under rainfed conditions also the performance of hybrids is better than elite cultivars with regard to early flowering as well as nut production.

Rice: Among the rice cultures/varieties tested, A 21 and Cul. 1727 gave maximum grain yield followed by IET 55. Cultures IET 6755 and IET 6661 which produced moderately high yield and showed multiple resistance were sent for farm trial in Kannur and Kasaragod Districts.

In a varietal trial with three rice cultures RM-1 recorded highest grain yield.

The CERES-RICE (DSSAT) Model was tested for all the three varieties. The model simulates well under high humid situation also.

Kacholam: The results obtained from the experiment conducted with various medicinal plants indicated that the net return was maximum in the case of Kacholam.

Ginger: A total number of 26 Ginger varieties were tried under open as well as partially shaded conditions. The variety V2E5-2 recorded the highest yield of 23.2 t/ha in open and Kuruppampady recorded the highest of 57.05 t/ha in partial shade. A significant positive correlation was also observed in rhizome yield with leaf N and K content.

Turmeric: Among the ten *Turmeric* cultivars tried under open and partial shade the cultivar VK.31 performed better.

Banana: In Banana cv Nendran, increase in bunch weight and reduction in crop duration were achieved by using large sized suckers (more than 1500g).

Fertilizer dose of NPK 120:120:240 per plant, with irrigation water at the rate of 30 litres during December and January, 40 litres during February, March, April and May at weekly intervals was found to be optimum for Poovan banana raised as intercrop in coconut garden.

Veterinary Hospital and A.I. Centre

A Veterinary Hospital has been inaugurated on 28-12-1994 by Sri. K. M. Soopy, M.L.A. & Executive Committee Member, KAU in the presence of Hon'ble Vice-Chancellor Dr. A.M. Michael.

An average number of 50 cases per month are treated in the Hospital and 30 Insemination per month are done in the A.I. Centre

Important visitors

Dr. S. Gangopadhyay, Senior Scientist (NARP), New Delhi, visited this station on 28-5-1993.

KAU Accounts Committee Chairman and Members visited the station on 13-8-93 and 21-12-93. The Chairman and Members of Assurance Committee visited the station on 16-8-1993.

Sri. P.P. George, Hon'ble Minister for Agriculture, Government of Kerala visited this station on 29-9-93.

Dr. M.V. Rao, Vice-Chancellor, Andhra Pradesh Agricultural University, Hyderabad, Chairman of QRT on Coconut visited this station on 29-9-93.

Dr. P.C. Sivaraman Nair, Chairman of the QRT on spices visited this station on 12-10-93.

Mr. P.J. Joseph, former Revenue Minister of Kerala visited this campus twice and appreciated the various activities carried out at this station.

Hon'ble Vice-Chancellor, Kerala Agricultural University visited this station on 28-12-1993.

Sri. K. Oommen Chandy, Hon'ble Minister for Finance, Government of Kerala visited Nileshtar station on 10-1-94.

Dr. S. Chelliah, Director of Research, TNAU, Coimbatore visited the station during December 1993.

Sri. Velappan, E., Director, Cocoa, Arecanut and Spices Directorate, Calicut, Dr. P. C. S. Nair, Chairman QRT Team ICAR and Dr. Chelliah, Director of Research, TNAU, Coimbatore visited PRS Panniyur also.

ii) PEPPER RESEARCH STATION, PANNIYUR

Pepper Research Station, Panniyur enjoys a unique position among other institutions of Agricultural Research being the only Research Station solely devoted for research on Black pepper. The origin of the station dates to 1932, which had a modest beginning as a small scheme on 'Scientific aid to pepper industry in South India' launched by the erstwhile Madras Department of Agriculture. Consequent on the formation of Kerala State the Station came under the Department of Agriculture, Government of

Kerala in 1956 and further, with the organization of Kerala Agricultural University, this became one of its constituent research stations from 1/2/1972 onwards. Almost the entire package of practices recommendations on Black pepper were evolved in this station.

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

The thrust areas of research included Nursery Management, Crop Improvement, Crop Management and Crop Protection. Post harvest aspect are also being taken up recently.

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

Staff

Prof. V. Sukumara Pillai continued as Head of the Station

Designation	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientists</i>			
KAU Scheme			
Professor	1	1	—
Asst. Professor (Botany)	1	—	1
Asst. Professor (Agro.)	1	—	1
Jr. Asst. Professor	1	—	1
<i>Para-technical</i>			
Farm Supervisor Gr. I	2	2	—
Farm Asst. Sr. Gr.	1	1	—
<i>Administrative Staff</i>			
Admn. Assistant	1	1	—
Assistant Gr. II	2	2	—
Typist Sr. Gr.	1	1	—
Watchman	2	1	1
Jeep Driver	1	1	—
Peon	2	2	—
Central Nursery for Hybrid pepper			
Farm Asst. Gr. I	1	—	1
NARP Phase I			
<i>Scientists</i>			
Assistant Professor (Ento.)	1	—	1

Designation	No. of posts		
	Sanctioned	In position	Vacant
AICRP on Spices			
Assoc. Professor (Nem./Patho.)	1	1	—
Asst. Professor (P. P.)	1	1	—
Asst. Professor (Agro.)	1	—	1
Asst. Professor (Botany)	1	1	—
Para-Technical Staff			
Farm Asst. Gr. II	2	2	—
Lab Asst. Gr. I	1	—	1
Peon	1	1	—

Major Research Achievements

Among the germplasm collection of pepper, Karimunda-I, Karimunda III, PRS 22, and Sullia (RS 49) recorded the highest green berry yield. Cultivar TMB VI (PRS 68) consistently recorded bolder berries.

Among the open pollinated and hybrid progenies, Culture 5035, Culture 308, Culture 5186 and Culture 34 were the top yielders. In the MLT on black pepper cultivars, Kalluvally recorded highest yield followed by Kuthiravali and Neelamundi.

In the control of phytophthora diseases, plants receiving cultural practices + 1 kg Neem cake + 3g aiphorate + 1% Bordeaux mixture + 2 drenching with copper oxychloride 0.2% showed minimum defoliation and disease incidence. Slow wilt was minimum (in plants receiving 2 kg neemcake and 3 g aiphorate + drenching with Bavistin 0.1% + Copper Oxychloride 0.3%. Nursery disease could be controlled by spraying 0.2% validuct under medium shade.

1.5.5 High Range Region

The high range zone is a sub-region of Western Ghats lying at an elevation of 750 meters above MSL comprising of the hill districts of Wayanad, Idukki, Nelliampathy and Attappady ranges of Palghat, Thannithode and Seethathode Panchayats of Pathanamthitta, Aryankavu, Kulathupuzha and Thenmala areas of Kollam district, Peringamala, Aryankavu, Vithura, Amboori and Kallikadu Panchayat of Thiruvananthapuram district. The total geographical area of the zone is 1140.67 sq. km sharing 28.67 percent of the total geographical area of the state. This zone is mainly agrarian with a predominance of high value perennial crops. The major crops grown are coffee, paddy, cardamom, rubber,

pepper, tea, tapioca etc. The climate prevailing here is by and large mild subtropical which is conducive for growing both tropical and subtropical fruits.

The NARP Phase I Subproject for this zone was launched in November 1983 and was completed in November 1988. The NARP Phase II project was in operation since April 1988 and was completed on 19-4-92. Under the National Agricultural Research Project, the Regional Agricultural Research Station at Ambalavayal functioned as the lead station with Cardamom Research Station at Pampadumpara as its sub-station.

**i. REGIONAL AGRICULTURAL RESEARCH STATION,
AMBALAVAYAL**

This station was established on 1946 as a part of the Wayanad colonisation scheme to support agriculture in the colony areas and in Wayanad region. 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 later brought under the control of Kerala Agricultural University in 1972. In 1983, it was elevated to the status of a Regional Agricultural Research Station under the National Agricultural Research Project with Cardamom Research Station, Pampadumpara as its sub-station.

The Regional Agricultural Research Station, Ambalavayal is located at an elevation of 974 meters above MSL in Sultan Bathery Taluk of Wayanad district. It is 100 Km north-east of Kozhikode along the Kozhikode—Mysore state Highway.

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

Verification

function : Essential oils and medicinal plants, ginger

Dr. K. Kumaran was the Associate Director of Research during the period under report.

Staff

Category	Sanctioned	In position	Vacant
1	2	3	4
KAU Non Plan			
Professor (Plant Pathology)	1	—	1
Assoc. Professor (Nematology)	1	1	—
Asst. Professor (Entomology)	1	1	—
Asst. Professor (Botany)	1	1	—

	1	2	3	4
NARP Phase I				
Assoc. Director of Research	1		1	—
Assoc. Professor (Agronomy)	1		1	—
Asst. Professor (Horticulture)	1		—	1
Asst. Professor (Plant Propagation)	1		—	1
Asst. Professor (Plant Breeding)	1		1	—
Asst. Professor (Agrl. Economics)	1		1	—
NARP Phase II				
Assoc. Professor (Horticulture)	1		—	—
Assoc. Professor (Animal Science)	1		—	—
Asst. Professor (Horticulture)	1		1	—
Asst. Professor (Agrl. Engg.)	1		1	—
Asst. Professor (Plant Pathology)	1		1	—
AICRP on Spices				
Assoc. Professor (Plant Breeding)	1		1	—
Administrative & supporting staff				
NARP Phase I				
Administrative Officer	1		1	—
Assistant Gr. II	1		1	—
Stenographer	1		1	—
Typist Gr. II	1		1	—
Driver Gr. II	1		1	—
Lab Assistant	1		1	—
Farm Assistant	2		2	—
Lab Assistant	1		1	—
K.A.U				
Section Officer	1		1	—
Assistant (Sr. Gr.)	1		1	—
Assistant Gr. I	2		2	—
Assistant Gr. II	1		1	—
Typist (Sr. Grade)	1		1	—
Farm Supervisor (Sr. Grade)	1		1	—
Farm Supervisor (Sr. Grade)	4		1	3
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	9		9	—
Laboratory Assistant	2		2	—
Watchman	3		3	—
Class IV on working arrangement	5		5	—

Faculty Improvement Programme

New posts sanctioned/created/shifted	—	Nil
Scholarships awarded to staff and deputation of staff for higher studies	—	Nil

Details of Seminars/Symposia, training attended by staff

Scientists of the station participated in the XI Zonal Research & Extension Advisory Council meeting held on 29th and 30th April 1993.

Sri. C.M. George attended a training on sericulture at Central Sericulture Research and Training Institute, Mysore from 7.6.93 to 14.6.93.

Smt. P. Mayadevi, Associate Professor attended the 12th workshop on AICRP (Spices) held at Vellanikkara from 26th to 28th July 1993.

Dr. T. R. Gopalakrishnan attended group meeting on vegetable research at JNKVV at Jabalpur from 15th to 18th December 1993.

Dr. T. R. Gopalakrishnan and Miss Veenakumari D. participated in the VI Kerala Science Congress held at Thiruvananthapuram from 27th to 29th January 1994.

Sri. C. M. George, Associate Professor attended a meeting on sericulture at Central Silk Board, Mysore on 10-3-94.

Scientists of the station attended the workshop on Land Resources Conservation, Development and Management, High Range Zone at R.A.R.S., Ambalavayal on 17-3-94.

Dr. T. P. Manomohandas, Assistant Professor attended the VIII NARP Specialised training on production and post harvest technology of horticultural crops held at Central Institute of Horticulture for Northern Plains from 17-3-94 to 15-4-94.

Involvement of staff in Academic Programmes :

A batch of 13 B.Sc. (Ag.) students from the College of Horticulture, Vellanikkara were given field training at this station from 18-10-93 to 30-10-93.

Research

Major research achievements of the research projects during the period are given below.

Major research achievements

Fruits : In Nendran banana, September and October planting produced heaviest bunches.

Vegetables : Cauliflower variety 'Pusa Early Synthetic' gave the highest yield of 5.63 t/ha. This variety flowered and produced seeds under Wayanad conditions.

Cabbage variety 'September' gave the highest yield of 50.49 t/ha.

Spices: Among the thirty six accessions in the ginger germplasm V2E5-2 gave the highest yield of 67.55 t/ha.

Ginger variety Rajgarh gave the highest driage of 30.5%.

Among the 40 varieties of turmeric maintained in the germplasm Sugandham gave the maximum yield of 44.22 t/ha followed by Mundakkayam (40.438 t/ha).

Rice : Among the 40 accessions in the rice germplasm Kirwana gave the highest grain yield of 6077 kg/ha followed by Intan 5702 kg/ha.

In the multilocational trials, Moncompu rice variety cul MO-I 20-19-4 and Pattambi rice variety RM-7 gave the highest grain yields.

In the observational trial on the performance of five scented rice varieties, Pusa Basmati-1 gave a grain yield of 2462 kg/ha.

Farm revenue

Year	Receipts (Rs. lakhs)	Expenditure (Rs. lakhs)
1993-94	19.16	79.54

Publication by staff

The details of publication by staff are presented in Annexure V.

Other matters

- i) The Eleventh Zonal Research and Extension Advisory Council Meeting of the high range zone was held at RARS, Ambalavayal on 29th and 30th of April 1993. The scientists of Kerala Agricultural University, Regional Stations of ICAR, Coffee Board and extension personnels from the Department of Agriculture and Progressive farmers attended the meeting.
- ii) Scientists of the station participated in the Agricultural Exhibition-cum-Seminar held in connection with the 21st anniversary of Farm and Home of AIR, Calicut held at Kakkavayal on 16th and 17th of January 1994 and presented papers.
- iii) The station participated in the flower show organised by Agri-Horticultural Society, Wayanad from 7-1-94 to 10-1-94.
- iv) The station conducted training on the following aspects.
 - (1) Mushroom cultivation.
 - (2) Recent trends in the production technology of cool season vegetables.
- v) The scientists of the station attended trainings, seminars and meetings organised by Krishi Vijyan Kendra, Department of Agriculture and commodity boards.

Important visitors

Sl. No.	Name and Designation	Purpose	Date
1	Dr. M. Aravindakshan, Director of Research	To attend the Planning and Development Committee meeting	30-4-93
2	Sri. P.N. Kanakambaran, Registrar, KAU	"	"
3	Sri. Johny Nellore, MLA Executive Committee Member	"	"
4	Sri. Jose Joseph Executive Committee Member	"	"
5	Dr. Ani S. Das Student Representative KAU Executive Committee member	"	"
6	General Council members	a. In connection with the discussion of labour norms b. Participated in the meeting of the Accounts Committee of the General Council	11-10-93
7	Mr. E. K. Majhi, Registrar, KAU	In connection with tree disposal and assignment of land deeds of the station from Revenue Department	6-11-93
8	Sri. K.C. Joseph, MLA, Member, Executive Committee, KAU	Selection of Driver Gr. II and to acquaint with the various activities of the station	31-1-93
9	Justice Smt. K.K. Usha, Kerala High Court	To acquaint with the various activities of the station	20-2-94
10	Dr. M. S. Subhaiha, District Collector	To attend the workshop on Land Resources, Conservation, Development and Management, High Range Zone	17-3-94
11	Dr. C. J. Thampi, Director, Land Use Board, Thiruvananthapuram	"	"
12	Dr. John Thomas, Dean i/c., K. C. A. E. T., Tavanur	"	"

ii. CARDAMOM RESEARCH STATION, PAMPADUMPARA

This station was established in the year 1956, under the Department of Agriculture with a view to undertake research programmes on the various agronomical, botanical, entomological and phytopathological problems of cardamom cultivation, soil and water management problems in the Idukki region, Selection of promising pepper cultivars for high ranges, standardization of agro-techniques and formulation of plant protection measures, in collaboration with Pepper Res. Station, Panniyur for cardamom and pepper and to serve as a centre for agricultural extension education activities in the Idukki Region.

The station has been taken over by Kerala Agricultural University in 1972. The All India Co-ordinated Spices and Cashew Improvement Project was started in 1972 and NARP in 1983. Dr. C. T. Abraham was the head of the Station till 30-11-93 and Dr. Arthur Jacob took over charge on 1-12-93.

Staff

Category	No. of posts		
	Sanctioned	In position	Vacant
KAU (Non-Plan)			
Asst. Professor (Ent.Agrl. Chemistry.Hort. & Pl. Pathology)	4	2	2
NARP Phase I			
Asst. Professor (Pl. Breeding & Agrl. Extension)	2	1	1
ICAR-AICARP on spices			
Assoc. Professor	2	1	1
Asst. Professor	1	—	1
Administrative & Supporting (KAU)			
Administrative Assistant	1	1	—
Senior Grade Assistant	1	1	—
Assistant Gr. II	1	1	(provisional hand)
Typist Gr. II	1	—	1
Driver Gr. II	1	1	(provisional hand)
Watchman	4	3	1
Farm Supervisor	1	1	—
Farm Assistant	1	1	—
Field Supervisor	1	1	—
NARP Phase I			
Farm Assistant Gr. I	2	2	—
Typist Gr. II	1	1	—
ICAR - AICRP on spices			
Farm Assistant Gr. I	2	2	—
Lab. Assistant Gr. II	1	1	—
Peon (Hr. Gr.)	1	—	1

Two Research Associates working against posts of Asst. Professors.

Major research achievements

Cardamom: The station has a germplasm bank of 73 cultivated and 14 wild varieties of Cardamom. On an initial evaluation, the types PS-21, PS-22 and clone 57 were found to be superior for bold capsules. The varieties' PS-2, S-1, MBP, PS-4, PS-5, PS-12, PS-6, Manjirabad, PS-22 and Veeraputhran were found promising for better dry recovery.

PV-1, a clonal selection from Walayar Local, the released cardamom variety from the station has gained good popularity among the cardamom growers.

Thirty pepper varieties are maintained in the germplasm and are being evaluated for yield and pest and disease resistance.

PS-35 and PS-21 are promising selection with bold capsule shape and good yield. A variant/mutant with variegated leaf character was noticed in PS-21.

The cultivation of cardamom under artificial shade has shown promising results with PV-1 variety.

The station has a collection of 505 rose varieties and serves as a source for supply of rose buddings in polybags and pots.

Details of Seminars, Symposia, Training etc.

Name and Designation	Details	Duration
Dr. C. T. Abraham Assoc. Professor (Agron.)	International Symposium on integrated management for sustainable Agriculture, C.C.S., H.A.U., Hissar	18-20 Nov. 1993
Dr. V. K. Girija, Assistant Professor (Pl. Path.)	National Symposium on Ultrastructure, Cytology, Sexuality and variability in plant pathogens. T.N.A.U. Coimbatore	27-29 Jan. 94

Visitors

Date	Name of Visitor
7-8-1993	Dr. A. M. Michael, Vice Chancellor, Kerala Agricultural University
19-5-1993	The Chief Security Officer, Kerala Agrl. University
25-8-1993	Dr. M. Aravindakshan, the Director of Research, Kerala Agricultural University Dr. M. J. Thomas, Associate Director (Plg), Johny Nelloor, MLA, S.S. Potti, Vijayakumar (Members of General Council, KAU.

- 2-11-93 The Chief Security Officer, Kerala Agricultural University
- 7-11-93 II year B.Sc. (Ag) students, College of Horticulture, Vellanikkara
- 26-11-93 Dr. Rajagopalan, Director of Students Welfare & Dr. Raju, Prof. of Vety. Extn.
- 12-1-94 Dr. M. J. Thomas, Assoc. Director of Research (Plg)
- 27-1-94 V. H. S. E. students, Taliparambu
- 24-2-94 Dr. V. K. Sasidhar, Director of Extension (i/c), KAU.
- 17-3-94 Sri. Alkesh Kumar Sharma, Sub. Collector, Devikulam
- 21-3-94 Sri. P. O. Thomas, D. P. P. KAU
- 91.3.94 II B.Sc. (Ag) students, College of Agriculture, Vellayani
- 29-3-94 Anjan Kumar Das, SMS, Dept. of Agriculture, Andaman & Nicobar Island

Farm Revenue (1993-94)

Sale of farm produce	: Rs. 5,09,997.63
Revolving Fund	: Rs. 15,112.00
Total revenue	: Rs. 5,25,109.00

Others

Civil works

Strengthening the overflow spillway of the checkdam in the Kurisumala nursery area by concreting the top.

- Raising the hight of the above checkdam by 1 foot.
- Electrification and plumbing works of the canteen-cum-recreation building was completed.
- Checkdam in Block III area of farm constructed at a total cost of Rs. 19,700.
- Construction of generator room.

Farm Development

- Security measures were continued to prevent trespassing and theft in the farm.
- 5 H. P. diesel engine installed in Mass Selection area & Pipeline extended to main storage tank.

1.5.6. Kerala Horticulture Development Programme—Research and Development Project

The Government of Kerala with the financial assistance from EEC is implementing the Kerala Horticulture Development programme. The main objective of the scheme is to increase the production, processing and marketing of fruits and vegetables in

the pilot project areas of Thiruvananthapuram, Ernakulam, Palakkad, Kozhikode and Wynad. This programme is also linked with a Research and development component which is undertaken by the Kerala Agricultural University.

The total duration of the programme is 5 years starting from 1993. The first project period is from October 1993 to March 1995. The estimated expenditure for the first project period is 156 lakhs rupees for Research & development and Hybrid seed production. As per the MOU the programme Directorate, Kochi has released 40% of the total budget amount. Balance amount will be released in 3 equal instalments after reviewing the progress of work.

The KAU will provide adequate research support by designing experiments based on the requirement of KHDP, Kochi. The programme Directorate has identified broad areas for research and communicated to the University. Among the fruit crops, emphasis is given for banana (Nendran), Pineapple and Mango (Alphonsa and Thottapuri). The major tropical vegetables are also included in the programme. Post-harvest handling and processing of fruits and vegetables including the hybrid vegetable seed production is also envisaged in the programme.

The University has appointed 14 Scientists and 14 supporting staff for the efficient functioning of the programme. The programme is initially implemented in 3 districts (Thiruvananthapuram, Ernakulam and Palakkad) with its headquarters at KAU main campus, Vellanikkara. Another sub-centre is functioning in Thiruvananthapuram at the College of Agriculture, Vellayani.

The University has approved 35 research projects (24 fruits and 11 vegetables) for implementation during the first year work plan.

The first financial commitment to the project was made on 1st March 1994. About 50% of the staff posted to the scheme has joined for duty during the month.

2. FACULTY OF VETERINARY AND ANIMAL SCIENCES

2.1 COLLEGE OF VETERINARY AND ANIMAL SCIENCES, MANNUTHY

The College of Veterinary & Animal Sciences was established in 1955 with a view of training sufficient veterinary personnel. For the first few years the institution was directly under the administrative control of Kerala Government but subsequently brought under the control of 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 a Livestock Farm, a Poultry Farm, a Pig Breeding Farm, Goat Farm, a Dairy Technology unit & a Meat Technology Unit in the campus. Two Veterinary hospitals, one at Mannuthy and another at Kokkalai and a Farm Clinic at U.L.F. Mannuthy are also attached to the college.

In addition to teaching, a number of research projects are being operated at the College. Importance was given for the transfer of technology.

The following research stations—Livestock Research Station, Thiruvazhamkunnu 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.

a. There are 18 departments viz.

- 1 Anatomy
- 2 Livestock Production Management
- 3 Animal Reproduction
- 4 Animal Breeding and Genetics
- 5 Clinical Medicine
- 6 Dairy Science
- 7 Extension
- 8 Microbiology
- 9 Nutrition
- 10 Parasitology
- 11 Pathology
- 12 Pharmacology and Toxicology
- 13 Physiology
- 14 Poultry Science
- 15 Preventive Medicine
- 16 Statistics
- 17 Surgery and
- 18 Veterinary Public Health

All the Departments are offering post-graduate course at the Masters level and all except Extension, Preventive Medicine, Veterinary Public Health, Statistics are offering Ph. D. Programmes.

b. Dr. M. Krishnan Nair, Director (RC) was holding the charge of the Dean from 1.4.93 to 19.4.93.

Dr. A. Rajan, Director, Centre of Excellence in Pathology took over charge as the Dean on 19.4.93.

Staff position

Department and Category	Sanctioned	In position	Vacant	Remarks
(1)	(2)	(3)	(4)	(5)
Dean	1	1	—	
Anatomy				
Professor	1	—	1	
Assoc. Prof.	3	2	1	2 posts upgraded to Professor
Asst. Prof.	2	2	—	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	4	3	1	1 post upgraded to Assoc. Prof.
Animal Reproduction				
Professor	3	3	—	
Assoc. Prof.	3	2	1	2 posts upgraded to Professor
Asst. Prof.	4	3	1	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	2	—	2	
Animal Production Economics				
Professor	1	1	—	
Clinical Medicine				
Professor	2	1	1	
Assoc. Prof.	2	1	1	1 post upgraded to Professor
Asst. Prof.	3	2	1	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	4	3	1	2 posts upgraded to Asst. Prof.
Dairy Science				
Professor	1	—	1	
Assoc. Prof.	5	4	1	3 posts upgraded to Professor
Asst. Prof.	3	3	—	3 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	2	—	2	
Extension				
Professor	1	1	—	
Assoc. Prof.	2	—	2	
Asst. Prof.	2	2	—	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	4	3	1	

(1)	(2)	(3)	(4)	(5)
Genetics				
Director	1	1	—	
Professor	1	—	1	One post upgraded
Assoc. Prof.	3	—	3	
Asst. Prof.	3	3	—	
Jr. Asst. Prof.	3	1	2	
Livestock Production Management				
Professor	2	2	—	
Assoc. Prof.	2	1	1	1 post upgraded to Professor
Asst. Prof.	2	2	—	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	2	1	1	
Microbiology				
Professor	2	1	1	
Assoc. Prof.	2	1	1	One post upgraded
Asst. Prof.	3	4	—	3 posts upgraded to Assoc. Prof., One upgraded to Prof., One post to Assoc. Prof.
Jr. Asst. Prof.	2	2	—	
Nutrition				
Professor	1	—	1	
Assoc. Prof.	2	2	—	2 posts upgraded to Professor
Asst. Prof.	4	4	—	1 post upgraded to Prof., 3 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	3	1	2	1 post upgraded to Asst. Prof.
AICRP Agri. Byproducts				
Assoc. Prof.	1	1	—	1 post upgraded to Professor
Asst. Prof.	1	1	—	1 post upgraded to Assoc. Prof.
Pathology				
Director	1	1	—	
Professor	1	1	—	One post upgraded
Assoc. Prof.	2	2	—	
Asst. Prof.	6	3	3	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	4	4	—	
USAID Project on Ethmoid Tumour				
Professor	1	—	1	
Assoc. Prof.	1	—	1	
Res. Assoc.	1	1	—	
Res. Asst.	1	—	1	

(1)	(2)	(3)	(4)	(5)
Parasitology				
Professor	1	1	—	
Assoc. Prof.	4	4	—	4 posts upgraded to Professor
Asst. Prof.	2	2	—	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	2	2	—	
Pharmacology				
Professor	1	1	—	
Assoc. Prof.	3	3	—	2 posts upgraded
Asst. Prof.	4	4	—	3 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	3	2	1	1 post upgraded to Assoc. Prof.
Physiology				
Professor	1	1	—	
Assoc. Prof.	3	3	—	3 posts upgraded to Professor
Asst. Prof.	2	1	1	1 post upgraded to Assoc. Prof.
Jr. Asst. Prof.	2	2	—	
Poultry Science				
Director	1	1	—	
Professor	2	1	1	1 post upgraded
Assoc. Prof.	3	1	2	1 post upgraded to Professor
Asst. Prof.	4	3	1	3 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	2	—	2	
AICRP on Eggs				
Professor	1	1	—	
Asst. Prof.	2	2	—	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	3	2	1	
AICRP on Nutrition				
Assoc. Prof.	1	1	—	
Asst. Prof.	1	1	—	1 post upgraded to Assoc. Prof.
AICRP on Housing				
Assoc. Prof.	1	1	—	
Asst. Prof.	1	1	—	1 post upgraded to Assoc. Prof.
Physical Education				
Asst. Prof.	1	1	—	1 post upgraded to Assoc. Prof.
Jr. Asst. Prof.	1	1	—	

(1)	(2)	(3)	(4)	(5)
Preventive Medicine				
Professor	1	1	—	
Assoc. Prof.	2	2	—	2 posts upgraded to Professor
Asst. Prof.	4	2	2	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	3	1	2	
Surgery				
Professor	2	1	1	
Assoc. Prof.	4	4	—	4 posts upgraded to Professor
Asst. Prof.	3	2	1	2 posts upgraded to Assoc. Prof.
Jr. Asst. Prof.	3	3	—	
Statistics				
Professor	1	1	—	
Assoc. Prof.	1	—	1	
Asst. Prof.	3	3	—	1 post upgraded to Assoc. Prof.
Jr. Asst. Prof.	3	1	2	
Vety. Public Health				
Professor	2	2	—	One on Special recruitment
Assoc. Prof.	2	2	—	2 posts upgraded to Professor
Asst. Prof.	2	2	—	2 posts upgraded to Assoc. Prof. (5 years)
Jr. Asst. Prof.	3	2	1	1 post upgraded to Assoc. Prof. 1 post upgraded to Asst. Prof.
Vety. Hospital, Mannuthy				
Assoc. Prof.	1	—	1	
Asst. Prof.	2	2	—	2 posts upgraded to Assoc. Prof.
ICAR Progeny Testing Scheme				
Assoc. Prof.	1	—	1	
Asst. Prof.	2	—	2	
Goat Farm				
Assoc. Prof.	1	1	—	Upgraded to Prof.
Pig Farm				
Assoc. Prof.	1	—	1	
Livestock Farm				
Professor	1	1	—	
Assoc. Prof.	1	1	—	Upgraded to Prof.
Asst. Prof.	1	1	—	
Jr. Asst. Prof. (Vety)	1	—	1	
Jr. Asst. Prof. (Agri)	1	—	1	

Faculty Improvement

a) Details of deputation for higher studies:

Dr. Sisilamma George & Dr. K. P. Sreekumar, Asst. Professors, Department of Physiology & Biochemistry are on deputation for higher studies in U. K.

Dr. M. Gopalakrishnan Nair, Asst. Prof. Dept. of Pathology is on study leave for doing Ph. D. Programme in U. K.

Dr. Saradamma, Dr. Rajankutty, Dept. of Surgery Dr. H. Subramanian, Department of Parasitology and Dr. N. Divakaran Nair, Asst. Prof. Department of Pathology entered on Study leave for doing Ph. D. programme.

Dr. K. Venugopal, Assoc. Prof., Dept. of Preventive Medicine is on leave for doing Post graduate research work in U. K.

Dr. M. Mini, Asst. Professor, Department of Microbiology entered on study leave for Ph. D. programme in Madras.

Dr. D. Sudharma, Asst. Professor, Department of Microbiology is continuing her study leave for Ph. D. programme.

Dr. A. D. Mercy, Assoc. Prof. Department of Nutrition entered on study leave for higher studies in U. S. A.

Dr. A. M. Chandrasekharan Nair, Assoc. Professor, Department of Pharmacology is on study leave for Ph. D. programme.

Dr. T. V. Viswanathan, Assoc. Prof., Department of Nutrition continued on study leave for Ph. D. Programme in U. S. A.

b) Change in Academic Staff

Dr. Girish Varma joined the Department of Physiology and Biochemistry as Asst. Prof. on 11-2-94.

Dr. Sisilamma George, Asst. Prof. was relieved on 20-9-93 for higher studies in U. K.

Dr. K. P. Sreekumar, Asst. Prof. was relieved on 15-2-94 for higher studies in U. K.

Dr. M. R. Sasindranath, Assoc. Prof. (NC) joined duty after Ph. D. programme and transferred to KVK Ambalavayal.

Dr. P. G. Baby, Asst. Prof. joined the Department of Preventive Medicine on working arrangement.

Dr. P. A. Ommer, Prof. & Head retired on 25-6-93.

Dr. Lucy Paily, Prof. took charge of Head of the Department of Anatomy on 26-6-93.

Dr. M. Divakaran Nair, Asst. Prof. entered on study leave from 14-9-93.

Dr. K. I. Maryamma, Prof. & Head retired on 3-10-93.

Dr. K. M. Ramachandran, Prof. took charge of the Head of the department of Pathology, with effect from 19-4-93.

Dr. Koshy Varghese, Asst. Prof. joined as Scientist in the USDA Scheme on 29-10-93, after his Ph. D. programme.

Dr. M. Mini, Asst. Prof. transferred back to department of Microbiology on 19-10-93 from the USDA Scheme.

Dr. A. D. Joy, Assoc. Prof. (NC) joined after deputation for Ph. D. programme on 28-1-94.

Dr. P. Gangadevi, Asst. Prof. was transferred to ICAR Pig Project from the department of Nutrition on 18-8-93.

Dr. P. C. Alex, Assoc. Prof. (NC) rejoined duty on 18-9-93 after completion of his Ph. D. programme.

Details of participation of Scientists in Seminars,/Workshops/ Training/Symposia/Summer Institute:

Name & Designation	Type of course	Venue	Period
1	2	3	4
Dr. M. G. Ramakrishna Pillai, Prof. & Head Physiology	National conference of society of Animal physiologists of India	Akola	7-2-94 to 12-2-94
Dr. S. P. Sureshan Nair, Asst. Prof. Animal Reprodn.	Seminar on "Frozen Semen Technology"	Mattupetty	31-10-93
Dr. K. Prabhakaran Nair, Prof. Animal Reprodn.	National Symposium on "The role of Theriogenology for augmenting fertility of animals"	Calcutta	25-11-93 to 27-11-93
Dr. K. Chandrasekharan, Prof. Parasitology	International Seminar on "Asian Elephants"	Mudhumalai	13-6-93 to 18-6-93
Dr. V. Satyanesan, Prof. Parasitology	National Congress of Parasitology	Udaipur	22-2-94 to 24-2-94
Dr. K. V. Reghunandan, Assoc. Prof. (NC)	National workshop on "Animal Tissue culture Technology"	Karnal	—
-do-	Kerala Science Congress	Thiruvananthapuram	27-1-94 to 29-1-94

1	2	3	4
Mr. Jacob Thomas Asst. Prof. Statistics	Summer Institute on "Advances in Agril. Statistics"	New Delhi	17-5-93 to 5-6-93
Mr. Mathew Sebastian, Asst. Prof. Statistics	—	"	"
-do-	Refresher course in Statistics	University of Cochin	1-3-94 to 23-3-94
Dr. B. Gangadha- ran,, Asst. Prof. Pathology	Training Programme on "Aflatoxin deter- mination in feed"	Hesser- ghata, Bangalore	19-12-93 to 29-1-94
Dr. K. V. Valsala, Assoc. Prof. Pathology	National Seminar on "Pathology & Biotechnology	Bikaneev, Rajastan	8-10-93 to 10-10-93
Dr. B. Ganga- dharan, Asst. Prof. Pathology	-do-	-do-	-do-
Dr. K. Vijaya- kumar, Asst. Preventive	Summer Institute on Advances in Vety. Medicine	Madras	21-6-93 to 10-7-93
-do-	Kerala Science Congress	Thiruvanan- thapuram	27-1-94 to 29-1-94
-do-	Annual Conference of Indian Society for Vety. Medicine	Madras	4-2-94 to 6-2-94
Dr. R. Madhu- soodanan Pillai, Assoc. (NC) Microbiology	Kerala Sceince, Congress	Thiruvanan- thapuram	27-1-94 to 29-1-94
Dr. A. Ramakrish- nan, Director, CASP	Annual Scientists Meet of AICRP on Poultry	Hyderabad	7-9-93 to 9-9-93
Dr. A. Jalalu- dheen, Assoc. Prof. (NC) CASP	Workshop on "Meat Prodn."	Mannuthy	2-1-94
Dr. N. Gopa- kumar, Assoc. Prof. (NC) Pharmacology	Summer Inst. on "Vety, Pharmacology"	Ranchi	3-11-93 to 22-11-93
-do-	Physiologists & Pharmacologist conference	Thiruvanan- thapuram	27-12-93 to 30-12-93
Dr. Maggie. D. Menacherry, Prof.	6th Animal Nutrition Res. Workers conference	Bhubanes- war	13-9-93 to 16-9-93

1	2	3	4
Dr. K. M. Alikutty Prof. & Head	National symposium on "Recent Advance to control Prodn. disease of farm animals and birds"	West Bengal	23-4-93 to 25-4-93
-do-	National Symposium "Advances in Diagno- stic Procedures and 'Treatment of disease of Livestock"	Madras	4-2-94 to 6-2-94
Dr. V. S. Balakrish- nan, Prof. Clinical Medicine	-do-	-do-	-do-
Dr. P. C. Alex Assoc. Prof (NC) Clinical Medicine	-do-	-do-	-do-
Dr. Sreeja and Dr. Geetha, Dairy Plant	Summer Institute	Karnal	14-6-93 to 3-7-93
Dr. Rajendra- kumar, Assoc. Prof. Dairy Plant	Training on "Recent Advances in Dairy Processing	Karnal	6-12-93 to 15-12-93

d) Details of Training/Symposia/Workshops conducted:

Type of course	Period	No. of participants
Seminar on Poultry Diseases	16-7-93 to 17-7-93	175
Training on Advances in disease Investigation	18-10-93 to 17-1-94	13
-do-	14-2-94 to 13-5-94	14
Training on Postmortem techniques	1-2-94 to 11-2-94	4
Diagnosis of Poultry diseases	22-2-94 to 4-3-94	6
Training on Aflatoxin Analysis	1-11-93 to 5-11-93	4
Training on "Earn while you learn -broiler"	27-11-93 to 24-12-93	4
Short term training on "special diagnostic procedure"	13-9-93 to 18-9-93	6

Academic Programme

Students statistics

a) U. G. Programme

Years of Admission	Total
1993	115
1992	87
1991	80
1990	84
1989	97
1988	27
1987	14
1986	14
1985	2
1984	1
1983	2
	523

b) P. G. Programme (M. V. Sc)

Ph. D. Programme

A new four year degree programme in Dairy Science and Technology was started during the Academic year 1993-94.

c) B. Sc. (D. S. & Tech.)

Year of Admission	Total
1993	21

d) No. of students passed out:	Total
B. V. Sc.	101
M. V. Sc.	14
Ph. D.	4

Practical Training Programme

The undergraduate and post graduate students had farm training in the various instructional farms.

Study tour conducted

As in the previous year, All India study tour, South India study tour and All Kerala Study tour were conducted during the current year.

Scholarships, Awards and Aids to Students

- 1 Fee concession under KPCR
- 2 KAU Merit scholarship
- 3 ICAR Merit-cum-Means Scholarship
- 4 Districtwise merit scholarship

- 5 Kerala Labour Welfare Fund Scholarship
- 6 KAU Junior Fellowship
- 7 ICAR Senior Fellowship
- 8 ICAR Junior Fellowship
- 9 Educational concession to Lakshadweep students
- 10 Educational concession to SC & ST students
- 11 Educational concession to OBC/X'ian convert students
- 12 National Merit scholarship

Students' Union Activities

President	: Manoj Mathew
Vice-President	: Liz Simon
Secretary	: Rajesh P.
Joint Secretary	: Soya K. L.
Arts Club Secretary	: Noushadali K. N.
Student Editor	: Biju P. Habeeb
University Union Councillors	: Mini, B., Beetu Joseph, Biju P.

Dr. E. Mathai, Prof. Department of Animal Reproduction and Dr. K. Madhavan Pillai, Professor, Dept. of Parasitology were nominated as Associate Patron and Staff editor respectively.

Activities—General

The Students' Union was formally inaugurated by Sri. Oommen Chandy, Hon'ble Minister for Finance, Kerala State on the 3rd of April 1993. The Arts club was inaugurated on the same day by Sri. Tom Cartoonist. The inaugural ceremony was followed by an orchestra.

Activities of various Associations

Arts Club: A team of students represented the College in the Inter Professional College Arts Festival 'Crescendo '93 organised by the T. K. M. Engg. College, Kollam and won several prizes.

Inter class Arts Festival was held from 28-30th of September 1993. A new experiment was attempted by conducting the programme itemwise. The 1993 batch emerged as overall champion and '90 batch came second.

A colourful function "Campus Nite" was conducted on 6-1-94.

Planning Forum

An individual quiz competition and an inter class quiz were conducted. A talk by Dr. M. Krishnan Nair on Liver in health and disease, and kidney in health and disease was arranged on the 22nd and 23rd of June 1993. Revised and updated version of the clinical diary was published. The College was represented in the Inter Collegiate Quiz at KAU and AIR.

Film and Photographic Club

A film festival of foreign films from 31-5-93 to 3-6-93 and a film festival of Malayalam Film from 3rd to 8th of January 1994 were conducted. A Film Quiz was also conducted.

Social Service League

An Eye Donation Motivation Campaign was conducted on 24-6-93. Dr. Mary Kuriakose, Professor and Head, Department of Ophthalmology conducted an orientation class which was followed by the screening of a documentation on eye donation.

National Integration Club

An Interclass competition of mime and patriotic song was conducted on 25-6-93 and a procession was undertaken in the campus on August 9th to commemorate the Quit India Day.

Literacy and Debating Club

A Malayalam short story writing competition, a discussion on 'Literature and Culture' and a book exhibition were conducted by the Club.

Library

No. of books procured during the period	: 269
No. of books as on 31-3-94	: 15135
No. of Indian & Foreign journals subscribed during the period.	: 97

Hostels

Hostel	Warden	Asst. Warden	Steward/ Matron	Strength
UG Annexe	Dr. A. Rajan	Dr. Jose John Chungath	Mr. K. N. Raveendran	145
UG Main	-do-	Dr.C.B. Devanand	M.M. Babu	127
PG	-do-	Dr.V.S. Balakrishnan		40
UG (Ladies)	-do-	Dr. Shyla Prakash	Mrs. T.P. Sicily (till 31-8-93) Mrs.Chandra (from 22-11-93)	213

RESEARCH

246 research projects approved by FRC were in progress in various departments.

List of new Research Projects started during the year are given below:

1. Prevalence and Pathology of the Myocardial Lesions in Bovine.
2. Comparative study of the Immunopathological response in Ochratoxin A, Cadmium and Mercury toxicities in Ducks. (*Anas platyrhynchos domesticus*)

3. Immunopathological response of the duck (*Anas platyrhynchos domesticus*) to sublethal dose of selected agrochemicals.
4. Comparative pathology of Aflatoxicosis in the duck and fish with special reference to the immune system.
5. Prevalence and pathology of dermatological disorders in cattle.
6. Homologous and heterologous transplantation of bovine ethmoid carcinoma cells.
7. Pathology of Hypothyroidism in pigs.
8. Effect of anthelmintic treatment on milk production in sub-clinical nematode infections of cows.
9. Secretory immunoglobulins of the duck (*Anas platyrhynchos domesticus*)
10. Certain plasmid-mediated characters of staphylococci isolated from bovine mastitis.
11. Antigens of *Pasteurella multocida* isolated from rabbit and their immunogenicity.
12. Quality evaluation of quail meat patties under storage.
13. Physico-chemical quality of buffalo meat under refrigeration.
14. *Lactobacillus acidophilus* as a dietary adjunct in dahi and yogurt.
15. Preparation of Mozzarella cheese using skim milk filled with coconut milk.
16. Structural and functional changes in the testis and epididymis of cross bred bulls with impaired fertility.
17. Management of oestrous cycle in Crossbred Cattle using Prostaglandin.
18. Superovulatory response, embryo collection and transfer in crossbred cows.
19. Chromosome profile of crossbred bulls in Kerala.
20. Evaluation of Australorp with respect to economic traits.
21. Postnatal development of the oviduct in the Japanese quail (*Coturnix coturnix japonica*).
22. Influence of pullet body weight on production traits in white leghorns.
23. Influence of age and weight of gilt on breeding performance and feed intake during gestation and suckling period.
24. Assessment of the role of mycoplasma in genital infections of cattle.
25. Non antibiotic alternate therapies for endometritis.
26. Egg weight profile in three strains of White Leghorns.
27. Postnatal development of the upper digestive tract in the Japanese quail.

Major Research Achievements

A comparative assessment of the roles of men and women in dairying including their knowledge level in dairying and involvement in decision making was made. The influence of socioeconomic function on adoption of dairy practices were studied.

The existing levels of performance and satisfaction in the discharge of professional duties by veterinarian, along with the constraints were studied.

Intraperitoneal administration of xylazine alone, ketamine hydrochloride alone and combination of xylazine and ketamine hydrochloride produce satisfactory anaesthesia in pigeons and quails. However, the combination of xylazine and ketamine hydrochloride is found more advantageous due to short time for induction and long duration of anaesthesia.

The $2n=60$ diploid number revealed the Y chromosome as submetacentric in HF cross whereas it was more towards metacentric in Jersey and Brown Swiss cross. The X chromosome were the second largest on the Karyotypic among all the breeds studied.

The normal chromosome complement of $2n=60$ with 58 acrocentric autosome and acrocentric X chromosome was observed in goats. Y chromosome was the smallest. There is no correlation with chromosome status and reproductive disorders.

Vechur cattles are found to be more disease resistant.

Response to B. C. G., P. H. A, and D. W. C. B. was evaluated using calf skin as the model. The immune response generated was delineated.

Forty skin biopsies of cattle were conducted and lesions were classified as Pappiloma-6, Hyperkeratosis-8, Tick infestation-6, Mange-4, Nutritional alopecia-9, Foot and mouth disease-1 Rinderpest-1, Photosensitisation-2, and dermatophilus congoleasis-1.

Transplantation studies on ethmoid carcinoma in homologous host like rats, mice and rabbits were conducted both intraperitoneal and subcutaneous route were employed with immunosuppression. No gross lesions were visible. Histological examination is in progress.

Pathology of aflatoxicosis in ducks were studied. There was reduction in body weight and reduction in various cell counts. The sequential damage to the liver was also demonstrated.

Ninety nine bovine hearts were examined grossly and histopathologically. Sarcocystosis is observed in 95% of the histological sections examined. Other lesions like congestion, haemorrhage, focal myocarditis etc. were also encountered.

During the period of 1991 to 1994 36,412 chicken autopsies were conducted. Out of this 425 cases of Ascites syndrome was recorded. Broilers only were affected and the age group affected was in between 3 to 6 weeks.

Transfer of the haemolytic character of *E. coli* isolated from mastitis is plasmid mediated. A correlation between antibiotic resistance and heavy metal resistance such as Pb, An, Cu was observed in the descending order.

Comparative studies on the sensitivity of AAPA-AMHA and PHA test in screening *C. jejuni* specific antibodies have shown the SAPA-AMHA could advantageously replaced conventional PHA for serological diagnosis of animal and human campylo bacteriosis.

A killed formalinised vaccine prepared from *Pasteurella anatipestifer*, isolated from ducks was found to give satisfactory protection to duck pasteurellosis.

The combination of Xylazine (1 mg/kg) and Tiletamine-Zolazepaus (1.25 mg/kg 1/V) could be used to produce satisfactory short term anaesthesia in dogs.

Aminophylline at a dose rate of 20 mg/kg i/v could be used to reverse anaesthesia produced by Tiletamine-Zolazepaus-Xylazine combination in dogs.

Prawn waste can be satisfactorily ensiled with paddy straw and tapioca flour and that the prawn waste paddy straw silage is well relished and digested by cattle.

A level of up to 5.5 per cent of total tannins and 3.4 per cent of condensed tannins in tree leaves does not appear to exert any deleterious effect on feed consumption and nutrient utilisation in goats.

The common metabolic diseases among cross bred cattles in Kerala are hypocalcaemia, ketosis, downer cow syndrome and response to treatment for downer cow syndrome was poor.

The clinical cases of Downer cow syndrome serves sample analysis revealed a significant reduction in calcium, phosphorus, total protein and albumin. Haemorphological data showed neurophilia and eosinopenia.

Incorporation of dried spleen in the diet of rats and rabbits at the rate of 0.1% on dry matter basis enhances growth rate and nutrient utilization. At least 25% of feed nutrients can be saved by the incorporation of the dried spleen in the ration.

In broiler rabbits, a ration containing 16% CP and 2500 of DE is found to be satisfactory for economic growth upto third month after weaning, but for overall growth, 20% CP in the ration is found to be required for both economic and biologic efficiency.

EXTENSION

Village adoption programme

An animal Health camp was organised at Vellakarithadam. Classes were taken by experts on various aspects of dairy cow managements. Deworming drugs and Fodder slips were distributed to the farmers. A video film show was also conducted.

A film show was conducted by the AV unit of the Department of Extension in connection with the Village Adoption Programme at Thiruvazhamkunnu.

Services rendered to Farmers

A total of 180 cases were treated in the department of Surgery.

Clinical samples (485) were examined in the department of Parasitology for the presence of various parasites.

The following services were rendered to farmers by the department of Preventive Medicine.

i) No. of vaccinations conducted against Foot & Mouth disease	: 473
ii) No. of vaccinations conducted against haemorrhagic septicaemia	: 561
iii) No. of vaccinations conducted against Rinderpest	: 163
iv) No. of Animals tested for Johne's Disease	: 138
v) No. of STAT conducted	: 82
vi) No. of MRT conducted	: 120

A total of 278 51 cases were treated in the Veterinary Hospital, Kokkalai including 30 major and 763 minor surgical operation. Vaccinations done—PARV: 991, RD, 8867, Fowl pox vaccination: 390; Clinical samples examined : 1668.

The following diagnostic services were rendered by the department of Pathology:

Poultry autopsy diagnosis	: 26709
Large Animal autopsies	: 671
Rabies Diagnosis	: 488
Histopathological examination	: 2322
Clinical pathology	: 803
Feed samples analysed	: 888
G. N. C. samples analysed	: 321
Milk samples tested for aflatoxin	: 415
Ethmoid tumour cases studied	: 209

A total of 1494 clinical specimens of various nature including samples of milk, PVS, blood smear, uterine discharge, nasal discharge, skin scrapings, eye swab, rectal swab etc. were examined in the microbiology department by bacteriological, serological, virological and mycological tests and the results were communicated.

In the department of Pharmacology & Toxicology, 180 water samples, 112 feed samples & mineral mixtures and 64 biological specimens were analysed for various chemical constituents and toxins.

During the period under report 292 feed samples of mineral mixture for proximate principles and 58 sample of mineral mixture for total ash & major minerals were analysed in the Department of Animal Nutrition. A total of 8240 estimations were made using Atomic Absorption Spectrophotometer for various major and trace elements.

From the Small Animal Breeding station a total No. of 1961 Albino Rats, 456 Scoiss Albino Mice, 125 laboratory and broiler type rabbit, 36 coloured and Albino guinea pigs were sold to Government and private agencies.

The quantity of milk received during the period under this report at the Dairy plant and the different Dairy products manufactured are given below.

Total milk procured from ULF Mannuthy—12,097 lit.

Quantity of pasteurised milk sold—6,049.5 lit.

Skim milk powder—72.55 kg, Khoa—268.55 kg,

Paneer—94.5 kg, Butter—58.0 kg

Ice cream—839.28 lts.

Dahi—11.5 lts.

Yogurts—4.8 lts.

Flavoured milk drink—8.2 lts. whey drink—36.0 lts

Total production of meat and meat products at Meat Technology unit is as follows. Beef 9,280 kgs, Liver 614 kgs, Bone 4,078 kgs, Fat 1,009.8 kgs, Pork-8138. $\frac{1}{2}$ kg-1403.0, Cutlet 8269 Packets, hide-Cattle-91 Nos. Buffalo 563.1 kg. Broiler chicken 659.80 kg, Chicken liver 6.50 kg, Mutton 26 kg, Dogpack 2482 Pkt. (1 kg/1Pkt), Beef sausage 614 Pkt, Pork sausage 1030 Pkt, Cocktail sausage 636 Pkt.

Total Revenue Collected

Meat Technology unit	720000.00
Small Animal Breeding Station	54,010.00
Dept. of Surgery	628.00

Important visitors

Sri. P. P. George, Hon. Minister for Animal Husbandry, Govt. of Kerala visited the Centre of Excellence in Pathology on 16-7-93.

Dr. V. Gnanaprakashan, Vice-Chancellor, Tamil Nadu, Veterinary and Animal Sciences University visited the Centre of Excellence in Pathology on 17-7-93.

Dr. B. K. Sony, FAO Regional Animal Production and Health Officer, Bangalore visited the Meat Technology Unit.

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, Professor was in-charge of the unit during the period.

Major objectives of the farm are to provide hatching eggs, chicks and breeders for farmers, to provide instructional facilities for teaching and research and to take up independent research in various aspects of Poultry Production.

Category	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
Assoc. Professor	1	1	—
Asst. Professor	2	1	1
<i>Administrative staff</i>			
Senior Farm Supervisor	1	1	—
Farm Supervisor Gr. II	2	2	—
Farm Asst. Gr I	1	1	—
Farm Assistant Gr. II	1	1	—
Poultry Attendant	3	3	—
Admn. Asst.	1	1	—
Sr. Gr. Asst.	1	1	—
Assistant Gr. I	1	1	—
Peon Hr. Grade	1	1	—
Watchman	1	1	—

The research efforts of the University Poultry Farm could bring out the strain White Leghorn, namely 'F' strain as one of the best layers as per VII Random Sample Test Results of Hesserghatta in 1978. The farm was able to develop a crossbred chicken by name Gramalakshmi (Austra White) which as an ideal bird has attracted the attention of poultry farmers and is in great demand. This technology has been taken over by the State Department of Animal Husbandry and is being supplied through its farm.

Research on ducks is being undertaken only by few research centres, in the country. The research efforts on this species carried out in the farm has placed the Kerala Agricultural University as a centre for information on duck in the country.

Recently, the farm has taken up popularisation of quail farming which has attracted many farmers in Kerala.

The State Department of Animal Husbandry is assisted by the farm in implementing its programme of 'Poultry Nursery Project' through supply of chicks. The efforts are being continued.

Broadcasted lessons on poultry keeping through All India Radio under 'Farm School on AIR Programme.

2.3. UNIVERSITY PIG BREEDING FARM, MANNUTHY

It is a unit of College of the Veterinary and Animal Sciences, started in 1965 with the objective of conducting research on various aspects of swine production, to function as a demonstration unit for farmers and instructional unit for students and to produce and distribute good quality piglets to farmers. The area of the farm consists of four hectares.

Dr. Kurian Thomas was the head of the station during the period.

The details of staff sanctioned, in position and vacant are furnished below.

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
Professor and Head	1	1	—
Assoc. Professor	1	1	—
Asst. Professor	2	2	—
<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. 1	1+1	1+1	—
Pump Operator	1	1	—
Peon Hr. Gr.	1	1	—
Pig Attendant	2	2	—
Watchman	1	1	—

The Scientists handled classes for UG and PG students. Physical facilities were provided for PG students and research scholars for research work. A booklet in Malayalam entitled Pannivalarthal was published.

A centre of the All India Co-ordinated Research Project on Pigs was functioning at this station with effect from 1.4.93 at an estimated outlay of Rs. 49.14 lakhs for 8 th plan period. The project envisages investigation of the performance of native pigs vis a vis exotic and to develop a suitable pig for our agroclimatic conditions. The project was headed by Dr. Kurian Thomas, Professor.

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.

Dr. A. Ramakrishnan continued to be the Director of the Centre.

2.5. ALL INDIA CO-ORDINATED PROJECT ON POULTRY BREEDING

The ICAR sponsored project was initiated in 1976 to develop a commercial layer of average yield of 270 eggs of standard size during 500 days of age with less than 1% layer house mortality per month.

During 1992-93, S14 generation of both IWN and IWP strains were raised and tested at Mannuthy Centre for their part year production. Overall performance of both the strains was found to be good. Four pedigree hatches of IWN and IWP strains were taken at five day intervals to produce S15 generation.

Dr. A.K.K. Unni continued as the Senior Scientist incharge of the project.

2.6 CENTRE FOR ADVANCED STUDIES IN ANIMAL GENETICS AND BREEDING

The Department of Animal Genetics and Breeding started in the year 1976 was raised to the status of Advanced Centre in the year 1985. Dr. G. Mukundan continued to be the Director. The details of activities are given in the report of the College of Veterinary and Animal Sciences.

Staff

Name of post	Sanctioned	Vacant
Director	1	Nil
Associate Professor	1	Nil
Assistant Professor	1	1

Major Research Achievements

Screening of crossbred bulls used for A.I. in Kerala

53 crossbred bulls of 3 genetic groups (H.F cross, Jersey cross and Brown Swiss cross) were analysed for chromosomal status. The reproductive status of these bulls viz. Freezability of semen, morphology and morphometry of spermatozoa were also analysed. The normal sound bull and bulls showing semen abnormalities were compared for chromosomal status such as morphology, morphometry and bonding pattern. The analysis for karyotype is in progress.

Chromosomes profile of crossbred bulls in Kerala:

Crossbred bulls of three genetic groups viz. H. F. cross, Jersey cross and Brown Swiss cross used for A.I. in Kerala were karyotyped. More than 55 crossbred bulls were subjected to karyotyping using peripheral blood leucocyte culture technique and were Gbanded. The $2n = 60$ diploid number revealed the Y chromosome as submetacentric in HF cross whereas it was more towards metacentric in Jersey and Brown Swiss cross. The X chromosome were the second largest on the karyotypic among all the breeds studied.

A survey on chromosome abnormalities in goats:

The normal chromosome complement of $2n = 60$ with 58 acrocentric autosome and acrocentric X chromosome was observed. The Y chromosome was the smallest and the only submetacentric are in the Karyotype. Among the reproduction data no chromosomal abnormalities were noticed in repeat breeder and subfertile goats. The reproductive abnormalities such as sub fertility, repeat breeder etc. has no correlation with chromosome status.

Parentage control in cattle using blood types

More than 702 crossbred animals available at various farms of Kerala State were blood typed using the reagents available at this centre. Parentage studies were carried out in 83 sire-Dam-offspring sets available at University farm.

Blood Groups and Biochemical Polymorphism in Cattle

More than 46 bovine monovalent blood typing reagents were produced at this Centre. 39 polyclonal antisera collected and stored subjected to absorption. 638 crossbred animals were typed for haemoglobin. The population was found to be in genetic equilibrium set of Hb locus.

Genetic studies on the immune response of broiler rabbits

The contact sensitivity to DNCB in different broiler rabbits breeds have been assessed. The JR to BRBC as well as the immunoglobulin status of these animals have been assessed. The data awaits final analysis.

ICAR scheme on "Progeny Testing procedures in crossbred cattle utilising information from both large and small herds

In order to develop a methodology for evaluation of breeding bulls and also to bring in genetic improvement in the cow population, a scheme on Progeny Testing of cross-bred bulls was undertaken.

A milk recording system has been developed and factors have been developed for 22 fortnightly test day milk yields independently to predict 305 days lactation milk yield. Prediction factors for 305 days milk yield from test day milk yields at (a) 4 weeks (b) 6 weeks and (c) 8 weeks have been developed. It was seen that under field conditions, monthly recording would be enough to predict 305 days yield with sufficient accuracy.

Average predicted body weight at calving was found to be 258 kg. Sires and centres significantly effected body size at birth and at calving.

Age at first calving under field conditions was found to be 1234 ± 17.2 days (40.5 months).

Sires were ranked on the basis of daughter average and contemporary average. The rank and product moment correlation of sire proofs between the two methods were 0.996 and 0.921.

More than 40 per cent of the registered progenies are sold before calving. Among cows about 24 percent are sold during lactation.

A breeding programme has been initiated for the three University Livestock Farms for genetic improvement of future generation cows, using the semen from the scheme.

ICAR Scheme on 'Conservation of Germplasm of Vechur Cattle of the coastal area and dwarf cattle of the high ranges

An effort was taken to save the once popular and favoured Vechur cow of Kerala, with financial assistance amounting to Rs. 25.6 lakhs from Indian Council of Agricultural Research.

A few old cows that could be found out after long search have been purchased. Now, a nucleus stock of 84 Vechur and other dwarf cattle of Kerala are maintained by the University.

Characterisation of the breed is in progress. The average body weight of the cows was observed to be 129 kg and height 89 cm confirming belief about the smallness and dwarfness of the cow. Average birth weight of the calves was 10.9 kg which is about 1/3 of that of the cross-bred calf. The average milk production was 2.47 kg/day and meat production was 3.67 kg/day. Fat percentage in morning milk was 4.19 and in evening milk 5.88.

Average intercalving period was quite satisfactory i.e., 14.7 months. Age at first calving on the basis of three heifers was 33 months.

Vechur cattle are found to be more disease resistant. Calves are more healthy, compared to the cross-breds. The adaptability of Vechur cattle to the local situation can be exploited for the benefit of the farmers who require milk, just for home consumption and who cannot give sophisticated management to the cows.

Services rendered to the farmers by way of consultancy/ advisory work etc.

This Centre extended technical support to various farmers especially those involved in rabbit, goat and cattle breeding.

The Rabbit Unit under this Centre distributed about 300 pairs improved varieties of rabbits to farmers.

The goat unit attached to this Centre extended technical assistance to farmers involved in goat farming. 83 goats have been sold to farmers.

2.7. 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.

Considering the outstanding contribution of the Centre of Excellence in Pathology the Indian Council of Agricultural Research has sanctioned a National Advances Centre in Animal Pathology. An amount of Rs.42 lakhs has also been sanctioned. This centre of Excellence in Pathology will offer postgraduate courses for candidates from all State Agricultural Universities and organise various Training programmes at the National level for teachers and research workers in Animal Pathology. This is the only centre in the country for this subject. Research on frontier areas in this discipline will also be undertaken.

Research activities and Achievements

1. Number of Research Projects

Kerala Agricultural University—Sixteen	
United States Department of Agriculture—One	
Animal Husbandry Department, Govt. of Kerala—Four	
State committee on Science, Technology and Environment	—One

Highlights of the research projects

1. Response to B. C. G; P. H. A and D. N. C. B was evaluated using calf skin as the model. The immune response generated was delineated.

2. Fourty skin biopsies of cattle were conducted and lesions were classified as pappiloma—6; Hyperkeratosis—8, Tick infestation—6, Mange—4, Nutritional alopecia—9, Foot and Mouth Disease—1, Rinderpest -1, photosensitisation —2 and dermatophilus congolensis—1.

3. Transplantation studies on Ethmoid carcinoma in homologous host like bovine calves and heterologous host like Rats, Mice and Rabbits were conducted. Both intraperitoneal and subcutaneous route were employed with immunosuppression and without immuno suppression. No gross lesions were visible. Histological examination is in progress.

4. Pathology of aflatoxicosis in ducks were studied. There was reduction in body weight and reduction in various cell counts The sequential damage to the liver was also demonstrated.

5. Ninety nine bovine hearts were examined grossly and histopathologically. Sarcocystosis is observed in 95% of the histological sections examined. Other lesions like congestion, haemorrhage, focal myocarditis etc. were also encountered.

6. During the period of 1991 to 1994 36,412 chicken autopsies were conducted. Out of this 425 cases of Ascites syndrome was recorded. Broilers only were affected and the age group affected was in between 3 to 6 weeks. The classical symptoms were droopiness, lack of feed consumption and pendulous abdomen. Ascites was pronounced. Abdominal cavity contained about 50–100 ml of clear straw coloured fluid. Liver was atrophic and pale. Hypertrophy of the left ventricle, pulmonary oedema etc were noticed as gross lesions. Feed analysis and histopathological studies were conducted. The work is in progress.

7. Pathological features of sublethal toxicity to certain agro-chemicals is being conducted. The work is in progress.

2.8 VETERINARY COLLEGE HOSPITAL, MANNUTHY

Veterinary College Hospital, Mannuthy was established in the year 1961 with the primary objective of imparting clinical training to the students and providing clinical materials for field/problem oriented research. Both in-patients and out-patients are attended category wise under supervision of specialists from four clinical departments viz. Clinical Medicine, Preventive Medicine, Surgery and Animal Reproduction.

Teaching and Technical Staff

Category	Sanctioned	In position	Vacant
<i>Scientific Staff</i>			
Professor	1	1	—
Assoc. Professor	1	1	—
<i>Supporting staff</i>			
Farm Assistant Gr. I	1	1	—
Permanent Labourer	1	1	—

Cases treated

Equine	: 10
Bovine	: 5562
Others	: 3417
Total	: 8989
Daily average attendance	: 24.6
Castrations done	: 8
Surgical operations	: 440

2.9. LIVESTOCK RESEARCH STATION, THIRUVAZHAMKUNNU

Livestock Research Station, Thiruvazhamkunnu is located in Kottoppadam Village, Mannarkkad Taluk, Palakkad District. The station is situated 17 kms. north of Mannarkkad.

The farm was started under the postwar development scheme of Animal Husbandry Department of Madras Government in the year 1950 with its office at Perinthalmanna. The farm was then transferred to Department of Animal Husbandry, Kerala in 1956 and then to Kerala Agricultural University in February, 1972. It was converted into Livestock Research Station on 14.8.1978. An A.I.C.R.P. on Agroforestry was started on 8.12.1983 and continues to be under operation. Dr. P. Ramachandran continued to be in charge of the station.

Main objectives

To evolve elite breed of cattle by scientific breeding, feeding and management.

To conduct adaptive research to reduce production cost.

To hold problem oriented research projects in the field of Animal feeding, production and management.

To advise local farmers on scientific management of livestock and technology transfer to villages.

To provide artificial insemination and animal health care to animals of local farmers.

Staff

Details of staff sanctioned, in position and vacant are given below:

Category	Sanctioned	In position	Vacant
<i>Scientific</i>			
Professor	1	1	—
Assoc. Professor	2	2	—
Asst. Professor	2	1	1
Junior Asst. Professor	2	0	2
		One post of JAP shifted to College of Vety. & Animal Sciences, Mannuthy	
<i>Administrative and Supporting</i>			
Farm Supervisor (Ag) Gr. I	1	1	—
Senior Farm Supervisor (Vety.)	1	1	—
Farm Supervisor (V) Gr. I	1	1	—
Farm Assistant (V) Sr. Gr.	1	—	1
Farm Assistant Sr. Gr. (A)	1	1	—
Farm Asst. (Ag.) Gr. I	3	3	—
Farm Asst. (Ag.) Gr. II	1	1	1
Tractor Driver Gr. II	1	—	1
Technician Sr. Gr	1	1	—
Field Supervisor/Class IV	1	1	—
Maistry	2	2	—
Mazdoor Hr. Gr.	4	2	2
Mazdoor	5	5	—
Pump Operator	2	2	—
Administrative Assistant	1	1	—
Sr. Gr. Assistant	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	8	8	—

Dr. K. V. Athman, Associate Professor (Animal Reproduction) and Dr. Mammen J. Abraham, Assistant Professor (Pathology) continued to be under deputation, for their Ph. D Research work.

A. Production/Development

Increase in milk production (+42.6%)milking average against milch cows (+31.3%), milking average against wet cows (+56.6%).

Quantitative and qualitative increase in fodder production and preservation. Silage production increased by 50%. Introduced high yielding varieties of grass and legumes replacing low yielding local grass. Intensive afforestation programme implemented planting more than 32,700 tree saplings including 20,000 teak stumps. Got sanction for Wasteland Development Project. Strengthened Irrigation facilities by installing pumping system utilizing river water.

B. Teaching

One month's Internship Training of B. V. Sc. & A. H. final year students and short term Farm Practical Training for B. V. Sc. students.

C. Research

Recorded basic data of the crossbred Dairy herd.

Ph. D. Research project on 'Effect of Bypass Protein on yield and composition of milk in crossbred cows.' completed.

Library and laboratory facility strengthened by purchase of Journals, Books, etc.

D. Extension

Village Adoption Programme implemented with cattleshow, seminar etc.

Veterinary aid and A. I. facilities were provided to animals of farmers.

Proposals for Training Programmes for farmers/IRDP/SC-ST/ beneficiaries sent for sanction.

2.10 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 Thumburmuzhi with the financial assistance from the Indian Council of Agricultural Research. The dry cattle salvage farm was wound up

in 1962. The ICAR scheme 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 congosignal. At present the farm has 593 bearing and 148 young coconut trees.

The main objectives of the farm are (1) to develop the farm into a model dairy farm (2) to extend facility of artificial insemination to the cattle of the surrounding villages and to supply improved varieties of fodder slips. (3) To provide facility for PG Research on large animals.

Staff position

Category	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
Assoc. Professor	1	1	—
Asst. Professor	1	1	—
<i>Administrative & Supporting</i>			
Administrative Asst.	1	1	—
Assistant Gr. I	1	1	—
Assistant Gr. II	1	1	—
Peon Hr. Gr.	1	1	—
Farm Supervisor Gr. I (Vety)	1	1	—
(Ag) Gr. I	1	1	—
Farm Assistant (Vety) Gr. I	2	1	1
Pump Operator	1	1	—
Herdsman (Spl. Gr.)	1	1	—
Herdsman	4	4	—
Pharmacist	1	1	—

Research activities

Two post-graduate scholars have completed their animal experimentation part of their research in the farm. One P. G. scholar is presently working in the farm on the feeding of cross-bred calves.

Animal Husbandry Section**Herd strength (cross-breds)**

Sl. No.	Age group/Type	Strength	
		As on 1-4-93	As on 31-3-94
1.	Upto 6 months	7	24
2.	6 months—12 months	5	17
3.	12 months—18 months	8	6
4.	Above 18 months—Heifers	56	34
5.	Dry cows	8	13
6.	Cows in advanced pregnancy	17	15
7.	Milch cows	21	42
Total		122	151

The number of cows in milk increased by 50 percent and the young stock increased by 135 percent during the year under report.

Performance record

Basic data on herd production and reproduction are regularly recorded and evaluated to assess the herd performance.

Sl. No.	Parameter	Period	
		1992-93	1993-94
1.	Average number of cows in milk	19	30
2.	Total milk production (kg)	37,681.2	71,794.8
3.	Average daily milk yield (kg)	103.24	196.70
4.	Milking average/cow/day (kg)	5.43	6.56
5.	Number of calvings	25	52
6.	Number of animals purchased	Nil	Nil
7.	Number of animals died	3	1
8.	Number of animals culled/sold	20	24

2.11. CATTLE INFERTILITY SCHEME, KOZHIKODE

The cattle infertility scheme was started functioning during 1.9.1980 at Veterinary Hospital, Calicut and shifted in 1984 to rented building at Vellimadukunnu.

The aim of the scheme is to conduct research on infertility and to find out the incidence, nature and magnitude of prevalence of infertility conditions among crossbred cattle of Kerala.

Under the scheme the main centre is functioning at Mannuthy with regional centre at Calicut and Kottarakkara. Under the regional centre at Calicut four ICDP Sub centres and two Veterinary Hospitals were selected for conducting the regular infertility camps and regular monthly visits, carried

out for screening of cows and buffaloes for various infertility conditions, In addition infertility camp organised by Animal Husbandry Department, Dairy Development Department and Krishi Vigyan Kendra, Ambalavayal were also attended.

Staff in position

Designation	No. of posts		
	Sanctioned	In position	Vacant
Assoc. Prof.	1	1	—
Asst. Professor	1	1	—
Junior Asst. Professor	1	—	1
<i>Technical & Supporting staff</i>			
Senior Gr. Farm Asst. (Vety.)	1	1	—
Lab. Technician	1	1	—
Lab Assistant Gr. III	1	1	—
Attendant	1	1	—
<i>Administrative staff</i>			
Assistant Gr. II (Sr. Gr. Asst.)	1	1	—
Peon	1	1	—

Faculty improvement programme

No new posts sanctioned during this period. Part-time registration facilities for Ph. D. programme was given to Dr. K. Ramachandran, Assistant Professor of this scheme during this period.

Major Research Achievements

During this period 1195 cases were reported in this Centre for diagnostic and treatment purpose. A total number of 684 cows and buffaloes were given artificial insemination after proper infertility treatment and 356 animals were screened for pregnancy examination.

The various forms of infertility conditions noticed during the detailed investigation were underdeveloped genitalia, anoestrus, endometritis, repeat breeding conditions, delayed ovulation, metoestral bleeding, silent oestrus and other miscellaneous gynaecological conditions.

Detailed haemogram of 161 animals were carried out. The serum samples in the case of anoestrus in heifers, cows and buffaloes were examined for calcium, phosphorus, blood glucose and protein.

The incidence of repeat breeding problem was higher in heifers than in cows. It may be due to lack of proper care by the

owners because of the unproductive status of the animal. Feeding of adequate high quality food and supportive therapy with trace minerals were recommended for routine adoption. In anoestrus condition of heifers, where ovaries were small, smooth and inactive 30 gm of mineral mixture along with Vitamin, atleast from 18th month upto insemination should be given along with concentrate feed. In post partum anoestrus of cows and buffaloes 30 gm of mineral mixture twice daily during the first four months after calving is recommended.

Uterine infection with the non-specific organism, were the predominant cause of repeat breeding in cow. In such cases Lugol's Iodine therapy with proper antibiotic coverage and adequate sexual rest will be beneficial. The incidence of endometritis cases were higher in cow than in heifers because cows were frequently exposed to genital infection than heifers.

In animals where the exact cause is buffing and stress artificial insemination at right time or after monitoring corpus luteum. Prostaglandin F2 alpha can be administered (25 mg.) intramuscular and artificial insemination on 2nd or 3rd day with oxytocin 5 mg. i/unit intravenous and post insemination antibiotics preferably chloramphenicol, gentamycin is recommended.

Extension activity

Routine artificial insemination of cows and buffaloes and other veterinary aids and suggestions were also given to the local farmers of this area in addition to the research work. The scientific staff of this centre attended seminars and infertility camps organised by the Animal Husbandry Department, Calicut.

2.12 UNIVERSITY VETERINARY HOSPITAL, KOKKALAI

This University Veterinary Hospital situated in the heart of Thrissur town has a campus area of 1.2 acres. This being the oldest Veterinary Hospital of the State was started as Cochin State Veterinary Hospital during August 1904, was subsequently been taken by the Kerala Agricultural University during 1972.

Several problem cases of animal diseases are being referred to this hospital by field Veterinarians, Police Departments and other farmers from the entire State. This hospital is equipped with modern infrastructures for proper diagnosis of animal diseases and expert treatment are rendered to the farmers.

An Ultra Sound Sector Scanner was procured and is being made use of in the special clinical examination of small animals.

A Portable Electro Cardiograph (E.C.G.) unit is also made available for diagnosing cardiac problem in small animals.

The Clinical Laboratory attached to this hospital is fully equipped especially with *Chemistry Analyser* for examining blood samples for various diseases. The existing Operation Theatre is fully air-conditioned and furnished with essential equipments and appliances to cater to the need of modern surgery. This hospital has three speciality units viz. Medical Unit, Surgery Unit and Gynaecology Unit with Artificial Insemination Centre for Cattle, Buffaloes and Goats.

Residential quarters are provided to the officers in order to attend emergency cases brought outside office hours.

Dr. K. Ramdas continued as Professor and Head during this period.

Staff position

Category	Sanctioned	In position	Vacant
a) <i>Academic</i>			
Professor	1	1	—
Asst. Professor	1	1	—
Farm Assistant (Vety.)	2	2	—
Pharmacist	1	1	—
b) <i>Administrative Staff</i>			
Section Officer	1	1	—
Assistant Sr. Gr.	1	1	—
Class IV employees	4	4	—

Besides the above staff members, experts from the Veterinary College Departments like Medicine, Surgery, Animal Reproduction and Parasitology attend different speciality units for imparting clinical training to the undergraduate and postgraduate students. Hospital is functioning regularly from 8 a.m. to 12 noon and 3 p.m. to 5 p.m. During outside hours emergency cases are attended by the Resident Veterinary Officer.

Research

Various Research Schemes on various diseases of the animals are operated here. This includes clinical trials in the newer drugs, studies on reproduction disorders in animals and cheaper techniques for treatments.

Other activities

The following extension activities are given to the farmers.

- a) Expert Veterinary advice on various disease problems are given to the farmers.
- b) Poultry vaccination. Anti-rabies vaccination and parvoviral vaccination are given during hospital hours.

- c) Analysis of clinical samples brought from various Veterinary hospitals and sub centres.
- d) Consultancy services to Field Veterinarians and farmers.

A brief account of cases treated during the year 1993-94 are given below :

1. Total no. of cases treated	:	27851
Total no. of referred cases	:	1820
2. Castration	:	46
3. Operation: Major/Minor	:	24/836
4. PAR Vaccination	:	991
5. Birds treated	:	3321
6. Birds vaccinated: RD vaccination	:	8867
Fowl pox vaccination	:	390
7. Daily average of cases	:	76.3
8. Clinical samples examined in the Laboratory	:	5935

2.13. UNIVERSITY LIVESTOCK FARM & FODDER RESEARCH AND DEVELOPMENT SCHEME, MANNUTHY

The University Livestock Farm, Mannuthy, established more than 70 years back has been functioning as a Cattle Breeding Farm for the supply of superior breeding bulls for about 40 years. Since the starting of Kerala Veterinary College in 1955, the farm had the added objective of instruction to students and also undertaking research.

This farm provides learning facilities both at under-graduate and post-graduate levels and provides training facilities to farmers apart from serving the needs of farmers for their fodder seeds and slips. It undertakes problem oriented research projects on livestock farming applicable to Kerala conditions.

Now, the Livestock Farm is having a fodder section as well as a central pool of labourers. The area under the farm is 69 hectares.

Livestock Section

a) Animals as on 31/3/1994

Milch cows	:	92
Dry cows	:	71
(including experimental)		
Bullocks	:	03
Calves	:	41
Heifers	:	28
<hr/>		
Total	:	235
<hr/>		

Total Milk production 1993-94	:	2,04,947.750 litres
Cost of milk produced @ Rs. 9/ltr	:	Rs. 18,44,530
Average No. of milk cows maintained	:	120 Nos.

Fodder Section

There is a total area of 69 hectares of land of which about 15 hectares are located in the plains (irrigated) and rest is in hilly area of the farm. There is no waste land.

Total Fodder Production 1993-1994

Quantity (MT)

1 Green grass	:	2,755.150 Tonnes
2 Maize fodder	:	45.060 T
3 Silage	:	605.675 T
4 Cowpea	:	7.725 T
5 Lab-Lab	:	0.055 T
6 Sorghum	:	3.200 T

Total fodder slips distributed in 1993-94

1 Hybrid Napier slips	:	18,700 Nos.
2 Improved Guinea grass slips	:	20,850 Nos.
Annual Receipt during 1993-1994	:	Rs. 16,59,739.27
Annual Expenditure during 1993-94	:	Rs. 62,73,634.00

3. FACULTY OF FISHERIES

3.1 COLLEGE OF FISHERIES, PANANGAD

The College of Fisheries was started during the academic year 1979-80, with the approval of ICAR and the Govt. of Kerala. To begin with the College, started functioning at Mannuthy, but was shifted to the permanent campus at Panangad, Kochi, in the year 1981. The College is situated in a 30 ha campus by the side of Kochi-bypass (NH 47), 6 kms South of Vyttila. The College offers a 4-year degree programme leading to the Degree of Bachelor of Fishery Science (B. F. Sc.) following the Semester system of teaching. The intake capacity at present is 40 per year. Post graduate programme (M. F. Sc.) is also being offered in the College in the disciplines of 'Aquaculture', 'Fishery Biology' and 'Processing Technology'.

Dr. M. J. Sebastian, Professor, Aquaculture and Head of Department officiated as Dean i/c (Fisheries) during the period.

Departments

The College of Fisheries continued to function with the following seven Departments:

1. Department of Aquaculture
2. " Fishery Biology
3. " Fishery Hydrography
4. " Fishery Technology
5. " Fishery Engineering
6. " Processing Technology
7. " Management Studies

Departmentwise staff

Dr. M. J. Sebastian, Dean i/c.

Designation	Strength			Remarks
	S	P	V	
Professor	4	3	1	Professor (Fish. Biol) Vacant
Assoc. Professor	14	13	1	Fishery Engg. vacant (2 posts Asst. Profs. working)
Asst. Professor	20	11	9	In one post JAP working. One vacant from 24-4-92.
Jr. Asst. Prof.	12	3	9	All post vacant throughout the period
Administrative Officer	1	1	—	
Section Officer	3	3	—	
Asst. Librarian	1	—	1	Vacant
Ref. Assistant	1	1	—	
Sr. Office Supdt.	3	3	—	
Office Supdt.	1	1	—	
Sr. Gr. Typist	3	3	—	
Typist Gr. II	1	1	—	
Sr. Gr. Assistant	3	3	—	
Asst. Gr. I	2	1	1	Vacant from 14-5-92
Asst. Gr. II	5	5	—	
Steward	1	1	—	
Lab Asst. Gr. II	4	3	1	Vacant from 2-6-92
Lab Asst. Gr. III	1	1	—	
Technician Gr. I	1	1	—	
Farm Asst. Gr. I	1	1	—	
Fieldman-Fisheries	2	2	—	
Fisherman-cum-watchman	5	1	4	
Driver HDV	1	1	—	
Driver LDV	3	3	—	
Bus Attendant	1	1	—	
Duplicator Operator	1	1	—	
Pump Operator	1	1	—	
Peon (Class IV)	6	6	—	

Change in Staff position : Nil

Faculty Improvement programme: No scientific staff is deputed for higher studies during the period.

Seminars/Symposia/Training programme attended by Scientific Staff

Eleven members of the scientific staff attended 18 Symposia/Seminars/Workshops in different centres in 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.

Department of Fishing Technology

Courses under Gear technology I and II, fishing methods, onboard fishing experience, navigation and seamanship were offered for the UG programme and in minor fields for M. F. Sc. (Fishery Biology) 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, Physical Education and related subjects were offered for the B. F. Sc. (Aquaculture & Fishery Biology) programmes were also offered.

U. G. Courses

a) Strength of students as on 31-3-1994

Batch	Men	Women	Total
1987	—	—	—
1988	—	1	1
1989	2	1	3
1990	6	6	12
1991	14	7	21
1992	16	3	19
1993	22	12	34
Total	60	30	90

b) No. of outside students — Nil

c) No. of students who obtained the degree during the year

9	3	12
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P. G. Programme

M. F. Sc.

1992 batch	1	1	2
1993	2	1	3

No. students who obtained the degree during the year

5	3	8
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Ph. D. offered — Nil

Details of Scholarships, awards and other financial Assistance to the students

K. A. U Merit Scholarship	— 9
I. C. A. R Jr. Fellowship	— 2
ICAR Merit cum Means Scholarship	— 4
KPCR	— 2
KAU Jr. Fellowship	— 3

Awards

Kunjan Pillai Memorial award	— 1
Fish Process. Tech-Best student	— 1

Practical training programme

Work experience was given to the students in fish farms, fishing vessels and processing plants. Under the practical training programme fishing trips and field trips for operation of Oceanographic instruments were conducted for students. Under 'Earn while you learn' programme, training in integrated farming was undertaken by students.

Study tour

The 1990 and 1991 batches of B. F. Sc. students were taken on a study tour during 10th–24th January, 1994. Dr. K. K. Varma, Associate Professor, Dr. K. V. Jayachandran and Dr. Elizabeth Joseph, Assistant Professors accompanied the students. They visited Madras University, CIBA, Madras, ZSI, Madras, Commercial Fish Farms at Calcutta, CIFRI, Barrackpore, CIFA, Bhubaneswar, College of Fisheries, Behrampur (Orissa), Department of Marine Sciences, Utkal University and OSPARC, Orissa.

Classes on 'AIDS Awareness' and a survey on AIDS Awareness were conducted in the campus.

A 3 week training programme on aquaculture and animal husbandry was conducted at the College as part of the training programme on rural youth for self employment, jointly organised by NSS Training and Orientation Centre, Kalamassery and the NSS unit of the College. 30 persons underwent the training. The programme was inaugurated on 17-1-1994.

Students Union Activities

The Students Union election for the year 1993 was held on 22-5-93. The union organised a talk on 'Entrepreneurship' by Sri. M. I. Varghese, General Manager, Kerala Industrial Technical Consultancy Organisation.

The inaugural function of the students union, 1992-93 was held on 10-6-93 and Sri. K. S. S. Panicker, Mayor of Cochin inaugurated the function and Sri. M. S. Thripunithura, the Arts club.

20th August 1993 was observed as 'Sadbhavana Diwas'. Students and staff took pledge for national integration on the occasion.

The students union arranged a 'Kathakali demonstration' by the eminent artist, Sri. Kalamandalam Gopinath and his learn on 19-8-93.

Interclass Arts competition was held at College on 23-25 September 1993.

Hostel

Name of Warden	—	Mr. M. J. Sebastian, Dean i/c.
Name of Asst. Warden	—	Dr. P. M. Mathew, Professor
Name of Hostel Manager	—	Sri. Mohammed Mosadiq
Hostel Strength	—	Boys—64 Nos. Girls—26 Nos. (As there is no girls hostel, the girls are accommodated in YWCA (19 Nos.) and N. S. S. working Womens Hostel (7 Nos.)

Library

The details of books & journals in the College library are as follows.

	Books (including reports, bulletin etc.)	Journal subscribed	
		Indian	Foreign
No. as on 1-4-93	10944	32	19
No. as on 31-3-94	11495	32	21
Addition during the period	551	Nil	2

Research Projects in Progress

- 1 Development of brood stock and hatchery production of *Lates calcarifer*.
- 2 Optimisation of factors to maximise prawn production.
- 3 Intensive culture of giant freshwater prawn *Macrobrachium rosenbergii* in pokkali field ponds.
- 4 Selective breeding of gold fish *Carassius auratus* and breeding and rearing of a few selected ornamental fishes.
- 5 Grow out of giant freshwater prawn *Macrobrachium rosenbergii* alone and along with fishes.
- 6 Culture of the pearl spot *Etroplus suratensis* in homestead ponds.
- 7 Standardisation of oxygen packing and transporting procedure of *Macrobrachium rosenbergii*.
- 8 Induced maturation and spawning of penaeid prawns for commercial larval production.
- 9 Intensive culture of fish in brackishwater ponds.
- 10 Production techniques for seed of pearlspot *Etroplus suratensis*
- 11 Studies on the effect of turbidity on growth and production of brackishwater fishes.
- 12 Studies on the reproductive physiology and induced breeding of grey mullet.
- 13 Fish diseases and their possible relation to aquatic pollution with special reference to Kuttanad, Kerala.
- 14 Aquaculture in karilands of Kuttanad, selection of species and standardisation of culture techniques.
- 15 Fish—crop—livestock integrated farming system in coconut gardens of the Kuttanad tract
- 16 Rearing of giant freshwater prawn *Macrobrachium rosenbergii* in fresh water bodies of Kuttanad, Kerala

- 17 Induced maturation of *Penaeus indicus* with exogenous hormones.
- 18 Utilisation of silkworm pupae as feed for selected species of brackishwater and freshwater fishes
- 19 Intensive culture of fish in running waters
- 20 Intensive farming and seed production of monosex tilapia (*Oreochromis mossambicus*)
- 21 Agricultural cropping pattern suitable for a coconut fish farming system in an accreted wetland
- 22 Chromosomal and electrophoretic studies of certain palaemonid prawns of Kerala.
- 23 Studies on wave refraction along the shore line near Kochi
- 24 Preparation of reagent kits for on the spot assessment of water quality in fish farms

Research projects concluded

- 1 Mixed culture of *Lates calcarifer* and *Oreochromis mossambicus* in brackish water ponds
- 2 Effect of eyestalk ablation on growth and reproduction of *Macrobrachium equidens* (Dana)
- 3 Culture of *Spirulina fusiformis* and its evaluation as a protein source in the diet of *Etroplus suratensis*
- 4 Infestation of crustacean parasites in carps
- 5 Effect of various growth promoters in the diets of *Macrobrachium rosenbergii* post larvae
- 6 Conditions for oxygen-packed transportation of *Penaeus indicus* seed
- 7 Evaluation of different protein sources in the formulated feed for *Macrobrachium rosenbergii*
- 8 Adaptive trials on culture of *Clarius batrachus* in brick field ponds of Thrissur District
- 9 Comparative study on certain aspects of the biology of *Macrobrachium equidens* (Dana, 1852) and *M. equidens*
- 10 Effect of certain pesticides on the developmental biology of a Cichlid *E. suratensis* (Bloch)
- 11 Studies on depuration of edible oyster *Crassostrea modraensis*
- 12 Investigations on head drooping in head-on processed prawns
- 13 Investigations on the effect of purging the freshwater prawn *Macrobrachium rosenbergii* in extending its ice storage life.

Research Highlights

The protein level in the diet of *Macrobrachium rosenbergii* could be reduced from 35 to 30%, without affecting the growth, survival and feed efficiency, by increasing the carbohydrate level from 20 to 30%.

Lowering the temperature from $30 \pm 1^\circ\text{C}$ to $23 \pm 1^\circ\text{C}$ and maintaining a salinity of 25 ppt were found effective in increasing the duration and survival rate of *Penaeus indicus* seed during transport in oxygen packing and in this condition 100% survival could be obtained for a duration of 4.00 to 4.75 hrs at a packing density of 500 post larvae/litre of water.

Spirulina fusiformis has been found as an effective substitute for fishmeal in the diet of *Etroplus suratensis*.

De-oiled silkworm pupae has been found a nutritionally better substitute for fish meal as an animal protein source in the diet of *Chanos chanos* seed.

A production rate of 808 kg/ha/5 months was achieved from the monoculture of *Macrobrachium rosenbergii* in pokkali field ponds.

From the biculture of *Chanos chanos* and *Mugil cephalus* in ponds at Puduveypu production rates ranging from 1,493 to 1,819 kg/ha/year were achieved.

The hormone progesterone injected at 0.2 mg/g body weight of the prawn has proved to be capable of giving an impetus for ovarian development in *Penaeus indicus*.

Infestation of the Isopod, *Alitropus* sp, has been found as one of the serious pest problem in culture fishes in Kuttanad. Application of DDVP (100% E C) at different concentrations was partially effective in controlling the parasite.

Application of Povidone Iodine (0.5% w/w available iodine) has been found effective in containing EUS infections in fishes which were moderately ulcerated.

Macrobrachium equidens (Dana 1852) and *M. equidens* (Pillai Jayachandran, 1989), the two closely related populations of palaemonid prawns in Cochin backwaters, were found to possess constant characters of their own and hence they have been separated into two distinct species. A thorough taxonomic revision has been made and names for the two species has been proposed as *M. equidens* Dana, 1852) and *M. sulcatus* (Henderson & Mathai, 1910).

The major determinants of head drooping in prawns were found to be the biochemical composition of the arthroid membrane and the easiness with which the hydrolytic enzyme of the hepatopancreas are released on postmortem handling and processing.

Visitors

Mr. Raju Alu, First Secretary, Department of Fisheries and Marine Resources, Konedobu, Papua, New Guinea visited the College in 22nd March 1993.

Mr. Manfred Aberis the Regional Manager, Hoechst and his Indian counterpart visited the College in April 1993.

Sri. Janaprakasam, Vice-Chancellor of Tamil Nadu University of Veterinary and Animal Sciences, visited the College in 3rd June, 1993.

Mr. Steenes Olsem, Director of Department of Marine Resources, Norway visited the College in 29th October 1993.

Smt. M. T. Padma. Hon'ble Minister for Fisheries and Rural Development visited the College in 23rd December 1993.

3.2. FISHERIES STATION, PUDUVEYPU

An area covering 161.11.84ha. belonging to Revenue Department, Government of Kerala was handed over to the Kerala Agricultural University for establishing an Instructional Farm for brackishwater fish and shrimp culture. Of this, 101.11.84 ha. was handed over on 16.7.79 and the remaining 60 ha. was allotted on 31.3.93. The farm is located at a distance of about 2 Km west of Murikumpadam Road. Arabian sea on the west, Cochin barmouth on the south and a canal emerging from the barmouth in the east form its main boundaries. Northern side of the Station faces mainland.

The campus is partially marshy with a lot of mangrove vegetation, low lying water logged canals and ditches. There are 1015 coconut palms including seedlings of different age groups. Of this, 445 are yielding.

Imparting practical training on brackishwater fish culture for B. F. Sc. and M. F. Sc. students, collection and distribution of cultivable varieties of shell fish and finfish, conducting various experiments to develop appropriate farming methods to achieve better production from unit area etc. are the important programmes undertaken at this place.

Sri. K. S. Purushan, Associate Professor (Aqua) continued to be the Head of Station.

Staff

Designation	No. of posts		
	Sanctioned	In position	Vacant
Assoc. Prof.	1	1	—
Assoc. Professor (NC)	1	1	—
Jr. Asst. Professor (Aq)	1	—	1
Research Fellow	1	—	1
<i>Administrative & Supporting staff</i>			
Senior Office Supdt.	1	1	—
Assistant Gr. I	1	1	—
Assistant Gr. II	1	1	—
Typist Grade II	1	1	—
Fieldman (Fisheries)	1	1	—
Lab Assistant Grade III	1	—	1
Pump Operator	1	1	—
Jeep Driver	1	1	—

Details of Seminars/Symposia/trainings attended by staff

Dr. K. S. Purushan, Associate Professor (Aqua) attended the following seminars.

Participated the workers education camp for women farmers at Chellanum under the auspices of CMFRI, Cochin and presented a paper entitled "Role of women in shrimp farming".

Presented the project "Demonstration and Training model for a fishery based farming system in coastal wasteland" at National Wasteland Development Board, Nirman Bhavan, New Delhi.

Participated the farmers meet at Parur under the auspices of Office of the Asst. Director of Agriculture, Parur and presented a paper in Malayalam "On scientific shrimp farming".

Participated in the NSS Training camp at the College of Fisheries, Panangad under the auspices of the College of Fisheries and Rajagiri College of Social Sciences, Kalamassery and handled the class "On brackishwater farming systems and equipments".

Involvement of staff in the academic programmes

Theory and practical classes on various aspects of brackish-water fish and shrimp farming were imparted to the P. G. and U. G. students of the College of Fisheries, Panangad. Different techniques of seed collection, rearing and management of broodstock of important species were also offered to the University students from Kerala and other states.

Research activities

The six approved research projects including one externally aided are at present in different stages of implementation

- a) Concluded projects : One
- b) Ongoing projects :

Development of broodstock and hatchery production of *Lates calcarifer*

The project has been continued as per technical programme. Monitoring of water quality parameters was observed and mean growth assessed at quarterly intervals, as usual.

By the end of March 1994, the specimens attained the size range of 4.5 to 6.5 kg, the mean being 5.246 kg (801.3mm). However, none of the specimens showed any indication of gonadal maturity. Therefore, no induced breeding was carried out. It was surprising to note that the quantum increase in annual growth rate (length/weight) was coming down to 145.0g (11.8 mm) towards the end of fourth year against the corresponding values of 338.0 g (37.5mm) achieved during the end of third year, clearly enunciating the impact of ageing process on growth.

Studies on the reproductive biology and induced breeding of grey mullet

The brood stock of *M. cephalus* were properly maintained during the report period. Manuring, supplementary feeding and other management practices were carried out as per technical programme. Monitoring of various water quality parameters was also done at weekly intervals. External examination of grown up specimens did not show any appreciable advancement in the maturity stages. So, breeding trials were not taken up.

Studies on the effect of turbidity on growth and production of brackishwater fishes

The experiment was continued as per technical programme and harvested during November 1993. On conclusion of the experiment after eleven months, *C. chanos* registered a mean size of 305.8 g (364 mm), 290.8 g (351 mm) and 213.1 g (335 mm) in treatments (T1) and (T2) and control respectively while those of *M. cephalus* were 403.7 g (340 mm), 445.6 g (349 mm) and 487.6 g (351 mm) in order. Survival rate ranged between 51.33 and 83.95% in the case of *C. chanos* while it was 75.40 to 94.65% for *M. cephalus*. Total yield including miscellaneous items realised 125.05, 122.45 and 114.40 kg/ 1750 m², worked out to 1818.9, 1781.0 and 1493.3 kg/ha/yr from treatments (T1 and T2) and control respectively.

Results of the experiment indicate that there is some correlation between fish production and sediment load present in the culture system. While the fish yield remained at a comparatively low level of 1493.3 kg/ha/yr in control pond with maximum clay turbidity, it gradually improved in treatment ponds reaching a level of 1819.9 kg/ha/yr in (T1) where clay turbidity level was found minimum. Similar growth pattern was also seen in the case of *C. chanos*. However excessive clay turbidity in the control pond does not seem to have affected the growth of *M. cephalus* as evidenced by its better performance than that of *C. chanos*.

Second operation of the turbidity experiment was also initiated during December 1993 in three ponds prepared in the similar manner.

Agricultural cropping pattern suitable for a coconut-fish farming system in an accreted wetland

After macro and micro level survey, suitable sites have been selected and land preparation completed for initiating the experiment.

Intensive farming and seed production of monosex tilapia (*Oreochromis mossambicus*) in coastal wetlands

Six ponds (4x10.6 m²) were scientifically prepared and kept ready for experimental work. So also tilapia seed collected locally were stocked in suitable nurseries giving supplementary feed for attaining the required size for the experiment. Physico-chemical parameters were monitored regularly.

Externally aided project under the National Wasteland Development Board, New Delhi

Awareness campaign conducted among panchayath authorities. Macro level survey of the project area and site locations have been carried out. Data collection on microlevel survey is in progress.

Research Highlights

The substantial difference in the growth rate of *L. calcarifer* (brood stock) after 3rd and 4th year (338.0 g/37.5 mm and 145.0 g/11.8 mm) clearly indicated the impact of aging on growth.

Judicious water management could control silt load in treatment ponds, resulting in higher survival and production of *C. chanos*.

Farm Revenue

Total Expenditure	Rs. 10,97,875.00
-------------------	------------------

Receipts

Farm revenue	38,256.50
Fish revenue	66,212.50
Miscellaneous receipts	410.00
Total	1,04,879.00

Important visitors

Date of visit	Name and designation	Institutional affiliation
6-4-93	Sri. Kanakambaran Registrar	Kerala Agricultural University
4-5-93	Dr. M. J. Sebastian Dean i/c.	"
"	Sri. T. P. George Dean i/c.	"
24-6-93	Abraham Varghese IES Project Evaluation Officer	Planning Commissioner Govt. of India Thiruvananthapuram
25-6-93	Hemachandran Nair	National Academy of Agrl. Res. Institute & Management Hyderabad
16-10-93	Dr. Thomas John	Environmental Resource Res. Centre, Peroorkada Thiruvananthapuram
"	Dr. B. J. Prasad Environmental Engg.	NTPC, Delhi
4-11-93	Dr. M. J. Sebastian Dean i/c,	Fisheries College, Panangad
12-1-94	Simon Turmaine, Traveller	Stock well St. London
27-1-94	Sri. I. V. Simon Lecturer & Trainees of N. S. S.	Rajagiri College of Social Science, Kalamassery
28-1-94	Eija Liisa Inkinen mark Velthausz DNS, 16	Ulfrog Denmark
"	Prof. Balakrishnan & Trainees of NSS	Rajagiri College of Social Science, Kalamassery
18-3-94	All members of Public Accounts Committee	KAU
21-3-94	Sri. Maji, Registrar	KAU, Vellanikkara

Extension activities

Technical guidance in fish farming

Informations on viable methods of brackishwater shrimp and fish farming were passed on to pisciculturists and other enthusiastic farmers through discussions and distribution of extension literature. Scientific fish farming was promoted by supplying seed of commercially important fish and shrimp species.

4. FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY

4.1 KELAPPAJI COLLEGE OF AGRL. ENGG. AND TECHNOLOGY, TAVANUR

The College campus is located in Tavanur village on the Southern bank of Bharathapuzha in Malappuram District 7 km. west of Kuttippuram. The campus is the seat of Rural Institute which was established in July, 1963. The Institute was taken over by the Kerala Agricultural University on 12th December, 1975 under section 59 of the KAU Act of 1971. The Institute was renamed as Institute of Agricultural Technology and it was functioning as one of the campuses of the University. The University subsequently opened the Faculty of Agricultural Engineering & Technology on 2nd October, 1985 and the Institute was upgraded and renamed as 'Kelappaji College of Agricultural Engineering & Technology' after the famous Gandhian Social Worker and Sarvodaya leader Sri. K. Kelappan. The total area of the campus is 40 hectares.

Prof T. P. George continued as Dean i/c. till his retirement from service on 28-9-93. Dr. K. John Thomas was posted as Dean i/c. with effect from 1-10-'93 and continues. The list of staff is appended.

Departments:

Department of Land and Water Resources & Conservation Engineering.

Department of Irrigation and Drainage Engineering.

Department of Farm Power, Machinery & Energy.

Department of Supportive and Allied Courses of study.

Department of Post Harvest Technology & Agricultural Processing.

Academic Programmes

Strength of students under each programme

B. Tech. (Agrl. Engg.) Programme

	Men	Women	Total
89 admission	4	1	5
90 ..	9	11	20
91 ..	10	7	17
92 ..	12	6	18
93 ..	18	9	27

M. Tech. Programme

91 admission	1	Nil	1
92 ..	5	1	6
93 ..	6	2	8

Practical Training Programme

The final year B. Tech. students have gone to KAMCO, Athani and Soil Conservation Dept. for field training. A few B. Tech. students have undergone practical training at TAFE, Madras and some P.G. students had field training at Central Soil and Water Conservation Research Institute, Ootacamund.

Study Tour

The All India Study Tour for the 1990 and 1991 admission was conducted by B. Tech. students of this College during the period from 7-11-'93 to 1-12-'93.

Details of Scholarships, awards to students

- KAU Merit Scholarship
- District Merit Scholarship
- Educational Concession to SC/ST students
- KAU Junior Fellowship

Extra-curricular activities

Tournaments, Championships etc

The College team have participated in the KAU inter-Collegiate Tournament and the Malappuram Dist. Championships.

The College won the following places in the KAU tournaments:

- Table Tennis—Women—1st place
- Table Tennis—Men—1st place
- Basket Ball—Men—2nd place

The following students were selected to represent the University in the Inter University Tournaments.

1. Vinod R. Nair —Cricket
2. Susmitha Nair —Table Tennis
3. Jacintha. T. —Table Tennis
4. Dinesh K. Menon —Table Tennis

Students' Union activities

The following were the students union activities for the period under report.

The election of the College Union for the year 1992-93 was held on 25-2-93 and the results were declared on 27th February 1993.

- | | | |
|--------------------------|---|--|
| 4-4-1993 | : | Inauguration |
| 7-3-93 | : | Medical and blood group identification campus. |
| 27 & 28 May 93 | : | AGRIFAIR '93 |
| 6th, 7th & 8th July, 93. | : | IMPULSE 93 (Arts festival) |
| 13 th to 16th Sept., 93 | : | CHITRAM 93 (Film festival) |
| 27-9-93 | : | Quiz competition |
| 6-12-93 | : | Career Guidance Day. |

The students union made its contribution to the earthquake relief fund by collecting the humble donations from the students.

Hostels

Ladies Hostel

- | | | |
|----------------------|---|--|
| Name of the Warden | : | Prof. T. P. George/Dr. K. John Thomas |
| Name of Asst. Warden | : | Smt. Santhi Mary Mathew, Asst. Professor |
| Name of Matron | : | Smt. Chandra, K.K. |
| No. of inmates | : | 37 |

Men's Hostel

- | | | |
|----------------------|---|------------------------------------|
| Name of Warden | : | Dr. T.P. George/Dr. K. John Thomas |
| Name of Asst. Warden | : | Dr. M. Sivaswami, Asst. Professor |
| Name of Steward | : | Sri. M. Radhakrishnan |
| No. of inmates | : | 65 |

Library

- | | | |
|---|---|--------------|
| No. of books as on 1-4-'93 | : | 16466 |
| No. of books procured | : | 130 |
| No. of books under centrally sponsored scheme | : | 242 |
| Total | : | <u>16838</u> |
| No. of Indian journals | : | 61 |
| No. of foreign journals | : | 32 |

Instructional Farm

Administration

Sri. P. Rajendran, Asst. Professor continued to be in charge of the farm.

Dr. P. V. Habeeburrahman, Asst. Professor is also working in the farm. He is taking care of the major cropping activities in the farm. He is also handling courses to the B. Tech. students.

Labour

The labour strength as on 1-10-'94 was as follows:

1 Permanent Men	:	21
2 Permanent women	:	23
3 Casual men	:	Nil
4 Casual women	:	Nil

The available labour is insufficient to carry out over the primary farm operations.

Area

1 Total area of the farm	:	40.19 ha.
2 Area under cultivation	:	27.65 m.
3 Waste land including fallow	:	12.54 ha.
a Area occupied by roads and buildings	:	6.54 ha.
b Area vacant and not utilized	:	Nil
c Area not suitable for cultivation	:	4 ha.
d Fallow land	:	2 ha.

I. **Paddy:** Details of paddy cropped during the period under report are furnished below:

Season	Variety	Area (ha.)	Production (Kg.)				
			Seed	Bulk	Half filled	Total	Average
Ist Crop 1993	1 Red Thri- veni	4.2	7850	2125	304	10279	2554 Kg
	2 Jyothi	3.9	10880	3100	210	14190	3638 Kg
	3 Mixture (ragued)			150		150	
	Total	8.1	18730	5375	514		
II nd Crop 1993	1 Red Thri- veni	0.9	1529	258	28	1815	2017 Kg
	2 Jyothi	2.0	667	4635	131	5438	2716 Kg
	Total		2196	4893	159	7248	

Coconut

During the period under report, total nut production was 54629 nos. Collection of seednuts was in progress and 2928 seed nuts were collected as on 31-3-'93.

1535 seedlings of WCT were selected and distributed during the period.

Vegetables

4.7 tonnes of vegetables were produced and distributed during the period under report.

135 Kg. vegetable seeds have been produced and supplied during the period.

Banana

2.43 tonnes of Nendran banana has been produced and distributed during the period under report.

Developmental activities:

Steps have been taken to augment vegetable seed production and coconut seedling production.

Under the Intensive Tree planting programme, 200 cashew seedlings, 750 bamboo seedlings, 100 teak stumps and 200 nos. of other tree seedlings have been planted along the farm boundaries.

Dairy Unit

Milk produced	:	14625.250 lit.
Milk sold	:	13628.250 lit.
No. of animals	:	42
No. of animals sold	:	5

Construction of a new Dairy Barn at the campus has been started.

Research Programmes:

FPME Department

AICRP on Farm Implements and Machinery (ICAR)

- i) The Power tiller operated rice transplanter was successfully field tested and observations were made for further modifications. The actual field capacity is 0.10 ha. per hour.
- ii) Evaluation of self-propelled vertical conveyor reaper: Improvements were carried out. The actual field capacity is 0.17 ha. per hour. An amount of Rs. 800/ is saved per ha. and about 128 man-hours are saved per ha. by the harvester.

A power tiller mounted paddy harvester is being evaluated.

A tractor mounted paddy harvester has been successfully modified to suit Kerala condition. A saving of Rs. 1225 per ha. and 120 woman-hours per ha. has been found by using the reaper. The actual field capacity is 0.37 ha. per hour.

iii) Feasibility trials on Rasp-bar paddy thresher cum winnower.

The 7.5 hp thresher with modified concave was field demonstrated at farmers' fields with different paddy varieties at different crop conditions. An output of 1000 to 1200 Kg. of cleaned paddy per hour was obtained. A saving of Rs. 900/- per ha. and 150 man-hours per ha. were achieved by using the modified thresher.

iv) The tractor mounted rotovator in coconut garden in puddling for paddy cultivation as well as tractor operated pit digger were evaluated.

Participated in a dozen of exhibition/demonstration/seminars involving farmers and Agricultural officers.

Department of PHT & AP:

M. Tech. Programme:

Modification and evaluation of KAU Arecanut dehusker.

M. Tech. Programme:

Modification and testing of a ginger peeler.

Department of IDE:

B. Tech. Project:

Field testing and evaluation of a two layer soil-water balance model.

ICAR adhoc project "Development, Testing and Introduction of Low and Medium Head High Discharge Pumps" got sanctioned.

CAPART Scheme:

The work on hydraulic performance of 'petti and para' was continued at the specially designed and constructed test bed at the KAU Headquarters. During the period under report extensive further studies for optimising the speed of operations were carried out.

Seminars/Symposia/training attended

Dr. M. S. Hajilal, Asst. Professor attended the National training programme on "Field Drainage for the control of Ground Water table and Soil salinity in irrigated agricultural lands of semi-arid regions" during the period from 7-2-'94 to 12-3-'94 held at CSSRI, Karnal.

Dr. M. Sivaswami, Asst. Professor attended the Annual Workshop of FIM Scheme at HAU, Hissar during Dec. 28th & 29th, 1993.

Sri. P. Rajendran, Asst. Professor attended the sixth Kerala Science Congress held from 27th to 29th Jan. '94 at Thiruvananthapuram.

5. **KAU School, Vellanikkara**

Kerala Agricultural University School was established in 1981 with a view to provide school education to the wards of University employees and labourers. 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. Pre primary and creche are also functioning along with this. The school secured 100% result in SSLC Examination March, 1993. Now it is a reputed institution in Thrissur District.

Staff: Shri. A. J. Abraham was the Headmaster of the school during the period under report.

Details of staff strength (sanctioned and in position) are given below.

Category	No. of posts		
	Sanctioned	In position	Vacant
High School Assistants	7	—	7
U. P. S. Assistants	5	4	1
Teacher (Eng. Med)	7	5	2
LPS Assistant (Mal. Med)	5	5	—
Specialist Teachers	3	—	3
Nursery school Assistants	4	3	1
Ayah	4	2	2
Asst. Grade II	1	1	—
Class IV	3	3	—

(List of personnel is given in appendix)

Strength of Pupils during 1993-94

Standard	Strength
LKG	42
UKG	35
I	55
II	59
III	53
IV	64
V	81
VI	70
VII	63
VIII	55
IX	60
X	30
Total	667

Extra Curricular Activities

Science club and Maths club are functioning in the school. Our school lifted the first prize in science and maths exhibition in Thrissur Educational District during the school year 1993-1994.

Scouts and guides group was organised and started functioning during this academic year.

Excursion to Bangalore, Mysore, Ooty was organised to provide an opportunity to see historically important places and enjoy sight seeing for high school students.

Parent Teacher Association of the school is functioning properly. Shri. K. S. Nadarajan, Section Officer, KAU Headquarters, Vellanikkara was the President of the Association during the year 1993-94. Cash award was given to SSLC Ist, IInd and IIIrd place winners from our school by the Association.

□□

CHAPTER III

Extension

The basic extension education role of the University is to make available useful information based on the findings of research to the farmers and others through mass media and the Government departments concerned.

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

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

Dr. V. K. Sasidhar, Professor, Farm Advisory Service continued to hold full additional charge of the Director of Extension during the period under report.

Communication Centre

Information communication through various media is the major activity of the Communication Centre which comprises the Farm Advisory Service, the Information Unit, Exhibition and Graphic service and the Publication Unit. Prof. K. C. Varghese continued to be the Professor and Head of the Communication Centre, during the period under report. The major activities of the Communication Centre during the period were as follows.

Farm Advisory Service
Consultancy service to farmers

Advice was given to 550 farmers in person on various problems confronted by them in the field of agriculture, animal husbandry and fish culture. Replies were also sent to 271 letters seeking advice/information on agriculture and allied subjects through mail. Besides 35 diagnostic field visits were also conducted during the period under report.

Programmes through All India Radio

The Kerala Agricultural University is feeding news items for the Karshika Sarvakalasala Varthakal to be broadcast on every Friday morning at 6.40 a. m. by the AIR stations at Thiruvananthapuram, Thrissur, Alappuzha, Kozhikode and Kannur.

Fifteen radio talks on agriculture and allied subjects delivered by the Scientists of Communication Centre were also broadcast through the AIR.

A farm school on AIR under the title 'ഇല്ലം ന്റെ വല്ലം ന്റെ' was broadcast by the AIR Kozhikode. Majority of the lessons for this were contributed by the Scientists of Kerala Agricultural University.

Seminars attended/conducted

Scientists of the FAS served as resource personnel in the seminars organised at the following places.

Date	Place	No. of participants
1	2	3
1-4-93	Mannamukku	172
19-4-93	Vazhathoppu	105
21-4-93	Idukki	200
3-6-93	Vilangannur	42
10-6-93	Vilangannur	42
11-6-93	Perinjanam	120
17-6-93	Anthikkad	100
20-6-93	Manalur	64
26-6-93	Vilangannur	42
11-8-93	Mala	50
11-8-93	Kanhangad	100
17-8-93	Mannuthy	50
21-8-93	Kollenkode	100
23-8-93	Kannara	55
2-9-93	Vazhithala	100
3-9-93	Kunnamkulam	100
18-9-93	Edathua	40
11-10-93	Chowannur	50
6-11-93	Aarthattu, Vaduthala	50
6-11-93	Porkulam	65
11-11-93	Choondal	55

1	2	3
12-11-93	Anthikkad	71
12-11-93	Kozhikode	114
13-11-93	Thrissur	100
14-11-93	Kolenchery	100
27-11-93	Madakkathara	150
15-1-94	Kannambra	100
10-2-94	Vilangannur	40
11-2-94	Mannuthy	170
18-2-94	Moncompu	110
24-2-94	Vilangannur	42
3-3-94	Palakkad	120
9-3-94	Chazhoor	75
10-3-94	Vellayani	150
11-3-94	Thrissur	175
13-3-94	Vilangannur	40
17-3-94	Vilangannur	40
21-3-94	Chazoor	55
22-3-94	Chazoor	45
26-3-94	Parappur	120

Information Unit

The main function of the unit is to provide information support to Technical personnel and dissemination of information to the farmers through mass media. Feature articles are published in leading Malayalam dailies in their Agricultural columns.

A total of 52 news items both technical and functional related to KAU were sent to AIR for broadcast on every Friday at 6.40 a.m., under the banner "Agricultural University News" having a duration of five minutes each.

Under the visual media the following video cassettes were produced.

1. പാഴ് മണ്ണിലെ കല്പ വ്യക്തം. (Cashew)
2. കോഴി വളർത്തൽ—ഇറച്ചിയ്ക്കുവേണ്ടി
3. കോഴി വളർത്തൽ—മുട്ടയ്ക്കുവേണ്ടി
4. വീട്ടു മൃഗത്തെ കോഴി വളർത്തൽ
5. Underground pipeline irrigation system for undulating topography.

Seventeen Radio talks were broadcast through AIR.

Twenty five articles were published through leading Malayalam Dailies of the state.

A farmer's meet was organised on first Chingam in connection with the farmer's day celebration at the Communication Centre.

A correspondence course on 'aquarium keeping' was organised during the period. A total of 987 participants were benefitted by this programme. Contact classes and practicals were also conducted at the College of Fisheries, Panangad.

Communication Centre also organised a three-day 'Onam Fair' and 'X-mas fair' at Trichur for the sale of Banana, Coconut and fruit products.

Exhibition and Graphic Services

Major and mini exhibitions conducted

1. Trichur Pooram Exhibition and KAU bagged the special prize for the best pavilion.
2. Karshikotsavam and Agricultural Exhibition organised by Vazhithala Farmer's Co-operative Bank, Thodupuzha.
3. Agri Fair 1993 at Fort Maidan, Palakkad
4. Agri-Horti Society Exhibition at Moovattupuzha
5. Agri-Horti Society Exhibition at Thrissur

Graphic unit also prepared the blow-ups, photographs and transparencies for the various exhibitions.

Publication Unit

This unit had brought out the following periodicals and non-periodicals during the period under report.

(a) Periodicals published

1. Kalpadhenu (Malayalam quarterly)
Vol. XX (2) October-December 1992
Vol. XX (3) January-March 1993
Vol. XX (4) April-June 1993
2. KAU News letter
Vol. XX July 1993
Vol. XX August 1993

(b) Non-periodicals published

(i) Books & Booklets

1. Package of Practices Recommendations 1993 (English)
2. Kole lands of Kerala (English)
3. A farmers primer on coconut cultivation (English)
4. Diseases and pests of Cardamom in Kerala (English)
5. KAU Telephone Directory (English)
6. Weed flora of the humid tropics (English)
7. Insect pests of factory processed cashew nuts and their control (English)
8. Top working in cashew (English)

9. ആര്യൻ മുതൽ ഐശ്വര്യ വരെ	(Booklet Malayalam)
10. വഴയിനങ്ങളും കൃഷിമുറകളും	"
11. കായ്കറികൾ നൂറുമണി	"
12. കേര സമൃദ്ധിയിക്കു കേരശ്രീ	"
13. ഇഞ്ചികൃഷി	"

(ii) Leaf-lets

1. ജീവ വളങ്ങൾ
2. കൃഷികൃഷി
3. ഇഞ്ചികൃഷി
4. പട്ടുന്നൂൽക്കൃഷി കേരളത്തിൽ
5. മുരിങ്ങ
6. കോവൽ
7. കൂരുമുളക്
8. കശുമാവ്
9. മാവ്
10. കൊക്കൊ
11. ഒരാണ്ടൻ മുരിങ്ങ
12. അലങ്കാര തൽസ്യങ്ങൾ
13. ഹസ്വ

In addition to the above, 16 publications are under reprint at various stages.

Staff Position

Category	Sanctioned	In position	Vacant
<i>Communication Centre</i>			
<i>Scientific Staff</i>			
Assistant Professor (Extn)	2	2	—
<i>Publication Unit</i>			
Assoc. Professor	1	1	—
Asst. Professor (Extn)	1	1	—
Asst. Professor (Ani. Sci.)	1	—	1
Unit total	5	4	1
<i>Information Unit</i>			
Assoc. Professor (Extn)	1	1	—
Assoc. Professor (Fisheries)	1	1	—
Asst. Professor (Ani. Sci)	1	—	1
Asst. Professor (Extn)	2	1	1
Unit total	5	3	2

Exhibition and Graphic Service

Jr. Asst. Professor (Extn)	3	1	2
Jr. Asst. Professor (Aquaculture)	1	—	1
Unit total	4	1	3

Farm Advisory Service

Professor (Agronomy)	1	1	—
Professor (Plant Protection)	1	1	—
Assoc. Prof. (Agronomy)	1	—	1
Assoc. Professor (Horti)	1	—	1
Assoc. Prof. (Plant Prot)	1	1	—
Assoc. Prof. (Ani. Sci)	1	—	1
Assoc. Professor (Poultry)	1	—	1
Asst. Professor (Soil Sci. and Agrl. Chemistry)	1	1	—
Asst. Prof. (Plant Pathology)	1	1	—
Asst. Prof. (Entomology)	1	1	—
Unit total	10	6	4
Grand total	24	14	10

Para-Technical Staff

Language Editor (English)	1	—	1
Language Editor (Mala)	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

Administrative staff

Administrative Assistant	1	1	—
Section Officer	1	1	—
Assistant	6	6	—
LDV Driver	2	1	1
Typist	1	1	—
Total	11	10	1

Class IV Employees

Peon	3	2	1
Sweeper-cum-Sanitary worker	1	1	—
Total	4	3	1
Grand Total	23	17	6

Information and Sales Centre, Mannuthy

The Information Sales Centre, Mannuthy was inaugurated on 16th July, 1993 by Sri. K. Karunakaran. Hon: Chief Minister of Kerala.

The Information and Sales Centre is a unique extension service venture of Kerala Agricultural University through which quality planting materials, live stock products like egg, meat and meat products, fruit and vegetable products, ornamental fingerlings and KAU Publications are made available to the public through a single window. The supplies are supplemented by imparting technical advice through Farm clinics and Video films by the Scientists of the Farm Advisory Service of Kerala Agricultural University.

Officer in charge

Sri. K. Satheesh Babu, Asst. Professor from 14.7.94 to 15.1.94
Dr. O. Abdul Rahiman kunju, Professor from 16.1.94 to 14.2.94
Sri. V. Kunchu, Asst. Professor from 15.2.94 to 21.2.94
Dr. P. A. Joseph, Asst. Professor from 22.2.94 onwards

Achievements

- | | |
|---|---------------|
| 1 Total sale during the year under report | : 22.09 lakhs |
| 2 Agroclinic services rendered to farmers | : 101 |
| 3 Video projections | : 43 |
| 4 Subscription arranged for Kalpadhenu | : 115 |
| 5 Press release | : 9 |
| 6 Correspondence to enquiries to farmers | : 92 |

KAU Press

The KAU Press was established to cater to the printing needs of the university during the period from 1.4.93 to 31.3.94. 222 works were received out of which 195 works were completed. This includes periodical publication of Kalpadhenu, Vety. Res. Journal, News letter and other non periodical Technical bulletins. About 33 leaflets, pamphlets and folders were printed and published during this period. Besides this Research Report, Annual Administration Report, (Mal. & Eng.) Reports for Krishi Vignana Manjari Series—reprints, were published.

The form and registers and other stationery items required for the university were also undertaken and completed.

Sri. K. Rajappan, continued to be the Press Manager throughout the period.

The staff position is as given below:

Category	No. of posts		
	Sanctioned	In position	Vacant
Press Manager	1	1	—
General Foreman	1	1	—
Senior Foreman	1	1	—
Proof Reader	2	2	—
Computer	1	1	—
Printer	6	4	2
Compositor	10	6	4
Copy Holder	2	—	2
Binder	4	4	—
Helper	1	1	—
Class IV	3	3	—
Peon	1	1	—
Sweeper-cum-attendant	1	1	—
Watchman	1	1	—
Section Officer	1	1	—
Assistants	3	3	—
Typist	1	1	—
Plan Scheme			
L. G. Printer	2	—	2
Jr. Foreman	1	—	1

Central Training Institute

The Central Training Institute started in October 1986 as Special Sub Project II under NAEP-1 with the financial assistance of the Government of India has now become the nodal point of all the training activities of the University. The Government of India assistance terminated on 31/3/1991 and the Central Training Institute is being run as a University programme since then. The Central Training Institute has a Sub Unit at Vellayani and Pilicode.

The Central Training Institute caters to the training needs of State Development Departments, Commodity Boards, Banks, Defence Department, Union Territory of Lakshadweep etc. The state level Joint Training Committee under the Chairmanship of the Vice-Chancellor is the apex body to discuss and finalise the training proposals of the State Development Departments and other organisations.

Staff position

Category	No. of posts		
	Sanctioned	In position	Vacant
Professor of Extension	1	—	1
Assoc. Professor	1	1	—
Assistant Professor	1	1	—
Farm Supervisor	1	1*	—
Farm Assistants	1	1	—
Section Officer	1	1	—
Assistants	2	2	—
Sr. Gr. Typists	2	2	—
Duplicator Operator	1	1	—
Driver LD V	1	1	—
Peon	1	—	1

*On working arrangement at I & S Centre, Mannuthy

Training programmes conducted during 1993-94

Sl. No.	Topic	Number of trainings	Number of participants
1.	Agriculture	18	185
2.	Animal Husbandry	12	68
3.	Social Forestry	2	20
4.	Co-operation & Banking	2	9
5.	Dairy Science	2	39
6.	Extension methods	7	159
7.	Applied nutrition	1	8
8.	Govt. of India Trg. programmes	2	43
9.	Orchid cultivation	4	94
10.	Mushroom cultivation	14	271
11.	Ornamental fish culture	3	30
		67	926

Krishi Vigyan Kendra, Ambalavayal

The Krishi Vigyan Kendra, Ambalavayal financed by ICAR became functional in 1984 under Kerala Agricultural University primarily to cater to the needs of the tribal population of Wayanad District, who constitutes more than 20 percent of the population of the district. However, now its mandate has been extended to cover non-tribal farmers also.

Dr. G. K. Balachandran Nair was the Head of the Station from 1-4-93 to 16-10-93 and Dr. Jacob John took charge on 17-10-93.

Staff

Designation	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientific staff</i>			
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	—
<i>Administrative/Supporting staff</i>			
Section Officer	1	1	—
Assistant Grade II	1	1	—
Typist Grade II	1	1	—
Audio-Visual Operator	1	—	1
Driver	1	1	—
Farm Assistant	4	3	1
Class IV	7	7	—
Total	27	17	10

Training achievements

Subject	Short term courses					
	No. of courses organised	Tribe		Non Tribe		Total
		M	F	M	F	
<i>A. Crop Protection</i>						
a) Horticulture	15	73	130	264	84	551
b) Plant Protection	15	84	100	305	85	574
c) Mushroom cultivation	7	—	—	53	104	157
d) Extension	3	10	—	135	52	197
e) Animal Husbandry	19	208	93	104	140	545
Total	59	375	323	861	465	2,024

Village Adoption Programme

The Village adoption programme 1993-94 of this Kendra has already been implemented at the Nellarchal colony which is 13 km away from this Kendra, after preliminary survey and various inputs such as planting materials, P. P. chemicals and fertilizers were distributed among the 25 beneficiaries of the tribal colony. The scientific staff frequently visited the adopted colony and gave necessary technical advice to the beneficiaries.

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

Name of Scientist	Seminars/Symposia/Venue to which deputed
Smt. V. Indira Associate Professor	KVK at CPCRI Kasaragode (refresher course)
Smt. V. Indira Associate Professor Home Science	Seminar organised by Krishi Bhavan, Kaniyampatta at Kambalakkad
Dr. G. K. Balachandran Nair Professor	Meeting in the formulations of research projects for watershed at KAU Head Quarters, Vellanikkara
"	Discussion with Quinquennial Review Team of KVK at Directorate of Extension, Mannuthy
"	Discussion meeting of KVK's of Zone VIII at the Zonal Unit, Bangalore
"	Centre for Advanced Studies, Thiruvananthapuram
Dr. M. R. Saseendranath Associate Professor	Symposium on Advances in diagnostic procedures and treatment of diseases of livestock, poultry and companion animals at Madras Veterinary College
Dr. Jacob John Associate Professor and Head and Dr. M. R. Saseendranath Associate Professor	Zonal Co-ordination meeting and workshop held at KVK, Kattupakkom, Tamil Nadu
Dr. Jacob John Associate Professor and Head	Zonal workshop at K. V. K. Pondicherry
Sri. Abdul Kareem	ICAR trainees for trainees of K.V.K. staff computer application in agricultural research

Details of seminars/workshops/symposia etc. conducted at the station

Particulars	Number of participants
Karshakadinam for 1993-94 was celebrated on Chingam 1—jointly by Agricultural Department and Karshaka Samathi at Community Hall of Ambalavayal	11 Scientists and 300 farmers
Training on self employment programme organised by Nehru Yuva Kendra held at K. V. K. Ambalavayal	32 youths

Other Extension Activities

Type of Activity	No.	No. of participants			No. of SC/ST
		M	F	T	
Field days	1	102	48	150	12
Farmer's fair	1	7000	3000	10000	1000
Film shows	10	280	200	480	160
Exhibitions	2	12000	8000	20000	2000
Radio talks	12	—	—	—	—
Seminars	5	103	82	185	42
Workshop on land resource conservation	1	87	6	93	3

Important visitors

Dr. A. M. Michael, Vice Chancellor, KAU
 Dr. S. D. Rai, Zonal Co-ordinator, ICAR
 Dr. Sinha, Zonal Co-ordinator, ICAR
 Dr. V. K. Sasidhar, Director of Extension

Krishi Vigyan Kendra, Manjeswar

The Krishi Vigyan Kendra, Manjeswar was established considering the general backwardness and preponderance of Kannada and Tulu speaking linguistic minorities of Kasaragod district. The Kendra envisages the imparting of periodic and timely training in skill oriented agricultural techniques and transfer of upto date knowledge on crop production technology to the farming community.

The Kendra started functioning with Kerala Agricultural University funds in a rented building at Thimmangur in Vorkady

village of Kasaragod District in October 1984. The proposals have been submitted for assistance from ICAR. About 19.10 acres of revenue land will be available for the Kendra at Dharmanagar in Vorkady village of Kasaragod district.

The Krishi Vigyan Kendra, Manjeshwar was inaugurated by the Hon. Chief Minister of Kerala, Sri. K. Karunakaran on 12-10-85. The centre is presently conducting one day training classes on crop production technology to the farmers in local language. Apart from this, the staff of this centre also assist in the developmental activities of the other development agencies at this region. Vegetable seeds of improved varieties of KAU have been distributed to the farmers of this locality.

Staff

Designation	No. of posts		
	Sanctioned	In position	Vacant
<i>Scientists</i>			
Professor	1	1	—
Asst. Professor	2	2	—
<i>Technical:</i>			
Farm Asst. (Agri)	1	—	1
Field Associate	1	1	—
<i>Administrative:</i>			
Sr. Gr. Assistant	1	1	—
Typist Gr. II	1	—	1
<i>Supporting:</i>			
Peon/Attender	1	—	1
Watchman	1	—	1
Daily paid Helper	1	1	—

Training

910 farmers of this area have been trained on different topics during 1993-'94 in 62 training programmes.

Seminars and Camps

One seminar on the functioning of K. V. K. and development was organised during August 1993 in the Executive Committee members of K.A.U. and the local MLA participated.

Four hundred and thirteen (413) farmers participated in the seminar.

Land acquisition

The pending land acquisition was pursued at Government level.

Freshwater fish farming

45 ponds selected for fresh water fish culture was stocked with fish fingerlings.

Village adoption

Fruit plants were supplied to schools during the year.

Krishi Vigyan Kendra, Pattambi

The Krishi Vigyan Kendra, Pattambi, is functioning in the RARS Campus, Pattambi and has operational area in the whole of Palakkad district. This Kendra is an innovative first line transfer of technology project with aims to reduce the time lag between the generation of technology and its adoption by the farmers in the larger interests of the farming community and the nation. In order to achieve this aim, the KVK has to perform the following major functions through integrated approach.

- A. Farm Advisory Service
- B. On-Farm Research Programme
- C. Training Programmes

Staff

Category	Sanctioned	In position	Vacant
Training Organizer	1	1	—
Training Associates			
Agril. Extension	1	1	—
Agronomy	1	1	—
Horticulture	1	—	1
Veterinary Science	1	1	—
Home Science	1	1	—
Agro-forestry	1	—	1
Plant Protection	1	—	1
Soil Science	1	1	—
Technical Assistants			
Agronomy	1	1	—
Animal Husbandry	1	—	1
Home Science	1	—	1
Fisheries/Sericulture			
Rural crafts	1	—	1
Art-cure-AV Aids	1	1	—

Note: Against the vacant posts of technical assistants viz; Animal husbandry, Home Science and fisheries three Farm Assistants (Agri) are posted, and are in position.

Section Officer	1	1	—
Typist Grade II	1	1	—
Assistant Grade II	1	1	—
Class IV Employees			
Peon cum Messenger	1	1	—
Watchman	1	1	—
Attendant/Sweeper	1	1	—
Field/Extension attendant	3	—	3
Driver Grade II	1	1	—
Tractor Driver	1	—	1

Faculty Improvement Programme

- a. New posts sanctioned — Nil
 b. Higher studies

One of the Scientists in Soil science of this Kendra was awarded Ph. D Degree from IARI, New Delhi. A former Assistant Professor of Veterinary Sciences was relieved to undertake Ph. D Programme in United States.

Seminars/Workshops/attended by the staff

The Scientists of this Kendra attended 24 monthly Workshops 12 each in Palakkad and Malappuram districts.

Research activities

Eight on-farm trials on rice and vegetables in Palakkad District were organised and conducted. A total of 18 pest and diseases survey on rice, coconut, vegetables, poultry, cattle and goats were conducted.

Extension Activities

a) Farm Advisory Service

1. Lab to Land Programme

The Lab to land programme has been implemented at Anakkara Panchayat. A total of 100 farm families are being given input and training support regarding paddy, coconut and vegetable cultivation.

2. National Demonstration

The following demonstrations are being established in Thirumittacode Panchayat.

Rice based	—	4 nos.
Coconut based	—	6 nos.
Areca nut based	—	5 nos.
Total	—	15 nos.

b) On farm research Programme

1. Problem oriented research

The Programme identified is entitled as control of major pests of vegetable crops using eco-friendly methods in the river basin system of cultivation practiced in the banks of Bharathapuzha.

2. Client-oriented research (SC/ST Programme)

Selection of villages, beneficiaries and research model development were done during the period. The proposed programme recommendation is under the consideration of Zonal Co-ordinator for technical/financial approval.

3. Watershed Programme

The research proposal was submitted to the state department of soil conservation.

Training Programmes

a. Short Term Trainings

Topic	No. of courses	No. of Participants		
		Male	Female	Total
Fodder cultivation and mixed farming	1	—	21	21
Child development and creche management	1	—	100	100
Fruit and vegetable preservation	4	28	52	80
Orientation training for mitra kisans	2	31	—	31
Follow up training for mitrakisans	2	21	—	21
Inland fish farming	2	40	—	40
Commercial production of ornamental fishes	3	60	—	60
Integrated pest and disease management	1	4	17	21
Integrated training on intensive agriculture for SC/ST youth	1	23	4	27
Leadership training for rural youth	1	11	10	21
Follow training for rural youth workers	1	20	—	20
Total		238	204	442

b. Long term training (6 months)

Topic	Participants		Total
	SC	ST	
Self employment training programme in tailoring and garment making	—	—	12
Handicrafts making	—	—	15
Total			27

Other Extension Activities

- a) As part of the lab to land programme two field days were organised at Umatheer area of Anakkara Panchayat.
- b) Two orientation sessions of farm science clubs of schools were organised.
- c) A state wide kisan mela focussing on various aspects of farm mechanization was held on 16.2.1994.
- d) A kisan mela cum seminar on land resources conservation, development and management was conducted.
- e) Participated in the District agricultural exhibition at Palakkad and the exhibition at Karimpuzha in Palakkad District
- f) The Scientists of this Kendra prepared a TV script on Scientific rice cultivation
- g) Karshaka Seminar on fruit and vegetable cultivation and preservation
- h) Farm women in agriculture Seminar
- i) Under vegetable seed production programme an area of 1.5 acres was utilized for producing quality seeds of important vegetables.

Village Adoption Programme

The Kerala Agricultural University has adopted 27 villages around the Educational and Research Institutions of the University during the period under report. These villages serve as field laboratories for the Scientists and Students of Kerala Agricultural University. Farm trials and front line demonstrations were conducted in the adopted villages to popularise new technologies developed by Kerala Agricultural University and to refine the package of practices recommendations suitable to the locality.

**Other extension activities of different research stations/
Colleges/Departments**

College of Veterinary and Animal Sciences

Out reach programmes :

Given technical advice to the members of P. D. D. P., Kalady, Bethel Asram, Thrissur and Women Co-operative Society, Kothamangalam. Acted as co-ordinating agency for the Samaritan Service Centre, Thrissur.

Village Adoption Programme :

To strengthen the organised effort on popularising goat farming, the activities to help the goat farmers at Vilvattom Panchayath under the Village Adoption Programme was continued. The farmers were given information on Scientific management of goats. They were also supplied with necessary denot using drugs and mineral mixture for their goats, under the village adoption programme.

Exhibitions :

Participated in the Thrissur Pooram Exhibition 1993 and in the Exhibition conducted at KCAET, Tavanur. Also participated in the exhibition in connection with the Annual Conference of Kerala State Women's Industries Association at Ernakulam. Participated in "Karshikotsavam 1994" at Palakkad and conducted an exhibition from 30-1-94 to 13-2-94 and won the first prize for the KAU Pavilion/Stall.

Audio Visual Unit :

The Audio Visual Unit conducted film shows inside and outside the campus pertaining to Animal Husbandry, Agriculture and Wild life. It also supplied and assisted various meetings organised by the College and University with the public addressing system and other Audio Visual equipments.

About 1100 visitors from different institutions visited the College during the period. Classes on various aspects of Animal Husbandry were taken for them depending upon their category. The different activities on various farms of the College were explained to them.

The following seminars and group discussions were organised.

Date	Place	Topic/Extension programme
17-4-93	Elthururth	Discussion class on contagious disease of cattle and poultry
24-4-93	Thiruvambady	Discussion class on rabies
25-4-93	Annamanada	Discussion class on scientific management of cows
14-5-93	Kannambra	Class on scientific management of dairy cows
22-5-93	Cheroor	Follow up of Village adoption programme
28-5-93	Thavanoor	Class on scientific management of dairy cows and rabies and its control measures
29-5-93	Mission Quarters Thrissur	Class on rabies and its control measures
3-6-93	Peechi	AIR meeting at KFRI
30-7-93	Kothamangalam	Discussion class on scientific management of cows
31-7-93		
17-8-93	Communication Centre, Mannuthy	Seminar in connection with "Karshakadinam"
3-9-93	Vazhithala	Class on scientific management of dairy cattle and rabbits
4-9-93		
29-10-93	Chalakydy	Class on management of cattle "Karshakasangam"
20-11-93	Communication Centre, Mannuthy	Class on "How to motivate farmers to adopt new technologies"
27-11-93	Kuttichira	Class on scientific management of cattle and poultry
14-12-93	Chalakydy	Management of cows, goats and pigs—discussion class
1-2-94	Kalady	Arrangement of seminar in connection with the PDDP, Vety. Hospital, Vattaparambu
6-3-94	Pattikad	Dr. P. S. Pushkaran took class on the management of dairy cattle, goats, pigs, poultry and rabbits to the farmers selected under the "Scheme for self sufficient agricultural family" by CADA
19-3-94	LRS, Thiruvazhamkundu	Village Adoption Programme. Dr. S. S. Anil took class on scientific dairy farming
26-3-94	Kunnukara	Ksheerotsavam, Dairy Development Department. Dr. P. S. Pushkaran took class on dairy cattle.

Radio talks

- 20-8-93 "Scientific management of dogs"
by Dr. P. S. Pushkaran
30-12-93 "Mastitis" by Dr. P. S. Pushkaran

TV Programme

- 9-8-93 "Quail farming" by Dr. P. S. Pushkaran and
Dr. Narayanankutty.

Three Video films were produced

1. വിട്ടുതുറന്ന പണവും പൊഷകാഹാരവും
2. ബ്രോയിലർ കോഴിവളർത്തൽ-ഒരു സ്വയംതൊഴിൽ പദ്ധതി
3. മുട്ടക്കോഴി വളർത്തൽ-ഒരു വ്യാവസായിക സംരംഭം

**College of Fisheries Panangad,
Training Programme conducted:**

Five day's intensive training in 'Ornamental fish culture' was conducted at the College for the benefit of unemployed youth. 30 people were trained in three batches of ten each, during the period September, October, 1993. Dr. P. M. Mathew, Professor, functioned as the Course Director for the programme.

A training programme on 'Watershed Management for fisheries development' was conducted during the period from 15th to 20th November, 1993. Five Officers from the Department of Fisheries, Govt. of Kerala, underwent the training. Dr. P. M. Mathew, Professor, served as the Course Director for the programme.

A four days' training programme on "Collection and analysis of meteorological parameters and on elementary weather forecasting" was conducted during 22-25 February, 1994 for the Officers of MPEDA and the Department of Fisheries, Kerala. Sri. N. N. Raman, Assistant Professor functioned as the Course Director of the programme.

The contact classes for the correspondence course on 'aquarium fishes' conducted from the Communication Centre, Mannuthy, were held at the College on 25th and 26th August, 1993. About 200 persons attended the classes. Dr. P. M. Mathew, Professor and Dr. K. G. Sunny, Asst. Professor, conducted the classes.

Dr. D. M. Thampy and Dr. P. M. Mathew, Professors conducted one class each as part of the Farmer's Training and Workshop on 'Carp Seed Production Technology' organised by the Department of Aquatic Biology and Fisheries, University of Kerala at Thiruvananthapuram in July, 1993.

Dr. Susheela Jose, Associate Professor took theory and practical classes on freshwater aquaculture as part of the RARTC training programme for 15 Agricultural Officers on 8.6.93 and for

20 Agricultural Officers on 2.7.93. She also gave a training on different aspects of freshwater aquaculture to 23 Farm Assistants of the Department of Agriculture, Govt. of Kerala, on 20th July, 93, at the College.

Village adoption programme

Under the Village Adoption Programme for 1993-94, the neighbouring Village Kumbalam was selected. 26 families adopted were supplied chicks, poultry feed and vegetable seeds.

Extension lectures

Dr. P. M. Mathew, Professor, delivered a talk on 'Recent advances in fish and prawn seed production technology' at the Academic staff College, University of Kerala, Thiruvananthapuram on 31st July, 1993, under the Refresher Course in Zoology for College Teachers 'Applications of Biotechnology in Aquatic Biology'.

Dr. D. M. Thampy, Professor, gave a talk on 'Aquaculture Development' under the same programme, on 13th August, 1994.

Dr. P. M. Sherief, Assistant Professor, delivered a lecture on 'Enzyme assay and enzyme kinetics' to the students of M. Phil. in Botany S. D. College, Alloppey on 31-7-93.

Dr. P. M. Mathew, Professor, gave a talk on 'Recent developments in aquaculture' in the seminar conducted by the Zoology Association, Mar Athanasius College, Kothamangalam on 27th November '93.

College of Horticulture, Vellanikkara

The Entomology, Plant Pathology and Soil Science & Agrl. Chemistry Departments continued to offer consultancy on pest/disease/soil problems brought by farmers from several parts of the State.

The Department of Soil Science & Agrl. Chemistry provided active support to the District Collector, Thrissur in analysing Peechi reservoir water and sediment samples for phenol content.

The Plant Pathology Department and Home Science Unit offered consultancy on mushroom production to several farmers. The Home science Unit of the Department of Agricultural Extension provided advice to farm women on food, nutrition, hygiene, clothing and related items.

A unit for soil and plant Diagnostic Facility was established in the Department of Soil Science & Agricultural Chemistry utilising the equipment assets of the Agri Electronics scheme. Advisory Soil testing service was started through the Information and Sales Counter, Mannuthy. The Agro clinic of the College of Horticulture at the Information and Sales Centre, Mannuthy, was actively involved in the functioning of the Diagnostic services.

As part of the Village adoption programme and the rural orientation programme of the final year B.Sc (Ag) students an Agricultural Seminar and Exhibition (Karshikam, 1994) were conducted at the AKM High School, Poochatty, Nadathara on 26-3-1994. Over one hundred farmers and farm women attended the programme. Planting materials of selected crops and mushroom spawn were distributed to selected contact farmers of the Nadathara Panchayat.

College of Agriculture, Vellayani

During the period under report the following activities were conducted in the adopted village.

Two farmers were identified and training was given on mushroom spawn production and pesticide application procedure so as to develop self employment avenues in the adopted village.

Identified and assessed the extent of pest and disease damage caused in vegetable and other crops.

Recommended tips and techniques for overcoming the problems and suggestions for maximising the production possibilities in the area.

Environmental awareness and pollution free techniques were inculcated to the farmers.

Interested group of farmers for starting sericulture was also identified for imparting training in sericulture.

Group discussion

Group discussions on indigenous technology and knowledge of the farmers practices were documented and tested for their scientific validity.

Discussion for assessing the training needs of unemployed educated youths in the village.

Group discussions were conducted in the farmers field rendering advice for collection of soil samples from the field, reclamation method for recycling the acid soils.

Self employment guidance

Proper guidance and advice were rendered to the educated youth of the area regarding the initiation of self employment programmes with the help of the resources available at their disposal.

Leadership development

Motivation techniques have been adopted to develop possible leadership in the farming activities.

Feed back information from farmers were collected and accounted for considering the same in the future plan proposal.

Trainings

One day training was conducted for the leaders potential farmers in the adopted village on improved farming techniques.

Periodical training in the form of personal discussions and group discussions were organised with farmers of the locality regarding the indigenous knowledge as well as practices to be adopted in the field as part of environmental education and ecologically clean farming.

Training were given to farmers in collecting soil samples.

Assessed the training needs of farm women. Arrangements were made with the experts of Home Science Department for conducting production training to generate self employment activities for the benefit of farm women.

Orientation training in biofertilizer use and their advantages were explained to the farmers.

Orientation programme on sustainable agriculture, use of local resources as manures to vegetables, minimum use of chemical fertilizers, importance of indigenous technology in controlling pests and diseases.

One demonstration was conducted at Venniyoor on the safe use of pesticides in vegetable cultivation.

Participation in National Workshop/Exhibitions

All staff members actively involved in the exhibition arranged at Kottayam in connection with Karshikarangam of Mathrubhoomi.

Four scientists of this department attended summer Institute on Extension Management, at Tamil Nadu Agricultural University, Coimbatore sponsored by ICAR from 7.6.'93 to 26.6.'93.

Dr. N. Kishore Kumar and Dr. S. Bhaskaran, attended National Seminar Integrated Extension Approach held at TNAU, Coimbatore from October 11 to 13.

Dr. N. Kishore Kumar attended workshop on video production at G. B. Pant University from May 6-26, 1993.

Dr. M. M. Hussain, attended the seminar on Cashew in 21st Century Problems and Prospects for India.

Staff members of this department attended the National Workshop on Honey bee diseases and Training held at Thiruvananthapuram in May 1993.

Classes handled

The staff of Department of Extension handled classes under orientation course for the staff of CARP at Thiruvalla on 21.4.'93 and 24.4.'93

The staff members handled classes for Agricultural assistants on communication and adoption at RATT Centre, Kazhakuttam.

Classes were handled for the field level workers of Khadi and Village Extension Officers and Asst. Directors of KERAFED on Extension Methods.

Karshikam—'93

A seminar-cum-exhibition was organised by the final B.Sc. (Ag) students, of the College at Perumpazhatur, Neyyattinkara on 13.6.1993 in connection with their course Ag. Ext. 405 programme Planning.

Visitors

Five farmers group, six Vocational Higher Secondary Students, two womens club and number of tourists visited the campus. They are being guided through the campus and shown to the development works of the college.

A visiting team from Marathwada Agricultural University came to the campus and they were taken to different department in the College and explained the activities of KAU from 8 to 10 September 1993.

A group of farmers from Pondichery visited the Campus and they were given sufficient information about the plantation crops.

50 members of Parish from Konni and 20 farmers from Puthur visited the Campus.

Regional Agricultural Research Station, Vellayani

Zonal and other workshops conducted:

The XV Zonal Workshop of the southern zone was held on 4th and 5th June, 1993 at the RARS, Vellayani.

The research results and the results of the farm trials conducted were presented at an exhibition arranged for the occasion. There were 102 participants classified as below:

Zonal workshop	No. of participants			
	DOA	SAU Stations	ICAR/CSIR Institutions	Other Departments/ Organisations
XV	36	48	5(CTCRI 2 CPCRI 3)	13 (Soil Conserv. 4 Soil Survey 6 FIB 1 Forestry 1 Fisheries 1)

Sericulture training programme

A sericulture training programme was arranged for the benefit of the Deputy Directors of Agriculture and Officers of the

Social Forestry Department, from 22 to 25 September, 1993. The programme was inaugurated by Sri. P. S. S. Thomas, Member-Secretary, Central Silk Board. Dr. N. Mohanakumaran, Associate Director and the scientists of the CSB Scheme were actively involved in the programme.

T & V monthly workshop

The T & V Monthly Workshops for the Thiruvananthapuram dist. were held at Vellayani on 16.4.93, 7.5.93, 9.7.93, 13.8.93, 16.9.93, 8.10.93, 12.11.93, 10.12.93, 7.1.94 and 11.2.94. Dr. N. Mohanakumaran Associate Director continued to function as Chairman of the Workshop. Dr. V. Muraleedharan Nair was the Chairman of the Diagnostic Team. Dr. A. Visalakshi, Professor of Entomology, Dr. P. Karunakaran, Professor of Plant Pathology and Dr. P. Manikantan Nair, Professor of Plant Breeding were the resource persons.

Field Experience Training programme

The NAARM, Hyderabad has recognised the RARS, Vellayani as a Centre for offering the Field Experience Training Programme to the ARS Scientist Trainees.

During the period under report, the following scientist-trainees underwent the training.

Name of trainee	Period of training	
	From	To
Chandran, K Saji, K. V. Suja, G.	02.06.1993	13.07.1993
Asha, K. l., Anithakumari, P., Rasheed Sulaiman, P.	06.11.1993	16.12.1993

Workshop on Communication through radio

Dr. D. Dale, Professor of Entomology organised a two-day workshop on "Communication through radio", under the auspices of the Magazine Committee of the College, on 24 and 25 October, 1993.

Farm Advisory Service rendered

Necessary advice was rendered to the visiting farmers by the Scientists. Muttacaud & Kalliyoor continued to be the adopted villages of the RARS/COA, Vellayani.

Training classes handled

The following training classes were handled by the Scientists

Name of Scientist	Training programme	Date & Venue
Dr. T. Nalinakumari Assoc. Prof. (Ent.)	Class on "Major pests of important crops of Kerala" for the MGTE students, organised by DoA.	6.4.1993 Kollam
Dr. M. S. Sheela Assoc. Prof. (Ent.)	Class on "Nematodes & their management" for the Jr. Agrl. Officers, organised by DoA.	26.4.1993 RATT, Kazhakutom
Sri. N. Ramachandran Nair, Assoc. Prof. (Pl. Breeding)	Class on "Maintenance of breeder seeds of self pollinated and cross; pollinated crops" for the Officers of the Department of Agriculture	20.10.1993 RATT, Kazhakuttom
Dr.N.Mohanakumaran, Assoc. Director	Class on "Plant tissue culture & its applications in Agriculture", for the Assistant Directors of Agriculture (Training in Biotechnology)	8.12.1993 Vellayani
Dr. G. Raghavan Pillai, Prof. (Agron.)	Class on "Food grain production", for the PG students in Home Sci; Women's College, Thiruvananthapuram	27.1.1994 Thiruvananthapuram
Dr. P.R. Rama- subramonian Prof. (Soil Science)	Class on "Micronutrients for rice", for the farmers attending one day seminar	28.3.1994 Kottarakkara

Coconut Research Station, Balaramapuram Farm Advisory Service rendered

A group of five farmers of the influence area of the Coconut Research Station, Balaramapuram was taken to the Farming Systems Research Station, Kottarakkara to participate in the "Seminar on Land Resources Conservation and Utilisation" held on 28-3-1994.

The farmers of the nearby area who visited the station were given advice on the scientific methods of cultivation of coconut, the plant protection aspects, inter-cropping etc.

Cropping Systems Research Centre, Karamana
Extension activities

Village Adoption Programme

The Scientists of the station selected ten vegetable demonstration plots (in farmers' fields) and provided the farmers with improved seed material and recommended fertilisers, besides rendering technical advice on plant protection aspects.

Farm Advisory Service

The Scientists of the station visited farmers' fields on their request to investigate upon the problems and to suggest remedial measures.

The technique of *Pleurotus* cultivation was demonstrated to the farmers of the locality.

NARP Special Station, Sadanandapuram

Training programmes conducted at the Station :

Particulars	No. of participants	Period
Training programme on nursery management	21	27th and 28th Sept. 93
Training programme on vegetable production	23	16th Oct. 93
Training on principles and practices of homestead farming	14	22nd to 24th Nov. 93
Training on nursery management	18	30th to 31st Dec. 93
Training programme on nursery techniques in cashew and ornamental plants	15	4th to 7th Jan. 94
Training on propagation of horticultural crops	43	1st to 11th Feb. 94
Training on cultivation of vegetables, ornamental plants, flowering plants, mushrooms and seed storage	41	17th to 28th Feb. 94
Training on pest and disease control of major cultivated crops and maintenance of plant protection instruments	40	16th and 26th March 94
Karshika Seminar		28th March 94

Regional Agricultural Research Station, Kumarakom

T & V Programme

Regular workshop on T and V system was conducted by the stations during the period under report. The following are the stations in which T and V Workshops are conducted.

Name of station	Name of T and V district	No. of resource personnels
RARS, Kumarakom	Kottayam	4
RRS, Moncompu	Alappuzha	5
RRS, Vyttila	Ernakulam	3
RRS, Kayamkulam	Kollam	4
SRS, Thiruvalla	Pathanamthitta	4

Diagnostic Team visits

The diagnostic team framed under each T and V district conduct regular visits to study field problems as and when they occur and suggest remedial measures.

Training programmes

The following training classes were held during the period under report.

Name of training	Training Centre	Date
Short term training on mushroom production	RARS, Kumarakom	14-16 Sept. 93
One day training to B.Sc.(Ag.) students of COA, Vellayani	"	18-10-93
One day training to B.Sc.(Ag.) students of COH, Vellanikkara	"	9-11-93
One day training to PG students of Cochin University	"	5-3-94
Training on latest trends in oil seed production to Agricultural Officers	RRS, Kayamkulam	12-11-93
Three day training on mushroom production	"	29-31st Dec. 93
Field training to final year B.Sc. students of COA, Vellayani	"	Nov. 93
Training on front line demonstration in sesamum	"	25-1-94
Training on mushroom production to Agricultural Assistants, DOA	"	11-2-94
Practical training on water management in rice to Agricultural Officers, DOA	RRS, Moncompu	6-11-93
Field training to B.Sc. (Ag.) students of the COA, Vellayani	"	29-11-93 to 10-12-93
State level training on rice production technology	"	18th to 20th Jan. 94
Training programme on site selection and construction of fish ponds for fresh water aquaculture and shrimp farming	RRS, Vyttila	March 93

Exhibitions

The following exhibitions were conducted by the different stations under the zone.

Name of exhibition	Venue	Date
RARS, Kumarakom		
Agricultural exhibition (Mathrubhoomi Jubilee)	Thirunakkara Maidan, Kottayam	6th to 9th May 93
Agricultural exhibition (Agri-Horti. Society)	Lions Hall Alappuzha	24-3-94
SRS, Thiruvalla		
Agricultural exhibition (Agri-Horti. Society)	Thiruvalla	22-1-94 to 25-1-94

Participation of scientist in seminars

- G. Mathai, Professor attended agricultural seminar held at NSS High School, Kottayam on 16-5-93
- G. Mathai, Professor and Dr. A.V. Mathew, Asst. Professor attended agricultural seminar held at Service Co-operative Bank, Koorali on 30-6-93
- G. Mathai, Professor and Dr. A.V. Mathew, Asst. Professor attended agricultural seminar held at Madona Rural Development Society, Nazreth, Kumarakom South on 1-7-93
- G. Mathai, Professor and Dr. M. Suharban, Associate Professor attended agricultural seminar organised by Manjoor Village Development Samithy at Govt. H. S. Manjoor on 17-7-93.
- Dr. M. Suharban, Assoc. Professor attended agricultural seminar held at Darsana Auditorium, Kottayam on 10-12-93
- Dr. A. V. Mathew, Asst. Professor attended agricultural seminar held at Kanakary on 15-1-94
- G. Mathai, Professor attended agricultural seminar organised by the Vikas Volunteer Vahini Farmers Club held at YMCA Auditorium, Mundakayam on 19-2-94
- Dr. Anuradha Krishnan, Asst. Professor attended seminar on sustainable farming and environment held at Ernakulam on 28 to 30th April, 93
- Dr. K. Sivan Pillai, Professor and Prof. P. Reghunath attended seminar organised by FACT at Marthoma Auditorium, Kayamkulam on 30-11-93
- Dr. Syam S. Kurup and Prof. P. Reghunath attended technical session organised by the Botany Association of M3M College Kayamkulam on 5-12-93

They also attended the same session of the SN College, Varkala on 22-12-93

Prof. K. M. George and N. K. Sasidharan attended district level working group on rice year held during March 94

Prof. K. M. George and K. S. Shylaraj attended ICAR-IRRI working group on soil salinity, Cochin during 3-5 Sept. 93

Sri. N. K. Sasidharan and Dr. M. V. Mohan attended indigenous instrumentation of agriculture and fisheries investigations held at CIFT, Cochin during 15-23 Sept. 93

Dr. N. Remabhai, R. Devika, Elizabeth Syriac, Ahamed Regina, Annie Koruth and P. R. Krishnakumari Amma attended VIth Kerala Science Congress held at Thiruvananthapuram on 27-29 Jan. 94

Dr. C. A. Joseph, Prof. P. J. Ittyvirah and Dr. P. V. Nair attended seminar on Land Resources Conservation held on 4-3-94

Dr. C. A. Joseph attended All India Rice Group meeting held at Raipur from 19-3-94 to 22-3-94

Dr. C. A. Joseph attended District level seminar on Rice Cultivation held at Kottayam on 9-2-94.

Workshops/Seminars conducted

The XVI Zonal Research Extension Advisory Council Workshop was held at RARS, Kumarakom from 16th to 17th April, 93.

Land Use Development and Management workshop was held on 4-3-94.

The ICAR-IRRI working group on Soil Salinity was held at Ernakulam on 3-5 September, 93.

Visit of farmers

About 614 farmers visited the different stations during the period under report.

REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

The newer technologies generated in the Kerala Agricultural University were passed on to the extension agencies and farmers through periodical meetings, group discussion, and also through 'Akashavani' and other mass media.

T & V Workshop

Scientists of RARS Pilicode and Pepper Research Station, Panniyur participated in the T & V Monthly Workshop of Kozhikode, Kannur and Kasaragod District. Messages on production recommendation were formulated for the timely adoption by farmers.

Zonal Workshop

The Zonal Workshop for the region was conducted at RARS Pilicode on 19th and 20th of May 1993. Officers of the Department

of Agriculture, Scientists from sister organization and representatives from input agencies participated in the deliberation and field problems were discussed in detail.

Joint field visit

The field problem reported by the officers of the Department of Agriculture were discussed and investigated in detail by conducting joint field visit and sample analysis. Suitable remedial measures were also suggested to their best satisfaction.

Village Adoption Programme

The programme was implemented in the Cheruvathur village during the period under report. Vegetable seeds and fertilizer packets were distributed to 50 selected farmers in the village. One day training programme on improved agricultural practices was also organised for the benefit of farmers.

Ten farm families of Kalliassery Village were selected, giving priority to SC/ST farmers under the leadership of Pepper Research Station, Panniyur. Planting materials worth Rs. 2000 were distributed including new varieties/hybrids of pepper, arecanut, cashew and mango.

Training Programmes

A total number of 57 training programmes were organized under the training service scheme of RARS Pilicode and Pepper Research Station Panniyur during the report period. In addition to the above training programmes, practical orientation classes were conducted for the Vocational Higher Secondary students.

Exhibition

Participated in the Exhibition organized by Nehru Arts and Science College, Kanhangad in connection with the silver Jubilee celebrations.

Both RARS Pilicode and PRS Panniyur station participated in the exhibition conducted at Kannur as a part of Co-operative week celebration.

Seminars/Farmers counselling

Scientists of RARS Pilicode and Pepper Research Station, Panniyur attended Agricultural Seminars and handled classes on topics of interest to the farmers. A total number of 20 seminars were attended during the report period.

Information-cum-Sales Counter

Established an Information-cum-Sales counter at RARS Nileshwar and was inaugurated by the Hon'ble Finance Minister of Kerala Sri. Oommen Chandy on 10-1-1994. The unit is functioning

well, catering the needs of the farmers of Northern Region for the supply of planting materials, technical advice and other agricultural requirements.

**AROMATIC & MEDICINAL PLANTS RESEARCH STATION,
ODAKKALI**

Extension Activities

Training Programmes

The following training programmes were conducted on various aspects of agricultural sciences.

- 1 One day training was imparted to a team of 40 teacher trainers of District Institute of Education and Training Kuruppampady on various aspects of agricultural sciences on 7-8-93.
- 2 A team of 60 farmers led by the Joint Director of Agriculture, Alappuzha District visited the Station on 29-9-93 and they were given one day training on the oil extraction technology of various aromatic plants.
- 3 25 farmers from different Asian and African countries visited the station on 2-10-93. Mr. Soman, Deputy Director, Soil Conservation, Ernakulam District headed the team.
- 4 40 senior lecturers guided by Mr. K. J. James from DIET, Kuruppampady were given a one day training on various aspects of agricultural sciences on 25-10-93.
- 5 15 students and 3 staff of M. G. College, Perumbavoor were imparted one day training on the oil extraction technology and essential oil analysis.
- 6 30 students of B. Sc. (Chemistry) guided by 3 teachers of M. A. College, Kothamangalam were given one day training on the 'Advances in essential oil analysis using TLC & GLC' on 21-1-94.
- 7 A team of 20 students of M. G. T. E., from All Saints College, Perumbavoor had one day training on various fields of agricultural sciences on 1-2-94.
- 8 Fifteen students of M. G. T. E. from S. N. College, Pattimattam were given a training on various agricultural subjects on 2-2-94.
- 9 Seventeen students of M. G. T. E. from Athully College, Paravoor were given one day training on 3-2-94.
- 10 Forty students of B. Sc. and M. Sc. Chemistry were imparted one day training on gas chromatography and spectrophotometric techniques in modern chemistry on 8-2-94.

- 11 50 farmers of Madurai district guided by Mr. C. Robert James Ponmiah, Asst. Director of Agriculture, Melur, Vinayagapuram visited the station on 21-2-94.
- 12 The V. H. S. E. Students (18 Nos.) along with 3 staff of Odakkali were given one day training on the essential oil extraction technology and modern methods of quality analysis of essential oils on 22-2-94.
- 13 Mr. Joy, P. P., Asst. Professor, AMPRS, handled a training class on propagation techniques and nursery management for the Agricultural Officers and nursery men at Okkal Krishi Bhavan on 9-3-94 and at Muvattupuzha on 23-3-94.
- 14 The second year batch of B. Sc. (Agri.) students College of Agriculture, Vellayani, Thiruvananthapuram visited the station on 19-3-94.
- 15 Dr. J. Thomas, Assoc. Prof. & Head and Mr. P.P. Joy, Asst. Professor, AMPRS, handled training classes on Pulse production technology for the Agrl. Officers.

Inauguration of regional analytical laboratory

Inauguration of the newly constructed Regional Analytical Laboratory was done on 31-12-'93 at 3 P.M. by the Hon'ble speaker Sri. P. P. Thankachan. The Laboratory constructed by the Kerala Agrl. University for strengthening research on post harvest technology of medicinal and aromatic plants was elevated to the status of one of the five Regional Analytical Laboratories in the country by the Ministry of Agriculture, Govt. of India.

Seminar on strategies for Conservation and Development of medicinal plants

In connection with the inauguration of the Regional Analytical Laboratory at the station, a national seminar on "Strategies for Conservation and Development of Medicinal Plants," was organised on 31-12-93. Sri. Johny Nelloor, MLA inaugurated the seminar. Institutions like Ayurveda Colleges, Universities of Kerala, Cochin, Calicut and Mahatma Gandhi, International Institute of Ayurveda, Coimbatore, ICRI, Myladumpara, Spices Board, Farm Information Bureau, A.V. Thomas & Co., D. V. Deo & Sons, RRI, Kottayam, UPASI, Kottayam, Canara Bank, SPIC Coimbatore. Agrl. Dept., Forest Dept., Non-Governmental organization, Charitable and Co-operative Societies participated in the seminar.

Exhibition on herbs and herbal products

An exhibition on Herbs and Herbal Products was also arranged on 31-12-93. It was participated by various institutions

and organization associated with medicinal plants and agriculture. About 6000 people visited the exhibition and it was highly appreciated by all including the public.

Release of "Sugandhini"

During the auspicious occasion of Regional Laboratory inauguration a new bathroom deodorant "Sugandhini" was released by Shri. Johny Nelloor, M.L.A. It is a blend of natural essential oils like lemongrass, palmarosa and eucalyptus developed in the phytochemical laboratory of the station.

Linkage and Co-ordination

Dr. J. Thomas, Associate Professor acted as the resource personnel for the KAEP of Idukki district. Other scientists also occasionally participated in the KAEP meeting. Dr. J. Thomas also functioned as a member of the District Planning Council.

Seed/Planting material distribution

During the year under report 57 kg of lemongrass seed, 77 kg of palmarosa seed, 1400 kg of ginger and 14.0 kg of kacholam were distributed from this centre. More than 300 plants of various medicinal plants were also distributed from this centre.

From last year onwards the station has started selling essential oils of lemongrass, palmarosa, cinnamon and eucalyptus in sample bottles of 20 g each. During the period under report 250 sample bottles of lemongrass, 120 palmarosa, 156 cinnamon and 150 eucalyptus were sold out from this station. Arrangements have already been made for selling the station products from the University Sales Centre at Mannuthy and Pattambi.

Laboratory and library service to the public

Essential oil samples brought by industrialists, traders and cultivators are analysed in the Regional Analytical laboratory and results are given on a regular basis.

The station library with more than 500 accessions on medicinal and aromatic plants is also available to researchers, students and industrialist free of cost, who regularly visit the station library for collecting literature on the cultivation and utilization of aromatic and medicinal plants.

Publications and liaison with the public

Enquiries are received from scientists, industrialists, traders and growers for published literature and project reports on aromatic and medicinal plants. Available literature on the field and pamphlets on lemongrass, palmarosa, vetiver and aromatic and medicinal plants and reprints of research articles are supplied

free of cost in person and through post. Manuscripts of new pamphlets on lemongrass, palmarosa and vetiver both in English and in Malayalam were prepared and given for printing in KAU Press. Regular correspondence with researchers, industrialists, traders and growers is undertaken and during the period under report more than 300 queries were replied by the station.

Extension melas and exhibitions participated

- 1 AMPRS, Odakkali participated in the "Kothamangalam Pushpamela 1994" at Forest Depot Ground from 2 to 6 February 1994 organized by the Agri-Horticultural Society, Kothamangalam.
- 2 The station participated in the Muvattupuzha Flower show 1994 at A. C. Alias Nagar (Municipal Park) from 9 to 13 February 1994 organized by Agri-Horticultural Society, Muvattupuzha.
- 3 Also participated in the "Kakkoor Kalavayal 1994" and Exhibition from 16 to 19 February 1994 at Kakkoor Kalavayal organized by the Kerala Cultural Department.

The station exhibited all the aromatic and medicinal plants and other station products at these exhibition and won various prizes of excellence.

Agronomic Research Station, Chalakudy

The onfarm water management Pilot project is being implemented by the Centre in collaboration with CADA and Department of Agriculture. Village Adoption Programme is also being implemented by the centre. A nearby village Karukutty is selected for this and improved vegetable cultivation techniques are being practiced in selected fields. The scientists of the centre are being participated in a number of seminars organised by the Department of Agriculture. A number of farmers visited the station for seeking advice on scientific cultivation including water management, plant protection measures, fertilizer application etc.

Livestock Research Station, Thiruvazhamkunnu

Veterinary aid, A. I. facilities and Pregnancy Diagnosis facilities were made available to the animals of the farmers. A total of 235 animals were inseminated and 574 were treated during 1993-94, when compared to 258 and 183 in 1992-93.

Village Adoption Programme implementation was completed in March 1994 adopting Erattavari Village. Cattle show and Infertility Camps were conducted in which 71 animals were presented. Mineral Mixture, deworming drugs were supplied free of cost to selected farmers. Seminar, film show and meetings were held.

Regional Agricultural Research Station, Ambalavayal

The eleventh Zonal Research and Extension Advisory Council Meeting of the high range zone was held at R. A. R. S, Ambalavayal on 29th and 30th of April 1993. The scientists of Kerala Agricultural University, Regional Stations of ICAR, Coffee board and extension personnels from the Department of Agriculture and Progressive farmers attended the meeting.

Scientists of the station participated in the Agricultural Exhibition-cum-Seminar held in connection with the 21st anniversary of Farm and Home of AIR, Calicut held at Kakkavayal on 16th and 17th of January 1994 and presented papers.

The station participated in the flower show organised by Agri-Horticultural Society, Wayanad from 7/1/94 to 10/1/94.

The station conducted training on the following aspects.

- 1) Mushroom cultivation.
- 2) Recent trends in the production technology of cool season vegetables.

The scientists of the station attended trainings, seminars and meetings organised by Krishi Vigyan Kendra, Department of Agriculture and Commodity boards.

Cardamom Research Station, Pampadumpara Extension activities

Name & designation of Scientists	Details	Date/Duration
1	2	3
All staff C. R. S. Pampadumpara	Exhibition-cum-Agrl. seminar at Vazhathope, Idukki	18-22
Dr. C. T. Abraham, Assoc. Prof. (Agron) & Head	T & V monthly workshop at J D A office, Thodupuzha	Jan. 1993
Dr. C. T. Abraham, Asso. Prof. and Head and Dr. Maicykutty. P Mathew	T&V monthly workshop, Adimali	6-8-1993
Dr. C. T. Abraham, Asso. Prof. and Head	Committee on 'Govt. assurances' Thiruvananthapuram	14-7-93
Dr. C. T. Abraham and Dr. Maicykutty. P. Mathew	Karshaka Seminar, Pampadumpara Krishibhavan	14-8-93
Ms. Ancy Joseph, Research Associate	Karshakadinam, Mariapuram Panchayat	17-8-93

1	2	3
Mrs. I Priya, Research Associate	Class at ICRI, Myladumpara	15-9-93
Dr. C. T. Abraham, Asso. Prof. and Head	T and V monthly workshop at Thodupuzha	17-9-93
Dr. C. T. Abraham and Dr. Maicykutty P Mathew	T and V monthly workshop at CRS Pampadumpara	7-10-93
Dr. Arthur Jacob, Assoc. Prof. & Head	Seminar and exhibition in connection with inauguration of the new Analytical Laboratory at A. M. P. R. S, Odakkali	31-12-93
Dr. C. T. Abraham, Assoc. Prof. Dr. Maicykutty P. Mathew, Asst. Prof.	T and V monthly workshop, Thodupuzha	27-1-94
Dr. Arthur Jacob, Assoc. Prof. & Head	One day training progra- mme on 'Management of pests and diseases of Cardamom and Pepper' to farmers of Pampadumpara and Nedumkandam	4-3-94 & 24-3-94
Dr. V. K. Girija Asst. Profesaor		

Banana Research Station, Kannara

Dr. Rema Menon and Dr.P.K. Sudhadevi attended the Golden Jubilee Symposium on Horticulture--changing Scenario--during May 1993.

The Group Discussion of AICRP (Tropical Fruits) held at Periakulam from 4-7 October 1993 was attended by Sri. T.C. Radhakrishnan, Associate Professor. Dr. J. S. K. Charles, Associate Professor; Dr. Rema Menon, Assistant Professor and Dr.P.K. Sudhadevi, Assistant Professor.

Dr. Rema Menon attended a training course on Tropical Fruit Production Technology at IIHR, Hessaraghatta from 2nd to 15th Feb, 1994.

Dr. J. S. K. Charles attended the 6th Kerala Science Congress at Thiruvananthapuram from 26th-28th Jan. 1994 and presented a paper entitled 'Histopathological changes on banana infected with cyst nematode, *Heterodera oryzae*.

Dr. J. S. K. Charles, Associate Professor, took part in a Farmers' Seminar at Madakkathara Panchayat Office Hall, organised by the Bank of Baroda, Thrissur and took classes on banana cultivation.

A farmers Day was organised on 23-8-1993 at the Station. The function was presided over by the Vice-Chancellor, KAU. The welcome address was delivered by the Director of Research, KAU. Hon'ble Agriculture Minister of Kerala, Sri. P. P. George inaugurated the function. Agricultural Officers of the various Krishi Bhavans in Thrissur Dist. and about 300 farmers participated. An exhibition of different banana varieties was arranged. A seminar on banana cultivation was also conducted on that day.

College of Forestry, Vellanikkara

Tree crop Nursery:

A tree nursery was established in the premises of the College. Seedlings of more than 80 species were maintained in the nursery for instructional purpose. Seedlings raised in college nursery and also those raised by students through "Earn While You Learn" programme were sold to farmers. Seedlings were also used for campus planting.

Out reach programme:

i) NSS Activities

Under the auspices of NSS, about 500 tree seedlings were planted in the Industrial Estate at Ollur. The NSS volunteers also donated blood for the patients.

ii) Village Adoption Programme

The Village adoption programme was implemented at Payyanam tribal colony, Peechi forest area during March, 1994. Planting materials and vegetable seeds were distributed to tribals. Technical advices were also given by the students and staff members.

Fisheries Station, Puduveypu

Village Adoption Programme (VAP)

As part of KAU Extension activity, V. A. P. was implemented at the Station during the report period. 25 families residing in a colony at Narakkal Panchayath were selected as beneficiaries and provided them with critical inputs worth Rs. 2000. Details of inputs supplied to the beneficiaries are as follows:

Sl. No.	Item distributed	Quantity
1.	Hybrid chicks	50 nos.
2.	Poultry feed	25 kg.
3.	Vegetable seed	50 pkts.
4.	Vegetable fertilizers	21 kg.

Radio talks and Popular articles

In order to disseminate informations regarding shrimp and fish farming, a number of radio talks were given and broadcast over Thrissur and Kochi stations of All India Radio.

With a view to attract more entrepreneurs into scientific fish/shrimp farming activities, popular articles were published in several national and regional newspapers as well as farm journals like "Kalpadhenu", "Kerala Karshakan", "Seafood Export Journal", "Fishing Chimes" etc.

NSS Activities

Dr. V.K. Sasidhar, Director of Extension continued to function as the part-time Programme Co-ordinator of NSS during the year 1993-94.

The enrolment details during the year are given below.

Name of College	Strength allotted	No. of units	Enrolment		Total
			M	F	
College of Agriculture Vellayani	280	2	107	173	280
College of Vety. & Animal Sciences, Mannuthy	300	2	181	111	292
College of Horticulture Vellanikkara	300	2	137	150	287
College of Fisheries, Panangad	110	1	62	33	95
College of C & B, Mannuthy	110	1	55	32	87
KCAE & T, Tavanur	70	1	42	28	70
College of Forestry, Vellanikkara	55	1	38	—	38
Total			622	527	1149

The University level NSS Silver Jubilee Year was inaugurated by Smt. M. T. Padma, Hon'ble Minister for Fisheries & Rural Development, Government of Kerala on 23.12.'93 at the College of Fisheries, Panangad. Various programmes envisaged in the NSS Silver Jubilee year was conducted in the colleges. The Programme Co-ordinator attended the various committee meetings in connection with the NSS Silver Jubilee year and Co-ordinated NSS activities.

College of Agriculture, Vellayani

The NSS units of the College of Agriculture, Vellayani continued for the function for the year 1993-94 also with Dr.

M. M. Hussain and Dr. R. Vijayan as Programme Officers. After the relief of Dr. R. Vijayan in connection with his higher studies, Dr. D. Wilson assumed charge from January 1994.

The volunteer strength of the college also continued to be 280 for the year under report. The following activities were undertaken during the year 1993-94.

- 1 Two advisory committee meetings were conducted during the year.
- 2 The Community centres at Palappur and Kakkamoola continued to function with facility to read newspapers and Malayalam journals.
- 3 The NSS adopted village, Palappur was also under operation during the year. The farmers had many technology transfer programmes and they had participated in many of the activities organised by the NSS units.
- 4 74 NSS volunteers participated in the literacy programme organised by the college and Kalliyoor panchayat Saksharatha Samithi.
- 5 The literacy centre attached to the college for the purpose of workers of the Instructional farm continued to function during the year.
- 6 The NSS Volunteers involved in the teaching of the farm labourers were issued with certificates by the district literacy centre in a well organised function.
- 7 Two communal harmony marches were arranged with the active participation of NSS volunteers, farm labourers and staff members.
- 8 Manavamaithri day was celebrated. 66 NSS Volunteers and 2 programme officers participated in this function.
- 9 Quami Ekta week was celebrated in this campus with the active participation of 102 NSS Volunteers.
- 10 Two Animal husbandry camp, one poultry vaccination camp and one Agro clinic were arranged in different parts of Kalliyoor panchayat and Thiruvallam panchayat in collaboration with the local youth and other organization.
- 11 500 Teak stumps were planted in the college campus with the active participation of the NSS Volunteers.
- 12 2000 saplings of avenue trees were planted in the campus during the year with the help of NSS Volunteers.
- 13 World Environment day was celebrated in the campus as a part of the World Environment Day. In connection with

this programme a college competition was conducted and prizes were awarded. A one day seminar on organic farming was also arranged on that day. A mass tree planting programme was initiated as a part of this function.

- 14 100 NSS Volunteers participated in the workshop on honey bee research in Co-operative Bank towers organised by Kerala Agricultural University.
- 15 The inauguration and follow up work of the Horticultural therapy programme were carried out at Cheshire Home, Thiruvananthapuram. A kitchen garden was raised in the cheshire home by involving the inmates and NSS Volunteers.
- 16 A group discussion and an awareness programme on the relevance of 'Quit India Movement' were arranged in the adopted village Palappur.
- 17 'Sadbhawana Day' was celebrated in the college campus on 20-8-1993 by taking a Sadbhawana pledge and communal harmony songs competition.
- 18 Fingerlings of Freshwater fishes were released in Vellayani lake by the NSS Volunteers. This programme was inaugurated by Smt. M. T. Padma, honourable minister for fisheries and attended by Dr. Sreedharan, Dean, Director of Fisheries and other dignitaries.
- 19 153 NSS Volunteers donated blood to different needy patients in the hospitals of Thiruvananthapuram city.
- 20 An awareness programme on drug abuse was carried out in the campus for the labourers of Instructional farm in collaboration of 'Dale View', Poovachal, Thiruvananthapuram.
- 21 A counselling programme for the labourers was arranged by the NSS units in collaboration with 'Dale View' Thiruvananthapuram. Four cases were identified for intensive treatment in the counselling centre.
- 22 Two batches of farm women were trained in the Home Science Department of the college in canning and preservation of fruits and vegetables. They were later sent for advance training in canning and preservation in the community canning centre at Thiruvananthapuram. The trained batches were recommended to D. R. D. A. Thiruvananthapuram for financial assistance.
- 23 A quiz competition on road safety was conducted for the benefit of NSS Volunteers of our college.
- 24 A lecture on 'Bonsai' technique was arranged for the benefit of NSS Volunteers in collaboration with the 'Bonsai Association', Thiruvananthapuram.

- 25 The NSS Volunteers participated in the Silver Jubilee celebrations of NSS Programme in different places.
- 26 The NSS Volunteers involved in the Panchayat level free tuition programme with the 2 Programme Officers.
- 27 The NSS Volunteers arranged a literacy campaign at Panathara village.
- 28 NSS Volunteers arranged the Inter class Athletic Meet of our college.
- 29 The NSS Volunteers and Programme Officers helped the farmers in solving the vegetable cultivation problems by this periodic visits to the adopted village.
- 30 Republic Day was celebrated in the adopted village with the involvement of farmers of adopted village and NSS Volunteers.
- 31 Dr. D. Wilson, undergone training under the 'University Talk Aids Programme' (UTA) from 14th to 17th February, 1994 at NSS Orientation and Training Centre, Kalamassery.

College of Horticulture, Vellanikkara

Dr. Ranjan S. Karippai and Smt. Norma Xavier continued as the Programme Officers during the year. There were 287 volunteers during the report period. Smt. Norma Xavier, Assistant Professor received Orientation Training during the period. The Programme Officers took classes on personality development and Counselling (Govt. Women's Polytechnic, Nedupuzha, 8th and 9th September), Kitchen gardening (Govt. Women's Polytechnic, Thrissur, September 10, 1993), demonstration classes on kitchen gardening and processing of fruits and vegetables (Govt. Women's Polytechnic, Nedupuzha, Sept. 10, 1993 and Personality traits and Counselling (Morning star Home Science College, Ankamaly, December 27, 1993), for the benefit of the NSS volunteers of these institutions.

College of Co-operation and Banking, Mannuthy

Death Anniversary of Rajeev Gandhi was observed by pledge taking by NSS volunteers for upkeeping National Integration on 21-5-1993.

Campus beautification cum cleaning programme was arranged by conducting a cleaning activity at C and B College Students' Men's Hostel, Mess hall on 12th June 93. All the NSS volunteers took part (Alongwith Social Service Scheme of the NSS Unit)

Reorganisation and arrangement of C and B College Library with the help of 30 volunteers on July 23 and 24, 1993.

Closing day of the 50th Anniversary of Quit India Movement was celebrated by conducting an interclass Quiz competition on 10-8-1993.

Independence day was observed by the NSS Volunteers.

Sadbhawana day was observed by arranging a pledge taking function in which Dr. N. Rajan Nair, Professor, College of C and B, administered the pledge.

Deputed two students to attend seminar on "Swami Vivekananda and Modern India" at Government Engineering College, Thrissur. on 11th and 12th September.

NSS Volunteers celebrated the Gandhi Jayanthi by arranging a Campus beautification cum cleaning programme.

Deputed two volunteers to attend two days consumer protection Education study camp at Thrissur on 31-12-1993.

The NSS Unit celebrated the Dawn of the New Year.

Dr. A. Sukumaran was relieved from the charges of NSS Programme Officers and handed over charges to Shaheena, P.

NSS Programme Officers attended UTA training programme from 14-2-94 to 17-2-94.

College of Fisheries, Panangad

The total strength of NSS Volunteers during the period was 98, out of which 33 were woman. Dr. K.G. Sunny served as Programme Officer till 31st July 1993 and Dr. T. M. Jose was given charge from 1st August 1993. Sri. Praveen. K. was nominated as Volunteer Secretary. Dr. T. M. Jose attended the training programme for NSS Programme Officer conducted at NSS TOC, Rajagiri College of Social Sciences, Kalamassery from 2nd to 14th August 1993.

Karshaka Dinam was celebrated on 17th August 1993. Sadbhavana Divas was observed on 20th August 1993 and the pledge was taken by all students and teachers and administered by Dean i/c., Dr. M. J. Sebastian. In response to an appeal from the youth Officer, Rs. 570/ was collected and sent towards Maharashtra Earth Quake Relief Fund. Gandhi Jayanthi was celebrated. Campus cleaning and preparation of the Sadbhavana Udyam were the main programmes. Towards room, there was one open discussion with the Dean i/c on the priority NSS Programmes relevant in Panangad.

Inauguration of the University level celebration of NSS Silver Jubilee year was conducted at the College Campus on 23.12.1993. Smt. M. T. Padma, Hon. Minister of Fisheries and Rural Development inaugurated, in presence of Hon. Vice-Chancellor Dr. A.M.Michael, University Executive Committee members,

MLAs, NSS Youth Officer. Sri. G. R. Sathyanarayana; Dean i/c., Dr. M. J. Sebastian and NSS Programme Co-ordinator, Dr. K. S. Sasidhar.

In connection with this, a two days special camp was organised at the College on 22nd and 23rd December 1994. 45 NSS volunteers including those from other faculties attended the camp. Five programme Officers were also present. The main theme was social harmony and lifestyle education. Professor K. A. Balakrishnan talked on social harmony. Dr. John Chungappura from TRADHA took study class on the role of life style education in combating the menace of drug addiction. Smt. Asha. P. Rao conducted a survey on AIDS awareness and also delivered a conscientation lecture on AIDS. The campers helped to make all arrangements to make the inaugural function a grand success.

A training programme extending for 45 days for 60 unemployed young people (29 women, 31 men) in two batches to equip them for self-employment was organized under the joint auspices of NSS TOC, Rajagiri College, Kalamassery and NSS Unit, College of Fisheries. The project was sponsored by Ministry of HRD, New Delhi. The benefactors were mainly from Panangad region. The subjects included mainly aquaculture, dairy farming, vegetable cultivation etc. 3 ½ weeks training in aquaculture for each batch was imparted by the teachers of the Fisheries Faculty. The lessons in Malayalam were cyclostyled and given to the trainees in a bound form for future reference. The Programme was inaugurated by Sri. Dominic Presentation, MLA on 17.1.94 and the Chief Guest for the valedictory function held on 6.4.94 was Hon. Justice (Rtd.) Ms. Janaki Amma. Fr. Jose Alex, Director of NSS TOC, Prof. P. K. Mohammed, Programme Co-ordinator, NSS TOC, and Sri. I. V. Soman, Lecturer NSS TOC, supervised the Programme. The aquaculture training was coordinated by the NSS Programme Officer, College of Fisheries. This training has been the first major contact of the College teachers with village people around.

Eight NSS volunteers donated blood to needy patients. An orientation lecture for NSS volunteers was delivered by Prof. P. K. Muhammed on 4-3-94.

The Programme Officer attended the AIDS education training Camp of University Talks AIDS project at NSS TOC from 14th to 17th February, 1994.

He also attended the 21 days Orientation course on Education technology and the Man Resources Development at C. M. S. College, Kottayam.

Kelapaji College of Agricultural Engineering and Technology Tavanur

The N. S. S. Unit of the College undertook the following regular activities during the year 1993-'94.

Celebration of World Environmental Day:

The World Environmental Day was celebrated on 5th June by planting new tree seedlings in the campus and providing protection to the young trees planted last year. The work of laying out a garden and lawn in front of the Library building was initiated on the same day involving all the NSS volunteers. Mass awareness programme about global warming and pollution problem were also undertaken. A seminar was arranged under the guidance of Dr. P. V. Habeeburrahman, Asst. Professor (Agronomy) on global warming and fertiliser application which was followed by a detailed discussion leading to various aspects of environment.

Observance of Sadbhavana Divas & Community Fortnight:

Sadbhavana Divas was observed on 20th August, by arranging a memorial meeting presided over by Prof. T. P. George, Dean i/c. who administered the Sadbhavana pledge to the students and staff of the College.

A debate on Secularism was organised on 21st August '93 the topic being "Whether secularism is practised in India". A Poster Competition relating to Communal harmony was also conducted on 25th.

50th year celebration of Quit India Movement:

A memorial meeting was held on 8th August 1993 to mark the conclusions of the year-long Quit India Movement Golden Jubilee Celebrations. The speakers included Sri. T. M. Vasudevan Namboodiripad, the Veteran Freedom Fighter and Sri. K. Balan Master, K. M. G. V. H. School, Tavanur. Sri. Namboodiripad also administered an oath to the students.

Comprehensive Survey of Tavanur Panchayat:

Twenty one volunteers of this College participated in Comprehensive Survey undertaken in view of the Silver Jubilee year of the Malappuram District. The NSS volunteers surveyed all the families in ward 3 and 14 of Tavanur Panchayat. It was a one day field programme organised on 2nd October, 1993.

Campus Cleaning Campaign:

All the students and staff of this College participated in the campus cleaning programme organised on 2nd November by the

NSS unit of the College. Dr. K. John Thomas, Dean i/c. inaugurated the programme which included cleaning the premises of the Central office building and removing the bushes and wild plants grown on both sides of the roads.

Quami Ekta Week:

As part of the celebration, a meeting was convened in the auditorium and Dr. K. I. Koshy, Prof. and Head, Dept. of SAC administered the Integration pledge to the students and staff.

Republic Day Celebration

On the Republic Day, a group of NSS volunteers took part in the hostel cleaning campaign in the morning and paid a visit to the leadership training camp organised by the Nehru Yuvak Kendra at Tavanur for the village youth. They participated in the group discussion classes on Population Education.

Awareness of AIDS

The survey to understand what the students know and how they feel about AIDS was conducted on 24.3.94. A group discussion on the AIDS issue was arranged to create a favourable climate for launching the UTA projects in the campus. Posters relating to various aspects of AIDS were also displayed.

College of Forestry, Vellanikkara

Under the auspices of NSS, about 500 tree seedlings were planted in the Industrial Estate at Ollur. The NSS volunteers also donated blood for the patients.

COLLEGE OF VETERINARY & ANIMAL SCIENCES

There were a total of 292 student volunteers and two programme officers in this scheme of this college in two units. 181 were boys and 111 girls. The funds were operated by the Dean.

Dr. A. Rajan, Dean functioned as the administrative head and Chairman of the college level Advisory Committee of the scheme. Dr. C. George Varghese, Professor took charge as the Programme Officer on 1/7/93 and Dr. K. P. Sreekumar, Assistant Professor in place of Dr. V. Raju and Dr. K. M. Ramachandran, Professors respectively.

Dr. C. George Varghese was deputed to undergo Programme Officers Orientation training at Rajagiri College of Social Sciences, Kalamassery from 12/7/93 to 24/7/93 and Dr. Sreekumar from 2/8/93 to 14/8/93.

Campus cleaning Programme

The bushes in and around the College and the Vety. Hospital premises were cleared and cleaned at different days and 125 students were involved each time. On 15th August there was planting of flowering hedge plants along the road to the Mens' Hostel. The students also cleaned the premiess of the Mens' Hostel for 7 days continuously before the hostel day celebrations.

Donation of blood

50 students donated blood to patients admitted in various hospitals of Thrissur.

Meeting attended by the Programme Officers

Dr. C. George Varghese attended a meeting of Programme Officers convened by NSS Programme Co-ordinator at Directorate of Extension, Mannuthy on 1/11/93.

Dr. K. P. Sreekumaran attended a meeting at Ramanilayam on 20/11/93 in connection with the inauguration of Silver Jubilee year of NSS by the Hon'ble Chief Minister of Kerala.

Dr. C. George Varghese attended a meeting convened by the District Council President on 20/10/93 in connection with the Preparation of Resource map of Thrissur Dist.

Seminars and Camps attended by the student volunteers

5 student volunteers attended 2-days seminar on Swamy Vivekananda and the modern India at Thrissur Engineering College on 11/9/93 and 12/9/93.

5 students participated in the University level inauguration of NSS S. J. celebrations camp at Fisheries College, Panangad on 22/12/93 to 23/12/93.

10 student volunteers attended consumer education camp organised by the Kerala State consumer co-ordination committee at Hotel Elite, Thrissur on 26/12/93 and 27/12/93.

11 students participated in cattle infertility and health camp on 1/1/94 at Mezathur organised by the Animal Husbandry department.

Camp Organised

A mini camp of 4 days duration from 1/10/93 to 4/10/93 was successfully organised at Muthalamada, Palakkad.

Other activities

A Sadbhavana Essay Competition for youth 1993 was organised for the college students on 22/8/93 and the best entry was forwarded to the Dist. Collector, Thrissur and the entry of Miss Anitha of this college was adjudged as the best from Thrissur Dist.

Two batches of unemployed trainee youths from the Rajagiri College of Social Sciences, Kalamassery visited the College and the farms besides two batches of NSS Programme officers trainees from the same institution.

On the auspices of the NSS unit an artificial limb made from the financial contributions of students, teachers and other willing persons was presented to Sri. C. Rajan, a patient of Damien Institute, Mulayam.

□ □

CHAPTER IV

Students Welfare

Dr. T. G. Rajagopalan continued as Director of Students Welfare during the report period.

Staff

Category	Sanctioned	In position	Vacant
Director of Students Welfare	1	1	—
Deputy Director of Students Welfare (Sports and Games)	1	1	—
Deputy Director of Students Welfare (Acad. and Counselling)	1	—	1
Jr. Asst. Professor (Lady Phy. Education)	1	1	—
Section Officer	1	1	—
Assistant	3	3	—
Typist (Gr. II)	1	1	—
Peon	2	2	—

A. Sports and Games

I. The following Inter-Collegiate Tournaments were conducted during the period under report.

Event		Date and Venue	Results
1	2	3	4
Table Tennis	(Men)	23 to 25 Aug. 93, Mannuthy	I KCAE & T II Horticulture
"	(Women)	"	I KCAE & T II Veterinary
Badminton	(Men)	23 to 25 Aug. 93 Mannuthy	I Veterinary II Forestry
"	(Women)	"	I Agriculture II Veterinary

1	2	3	4
Basket ball	(Men)	18 to 20 Sept. 93 Vellayani	I Veterinary II KCAE & T
"	(Women)	"	I Veterinary II Agriculture
Volley ball	(Men)	18 to 20 Sept. 93 Vellayani	I Veterinary II Horticulture
"	(Women)	"	I Horticulture II Agriculture
Ball Badminton	(Men)	1st to 3rd Oct. 93 Mannuthy	**
"	(Women)	"	
Football	(Men)	14 to 16 Oct. 93 Mannuthy	I Agriculture II Veterinary
Hockey	(Men)	15, 16, 17 Oct. 93 Thrissur	I Veterinary II Agriculture
Cricket	(Men)	8th to 12 Feb. 94 Mannuthy	I Forestry II Horticulture

** Due to heavy rain, the final matches were not completed.

Inter-University participation:

Our students participated in the following Inter-University tournaments:

Aquatic Championship (Men)

(From 1st to 4th October at Thiruvananthapuram)

1. Somasekharan, K. Agril. College

Manager: Smt. A. C. Marykutty, Associate Professor, College of Agriculture, Vellayani.

Inter-University Football Tournament

(From 29th Oct. '93 to 9th Nov. 93)

Name	College
Jimmy Jose (Captain)	Agril. College
Arunkumar, S.	"
Santhosh, T.	"
Prakash, K.	"
Rajkumar	Horti. College
M. K. Mohammed Nazeemkhan	"
Ajithkumar, T.	"
Abdul Salam, K.	Vety. College
Vinod Kumar, M.	"
Noushad Ali, K. M.	"
Saji Thomas Thoppil	"
Saji, P. S.	Co-op. & Banking
Manojkumar, B.	"
Dilip, S.	"
Xavier, V. V.	K. C. A. E. & T
Suresh' E. K.	Forestry

Manager: Sri. M. Velayudhankutty, Asst. Professor, Kelappaji College of Agril. Engg. & Tech., Tavanur.

All India Inter-University Athletic Meet.
(from 2nd to 5th March, '94)
Jessy Joseph Vety. College

Manager: Sri. M. Velayudhankutty, Assistant Professor, Kelappaji College of Agril. Engg. & Tech., Tavanur.

B. Inter-University Football Tournament, 1993-94

The South-Zone Inter-University Football Tournament was organised by our University at Veterinary College Ground, Mannuthy from 29th October to 9th December, 93. Dr. C. Sreedharan, Vice-Chancellor i/c, inaugurated the tournament on 29-10-93 which attracted 29 teams from the Southern states of the country. Sri. K. P. Viswanathan, Hon'ble Minister for Forest was the Guest of Honour for the closing function.

The Semi Final League Matches were covered by the All India Radio through running commentary of the matches. Door-darsan also covered the highlights of the last day's matches on 9-11-'93.

Calicut University won the championship and Kerala University secured 2nd position. Madras University and Osmania University were the winners of 3rd and 4th positions respectively.

The tournament was attracted by large number of spectators and widely covered by the press media.

C. Report of the activities of K. A. U. Union during 1992-'93.

The following were elected as Office bearers of the KAU Union for the year, 1992-'93.

President	: Sri. K. Rajesh (C & B College)
Vice-President	: Sri. T. N. Ajithkumar
Vice-President	: Smt. V. Elizabeth Cheriyan
Secretary	: Sri. Vinaya, Raghavan Nair (Fisheries)
Joint Secretary	: Sri. Pradeep Aravind (C & B)

Dr. A. M. Michael, the Hon'ble Vice-Chancellor of Kerala Agricultural University and Patron of the Union nominated the following Faculty members.

Prof. M. Mohandas, Associate Dean, College of Co-operation and Banking as Vice-Patron. Dr. T. G. Rajagopalan, Director of Students Welfare i/c. as Staff Advisor and Sri. O. K. Paul, Deputy Director of Students Welfare as Hony. Treasurer.

Activities of the KAU Union

The activities of the 16th Kerala Agricultural University Union (1992-'93) was inaugurated on 23rd August, '93 at Vellanikkara by Dr. I. S. Gulati, former Vice-Chairman of State Planning Board. Dr. A. M. Michael delivered Patron's address. Sri. Govinda Pillai and Sri. Thomas K. Thomas, Executive Committee member graced the occasion by their active participation. The inaugural function was attended by large number of students.

A film festival was conducted in the College of Veterinary and Animal Sciences, Mannuthy, during 21st to 23rd December 1993. The Festival was inaugurated by Sri. C. V. Sreeraman, Noted literacy figure.

An Inter-Collegiate Quiz competition was conducted in the College of Horticulture during this period. The College of Cooperation and Banking, College of Veterinary and Animal Sciences and College of Forestry won the 1st, 2nd and 3rd position. Cash prizes were presented to the winners.

On 31st January 1994 a Seminar on Dunkel draft text was arranged in the College of Horticulture. The Seminar was inaugurated by Retd. Justice V. R. Krishna Iyer. Six different papers were presented by the noted scientists.

The drama festival was conducted at the Main Campus from 16th to 17th February, 1994. The following teams participated in the Festival.

1. St. Aloysius College, Elthuruthu
2. Ranga chethana, Cherur
3. S. N. College, Nattika
4. Sree Kerala Varma College, Thrissur.

One Workshop on Soil and Water Engineering was conducted at the Kelappaji College of Agricultural Engineering and Technology, Tavanur on 19th and 20th February, 1994. Sri. Sahasranama Iyer inaugurated the workshop. The technical and general sections contributed a new understanding of the topic concerned to the Engineering graduates of the Faculty.

D. Report on 1 (K) R & V Sqn NCC activities, 1993-94

The NCC activities of this unit for the period from 1st April, '93 to 31 March, '94 are furnished hereunder.

- c) Change of Command. V. 298 P Lt. Col. V. N. Kapre has assumed the appointment of Commanding Officer, 1 (K) R & V Sqn. NCC, Mannuthy, with effect from 15-4-93 Vice V-330 Y Lt. Col. J. K. Srivastava Commanding Officer relieved.

- b) Parade—Regular parades and horse riding were conducted during the period.
- c) *Annual training Camp/National Integration Camp*
- i) 3 NCC Cadets (Girls) attended combined Annual training camp at Chuthalai from 12 June to 21 June '93.
 - ii) 25 NCC Cadets (Boys) of this Unit attended the Combined Annual training camp at Alagappa Nagar from 7 July to 18 July, '93.
 - iii) 5 NCC Cadets (Boys) participated in the National Integration Camp at Kottayam, Kollam from 22 December to 2 January 1994.
- d) *Adventure Activities*
- 13 NCC cadets together with one Associate NCC Officer and one P. I. Staff went for cycle expedition from Mannuthy to Kanyakumari and back from 14 September to 22 September '93. Total mileage covered for the expedition is 780 kms.
- e) *Social Service Activities*
- i) Anti Rabies Vaccination was given to 25 dogs by the NCC cadets of this Unit on 20 April 93 at Lions Community Hall at Thrissur. The programme was organised by the Lions Club, Thrissur.
 - ii) Tree plantation: NCC cadets of this Unit participated in the Social Forestry Campaign on 8 June '93 and planted 500 saplings of trees in Veterinary College Campus and mounted training area. Saplings were provided by the Department of Social Forestry.
- f) *Other Activities*
- i) One Associate NCC Officer, 5 P. I. Staff, 70 NCC Cadets and 4 horses participated in Guard of honour at Stone Laying Ceremony of University Library and inauguration of Sales Counter at Mannuthy on 16 July 93.
 - ii) One Officer, One Associate NCC Officer, 3 P. I. Staff 60 NCC Cadets and 4 horses participated in the award of Honour to His Excellency Governor of Kerala during the function at this University.
 - iii) Sadbhavana fortnight was celebrated from 20 August to 5 September 93 at Thrissur. The celebration was organised by Nehru Yuva Kendra, Thrissur. 55 NCC Cadets took part in Mass Run Rally Youth Symposium, Cycle Rally, Sadbhavana Oath and painting competition.

- iv) 7 horses have been allotted to this Unit from RTS & D Hempur and the same were collected and reached the Unit on 24 November 93.
- v) A sum of Rs. 100/- was collected by the cadets of this Unit by the sale of Flag in connection with the Ex-servicemen Week 1993 and sent the same to IESL, New Delhi.
- vi) An amount of Rs. 500/- was contributed by the Staff and cadets of this Unit in connection with the earthquake relief fund.
- vii) NCC Day was celebrated on 28 November 93 at Football ground of Veterinary College, Mannuthy and Dr. A. M. Michael, Vice-Chancellor, KAU took the salute of the impressive parade. The R & V Sqn. NCC Cadets gave excellent display of mounted activities including show jumping and tent pigging.
- viii) 2 NCC Cadets with horses took part in Sainik Centre inauguration by Sri. K. Karunakaran, Chief Minister of Kerala at Thrissur on 26 December 93.
- ix) During the month of February, a G. P. Seminar on NCC was held at Town Hall, Thrissur on 8-2-94. In this Seminar, 3 Instructional Staff, one ANCCO, twentyeight cadets and two horses participated which emphasised the need of creating disciplined cadets for making use of them in the nation building activities. District Collector, Sri. Rajasekharan, IAS, presided over the function. Vice-Chancellor of KAU also delivered a valuable lecture in the seminar.
- x) 'B' and 'C' Certificate Examinations were conducted for eligible cadets during these period.
- xi) Lt. Col. V. N. Kapre, Commanding Officer of this Unit has been detailed as Chief Co-ordinator, Horse show during Republic Day parade Camp at Delhi Cantt. from 1 January to 15 February 94.
- xii) During the period in January 94, 6 cadets of this sqn. participated in the RDC at New Delhi. One of our Cadet Sgt Nagaraj BN secured DG's Bronze Medal in one event.

The activities of the University Employment Information & Guidance Bureau, Mannuthy, during 1993-94.

- 1 An Employment Information Bulletin published in every month.
- 2 Conducted two days' Career Guidance Seminar (i) at the C & B College, Mannuthy on 28.6.'93 and (ii) at KCAE & T, Tavanur on 6.10.'93.

- 3 Registered 103 numbers of students during this period.
- 4 Individual Guidance rendered about job opportunities and higher studies 729 students visited this Bureau.
- 5 Group discussion arranged and explained the activities in various Colleges under KAU and Science and Arts Colleges in Municipal area.
- 6 Dy. Chief visited 30 Colleges during the period.
- 7 Collected and disseminated the occupational information and guidance, Employment and higher studies in India and abroad to the Colleges under KAU.
- 8 Conducted 1 month coaching class for Scheduled Caste/Schedule tribe candidates for preparing various competitive examinations from 16.2.'94 to 18.3.'94.

SAI Field Station

To impart specialised training one coach in the discipline of Hockey is coaching in this field station attached to our University by the SAI.

University Chorus

The University chorus comprising of 25 students selected from the various Colleges of KAU has participated various University functions during this period.

Transport Section

There are 5 buses and 3 Mini Buses in the general pool under the Directorate of Students' Welfare. The requirements of students for educational purposes are met by this section and also conduct of the schedule trips for the conveyance of staff and students is monitored by this Directorate.

Staff strength of Directorate of Students' Welfare

Sanctioned post	No. of post	Name of Officer/Staff
1	2	3
Director of Students' Welfare	1	Dr. T. G. Rajagopalan (Holding charge)
Dy. Director of Students' Welfare	1	Sri. O. K. Paul (Holding charge)
Dy. Director of Students' Welfare (Acad. & Councelling)	1	Vacant
Asst. Professor (Phy. Edn.)	1	Sri. E. U. Rajan
Section Officer	1	Sri. P. M. Balakrishnan

1	2	3
Assistants	3	1. Sri. V. S. Skandakumar (Upto 17.5.'93) Smt. Sreekumari (from 2.6.'93) 2. Sri. P. V. Sreedharan 3. Sri. I. K. Venugopalan
Typist	1	(Smt. Sathidevi—upto 13.11.'93) (Smt. Mary K. M. from 7.10.'93 —working as Steno Typist)
Peon	2	1. Sri. Govindan, C. 2. Sri. Saji Antony

NIS (SNIPES) Field Station Coaching

Hockey 1 Smt. S. Prabavathy

Staff strength of constituent Colleges (Phy. Edn.)

Name of College	Assoc. Prof. (N. C.)	Asst. Prof. 1	Marker 1
College of Vety. & A. S.	1	1	1
College of Agril.	1	1	1
College of Horti.	1	1	1
College of Fisheries	1	—	—
KCAE & T	—	1	1
C & B College	—	—	—
Forestry	—	—	—
Total	4	4	4

Name and designation of staff in the Physical Education Unit in the constituent Colls ges under KAU for the period from April, 93 to March, 94

Name of College	Name & designation of the Staff
1	2
College of Vety. & Ani. Scs., Mannuthy	1 Sri. O. K. Paul Associate Professor (N. C.) 2 Smt. Molly Cheriyan Asst. Professor
College of Agriculture Vellayani	1 Smt. A. C. Marykutty Associate Professor (N.C.) 2 Sri. Pazhania Pillai Assistant Professor

1	2
College of Horticulture Vellanikkara	1 Sri. E. Soman Associate Professor (N. C.) 2 Dr. P. J. Manga Assistant Professor
K. C. A. E. & T, Tavanur	1 Sri. M. Velayudhankutty Assistant Professor
College of Forestry Vellanikkara	Nil
College of Fisheries Panangad	1 Smt. Susy V. John Associate Professor (N. C.)
College of Co-op. & Banking, Mannuthy	Nil

□ □

CHAPTER V

Engineering Wing

Engineering Wing of K.A.U. consists of the Directorate of Physical Plant with its Headquarters at Vellanikkara and one Engineering Division at Panangad and four Civil Sub Divisions functioning at K. C. A. E. T, Tavanur, Mannuthy, Vellanikkara and Vellayani. Mechanical Sub Division at Vellanikkara and two Electrical Sub Divisions one each at Vellanikkara and Vellayani also come under the jurisdiction of this Directorate.

Shri. P.O. Thomas, continued as the Director of Physical Plant during the year 1993-94.

Construction and maintenance of buildings and roads including tools and plants, machineries, purchase of vehicles are the important function associated with the Directorate.

Four major civil works—i. e. Construction of Central Library and Auditorium at Vellanikkara and construction of an Academic Block and Ladies Hostel, Fisheries College, Panangad are entrusted to the C. P. W. D.

The details of works in progress and completed during the year under report are furnished in Appendix VIII.

□

CHAPTER VI

KAU Estate, Vellanikkara

The KAU Estate was established in 1973 by acquiring an area of 379.56 ha. and an area of 11.83 ha. was additionally acquired during 1977-81. The total area of the Estate was 391.44 ha.

Out of the total area of 391.44 hectares, 233.30 hectares has been allotted to other schemes as detailed below:-

1 Botanical garden	: 25.00 ha.
2 Instructional Farm	: 95.50 „
3 Cocoa project	: 6.00 „
4 Olericulture & Medicinal Plants	: 6.30 „
5 Coconut (Plantation crops)	: 4.00 „
6 K.A.D.P.	: 14.00 „
7 Central Nursery	: 5.00 „
8 Pepper & Pineapple	: 6.00 „
9 N.B.P.G.R./ICAR	: 12.00 „
10 Mango Orchard for 20 years	: 9.00 „
11 Forestry	: 20.00 „
12 Water Management Unit	: 5.00 „
13 Cashew Research Station	: 5.50 „
14 Coconut Development Board, Kochi	: 20.00 „
<hr/>	
Total	233.30 „

Production and Sales

A total quantity of 47329.360 kgs. of latex produced during the year. 49100 kgs. of latex were sold during the year.

Finance

Total expenditure for the year 1993-94	: Rs. 34,39,358.15.
Total income for year 1993-94	: Rs. 14,55,826.82.

Campus Development, Vellanikkara

The Campus Development Programme was launched at the Main Campus in the year 1990. It comprises of the following four components.

- 1 Campus Development
- 2 Central Nursery
- 3 Mango Research Unit and
- 4 Botanical Garden

Campus Development

The Campus Development programme involves the general development and beautification of the Campus. Avenue trees were planted along all the important roads, the total distance being about 4 km. and were maintained. The species used include mango, jack, kelli, Jamun, May flower bawhimia, caesalpinea and chambakom. Lawns were laid out and were maintained around the administrative block. Annual flower beds were raised and maintained.

Conventional method of irrigation was stopped and integrated water supply system was installed in the entire Vellanikkara Campus with the assistance of the Agro Industries Corporation. One papaya garden was established during the year. Five varieties of papaya viz. Co. 1, Co.2, Co.3, Co.5 and Co.6 were collected and planted.

A cropping plan for the whole KAU Main Campus, Vellanikkara was prepared. The entire campus was divided into 33 blocks and the area was earmarked for different purposes.

Central nursery

The Central Nursery is a plant propagation and nursery management facility created at the main campus to produce planting materials of elite species of horticultural crops. Quality planting materials of major fruit plants like mango, jack, sapota, lovi lovi, champa, arinelli, West Indian cherry, guava, averrhoa and garcinia were produced and distributed. Different varieties of ornamental plants like rose, dieffenbackia, aralea, Calathea, maranta, crotons, begonia, ferns, orchids and palms were also produced and sold out during the period under report.

Beautification and upkeep of the main office building and its premises including interior decoration was attended to by the Central Nursery.

Ornamental plants and mango grafts for the Campus Development Scheme and Mango Research Unit was produced and supplied.

The progeny orchard with important varieties of mango, sapota, guava, lime and jack and minor fruits was maintained. A germplasm collection of 357 varieties of roses, 45 types of orchids, 26 types of anthurium and 47 types of begonia were maintained. Besides a large collection of other ornamental foliage plants were also maintained. Twelve number of nursery structures were constructed and are maintained.

A tissue culture laboratory for the commercial production of planting materials for Banana and Pineapple was inaugurated during the period under report.

Sprinkler irrigation system in the Central Nursery was laid out and commissioned.

Internal revenue by sale of plants was Rs. 3.75 lakhs during the period under report'

Mango Research Unit

The germplasm collection of mango varieties was enriched by planting 116 varieties in addition to the 38 varieties planted during last year. The plants are well maintained and the stand of the crop is good.

An experiment on high density planting in mango was laid out and planted. The variety used is 'Alphonso', the grafts being collected from Fruit Research Station, Vengurla. The spacing treatments are 9 x 9M, 6 x 6M and 3 x 3M.

The bulk planting of prior variety consists of 120 plants which are being maintained well.

Botanical garden:

In the botanical garden, 153 tree species had already been planted. They were maintained properly during the year. Lawns were laid out in the botanical garden under trees with shade loving grass species viz. St. Augustin grass in an area of 1.5 hectares. Seeds and seedlings of 150 new species of plants were collected from different locations in the country.

□ □

CHAPTER VII

Finance and Accounts

Smt. Elizabeth John, I. A & A. S continued as Comptroller. Three internal audit circles/Northern, Central and Southern-manned by Assistant Comptrollers were also functioning during the year 93-94.

Budget Estimate '93-94

The University had adopted a Budget Estimate for Rs. 5227 lakhs for 93-94 anticipating receipt of Rs. 3795 lakhs from State Government as annual block grant (Rs. 3000 lakhs under Non-Plan and Rs. 795 lakhs under Plan, assistance of Rs. 367 lakhs from ICAR, Rs. 79 lakhs from other agencies, Rs. 372 lakhs as internal receipts and Rs. 614 lakhs from recoveries from Pension Fund, Loans, Income from investment, opening balance etc.

As against our anticipation of Rs. 3795 lakhs from State Government, Government have released Rs. 2850 lakhs only (Rs. 2100 lakhs under Non-Plan and Rs. 750 lakhs under Plan) resulting in a shortfall of Rs. 945 lakhs.

In order to accommodate post-budget commitment and honour court verdicts in LA cases the estimate has been revised to Rs. 5445 lakhs which had been approved by the General Council 26/27-3-94.

Receipts and expenditure for 93-94 are as below.

Receipts

Grant-in-aid from Government

Non-Plan	: Rs. 2100.00
Plan	: Rs. 750.00
Grant-in-aid from ICAR & other agencies	: Rs. 615.06

Internal resources	:	Rs. 380.17	
		<u>3845.23</u>	
Opening balance	:	305.53	
		<u>4150.76</u>	
Total	:		
Expenditure			
Non-Plan	:	Rs. 2654.37	
State-Plan (including State share on ICAR Co-ordinated project)	:	843.67	
ICAR Plan (ICAR Share)	:	109.76	
ICAR Projects	:	167.32	
Others	:	70.37	
		<u>3905.47</u>	

(The figures are provisional subject to finalisation of accounts).

Special attention was paid towards welfare measures and there was substantial improvement in clearing back-log of house loan, motor conveyance loans etc. Housing loan scheme was also introduced to the labourers with an allocation of Rs. 10 lakhs for 93-94.

Workers Welfare Fund Scheme was also introduced to the labourers having risk coverage of Rs. 50,000 for a nominal contribution of Rs. 10 per month and one time payment of admission fee of Rs. 250/-

The Finance Committee met on 6-2-94 to finalise the budget estimate 94-95 and revised estimate 93-94. There were 13 sitting of the Accounts Committee to consider Accounts and Audit Report for 84-85 and 85-86 and finalise the reports and recommendations, which has since been accepted by the General Council in its meeting on 19-11-94.

Statutory Audit Wing

Shri. C. Krishnankutty continued as Government Auditor. Audit Reports for 86-87 and 87-88 were issued in 93-94. Audited utilisation certificates of ICAR and other externally aided projects for 90-91 and 91-92 and 92-93 (part) were issued in 93-94 to facilitate drawal of assistance from funding agencies.



Appendix I

MEMBERS OF THE STATUTORY AUTHORITIES

GENERAL COUNCIL

EX-OFFICIO MEMBERS

- The Chancellor
- The Pro-Chancellor
- The Vice-Chancellor
- The Secretary to Government (Agri)
- 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 Veterinary & Animal Sciences, KAU
- The Dean, Faculty of Fisheries, KAU
- The Dean, Faculty of Basic Sciences & Humanities, KAU
- The Dean, Faculty of Agricultural Engineering and Technology, KAU
- The Director of Research, KAU
- The Director of Extension, KAU
- The Director of Students Welfare, KAU

ELECTED MEMBERS

Members of the Legislative Assembly (5 members 1 from SC or ST)

Sri MP Thami, MLA, Mangalapparambil House, Parathoor P.O. Pattambi (Via), Pallippuram, Palakkad.

Sri TV Chandramohan, MLA, 14/587, Govind, Puzhakkal Road, Poonkunnam, Thrissur.

Sri KC Joseph, MLA, Congress House, Sreekantapuram-670631 Kannur

Sri P Raghavan, MLA, Munnad P.O., Chengala (Via), Kasaragod
Sri KM Sooppy, MLA, Firoz Manzil, Panoor P.O. 670 692 Kannur

Representatives of students of Post Graduate courses (2 Nos)

Dr Ani S Das (90-13-05), M.V.Sc. Student, College of Veterinary
& Animal Sciences, Mannuthy, Thrissur (Upto 21-10-1993)

Sri George Joseph (90-11-19), M.Sc. (Agri) Student, College
of Agriculture, Vellayani, Thiruvananthapuram (Upto 19-7-93)

*Representatives of the students of the Doctorate Degree Course
(1 No.)*

Vacant

Representatives of the students of Graduate Courses (2 nos)

Sri Mohammed Shafy (89-03-61), B.V.Sc. & A.H. Student, College
of Veterinary & Animal Sciences, Mannuthy, Thrissur

Sri Thomas K. Thomas (88-03-22), B.V.Sc. & AH Student, College
of Veterinary & Animal Sciences, Mannuthy, Thrissur

*Representatives of the students of Diploma courses and Certificate
course (1 No)*

Nil

*Representatives of Teachers of Faculties (other than Deans)
(not more than 4- one from each faculty)*

Faculty of Agriculture

Sri Jose Joseph, Asst. Professor, Communication Centre,
Mannuthy, Thrissur

Faculty of Veterinary and Animal Sciences

Dr CB Manomohan, Asst Professor, College of Veterinary
and Animal Sciences, Mannuthy, Thrissur

Faculty of Fisheries

Sri CG Rajendran, Associate Professor (Agriculture) Rice
Research Station, Vyttila. P.O., Kochi 19

Faculty of Agricultural Engineering and Technology

Sri John Thomas K, Professor, Kelappaji College of Agricultural
Engineering & Technology, Tavanur, Malappuram

Representatives of Non-Teaching staff (1 No)

Sri VS Skanthakumar, Senior Grade Assistant, KAU Head
Quarters, Vellanikkara P.O., Thrissur

Representatives of Presidents of Panchayats in the State (4 nos)

Sri MM Ashtamoorthi Namboodiripad, President, Elamkulam
Panchayat, Kunnakkavu P.O., Chenikara (Via), Malappuram Dt.

Sri KR Chakkunny, President, Ollukkara Panchayat, Mannuthy
P.O., Thrissur

Sri TM Ramesan, President, Thillenkery Panchayat, Thillenkery, P.O., Kannur Dist.

Sri V Sivan Kutty, President, Ulloor Panchayat, Medical College P.O., Thiruvananthapuram

Representatives of Mayors of Municipal Corporations and Chairman of Municipal Councils in the State (1 No)

Sri Kerala Varma P., Chairman, Thripunithura Municipality, Thripunithura, Ernakulam Dist

MEMBERS NOMINATED BY THE CHANCELLOR

Agricultural Scientists (2 Nos)

Prof. KV Peter, Director, National Research Centre for Spices, PB No. 1701, P.O. Marykkunnu, Kozhikode-673 012

Dr A Jalaluddin, Assoc. Professor, AICRP on Poultry, College of Veterinary & Animal Sciences, Mannuthy, Thrissur

Farmers (5 Nos.) (one from SC/ST)

Sri D Vijayakumar, Advocate, Chengannoor, Alappuzha Dt.

Sri Ahammed Bavappa, Munayakunnu, Eravukadu P.O. Kumaranellor-679 552, Palakkad Dt

Sri CV Narayanan, Chettakkulam House, Madakkathara, P.O. Thrissur

Sri K Janardhanan, Ambadi, Vazhuthacaud, Thycaud P.O., Thiruvananthapuram

Sri K Gopalan, Thazhathuveedu, Makkada P.O, Kakkoor, Kozhikode

Non-Official representatives (3 nos)

Co-operation

Sri MV Kurian, Rtd., Block Development Officer, Ollur, Thrissur

Fisheries

Sri N Prabhakaran, Advocate, 'Sreenivas', Madappally College P.O. Vadakara, Kozhikode

Animal Husbandry

Sri Prayar Gopalakrishnan, Prayar P.O., Ochira, Kollam Dt.

One Non-Official representative of the Plantation Industry in the State

Sri Johny Nelloor, MLA, House No.8, Housing Colony, Moovattupuzha, Ernakulam Dist.

Two Women Members

Smt Saraswathy Kunjkrishnan, Kalangara House, Kollam-13,

Smt C.Dhanalakshmi, Advocate, Ezhavamthuruthu, Ponnani PO Malappuram Dist.

One Engineer specialised in Agrl. Engineering or Irrigation

Dr AM Salim, Chief, Projects Division, State Planning Board,
Pattom, Thiruvananthapuram

One Educationist

Dr K Ramadas, Professor, University Veterinary Hospital,
Kokkalai, Thrissur

Four members to represent Agricultural Labour of whom one shall be a member belonging to the scheduled caste

Sri C. N Govindankutty, Cherpu. P. O., Thrissur Dt.

Sri MK Purushothaman, Panavu. PO, Idukki Dt.

Sri Joseph Perumpilly, Chevoor. Cherpu (Via), Thrissur Dt.

Sri P Narayanan Nair, Omassery PO., Thamarassery (Via),
Kozhikode Dt.

Representatives of Plantation labour in the State (1 No)

Sri VV Shoukkathali, Vadakevalappil House, Vallaramkunnu,
Thenkara P. O., Mannarkkad, Palakkad Dist.

Representative of SCIST (2 SC and 1 ST among them one should be an MLA)

Sri K Raghavan Master, MLA, Kariyampathi House, Kalanadi-
kolli, P. O., Pulppilly, Wayanad Dt.

Sri Thankappan, Advocate, Vizhinjam, Thiruvananthapuram.

Sri V Ratnakaran, 'Vrindavanam', Near Toll Booth,
Valappattanam, Kannur Dt.

OTHER MEMBERS

Representatives of University Scientists (3 Nos)

Representatives of University of Calicut

Dr K Unnikrishnan, Head of the Department of Botany,
University of Calicut, Calicut University

Representative of Senate of Cochin University of Science and Technology

Sri Binoy Viswam, 333 Vikas Nagar, Kozhikode - 673006

Representative of University of Kerala

Sri S Subramaniam Potti, TC 14/1680, Sanskrit College Road,
Palayam, Thiruvananthapuram

Representative of Indian Council of Agricultural Research

Dr M Aravindan, Principal Scientist (ASE), Indian Council of
Agricultural Research, Krishi Anusandhan Bhavan, Dr KS
Krishnan Marg, New Delhi - 110 012

EXECUTIVE COMMITTEE

I EX-OFFICIO MEMBERS

The Vice-Chancellor, Kerala Agricultural University
The Secretary to Government, Department of Agriculture,
Secretariat, Thiruvananthapuram
The Secretary to Government, Rural Development Department,
Secretariat, Thiruvananthapuram
The Secretary to Government, Finance Department, Secretariat,
Thiruvananthapuram

II OTHER MEMBERS - MEMBERS REPRESENTING KAR

Dr M Aravindan, Principal Scientist (ASE), ICAR Krishi
Anusandhan Bhavan, Dr KS Krishnan Marg, New Delhi-110 012
ELECTED DEAN OF FACULTY

Dr C Sreedharan, Dean, Faculty of Agriculture, College of
Agriculture, Vellayani PO., Thiruvananthapuram

III ELECTED TEACHERS

Sri Jose Joseph, Asst. Professor, Communication Centre,
Mannuthy PO, Thrissur

IV ELECTED NON-OFFICIAL MEMBERS

SC/ST Representative

Sri MP Thami, MLA, Mangalamparambil House, Parathoor PO.,
Pattambi (Via), Pallipuram, Palakkad Dt.

Smt Saraswathy Kunjukrishnan, Kalangara House, Kollam-13

OTHER ELECTED NON-OFFICIAL MEMBERS

Sri KC Joseph MLA, Congress House, Srikantapuram, Kannur
Dt.

Sri Johny Nelloor, MLA, House No. 8, Housing Colony,
Moovattupuzha, Ernakulam Dt.

Sri KM Sooppy, MLA, Firoz Manzil, Panoor PO Kannur Dt.

ELECTED STUDENT REPRESENTATIVE

Dr Ani S Das, MVSc. Student, College of Veterinary and Animal
Sciences, Mannuthy PO Thrissur upto 6-5-93.

Sri Thomas K Thomas (88-03-22) B.V.Sc. and A. H. Student,
College of Veterinary and Animal Sciences, Mannuthy, Thrissur
from 24-9-93

ACADEMIC COUNCIL

(from 28/12/93)

The Vice-Chancellor, Kerala Agricultural University

The Dean, Faculty of Agriculture, Kerala Agricultural University

The Dean, Faculty of Veterinary and Animal Sciences, Kerala
Agricultural University

The Dean, Faculty of Fisheries, Kerala Agricultural University
The Dean, Faculty of Agricultural Engineering and Technology
Kerala Agricultural University
The Director of Research, Kerala Agricultural University
The Director of Extension, Kerala Agricultural University
The Director of Students Welfare, Kerala Agricultural
University
The Registrar, Kerala Agricultural University
The Director of Agriculture, Thiruvananthapuram
The Director of Animal Husbandry, Thiruvananthapuram

ELECTED MEMBERS

One member elected by the Teachers (Other than the Dean) of each faculty from among themselves.

Sri Hajilal, MS., Assistant Professor, Kelappaji College of Agricultural Engineering & Technology, Tavanur

Dr. CS Jayachandran Nair, Associate Professor (NC), Department of Horticulture, College of Agriculture, Vellayani

Dr KN Muraleedharan Nair, Professor, Department of Surgery, College of Veterinary & Animal Sciences, Mannuthy, Thrissur

Dr KV Jayachandran, Assistant Professor, College of Fisheries Panangad, Cochin.

Post graduate Students and Research Students of the University.

Biju Lal BL (93-11-55) M.Sc. (Ag.) Soil Science & Agricultural Chemistry, College of Agriculture, Vellayani

Kuriakose, KJ (92-12-13) II M.Sc. (Hort.) Student, Department of Processing Technology, College of Horticulture, Vellanikkara.

Dr H Subramaniam (93-26-02) PhD. Student Dept. of Parasitology, College of Veterinary and Animal Sciences, Mannuthy, Thrissur

Members nominated by the Chancellor from among the Heads of Departments of the Faculties (6 members)

Dr KM Narayanan Namboodiri, Professor and Head (Agricultural Botany), College of Horticulture, Vellanikkara, Thrissur

Dr Al Jose, Professor and Head (Soil Science & Agricultural Chemistry), College of Horticulture, Vellanikkara, Thrissur

Dr K Pavitharan, Professor and Head (Dairy Science), College of Veterinary and Animal Sciences, Mannuthy, Thrissur

Sri K Kerala Varma, Assoc. Professor and Head (Fishery Hydrography) College of Fisheries, Panangad, Ernakulam.

Dr KI Koshy, Professor and Head (Supportive and Allied Courses), Kelappaji College of Agricultural Engineering and Technology, Tavanur, Malappuram

Dr PS Pushkaran, Professor and Head (Extension), College of Veterinary and Animal Sciences, Mannuthy, Thrissur

Members nominated by the Chancellor from among the staff of the Research Stations of the University (3 members) as per section 17 (1) (i) of KAU Act

Sri KS Purushan, Associate Professor, Fisheries Research Station, Puduveyyu, Ernakulam

Dr U Jaikumaran, Associate Professor (NC), Agricultural Research Station, Mannuthy

Dr Sosamma Iype, Professor, University Livestock Farm, Mannuthy

Members nominated by the Chancellor from among the Scientists of Indian Council of Agricultural Research and/or its institutions, from other Universities in India or from among well-known scientists in India

Dr M R Sethuraj, Director, Rubber Research Institute of India, Kottayam.

Dr R Gopalakrishnan, Retd: Director of Research, Kerala Agricultural University, Plot No. 228, Gate No. 4, Hill Gardens, Kuttanellur P. O., Thrissur: 680 014

Dr AD Damodaran, Director, Regional Research Laboratory (CSIR), Thiruvananthapuram.

Dr Subramanian, Dean, Tamil Nadu Agricultural University Coimbatore.

Dr SP Palaniappan, Professor of Agronomy, Agricultural College & Research Institute, Tamil Nadu Agricultural University, Coimbatore:641 003.

Members co-opted to secure adequate representations to different aspects of agriculture,

Dr CC Abraham, Associate Dean i/c.. College of Horticulture, Vellanikkara.

Dr U Mohammed Kunju, Director, Academic & P. G. Studies, KAU Head Quarters, Vellanikkara.

The Special Officer, College of Forestry, Vellanikkara.

Sri M Mohandas, Associate Dean i/c. College of Co-operation & Banking, Mannuthy.

Dr N Mohanakumaran, Associate Director, NARP (SR), College of Agriculture, Vellayani.

Dr. G Mukundan, Director, Centre of Advanced Studies on Animal Breeding & Genetics, College of Veterinary & Animal Sciences, Mannuthy.,

Dr MJ Thomas, Associate Director, Directorate of Research, KAU Headquarters, Vellanikkara.

Dr PM Mathew, Professor (Fisheries Research), College of Fisheries, Panangad.

Associate Dean/Special Officer, College of Agriculture,
Pilicode/Nileswar.

Smt KK Santha, Associate Professor, Directorate of Extension,
Mannuthy.

I. BOARD OF STUDIES

FACULTY OF AGRICULTURE

Dean, Faculty of Agriculture, KAU — Chairman

Heads of Departments under the faculty — Members

Agronomy	"
Physiology	"
Agri. Entomology	"
Agri. Economics	"
Agri. Meteorology	"
Agri. Extension	"
Agri. Statistics	"
Horticulture	"
Plant Pathology	"
Soil Science & Agri. Chemistry	"
Plant Breeding and Genetics	"
Plantation Crops and Spices	"
Pomology and Floriculture	"
Olericulture	"
Processing Technology	"
Home Science	"
Co-operative Management	"
Rural Marketing Management	"
Rural Banking and Finance Management	"
Development Economics	"
Silviculture and Agro-Forestry	"
Tree Physiology and Breeding	"
Forest Management and Utilisation	"
Wood Science	"
Wild Life Science	"

Two Specialists

Dr. NM Ramaswami, Dean, P. G. Studies, Tamil Nadu Agrl.
University, Coimbatore

Dr P Pushangadan, Director, Tropical Botanical Garden,
Palode, Thiruvananthapuram

*Such other members (Two members) appointed by Executive
Committee from among the teachers of Kerala Agricultural
University*

Sri KK Ravindran Nair, Professor, College of Agriculture,
Vellayani

Dr N Mohanakumaran, Assoc. Director, NARP (SR), Vellayani

Student representatives

BL Bijulal (93-11-55) M. Sc (Ag) College of Agriculture, Vellayani.

KJ Kuriakose (92-12-13) M. Sc (Hort) Department of Processing Technology, College of Horticulture, Vellanikkara

Special Invitees

Director of Agriculture, Thiruvananthapuram

Deani/c. Kelappaji College of Agri. Engg. & Technology, Tavanur

Assoc. Dean, College of Horticulture, Vellanikkara

Special Officer, College of Forestry, Vellanikkara

Assoc. Dean, College of Co-operation and Banking, Mannuthy

ii. FACULTY OF VETERINARY AND ANIMAL SCIENCES

Dean, Faculty of Veterinary and Animal Sciences Chairman

Heads of Departments under the Faculty of Members
Veterinary and Animal Sciences

Livestock Production Management	''
Anatomy	''
Dairy Science	''
Preventive Medicine	''
Microbiology	''
Parasitology	''
Poultry Science	''
Pharmacology	''
Surgery	''
Animal Breeding and Genetics	''
Animal Reproduction	''
Extension	''
Nutrition	''
Pathology	''
Physiology	''
Clinical Medicine	''
Veterinary Public Health	''
Statistics	''

Two Specialists in the subject with which the Faculty is concerned

Dr S Shanmugha Sundaram, Dean, Veterinary College, Namakkal, Salem Dist.

Dr O Ramakrishna, Principal, Veterinary College, Thirupathy, Chittoor Dist., Andhra Pradesh

Such other members (Two members) appointed by the Executive Committee from among the teachers of the University

Dr K Madhavan Pillai, Professor (Parasitology), College of Veterinary and Animal Sciences, Mannuthy

Dr Zacharias Cherian, Professor, Department of Pharmacology, College of Veterinary and Animal Sciences, Mannuthy

Student representative

Dr H Subramaniam (93-23-2), Ph. D Student, Department of Parasitology, College of Veterinary and Animal Sciences, Mannuthy

Special invitee

Director of Animal Husbandry, Thiruvananthapuram

iii. FACULTY OF FISHERIES

Dean; Faculty of Fisheries

Chairman

Heads of Departments in the Faculty of Fisheries

Members

Aquaculture

"

Fishery Biology

"

Processing Technology

"

Fishery Engineering

"

Fishing Technology

"

Fishery Hydrology

"

Management Studies

"

Two specialists in the subject with which the Faculty is concerned

Dr Varghese, Professor of Aquaculture, Fisheries College, Mangalore.

Dr NR Menon, Director, School of Marine Sciences, Foreshore Road, Kochi

Such other members not exceeding two appointed by the Executive Committee from among the teachers of the University

Dr PM Mathew, Professor (Fisheries Research), College of Fisheries, Panangad, Kochi

Smt Jayasree Vadhiar, Assoc. Professor, Department of Aquaculture, College of Fisheries, Panangad, Kochi.

Student representatives

Nil

Special Invitee

Director of Fisheries, Thiruvananthapuram

The Director of Research, Director of Extension, and Director Acad & P. G. Studies

IV. FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY

Dean, Faculty of Agrl. Engg. and Technology Chairman
Heads of Departments under the faculty (4 members) Members

Specialists

State Agricultural Engineer, Department of Agriculture,
Government of Kerala, Thiruvananthapuram

Sri N Abdul Azeez, Additional Director of Soil Conservation,
Directorate of Agriculture (S. C. Unit), Thiruvananthapuram

Two members from among the teachers of the University

Dr ER Nair, Assoc. Director of Research, Directorate of Research,
KAU Headquarters, Vellanikkara

Dr K Pavithran, Prof. and Head, Department of Dairy Science,
College of Veterinary and Animal Sciences, Mannuthy

Student Representative

Nil

Special Invitees

Dr C Gopinath, Director, Centre for Management Studies,
Thycaud, Thiruvananthapuram

Sri KR Swaminathan, Dean, College of Agrl. Engineering,
Tamilnadu Agricultural University, Coimbatore-641 003.

Dr AN Remadevi, Professor, Department of Agrl. Engineering
College of Agriculture, Vellayani, Thiruvananthapuram

Sri P John Zachariah, Rtd. Jt. Commissioner, Government of
India, HOREB-12, Perissery, Chengannur 689 121

Dr M Jayakumar, Scientist 'F' and Project Director, IMTC,
CWRDM, Kunnamangalam PO. Kozhikode 673 571

Dr GT Kurup, Scientist CTCRI, Sreekaryam, Thiruvananthapuram

The Director of Research, Director of Extension and Associate
Director (Academic) of Kerala Agricultural University.

Appendix II

SUB COMMITTEES

SUB COMMITTEES OF EXECUTIVE COMMITTEE

Finance Committee

The Vice-Chancellor	Chairman
Sri KM Sooppy, MLA	Member
The Secretary to Government (Finance Expenditure)	"
The Secretary to Government (Agriculture)	"
The Comptroller, KAU	Convenor

Planning and Development Committee

Sri Johny Nelloor, MLA	Chairman
Sri MP Thami, MLA	Member
Sri KC Joseph, MLA	"
Sri KM Sooppy, MLA	"
Smt Saraswathy Kunjukrishnan	"
Sri Jose Joseph, Teachers Representative	"
The Secretary to Government (Agriculture)	"
Dr Ani S Das upto 6-5-93 and Sri Thomas K Thomas from 24-8-93	"
Students Representative	"
The Comptroller, KAU	"
The Director of Research, KAU	Member- Convenor

Research Review Committee

Sri KM Sooppy, MLA	Chairman
Sri KC Joseph, MLA	Member
Sri Johny Nelloor, MLA	"
Sri MP Thami, MLA	"
Smt Saraswathy Kunjukrishnan	"

Sri Jose Joseph, Teachers Representative	Member
Director of Research, KAU	Member- Convenor

Establishment Committee

Smt Saraswathy Kunjukrishnan	Chairperson
Sri KC Joseph, MLA	Member
Sri Johny Nelloor, MLA	"
Sri KM Sooppy, MLA	"
Sri MP Thami, MLA	"
Dr C Sreedharan (Dean), (Agriculture)	"
Sri Jose Joseph, Teachers Representative	"
Dr Ani S Das, Students Representative upto 6-5-93	"
Registrar, KAU	Member- Convenor

Students Welfare Committee

Sri Johny Nelloor, MLA	Chairman
Dr Ani S Das, Students Representative upto 6-5-93 and Mr. Thomas K Thomas from 24-8-93	Member
Sri KC Joseph, MLA	"
Sri KM Sooppy, MLA	"
Sri MP Thami, MLA	"
Smt Saraswathy Kunjukrishnan	"
Director of Students Welfare	Member- Convenor

Works Committee

Sri MP Thami, MLA	Chairman
Sri Johny Nelloor, MLA	Member
Sri KC Joseph, MLA	"
Sri KM Sooppy, MLA	"
Smt Saraswathy Kunjukrishnan	"
Sri Jose Joseph, Teachers Representative	"
The Registrar, KAU	Member Convenor
Director of Physical Plant, KAU	Permanent Invitee

SUB COMMITTEES OF GENERAL COUNCIL

Statute Sub Committee

Sri MV Kurien	Chairman
Smt Saraswathy Kunjukrishnan	Member
Sri Jose Joseph	"
Sri CG Rajendran	"
Dr CB Manomohan	"
Dr A Jalaluddin	"
Sri A Thankappan	"
Sri VS Skandakumar	"
Sri Joseph Perumbilly	"
Smt C Dhanalakshmi	"
Sri K John Thomas	"
Sri Thomas K Thomas	"
Registrar	Convenor

Accounts Committee

Sri D Vijayakumar	Chairman
Sri CN Govindankutty	Member
Sri MK Purushothaman	"
Sri VV Shoukkathali	"
Sri V Retnakaran	"
Sri Prayar Gopalakrishnan	"
Sri V Sivankutty	"
Sri P Narayanan Nair	"
Comptroller	Convenor

Assurance Committee

Sri K Gopalan	Chairman
Sri K Janardhanan	Member
Sri CV Narayanan	"
Sri Subramanian Potty	"
Sri Binoy Viswam	"
Dr K Ramdas	"
Sri N Prabhakaran	"
Registrar	Convenor

Postgraduate Committee

Vice-Chancellor, KAU	Chairman
Director, PG Studies	Member
Dean, Faculty of Agriculture, KAU	"
Dean, Faculty of Veterinary and Animal Sciences, KAU	"
Dean, Faculty of Agricultural Engineering, KAU	"

Dean, Faculty of Fisheries, KAU	Member
Director of Research, KAU	"
Director of Extension, KAU	"
Associate Dean, College of Horticulture, Vellanikkara	"
Associate Dean, College of Co-operation and Banking, Mannuthy	"
Special Officer, College of Forestry, Vellanikkara	"
Professor, Research Co-ordination (Agri.)	"
Professor, Research Co-ordination (Vety.)	"
Registrar	Convenor

OTHER COMMITTEES

Research Council

Vice-Chancellor	Chairman
Director of Research	Secretary
Members (KAU officials)	
Director of Extension, KAU	
Dean, College of Agriculture, Vellayani	
Dean, College of Veterinary & 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 and Animal Sciences, Mannuthy	
Teacher Representative in the Executive Committee of KAU	
Assoc. Director, NARP (SR), College of Agriculture, Vellayani	
Associate Director, Regional Agrl. Research Station, Pilicode.	
Associate Director, Regional Agricultural Research Station, Ambalavayal	
Associate Director, Regional Agricultural Research Station, Pattambi	
Associate Director, Regional Agricultural Research Station, Kumarakom	
The Managing Editor, Kerala Journal of Veterinary Research, College of 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 KM Sopyy, M.L.A., Feroosh Menzil, Panoor P. O., Kannur
670 692
Sri MP Thami, M.L.A., Mangalamparambil House, Paruthoor P.O.
(Via) Pattambi, Pallippuram, Palakkad
Sri Johny Nelloor, House No,8, Housing Colony, Muvattupuzha
Sri KC Joseph, M.L.A., Congress House, Sreekantapuram,
Kannur
Sri TV Chandramohan, M.L.A., 14/587, Govinda, Puzhakkal
Road, Punkunnam, Thrissur-2
Smt Saraswathy Kunjukrishnan, Kalangara Veedu, Kollam
Sri Ahammed Bavappa, Munayamkunnu, Eravukadu,
Kumaranelloor: 679 555, Palakkad Dt.
Sri PC Nair, Thripathi, Engineers Line, Thrissur
Sri Joseph Alappat, Thoppil, Green Gardens, Karanchira
Sri CK Joseph, Chamachaparambil, Ramagiri P. O. Kuttanadu
Sri KK Velayudhan, Karshakashri
Sri Prayer Gopalakrishnan, Chairman, Milma,
Thiruvananthapuram

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. Research Station, Ambalavayal	"
Assoc. Director, Regional Agrl. Res. Station, Pattambi	"
Assoc. Director NARP (Southern Region) College of Agriculture, Vellayani	"
Assoc. Director, Regional Agrl. Research Station, Kumarakom	"
Assoc. Director, Regional Agrl. Research Station, Pilicode	"
Assoc. Dean, College of Co-operation and Banking, Mannuthy	"
Special Officer, College of Forestry, Vellanikkara	"

Project Co-ordinators

Dr CA Joseph, Professor and Head, Rice Research Station, Moncompu	Member
Sri B Thomas, Professor (Ent), Regional Agricultural Research Station, Kumarakom	"
Dr S Rajan, Assoc. Professor (Hort.) College of Horticulture, Vellanikkara	"
Dr SR Nair, Professor (Hort.), College of Agriculture, Vellayani	"
Dr G Sreekantan Nair, Professor, College of Horticulture, Vellanikkara	"
Smt S Santhakumari, Professor (Bot.), SRS, Thiruvalla	"
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 TV Viswanathan, Associate Professor (PB) College of Hort., Vellanikkara	Member
Dr Alice Abraham, Professor (Chem.) College of Agriculture, Vellayani	"
Dr MC 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 GT Nair, Professor (Extn.) College of Agriculture, Vellayani	"
Dr SK Nair, Professor (Micro), College of Agriculture, Vellayani	"
Dr VK Sasidhar, Professor (Agronomy), College of Agriculture, Vellayani	"
Dr P Balakrishna Pillai, Associate Director Regional Agrl. Research Station, Ambalavayal	"
Special Officer, College of Forestry, Vellanikkara	"
Dr KC Rajan, Associate Professor (Agro), ORP, Ozhalapathy	"
Dr GR Pillai, Associate Director, Regional Agrl. Research Station, Pattambi	"
Dr P Padmaja, Professor (Chem) College of Agriculture, Vellayani	"

Heads of Departments other than Project Co-ordinators

Professor & Head, Dept. of Soil Science and Agrl. Chemistry, College of Agriculture, Vellayani	Member
Prof. PV Prabhakaran; Professor (Ag. Stat.), College of Horticulture, Vellanikkara	"
Professor & Head, Dept. of Agrl. Extn., College of Agriculture, Vellayani	"
Professor & Head, Department of Plant Pathology, College of Agriculture, Vellayani	"
Dr. L. Prema, Professor, Dept. 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-ordination) 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. AN Namboodiri, Director, TBGRI, Thiruvananthapuram		"
iv. FISHERIES (FRC)		
Director of Research		Chairman
Dean, Fisheries		Member
Director of Extension, KAU		"
Professor (Fisheries Research)		Secretary
Professor, Aquaculture		Member
Professor, Fishery Biology		"
Head, Department of Fishery Hydrography, College of Fisheries, Panangad		"
Professor, Processing Technology, College of Fisheries, Panangad		"
Head, Department of Fishing Technology, College of Fisheries, Panangad		"
Head, Department of Fishery Engineering, College of Fisheries, Panangad		"
Head, Department of Management Studies, College of Fisheries, Panangad		"

Other Science and Technology Organisations

Director, State Committee on Science,
Technology and Environment (STEC),
General Hospital Road, Thiruvananthapuram Member

Mass Media

Station Director, All India Radio, Thiruvananthapuram ..
Station Director, All India Radio, Thrissur ..
Station Director, All India Radio, Kozhikode ..
Editor-in-chief, Kerala Kaumudi Daily,
Pettah, Thiruvananthapuram ..
Sri M. C. Varghese, Chief Editor, Mangalam Daily,
P. B. No. 1, Kumaranelloor P. O. Kottayam ..

Commodity Boards

Sri PK Narayanan, Joint Director,
Publications and Public Relations,
Rubber Board, Sastri Road, Kottayam ..
Sri Antony Cherian, Director, Spices Board,
St. Cross Vincent Road, Kochi ..

Voluntary Organisations

Fr. Joseph Muttumana, Peoples Dairy Development
Project, Mattur, Kalady, Ernakulam District ..

Kerala Agricultural University

Dean, College of Agriculture, Vellayani ..
Director of Research, KAU, Vellanikkara ..
Dean, College of Vety. and Animal
Sciences, Mannuthy ..
Dean, College of Fisheries, Panangad ..
Dean, Kelappaji College of Agri. Engineering and
Technology, Tavanur ..
Associate Dean, College of Horticulture
Vellanikkara ..
Professor and Head, Department of Home Science,
College of Agriculture, Vellayani ..
Professor and Head, Department of Extension
College of Agriculture, Vellayani ..

Farmers

Dr. KC George, IX/49, Karanchira,
Vettikkal PO, Ernakulam Dt. 682 313 Member
Sri MK Vijayaraghavan, Thrissur 680 007 ..
Sri AM Varghese, Velangannoor Milk Society,
Velangannoor ..

Variety Evaluation Committee

	Chairman Member
Director of Research, KAU	
Director of Extension, KAU	
Director, CTCRI or his nominee	"
Director, CPCRI of 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 Agrl. Chemistry, College of Hort. Vellanikkara	"
" Plant Pathology, College of Agri., Vellayani	"
" Agrl. Botany, College of Hort. Vellanikkara	"
" Agrl. Entomology, College of Agri., Vellayani	"
" Agrl. 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 Agrl. Research Station, Pilicode	"
Associate Director, Regional Agrl. Research Station, Pattambi	"
Associate Director, Regional Agrl. Research Station, Ambalavayal	"
Associate Director, Regional Agrl. Research Station, Kumarakom	"
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

Vice-Chancellor, Kerala Agricultural University	Chairman
District Collector, Thrissur	Member
Registrar, KAU	"
Agriculture Secretary, Govt. Secretariat, Thiruvananthapuram	"
Asst. Programme Adviser, NSS Regional Centre, Thiruvananthapuram	"
Co-ordinator, Training and Orientation Centre, Kalamassery	"
Professor of Agrl. Extension, College of Veterinary and Animal Sciences, Mannuthy	"
All Heads of Colleges having NSS Units of the KAU	"
President, KAU Students Union	"
Secretary	"
One Programme Officer from each of the College having NSS Units (In the case of colleges having more than one unit the Programme Officer to be included in the Committee will be nominated by the Dean of the College concerned)	"
State Co-ordinator, NSS, Govt. of Kerala, Thiruvananthapuram	"
Director, Mitraniketan, Thiruvananthapuram	"
Comptroller, KAU	"
Director of Students' Welfare, KAU	"
Programme Co-ordinator, NSS, Kerala University Thiruvananthapuram	"
Programme Co-ordinator, Calicut University	"
" MG University, Kottayam	"
" NSS Technical Cell, Thrissur	"
Programme Co-ordinator, NSS, KAU	Member-Convenor

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 of Horticulture, Vellanikkara	"
Associate Dean, College of Co-operation and Banking, Mannuthy	"

Special Officer (Forestry), College of Forestry, Vellanikkara	Member
Professor, Research Co-ordination (Agri)	"
Professor, Research Co-ordination (Vety)	"
Registrar, KAU	Convenor

Sports Board

Vice-Chancellor, KAU	Chairman
Director of Extension	Vice-Chairman
Heads of constituent colleges	Member
Chairman, Students' Welfare Committee	"
Student Representative in the Executive Committee	"
Teacher Representative in the Executive Committee	"
Comptroller, KAU	
Director of Physical Plant	"
Teachers in Physical Education	"
Officers in charge of the Sports and Games of the Constituent Colleges where no teacher in Physical Education is available	
Athletic Secretaries of Constituent Colleges	"
Dy. Director of Students' Welfare i/c	Convenor & Secretary

Appendix III

LIST OF STAFF AT HEADQUARTERS

Vice-Chancellor	:	Dr AM Michael
<i>Vice-Chancellor's Office</i>		
PS to VC	:	CN Muraleedharan Nair
PA to VC	:	K Sadasivan Nair
Sr Office Supdt.	:	P Haridasan
Peons	:	V Krishnan EK Padmanabhan A Ramachandra Bahadur
Driver	:	CP Karunakaran Nair
<i>Registrar's Office</i>		
Registrar	:	PN Kanakambaran upto 6-5-93 Dr U Mohammed Kunju 6-5-93 to 25-8-93 EK Majhi IAS 25-8-93 onwards
Senior Deputy Registrar	:	PM Chandran
Deputy Registrar (Admn II)	:	CS Asokakumar
Deputy Registrar (Acad)	:	V Chandrika
Asst Registrar (Admn I)	:	C Rajamma
Asst Registrar (Admn II)	:	D Gilbert
Labour Officer	:	C Sasikumaran Nair
Recruitment Officer	:	T Aravindan
Section Officers	:	KK Gauthamy KP Ramachandran Nair VV Radhamma L Syamala TA Zainaba Beevi V Viswambharan AK Lyla R Remadevi PV Nalini MA Alikutty KV Sugunan KP Narayanikutty S Vanaja

	A Subbalakshmy Ammal KP Saramma NK Unnikrishnan CM Omana PA Lakshmy MN Sasidharan MN Vijayakumar CV Santha M Rugmini KK Subramonian K Chandramohan
Senior Grade Assistant	: MA Urmiladevi A Abdul Kareem upto 2/94 A Santhakumari upto 10/93 VA Achuthan K Haridasan S Rajalakshmi Amma KR Suresh V Chellamma GV Kumar KC Joseph KS Paul PK Pushpaja ME Rajan C Usha P Krishna Prakash Baby Saroja VR Santhakumari K Subramanian
Assistant Gr. I	: KP Vasanthakumari K Meera VR Padmanabhan upto 6-1-94 VN Narayanan Mary Joseph PV Asokan TJ Babychan KV Ammalukutty K Pradeep U Mukundan KN Radhakrishnan PA Saraswathy K Sreekumar KB Sudha P Mohini P J Thimose TC Latha K Mohanan

Assistant Gr. II : Liakath Alikhan
 KD James
 Mohammed Iqbal
 EV Ambily

Pool Officer : AK Abdul Kadir
 Retired on 31-10-93 AN
 N Somarajan
 From 23-11-93 onwards

Senior Office Superintendent : TK Prabhakaran
 Retired on 30-9-93
 PO Elsy
 VB Leelavathy Amma
 PA to Comptroller
 KK Ramachandran Nair
 VP Asokan PA to Registrar
 P Haridasan
 Steno to Vice-Chancellor
 PV Brizitha upto 17-5-93
 R Sadan
 S Seemanthini upto 17-5-93
 Razia Beevi upto 17-5-93
 PR Sarojini
 K Sadasivan Nair
 PA to Vice-Chancellor
 K Sathyavathi Bai
 From 1-12-93 onwards
 R Saradadevi
 From 12-10-93 to 2-04

Office Superintendent/Typist : MA Bhargavi
 KA Valsala
 P Sarada
 K Girija
 IA Surendran
 S Sarojini Amma upto 17-5-93
 Sreemathy Kumari
 MA Rajini
 TC Ajitha upto 15-5-93
 R Vijayan upto 17-5-93
 K Chandrakumar upto 15-5-93
 P Ushakumari upto 17-5-93
 B Lalithakumari upto 17-5-93
 B Sukumari Amma
 S Sudhakaran Nair on deputation
 to PS of Minister of Agriculture

	KK Mary on W/A at Poultry and Duck Farm, Mannuthy
	R Usha upto 21-5-93 AN
	G Sukumaran Nair upto 14-6-93 AN
	Z Sareena
	VM Mulaleedharan
	MC Devassy upto 17-5-93
	TA Vincent
	K Vimala from 17-5-93
	L Sobhanakumari from 5-6-93
	M Ponmani Mohana
	S Remani from 2-6-93
	K Sathyavathi Bai 22-5-93 to 15-11-93
	KR Nirmala from 24-6-93 to 28-2-94
	PK Easwari from 26-6-93
	A Vasantha from 22-5-93
	AJ Mary from 8-7-93
	E Sathidevi from 8-10-93
	TJ Leena from 19-3-94
	PK Jayanthi on daily wages from 1-3-94 to 29-4-94
	P Subhashini
	C Padmavathy
	KM Mary upto 6-10-93
Clerical Assistant/ Lab Assistant Gr. III	: TN Aravindakshan V Sreedevi AN Saraswathy K Thankamani
Malayalam Translator Programmer	: KN Chandralekha : Mollykutty George M Viswanathan Nair
Junior Programmer	: TA Sebastian (on LWA for 5 years w.e.f. 2.3.94 AN)
H.D.V. Driver	: VR Kochu AJ Antony (Retired voluntarily from service with effect from 30-11-93)
	IT Rappai 1-1-94 to 31-3-94
	TK Govindan from 31-5-93
	PK Devassy from 6-12-93
	PV Sudhakaran upto 24-1-94
	KK Thankappan from 24-1-94
	CP Karunakaran Nair

L.D.V. Driver

: KP Jose
KM Subramanian
KO John Stephen
ES Chandran
MP Paul
MV Karappan upto 27-1-94
VR Chandran from 6-1-94
Mathai Kurian
from 29-5-93 to 4-1-94
NA Sukumaran
KC Chinnan
MS Reghu
TM Chacko

Binder

: R Vijayan

Duffedar Class IV

: TS Keralavarman
CP Kausallia
MK Vasudevan
EK Padmanabhan
MN Vasu
V Gopinathan
KK Chandra
TV Santha
K Santhakumari
KV Chetty
V Krishnan
PD Rosa
VA Ittiara
PV Devoo
AP Manikkan
IR Vilasini
CO Varunny
NV Santhosh Kumar
KK Nabeesa
M Lakshmikutty
PE Thankappan
VI Balan
VA Mathew
MK Thankappan
KA Basheer
TR Raveendran
T Sasi
Ramachandra Bahadur
PR Surendran
PD Annamma

C Govindan
 K Saji Antony
 A Kochammu
 MD Roy joined duty on 7.3.'94
 Bus Attendant : KA Abdul Rasheed
 Beer Bahadur Singh
 VA Ouseph
 M Jebbar
 KC Krishnan
 Duplicator Operator : IR Govindan
 M Gopinathan joined duty on
 15.5.'93
 CA Divakaran joined duty on
 14.5.'93
 CR Antony upto 14.5.'93
 PA Madhavan upto 14.5.'93

Finance Wing

Comptroller : Elizabeth John
 Senior Deputy Comptroller : O Vinodakrishnan
 Asst Comptroller, IAC (CR) : VC Bharathan Pillai
 Asst Comptroller (B&P) : VR Sankarankutty
 Asst Comptroller (CC) : S Bhaskara Pillai
 Section Officer : KI Chakkunny
 CC Rosily
 KK Sadeesan
 PT Thankamony
 Susy Mathew
 R Thankamony
 Senior Grade Assistant : C Sobhanakumari
 PA Geetha
 Y Rajas
 N Mary Joseph
 K Dinesan
 NP Valsan
 PL Tony
 G Santhakumari
 P Vijayakumari
 Shirly Mathew
 KK Sadeesan upto 10/93
 B Bhanumathy upto 7/93
 A Abdul Kareem from 11/93
 KK Sunetha
 T Ally

Assistant Grade I

: MP Narmada
K Girindrababu
TC Jose
Bobby Abraham
PS Suresh Kumar
MA Many
PP Prema
EK Dalika
P Sudha
KK Sudharma
Josee Jobes Justus
K Philip John upto 29/6/93
KP Sajan
S Sureshkumar
PL George
CS Baburaj
KP Gopi
CP Jayakumar upto 29-6-93

Assistant Gr. II

: PK Ajayakumar
PD Toney
PB Abdulkader
V Unni
CP Raphi
V Mohandas
Relieved w. e. f. 28-6-93
KN Leela
I Indira
MA Ullas
EX Antony Joseph
M Lyla upto 18-5-93
C Sivadasan
Varghese J. Ollukkaran
M Babu Varghese
PM Sarada
PN Shylajadevi
PK Kochu Paul
KK Sudharma
KN Murukes
KV Rathidevi
C Kunhunny
KS Jitha
NS Kumaranandan from 29-6-93
PN Ramesh from 8-93

Directorate of Research

Director of Research	:	Dr M Aravindakshan
Associate Director of Research (M&E)	:	Dr U Mohammed Kunju upto 25-8-93 Dr P Balakrishna Pillai from 25-8-93
Associate Director of Research (V&AS)	:	Dr MS Nair
Associate Director of Research (AR&T)	:	Dr GR Pillai
Associate Director of Research (Plg.)	:	Dr RR Nair upto 17-6-93 Dr MJ Thomas from 21-6-93
Administrative Officer Gr. II Section Officer	:	V Balagopalan PR Sreedevikutty N Vijayakumar
Sr. Office Supdt.	:	KN Santhakumari G. Shanmughan
Assistant Gr. II	:	VS Sathia Seelan Sheela A. Attokaran K Harinatha K Sujathabhai
Assistant Gr. I	:	MD Kunjamma K Rajendran KM Ajayakumar
Senior Grade Assistant Typist	:	KF Mathew K Saraswathy Amma, Office Supdt. Fathima Beevi PT Ajith PK Kalyani on W/A at Campus Development B Shiras AJ Mary upto 1-7-93 A Vasantha upto 21-5-93 S Raghavan from 4-6-93 PG Elizabeth N Dasamma A Ramachandran Unnithan, Office Supdt.

Academic wing

Director (Academic and P. G. Students)	:	Dr U Mohammed Kunju from 25-8-93
Office Supdt.	:	P Subhashini from 6-10-93

Directorate of Physical Plant

Director of Physical Plant	:	PO Thomas
P. A. to DPP (Executive Engineer)	:	P Sreekumar
Financial Assistant to DPP	:	A Basil
Section Officers	:	KP Sreedharan PJ John KS Natarajan from 1-7-93 onwards
Assistants	:	KK Sadeesan upto 19-5-93 S Valsala KK Kuttappan upto 18-5-93 Abdul Muthalavi KM AKberali PJ Thimose upto 22-5-93 NV Annie PM Latha Kumari Girija upto 17-5-93 N Ponnamma upto 17-5-94 TK Sarada B Sobhana from 21-7-93 onwards EN Savithri from 31-7-93 B Ajithkumar from 19-5-93 to 4-10-93 VS Skandakumar from 19-5-93 onwards VI Sureshkumar from 2-6-93 onwards
Sr. Office Supdt.	:	PI Ittoop
Office Supdt.	:	N Haridas
Typists	:	TK Ponnamma upto 17-5-93 Rosy K. Francis upto 20-5-93 KA Geetha from 3-6-93 onwards B Kumari Sathya Bhama from 7.6.93 TM Meera MK Thankamani MK Parukutty
Blue printer cum Stereo Operator	:	Vacant
Head Draftsman	:	KV Ajitha

Overseers : EK Radhakrishnan
 TN Suresh Babu
 ET Lal
 Meera Bai
 CI Sali upto 21.5.93
 KG Ajithkumar

Peons : CV Vijayan
 PI Kunjumol
 MO Kochannam
 NP Chandran

Driver LDV : PK Sasi

Directorate of Students Welfare
Director of Students Welfare : Dr TG Rajagopalan (Holding charge)

Dy. Director of Students Welfare : OK Paul (Holding charge)

Dy. Director of Students Welfare (Acad. & Counselling) : Vacant

Asst. Professor (Phy. Edn.) : EU Rajan

Section Officer : PM Balakrishnan

Assistants : VS Skandakumar (Upto 17.5.'93)
 D Sreekumari (from 2.6.'93)
 PV Sreedharan
 IK Venugopalan

Typist : Sathidevi upto 15.11.'93
 KM Mary from 7.10.'93 working as Steno Typist)

Peon : C Govindan
 Saji Antony

NIS (SNIPES) Field Station Coaching
Hockey : S Prabhavathy

Appendix IV

LIST OF STAFF AT VARIOUS CAMPUSES

College of Agriculture, Vellayani

- Dean : Dr C Sreedharan
Professor (Research : Dr KM Rajan
Co-ordination)
- Department of Agronomy**
Professor and Head : P Chandrasekharan
Professor : MR Chidananda Pillai
Dr V Muraleedharan Nair
Associate Professor : Dr VL Geethakumari
„ Kuruvilla Varghese
„ R Pushpakumari
„ PH Latif
„ M Achuthan Nair
Assistant Professor : Dr K Viswambharan
- Department of Agrl. Botany**
Professor : Dr R Gopimony
„ ST Mercy
Associate Professor : Dr N Kamalam
„ D Chandramony
„ S Radha Devi
- Department of Plant Breeding and Genetics**
Professor : Dr PD Vijayagopal
„ P Manikantan Nair
Assistant Professor : Dr D Wilson
„ KM Abdul Khader
„ C Lekha Rani
- Department of Plant Physiology**
Professor : Dr S Seshadrinath
- Department of Soil Science and Agrl Chemistry**
Professor and Head : Dr P Padmaja
Professor : Dr Thomas Varghese
„ Abdul Hameed

Associate Professor	:	Dr S Pushkala
		„ K Babukutty
Professor	:	Dr Alice Abraham
Assistant Professor	:	Dr P Rajendran
Professor	:	Dr PA Korah
Assistant Professor	:	Dr P Ushakumari
		„ P Prabhakumari
		„ Usha Mathew
Associate Professor	:	Dr VK Venugopalan

Department of Plant Pathology

Professor and Head	:	Dr M Chandrasekharan Nair
Professor	:	Dr CK Peethambaran
		„ Susamma Philip
		„ P Karunakaran
		„ Sasikumar Nair
Associate Professor	:	Dr B Rajagopalan
Associate Professor (NC)	:	Dr P Sivaprasad
		„ P Santhakumari
		„ M Vijayan
		„ A Naseema
Associate Professor	:	Dr S Bhavani Devi
Assistant Professor	:	Dr Lulu Das
Professor	:	Dr KJ Alice

Department of Agricultural Entomology

Professor and Head	:	Dr K John Kurian
Professor	:	Dr G Madhavan Nair
		„ K Sasidharan Pillai
		„ George Koshy
		„ KK Ravindran Nair
Associate Professor	:	Dr K Susamma Mathai
Professor	:	Dr A Visalakshy
		„ KS Remamony
Associate Professor	:	Dr K Santhakumari
		„ K Saradamma
		„ PA Rajan Asari
Assistant Professor	:	Dr D Devanesan

Department of Agrl. Extension

Professor and Head	:	Dr G Thiagarajan Nair
Professor	:	Dr B Babu
Associate Professor (NC)	:	Dr S Bhaskaran
Associate Professor	:	Dr M Mohammed Hussain
		„ VB Padmanabhan
		„ S Shylaja
		„ Mothilal Nehru

Assistant Professor : Dr N Kishore Kumar

Department of Horticulture

Associate Professor : Dr BK Jayachandran
 „ CS Jayachandran Nair

: „ BR Reghunath
 K Rajmohan

Assistant Professor : Sabeena George Thekkayam
 VL Sheela
 I Sreelathakumari

Department of Plantation Crops

Professor & Head : Dr G Sreekantan Nair

Department of Home Science

Professor and Head : Dr L Prema

Associate Professor : NK Vimalakumari
 P Mary Ukkuru

Assistant Professor : C Nirmala
 Sofii Cherian

: P Geetha
 Subaida Beevi
 B Prasannakumari
 S Chellammal
 S Rajani
 Rari John

Department of Agricultural Statistics

Assistant Professor : Brijit Joseph

Department of Animal Husbandry

Professor : Dr Skariah Oommen

Associate Professor : Dr MR Rajan

Department of Agricultural Economics

Professor : S Venugopal
 ER Narayanan Nair

Assistant Professor : K Ravi Raman
 Elsamma Job

Department of Agricultural Engineering

Professor and Head : Dr AN Rema Devi

Associate Professor : MS Thomas

Department of Physical Education

Associate Professor : AC Marykutty

Assistant Professor : S Pazhanian Pillai

Instructional Farm

Professor and Head	:	Dr M Oommen
Associate Professor	:	Dr S Mothilal Nehru Dr R Prakash C Nandakumar CA Mary
Assistant Professor	:	PB Usha Dr Babu George Babu Mathew

Technical, administrative and supporting staff

Administrative Officer	:	L Wilson
Section Officer	:	Ravikumar PR Sasidharan Pillai P Jameela S Saraswathy Amma VM Lalithakumari Amma R Vasumathy J Remadevi Amma CP Padmakumari V Chandrika
Senior Office Supdt.	:	A William S Valsala JA Emi Ammal

Instructional Farm, Vellayani

Administrative Officer	:	Kochukunju
Section Officer	:	MN Sreedevi JR Fathima Malar
Librarian	:	B Leela
Asst. Librarian	:	P Sanjeev KR Sarala R Manohar
Technical Assistant	:	K Muraleedharan Nair S Saraswathy
Chemist	:	A Sushama S Vasundhara Bai
Farm Supervisor (Vety)	:	R Ramachandran Nair
Farm Supervisor Grade I	:	K Gopinathan Nair R Nelson K Radhamma Thankachi S Kamala Bai B. Indira Bai Amma J Vimala Bai S Sarojini

Department of Agrometeorology

Professor & Head	: Dr P Balakrishna Pillai
Asst. Professor	: Dr AVRK Rao One post vacant
Farm Supervisor	: VM Mathew
Lab Assistant Gr. II	: PK Velayudhan

Department of Agricultural Botany/Plant Breeding & Genetics

Professor & Head	: Dr KMN Namboodiri
Asst. Professor	: Dr Achamma Oommen Assoc. Professor (NC) Dr K Pushkaran Assoc. Professor (NC) Dr SG Sreekumar Assoc. Professor Dr KT Presannakumari from 1-10-93 T Girija K Arya upto 30-6-93
Lab Asst. Gr. III	: P Narendran

Department of Agricultural Economics

Professor & Head	: Dr V Radhakrishnan
Assoc. Professor	: Dr K Mukundan Professor
Asst. Professor	: Dr EK Thomas Assoc. Professor (NC) K Satheesh Babu Asst. Professor from 18-2-94 3 posts vacant *Includes 2 posts created for the faculty of Basic Science & Humanities)
Senior Typist (Faculty of Basic Science and Humanities)	: S Geetha Bai

Agricultural Entomology

Professor	: Dr Baby P Skariah Assoc. Professor (NC) Posted against Professor's post
Professor of Nematology	: Dr TS Venkitesan
Assoc. Professor	: Dr Jim Thomas Assoc. Professor (NC)

Asst. Professor : Dr D Seetha Rama Rao
 Assoc. Professor (NC)
 Dr Sosamma Jacob
 Assoc. Professor (NC)
 Dr AM Ranjith
 Assoc. Professor (NC)
 R Ushakumary
 Includes one post of JAP

Lab Asst. Gr. III : TU Parameswaran

AICRP on BCCP

Assoc. Professor (Ent.) : Dr PJ Joy Professor
 Asst. Professor : NV Satheesan
 KR Lyla upto 31-1-94
 Technical Assistant : KV Dinesan
 Farm Assistant : TR Radhakrishnan
 PC Girijavallabhan upto 3-9-93
 MT Varghese from 8-10-93

Department of Agricultural Engineering

Professor : TP George
 On working arrangement at
 KCAET, Tavanur as Dean i/c.
 upto 28-9-93 Vacant thereafter
 Asst. Professor : MR Sankara Narayanan
 One post vacant
 Asst. Professor : 2 posts vacant
 Technician : KV Johny
 P Balakrishnan

Department of Agricultural Extension

Assoc. Professor and Head : Dr C Bhaskaran
 Associate Professor (NC)
 Asst. Professor : Dr Ranjan S Karippai
 Assoc. Professor (NC)
 Dr PS Geethakutty Asst. Professor
 Dr N P Kumari Sushama
 Asst. Professor

Home Science unit

Assistant Professor : Dr V Indira
 Assoc. Professor (NC)
 Dr V Usha
 Assoc. Professor (NC)
 Norma Xavier Asst. Professor
 One post vacant

Department of Agricultural Statistics

Professor & Head	:	Prof. PV Prabhakaran
Assoc. Professor	:	VKG Unnithan
Asst. Professor	:	Graceamma Kurien
		KA Mercy
		S Krishnan
		KL Sunny
		Assoc. Professor (NC)
		TK Girija
		3 posts vacant
Junior Programmer	:	Vacant
Technical Assistant	:	Joicy T John

Department of Olericulture

Professor & Head	:	Dr S Rajan
		Assoc Professor (NC)
		holding charge
Associate Professor	:	Dr KV Suresh Babu
		Asst Professor
Assistant Professor	:	P Indira
		Baby Lissy Markose
		KP Prasanna
		K Krishnakumari
		Dr TE George, Assoc. Prof. (NC)

Vegetable Seed Production complex

Assistant Professor	:	P Meagle Joseph
		Vacant
Farm Supervisor	:	KV Eliamma
Farm Assistant	:	PK Kalyani Farm Supervisor
		L Radhammal Farm Supervisor
		Vacant
Lab Assistant	:	AP Augusthy
Typist	:	PS Shylaja

AICVIP

Assistant Professor (Hort)	:	Dr M Abdul Wahab
		Assoc. Professor (NC)
		Dr S Nirmala Devi
Asst. Prof. (Pl. Path)	:	Dr Sally K Mathew
		Assoc. Professor (NC)
Farm Assistants Gr. I	:	K Vijayanarayanan
		Sr. Gr. Farm Assistant
		Padma Narayana Pillai

Department of Plantation crops & Spices

Professor & Head	:	Dr EV Nybe Assoc. Professor (NC) holding charge
Asst. Professor	:	Dr S Prasannakumari Amma Assoc. Professor (NC) Dr Alice Kurien Assoc. Professor (NC) PA Valsala Assoc. Professor (NC) Dr T Radha Assoc. Professor (NC) on working arrangement in the Campus Development Unit upto Feb 1994. Post shifted to KHDP thereafter Dr VS Sujatha Assistant Professor MR Shylaja Assistant Professor Lissamma Joseph Asst. Professor
Farm Assistant	:	T Raveendran
Lab Assistant	:	KK Chandran PK Savithry

Manpower Development scheme of the coffee board

Assistant Professor : Dr R Keshavachandran

PG Diploma in natural rubber production (NRP)

Assistant Professor ; Dr PA Nazeem
Assoc. Professor (NC)

Farm Assistant : KS Thankappan upto 21-9-93
George T Puravath
From 22-9-1993

Pepper unit

Farm Assistant : Vacant

Cadbury KAU Cocoa Research Project (CCRP)

Professor and Head : Dr R Vikraman Nair

Assoc. Professor : Dr VK Mallika
(Pl. Breeding)

Assoc. Professor : Dr Koshy Abraham
(Pl. Path.)
Assoc. Professor (NC)

Farm Asst. Sr. Gr. : PK Haridas

Farm Asst. Grade I : KV Natarajan

Office Assistant : PV Mohanan
S. Sreelal
LDV Driver : KM Davy

AICRP on Medicinal and Aromatic Plants

Assoc. Professor : Dr TV Viswanathan
Asst. Professor (Ag. Bot.) : Dr KT Prasannakumary
Upto 30-9-93
Dr EK Lalitha Bai
From 1-10-93
Asst. Professor (Biochem.) : A Augustine
Tech. Assistant : VJ Paul
(Farm Asst. Gr. I) CA Mathew
Lab Assistant : KV Padmavathy
Beldar : TE Abdul Muthaleef
CC Babu
Sujatha

Department of Pomology and Floriculture

Professor and Head : Dr PK Rajeevan
Assoc. Professor (N C)
holding charge
Assistant Professor : Dr PK Valsalakumari
Assoc. Professor (NC)
Dr Lila Mathew
Assoc. Professor (NC)
Dr NK Parameswaran
Assoc. Professor (NC)
Dr Sarah T George
,, CK Geetha
,, Sajan Kurien
from 23-6-93
PG Sadhankumar
from 2-9-93
Dr R Keshavachandran,
upto 2-9-93
Farm Supervisor : V Kunju upto 2-8-93
VCM Das from 16-9-93
Farm Assistant : CB Sugathan
Farm Supervisor
Lab Assistant : Vacant

AICFIP

Assoc. Professor : Dr PK Rajeevan
Asst. Professor : A Sobhana
Mali : CA Muthu
CP Elsy

Department of Processing Technology

Professor and Head : VK Raju
Assoc. Professor ((NC)
holding charge
Assistant Professor (Hort) : VK Raju Assoc. Professor (NC)
KB Sheela
MC Narayanankutty
Processing Tech. Asst. : Mr KL Karthikeyan Pillai
on deputation from the
Department of Agriculture
Lab Assistant : KG Krishnan

Department of Plant pathology

Professor and Head of the : CK Ramakrishnan
Associate Professor : Dr James Mathew Professor
„ S Balakrishnan Professor
„ A Sukumara Varma
Assistant Professor : Dr MV Rajendran Pillai
(Microbiology) Associate Professor (NC)
Assistant Professor : Anita Cherian
S Beena
TN Vilasini
Associate Professor (NC)
Vacant
Farm Supervisor Gr II : NJ Eliamma
Lab Assistant Gr.III : V Nandakumar
„ Gr. II : KM George

Department of Soil Science and Agricultural Chemistry

Professor and Head : Dr AI Jose
Associate Professor : K Leela Professor
: Dr NP Chinnamma Professor
Vacant
Associate Professor : Dr KC Marykutty
(Soil physics) Associate Professor (NC)
Assistant Professor : Dr KA Mariam
Associate Professor (NC)
Dr PK Sushama
Associate Professor (NC)

Asst. Grade I : KV Jayasankar
 MA Sujatha
 MV Lathika
 KM George
 A Shajikumar
 PV Amminikutty
 P Annamma Scaria

Asst. Gr. II : A Reghu
 EA Yousafali
 TK Jayaraj
 MA Chandran
 S Hema
 B Venugopalan

College Library

Asst. Librarian : MC Lalitha
 Reference Asst. : Abdul Razak
 Asst. Grade II : CV Flora

College of Co-operation and Banking, Mannuthy

Professor & Associate : M Mohandas
 Dean i/c

Professor : Dr N Rajan Nair
 Associate Professor : N Ravindranathan
 Professor : Dr PC Mathew
 Assistant Professor : Dr KA Suresh
 KS Sujatha
 Dr KP Mani
 Dr A Sukumaran
 Philip Sabu
 M Mohanan
 EVK Padmini
 P Shaheena
 Philip Thomas
 Molly Joseph
 Jaya S Anand
 KM George
 AM Jose
 E Vinaikumar

Administrative & Supporting staff

Administrative Officer Gr. II : S Krishnan Nair
 Section; Officer : KR Dileepkumar
 Shirly Bai George

Sr. Office Superintendent : VT Kurian
 Reference Assistant : CK Shylaja

Senior Grade Assistant	:	T Vijayalakshmi KN Lalithamma
Assistant Gr. I	:	TB Latha KN Sarojini
Gr II (H.G)	:	Mabel Philip
Office Superintendent	:	K Leela
Selection Grade Typist	:	VC Mariamma
Senior Grade Typist	:	GK Sukumari
Peon	:	PB Abdul Rahiman TK Ismail
Duplicator Operator	:	PA Francis
Driver	:	V Gopalakrishnan

College of Forestry, Vellanikkara

Special Officer	:	Dr CC Abraham upto 15.8.93 Nagesh Prabhu 16.8.93 to 20.4.94
Associate Professor	:	Dr Luckins C Babu Dr NK Vijayakumar
Assoc. Professor (NC)	:	Dr B Mohankumar Dr K Sudhakara Dr K Gopikumar Dr PK Ashokan
Asst. Professor	:	K Vidyasagaran Sonney George T Premkumar

Administrative and Supporting staff

Administrative Officer	:	V Venugopalan
Section Officer	:	Merly Sarojini
Senior Office Supdt	:	KG Balakrishnan
Grade I Assistant	:	N Radhakrishnan
Typist Gr. II	:	K Gopikuttan Nair

College of Veterinary and Animal Sciences, Mannuthy

Dean	:	Dr A Rajan
Department of Anatomy		
Professor & Head	:	Dr PA Ummer (till 25.6.93) Dr Lucy Paily (26.6.93 to 31.3.94)
Assoc Professor	:	Dr KR Harshan (NC) Dr Jose John Chungath (NC) Dr CKS Unni (NC)
Asst. Prof.	:	Dr N Asok Dr Shyla Prakash
Farm Supervisor Gr. I	:	M Narayanankutty
Permanant Labourer	:	KP Achuthan RV Velayudhan KR Wilson From 15.1.94

Dept. of Animal Reproduction

Professor & Head	:	Dr CP Neelakanta Iyer
Professor	:	Dr K Prabhakaran Nair Dr V Sudarsanan Dr E Madhavan Dr E Mathai
Assoc. Prof.	:	Dr T Sreekumar (NC) on study leave
		Dr KN Aravinda Ghosh
Asst Professor	:	Dr SP Suresh Nair Dr Metilda Joseph
Farm Supervisor Gr. I	:	Sri VM Jacob PS Kumaran
Farm Asst	:	MK Rajandran Nair V Gopalakrishnan
Driver	:	TG Mohanan
Lab Assistant	:	M Divakaran Gr. I KK Gopalan AA Krishnan

Centre of Excellence in Genetics and Breeding

Professor & Head (Director)	:	Dr G Mukundan
Professor	:	Dr Sosamma Iype ,, Rajagopala Raja (on leave) Geneticist
Assoc. Professor	:	Dr KV Raghunandan (NC) ,, B Nandakumar (NC)
Asst. Professor	:	Dr P Nandakumar ,, CR Girija ,, AP Usha (on study leave) ,, TV Aravindakshan
Farm Supervisor	:	PK Vijayamani
Technician (Fur and Meat Technology)	:	C Ramadasan
Farm Assistants (ICAR Progeny Testing scheme)	:	NM Surendran S Rajeev CP Mariamma KK Kuttan M Sukumaran
Sweeper-cum-Attendant	:	K Narayanan ,, KP Balakrishnan
Sr. Research Fellow (ICAR Adhoc Scheme on Blood groups)	:	AV Vijayalakshmi

Dept. of Animal Management

Professor & Head	:	Dr TG Rajagopalan
Professor	:	Dr CK Thomas
		„ Kurian Thomas
		(Pig Breeding Farm)
Assoc. Professor	:	Dr Francis Xavier (on deputation)
		„ KS Sebastian
		(Pig Breeding Farm)
Jr. Asst. Professor	:	Dr K Leena from 10-7-92
Farm Supervisor Gr. II	:	M Lalithamma
Class IV	:	K Saroja

Dept. of Animal Production Economics

Professor	:	Dr T Prabhakaran
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Dept. of Clinical Medicine

Professor & Head	:	Dr KM Alikutty
Professor	:	Dr NM Aleyas
		„ VS Balakrishnan
Assoc. Professor	:	Dr PC Alex
Asst Prof.	:	Dr (Mrs.) Usha Narayana Pillai
		„ KM Jayakumar
		„ PG Baby—on deputation
Farm Asst	:	P Ramany
Class IV	:	PA Mini

Dept. of Dairy Science

Professor & Head	:	Dr K Pavithran
Professor	:	Dr MV Sukumaran
		„ UT Francis
Assoc. Professor	:	R Rajendrakumar
		Dr V Prasad (NC)
		„ PI Geevarghese
		„ M Mukundan (NC)
Asst. Professor	:	Dr Sreeja Ramachandran
Farm Assistant	:	KT Sivasankaran
Technician	:	Chellappan
Attendant	:	PV Prabhakaran

Dept. of Extension

Professor & Head	:	Dr PS Pushkaran
Assoc. Prof.	:	Dr V Raju (NC)
		„ MR Subhadra (NC)
Asst. Professor	:	Dr S Ramkumar (on study leave)
		„ S Anil

Farm Asst. : PA Francis
Class IV : PK Rosy

Dept. of Microbiology

Professor & Head : Dr S Sulochana
Professor : Dr KT Punnoose (upgraded)
 : „ PC James („)
Assoc. Prof. : Dr V Jayaprakasan (NC)
 : „ R Madhusoodanan Pillai (NC)
 : „ G Krishnan Nair (NC)
Asst. Prof. : Dr D Sudharma (on leave)
 : „ M Mini (on leave)
 : „ ES Mathew („)
Farm Asst. (Vety) : OK Sukumaran
Class IV : VM Baby from 12.12.92

Dept. of Animal Nutrition

Professor & Head : Dr CT Thomas
Professor : Dr N Kunjikutty
 : „ CG James
 : „ Maggie D Menachery
 : „ PA Devassia
Assoc. Prof. : Dr TV Viswanathan (NC) on leave
 : M Nandakumaran (Chemist)
 : Dr AD Mercy (NC)
Asst. Prof. : Dr P Gangadevi from 4.1.93
 : „ A Sreekumar upto 3.8.93
 : „ Annamma Kurian
Research Assts. : Annamma Chacko
 : Mariamma Kurian
Farm Supervisor : MG Vasu
Class IV : KK Ramachandran

Small Animal Breeding Station

Research Asst. : Vacant
Farm Supervisor : KG Kamalamma from 4.8.91
Farm Asst. : Ammini
Class IV : Vacant

ICAR Adhoc Project on Subabool

Jr Asst. Professor : Vacant
Farm Assistant : CN Soman
Class IV : KK Gopalan

Adhoc Project on Nutrient Requirement of Broiler Rabbits

Research Associate : A Indiradevi
Research Fellow : Asha Mathew upto 24-3-92

AICRP on Agricultural by products

Scientist : Dr P Ramachandran upto 4-11-92
Asst. Scientist : Dr George Mathen (Assoc. Prof.)
upto 1-12-92

Lab. Technician : Kumaran
Livestock Asst (Vety) : K Chacko
KR Sasidharan
K Radhakrishnan
Technician : KP Sudarsanakumaran
Lab Attendant : MV Rosily
Assistant Gr. II : TD Annie upto 4-7-91
TA Sadanandan as on 5-7-91

Department of Pharmacology and Toxicology

Professor and Head : Dr MK Rajagopalan
Professor : Dr Zacharias Cherian
(on other duty)
.. Jacob V Cheeran
.. P Marykutty
Assoc. Professors : Dr N Gopakumar
.. AM Chandrasekharan Nair
(NC) (on leave)
VR Reghunandan (Chemist)
Dr CM Aravindakshan (NC)
.. AO Joy from 28-1-94
.. K Venugopalan
(on other duty)
Asst. Professor : Dr PTA Usha
Farm Assistant Gr. II : AN Sreedharan
Attendant : V Vasunny
Somasundaram

Department of Pathology

Director : Dr A Rajan
Professor and Head : Dr KM Ramachandran
Associate Professor : Dr KV Valsala
.. T Sreekumaran
.. CB Manomohan (NC)
.. PK Ismail
ICAR Mycotoxicosis)

AICRP on Poultry Housing and Management

Associate Professor	:	Dr K Narayanankutty	till 29-4-92
		„ OJ George	30-4-92—31-3-93
Asst. Professor	:	Dr PA Peethambaran	
Farm Assistant	:	P Valsalakumari	
		A Sarojam	24-5-92 to 31-3-93

University Poultry Farm

Associate Professor	:	Dr G Raghunathan Nair	
Jr. Asst. Professor	:	Dr A Anitha	
Farm Supervisor	:	VK Ratha	
		MV Chandran	
		N Sugathan	
		KV Rocily	
		KA Chackochan	

Administrative and Supporting staff

Administrative Assistant	:	AD Omana	
Assistant	:	E Hymavathy	
		TK Thankamma	
Peon	:	TK Saleena	
Watchman	:	Parukutty	
Poultry Attendant	:	KK Gopi	
		KN Somasekharan	
		MB Chandran	

AICRP on Poultry for Eggs

Professor	:	Dr AKK Unni	
Asst. Professor	:	Dr Lalithakunjamma	

Administrative and Supporting staff

Section Officer	:	N Sudhadevi	
Assistant Gr. I	:	PV Ambika	
Typist Gr. I	:	VG Girija	
Peon	:	PT Varghese	
Poultry Attendant	:	C O Mercy	
Asst. Prof.	:	Dr Leo Joseph	
Jr. Asst. Prof.	:	Dr Sreekumar	
		C Lalyl John	
Sr. Gr. Tech.	:	ET Paul	
Fram Asst.	:	V Indira	
		PP Sarada	
		N Gopinathan	
Driver	:	PS Kabir	

AICRP on Poultry Nutrition

Assoc. Prof. : Dr A Jalaludeen
Farm Asst. : MG Vasu

Dept. of Physiology

Prof and Head : Dr MG Ramakrishna Pillai
Professor : KP Surendranathan
Assoc. Professor : Vacant
Asst. Professor : Dr PT Philomina (Assoc. Prof. NC)
 : „ KP Sreekumar (on leave)
 : „ Sisilamma George („)
 : „ Girish Varma From 11-2-94
Research Associate : Dr Salim (till 19-2-94)
 P Sushela
Farm Supervisor : MC Annie
Class IV : AG Rajendran
 PK Subran

Department of Parasitology

Prof. & Head : Dr K Rajamohan
Prof. : Dr K Chandrasekharan
 : „ V Sathyanesan
 : „ C George Varghese
 : „ K Madhavan Pillai
 : „ C Pythal
Assoc. Professor : Dr H Subramonian (NC)
 on study leave
Asst. Professor : Dr Lucy Jacob
 : „ R Devada (working arrange-
 ment in Medicine) on study leave.
Farm Supervisor : TK Abdulrahiman
Class IV : AI Thomas

Dept. of Preventive Medicine

Prof. & Head : Dr K Baby
Prof. : Dr PT Georgekutty
Assoc. Professor : Vacant
Asst. Professor : Dr K Venugopalan (Assoc. Prof.
 NC) on leave
 : „ MR Saseendranath
 (Assoc. Prof. NC) on deputation
 K Vijaykumar
Farm Asst. Gr. I : VK Gracy
Class IV : OG Santha
 AI Thomas

Department of Surgery

Prof. & Head	:	Dr PO George
Professors	:	Dr KN Muraleedharan Nair ,, AM Jalaluddin ,, C Abraham Varkey ,, S Raveendran Nair 1 vacant
Assoc. Professor	:	Dr T Saradamma (NC) ,, K Rajankutty (NC)
Asst. Professor	:	Dr TR Balagopalan ,, N Padmakumar (on leave) ,, CB Devanand
Livestock Asst.	:	Vacant
Radiographer Class IV	:	K Indiradevi (on leave) Thirumali 1 vacant

Department of Veterinary Public Health

Prof. & Head	:	Dr R Padmanabha Iyer
Prof.	:	Dr M Soman ,, P Prabhakaran ,, E Nanu
Assoc. Prof.	:	Dr P Kuttynarayanan (NC) (on other duty) ,, MT Jose (NC) on leave from 18-9-91
Asst. Prof.	:	Dr George T Oommen on other duty ,, V Kumarasubramoniam on leave
Farm Supervisor Class IV	:	A Leela K Karappan

Department of Statistics

Prof. & Head	:	Dr KC George
Assoc. Professor	:	Vacant
Asst. Professor	:	M Jacob Thomas TK Indirabai Mathew Sebastian
Tech. Asst.	:	KV Prasadani
Jr. Programmer	:	Santha Bai
Sweeper-cum-Attendant	:	TP Rosily
Computer Operator	:	Vacant

Vety. Hospital, Mannuthy

Professor	:	Dr NM Aleyas
Assoc. Prof.	:	Dr Santha E. George
Farm Asst.	:	CC Narayanan

Administrative & Supporting staff

Administrative Officer	:	KP Koyamu
Section Officer	:	VR Vijayamma PK Manikutty Lillykutty Thomas P Aliyar KM Mary VM Sarada
Senior Office Supdt.	:	MK Jainuva KK Damondaran PV Brizitha
Senior Gr. Asst.	:	Sophiamma Joseph M Girija KG Somanath P Vijayalakshmi KS Vijayalakshmi MS Sanalkumar N Usha Rani
Asst. Gr. I	:	PA George IC Sheela KV Alamelu
Asst. Gr. II	:	VN Sreekumar AS George R Usha TM Asokan C Raveendranathan A Thankom MN Joy
Office Supdt.	:	P Reetha Joseph VM Sulaiman S Akhileswary
Sr. Gr. Typist	:	ML Sosamma
Gr. I Typist	:	V Mohandas Manjula Mercy Patrics NA Raju S Sarojini Amma
Clerical Asst.	:	KK Balakrishnan KK Velayudhan KP Reetha CK Karappan M Santhakumari IK Gopalan
Lab. Asst.	:	AA Krishnan
Librarian i/c.	:	KS Ambili

Technical Assistant	:	KV Prasadán
Res. Assistant	:	Mariamamma Kurian
Duplicator Operator	:	AV Poulóse PA Madhavan
Audio Visual Aid Operator	:	MR Gopinathan
Jr. Programmer	:	PP Santha Bai
Farm Supervisor Gr. I	:	PC Lilly PC Mary Narayanankutty CC Narayanan KG Kamalamma AN Sreedharan VM Jacob
Research Assistant	:	MC Annie C Ramadasan
Farm Supervisor Gr. II	:	A Leela PS Kumaran P Remany M Lalithamma MG Vasu
Farm Supervisor Sr. Gr.	:	PA Francis OK Sukumaran A Sarojam
Farm Asst. Sr. Gr.	:	C Ramachandran KT Sivasankaran MK Rajendran Nair V Gopalakrishnan AP Peter MM Ramani VK Gracy PK Ammini
Driver LDV	:	Balakrishnan M Sooryanarayanan KV Kumaran TG Mohanan
Driver HDV	:	K Radhakrishnan CT Louis KV Kochappan
Bus Attendant	:	VV Vasu
Artist	:	KR Kumaran
Hostel Manager	:	KN Raveendran MM Babu
Matron	:	KK Chandran
Syce	:	VL Devassy

Technician Gr. I	:	KP Sudarsana Kumar
Regular Marker	:	KP Manikantan
Class IV	:	V Radhakrishnan
		ML Antony
		MK Muraleedharan
		TK Mariam
		KK Madhavi
		VM Baby
		OG Santha
		PK Rosy
		KV Thressia
		AK Janaki
		K Saroja
		TP Rosily
		PA Mini
		VK Narayanan
		D Jolly
		P Radhakrishnan Nair
		VR Unni
		M Parvathy
		KP Balakrishnan
		PN Raghavan
		AI Thomas
		TA Kunjan
		PK Karappan
		KO Rosakutty
		MK Janaki
		PJ Mani
		PO Ouseph
		A Rajendran
		PK Subran
		VS Somasundaran
		KK Gopalan
		P Thirumalai
		M Somasekharan
		KK Ramachandran
		MJ Rosily
		PV Sreedharan
Attendant	:	M Narabahadur
Peon	:	KA Mathiri
		KN Saraswathy
		I Govindankutty
		V Narayanan
		M Divakaran
		KV Sukumaran

K. C. A. E. T., Tavanur

Dean i/c : Prof. K John Thomas

Department of LWRCE

Associate Professor : Dr Jobi V Paul

Assistant Professor : Xavier K Jacob
,, Noble Abraham

Department of IDE

Professor and Head : Dr K John Thomas

Assistant Professor : Alexander Seth
Dr MS Hajilal
EK Kurian

Department of FPME

Associate Professor : Jippu Jacob

Assistant Professor : Hamza Mollakadavath
VR Ramachandran

Department of PHT

Assistant Professor : Santhi Mary Mathew

Department of SAC

Professor and Head : Dr KI Koshy

Assistant Professor : Dr E Komala Amma
VP Lakshmi Kutty
M Velayudhankutty

Instructional Farm

Assistant Professor : P Rajendran
Dr PV Habeeburrahman

ICAR Scheme on FIM

Assistant Professor : Dr M Sivaswami

Administrative and Supporting

Administrative Officer : AK Sreenarayanan

Section Officer : C Arumughan
P Unnikrishnan
KU Prabhavathy
MP Balan

Senior Gr. Office Supdt. : KP Abdurahiman

Senior Gr. Assistant : P Janardhanan
KV Purushothaman Nambiathiri
KJ Kuruvilla
S Ushadevi

Assistant Gr. I : C Gopi
A Radhakrishnan

Assistant Gr. II	:	P Sivaprasad Radha Gopan Treesamma Titus
Typist Grade I	:	R Balasubramanian TG Jalaja
Typist Grade II	:	T Kamalam
Assistant Agricultural Engineer	:	D Sathyananden
Research Assistant	:	AP Gopalakrishnan
Reference Assistant	:	KP Sathian
Draftsman (Civil)	:	KH Abdurahiman
Technical Supervisor		
	(Carpentary) :	AK Padmanabhan
" "	(Smithy) :	VP Kannan
" "	(Fittings) :	CS Krishnan C Velayudhan TP Aboobacker
Trade Assistant (Plumbing)	:	MK Balakrishnan
Pump Operator	:	E Parameswaran Nair
Driver (HDV)	:	VN Sankarankutty
" (LDV) Gr. I	:	NV Krishnan
Bus Attendant	:	CR Velayudhan
Steward	:	M Radhakrishnan
Lab Assistant Gr. I	:	P Krishnankutty Nair
" Gr. III	:	KK Subramanian K Abdurahiman
Peon (Hr. Gr.)	:	P Kunhikutta Menon C Ponna P Krishnan P Amina AP Ayyappan C Narayanan KP Ayyappan KV Moideenkutty CP Damodaran K Kuttykrishnan K Aramukurupathiar
Peon	:	K Ravunni K Kunhan K Kunhumon A Burhanuddin

Instructional Farm

Farm Supervisor (Agri) Gr. I : RV Balamani
P Bhaskaran
" " Gr. II : MV Raveendran
K Sethumadhavan
Farm Supervisor (Vety) Gr. I : P Balakrishnan
" Asst. Gr. I : T Venu
Gardener (Hr. Gr.) : KMammikutty

D.A.Sc.

Lab Assistant Gr. III : PV Kumaran

AICRP on FIM (ICAR)

Technician : K Aravindan
N Narayanan
KT Ramachandran
Workshopmate : TN Balan
Assistant Gr. II : M Muraleedharan

N.A.R.P

Technician : TR Viswambharan

College of Fisheries, Panangad

Teaching staff

Dean i/c. : Dr MJ Sebastian
Professor : Dr D Manikantan Thampi
Dr PM Mathew
Associate Professor : Dr Jayasree Vadhyar
Dr Susheela Jose
Dr K Kerala Varma
Dr D. Damodaran Nambudiri
TM Sankaran
P Radhakrishnan Nair
Dr CJ Cherian
Assoc. Professor (NC) : PS Mrithunjayan
Lizy Behanan
Assoc. Professor : Susy V John
Dr MC George
Asst. Professor : Dr Thresiamma James
Dr C Thankappan Pillai
Dr C Mohanakumaran Nair
Aneykutty Joseph
Dr J Rajasekharan Nair
Dr KV Jayachandran
Dr TM Jose
Dr TV Anna Mercy
Dr KG Sunny

NN Raman
MS Raju
V Mallika
Alphi Korath
KM Mathew
Dr Sajan George
S Krishnakumar
Dr PM Sherief

Non-teaching staff

Administrative Officer Gr. I : R Rajendran Unnithan
Section Officer (Hr. Gr.) : A Kuriakose
Section Officer : PU Kesavan
C Suchetha
Sr. Office Supdt. : MI Balamani
KT Thanka
Ref. Assistant : TA Joseph
Jr. Programme Officer : Tessy K Thomas
Sr. Gr. Asst. : K Vinaya Bai
PG Sreekantha Pai
KR Santha
Gr. I Assistant : KA Pius
Gr. II Assistant : C Praleema Peter
TM Maheswaran
KK Sreedevi
Sandhya Rabindranath
VA Suprabha
Sr. Gr. Typist : Salomi Silas
Office Supdt. : KH Khadeeja Beevi
Gr. II Typist : TC Ajitha
CV Dinesan
Lab Asst. Gr. I : P Madhavankutty
Lab Asst. Gr. II : VR Lates
Lab Asst. Gr. III : PP Pushpakaran
Class IV : John Mendez
KM Khadeeja
R Gopal Singh
KN Sasikumar
TK Abdul Majeed
E Leelamony
PB Nabeesa
HDV Driver : P Moideen
LDV Driver : MJ Joseph
AS Sukumara Marar
AM Abdulkhadir

Bus Attendant	: PM Varghese
Duplicator Operator	: K Rajendra Babu Pillai
Technician	: KP Sreedharan Nair
Fieldman Hr. Gr.	: N Chakrapani VK Balakrishnan
Fisherman	: PJ Kunjappan
Pump Operator	: M Gopalan
Sr. Farm Asst.	: MC Sachidanandan
Steward	: M Mohammed Mosadiq

Regional Agricultural Research Station, Vellayani

NARP (Phase I)

Associate Director	: Dr N Mohanakumaran
Associate Professor	
Soil Science	: Dr PR Ramasubramonian (Professor)
Plant Breed	: N Ramachandran Nair
Statistics	: Dr P Saraswathy (H. Gr.)
Assistant Professor	
Soil Science	: Dr M Subramonia Iyer (Associate Professor)
Plant Breed	: Dr P Manju (Associate Professor)
Statistics	: R Balakrishnan Asan (Associate Professor)
Extension	: Dr R Prakash (Associate Professor)
Horticulture	: Dr K Rajmohan (Associate Professor) upto 17.5.93 ,, L Rajamony (Associate Professor) from 14.6.93
Entomology	: Dr T Nalinakumari (Associate Professor) upto 31.7.93 D Dale (Professor) from 1.8.93
Farm Assistant	: K Padmakshy (Farm Supervisor (Gr.I) D Sulochanan (Farm supervisor) (Gr.II) Jones Charles Farm Assistant (Gr.I)
Lab. Assistant (Gr.II)	: S Indirakumari
Driver (Gr.II)	: K Vikraman Nair (H. Gr.) PS Vijayakumaran Nair
Administrative Officer	: B Lalitha Bai

Section Officer	: B Rugmini Amma (H. Gr.) G Joice
Sr. Office Supdt.	: N Somarajan (Spl. Gr.) upto 15.11.93 K Sathyavathi Bai 16.11.93 to 29.11.93 CB Merlin from 30.11.93
Typist (Gr.I) steno	: P Radha (Office Supdt.)
Assistant (Gr. I)	: S Vallinayakom Pillai (S.Gr.)
Assistant (Gr. II)	: B Sulekha (Gr. I) : EM Savithri upto 12-5-93 C Prabhakaran from 28-5-93 N Hrishikesan Nair from 6-5-93 (Post shifted from Col. of Agri.) P Sreekumar upto 5-6-93
Typist (Gr. I)	: S Raghavan (Spl. Gr.) upto 27-5-93 P Ushakumari (Gr. II) from 27-5-93 Gopikuttan Nair upto 27-5-93 B Lalithakumari (Gr. II) from 27-5-93
Duplicator Operator	: G Madhusoodanan Nair (H. Gr.)
Photographer	: A Sulaimankutty
Class IV	: S Manikantan
NARP (Phase II)	
Assistant Professor	
Agronomy	: SM Shahul Hameed (Assoc. Prof.) upto 31-1-94 shifted to KADP — Vellayani unit w. e. f. 1-2-1994
Entomology	: KS Premila
Pl. Pathology	: B Balakrishnan (Assoc. Prof.)
Horticulture	: PC Jessykutty
Ag. Engg.	: V Ganesan upto 22-6-93 L Sailaja (Provl.) from 16-8-93
Assistant (Gr. I)	: Ansamma Philip
Assistant (Gr. II)	: AK Shajikumar upto 4-6-93 P Sreekumar from 5-6-93
AICRP on Forage Crops	
Associate Professor	
Agronomy	: Dr G Raghavan Pillai (Prof.)

Assistant Professor
Pl Breed : Dr DI Suma Bai (Assoc. Prof.)
Mareen Abraham (Asst. Prof.)

Agronomy : Dr Lekha Sreekantan (Assoc. Prof)
upto 30-11-93
KR Sheela from 30-11-93
L Girija Devi

Farm Assistant (Gr. I) : H Gopinathan (S. Gr.)
(Gr. II) : David Dharmakumar (Gr. I)
K Justin (Gr. I)

Lab Assistant (Gr. III) : G Appu
Assistant (Gr. II) : A Anithakumari (Gr. I)
Typist (Gr. II) : B Savitha Devi (Gr. I)
Peon : M Nagappan

AICRP (Nematode pests)

Associate Professor : Dr MS Sheela
Assistant Professor : Hebsybai (Assoc. Prof.)
T Jiji upto 21-3-94
N Anitha from 21-3-94

Farm Assistant (Gr. II) : D Sivaprasad
Lab Assistant (Gr. III) : P Thankayyan (H. Gr.)

AICRP (Pesticide Residues)

Associate Professor : Dr D Dale upto 31-7-93
,, T Nalinakumari from 1-8-93

Assistant Professor : Dr S Naseema Beevi
(Assoc. Prof.)
PA Rajan Asari (Assoc. Prof.)
upto 31-7-93
K Sudharma (Assoc. Prof.)
from 1-8-93
Dr Thomas Biju Mathew

Lab Assistant (Gr. III) : M Maniyan
R Raveendran Nair

AICRP (Honey Bees)

Associate Professor : Dr Abraham Jacob (Prof.)
(from 1-3-94)

Technical Assistant : Vacant
Lab. Assistant (Gr. II) : Vacant
Farm Assistant (Gr. I) : Vacant

ICAR adhoc scheme on nutritional studies on pulses

Sr. Res. Fellow : MS Karuna
Jessy Philip
K Mini 23-6-93 to 31-8-93
Neelofar Illiaskutty from 8-10-93

ICAR ad hoc scheme on VAM

Res. Associate : Christin P Robert

ICAR ad hoc scheme on nitrogen fixing bacteria

Res. Associate : Dr Najachandran

ICAR ad hoc scheme on Homestead Agroforestry

Res. Associate
Agronomy : Vacant
Forestry : Vacant

ICAR ad hoc scheme on Epidemiology of honey bee diseases

Res. Associate
Ag. Entomology : Vacant
Ag. Microbiology : Vacant
Apiculture Asst. : Vacant

STED project on investigations on the changes in the physico chemical properties of coconut garden soil due to continuous interculture of fodder crops (Terminated on 31.12.93)

Res. Fellow : PI Asok upto 30.4.93

STED project on identity of Phytophthora affecting coconut and pepper and their control

Res. Fellow : SS Veena from 15.9.93

Sericulture scheme (Central Silk Board)

Asst. Professor (Agronomy) : AS Anil Kumar upto 18.9.93
M Meera Bai from 19.9.93

Entomology : N Anitha upto 21.3.94
R Krishnakumar from 21.3.94

Farm Assistant Gr. I : MS Krishnakumar
H Rachel (F. S.)

Lab. Assistant Gr. III : C Gopalakrishnan
P Thankappan

Sr. Research Fellow : R Krishnakumar upto 20.3.94
M Meera Bai upto 18.9.93

DBT project on root diseases

Res. Associate : KS Lekha from 13.8.93

Jr. Res. Fellow : PJ Joseph

DBT project on micro-propagation of tree crops—clove and nutmeg

Res. Associate : K Valsala from 29.4.93

Lab. Asst. Gr III : L Samkutty

DBT project on rhizobium-pulses association

Jr. Res. Fellow : M Meena Kumari from 17.11.93

ICSSR scheme on women workers (Terminated on 29.3.94)

Research Associate : Leena P Joseph upto 29.3.94

Emeritus Sci. Scheme: Nutr. status of oil palm plantations

Res. Fellow : Vacant

Farming System Research Station, Kottarakara

NARP (Phase I)

Assoc. Professor

Horticulture : Dr K Vasanthakumar

Soil Science : Sumam George from 12.7.93

Assistant Professor

Agronomy : Dr S Chandini
S Lekshmi from 9.3.94

Entomology : Kunjamma P Mathew

Pl. Path. : Dr KK Sulochana

Ag. Econ. : Dr S Regeena

Farm Assistant Sr. Gr. : D Vighrahanadhan
PA Sankutty

Lab Assistant Gr.III : Vacant

Driver Gr. II : PS Anilkumar upto 20.6.93
K O Pappachan 13.7.93 to 7.1.94
B Sasidharan Nair from 2.2.94

Peon : N Krishnan Nair

NARP (Phase II)

Assistant Professor

Horticulture : Darley Jose

Veterinary : MO Kurien

Agri. Engg. : Gomathy Sarojam 4.9.93 to
31.3.94

Farm Asst. (Agri.) : E Raveendran Nair

Farm Asst. (Vety.) : Valsalakumari

Adm. Assistant : M Abdul Salam

Assistant Gr. I : D Suprabha
Mohanan upto 27.5.93
N Ponnamma from 27.5.93

Typist Gr. I : S Indiramma upto 31.5.93
R Usha

Cropping System Research Centre, Karamana

AICRP (ICAR)

Professor (Agron)	:	V Ramachandran Nair
Asst. Professor (Soil Sci.)	:	Dr C Sundaresan Nair
Statistics	:	U Narayanikutty
Technical Asst.	:	Vacant throughout
Farm Assistant	:	KS Ajayakumar MS Rajeevan
Typist	:	B Retnavally Amma
Messenger (Class IV)	:	K Pappachan

Non-Plan

Professor (Ag. Bot.)	:	K Gopakumar
Asst. Professor (Pl Path.)	:	Dr S Ravi
Entomology	:	Vacant
Admn. Asst.	:	K Gopinathan
Assistant	:	Philip John upto May, 1993 N Valsan 30.7.93 to 6.9.93 S Viswakumaran Nair from 13.9.93
Lab. Assistant	:	G Enose
Peon Hr. Gr.	:	PK Sukumaran Nair upto 30.10.93 R Raghavan Pillai from 1.12.93
Chowkidar	:	R Raghavan Pillai upto 1.12.93 A Anil Kumar from 9.12.93
Part-time Sweeper	:	P Bharathi

Coconut Research Station, Balaramapuram

Assoc. Prof. (Agron)	:	Dr K Pushpangadan upto 22-9-93
Post held by Professor	:	„ G Padmakumari 23-9-93 to 24-10-93 „ GK Balachandran Nair from 25-10-93
Asst. Prof. (Pl. Path.)	:	Dr G Padmakumari
(Post held by Professor)	:	.
Farm Supervisor Gr. I	:	M Rajaretnam
Farm Asst. Gr. I	:	L Mohandas
Administrative Asst.	:	N Rajasekharan
Office Supdt.	:	S Radhamma
Assistant Gr. I	:	M Mohammed Hamsa MS Noble upto 26-8-93 S Vasanthakumari from 27-8-93
Peon	:	K Mohanan
Watchman	:	N Prabhakaran Nair S Lalitha

RARS Kumarakom

Associate Director	:	Dr R Ravindran Nair
Associate Professor		
(Ag. Entomology)	:	B Thomas (Professor)
(Ag. Stat.)	:	P Gangadharan
Assistant Professor	:	K Geetha
NARP—Phase I		
Assoc. Professor	:	Dr KG Padmakumar
(Aqua.)		(Asst. Prof.)
Asst. Professor (Hort.)	:	Dr Joseph Philip
		(Assoc. Prof.)
(Weed Science)	:	KC Rajan
		(Assoc. Prof.)
(Microbiology)	:	Dr M Suharban
		(Assoc. Prof.)
(Aqua.)	:	Dr Anuradha Krishnan
(Plant Breeding)	:	KA Inasi
(Microbiology)	:	Dr AV Mathew
(Plant Physiology)	:	Alice Antony
(Bio-chemistry)	:	Dr Sosamma Cherian
(Economics)	:	AM Santha
NARP Phase II		
Assoc. Professor	:	KK Sathian upto 7-2-94
(Ag. Engg.)		(Asst. Professor on working arrangement at Campus Development Vellanikkara)
CRWD.		
Assoc. Professor (PP)	:	G Mathai (Professor)
<i>Administrative staff</i>		
NARP—Phase I		
Administrative Officer	:	Mary Amma Eapen
Office Superintendent	:	MC Jayakumar
Senior Grade Typist	:	Lillykutty Sebastian
Typist Grade I	:	NA Raju upto 27-5-93
		K Radhamoney from 28-5-93
Assistant Gr. I	:	KP Gopinathan
		(Asst. Gr. II) upto 28-8-93
		CP Jayakumar from 8-7-93
Assistant Gr. II	:	Anil G Nair
Lab. Assistant Gr. II	:	PS Retnam
Lab. Asst. Gr. III	:	Mary Sebastian
		Joseph Peter

Peon (Hr. Gr.)	:	N Purandaran
Dupl. Operator	:	CG Mohanan
Driver (HDV)	:	PC Kurian
Section Officer	:	MP Govinda Pillai D Vijayamma
Senior Office Supdt.	:	KK Gopikuttan Nair KV Kurian (Hr. Gr.) upto 31-1-94 K Sarada Devi from 11-2-94
Assistant Gr. II	:	TR Raju Anil G Nair PN Mohanan
Lab. Assistant Gr. I	:	VK Vasu
Sr. Farm Supervisor	:	VV Mariamkutty upto 2-6-93 Vijayalakshmi from 14-6-93 S Thankabhai from 22-11-93
Farm Asst. (Sr. Gr.)	:	S Sukumaran Nair MK Vijayan
Farm Asst. Gr. II	:	KC Varghese (Farm Asst. Gr. I) upto 5-6-93 PS Sanalkumar upto 5-6-93 K Gopalakrishnan Nair
Driver (LDV)	:	MG Sankaranarayanan Nair upto 20-5-93 PS Babu 7-6-93 to 21-6-93 TM Francis from 22-6-93
Typist Grade II	:	KR Nirmala upto 14-6-93 (Typist Gr. I) Mariyamma Mathew from 15-6-93 (Typist Gr. I)
Peon (Hr. Gr.)	:	TK Sreedharan KK Thankappan
Bus Attendant	:	PM Varghese upto 1-7-93 KK Raghavan from 17-7-93
Sweeper cum Attendant	:	AP Meenakshy
Pump Operator	:	CC Punnen
Watchman	:	TP James EP Sasidharan
CRWD		
Farm Assistant	:	N Kamalamma (Farm Supervisor Gr. I) upto 31-7-93 CT Kuttappan from 15-9-93 (Farm Asst. Gr. I) MV Sasidharan Nair upto 13-6-93 (Farm Asst. Gr. I) PV Reghunadhan from 14-6-93 (Sr. Gr. Farm Asst.)

Driver (LDV) : OR Sasidharan

IRP

Assistant Gr. II : PN Shylaja Devi upto 27-5-93
KP Rajan (Sr. Gr. Asst.)
B Bhanumathy from 2-8-93
(Sr. Gr. Asst.)

Farm Asst. Gr. II (Vety.) : KK Viswambharan
(Gr. I Vety.)

Watchman : MR Sudhakaran

NARP—II

Technician Gr. II : Thomas Scaria (Gr. I)

Assistant Gr. II : PN Ramesh upto 15-8-93
(Asst. Gr. I)
MR Ramachandran Nair
(Sr. Gr. Asst.) from 16-8-93

R. R. S. Moncompu

Research on rice

Assoc. Professor (Agron.) : PJ Ittyaverah (Professor)
Asst. Professor (Ento.) : Dr KV Mammen (Professor)
from 9-6-93

Asst. Professor (Chem.) : Dr Suman Susan Varghese
Assoc. Prof. (NC)

(Bot.) : R Devika (Assoc. Prof. (NC))

Jr. Statistician : PR Krishnakumari Amma

AICRIP

Asst. Professor (Bot.) : Dr N Remabai (Assoc. Prof.)
(Ent.) : Dr D Ambikadevi
(Agron.) : Elizabeth K Syriac up to 21-3-94
PS John (Assoc. Prof.) from 1-9-94
Reena Mathew
Vacant

NARP Phase I

Professor (Pl. Br.) : Dr CA Joseph
Assoc. Professor (Ent.) : D Joseph (Professor)
Asst. Professor (Pl. Path.) : Dr P Varadarajan Nair
(Professor)

Dr L Remadevi (Professor)

(Soil Sci.) : Annie Koruth

(Pl. Br.) : Ahmed Regina

Administrative and Supporting staff

Administrative Asst.	:	K Rajamma
Section Officer	:	B Sarasamma
Sr. Gr. Asst.	:	KP Rajan Govindarajan M Mohamed Bashir K Govindan Rajalekshmiamma
Asst. Gr. II	:	EV Ambili
Sr. Gr. Typist	:	PK Sreedeviamma
Lab. Asst. Gr. III	:	G Vasudevan
Sweeper cum Att.	:	Vacant
Peon	:	Vacant
Watchman	:	Vacant
Farm Supervisor Gr. I	:	AK Ayyappan Pillai CN Raghavan upto 28-2-94 Vacant
Farm Asst. Gr. II	:	KC Varghese from 14-6-93 MV Sasidharan Nair from 22-6-93
Jeep Driver	:	CC Chacko
Field Supervisor	:	Vacant
Lab. Asst. Gr. I	:	V Kunju Pillai
Lab. Asst. Gr. II	:	V Viswanathan
Lab. Asst. Gr III	:	PG Balakrishnan Vacant from 1-6-93
Boat Driver	:	MD Janardhanan
Boat Syrang	:	Vacant

RRS Kayamkulam

Research on rice

Professor	:	S Sukumaran Nair (Prof. & Head) 1-4-93 to 31-5-93 & 1-12-93 to 22-3-94 Dr K Sivan Pillai (full addl. charge as Prof. Head from 1-6-93 to 30-11-93 and 23-3-94 to 31-3-94)
Professor (Ent.)	:	P Reghunath upto 3-2-94
Assoc. Professor (Pl. Path.)	:	KP Jagan Mohan Dr S Bhavanidevi upto 24-9-93
Asst. Professor (Agron.)	:	Dr P Sushamakumari upto 9-6-93
(Ent.)	:	G Suja
(SS & AC)	:	M Indira

NARP Phase II

Assoc. Professor (Hort.) : Dr Shyam S Kurup
(Promoted by assessment as
Assoc. Professor)

AICRP on Oil Seeds

Asst. Professor (Pl. Br.) : Dr Sverup John
(Agron.) : Abraham Varghese
(Assoc. Prof. (NC) upto 9-6-93
Dr P Sushamakumary
from 10-6-93

*Administrative & Supporting Staff***Research on Rice**

Admn. Asst. : KP Rajendra Prasad upto 2-6-93
B Thankamony from 3-6-93
Sr. Gr. Asst. : K Govindan 3-6-93 to 31-5-93
Asst. Gr. I : MP Vijayachandra babu
from 31-5-93

AK Valsala
Typist Gr. I : S Kaladevi
K Sobhana from 7-6-93
Peon : T Balakrishnan
Watchman : K Bhaskaran
V Sindu
Driver (LDV) : PS Babu
Full Time Sweeper : N Rajamma
Lab. Asst. Gr. III : MG Thomas
Farm Supervisor Gr. I : A Mohammed kunju
Farm Asst. Sr. Gr. : R Satheesan
Farm Asst. : Dr Prasannakumar
VJ Rajamohan
Regular Mazdoor : N Viswanathan
N Raveendran

AICRP on Oil Seeds

Lab Asst. Gr. II : N Padmakaran Pillai
Farm Asst. Gr. I : TK Vijayan from 10-6-93

NARP Phase II

Tractor Driver : R Thankappan

*RRS Vyttila**Scientific*

Professor (Ag.Botany) : KM George
(Soil Sci.) : K Chandrasekharan Nair

Assoc. Professor (Agron) : NK Sasidharan
 (Aqua.) : CG Rajendran
 Asst. Professor („) : MV Mohan
 (P.Br.) : KS Shylaraj
Paratechnical
 Farm Supervisor Gr. I : MJ Annakutty
 P Jayamani
 Gr. II : Haridas upto 16.6.93
 Farm Assistant Gr. I : PK Kumaran
 Padma Narayana Pillai
 Driver Gr. II : G Balachandran Nair upto 28.2.94
 Pump Operator : Vacant
 Lab Asst. Gr. III : PM Gopi
 Fisherman cum Watchman : KG Gopi
 P Viswanathan

Administrative

Administrative Asst. : MA Alikutty
 Assistant Gr. I : MD Kunjamma upto 26.5.93
 Sr. Gr. Assistant : KA Lucy Mary
 Assistant Gr. I : CS Baburaj upto 29.5.93
 Gr. II : AR Sheela
 Typist Gr. II : MP Rajani
 Peon (Hr. Gr.) : NS Reghunandan
 Watchman : MA Sebastian upto 28.3.94

Sugarcane Research Station, Thiruvalla

Professor : S Santhakumari
 Asst. Professor : Thomas Mathew
 Jr. Asst. Professor : Dr R Hangovan

AICRP

Assoc. Professor : Dr D Alexander
 Asst. Professor : K Sreekumar

NARP

Asst. Prof. (Hort.) : Jessy M Kuriakose

Paratechnical staff

Farm Supervisor : CO Mathai upto 30-4-93
 Sr. Gr. Farm Asst. : ER Sukumaran

AICRP

Farm Asst. Gr. I : TK Omanakuttan

Administrative staff

Admn. Asst. : KP Rajendra Prasad
 Gr. I Assistant : S Gopakumar
 PB Anilkumar

Gr. I Typist : AK Indiradeviamma
 Driver : CA Chacko
 Peon : K Lalu
 Watchman : P Narayana Pillai

AICRP on Agricultural Drainage, Karumady

Scientific staff

Assoc. Prof. (Ag. Engg.) : EK Mathew, Asst. Prof.
 (Ag. Engg.)
 Asst. Prof. (Agron.) : PH Latif, Assoc. Prof. (NC)
 Madhusudanan Nair
 Assoc. Prof. (NC)
 Asst. Prof. (Ag. Engg.) : TD Raju

Supporting staff

Farm Asst. (Sr. Gr.) : VCM Das
 Farm Asst. Gr. II : G Udayakumar (Gr. I)
 KO Shahul Hameed
 I Krishnakumari
 Overseer Gr. I : KM Anilkumar upto 6.4.93
 MK Devarajakurup
 Draughtsman Gr. II : SR Antony
 Lab Asst. Gr. II : MM Haneef
 Technician Gr. II : One post vacant
 PS Anilkumar
 (Provisional appointment)

Administrative staff

Typist Gr. I : V Lalitha (Gr. II)
 Assistant Gr. I : NV Unnikrishnan
 Peon : Vacant
 Watchman : MT Ponnappan
 S Sasi
 Driver Gr. II : TM Francis (Hr. Gr.)

KAU Post

Section Officer : TV Rajasekharan Nair

Regional Agricultural Research Station, Ambalavayal

KAU Non plan

Professor (Plant Pathology) : Vacant
 Assoc. Prof. (Nematology) : Susannamma Kurian upto 14.10.93
 PK Unnikrishnan Nair
 from 15.10.93
 Asst. Prof. (Entomology) : CM George
 (Botany) : Jomol P. Mathew
 (Research Associate) from 12.4.93

NARP Phase I

- Assoc. Director of Research : Dr K Kumaran
Assoc. Prof. (Agronomy) : IP Sreedharan Nambiar
(Professor) from 31.5.93
Asst. Prof. (Horticulture) : Dr K Rajmohan from 27.5.93
Asst. Prof. (Plant Propagation) : Vacant
Asst. Prof. (Plant Breeding) : Susamma P. George
Asst. Prof. (Agrl. Economics) : ~~D. Manojkumari~~
(Research Associate) from 5.4.93

NARP Phase II

- Assoc. Prof. (Animal Science) : Vacant
Assoc. Prof. (Horticulture) : Dr TR Gopalakrishnan
upto 21.7.93
K Ajith Kumar 17.8.93 to 15.9.93
Dr TR Gopalakrishnan 15.9.93 to
9.2.94 post shifted to KHDP,
KAU, Vellanikkara
Asst. Prof. (Horticulture) : KK Nazeema
(Research Associate) from 5.4.93
Asst. Prof. (Ag. Engg.) : EVN Sheela
(Provisional) 1.4.93 to 24.4.93
13.8.93 to 1.12.93
Asst. Prof. (Plant Pathology) : Dr TP Manomohandas

AICRP (Spices)

- Assoc. Prof. (Plant Breeding) : P Mayadevi

Supporting staff

- Administrative Officer : R Kamala Bai 15.4.93 to 2.8.93
VC Bharathan Pillai from 11.10.93
on working arrangement
Section Officer : E George
Sr. Gr. Assistant : P Sulochana
Assistant Gr. II : M Manjunathan
TA Tilakaraj upto 31.5.93
N Gopinathan Kartha
Assistant Gr. I upto 31-5-94
S Rajan Assistant Gr.I from 5-6-93
C Mareena
Assistant Gr. I from 5-6-93
Typist Gr. II : P Ratnakaran
A Sudhakaran from 14-6-93
Driver L.D.V. : KCMathai Provisional appointment
Peon Hr. Gr. : KR Chandrasekharan
P Moosa
V Kunjipokku

KAU Non-plan**Supporting (Technical) staff**

Sr. Farm Supervisor	:	CV Thomas on working arrangement
Farm Supervisor Gr. II	:	KM Vijayakumar upto 19-1-94 K Aboobacker on working arrangement
Farm Assistant Gr. I	:	VK Kumaran upto 19-1-94 P Padmavathi upto 19-1-94 A Imbichi Ali A Kunhimohammed upto 31-5-93
Farm Assistant Gr. II	:	CP Nandakumar CT Jacob
Field Supervisor	:	K Raghavan upto 31-5-93
Lab Assistant Gr. I	:	A Govindan Nair upto 31-5-93
Lab Assistant Gr. II	:	CR Balakrishnan upto 31-5-93
Tractor Driver	:	M Mohammedkutty upto 31-5-93
Oil Engine Driver	:	A Varghese upto 31-5-93
Regular Mazdoor	:	N Ummer 1-4-93 to 30-4-93 E Chindan E Kunhiraman K Balan E Alavi P Saidu N Krishnan M Khader E Ayamu AT Mohammed from 11-2-94
Budder	:	K Ramakrishnan
NARP		
Farm Assistant	:	S Prabhakaran
Lab Assistant Gr. II	:	M Vasu
Farm Asst. Gr. II (Vety.)	:	K Sivasankaran
Technician Gr. I	:	K Vasudevan
Watchman	:	K Ibrahimkutty N Chandu V Alikutty VV Sajeer Kumar
Class IV (on working arrangement)	:	K. Kuttan from 2-8-93 KK Nabeesa from 29-7-93 KS Prema from 29-7-93 KP Mukundan from 11-2-94 E Abu from 27-7-93
Central Sector Scheme		
Farm Assistant Gr. I	:	KM George

Cardamom Research Station, Pampadumpara

Scientists I - ICAR

- Assoc. Professor (Ent) : Dr Maicykutty P Mathew
(Asst. Professor (1.8.93 to 1.12.93)
Dr Arthur Jacob J. from 1.12.93
- Assoc. Professor (Agron) : Dr CT Abraham 1.4.93 to 31.3.94

KAU (Non-Plan)

- Asst. Professor (Ent) : Dr J. Arthur Jacob
Assoc.Prof. (Ent) 1.11.93 to 1.12.93
Dr Maicykutty P Mathew†
1.12.93 to 21.2.94
- (Agrl. chem) : M Murugan Asst Prof.from 2.8.93
(Pl. Path) : Dr VK Girija from 1.11.93
- Assoc. Professor (Bot) : Dr Sunny K Oommen
Asst. Prof.(Pl.Breed) from 11.3.94
- Asst. Professor (Hort) : Ancy Joseph
Research Associate from 1.11.93

NARP

- Assoc. Professor (Pl. Breed) : Ancy Joseph
Research Associate
16.4.93 to 16.8.93 FN.
VR Shajan, Asst. Professor
(Pl. Br) from 16.8.93 AN
- Asst. Professor (Ent) : I Priya
Res. Associate from 7.4.93 to
4.3.94

Administrative and supporting staff

KAU

- Farm Assistant : VP Prasadu
F. A. Sr. Gr.
- Lab Assistant : PV Joseph
- Peon : K Aleykutty

NARP

- Farm Assistants Gr. II : CG Pradeep
KG Mohandas
- Typist Gr. II : V Rajayyan

KAU (Non-Plan)

- Administrative Asst. : MP Balan
Admn. Asst. Gr. II upto 20.5.93
KP Rajan 24.3.93 to 31.3.94
- Asst. Sr. Gr. : MR Ramachandran Nair
1.4.93 to 7.8.93

Farm Supervisor : K Devaky
Farm Supervisor Gr. I
Farm Assistants : TV Kuttichan
Farm Asst. Sr. Gr.

Regional Agricultural Research Station, Pattambi

Non-Plan A.

Assoc. Professor : Vacant
Asst. Professor : Sainamol
Junior Asst Prof. : Vacant
Section Officer : PM Cherukutty
K Leelamma
Assistants : KP Kallyani
NV Thankamany
TV Ravindramohan
AV Sreenivasa
Raghavan
S Sushama
D Sethumadhavankutty
PM Suresh
AW Kishore
A Anithakumari
Sr. Office Supdt. : N Haridas
Typist : M Mohandas
MK Thankamony
Lab. Assistant : MP Sankaran
P Santhakumari
KS Chandrasekharan
N Seffiya
K Divakara Panicker
Driver (LDV) : TR Sasidharan
Driver (HDV) : A Krishnan
Peon : KP Narayanan
K Krishnankutty

Non Plan B

Senior Farm Supervisor : Abraham K Cheru
Farm Supervisor : Saidalikutty
Farm Assistant : PK Abdul Salam
VP Ramakrishnan
TK Naseer |
TT Jacob | Through
KV Shaji | Employment
Ajithkumar | Exchange
Karthikeyan |

Technician	:	VK Ashokan
Tractor Driver	:	
Regular Mazdoor	:	P Mohammed N Hamza M Narayanan A Mohammedkutty PC Koya N Rugmini
Class IV	:	Beg Bahadur C Ramakrishnan MP Mohanan P Kunhilakshmi K Kumaran P Rayankutty M Sundaran
Watchman	:	KC Surya Bahadur P Mohammed C Mohammedkutty A Unnikrishnan
NARP I		
Professor	:	Dr KM Kajan
Assoc. Professor	:	Vacant
Asst. Professor	:	Dr K Anilakumar Dr P Rajendran Dr TE George Dr L Nadarajan C Sivakumar
Administrative Officer	:	P Meenakshikutty
Typist	:	V Santhakumari Krishnakumari
Duplicator Operator	:	C Kunhan
Lab. Asst. Gr. II	:	VP Balasubramanian
Lab. Asst. Gr. III	:	Vacant
Driver (LDV)	:	K Parameswaran
Tractor Driver	:	Vacant
NARP II (Non Plan)		
Asst. Professor	:	ML Jyothi P Shaji James
Farm Supervisor (V)	:	KV Mohanan
Technician	:	E Abdul Hakkim
Asst. Gr. II	:	V Mohammed Kunhi

AICRP

Scientific

Assoc. Professor (Pl. Br.)	:	Vacant
(Agron)	:	Dr Jose Mathew
(Path.)	:	Prof. VP Sukumara Dev
(Ento.)	:	Dr PB Gopinathan
Assoc. Professor (Agron.)	:	TK Bridgit
(Path.)	:	Vacant
Asst. Professor (Pl. Br.)	:	CR Elsy

Supporting

Farm Assistant Gr. I	:	PK Rajasekharan MJ Joseph PG Ajayakumar MV Yusuf
Driver	:	MV Arumughan
Tractor-cum-Jeep Driver	:	Vacant

AICRP on Guar (Arid Legumes)

Assoc. Professor	:	Gracy Mathew
Farm Asst. (Agri.) Gr. II	:	C Subramanian ER Soman
Assistant Gr. I	:	P Ramadasan
Typist Gr. II	:	K Vijayalakshmi
Lab. Asst. Gr. II	:	T Ramakrishnan
Peon	:	PK Aboo

NSP—BESP

Asst. Professor	:	G Valarmathi
Technician Gr. II	:	P Surendran

Cashew Research Station, Anakkayam

Scientific staff

Assoc. Professor	:	KC Chandy
Asst. Professor	:	PV Nalini PB Pushpalatha

Para-technical staff

Farm Assistant	:	A Abdurahiman Sreenivasan Palasseri K Mohammedali
Mali	:	KV Balakrishnan
Reg. Mazdoor	:	EU Kunhimoideen

Administrative staff

Assistant	:	PC Rajagopalan
Typist	:	KT Vijayalakshmi
Peon	:	C Mohammed
Full time Sweeper	:	KP Kadiyumma

Agricultural Research Station, Mannuthy

Scientific staff

Assoc. Professor (Agron.)	:	Dr R Gopinathan upto 26-5-93 Dr U Jaikumaran from 27-5-93
Asst. Professor	:	Dr VV Radhakrishnan ,, KK Ibrahim (Post shifted to Puduveypu) from 30-8-93 Dr EK Lalitha Bai (Post shifted to CRS Pampadumpara from 20-5-93 MT Kanakamony Tessy Joseph George Thomas (on study leave) T Sajitha Rani from 16-8-93

Technical staff

Farm Supervisor Gr. I	:	CK Vijayan
Farm Supervisor Gr.II	:	PG Yamuna
Farm Assistant Sr. Gr.	:	Abraham K Cheru upto 1-4-93
Farm Assistant Gr. I	:	Valsamma George upto 28-5-93 AX George upto 6-7-93
Farm Assistant	:	PR Sathian upto 6-7-93 R Rahu upto 5-6-93
Tractor Driver	:	Vacant
Technician	:	TR Viswambharan upto 11-6-93 AM Ramachandran
Workshop Attender	:	CJ Joseph upto 30-5-93 (on working arrangement at MTU, Mannuthy

Administrative and Supporting Staff

Administrative Assistant	:	Vivian Jose
Senior Grade Assistant	:	KP Gopi CK Prabhavathy
Grade I Assistant	:	TP Babu Raj
Grade II Assistant	:	A Daisy Anto
Sr. Officer Superintendent	:	R Noel
Peon	:	Parukutty RG Babu
Watchman	:	E Abu

Banana Research Station, Kannara

Scientific Staff

AICFIP

Assoc. Professor (Hort)	:	Dr Rema Menon
		Asst. Professor
Asst. Professor (Hort)	:	T Premalatha
(Pl. Path)	:	Dr D Geetha
(Ento)	:	KR Lyla
		Assoc. Professor

NARP

Assoc. Professor (Nemat)	:	Dr Job Sathyakumar Charles
(P.P)	:	TC Radhakrishnan
Asst. Professor (Hort)	:	Dr PK Sudhadevi
(Agron)	:	KP Pradeep

Technical Staff

AICFIP

Farm Asst. Gr. I	:	MN Pavithran
		R Jayanthi
		C Eswarachandran
Lab Asst. Gr. I	:	KR Gopalakrishnan
		Lab Asst. Gr. II
Oil Engine Driver	:	KA Narayanan
Mali	:	P Subhadra
Watchman	:	KT Rajan
		Krishnankutty

NARP

Farm Supervisor Gr II	:	N Vasudevan
Farm Asst Gr I	:	PM Poulouse
		Farm Asst Sr. Gr.

Administrative and Supporting Staff

AICFIP

Typist Gr. II	:	KK Parameswaran
		Sr. Gr. Typist
Peon	:	K Sarada

NARP

Typist Gr. I	:	K Shobhana
Administrative Assistant	:	AK Kamalabai
Asst. Gr. II	:	KK Valsa, Asst. Gr. I
Driver Gr. II	:	PI Rappai, Driver Gr. I
Pump Operator	:	George
Peon	:	RK Dhirjan Bahadur Singh
Watchman	:	Vacant

Agronomic Research Station, Chalakudy

ICAR

Professor/Chief Scientist	:	Vacant
Assoc. Prof. (Agronomy)	:	V Sreekumaran
(Agrl. Chemistry)	:	G Santhakumari
(Agrl. Engg)	:	K Susan Cherian
Asst. Prof. (Agronomy)	:	MA Peter
(Soil Physics)	:	KM Durga Devi upto 30.9.93
(Agrl. Engg.)	:	K Susan Cherian -do-
Farm Assistants Gr. I	:	V Unnikrishnan
		TA Vasanthi (Sr. Gr.)
Farm Assistant Gr. II	:	PK Reghu
Lab. Asst. Gr. III	:	TK Velayudhan upto 8.6.93
		TR Balakrishnan
Assistant Grade I	:	K Hemalatha
Driver Grade I	:	MP Paul
Peon	:	K Radhakrishnan

Non Plan

Administrative Assistant	:	L Syamaladevi
Assistant Grade II	:	A Rajeswary
Farm Supervisor	:	NM Mohanan
Pump Operator	:	KA Subran
Ploughman	:	CO Mercy
Assistant Grade I	:	B Ajith Kumar

NARP Phase I

Asst. Professor (Agronomy)	:	N Purushothaman Nair,
		Assoc. Professor
Assistant Prof (Soil Phy.)	:	Vacant
(Agrl. Engg)	:	P Suseela (provisional upto 5.4.93)
		KV Levan
Farm Asst. Grade I	:	John George (Sr. Gr.)
Lab. Asst. Grade II	:	TV Parameswaran
Typist Grade II	:	MC Devassy

NARP Phase II

Assistant Professor	:	
(Agron.)	:	Vacant
(Soil Phy.)	:	Vacant
Typist Grade I	:	KD Rosily

Aromatic and Medicinal Plants Research Station, Odakkali
Scientific

Assoc. Professor and Head	:	Dr J Thomas
Asst. Professor (Agrl. Chem)	:	Dr Samuel Mathew
(Agrl. Bot)	:	KP Kuriakose

Jr. Asst. Professor (Agrl. Chem)	:	PP Joy
Lab Assistant (Graduate)	:	KK Santhakumariamamma
Farm Supervisor	:	E Sudhakaran Nair
Farm Assistant	:	V James KG Mohan Das R Raghu
Administrative Asst. Assistant	:	PK Elsy KC Varghese PV Yeldhose
Typist	:	KU Selmath
Peon	:	MM Poullose
Gardener	:	KB Sivaramakurup
Watchman	:	I Veeran KA Ponnamma
Sweeper cum Attendant	:	PV Ayyappankutty

Livestock Research Station, Thiruvazhankunnu

Scientific

Professor (Extn.)	:	V Raju
Associate Professor (Animal Nutrition) (Animal Reproduction)	:	Dr P Ramachandran Dr KV Athman (on working arrangement at Vet. College, Mannuthy)
Asst. Professor (Genetics) (Pathology)	:	Vacant Dr Mammen J Abraham on study leave from 1-3-92
Jr. Asst. Professor (Dairy Science)	:	Dr CT Sathian upto 25-3-94
Animal Management	:	Joseph Mathew upto 31-5-93

Para Technical

Farm Supervisor	:	PP Sankaran upto 25-8-93 AS Karunakaran from 27-8-93 to 6-11-93 PK Vijayamoni from 15-12-93
Farm Supervisor (Vety.) Gr. I (Vety.)Gr.II	:	PP Narayana Panicker MK Vijayakumar
Farm Asst. (Vety.) Gr. I	:	KK Gangadharan
Lab Asst. Tech. Gr. II	:	C Mohammed Usman
Farm Supervisor (Agri.)Gr. II	:	Vacant
Farm Asst. (Agri.) Sr. Gr.	:	M Ummer

Farm Asst. (Agri.)	:	PA Moni VM George KC Sanuprasad Plassery upto 19-6-93
Farm Asst. (Agri.) Gr. II	:	A Abdu Rahiman from 15-6-93 Sreenivasan upto 31-5-93 Plassery
Refrigeration Mechanic	:	Vacant
Driver Gr. I LDV	:	PM Mohammed
Technician Gr. II	:	A Sankaran (Sr. Gr. Technician)
Tractor Driver	:	Vacant
Pump Operator	:	N Appunni M Ramachandran
Field Supervisor	:	K Krishnan
Class IV	:	V Appukuttan
Maistry	:	P Balakrishnan P Vasudevan
Watchman-Class-IV	:	A Chachunni C Chami K Manukuttan K Ayyappan Saseedharan P Veerankutty M Narayanan P Rajagopalan
Regular Mazdoor	:	C Kumaran
Mazdoor Class IV	:	C Chellamma P Vijayalakshmi K Mammed V Sunilkumar K Mohammedali
Sweeper-cum-Sanitary worker	:	K Ayisha
<i>Ministerial Staff</i>		
Administrative Asst.	:	C Suchetha
Senior Grade Asst.	:	A Surendran (Asst. Gr. I)
Assistant Gr. I	:	TG Deenamma Vacant B Anujan (Asst. Gr. II)
Assistant Gr. II	:	MS Noble from 5-6-93
Typist Gr. II	:	P Sowmini Devi (Gr. I) V Mohandas (Gr. I)
Peon Hr. Gr.	:	K Mohammed (Peon Spl. Gr.) P Narayanan Nair K Narayanan

AICRP on Agroforestry

Assistant Professor (Soil Con).	: S Parvathy (Provisional appointment)
Assistant Gr. II	: PV Chamunni (Asst. Gr. I)
Farm Assistant	: Thomas Chirakandathil (F. A. (A) Gr. II)
	: CP Nandakumar upto 31-5-93 (F.A. (A) Gr. II)
Lab Assistant Gr. II	: P Bharathan (Lab Asst., Hr.Gr.) AN Reghu
Driver L.D.V.	: T Moidu (Retired on 28-2-94)
Peon Hr. Gr.	: K Narayanan K Kirshnan

Cattle Breeding Farm, Thumburmuzhi

Assoc. Professor	: Dr George Mathen upto 2-9-94
Jr. Assistant Professor	: Dr Sreeja Rajmohan
Farm Supervisor (Vety.)	: AN Sreedharan upto 18-8-93 V Sukumaran Nair K Chacko from 27-5-93
Farm Supervisor (Agri.)	: K Sasidharan
Farm Assistant (Vety.)	: P Mohanan Nair
Administrative Assistant	: VK Pathumma
Assistant Gr. I	: CC George
Assistant Gr. II	: A Radhakrishnan
Pump Operator	: MP Joseph (Hr. Gr.)
Herdsmen	: PK Velayudhan TK Thomas KP Jose ES Yesodha TN Sasi PV Ayyappankutty
Pharmacist	: CK Alias

Veterinary Hospital, Kokkalai

Professor	: Dr K Ramdas (Professor & Head)
Asst. Professor	: Dr KM Jayakumar (On working arrangement from the College of Vety. & An. Sciences)

Section Officer	: M Baby
Sr. Gr. Asst.	: VK Beena (Asst. Gr. II)
Pharmacist	: VK Alias (Post shifted from CBF, Thumburmuzhy)

Associate Professor : Dr Babu M Philip from 8-2-93
Dr K Aravindakshan
1-4-92 to 7-2-94 (Transferred
to KHDP, Vellanikkara)
Dr T Radha 1-4-92 to 7-2-94
(Transferred to KHDP,
Vellanikkara)
Dr Jaikumar 15-2-93 to 25-5-93
(Transferred to Agrl. Res.
Station, Mannuthy)

Assistant Professor : AK Babylatha 22-1-93 to 2-2-94
(Transferred to KHDP,
Vellanikkara)
KE Usha 1-12-93 to 21-2-94
(Transferred to CRS,
Madakkathara)
KP Prameela from 24-2-94

Asst. Prof. (Agrl.Engineering) : KK Sathian from 13-8-93
(on working arrangement
from RARS, Kumarakom)

Sr. Farm Supervisor : PK Vijayalakshmi 14-6-93 to
12-10-93 (on working arrange-
ment from RARS Kumarakom)
from 13-10-93 (working
arrangement terminated and
posted at Campus
Development)

Sr. Gr. Farm Assistant : K Kesavan 1-6-92 to 31-1-94
(on leave without allowance
for 5 years to take up
employment abroad)
NT Satheesh Babu from 19-5-92

Gr. I Farm Assistant : VG Santha 1-3-92 to 28-2-94
(Transferred to KHDP
Vellanikkara)

Office Superintendent : PK Kalliani from 9-7-93
(on working arrangement
from Director of Research,
KAU Vellanikkara)

Typist Gr. I : P Baby (Continuing on working
arrangement at Instructional
Farm, Vellayani,

Assistant Gr. I : TA Sadanandan from 1-4-93
Lab. Assistant Gr. II : KL Fathimabeevi from 1-4-93
Typist Gr. II : MJ Mary (Working arrangement
terminated and transferred to
KAU Headquarters)

Directorate of Extension, Mannuthy

Director of Extension	:	Dr VK Sasidhar i/c
Assoc. Director of Extension	:	Dr E Sivaraman upto 11-11-93 vacant afterwards
Section Officer	:	PV Sreekumaran
Assistant Gr. II	:	PK Ananthakumari
Assistant Gr. I	:	A Pradeep, Grade I K Indiradevi K Girish Babu
Sr. Gr. Assistant	:	MN Chandrasekharan PV Ramani
Senior Office Superintendent	:	TD Jose
Office Superintendent	:	PP Rosy
Typist Grade I	:	AC Mancy
Senior Grade Typist	:	G. Hareendran from 4-6-93
Driver	:	NA Sukumaran
Peon	:	KV Sukumaran PD Annamma

Communication Centre

Assistant Professor	:	Dr Joy Mathew Associate Professor Jose Joseph
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Publication Unit

Assoc. Professor (Extension)	:	KC Varghese Professor and Head V Kunchu Asst. Professor from 2-8-93
Asst. Professor (AH)	:	Vacant

Information Unit

Assoc. Professor	:	Dr O Abdul Rehiman Kunju Professor
Asst. Professor (AH)	:	Vacant
Asst. Professor (Agrl. Extn.)	:	PA Joseph from 22-2-94

Exhibition and Graphic Service

Asst. Professor (Agrl. Extn.)	:	KK Santha Associate Professor from 1-10-93 Two posts vacant
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Farm Advisory Service

Professor (Agro)	:	Dr VK Sasidhar DE i/c.
Professor (PP)	:	Dr KP Vasudevan Nair from 17-6-93
Assoc. Prof. (Hort.)	:	Vacant
Assoc. Prof. (A. H.)	:	Vacant

Assoc. Prof. (Poultry Science) : Vacant
 Assoc. Prof. (Agron.) : P Sreedevi
 Assoc. Prof. (Plant Prot.) : Dr MK Sheela
 Asst. Prof. (Soil Science/
 Agrl. Chemistry) : Dr Jayasree Shanker from 23-3-94
 Asst. Prof. (Plant Pathology) : S Estelitta from 1-3-94
 Asst. Prof. (Ent.) : Suma Poulose
 Associate Professor from 1-3-94
 Asst. Prof. (Aquaculture) : Dr AD Antony

Non-teaching staff

Administrative Assistant : KN Pushpangathan
 Section Officer : MK Shylaja
 Assistant Sr. Gr. : TK Ambika

S Ramachandran
 VM Ammini
 KP Premakumari

Gr. I Assistant : KL Liza
 PV Yeldose

Gr. I Typist : AJ Rose Mary

Technical staff

Farm Supervisor Gr. I : Vacant
 Farm Supervisor Gr. II : John David
 Farm Asst. Gr. II : Valsamma George
 AN Manoj

Technician Hr. Gr. : Eugene G. Varghese

Photographer : VV Satheesan

LDV Driver : MS Kunju

Language Editor : Mrudula Devi

 " (English) : Vacant

Class IV : MS Ammini (Peon Hr. Gr.)
 MK Ramakrishnan (Peon Sr. Gr.)
 KJ Jose from 9-7-93

Sweeper-cum-Sanitary
 Worker : PJ Thankam

Artist : Surendran

Central Training Institute, Mannuthy

Professor of Extension : KP Ramachandran Nair

Assoc. Professor : KK Santha upto 30-9-93
 R Muraleedhara Prasad
 from 1-10-93 onwards

Asst. Professor : Alexander George
 (joined on 1-3-94 on
 completion of study leave)
 One post vacant

Section Officer	: KK Radhakrishnan
Farm Supervisor	: MJ Kochappan on working arrangement
Typist Sr. Gr.	: ER Vilasini
Typist Gr. I	: P Prasannakumari
Farm Assistant	: Vacant
Assistant Gr. II	: Samson J Koladi MN Jayanthi
Duplicator Operator	: CR Antony from 14-5-93 onwards
LDV Driver	: VN Dasan
Peon	: KL Devassy

Advanced Centre for Training in Plantation Crops, Vellanikkara

Co-ordinator	: Dr B Babu
Typist	: C Sasidharan
Driver	: KM Subramanian
A. V. Operator	: Polson Varghese

KAU Press, Mannuthy

Press Manager	: K Rajappan
General Foreman	: G Narayana Pillai
Senior Foreman H. G.	: PI Lonappan
Proof Reader H. G.	: Sherly Sam
Proof Reader	: KK Sadasivan
Computer	: K Santhakumari
Sr. Gr. Printer H. G.	: TP Joseph VR Kumaran
Hr. Gr. Printer	: C Viswanathan NJ Samuel
Lower Gr. Printer	: PR Aravindakshan One post vacant
Sr. Gr. Compositor	: V Subramanian KM Thankamma PA Elsy
Hr. Gr. Compositor	: V Rajendran K Leela
L. G. Compositor	: PM Santha 4 posts vacant
Sr. Gr. Binder	: KR Vijayan
Hr. Gr. Binder	: PT Annie
L. G. Binder	: M Kamalamma G Parvathy Ammal
Copy Holder	: 2 posts vacant
Helper	: VN Hassan

Asst. Professor Agro Forestry : Vacant
 Horticulture : Dr TR Gopalakrishnan
 from 12-7-93 to 14-9-93
 K Ajith kumar from 15-9-93

Supporting/Technical/Ministerial Staff

AO/AA

SO/SOS : K Rangaswamy from 29.5.93
 Assistant Grade II : George kuty from 11.6.93 to 1.6.94
 Typist Grade II : P Thankamani up to 18-3-84
 Ammini (Posted for 6 months)
 Farm Assistant/FS : KM Vijayakumaran
 FS Gr I from 19-1-94 to 28-7-94
 KR Sasidharan from 28-7-94
 (Mutual transfer)
 Farm Supervisor Gr. I : VK Kumaran
 P Padmavathy
 Farm Supervisor Gr. II : A Imbichi Ali
 Lab Assistant : Nil
 Driver : MV Karappan
 Class IV : Silak Bahadur
 K Bapputy
 MC Krishnan
 K Koya
 N Chandu
 T Saidalavi
 O Asokan
 Audio-Visual Operator : KP Koran from 24-6-94

Krishi Vigyan Kendra, Pattambi

Associate Professor (Extn.) : Dr P Rajendran
 relieved on 23-9-93 AN
 (Aqua.) : Dr GS Narayanan
 (Home Sci.) : NK Vimalakumari
 relieved on 21-5-93 AN
 (Hort.) : Dr Salikutty Joseph
 relieved on 1-11-93
 (Extn.) : Dr P Ahamed from 24-9-93
 (Home Sci.) : S Syamakumari from 3-6-93
 (Agron.) : Remesan from 25-8-93
 (Hort.) : VA Celine from 15-11-93
 (Soil Sci.) : Dr Sureshkumar from 7-9-93
 Jr. Asst. Professor (Ani. Sci) : Dr P J Rajkamal from 14-6-93
 Dr Geetha C Jayan
 relieved on 21-5-93
 (Home Sci.) : Jasmine Zachariah
 relieved on 20-10-93

Section Officer : PM Cherukutty
relieved on 31-5-93
MG Rajendra Babu from 31-5-93

Sr. Gr. Asst. : C Rajagopalan
relieved on 31-5-93

Asst. Gr. II : AW Kishore relieved on 31-5-93
K Surendran
Joined duty on 31-5-93

Typist Gr. II : E Gopinathan

Farm Supervisor Gr. II : EL Raichel from 25-1-94
CP Mohammed Abdul Azeez
from 25-1-94

Farm Asst. Gr. II : T Velayudhan
M Rajendran

Driver Gr. III (LDV) : MP Unnikrishnan

Audio Visual Operator : KP Koran relieved on 14-6-93
M Abdu Razak from 3-7-93

Peon : C Gopalakrishnan

Class IV : AP Yesoda from 7-3-94
T Gangadharan
NP Thankamony from 21-2-94
C Parukutty from 23-2-94
V Vasunny from 8-3-94

Hostel Attendant : PK Govindan

ECF Unit, Kayamkulam

Associate Professor : Abraham Varghese

Farm Assistant : EJ Mathew
Girija Vallabhan
Bhanu Prasad
Naseema
AX George
G Shaji

Typist : K Sobhana

Watchman : EV George

Mechanical Sub Division, Vellanikkara

Asst. Exe. Engineer : TK Sugathan

Asst. Engineer (Civil) : KP Baburaj

Overseer : VK Girishkumar

Road Roller Driver : MK Bhaskaran

Section Officer : KS Natarajan upto 30-6-93

Assistants : PN Mohanan upto 11-4-93
P Sreekumar upto 15-3-94
MA Shahida Beegum

Typists	:	VH Umaiva
Peon	:	VA Pareed
Watchman	:	KP Kunjipocker KK Balan
Pump Operator	:	TP Jose Mathew upto 6-6-93 KM Baby KK Francis VB Easaf A Narayanan VK Ramachandran PV Kumaran KV John upto 6-6-93 CM Prabhakaran MS Mohanan CC Velayudhan
Permanent Labourers	:	CR Chandran VV Sahadevan PK Majeed KC Mathew VK Thulaseedharan KK Anandan BV Viswanathan KM Sunil VV Kamala PK Radhakrishnan CR Hariharan Thampi

Electrical Sub Division, Vellanikkara

Assistant Exe. Engineer	:	PM James
Technical Supervisor	:	CK Varghese
Asst. Engineers	:	AJ Anto B Lukose
Lineman	:	KV Ravi
Assistant	:	Naveen Narayanan
Typist	:	OA Ushakumari
Peon	:	KP Kumaran

Engineering Sub Division, Vellanikkara

Asst. Exe. Engineer i/c.	:	TK Sugathan upto 24-6-93
Asst. Exe. Engineer	:	K Savy Joseph from 25-6-93 PM Vasudevan MV Chakoohan M Vijaya Kumari upto 23-6-93 TK Vasudevan from 1-7-93 to

24-1-94

Overseer : KP Baburaj upto 21-5-93
 B Mohammed Irshad
 CK Nazarudheen
 (on LWA 7-11-93 onwards)
 V Unnikrishnan from 21-6-93
 KK Anilan upto 23-6-93
 KG Ajithkumar upto 23-6-93
 KN Sathees from 2-7-93 onwards

Assistant : MS Valsala kumari
 B Ajithkumar upto 18-5-93
 T Jagadeeshan from 18-5-93

Typist : PA Mumtaz

LDV Driver : MA Joseph

Watchman : VA Paily upto 31-10-93
 KK Balan upto 31-10-93
 KP Kunji poker upto 31-10-93
 O Asokan (on working arrangement from KVK Ambalavayal)
 N Chandu upto 14-2-94
 PR Surendran upto 8-7-93
 M Kunji krishnan upto 21-3-94
 C Mukundan Nair

Permanent Labourers : VV Narayanan upto 31-8-93
 (retired from service on 31-8-93)
 CS Pareed upto 30-11-93
 PK Mohan upto 30-11-93
 IR Balan
 PK Arifa
 VH Sulaikha
 KK Sudhi
 KK Ambikavathy

Engineering Sub Division, Mannuthy

Asst. Exe. Engineer : PR Govindan

Asst. Engineer : P Raman
 PM Mohammed Ismail upto 25.6.93
 CI Sali from 21.6.93
 KV Ramanunni from 11.10.93

Technical Supervisor : PK Vijayan
 TS Govindan

Section Officer : EK Bharathy

Assistants : AT Gracy

Typist : K Sathivathi Bai upto 21.5.93
 K Rosey Francis from 21.5.93

Overseer : CA James
 PH Salim
 Mathew M Kizhakkot
 KH Abdul Rehiman upto 15.6.93
 V Unnikrishnan upto 17.5.93
 S Rajendra Prasad from 18.5.93
 KV Sunilkumar from 29.9.93

Pump Operator : MV Parameswaran
 VR Kochu
 VR Parameswaran
 TM Kesavan

Peon : N Man Bahadur

Engg. Sub Division, Vellayani

Asst. Exe. Engineer : EK Gokulan

Asst. Engineer : K Suresh Babu
 promoted to the cadre of Asst.
 Exe. Engineer w. e. f. 29.7.93
 CV Vivekanandan

Overseer (Gr. I) : Harikumar
 Mohammed Abdul Khader

Overseer (Gr. II) : VM Roy
 KV Sunilkumar upto 19.7.93

Section Officer : VM Lathikakumari

Assistant : B Sukesan
 C Chandrika kumari
 upto 16.11.93
 N Valsan

Office Supdt. : P Lathika from 1.6.93

Typist : S Sudhadevi upto 31.5.93

Driver (LDV) : P Reghunathan Nair

Peon : J Thampikunjan

Engg. Sub Division, KCAET, Tavanur

Asst. Exe. Engineer : PM Mohammed Ismail
 from 25.6.93 onwards

Asst. Engineer : TK Abdul Khader
 KT Vasudevan upto 30.6.93
 CV Vivekanandan from 21.5.93 to
 30.9.93
 M Vijayakumari from 1.7.93
 onwards

Overseer : CV Vivekanandan upto 20.5.93
 P Manoj from 17.6.93 onwards
 KK Anilan from 24.6.93 onwards
 AV Kesavan
 CV Poulouse
 CV Ambujan
Assistant : Vacant
Typists : A Mohammed Ali
Driver : AM Abdulkader upto 19.5.93
 PK Kunhiraman from 22.5.93
 onwards
Peon : M Sundaram
 Divakara Panicker

Electrical Sub Division, Vellayani

Assistant Exe. Engineer (Ele) : EK Gokulan
Asst. Engineer (Ele) i/c. : AJ Anto
Overseer : Vacant
Assistants : N Valsan upto 12.7.93 to 16.11.93
 NL Sivakumar from 13.7.93 to
 16.11.93
 Chandrikakumari from 17.11.93
Typist : T Santha
Peon : A Sathyan

KAU School, Vellanikkara

Teaching staff

Headmaster : AJ Abraham
Teacher (Eng. Med.) : KP Thresiamma
 Deborah Cyril
 AJ Lilly
 KS Indiradevi
 Babu Paul
High School Asst. : VC Gracykutty
 Mathew Peter
 Pramodkumar
 Sayedu Pathuma
 CK Indira
 CV Sherly
 (Hindi) : Alvin Joseph
UP School Asst. (Mal. Med.) : TJ Magy
 Najeema Unnikkammu
 KS Leena
 P Rejani
 Rosamma Kurian
 (Hindi) : K Narayani

LP School Asst. (Mal.)	:	V Sasidharan PK Bhaskaran MA Ali MV Mary MK Malika
Nursery School Asst. (Mal.)	:	P Devika DV Sylaja
(Eng.)	:	R Kamala MP Pushpam
Physical Education	:	PK Mohammed Rasheed
Drawing	:	PT Suresh R Radhamony
<i>Non Teaching staff</i>		
Assistant Grade II	:	Maria John
Peon	:	VA Mathew
Ayah	:	KR Sumithra M Soudamini
Sweeper-cum-Attendant	:	C Anitha

Appendix V

LIST OF PUBLICATIONS/RADIO TALKS/ TV PROGRAMMES ATTENDED

College of Agriculture, Vellayani

Books/Booklets

- ✓ Dr MC Nair, Gokulapalan, C and Lulu Das. 'Advances in Mushroom Biotechnology'.
- ✓ Peethambaran, CK and Nair, SK 'Safe use of pesticides' Published by FIB.
- ✓ Nair, SK and Peethambaran, CK, Jeeva valangal. Published by Kerala Agricultural University Publications.

Scientific Articles

- ✓ Kuruvilla Varghese and Iruthayaraj, MR 1994. Nitrogen management in sole and intercropped maize under varying moisture regimes. Proceedings of the abstract of National Symposium on Integrated input management for efficient crop production. Indian Society of Agronomy 22-25 February 94.
- ✓ Kuruvilla Varghese and Iruthayaraj, MR 1993. Effect of water stress at different phenophases of green gram. Agric. Sci. Digest, 13 (2): 87-89.
- ✓ Zapata, FJ, Torrizo, LB, Romero, RO, and Mercy, ST 1993. Cultivo de Anteras de arroz. In cultivo de tejidos en la agricultura Capitulo 24 pp. 534-542 ISBN. 958-9183-15-8 eIAT.
- ✓ Wilson, D, Mercy, ST and Nayar, NK 1994. Diallel analysis in green gram. (*Vigna radiata* (Linn.) Wilezelc). In proceedings of the Sixth Science Congress, January 94 Thiruvananthapuram pp. 135-136.
- ✓ Radha Devi, DS, and Nayar, NK 1992. Gamma ray induced bunch character variation in polygenic character expression in banana variety Nendran (*Musa paradisiaca* L.) Environment and Ecology 10 (4) 990-991.

- Radha Devi, DS and Nayar NK 1993. Direct effect of gamma rays on sprouting in banana variety Nendran (*Musa paradisiaca* L.). Environment and Ecology 11 (1) 200-201.
- Radha Devi, DS and Nayar, NK 1992. Gamma ray influenced variation in polygenic character expression in Banana IBC 9: 165-171.
- Radha Devi, DS 1993. Correlation studies in four improved upland rice varieties. Environment and Ecology 11 (1) 218-219.
- Sverup John, Gopinathan Nair, V, Wilson, D and Suma Bai, DI 1993. 'Thilak' The new high yielding stable sesame variety Proceedings of the VIth Kerala Science Congress.
- Alice Antony, Manikantan Nair, R, and Gopinathan Nair G, 1993. 'Genetic variability and correlation in sugarcane hybrid lines' Journal of Tropical Agriculture 31: 5-8.
- Remamony, KS. and Dale, D 1994. Insect pests of anthurium in Kerala and their control. Paper presented in the First National Seminar on Anthuriums, 8-9 May, 94, Mascot Hotel, Thiruvananthapuram.
- Saradamma, K, Das, NM and Dale, D 1994. Evaluation of the toxicity of some plant extracts against three important crop pests. Proceedings of the VI Kerala Science Congress, Jan. 94, pp. 150-153.
- Gokulapalan, C 1994. 'Other edible mushrooms' KISAN WORLD pp. 37.
- Lulu Das 1994. Evenings more glorified with spicy mushroom snacks. Indian Spices Vol. 30 (4) pp 11-12.
- Kurunakaran, P, Nair, MC, and Lulu Das 1994. Grey blight of Cinnamon. Journal of spices and aromatic crops 2 (1&2) pp. 66-67.
- Lulu Das 1994. Appealing to the eye, delicious to taste. Women's era, pp. 32-34.
- Shilaja and Jayaramiah, KM 1993. Roles performed by Women Agricultural Labourers. Journal of Ext. Edn. (4) 3 Society of Edn. Edn. Tamil Nadu Chapter.
- Shilaja, S Jayaramiah, KM 1993. Role of farm women in Agriculture in Kerala State. Maharashtra Journal of Extension Education XII.
- Santha, AM, Shilaja, S, and Balakrishnan Asan 1993. Technology utilisation and constraints in the maintenance of coconut palms. Indian Coconut Journal XXIV (2).

- Santha, AM, Shilaja, S and Asan, BR. 1993. An analysis of the adoption of improved technologies in banana production by farmers of Kerala. *South Indian Horticulture* 41 (3).
- Kishorekumar, N, Bhaskaran, S, Sobhana, G, and Shilaja, S Presented three theme papers in the National Seminars on Integrated Extension Approach for sustainable Agriculture held on 11-13 at TNAU, Coimbatore.
- Jana, MM, Nadganda, RS, Rajmohan, K and Masearenhas, AF 1994. Somatic embryogenesis in mango varieties. *In vitro plant* 30 (1): 55-57.
- Reghunath, BR, Ortega, JF, Newbury, HJ, and Ford-Lloyd, BV 1993. Methods for increasing the efficiency of seed germination *in vitro* in the fodder legumes tagasarte and escobon. *Seed Sci and Technol.* 21: 225-35.
- Ortega, JF, Reghunath, BR, Newbury, HJ and Ford-Lloyd, BV 1993. Discrimination between groups of tagasarte and ercobon from the canary Islands based on juvenile morphological characters. *Newzealand J. Agric. Res.* 36: 185-95.
- Reghunath, BR, and Priyadarshan, PM 1993. Somaclonal variation in cardamom derived from axenic culture of juvenile shoot primordia. *Acta Horticulturae* 330: 235-39.
- Rajamony, L, Anitha, N, Radhakrishnan, TC, and George, KC 1993. Stability analysis of the diploid banana clones. Paper presented in the Golden Jubilee Symposium, Horticultural Society of India, May, 1993.
- Rajamony, L, Anitha, N, and Radhakrishnan, TC 1993. Evaluation of popular clones of plantain (Musa AAB group) in the humid tropics. Paper presented in the Golden Jubilee Symposium, Horticultural Society of India, May, 93.
- Rajamony, L, George, KC, Anitha, N and Radhakrishnan, TC 1993. Stability and adaptation of banana clones belonging to AAA group. *The Planter* 69: 343-353.
- ✓ Rajamony, L, George, KC, Anitha, N, Radhakrishnan, TC, 1994. Assessment of banana clones of AAB group based on stability and adaptation. *Indian J. Agric. Sci.* 64 (8): 521-26.
- ✓ Rajani M, Amminjappalinde Urava vattumo. *Yojana* Nov. 1992.
- Rajani M, Better firewood stoves for fuel saving. *Yojana* March 1992.

Popular Articles

പു കൃഷിക്ക് ആത്മീയം. മേഴ്സി എസ്. ടി., കേരള കൗമുദി കാർഷിക
 പതിപ്പ് 1993.

- ഗോപിമണി ആർ. 1993. ഫൈറോഫ്തോറ 1, കേരള കർഷകൻ 38 (15)
- .. 1993. .. 1, 2 കേരള കർഷകൻ 38 (16)
- 4, കേരള കർഷകൻ 38 (17)
- ഡങ്കൽ നിർദ്ദേശം, കേരള കർഷകൻ 39 (4)
- വെട്ടുകൽ മണ്ണ്, സ്പൈസസ് ഇന്ത്യ 6 (9)
- കാർഷിക കേരളത്തിന്റെ ശാഖ, കൽപയന്ത്ര 20 (1)
- ടിഷ്യൂകൾച്ചർ, കേരള കൗമുദി കാർഷികപതിപ്പ് 1993
- ഫൈറോഫ്തോറ (5, 6), കേരള കർഷകൻ 38 (19)

'ടിഷ്യൂ കൾച്ചർ' സസ്യപ്രവർദ്ധനത്തിന് പുതിയ വഴിത്തിരിവ്. Sreelatha
 kumari, I. Wilson, D and Reghunath, BR, Kalpadhenu Vol. III
 January to March, 1994.

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 കായിക പ്രവർദ്ധനത്തിൽ ഒരു പുതിയ വഴിത്തിരിവ്. Kalpadhenu 21
 (3): 20-21.

Sreekandan Nair, G and Sheela VL 1994. ചെടിപ്പട്ടിയിൽ മണ്ണു നിറ
 യ്ക്കുവന്ന വിധം. ജനപഥം. February 1994.

Sreekandan Nair, G 1994. തുളസി ഒരു സർവരോഗ സംഹാരി. Panchayati
 Raj, April, 1994.

Prakash, R 'Athichakka—Irumbinte Sekharam' Mathrubhoomi daily
 dtd. 13-4-93.

Prakash, R 'Champakka' Mathrubhoomi daily dated 20-4-93.

Prakash, R 'Phalavargathikalude Uthpadanam Vitharanavum'
 Mathrubhoomi daily dated 27-4-93,

Prakash, K 'Thenginathaikalude Uthpadanam' Mathrubhoomi daily
 daily dated 29-4-93.

Prakash, R, 'Kairaliyum Kanchanayum — Puthiya Nellinangal'
 Mathrubhoomi dated 12-10-93.

Vijaykumar, S and Prakash, R 'Velicham Vitharunna Sasyangal'
 Mathrubhoomi daily dated 19-10-93.

Prakash, R 'Puthiya Sankara Inam Mavinangal' Mathrubhoomi daily
 25-1-94.

Prakash, R 1994. Orchid Krishi—Adayakaramaya Oru Upathozhil'
 Kerala Karshakan Book—39. Vol. 12 March 25.

College of Horticulture, Vellanikkara

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 perception of the importance of linkage activities in the transfer
 of technology of improved rice varieties. Agr. Res. J. Kerala
 30: 102-104.

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- Abraham, K and Mathew, J 1993. Evaluation of betelvine cultivars for host resistance against bacterial leaf spot disease. *South Indian Horticulture* 41:61-66.
- Beena Natesh, Aravindakshan, M and Valsalakumari, PK 1993. Effect of split application of fertilizers in banana. *Musa AAB Nendran South Indian Hort.* 41 (2): 61-63.
- Bridgit, TK, Potty, NN and Marykutty, KC 1994. A management model for the improvement of soil and crop productivity in semi dry rice. *Proc. Vith Kerala Sci. Congr.* 125-126.
- Devadas, VS and Seemanthini Ramadas, 1993. Report of a seedling marker character in bittergourd. *South Indian Hort.* 41 (2): 95-100.
- Geetha, CK, Aravindakshan, M and Wahid, PA 1993. Influence of method of fertilizer application on nutrient absorption by black pepper vines. *South Indian Hort.* 41 (2): 95-100
- Geetha, CK, Aravindakshan, M 1993. Variability in nutrient uptake among black pepper varieties. Abstract proceedings of the Golden Jubilee Symposium - Horticultural Research - Changing Scenario, Bangalore - May 94. p. 118.
- Geetha, CK and Aravindakshan, M 1994. Morphophysiological response of bush pepper to graded levels of N fertilization. Proceedings of the Vith Kerala Science Congress held at Thiruvananthapuram during 27-29 January, 94.
- Geethakutty, PS 1994. Alternative fertilizer use behaviour of rice farmer in Thrissur Dt. Vith Kerala Science Congress, Thiruvananthapuram January 27-29, 94.
- Geethakutty, PS 1994. Self-employment avenues for farm women and their consequences. Paper presented in the National Seminar on Families in Transition. MS University, Baroda, 29-31 March 94.
- Geetha Varghese and Abdul Vahab, M. 1994. Phenotypic stability in wilt resistant brinjal hybrids and their parents. *Proceedings of the 6th Kerala Science Congress*, Thiruvananthapuram 27-29 January 1994, pp. 198-199.

- George, BE, Sreedevi, P and Nair, RV 1994. Performance of ginger cultivars as influenced by shade levels. Abstracts, XIII National Symposium on integrated input management for efficient crop production. 22-25 February 94. P-136.
- George, KM and Sathees Babu, K 1993. Temporal shifts in the production—credit mix of PACS:—An Analysis. *Agricultural Banker*, 16 (3): 22-23.
- George, TE, Anand, N and Singh, SJ 1994. Isolation and identification of two major viruses infecting bell pepper in Karnataka. *Indian phytopath* 46 (1): 24-28.
- George TE and Anand, N 1994. Frequency distribution in recombinant populations of bell pepper x chilli crosses. *Proceedings of the 6th Kerala Science Congress*, Thiruvananthapuram 27, 29 January 94. pp. 190-191.
- Girija, D, Vasavan, MG, Rema Devi, L, Sheela Paul, T and Santhakumari, P 1993. Chemical control of Stackburn burn disease of rice. *J. Trop Agric*. 31: 140-142.
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- "Backyard, poultry Farming" by Dr. A Ramakrishnan on 28/7/93.
- "Kadavalarthal" by Dr Narayanankutty on 28/8/93.
- "Karavapashukkalkulla Sammessritha theetta" by Nutrition Department.
- "Management of mastitis in high yielders" by Dr KM Alikutty on 30/10/93.
- "Common first aids in cattle" by Dr NM Aliyar on 16/6/93.

TV Programmes

- "Quail Farming" by Dr. PS Pushkaran
- "Diseases in poultry" by Dr. KM Ramachandran
- "Kadavalarthal" by Dr. Narayanankutty
- "Tharavuvalarthal" by Dr. Peethambaran and Dr. Narayanankutty

KCAET, Thavanur

Publications

- Modification and performance evaluation of six row rice planter
George Mathew, Asst. Professor
- Design and Development of a power operated paddy weeder for
dry land cultivation—ISAE George Mathew, Asst. Prof.
- ഉണക്കാനൂറും യന്ത്രങ്ങൾ—Santhi Mary Mathew, Asst. Prof. Ajayambika
Devi. SJ

Appendix VI

LIST OF PROJECTS FINANCED BY OUTSIDE AGENCIES DURING 1993-94

<i>Project Title</i>	<i>Location</i>
FACULTY: AGRICULTURE	
<i>ICAR CO-ordinated 75%—25%</i>	
AICRP on Agroforestry	College of Forestry (at LRS, Thiruvazhamkunnu)
AICRP on Nematode Pests	NARP SR, Vellayani
AICRP on Agrl. Drainage	Karumady
AICRP on Spices-Research on Pepper	PRS, Panniyur
AICRP on Cashew—Research on Cashew	CRS, Madakkathara
AICS & CIP—Research on Cardamom	CRS, Pampadumpara
AIC Floriculture Improvement project	College of Horticulture
AICRP on Fruits (Banana)	BRS, Kannara
AICRIP--Double Cropping Main Centre	RARS, Pattambi
AICRIP--Double cropping Sub-centre	ARS, Mannuthy
AICRIP BHP & GSV Merger Sub-centre	RRS, Moncompu
AIC Pulses Improvement Project	RARS, Pattambi
AIC Vegetable Improvement project	College of Horticulture
AICRP on Forage Crops	NARP SR, Vellayani
AICRP on BCCP	College of Horticulture
AICRP on Sugarcane	SRS, Thiruvalla
AICARP Project Directorate of Cropping Systems Research	CSRC, Karamana Karamana & ECF Unit, Kayamkulam

AICRP on Water Management	ARS, Chalakudy
AICRP on Weed Control	College of Horticulture
AICRP on Medicinal & Aromatic Plants	-do-
AICRP on Pesticide Residue	NARP SR, Vellayani
AICRP on Oilseeds for groundnut and sesamum	RRS, Kayamkulam
All India Network project on Agricultural Ornithology	College of Horticulture

ICAR Co-ordinated Project (100%)

NSC Breeder Seed Production Unit	RARS, Pattambi
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ICAR Adhoc

Standardisation of agro-techniques in lemongrass and palmarosa for maximising oil production	College of Horticulture
Survey collection, evaluation, conservation and cataloguing of germplasm of certain under exploited perennial vegetables.	-do-
Evaluation of vesicular arbuscular mycorrhiza as bio-control agent against wilt diseases of pepper.	NARP SR, Vellayani
Crop weather models for Cashew	RARS, Pilicode
Nitrogen fixing bacteria associated with plantation and orchard crops of Kerala.	NARP SR, Vellayani
Homestead agroforestry systems of Kerala productivity of the extent homestead models and increasing the efficiency of the models.	-do-

Rainwater conservation in coconut based agro-forestry systems by water harvesting techniques.	College of Forestry
Standardisation of bare-root nursery techniques of some important tree species used for agro-forestry planting in Kerala	-do-
Evaluation of cultivated and wild rice germplasm for biotic stresses	RRS, Moncompu
Evaluation of tomato for summer season	College of Horticulture
Epidemiology of honey bee disease in Kerala and its management	NARP SR, Vellayani
Cytogenetic investigations of <i>Kaempferia galanga</i> L, <i>Piper longum</i> L. and <i>Andrographis paniculata</i> Brum	College of Horticulture
An evaluation of group management techniques in Agriculture adopted to enhance production and productivity of paddy in Kerala	College of C & B
<i>Non-ICAR (100%) Cad. India Ltd</i>	
Cocoa research collaboration project between KAU and Hindustan Cocoa Products Ltd	College of Horticulture
<i>Central Silk Board</i>	
Standardising sericultural practices for the agro-climatic conditions of Kerala	NARP SR, Vellayani
All India Co-ordinated experiments on sericulture at Vellanikkara	RARS, Ambalavayal
All India Co-ordinated experiments on sericulture at Vellanikkara	College of Horticulture
Tissue culture research on cocoa	-do-

Dept. of Biotechnology

Tissue culture research
on Black pepper

College of Horticulture

Micropropagation of the
tree spices in Kerala
(Clove and Nutmeg)

NARP SR, Vellayani

Management of root dis-
eases of important spice
crops of Kerala with VA
mycorrhiza

-do-

Rhizobium pulses asso-
ciation development of
efficient strains of Rhizo-
bium suitable for acid soil
conditions.

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Dept. of Agri. & Co-operation

Central sector scheme for
integrated programme for
the development of spices
(Panniyur & Ambalavayal)

PRS, Panniyur

Central scheme for
development of medicinal
and aromatic plants

AMPRS, Odakkali
& COH, Vellanikkara

Central Sector Scheme for
the Integrated Cashew
Development—Establish-
ment of Madakkathara
Centre

CRS, Madakkathara

Establishment of Central
Sector Scheme for Inte-
grated Cashew develop-
ment

RARS, Pilicode

Dept. of Sci. and Technology (GOI)

Estt. of a National Centre
for medium range weather
forecasting on experi-
mental basis at KAU main
campus

College of Horticulture

Crop growth simulation
models of rice

RARS, Pilicode

Agro Advisory Service at
Agro Meteorological field
unit established at KAU

College of Horticulture

Dept. of Atomic Energy, GOI

Studies on coconut palm
in coastal Kollam district
of Kerala

-do-

Directorate of Cocoa, Arecanut and Spices

Establishment of the Nursery for distribution of budded Cocoa plants and hybrid seedlings at the KAU College of Horticulture

EEC

Research and development and breeder seed production programme of Kerala Horticulture development Programme -do-

ICFRE (GOI)

Studies on intercropping of forest trees with fast growing nitrogen fixing tree species College of Forestry

Kerala Forest Development Fund

Clonal propagation of Rosewood through tissue culture -do-

Standardisation of nursery techniques of selected tropical forest tree species -do-

Ministry of Health and Family Welfare (GOI)

Centralscheme for providing assistance for development and cultivation of medicinal plants AMPRS, Odakkali

Ministry of Water Reso. (GOI) and CADA (GOK)

Pilot project on farm water management studies ARS, Chalakudy

Potash Research Institute of India

Standardisation of plant part as an index of potassium status in banana, Musa Nendran NARP SR, Vellayani

Root activity studies on rubber using P 32 as a tracer. College of Horticulture

STEC/STED (GOK)

Investigations on the diseases of bamboo seeds in Kerala.

NARP SR, Vellayani

Investigations on the occurrence of recombinants/hybrids in phytophthora and their role in the intensity of phytophthora diseases in plantation crops.

-do-

Investigations on the changes in the physico-chemical properties of coconut garden seeds due to continuous inter-culture of fodder crops.

-do-

Evaluation of acidity parameters in wet land soils of Kerala in relation to nutrient availability.

-do-

Utility value of foldable solar dryer at household level/farm level Standardisation studies.

-do-

Bio-ecological studies on the odonata (Dragon flies) with special reference to their predatory potential in the biological control of important rice pests.

College of Horticulture

Monitoring of pesticide residues in milk and milk products in Kerala.

NARP SR, Vellayani

Impact of sustainable farming practices on soil properties and crop productivity.

-do-

Potential of Bioagents (Bacillus macerans and Bacillus circulans) for the control of root knot nematode in the field.

-do-

Identity of phytophthora affecting coconut and pepper and their bio control.	NARP SR. Vellayani
Studies on pesticide residues in meat body fat, blood and various organs of animals slaughtered for meat purpose.	-do-
Pesticide induced histopathological changes in selected fresh water fishes of Kuttanad, Kerala.	College of Fisheries
<i>Taxes Dept.</i>	
Studies on preservation and quality improvement of toddy.	College of Horticulture
<i>USDA/FERRO</i>	
Light utilization and canopy nitrogen use efficiency of component crops in some selected agroforestry systems.	College of Forestry
<i>Non ICAR (75%, 25) International Ref. Info. Cent. N' landa</i>	
Establishment of soil reference, collections for training, extension and research purposes at KAU.	NARP SR, Vellayani
FACULTY : AGRICULTURAL ENGINEERING	
<i>ICAR Co-ordinated (75%-25%)</i>	
AICRP on Farm Implements and Machinery.	KCAE & T, Tavanur
AICRP on Energy requirements in Agriculture sector.	-do-
<i>Non ICAR (75%-25%) CAPART</i>	
CAPART Scheme--Modification of 'Petty and Para' to improve its efficiency and economy. (Functioning at COH, VKA.)	
FACULTY : FISHERIES	
<i>Non ICAR (100%) Dept. of Fisheries, (GOK)</i>	
Induced maturation and spawning penaeid prawns for commercial level seed production.	College of Fisheries

FACULTY : VETERINARY & ANIMAL SCIENCES

ICAR Co-ordinated (75%-25%)

AICRP on Poultry	College of Veterinary and Animal Sciences
AICRP on Pigs	PBF, Mannuthy
Field progeny testing project at Mannuthy.	College of Veterinary and Animal Sciences

ICAR Adhoc.

Progeny testing pro- cedures in cross-bred cattle utilizing information from both large and very small herds.	-do-
Utilization of elephant energy with enhanced system efficiency.	-do-
Studies on blood groups and biochemical polymor- phism in cattle.	-do-
Nutrient requirements of Broiler rabbits.	-do-
Conservation of germ- plasm of Vechur cattle of the coastal area and dwarf cattle of the high range of Kerala.	-do-

Non-ICAR (100%) Dept. of Animal Husbandry (GOK)

Survey to asses the econo- mic loss due to aflatoxi- crosis in dairy cattle in Kerala.	College of Veterinary and Animal Sciences
Investigations on mortality of Ducks in Kuttanad, Kerala.	-do-
Ascitic syndrome in poultry.	-do-
Schistosomiasis in cattle and buffaloes in Thrissur and Palakkad districts.	-dc-

A comparative study of the diagnostic techniques to evolve a simple rapid method for the diagnosis of rabies in domestic animals.	College of Veterinary and Animal Sciences
Etiology, diagnosis and control of Mastitis in Crossbred Cattle.	-do-
Kid Mortality	-do-
<i>STEC/STED (GOK)</i>	
Assessment of the mortality pattern in livestock and poultry.	-do-
<i>USDA/FERRO</i>	
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
KVK, Pattambi	RARS, Pattambi
KVK, Ambalavayal	RARS, Ambalavayal
Manpower Development Scheme	Vellayani, Vellanikkara
ICAR Golden Jubilee celebration—Lab-to-land programme.	Mannuthy
ICSSR Project—Transfer of Agricultural Technology evolved by KAU.	-do-
Popularising solar cookers—Trysem project on rabbit for processing.	Vellayani, Mannuthy

Organisation of short course on recent advances in tropical vegetable production.

Vellanikkara

KSCB Diamond Jubilee Endowment—Economic viability of Primary Agricultural Credit Co-operatives in Kerala.

College of Co-operation and Banking, 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 District.

-do-

All India Co-ordinated Project on low cost preservation of horticultural products.

College of Agriculture, Vellayani

Appendix VII

STATUTE AMENDMENTS ISSUED DURING THE PERIOD 1993-94

"Amendments to SRO No. 447/72 issued vide
GA/E3/7756/90 dated, 13.5'93".

Appendix VIII

WORKS EXECUTED DURING THE YEAR 1993-94

Name of work	Stage of work	Expenditure
1	2	2
Vellanikkara		
Construction of Central Library Building (C.P.W.D. Work)	Work in progress	50,00,000
Construction of Auditorium (")	do	30,00,000
Maintenance & repairs to the Ladies Hostel Block No. I & II Dining Block at Main Campus, Vellanikkara	Completed	2,71,826
Providing a cabin for Chief Security Officer in ground floor of Academic Block No. I, Main Campus, Vellanikkara	do	46,853
Maintenance of Water Supply System at Main Campus, Vellanikkara including urgent replacement of damaged pipe lines, valve etc.	do	14,19,652
Electrical maintenance and repairs to the existing installations and providing additional facilities to the Academic Block No. I, at M. C., Vellanikkara	do	1,38,856
Providing drain to the existing type-I duplex quarters	do	58,437
Providing a Cabin for Ammonia printing & cash counter in Acad. Block-I	do	42,712

1	2	3
Providing EPABX System to the M. C. Vellanikkara	Completed	4,59,366
Construction of a hostel and dining Block for College of Forestry, Vellanikkara	do	24,50,998
Construction and Electrification to type-III Quarters (Flat) at Vellanikkara	do	3,84,672
Construction of Teachers Hostel Block No. II—Electrification	do	6,80,295
Rewiring the College Building at College of Forestry	do	76,150
Modification and improvements supplying and fixing of furniture to the Conference Hall of the Academic Block No. I	do	3,91,640
Rewiring the Boys Hostel Block I and II and Kitchen block	do	5,30,282
Construction of a basket ball court at M. C. Vellanikkara	do	1,32,474
Supplying and installation of pipeline from GL Tank near Main Office building at M. C. Vellanikkara		3,40,214
Construction of Compound Wall along the NH from Estate Gate to type-IV A qrs. and Watchmen's Cabin	do	96,823
Construction of Compound wall along north western boundaries near K.A.U. School, Vellanikkara	do	72,199
Construction of Labourers waiting shed at Instructional Farm, Vellanikkara	do	1,67,727
Special repairs and maintenance to Pump House	do	1,86,146

1	2	3
Mannuthy		
Electrical maintenance to the V. C's Residence	Completed	27,326
Special repairs to KAU Guest House—Furnishing & Air conditioning etc.	do	2,35,077
Maintenance of W/S system and Pump House	do	6,14,048
Maintenance of AICRP Hatchery building layer house, brooder house and cage house No. II & III, Mannuthy	do	1,30,667
Maintenance to the duck houses at KAU Poultry Farm	do	1,00,720
Construction of a waste pit and drains for the flat type qrs.	do	73,591
Construction of a leech pit for PG & C & B Hostel for Men	do	50,506
Reconstruction of damaged compound wall at western side-- Southern & Northern side of the gate	do	82,919
Modification of Computer room for C & B	do	71,898
Construction of a lab-cum-administrative building at AICRP Poultry	do	14,94,107
Modification of old piggery shed to quarantine shed for Live-stock Farm	do	1,73,520
Supply and erection of machineries at Meat Technology Building	do	4,17,811
Construction of a buck shed at AI Centre	do	1,04,267
Construction of additional class rooms (2 Nos.) and Seminar Hall at College of Vety. & Animal Sciences, Mannuthy	Nearing completion	9,87,528
Additional space of Virology and Toxicology lab at CV & AS	do	13,79,363

1	2	3
Construction of two lab rooms on the 1st floor of Dairy Plant	Completed	2,24,288
Providing Kerbs to the existing road from main gate to K.A.U. Guest House, Mannuthy	do	1,05,575
Providing street light facilities along the main road from Farm Gate to type VI quarters	do	1,48,237
Rewiring and additional fittings to U. G. Hostel (Old).	do	2,10,090
Providing yard light facilities around V. C's residence	do	57,856
Construction of open pig styes, furrowing houses at Pig Breeding Farm	Nearing completion	52,45,691
Construction of G.L. Tank for irrigation purpose (Near V.C's residence)	do	62,234
Construction of Compound wall at southern side of yellow garden at A. R. S., Mannuthy	do	97,316
Construction of Sales Centre, Mannuthy—providing additional facilities, service connection, fencing—providing green house shade, drinking water, irrigation facilities etc.	do	12,25,520
Construction of a Kitchen block of Sales Centre—Electrification	do	1,48,344
College of Agriculture, Vellayani		
Special repairs and maintenance to the College building	do	2,35,772
Improvements to water supply arrangements, relaying water supply line to teachers quarters type V, VI and VII	do	83,759

1	2	3
Urgent repairs to toilet block attached to the extension and Statistics Department	Completed	1,72,489
Special repairs and maintenance to the Pathology building	do	2,37,150
Maintenance and repairs (M & R) to the teachers hostel (Flat)	do	2,71,069
Maintenance and repairs to the Office building (Balance work)	do	2,47,950
Extension, modification and electrification to the existing hall for Indoor Stadium	do	24,52,652
Rewiring of type VI quarters (9 nos.)	do	1,42,939
Providing welded mesh to windows and ventilators in the 1st floor, construction of compound wall and fencing rear portion of U. G. Hostel	do	19,895
Construction of a Silk worm rearing house	do	2,45,966
Kelappaji College of Agricultural Engineering and Technology, Tavanur		
Construction of Academic Block at KCAET, Tavanur	Work in progress	15,68,463
Renovation of Library building	Completed	1,09,591
Construction of Type VI Qrs. (electrification)	do	1,09,781
Black topping of campus road	do	4,71,982
Construction of play field	do	3,84,514
Electrification of workshop building for fabrication, fitting and processing of post harvest lab	do	2,61,270
Construction of a Farm machinery yard	do	1,25,515

1	2	3
Pattambi		
Maintenance and repairs to Office building	Completed	1,66,781
Special repairs to the Office and Hostel KVK Pattambi	do	1,02,895
Construction of a Canteen building, R. A. R. S. Pattambi	do	3,60,491
Construction of three insectories, R. A. R. S. Pattambi	do	66,072
Modification to the Guest House into Sales Connter	do	53,819
College of Fisheries, Panangad		
Construction of Academic Block (CPWD)	Work in progress	45,00,000
Construction of labourers waiting shed	Completed	81,362
Electrification to Computer room	do	56,678
Providing compound wall along the two sides of road near colony	Work in progress	89,207
Providing chain-link fencing around the hatchery and research ponds	Completed	97,485
Construction of 20 Nos. of G. L. Tank for enhancement of production of ornamental fishes	do	34,960
Ambalavayal		
Construction of a climate controlled green house at R.A.R.S., Ambalavayal	do	4,38,000
Construction and electrification of store building	do	1,41,889
Remodelling the existing building for bio-technology lab	do	1,61,836

1	2	3
R. A. R. S., Kumarakom		
Construction of a tank for chinese hatchery (balance) and fencing around the hatchery	Completed	1,02,184
Improvements to existing water supply line—Construction of a pump house	do	53,197
Construction of a labourers waiting shed	do	1,05,564
C. B. F., Thumburmuzhi		
Special repairs to cattle shed	do	1,57,489
Veterinary Hospital, Kokkalai		
Providing weather proof course over the roof of hospital building (Bal.) and improving drainage facilities	do	53,807
A. M. P. R. S., Odakkali		
Construction of Type IV Qrs. (Duplex)	do	6,35,502
Soiling, metalling and black topping of approach roads	do	1,17,620
C. R. S., Pampadumpara		
Construction of a building for Canteen-cum-recreation club	do	89,260
Soiling metalling and black topping of roads	do	764
Kottarakkara		
Soiling, metalling and bitumenisation of approach roads and construction of side drains	do	84,376
R. A. R. S., Pillicode		
Construction of labourers waiting shed	do	99,008

1	2	3
Nileswar		
Rewiring the Office, Lab., Store, Canteen, Farm Building and Cattle shed of R. A. R. S., Nileswar	do	71,645
Construction of compound wall to protect the old T x D hybrids at C. R. S., Nileswar	do	1,49,979
R. R. S., Kayamkulam		
Construction of retaining wall and providing fencing (balance)	do	1,99,621
R. R. S., Moncompu		
Conversion of existing small permanent shed into diagnostic centre and lab.	do	1,45,833
Construction of a retaining wall and chain link fencing	do	43,067
Vyttila		
Construction of labourers waiting shed	do	88,882
R. R. S., Thiruvalla		
Construction of a Farm Office-cum-vehicle shed at R. R. S., Thiruvalla	do	1,86,885
Construction of a retaining wall on the rear side of Office building	do	13,110
L. R. S., Thiruvazhamkunnu		
Construction of a P. G. Hostel	Work in progress	4,53,306
C. R. S., Madakkathara		
Construction of a G. L. Tank for irrigation purposes	Completed	1,42,466