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2003-'04



Kerala Agricultural University

KAU (P.O.) - 680 656, Vellanikkara, Thrissur

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July, 2004

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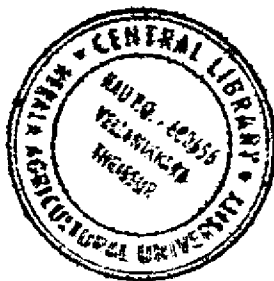
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CONTENTS

GENERAL REPORT	1
Chapter I	
GENERAL ADMINISTRATION	13
Chapter II	
EDUCATION	
Faculty of Agriculture	
College of Agriculture, Vellayani.	17
College of Horticulture, Vellanikkara	27
College of Agriculture, Padannakad, Kasaragod	52
College of Forestry, Vellanikkara.	56
College of Co-operation, Banking and Management, Vellanikkara	62
Faculty of Veterinary and Animal Sciences	
College of Veterinary and Animal Sciences, Mannuthy:	66
College of Veterinary and Animal Sciences, Pookot, Wayanad	79
College of Dairy Science & Technology, Mannuthy.	81
Faculty of Fisheries	
College of Fisheries, Panangad.	84
Faculty of Agricultural Engineering & Technology	
Kelappaji College of Agricultural Engineering and Technology, Tavanur.	90
KAU High School, Vellanikkara	96
Chapter III	
RESEARCH	
Faculty of Agriculture	
Southern Zone	
NARP (Southern Region), Vellayani.	98
Instructional Farm, College of Agriculture, Vellayani.	121
Cropping Systems Research Centre, Karamana.	124
Coconut Research Station, Balaramapuram.	129
Farming Systems Research Station, Sadanandapuram	131
Soil Conservation Research Station, Konni	138
Central Zone	
Regional Agricultural Research Station, Pattambi.	140
Cashew Research Station, Anakkayam.	150
Agricultural Research Station, Mannuthy.	152
Cashew Research Station, Madakkathara.	155
AICRP on Weed Control, Vellanikkara.	158
AICRP on M & AP, Vellanikkara.	162
AICRP on Biological Control of Crop Pests and weeds.	164
Agronomic Research Station, Chalakudy.	167
Aromatic and Medicinal Plants Research Station, Odakkali.	173
Pineapple Research Station, Vazhakkulam.	175
CSR Sub Centre (ECF Unit) Vadakkenchery.	180
Banana Research Station, Kannara.	184
Instructional Farm, Vellanikkara	188
Cadbury KAU Co-operative Cocoa Research Project, COH, Vellanikkara.	189

Northern Zone		
Regional Agricultural Research Station, Pilicode.	....	191
Pepper Research Station, Panniyur.	....	196
High Range Zone		
Regional Agricultural Research Station, Ambalavayal.	....	201
Cardamom Research Station, Pampadumpara.	....	205
Special Zone of Problem areas		
Regional Agricultural Research Station, Kumarakom.	....	209
Rice Research Station, Moncompu	....	219
Onattukara Regional Agricultural Research Station, Kayamkulam.	....	225
Rice Research Station, Vyttila.	....	229
Sugarcane Research Station, Thiruvalla.	....	231
All India Co-ordinated Research Project on Agricultural Drainage, Karumady	....	233
Faculty of Veterinary and Animal Sciences		
Centre for Pig Production and Research, Mannuthy.	....	235
University Livestock Farm & Fodder Research Development Scheme, Mannuthy.	....	237
KAU Dairy Plant, Mannuthy.	....	238
AICRP on Poultry, Mannuthy.	....	239
University Goat and Sheep Farm, Mannuthy.	....	241
Centre for Advanced Studies in Poultry Science, Mannuthy	....	246
Cattle Breeding Farm, Thumburmuzhi.	....	249
Livestock Research Station, Thiruvazhamkunnu.	....	251
Centre for Advanced Studies in Animal Genetics & Breeding, Mannuthy.	....	253
University Veterinary Hospital, Kokkalai.	....	258
Regional Cattle Infertility Research Centre, Kozhikode.	....	259
Faculty of Fisheries		
Fisheries Station, Puduveypu.	....	260
Regional Fisheries Research and Extension Centre, Kozhikode.	....	262
Chapter IV		
EXTENSION	....	263
Chapter V		
CENTRAL LIBRARY AND INFORMATION SYSTEM, VELLANIKKARA	....	284
Chapter VI		
DIRECTORATE OF STUDENTS WELFARE, MANNUTHY	....	285
Chapter VII		
DIRECTORATE OF PHYSICAL PLANT, VELLANIKKARA	....	288
Chapter VIII		
KAU ESTATE, VELLANIKKARA	....	294
PLANT PROPAGATION AND MANAGEMENT UNIT, VELLANIKKARA	....	295
Chapter IX		
FINANCE AND ACCOUNTS	....	296
APPENDICES		
I. List of General Council Members	....	299
II. List of Staff at Headquarters at Vellanikkara	....	304
III. List of Staff in Various Campuses	....	313
IV. Externally aided Research Projects operated under Directorate of Research	....	408

GENERAL REPORT

The Executive Committee of the Kerala Agricultural University presents to the General Council, the Annual Report of the University for the year 2003-2004 (1st April 2003 to 31st March 2004).

The report pertains to the general administration, education, research, extension, library and information service, students welfare, engineering works, estate and campus development and finance and accounts. The lists of members of the statutory authorities, staff at various campuses, projects operated under Directorate of Research are also appended.

Officers of the University

Designation	Name	Period
Vice-Chancellor	Prof. K.V. Peter	1.4.2003 to 5.6.2003
		7.7.2003 to 23.7.2003
		11.9.2003 to 31.3.2004
Registrar	Sri.C. Ramachandran IAS	6.6.2003 to 6.7.2003*
		24.7.2003 to 10.9.2003*
		1.4.2003 to 21.5.2003*
		25.5.2003 to 24.1.2004
Comptroller	Smt. Chandramathy Amma P. Sri. O.P. Kaler IFS	6.2.2004 to 31.3.2004
		25.1.2004 to 5.2.2004*
		1.4.2003 to 5.7.2003
Director of Extension	Smt. P.Chandramathi Amma	14.7.2003 to 31.3.2004
		6.7.2003 to 13.7.2003*
Director of Research	Dr.A.I. Jose Dr.R. Vikraman Nair	1.4.2003 to 31.3.2004
		1.4.2003 to 17.9.2003*
Director of Physical Plant	Dr.C. Sundaresan Nair	20.10.2003 to 13.2.2004
		18.9.2003 to 19.10.2003*
		14.2.2004 to 31.3.2004
		1.4.2003 to 31.3.2004*
Director of Students Welfare	Sri.P.R. Govindan Dr.J. Abraham	1.4.2003 to 7.5.2003*
		8.5.2003 to 31.3.2003*
Dy.Dir. of Students Welfare Director (Acad & P.G. Studies)	Sri.O.K. Paul Dr.M.Achuthan Nair Dr.P.A.Wahid	2.5.2002 to 31.3.2003
		1.4.2003 to 31.3.2004*
		1.4.2003 to 10.4.2003*
University Librarian Dean (Agri)	Dr.P.A.Wahid Dr.K.Pushkaran Smt.M.C.Lalitha Dr. G. Sreekantan Nair	16.5.2003 to 6.9.2003
		11.4.2003 to 15.5.2003*
		7.9.2003 to 31.3.2004*
		1.4.2003 to 1.3.2004*
		1.4.2003 to 11.8.2003
Dean (Veterinary)	Dr. A. N. Rema Devi Dr. C. K. Peethambaran Dr. C. Sundaresan Nair	12.8.2003 to 31.10.2003*
		1.11.2003 to 12.12.2003*
		1.4.2003 to 31.3.2004*
Dean, (Agri. Engineering)	Dr.E.Nanu, Professor Dr. K. John Thomas Dr. C. P. Mohammed	1.4.2003 to 20.10.2003 21.10.2003 to 31.3.2004*

*in charge

Dean (Fisheries)	Dr.D.Damodaran Namboodiri	1.4.2003 to 31.3.2004*
Associate Dean (Hort)	Dr. A. Sukumara Varma	1.4.2003 to 10.7.2003
	Dr. GSLHV Prasada Rao	11.7.2003 to 31.3.2004*
Associate Dean (Forestry)	Dr.Luckins.C.Babu	1.4.2003 to 31.3.2004*
Associate Dean (CCB&M)	Dr.M.Mohandas.	1.4.2003 to 31.3.2004*
Associate Dean,	Dr. M. Abdul Salam	1.4.2003 to 23.9.2003*
COA, Padannakkad	Dr. Joseph Philip	24.9.2003 to 31.3.2004*
Associate Dean, CV&AS,	Dr.P.P.Balakrishnan	1.4.2003 to 31.3.2004*
Pookode		
Associate Dean, CDST,	Dr.V.Prasad	1.4.2003 to 31.3.2004*
Mannuthy		

*in charge

EDUCATION

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

Name of College	Courses offered
College of Agriculture, Vellayani	B.Sc.(Ag), M.Sc (Ag.), M.Sc. (Hort) & Ph.D M.Sc (Home Sc.)
College of Horticulture, Vellanikkara	B.Sc.(Ag), M.Sc (Ag.), M.Sc. (Hort) & Ph.D M.Sc (Home Sc.) M.Sc.(Ag. Stat)
College of Agriculture, Padannakkad	B.Sc. (Ag)
College of Veterinary & Animal Sciences, Mannuthy	B.VSc & A.H., M.VSc and Ph.D
College of Fisheries, Panangad	B.F.Sc and M.F.Sc
Kelappaji College of Agri. Engineering & Technology, Tavanur	B.Tech (Agrl. Engineering) and M.Tech (Agrl. Engineering)
College of Co-operation, Banking and Management, Vellanikkara	B.Sc. (C & B) and M.Sc. (C & B)
College of Forestry, Vellanikkara	B.Sc. (Forestry) and M.Sc.(Forestry)
College of Dairy Science and Technology, Idukki	B.Tech (D.Sc. & Tech)
College of Veterinary & Animal Sciences, Pookode, Waynad	B.V.Sc & A.H.

Admission

Students are admitted to the U.G. courses of the University except B.Sc (C&B) on the basis of rank obtained in the common entrance examination conducted by the Government of Kerala. In the absence of common entrance test for B.Sc (C&B), University conducted, the admission based on the ranks obtained by students at Plus 2 level. For PG courses, selections are made based on entrance examination conducted by the Kerala Agricultural University. Semester system of instruction continued in all the colleges. A statement showing number of students admitted and passed out in various courses offered by the University during the report period is given below:

<i>(A) UG Programme</i>	<i>Admitted</i>	<i>Passed out</i>
B.Sc (Ag)	147	162
B.VSc.& AH	122	94
B.Sc. (Forestry)	17	9
B.F.Sc	50	39
B.Sc (C & B)	40	32
B.Tech (Agrl. Engineering)	30	21
B.Tech (DS)	23	27
Diploma in Dairying	30	28
Total	459	412
<i>(B) PG Programmes</i>		
M.Sc (Ag.)	59	85
M.Sc (Hort)	18	22
M.Sc. (Forestry)	4	3
M.Sc. (C&B)	5	2
M.Sc. (H.Sc.)	8	11
M.Sc. (Ag. Statistics)	2	0
M.FSc.	5	1
M.VSc.	56	62
M. Tech.	1	1
Total	158	187
<i>(C) Ph.D Programme</i>		
Ph.D (Agri)	18	23
Ph.D. (Vety.)	1	4
Total	19	27

A new P.G. programme M.Sc. (Ag.) Plant Bio-technology has been commenced at College of Horticulture, Vellanikkara and College of Agriculture, Vellayani during the report period.

Extra-curricular activities of the students and co-curricular activities were co-ordinated by the Director of Students Welfare through physical education teachers and other teachers of the various colleges.

The Kerala Agricultural University continued to be a member of the Association of Indian Universities and the Indian Agricultural Universities Association, New Delhi. The Kerala Agricultural University is to host the next South Zone Vice-Chancellor's conference at Main Campus next year.

RESEARCH

The Kerala Agricultural University undertakes fundamental, applied and adaptive research to develop technologies for the establishment of sound and viable farming systems suitable for the homesteads and other farming situations of Kerala. Research work is concentrated on thrust areas identified. In addition to State funds, the University receives assistance from ICAR, World Bank, Departments of Electronics, Science and Technology, Biotechnology, STED, GoK, Commodity Boards and various other agencies.

The research programmes of the university are channelised through Regional Agricultural Research Stations so as to conduct location-specific, production-oriented works in different agro-climatic zones of the state. The following are the six RARSS functioning in the University.

<i>Zone</i>	<i>Regional Station</i>
Northern Zone	: RARS, Pilicode, Kasaragod District
Central Zone	: RARS, Pattambi, Palakkad District
Southern Zone	: RARS, Vellayani, Thiruvananthapuram District
Special Zone of Problem Areas	: RARS, Kumarakom, Kottayam District
High Range Zone	: RARS, Ambalavayal, Wynad District
Onattukara Zone	: RARS, Kayamkulam, Alappuzha District

Dr.R.Vikraman Nair continued as Director of Research i/c. Dr.C.Sundaresan Nair continued as Assoc. Director of Research (AR&T) upto 11-12-2003. Dr.C.K.Peethambaran, took charge as Associate Director of Research (AR&T) i/c. on 06-02-2004. Dr.M.Achuthan Nair, took charge as Associate Director of Research (Farms) i/c. on 06-02-2004 and Dr.K.V.Athman took charge as Associate Director of Research.(V&AS) i/c. on 09-02-2004.

The Associate Directors of Research in charge of the various zones were:

Southern Zone, Vellayani	:	Dr.P.Saraswathy
Special Zone of problem areas, Kumarakom	:	Dr.P.J.Joy
Central Zone, Pattambi	:	Dr.P.V.Balachandran
High Range Zone, Ambalavayal	:	Dr.K.C.Iype
ORARS, Kayamkulam	:	Dr.D.Alexander

The details of EAPs as on 31-03-2004 is as follows:

1. ICAR Co-ordinated projects	:	35
2. ICAR Ad-hoc projects	:	27
3. NATPs	:	30
4. Other EAP	:	155

RESEARCH HIGHLIGHTS

CENTRAL ZONE

RARS, Pattambi

Ninety eight accessions of short, medium and long duration rice groups were maintained *in situ*, characterized and catalogued and transferred to Long term storage facility of NBPGR Reg. Centre, Thrissur.

A promising dwarf photoperiod sensitive culture, Cul. 20 D1 (a mutant of Chitteni) forwarded to farm trials out-yielded the check at all the 7 locations at Thrissur and Ernakulam districts.

In experiments on varietal combinations Swarnaprabha + Makaram and C3-2+Makaram out yielded the check (farmers combination) Chenkayama + Chettadi and the other three varietal combinations.

The seed quality of 812 samples submitted by the Dept. of Agriculture and Seed production centres of the University were analysed during 2003-2004.

A total of 103.97 quintals of Breeder seeds of various IIYVs popular in the state was produced and distributed for multiplication in the seed production chain during 2003-2004.

The TAR-IVL Programme was implemented in two villages of Palakkad District. Rice variety *Harsha* assessed during first crop season as a dry sown crop gave 2.70 to 3.57 t/ha grain yield compared to 2.0 to 2.4 tons obtained from varieties like Kattamodan and Kunjukunju.

Bush type cowpea (variety *Pusa Komal*) when sown along with rice under dry sowing conditions provided green matter of 1.8t/ha. This technology along with use of pre emergent herbicide pretilachlor @ 1 kg ai/ha could save costs upto Rs.650 per hectare.

Use of *Trichogramma* egg cards for management of rice stem borer and leaf folder was effective in managing the pest problem.

It was observed that seed yield of cowpea was significantly influenced by thiourea application. 500 ppm TU seed soaking + TU spraying at vegetative and at flowering stage increased the yield of cowpea by 26% and net return by 50%.

Banana Research Station, Kannara.

A clonal selection of Nendran termed 'Manjeri Nendran II' with higher bunch weight, tolerance to Sigatoka leaf spot and suitable for annual cropping was identified and is under farm evaluation.

B:C ratio was the highest for the spacing 2m x 3m with three plants per pit in Nendran and 1.8m x 3.6m with three plants per pit in Robusta.

Effective management measures were formulated against the Panama Wilt disease. Drenching of carbendazim 0.22% or carbendazim 2% (3 ml) injection at 5th, 7th and 9th month after planting effectively controlled the disease.

Effectiveness of neem based insecticidal preparations in controlling the pseudostem borer was confirmed.

Agronomic Research Station, Chalakudy

Studies on production potential of rice under different moisture regimes in farmers field revealed that application of silica and higher dose of K under irrigation at 3 days after disappearance of ponded water significantly increased rice yield by 21 to 98% over control. Pest and disease pressure was also low in treatment plots.

Comparative studies on wetting front advances of soil moisture under surface and sub-surface drip irrigation for different discharge rates showed that the lower the discharge ratio, wider was the area wetted. Subsurface application was found to conserve 3% more moistures than that under surface application.

In 'Integrated nutrient management studies for rice', vermicompost had significant influence on yield.

Sprinklet irrigation is very effective and economic in increasing the yield of cowpea grown in summer fallows in light soils. Irrigation at an intensity of 0.63 cm/ha for two hours at an interval of 6-8 days is recommended. For sesamum also, irrigation intensity of 0.63 cm/hr for two hours is very effective and economic.

Centre for Pig production and Research, Mannuthy

The Centre has developed a hybrid pig (Durowhite) incorporating the germplasm of existing Large White Yorkshire and also Landrace and Duroc, having 40-50% more growth rate and 30% less fat. This hybrid is proved more suited to the farmers with better economic gain, productivity and carcass quality which attain about 100-150 kg body weight at an age of 7-10 months and back fat thickness less than 1 cm.

College of Horticulture, Vellanikkara

The high yielding coccinia culture C.G 23 was recommended for release and will be placed in the next variety release committee.

The research project, "Assessment of hill top agriculture" at Vattavada Panchyath of the high ranges identified the constraints in agricultural production at Vattavada and

formulated a package for sustainable production of cool season vegetables, spices and fruit crops.

Standardized the recipe for preparation of mango ginger pickle, candy, preserve and cocktail. Ripe banana powder was prepared by spray drying and drum drying process after standardizing the additives and drying temperature. Technology for preparation of spray dried sapota milk shake powder and dried sapota powder was developed.

The black pepper yield in the State, which is affected due to the periodic dry spell from October to May can be managed by cultivating drought tolerant varieties and by judiciously scheduling irrigation depending on the availability of water resources in drought prone areas. Panniyur-5 may be preferred over Panniyur 1.

A change in the N source from urea to ammonium sulphate improved productivity of rice mainly due to the effect of sulphur fertilisation.

Integrated management of Phytophthora foot rot in black pepper nursery revealed that solarization of potting mixture, application of *Trichoderma* spp. and fungicide like Akomin-40 and Ridomil-MZ can be used for managing incidence of the disease.

Mycohit evaluation against coconut mite through frequent sprays was carried out during August 2003 to February 2004. The live mite count was significantly low in the nuts of second bunch collected from mycohit-applied palms when compared to the untreated control.

Coconut mite management was done at Mapranam area of Thrissur district covering thousands of palms and five rounds of treatment application were completed with Neemazal crown spray and Hexaconazole spindle drenching. The results so far indicated substantial reduction in mite population and substantial recovery in terms of reduction in nut damage.

Investigations on dry flower/foilage production revealed that crops like aster, gerbera and celosia can be dried and stored without affecting their shape and other flower qualities.

The Centre for Gender Studies has implemented an ICAR sponsored networking project on "Engendering Agricultural Research and Education" and a DBT sponsored project entitled "Women Empowerment networking in Kerala through science and technology"

The Centre for Plant Bio-technology and Molecular Biology has completed AFLP analysis for 48 varieties and 9 species of black pepper. Identified 5 *in vitro* derived clones of vanilla as superior and distributed to farmers for field evaluation.

The cocoa hybrids released recorded significant superiority over the clones in terms of yield, plant shape and tolerance to VSD.

The method of extracting cocoa butter on farm scale (upto 31%) was standardized using the cocoa butter extractor fabricated at Cadbury - KAU Cooperative Research Project.

KCAET, Tavanur

Under the NATP on "Development and Testing of Farm Machinery for Plantation Crops of Kerala", the following machineries were developed.

- * Self centering basin lister for tree crops.
- * Direct drive micro tiller/weeder
- * Large diameter pit digger
- * Powered Palm Climber
- * Rotary Coconut Husker
- * Tractor operated ditcher cum bed former

A motorized palm climber was designed and its fabrication is nearing completion. It will be field tested soon.

Studies showed that coconut oil is almost equal to the SERVO 2 T oil available in the market. More research in this direction is in progress. The instruments needed for the project are being procured.

An internally operated planting finger for transplanters is designed. This new type of planting finger was fabricated and tested at fields to replace the complicated and costly transplanting system.

Energy cost of operating different tools and implements that can be used by female workers of the region, have been estimated during the report period. Possible modifications for these systems were identified with a view to make them more handy and friendly with female workers.

Pineapple Research Station, Vazhakulam

About 10000 hybrid seedlings have been developed from a six parent crossing programme and are in the process of field evaluation.

One plant type with plant characters of the Mauritius variety and fruit characters of Kew variety was located in farmers field. Its fruit quality is comparable with that of Kew.

Fisheries Station, Piduveyyuppu

The different eco-friendly management techniques adopted in grow-outs were proved very effective to maintain broodstock specimens of *Penaeus indicus* disease free. The combined effect of fertilizer manure and feed in appropriate doses has a well defined role to enhance fish production substantially from ecofriendly farming system.

AMPRS, Odakkali.

- Conservation of medicinal tree species in large area plots was undertaken.
- Agrotechniques for *Curcuma aromatica* were developed.
- Quality evaluation techniques for stevia were developed.
- Efficacy of the surfactant APSA-80 in reducing the dosage of insecticides applied to vegetables was studied.

HIGH RANGE ZONE

Cardamom Research Station, Pampadumpara

Germplasm collection of cardamom was continued and seventeen accessions were collected during the report period. A total of 121 accessions are presently conserved in the gene bank.

Planting in solarized soil fortified with *Trichoderma* and VAM gave maximum number of sprouted cuttings, number of roots and length of roots. Incidence of nursery rot was also less in this treatment.

SPECIAL ZONE

RARS, Kumarakom.

In a trial for the evaluation of coconut hybrids with WCT as check variety it was found that WCT x CGD produced the highest yield. Efforts were taken to impart mosaic virus resistance to the vegetable cowpea variety KMV-I. Ten promising selections were identified and are under experimentation. Propagation studies and post harvest studies of the medicinal plant stevia are under progress. Spraying of 3% potassium sulphate solution on nendran bunches two and four weeks after emergence gave higher yields.

Studies on utilization of aquatic weeds for composting and vermicomposting were conducted. The ratio of 10:1 for aquatic weed and cow dung was found suitable for ordinary

composting as well as vermicomposting. As a part of NATP programme, 45 homesteads were selected for development activities and various interventions including development of integrated farming system models, intercropping coconut gardens etc. were done. Rain water harvesting structures and vermi composting units were built in the homesteads.

The NATP on 'economic analysis of rice based cropping system in coastal agroecosystem of India' is nearing completion.

Different species of oyster mushroom were evaluated.

Studies on wilt disease of bittergourd and cowpea showed that they are caused by *Ralstonia solanacearum* and the disease can be managed by regular use of bleaching powder in the basin, by proper sanitary measures and controlled irrigation.

Under the NATP programme, captive breeding of five endemic fish species were accomplished. Out of these three fish species endemic to western ghats are the first reports to science. During the year, the embryonic development of all the five species were documented. A river watch programme and awareness campaign named 'Meenachil fish Count 2004' was organised which recorded 151 fish species.

NATP, Karumady

- Perceptible improvement in soil conditions and productivity is attained by introducing subsurface drainage. An additional paddy yield of 1.36 t/ha could be obtained by introducing subsurface drainage.
- Subsurface drainage could control acidity and salinity and remove spatial variation in its occurrence.

Rice Research Station, Moncompu

Farm trials with three cultures with resistance to important rice diseases of Kuttanad were conducted during Puncta 2002-2003 in cultivators fields (5 locations each) at Alappuzha and Kottayam Dist. Culture M 95-1 with a grain yield of 5322 kg/ha performed better compared to the other cultures as well as the check variety Jyothy (4177 kg/ha).

Under the project "Collection, Maintenance and Evaluation of the germplasm", 430 accessions were maintained during the period.

The results of the Permanent Manurial Trial in rice conducted at RRS, Moncompu for the seventeenth year, showed that there was no response to Potash in the intensive double crop rice in Kuttanad where straw recycling is practiced, where as the response to nitrogen is 2.3 tons/ha. Skipping phosphorus reduced rice yield, even after 16 years.

The studies to develop appropriate techniques for growing direct seeded rice under puddled condition revealed the advantages of line sowing using the 8 row drum seeder for crop stand establishment and yield, over the conventional practice of broadcasting sprouted seeds and even transplanting. The grain yield was significantly higher for drum seedling and that too with a significantly lower seed rate of only 50 kg/ha., when seeding was done 48 hrs. after puddling.

RRS, Vyttila

- The saline tolerant cultures CIRJ-7 evolved at this station are recommended for state wide release.

Arresting of the tidal flow in the pokkali field influences rice production negatively

SOUTHERN ZONE

NARP (Southern Region), Vellayani

Results of the mineralization study of organic manures showed that recommended level of organic manures is not sufficient for short duration crops since only 18-28% of nitrogen was released by 12 weeks after application of organic manures.

Limed plots had a lower organic matter and higher available nitrogen levels suggesting the beneficial effect of lime on N mineralisation.

The method of preparation of flour from Dioscorea, Coleus, Taro, Arrowroot and Elephant yam were standardized.

Monitoring of pesticide residues in five types of vegetables viz., brinjal, chillies, cabbage, cauliflower and okra, indicated the presence of gamma HCH, endosulfan, dicofol, malathion, quinalphos, chlorpyrifos, monocrotophos and Lambda cyhalothrin.

70 plants could be identified as stingless bee flora in Kerala till July 2002 and six more plants were identified during the period under report.

Streptocycline (100ppm), Turmeric powder impregnated in Sodium bicarbonate (0.12 per cent) and crude extract of neem cake were effective under *in vivo* conditions for the management of Bacterial blight of anthurium.

Tricure @ 0.2% and Indofil M45 @ 0.2% were effective for management of anthracnose of anthurium.

AMF cultures, M8 and M9 were found to be the most efficient in suppressing damping off in chilli while M7 and M10 were effective for tomato. Inoculation in nursery furrows gave the maximum percentage of colonization.

CSRC, Karamana

The experiment on long range effect of continuous cropping and manuring on soil fertility and crop productivity showed that there was a significant increase in grain yield during *kharif* with increasing levels of N and P. During *rabi* increasing the level of P significantly increased grain and straw yields. However increasing levels of N gave significant increases in straw yield only. Application of K did not influence grain or straw yields.

Pooled analysis of grain yields from 1997-'98 to 2002-'03 revealed that the mean grain yield was higher for the treatment substituting 25 per cent nitrogen with Azospirillum as seedling dip. Economic analysis of the different treatments also indicated that the total returns from treatment plots receiving 100 per cent N P K as fertilizer as well as plots receiving 25 per cent N as Azospirillum are higher than the other treatments.

College of Agriculture, Vellayani

A study conducted on sustainable nutritional practices for bitter gourd – amaranths intercropping system revealed that substitution of chemical fertilizer with poultry manure in 1:1 ratio recorded the highest fruit yield, highest net profit and B:C ratio and high ascorbic acid and iron content. Vermicompost application registered maximum keeping quality of fruits.

Three high yielding lines of vegetables viz. VS3 (yard long bean), CA-38(chilli) and LE 45 (bacterial wilt resistant tomato) evolved were proposed for release.

Investigation with two crops of a cowpea var. Kanakamani to study the feasibility of using phosphogypsum, a waste product of the phosphoric acid plant of FACT, Always revealed that the material was highly beneficial in increasing the yield and yield attributes of the crop by mitigating the adverse effects of soil acidity.

Three sprays of neem seed oil 2% + garlic 2% or neem seed oil 2% + garlic 2% + karanj oil 1%, one each at spike emergence, berry formation and at berry maturation stage was observed to afford protection against all pests of black pepper.

Results of the study on the effect of plant products to control Red Palm Weevil showed that 10% cashew apple extract caused the highest mortality of the pest. Leaf extract of *Thevetia nerifolia*, seed oils of neem and *Samadera indica* showed repellent action.

FSRS, Sadanandapuram

A field experiment was conducted in banana based cropping system to identify the most suitable tuber crop as intercrop of banana and to assess the nutrient requirement of the system.

The results revealed that inter cropping banana var. Njalipoovan with tuber crops in general increased the banana yield. Among the different intercrops tried, lesser yam was proved to be the best followed by elephant foot yam. The increase in banana yield was to the tune of 12 to 64% over control (Banana alone).

Nutrient management studies in intercrops revealed that 50% of the recommended dose was sufficient for elephant foot yam, greater yam and lesser yam when grown as intercrop of banana.

ONATTUKARA ZONE

ORARS, Kaymakulam

Two promising rice cultivars viz. OM2 and OM3 were suitable for Orumundan tract of Onattukara. In the multilocational trial, these cultures performed better than the variety Sagara.

College of Fisheries, Panangad

In vitro and *in vivo* studies demonstrated that herbal preparation "Murivenna" could be successfully used for the treatment of fungal and bacterial diseases of different species of ornamental fishes.

Solar tent and solar cabinet driers were developed for drying fish without contamination, pest infestation and hence with minimum loss.

A technology was developed for curing fish using irradiated salt to control halophilic spoilage and insects.

NORTHERN ZONE

Pepper Research Station, Panniyur

- Intervarietal, inter specific hybridization and open pollinated progeny evaluation are in progress.
- Irrigation @ 2 litres/day/vine contributed more towards spike number, green berry yield and spike length.
- Metalaxyl Gold MZ + *Trichoderma* was effective in controlling the foot rot disease.

College of Agriculture, Padannakkad

Under the NATP entitled "Analysis and development of homestead farms of Kerala" a total 24 homesteads spread over Thrissur and Palakkad districts were selected and technical intervention related to crop, tree, livestock, soil management, plant protection etc. were implemented.

The bioassays with fresh leaf leachates, fresh leaf extracts, bark leachates, dry leaf leachate, dry leaf extract, root leachate, root extracts and multipurpose powdered leaf litter of multipurpose test trees on cowpea, bittergourd and brinjal were completed. In general, the various parts of the trees exhibited varied allelopathic effects when compared with control. The effects on shoot and root growth were more pronounced.

EXTENSION EDUCATION

Dr.A.I.Jose continued as Director of Extension for the period

The Directorate of Extension was actively involved in the dissemination of technological information catering to the needs of farmers, experts and other personnel in the farming/agro community. It was also responsible in nurturing the extension personnels of the various departments under the Govt. of Kerala. These objectives were operationalised through various extension oriented institutions of the Directorate spread through out the State. The five Krishi Vigyan Kendras situated in each of the agro-ecological zones served as a light house for both the laymen and professionals in the field of Transfer of Technology. The constituent units, viz, the Communication Centre, Central Training Institute, KAU Press, ATIC and Public Relations with their concerted efforts helped in identification, streamlining and organizing the extension activities of the KAU. The Directorate of Extension also rendered Yeoman's service in every walk and sphere of the extension activities for all the Research and Teaching Institutions under KAU.

The ATIC (Agrl. Technology Information Centre) paved new avenues for the entrepreneurs in agri based enterprises, imparting transfer of technology and also to the farming community through the single window approach, providing access to Information Technology to the rural farmers even from the remote and hilly districts of Idukki, Wynad and Kasaragod.

The Communication Centre, one of the major components of the Directorate was responsible in rendering Farm Advisory Services, media publications and conduct of seminars, workshops and exhibitions for the benefit of the farming community, under the Technology Transfer Commitment of the KAU. Technical advises were offered to hundreds of farmers with respect to diagnosing and tackling on-farm problems. The Centre was also instrumental in imparting technical know-how to the farmers through farm clinics, exhibitions and field visits by the Scientists. More than 300 farmers were benefitted through the Farm Advisory Services of the centre. Another constituent, the KAU Press was actively involved in the publications of the KAU like bulletins, periodicals, pamphlets and technical books etc, especially popular publications like Kalpadhenu. The two research journals of the KAU like Journal of Veterinary & Animal Sciences and Journal of Tropical Agriculture were also published during the period. Moreover, the research update and seasonal crop cultivation practices were aired on all Fridays, under the auspices of the Communication Centre.

The Central Training Institute and Centre of Excellence in Training for Plantation Crops co-ordinated the teaching/learning skills for the Agro technical and Extension Personnels belonging to the Development Departments, Commercial & Rural Banks, Boards etc. In addition various vocational, inservice, sponsored and stipendiary trainings were organised during the period for the farmers, unemployed youths and Village Extension Officers.

The five Krishi Vigyan Kendras, viz., KVK Pattambi, KVK Ambalavayal, KVK Manjeswaram, KVK Sadanandapuram and KVK Kumarakom situated in the nerve of the major agro-ecological zones catered to the specific socio-economic, local oriented

requirements of the respective zones. The KVKs played a major role in organizing various Vocational Trainings and Melas during the period.

In addition to the aforesaid activities, Directorate of Extension also coordinated the various NATP Projects and also NSS activities of the constituent colleges under the KAU, where the extension activities disseminated to the rural folk through the students. The activities of the Public Relations Unit of the KAU were also co-ordinated by this Directorate, especially in the publication of KAU News Letter which is an in-house publication.

LIBRARY AND INFORMATION SERVICES UNIT

Library and Information Services Unit of the KAU is the statutory division responsible for library and information services management in areas mandatory to the University as well as undertaking applied research leading to new developments in agricultural information handling for bridging the gap in the application of current information technologies to problems in agricultural education, research and development.

The University Central Library functions at the Headquarters. It serves as the main library for the colleges and stations in the main campus. All costly reference books, foreign journals and other documents are acquired and maintained by the University Library for common use.

An Information Technology Lab with facilities for customizing library and information service packages, database development and for generating information products according to the requirements of users, functions under the unit.

There are ten college libraries, all of which have infrastructure like building, equipments and collection of print and non print documents.

KAU ESTATE

The present total tapping area is 30 ha. with 12,000 tapping trees. Over matured rubber trees were cut and sold for Rs. 9,10,301/- and the area allotted for the research programmes. A total quantity of 13175 kg. of rubber and 28520 kg. of latex were produced during the year costing Rs. 20,62,866/-. Total expenditure for the report period was Rs. 25,88,556/-.

KAU SCHOOL

A total no. of 715 students were in the roll during the period. KAU School achieved 100% pass in the SSLC examination of 2003. The school received the award of "Best unaided school in rural area" sponsored by Vidyabhyasa Vikasana Samithi. Students of the school participated in the national, state and district level competitions and won prizes.

FINANCE

The University formulated a Budget Estimate for 2003-2004 showing Rs. 13278.47 lakhs as receipts Rs. 14627.576 lakhs as expenditure in anticipation of grant-in-aid of 8014 lakhs (Rs. 5914 lakhs under Non-Plan and Rs. 2100 lakhs under Plan) from the State Government, ICAR assistance of Rs. 958.884 lakhs, Rs. 475 lakhs towards the UGC package 01-01-1996 (20% State Share) from the State Government, Rs. 100.769 lakhs from Other External Aided Projects, Rs. 769.9 lakhs from Internal Resources, Rs. 500 lakhs from institutional functioning. Though, the budget was formulated with the expectation of Rs. 8489 lakhs as grant-in-aid from the State Government, Government released Rs. 6300 lakhs only (Rs. 4400 lakhs under Non-Plan and Rs. 1900 lakhs under Plan).

GENERAL ADMINISTRATION

The Kerala Agricultural University came into existence on 1st February 1972 under the KAU Act 1971 (Act 33 of 1971).

The Main Campus of the University is at Vellanikkara, located 13 km east of Thrissur town in the Thrissur-Palakkad Highway (NH-47). The College of Horticulture, College of Forestry and the College of Co-operation, Banking and Management are located at the Main Campus. The University has seven other teaching campuses, viz. College of Veterinary & Animal Sciences, Mannuthy, College of Fisheries, Panangad, College of Agriculture, Padannakkad, College of Agriculture, Vellayani, Kelappaji College of Agricultural Engineering and Technology, Tavanur, College of Dairy Science and Technology, Idukki (presently functioning at Mannuthy) and College of Veterinary and Animal Sciences, Pookode (presently functioning at Mannuthy). Development works related to the two Campuses, College of Veterinary and Animal Sciences, Pookode, Waynad and College of Dairy Science and Technology, Idukki are under progress. In addition to this, the University has 30 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, Patambi, Kumarakom and Vellayani. ORARS, Kayamkulam is involving in the works in root wilt disease of coconut and to implement a comprehensive coconut care programme.

The University received financial assistance mainly from the Kerala State Government and ICAR. Financial assistance was also received from outside agencies like NATP, Department of Science & Technology, DBT, Department of Atomic Energy, Spices Board, Coconut Development Board etc.

OFFICERS OF THE UNIVERSITY AND ADMINISTRATIVE SET UP

The Officers of the University are the Chancellor (Governor of Kerala), the Pro-Chancellor (Minister of Agriculture), 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 assisted by the Registrar, the Comptroller, Deans of Faculties, Directors of Research, Extension, Physical Plant, Students Welfare and the Librarian holding tenurial positions and recognised as the Officers of the University. In addition, the Director (Academic and Post Graduate Studies) assists the Vice-Chancellor in Academic affairs.

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 the extension education and public relations. The Deans and Associate Deans of the various colleges are in charge of resident teaching and instruction of the respective colleges. Director of Physical Plant is the

custodian of the University properties and in charge of the construction and maintenance of buildings, roads, vehicles and machinery.

AUTHORITIES OF THE UNIVERSITY

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

General Council

The supreme authority of the University is the General Council. The Council is reconstituted in every three years. The XII General Council was constituted on 18.6.2002. Usually the General Council meets once in four months. The General Council had met four times during the report period. Statute Committee, Accounts Committee and Assurance Committee are the sub committees of General Council.

The Executive Committee

The Executive Committee is the chief executive authority of the University. Consequent on the amendment of KAU Act (Act 16 of 2001) the strength of the committee has been reduced from 23 to 12 w.e.f. 26.12.01. The Executive Committee was reconstituted on 27.1.03. During the period under report, 15 meetings of the Executive Committee were held. Finance Committee, Planning and Development Committee, Research Review Committee, Establishment Committee, Students Welfare Committee and Works Committee are the Sub Committees of Executive Committee. Another Sub Committee, Legal monitoring Committee to constituted during the report period as decided by the Executive Committee. Details of above Committees such as list of members, number of meetings held etc. are included in the appendix.

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 upon it by statutes. During the year five meetings were held.

Major decisions taken by the Academic council during the report period:

1. The 93rd meeting of Academic Council held on 22.4.03 decided to institute K A U Silver Jubilee Award for the best thesis.
2. A new PG programme M.VSc in Livestock Products Technology was approved by 94th meeting of Academic Council held on 29.5.03. The programme will commence from the Academic Year 2004-05 at CV & AS, Mannuthy.
3. Another PG programme M.Sc (Agri.) Plant Bio-technology under the faculty of Agriculture commenced at CoA, Vellayani and CoH, Vellanikkara during 2003-04. This was approved by Academic Council at its 95th meeting held on 2.9.2003.
4. The 96th meeting of Academic Council held on 20.12.2003 recommended the deputation of teachers to acquire Ph.D, for the consideration of Executive Committee. Revised Syllabus for LSA training programme was approved in the same meeting.
5. Revised Syllabus for UG courses under faculty of Agriculture was approved by Academic Council in its 97th meeting held on 25.3.04. New Syllabus will come into force from the Academic Year 2004-05

Faculty Research Committee

The main duties of the Faculty Research Committee are to scrutinize the research proposals received from different Co-ordinators and to review the progress of research periodically. The four Faculty Research Committees viz., Agriculture, Veterinary, Fisheries & Agri. Engg. met once during the report period.

Co-ordination Groups

The various project co-ordination groups organised are authorities to critically examine the research proposals received from Project Leaders, Principal Investigators and to review the progress in the concerned group. Number of such groups under each faculty are Agri-30, Vet-10, Fisheries-5 and Agri Engineering-4.

Faculty Improvement

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

Labour

Farm labourers constitute a major category of personnel in the University. Two categories of workers-casual and permanent-exist in 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 Department of Agriculture and Animal Husbandry. Total labour strength is 2156 (Permanent labourer - 1629 and Casual labourer - 418).

ENGAGEMENTS/ACTIVITIES OF THE VICE-CHANCELLOR

Prof. K.V. Peter continued as Vice-Chancellor during the report period.

Major programmes of the Vice-Chancellor

Attended the Vice-Chancellors' Conference on 2nd of April 2003 at National Agricultural Science Centre, New Delhi and received the Award for the Best University securing maximum number of Junior Research Fellow/Senior Research Fellow.

Attended the Village Development Plan organised by the Department of Tourism at Kumbalangi on 7th April 2003 and the meeting on Geographical Indicators of Malabar Pepper at Spices Board, Kochi.

Attended the High Level Committee meeting on Information Technology and Biotechnology at Thycaud Guest House, Thiruvananthapuram from 12-13 April 2003.

Chaired the organising committee meeting of the International Conference of Prawn at College of Fisheries, Panangad on 24th April 2003.

Attended and delivered a lecture at the Global Conference on Coconut at Kochi on 7th May 2003.

Arranged the evaluation and monitoring on NATP projects by the National Coordinator, NATP and one representative of World Bank on 23rd May 2003.

Chaired the 36th Pepper Technology Meeting organized by the International Pepper Community at Kochi on 2nd September 2003.

Attended the Scientific Advisory Panel Meeting of NATP at Sugarcane Breeding Institute, Coimbatore from 4-5 September 2003.

Attended the Research Monitoring Committee meeting at Coir Board, Kochi on 16th September 2003.

Attended the 6th International Plant Growth Promotor Rhizobacteria Workshop at Indian Institute of Spices Research, Calicut on 5th October 2003.

Visited Bhabha Atomic Research Centre, Mumbai to finalise the Memorandum of Understanding between BARC – KAU from 14th to 16th October 2003.

Attended the South Zone Vice-Chancellors' meeting organized by the Association of Indian Universities at Gandhigram Rural Institute, Gandhigram, Dindigul, T.N. from 26th to 28th October 2003.

Attended the Swadeshi Science Congress at MSSRF Agro Biodiversity Research Centre, Kalpetta from 6th to 8th November 2003.

Visited Indian Institute of Vegetable Research, Varanasi from 20-24 November 2003 in connection with the QRT on Vegetables.

Attended the meeting convened by the Secretary, Higher Education at Hotel Muthoot Plaza regarding Virtual Campus on 3rd December 2003.

Member, Selection Committee to select "Karshakasree" organised by Malayala Manorama and visited Chennai for the purpose from 12 to 14 December 2003.

Attended the 13th meeting of the Regional Committee No. VIII of ICAR held at IVRI, Bangalore from 29-30 December 2003.

Delivered key-note address on "Effect of WTO decisions on Kerala Agriculture at the meeting convened by the Association of the Kerala Agricultural Officers at Mammen Mappila Hall, Kottayam on 3rd January 2004.

Delivered the key-note address on "Biotechnology in Indian Agriculture" at the National Seminar on Plant Bio-technology organised at St. Alyocious College, Mangalore on 14th January 2004.

Reviewed the DBT projects at Indian Institute of Spices Research, Calicut on 16th January 2004.

Attended the Kerala Science Congress held at CWRDM, Calicut on 29th January 2004.

Attended the second meeting of the Task Force on Plant Biotechnology from 9 to 10 February 2004 at New Delhi.

Attended the Vice-Chancellors' Conference at ICAR, New Delhi from 19 to 20 February 2004.

Attended the Indian Agricultural Universities Association Executive Committee meeting at 5 p.m. on 20th February 2004 at NASC, New Delhi.

Attended the High Power Committee meeting at Maharana Pratap University of Agriculture & Technology, Udaipur to establish a College of Horticulture and Forestry from 9-10 March 2004.

Chaired the Research Advisory Committee meeting of National Research Centre on Seed Spices at Ajmer from 14 to 18 March 2004.

Attended the Standing Committee meeting of Association of Indian Universities, New Delhi on 23rd March 2004.

CHAPTER II
EDUCATION
FACULTY OF AGRICULTURE

COLLEGE OF AGRICULTURE, VELLAYANI - 695 522

Introduction

The College of Agriculture, Vellayani was established in 1955 by the erstwhile Travancore-Cochin state government with the objective of producing trained agricultural graduates, which was felt as a dire necessity for the successful implementation of the rural development programmes of the state, which were largely based on agriculture. The Agricultural College and Research Institute started functioning in the Senior Maharani's palace building at Vellayani and the Institute provides sufficient practical training to students, demonstrates the scientific methods of cultivation of different crops, carries out field experiments and supplies good quality planting materials to farmers. The farm of the college has a total area of 243 hectares consisting of wet land, dry land and garden land. Almost all the tropical crops are being grown in the farm.

The college has in addition to imparting postgraduate education and offering avenues of research, entered in a highway in the dissemination of agricultural information and knowledge. At the time of inception in 1955, the college has only seven divisions *viz.* Agronomy, Agricultural Botany, Agricultural Chemistry, Agricultural Entomology, Agricultural Engineering, Plant Pathology and Animal Husbandry. Agricultural Economics, Agricultural Extension, Agricultural Statistics and Physical Education were originally part of the division of Agronomy which later became separate departments. In 1968, horticulture, which was part of Agricultural Botany, became an independent department. Later the department of Home Science was established. In 1979, the department of Plant Breeding came into existence. In 1997, the department of Plant Physiology was established. The departments at present functioning in the College are Agronomy, Agricultural Engineering, Agricultural Entomology, Agricultural Economics, Agricultural Extension, Agricultural Statistics, Animal Husbandry, Home Science, Horticulture, Olericulture, Plant Breeding, Plant Pathology, Plant Physiology, Plantation Crops & Spices, Pomology & Floriculture, Processing Technology, Physical Education and Soil Science & Agricultural Chemistry.

When the Kerala Agricultural University act was enacted by the State legislature, the college was declared as a constituent institution of the University with effect from 1.2.1972 and was named College of Agriculture. Semester system of teaching was introduced. Present intake capacity for B.Sc. (Ag.) programme is 60; for M.Sc.(Ag.) programme 60 and for Ph.D programme 19. Practical training programmes like work experience of raising important

crops, farm training and visit to important research centres of the state and all India level were included in the course syllabus of B.Sc.(Ag.) curriculum.

The institute is actively engaged in the extension linked farm advisory programme. Members of the staff are also participating in the extension education activities like training programmes, village adoption programmes, correspondence course, tribal development programmes, exhibitions, seminars and workshops, publications, radio talks, TV broadcasts etc.

Mandate of the Institution

Making provision for imparting education in different branches of study particularly agriculture, horticulture and other allied branches of learning and scholarship; furthering advancement of learning and prosecution of research; undertaking extension education programme are the existing mandate of the institution.

Increasing competency of agricultural graduates to meet national and international norms and to create confidence among graduates for self employment, consultancy services and entrepreneurship; creating leadership for integrated rural development and sustainable agriculture; and providing special attention to backward areas and tribal sector so as to attain social equity are a few of proposed mandate.

Memorable events of the institution

National level meeting of the All India Co-ordinated Research Project on Forage Crops was held on 9th to 11th May 2003 at Vellayani. 80 delegates from all over India participated in the meeting. The meeting recommended two cultures of high yielding varieties of Hybrid Napier grass for national level experiments.

Participated in the "Agri Fair & Flower Show - 2004" held at the Kanakakunnu Palace from 23 January to 1 February 2004.

Review Workshop of Co-ordinated Project on Integrated Management of Fruit Flies was held from 11 to 13 February 2004.

Faculty Improvement Programme

Scholarship awarded to staff / Deputation of Staff for higher studies

Dr. B.T.Krishnaprasad, Asst.Professor was deputed for BOYSCAST (Better opportunities for young scientist in chosen areas of science and Technology) for one year to University of California, Los Angeles, USA.

The Scientists of the College attended seminars on Environmental Science, Integrated system model, Biodynamic farming and various other workshop on National level.

**Academic Programme
Admission**

Year	M	F	TOTAL	SC/ST			Total	
				M	F	TOTAL	M	F
2003	06	38	44	01	03	04	06	38

(i) UG Programme (on rolls)

Year	M	F	TOTAL	SC/ST			Total	
				M	F	TOTAL	M	F
1996	0	01	01	0	01	01	0	01
1998	01	01	02	01	01	02	01	01
1999	0	03	03	0	0	0	0	03
2000	09	35	44	03	03	06	09	35
2001	06	27	33	01	05	06	06	27
2002	08	32	40	01	02	03	08	32
2003	06	38	44	01	03	04	06	38

(ii) PG. programme (on rolls)

Year	M	F	TOTAL	SC/ST			Total	
				M	F	TOTAL	M	F
2001	0	03	03	0	0	0	0	03
2002	12	20	32	0	0	0	12	20
2003	05	33	38	01	03	04	05	33

(iii) Ph.D. programme (on rolls)

Year	M	F	TOTAL	SC/ST			Total	
				M	F	TOTAL	M	F
2001	01	0	01	01	0	01	01	0
2002	02	14	16	01	0	01	12	14
2003	01	07	08	0	0	0	01	07

Study tour

The South Indian study tour of the IInd year B.Sc. (Ag.) students was undertaken for a period of 17 days from 22.10.03 to 7.11.03.

The North Indian Study Tour of the III Year B.Sc.(Ag.) students were conducted from 10.10.2003 to 26.10.2003

Students' Union Activities

Inter-class Arts Festival was conducted during March 2004.

Extra Curricular Activities

N.S.S Activities

Dr.D.Wilson , and Dr.M.Vijayan, Associate Professors continued as Programme Officer of N.S.S. The following programmes were conducted during the year:

As a part of the Gandhi Jayanthi Celebrations a one day agricultural programme was conducted at V.S. Auditorium Peringamala on 1st October 2003; A trekking programme for NSS volunteers was conducted at Kallar on 21st December 2003; A three day programme on personality development for NSS volunteers was conducted at College of Agriculture, Vellayani, 16th to 18th January 2004; A ten day special camping programme was organized at YMCA center, Vattapara from 11th February to 20th February 2004; Twelve NSS volunteers donated blood to patients in various hospitals in the Thiruvananthapuram; Community centre at N.S.S adopted village at Palappur continued its function during the period.

Sports Activities

Annual Athletic Meet and Intramural competitions on various sports and games were conducted during second week of March, 2004.

Mrs. Hasseena and Mr. Vishnunath represented KAU in All Inter Agricultural University Sports & Games held GKVK, Bangalore.

Research Programme

MAJOR RESEARCH ACHIEVEMENTS - HIGHLIGHTS

Department of Agronomy

A study conducted on sustainable nutritional practices for bitter gourd – amaranthus intercropping system revealed that substitution of chemical fertilizer with poultry manure in 1:1 ratio recorded the highest fruit yield, the highest net profit and B: C ratio and high ascorbic acid and iron content. Vermicompost application registered maximum keeping quality of fruits.

In a field experiment using chilli variety "Jwalasakhi", application of 75 per cent of the recommended dose of NPK (56.3: 30:18.8 kg/ha) + fluorescent pseudomonads + Azospirillum produced significantly higher yield (8.74t ha-1) and ensured a saving of 25 per cent of recommended dose of NPK and was the most economically viable treatment.

The most economically viable treatment for effective Nut sedge control was stale seed bed with glyphosate application followed by eucalyptus mulching. Spraying

glyphosate for two consecutive seasons in uncropped area, resulted in the lowest regeneration values compared to 2,4-D.

INM involving incorporation of vermicompost @ 6.25 t/ha/yr, addition of NPK @ 30:30:60 kg/ha/yr, 1 and combined application of bioinoculants viz, Azospirillum, Fluorescent pseudomonads & AMF was found favourable for enhancing both total fresh and dry spike yield and total alkaloid production in long pepper under partial shade.

For ginger variety 'Rio-de-Janero', it could be suggested that enhancement of N levels from 75 to 150 kg/ha, K levels from 50 to 150 kg ha⁻¹, Sulphur @ 15 kg/ha and Boron @ 2 kg/ha could improve ginger yields.

In respect of turmeric variety Alleppey Local enhancement of N levels from 30 to 90 kg ha⁻¹ and that of K from 60 to 120 kg ha⁻¹ along with micro nutrients Boron and Zn at 2 and 10 kg/ha improved yields.

Department of Plant Breeding & Genetics

Studies on photosynthetic variation in relation to light tolerance revealed that enzyme Rubisco content was the least in plants exposed to open condition and maximum in plants receiving 35% light. The free radical scavenging enzymes like SOD and peroxidase were also slightly high in the leaves exposed to full sunlight than under shade.

Department of Plant Pathology

Field studies with chilli and tomato using different isolates of Trichoderma and fluorescent pseudomonads showed that a combination of isolates P28 and T22 was the best with 90% disease suppression (*R.solani*) and 85% more yield in tomato.

Pleurotus eous and *schizophyllum commune* were efficient decomposers for composting of coirpith.

Management of virus diseases of chilli by use of plant products indicated that plant extracts from *Vitex negundo*, *Azadirachta indica* and *Phyllanthus niruri* reduced the survival of white flies and incidence of leaf curl disease of chilli.

Extracts of *Phyllanthus niruri* and *Curcuma longa* reduced the survival of aphid vectors and incidence of chilli mosaic.

Pre-inoculation of AMF (M8&M9) in the nursery could suppress damping off in chilli and tomato. Two efficient isolates of Azospirillum could increase growth and yield in both chilli and tomato when inoculated along with AMF. Of the different methods of inoculation of AMF, inoculation in nursery furrows gave maximum percentage of colonization.

Combination of soil application of *Trichoderma viride*, soil application of mancozeb (0.3%) and neem cake @ 150 kg/ha effectively suppressed Fusarium wilt of cowpea and also increased the biomass and pod yield.

A carrierless formulation for microbial inoculant was developed. Quality analysis of biofertilizers and biocontrol agents, mass production and sale of microbial inoculants are being continued (*Pseudomonas*, *Trichoderma*, *Azospirillum* & *VAM*) Technology can even be transferred to many private agencies and entrepreneurs on cost basis.

Department of Animal Husbandry

Samples collected from 3 taluks of Trivandrum, Kollam and Pathanamthitta showed contamination with traces of organochloride pesticides (0.01 to 0.22 ppm). A few of the samples were found contaminated with residues of α and β isomer of HCH but their level was well below the prescribed MRL value. Most of the samples were free from contamination.

It was noted that 15.5 per cent of animals were sold for slaughter by their owners because of infertility. Most of these animals had organochloride pesticide residues in body fat and meat.

Ten per cent of animals were disposed of by owners for meat purpose due to resultant agalactia from mastitis. Among that, 11.1 per cent had pesticide residues in liver, below MRL.

Department of Olericulture

Three high yielding lines of vegetables viz, VS3 (yardlong bean), CA 38(chilli) and LE 45 (bacterial wilt resistant tomato) evolved were proposed for release.

Dept. of Soil Science & Agri.Chemistry

Among eight varieties of cowpea screened for lime response, Charodi was the highest yielder (502 kg/ha). Lime application significantly influenced the uptake of all nutrients which was reflected on yield.

Experiments conducted in the Ambalapuzha block panchayat of Alappuzha district and Elamkunnappuzha village panchayat of Ernakulam district under NATP to identify the successful land use models indicated the following successful models.

1. Traditional farming with rice and fish.
2. Rotational farming with rice, fish and livestock.
3. Simultaneous farming of rice and fish.
4. Cultivation of water loving medicinal plants.
5. Cultivation of bush jasmine.

Investigation with two crops of a cowpea var. Kanakamani to study the feasibility of using phosphogypsum, a waste product of the phosphoric acid plant of FACT, Alwaye revealed that the material was highly beneficial in increasing the yield and yield attributes of the crop by mitigating the adverse effects of soil acidity.

In a study on the nutrient management schedule for Njalipooan banana in Onattukara soil application of N, P₂O₅ and K₂O at 200:200:400g/plant was the best for getting higher yield as well as maximum economic returns.

Department of Entomology

Studies on effect of eriophyid mite infestation on quality parameters of coconut water viz. reducing sugars, total soluble sugars and acidity indicated significant variation in the reducing sugar content in water of tender coconuts in different damage categories.

Mite infestation had no influence on seed nut germination, but seedling vigour was significantly affected as indicated by the reduced collar girth, height and no. of leaves. Seedlings, emerging from nuts belonging to categories 4 & 5 were found unfit for planting.

Botanicals (Neem seed oil 3% or Azadirachtin 0.004%) + half dose of synthetic insecticides (Quinalphos 0.0025% or Imidactoprid 0.0025%) were effective in controlling rice leaf roller and was safe to its specific parasitoid *Gonozius triangulifer*.

Three sprays of neem seed oil 2% + garlic 2% or neem seed oil 2%+ garlic 2%+karanj oil 1%, one each at spike emergence, berry formation and at berry maturation stage afforded protection against all pests of black pepper.

The accessions, Pusa Sadabahar and Khandari were moderately resistant to nematode.

Pusa Sadabahar , Pusa Jwala and Pant C-1 were moderately resistant to chilli thrips and chilli mite.

The high yielding varieties Jwalamukhi and Jwalasakhi released by Kerala Agricultural University were susceptible to nematode but moderately resistant to chilli thrips and chilli mite.

Application of the vermiculite formulation of AMF @250 spores per plant and *Trichoderma* sp. 5% were equally effective in reducing nematode infestation and increasing yield of chilli.

The infestation of the post red palm weevil was higher in coastal areas of Thiruvananthapuram district than in inland areas. Results of the study on effect of plant products to contain red palm weevil showed that apple extract of *Anacardium occidentale* 10% caused the highest mortality of the pest. Leaf extract of *Thevetia nerifolia*, seed oils of neem and *Samadera indica* showed repellent action against the pest. Triferon the most effective pheromone for trapping red palm weevil.

Six species of fruitflies viz., *Bactrocera cucurbitae*, *B. dorsalis*, *B. correcta*, *B. zonata*, *B. verbascifolia* and *B. versicolor* infesting various crops were recorded from Southern districts of Kerala. Studies on the efficiency of banana traps indicated that, besides Palayankodan, fruits of Red banana, Robusta and Rasakadali could be used as food baits for trapping *B. cucurbitae*. Pulp of the fruits with boiled jaggery not only increased the trap catch but also improved the keeping quality of the bait.

Among the true honeybees, *Apis cerana indica*, *A. mellifera*, *A. dorsata* & *A. florea* and among the stingless bees, the common species *T. iridipennis* were observed to be associated with pollination of coconut.

Among three doses of Fenazaquin, i.e, 0.01, 0.03 and 0.05%, tested for controlling *Varroa jacobsoni*, an important pest of *A. mellifera*, 0.05% effective for reducing mite infestation.

Monitoring of pesticide residues in five vegetables viz., brinjal, chillies, cabbage cauliflower and okra, indicated the presence of gamma HCH, endosulfan, dicofol, Malathion, Quinalphos, chlorpyrifos, monocrotophos and lambda cyhalothrin.

Monitoring of pesticide residues in seed spices viz., cumin, fennel and fenugreek, pepper powder and turmeric powder collected from local markets indicated that all the six samples were free from residues of OC, OP and synthetic pyrethroids. Samples of chilli powder collected showed presence of dicofol. However, the residues were below the MRL value.

Five samples each of surface and under ground water samples collected from Trivandrum district revealed that one sample each of surface and underground water were contaminated with gamma HCH residues to the tune of 0.003 and 0.001 ppm respectively.

Application of *Trichoderma viridae* @ 2.59 g / plant at the time of planting + 45 days after planting effectively controlled root knot nematode and increased yield of banana and this treatment was on par with the recommended practice of paring + hot water treatment of suckers + neem cake and Carbofuran application.

Extension and other activities

As a part of extension activities, scientists of the College took classes to unemployed youth about the recent trend in pickle making, bag making, mushroom cultivation and banana cultivation.

Farm Advisory Service Rendered

Staff members of all the departments were guiding students in the conduct of various modules of the RAWE programme of the final year B.Sc(Ag.).

Staff members of Agronomy, Plant Pathology, Entomology and Soil Science were actively involved in the conduct of Agro clinics in connection with the RAWE programme.

Scientists of the Dept. of Entomology visited farmers field to tackle the following problems:-

- a) Pest problems of rice, vegetables, banana and coconut.
- b) Nematode problems of vegetables and banana.
- c) Scientific management of bee keeping against TSBV
- d) Judicious use of pesticides.

Publications

Scientific articles -78

Popular articles -27

Radio talks broadcasted through AIR

1.	Dr.Annamma George	"Question-Answer session in Karshakavedi	8.4.2003
2.	Dr.Elizabeth.K.Syriac	"Mundakan vilayile samyojitha valaprayogam"	27.10.2003
3.	Dr.Elizabeth.K.Syriac	"Question-Answer session in Karshakavedi	30.6.2003
4.	Dr.K.R.Sheela	Question-Answer session in Karshakavedi	29.4.2003
5.	Dr. M. Meerabai	"Quesstion-Answer session in Karshakavedi	19.3.03
6.	Dr.L.Rajamony.	"Sapota-Krishiyum Krishi murakalum"	7.7.2003
7.	Dr.L.Rajamony	"Muringa-Vettumuttathevaidyan"	8.1.2004
8	Dr.T.Nalinakumari	IPM in rice	16-7-03
9	Dr. R. Krishna Kumar	Question- answer	30-7-03
10	DR. S Devanesan	Interview	30-9-03
11	Dr. C. Nandakumar	Discussion on Honey bee	31-10-03
12	Smt .S . Premila	Question- answer	9-12-03
13	Dr. Jiji.T.	Question- answer	8-12-03
14	Dr.Thomas Biju Mathew	Interview on control of Loranthus and Phanerogamic parasite on tropical fruit crops	5-5-03
15	Dr.B.K.Jyachandran	"Dhanu Masathile Pradhana Krishi Panikal"	4.12.03

Important Visitors

Dr.Ramesh, Project Co-ordinator (India), ACIAR; Dr.G.Kaloo, Deputy Director General (CS&H), ICAR; Dr.P.S.Pathak, Director, IGFRI, Jhansi; Dr.N.P.Melkania, Project Co-ordinator (Fodder crops); Biswas Additional Director (Agron) Fert.Association of India, New Delhi; Dr.G.B.Singh, Director General, UPCAR, Lucknow; Dr.R.P.Singh, Ex-Director, CRIDA, Hyderabad; Dr. M. Tayeb Mrabet, Secretary General, IMPHOS, Cassablanca, Morocco; Dr. L. Cisse, Head, Agronomy Division, IMPHOS, Cassablanca, Morocco; Dr.John Mumford (Director) Project on fruitfly funded by UK. DFID; Dr. John M. Stonehouse, (Project Manager Science) UK. DFID; Dr. Abraham Varghese (Project coordinator) UK.DFID; Gerald M Williams (Secretary of Association of Bee Keepers, Ireland).

Other Details

Crop Museum

A crop museum is maintained by the dept.of Agronomy where cereals (rice, wheat, maize, bajra, sorghum etc.), pulses(green gram, black gram, red gram etc.), oil seeds (ground nut, sesamum, ricinus etc.), green manure crops, banana, medicinal plants etc., are being grown. The crop museum is regularly visited by farmers, students from V.H.S.S., other Colleges etc.,. The crop museum is also used by other departments of the College of Agriculture, Vellayani for teaching purpose.

Agronomy Museum

A museum is being set up and maintained by the department of Agronomy for exhibiting different soil types, fertilizers, seeds implements like mould board plough, country plough, levelling board, threshers, kakkotta, inverters, weeders, puddlers etc.,

Finance (2003-04)

Head of Account	Provision (in lakhs)	Expenditure	Receipts
202-21- Non-Plan	702.360	557,61,605	--
202-21- Plan	62.880	52,10,969	--
202-06/07-receipts	20.000	--	22,09,430

COLLEGE OF HORTICULTURE, VELLANIKKARA

Introduction

The College of Horticulture was established in 1972 with the main objectives of starting graduate programme in Horticulture and strengthening research and extension activities in horticultural crops. B.Sc. (Hort.) Degree Programme was started with an intake of 20 students during 1972. The intake capacity was enhanced to 30 from 1976 and then to 40 from 1979. The B.Sc.Ag programme was also started from 1977 with an intake capacity of 50 students. This was subsequently increased to 75 and then to 90. The B.Sc. (Hort) Programme was discontinued from 1980-81. Postgraduate programme was started from 1976 in 6 disciplines viz., M.Sc. Ag in Agronomy, Soil Science & Agrl. Chemistry, Agrl. Botany, Agrl. Entomology, Plant Pathology and M.Sc. in Horticulture. From 1979, Ph.D. Programmes were also started in the above disciplines. Subsequently postgraduate programme was introduced in Agrl. Economics, Agrl. Extension, Agrl. Meteorology, Agrl. Statistics and Home Science (Food Science & Nutrition. The college functions with 16 departments viz., Agronomy, Agrl. Meteorology, Soil Science & Agrl. Chemistry, Plant Breeding & Genetics, Agrl. Entomology, Plant Pathology, Agrl. Economics, Agrl. Extension, Agrl. Statistics, Pomology & Floriculture, Olericulture, Plantation Crops & Spices, Processing Technology, Agrl. Engineering, Home Science & Physical Education. Radiotracer Laboratory, the Cadbury Cocoa Research Project, the Centre for Biotechnology & Molecular Biology and Instructional Farm are also functioning under the college.

Mandate of the institute

The College of Horticulture is proud of the achievements of the students in academic activities and teachers in their professional field. The college maintained a consistent and excellent track record in the national competitions like JRF, SRF and ARS-Net examinations. During the year 2002, 21 students bagged JRF, most of them with top ranks. The excellent performance of our students raised the position of the College of Horticulture to third in the country.

Miss. Preetha,D, PG student of the Department of Soil Science & Agricultural Chemistry and Miss. Vidya, A.S.,Dept. of Agronomy secured the Young Scientist Award in the 16th Kerala Science congress during January, 2004.

Post Graduate Programme leading to the award of M.Sc. (Agriculture) in Plant Biotechnology was started in the University and out of a total intake of 10 students, six were allotted to the College of Horticulture.

The research paper presented by Dr. T.D. Babu at the National Seminar on new perspectives in Spices, Medicinal and Aromatic Plants on 27th to 29th November at ICAR Research Complex for Goa at Old Goa won the best paper award 'H.S Metha Memorial National Award'. The research paper was 'Detection of genetic diversity in *Piper* species using RAPD and AFLP markers' by Dr. T.D. Babu, T.A. Nazeem, R. Kesavachandran, C.R. Achuthan, D. Girija, P. Sureshkumar and K.V. Peter.

The Board of Radiation and Isotope Technology (BRIT), Mumbai, the sole agency under Department of Atomic Energy, Govt. of India, supplied a beta shield worth Rs. 3500/- free of cost to Radiotracer lab as a complement for the isotope aided works being conducted in this lab. The Godrej Agrovet Ltd. Mumbai identified this lab as the only facility in the country to conduct absorption, translocation and metabolic studies in plants using radio-labelled compounds of herbicides, pesticides etc. As a result, a collaborative study was undertaken by the university with this firm on "Absorption, translocation and metabolism of ¹⁴C labelled Pyriithiobac-sodium (a new herbicide for cotton) in cotton plant". The study was completed and report submitted.

Faculty Improvement Programme

Seminars/Summer Institute/Symposia/Trainings attended

The scientists of the College attended various National and International seminars on Biotechnology, Rice Breeding, Medicinal plants and health care, Technique in gene cloning, Genetic Engg., Environment, Economics, Workshop on Gender, Agriculture and Rural livelihood and other ICAR sponsored programmes.

Academic programme

Admission (No. of students as on 31.3.2004)

Year of Admission	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
1	2	3	4	5	6	7	11	12

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

2000	9	39	48	-	6	6	9	39
2001	7	23	30	1	5	6	7	23
2002	15	25	40	1	9	10	15	25
2003	11	37	48	3	6	9	11	37

a (ii) P.G. Programme (on rolls) (Discipline wise)

2003 Admn. M.Sc(Ag)			
Agronomy	1	3	4
Entomology	2	2	4
Pathology	1	3	4

Year of Admission	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
Soil Science		1	1					
Ag.Extn.		1	1					
Ag.Economics	1	3	4					
Ag.Meteorology	-	-	0					
M.Sc(Hort)	5	6	11					
M.Sc(H.S.)	-	4	4					
M.Sc(Ag.Stat)	2	-	2					
M.Sc(Ag) in Plant Biotechnology	-	7	7					
2002 Admn.								
M.Sc(Ag)								
Agronomy	1	1	2					
Entomology	-	2	2					
Pathology	1	3	4		1			
Plant Breeding	1	2	3					
Soil Science	1	3	4		1			
Ag.Extension	-	1	1					
Ag.Economics	-	1	1					
M.Sc (Hort)	1	8	9		4			
M.Sc(H.S)	-	4	4					

a (iii) Ph.D. Programme (on rolls) (Discipline wise)

2000 Admn										
Pl.Breeding	1	-	1							
Ag.Extn.	2	1	3				1	-	1	
Soil Science	1	-	1							
Horticulture	-	1	1							

Years of Admission	M	F	Total	SC/ST			Foreign Students			Total	
				M	F	Total	M	F	Total	M	F
2001 Admn											
Agronomy	-	1	1								
Pl.Breeding	1	1	2								
Entomology	1	1	2								
Horticulture	-	3	3								
2002 Admn											
Entomology	-	1	1					1	1		
Horticulture	2	-	2								
2003 Admn											
Agronomy	1	1	2								
Ag.Entomology	1	1	2	1		1					
Pl.Pathology		1	1								
Ag.Extension		1	1								
Horticulture		1	1		1	1					

Study tours

B.Sc (Ag) students of 2000 admission had their North India Study Tour programme during which they covered all important places of agricultural importance in the North Indian states. Dr. Lalitha Bai, Dr. K.Krishnakumari and Sri.S.Krishnan were the staff members accompanied the students.

Students Union Activities

The Students Union 2003-04 came into power on 2nd September, 2003. The official inauguration of the Union was held on 10/11/2003 with Karshakasree Sri.T.V.Thomas and cine artist Mr. Arvinder as chief guests.

Inter-class arts competitions were held from 8th to 20th March, 2004. The hand written magazine Darpan'04 was released at the validation of Sopanam '04 - arts fest. The programme ended with a caricature programme by stage artist Sri.Jayaraj Warriar.

Students participated in a television programme 'Campus Hangama' and emerged as the Runners Up. This programme was telecasted on Jeevan TV on 27th, February. On 11th, March the Quiz Club conducted a programme "Quizzing yourself".

The Planning Forum conducted a debate on Genetically Modified crops: The Social service League conducted cleaning programmes in the hostel and college premises in connection with Gandhi Jayandhi Celebrations together with NSS.

Students Placement Cell

Bio-data of the graduates and postgraduates were collected and sent to needy entrepreneurs and companies.

Extra-curricular activities

N.S.S. Activities

Students were involved in various activities under the NSS programme. A Horticulture therapy programme was organised at the Tropical Health Foundation of India, Kunnankulam, an institute for the mentally and physically disabled children, during which the volunteers engaged the inmates in various gardening activities like preparation of potting mixtures, filling up of pots, sowing of seeds, planting of seedlings etc.

Sports & Games

Annual interclass athletic competitions was held in a befitting way on 10th April, 2003. Dr.Sukumara Varma, the then Associate Dean inaugurated the meet and Dr.Luckins C.Babu, Associate Dean of the College of Forestry distributed the prizes in the closing ceremony.

Students of College of Horticulture participated in the various inter-collegiate tournaments held during the period under report.

Research programme: Major research achievements.

Olericulture

The high yielding coccinia culture C.G 23 was recommended for release and will be placed in the next variety release committee. The following cultures were recommended for farm trial in the ZREAC meeting held at RARS, Pattambi .

Crop	Variety
Chilli	CC54, CC23
Amaranth	A 239, A 197
Salad cucumber	AAUC - 2
Cowpea	VS 492
Ridgegourd	LA 7

The performance of the above cultures are found superior in the farm trials and will be progressed for release. Ideal spacing for small fruited oriental pickling melon is standardized as 2 x 0.30 m. NAA (15 ppm) and CCC (300 ppm) were found to increase yield in yard long bean.

Plantation Crops and Spices

Completed (funded by GOK) nine research projects under the EAP scheme Technology Mission on Black Pepper. Reported being prepared; Completed the ICAR Ad-hoc scheme on Malabar Tamarind or Kudampuli; Sex differentiation of Kudampuli through isozyme banding technique using PAGE; *In vitro* germination of 3/4th mature seed so as to break the dormancy of 7 months' has standardised; Standardised somatic embryogenesis from endosperm callus of Kudampuli so as to develop seedless Kudampuli variety; Standardised multiple shoot induction of Kudampuli (upto 10 shoots) from nodal segments; Standardised methodology to avoid *Phytophthora* foot rot disease incidence in black pepper by giving weekly irrigation (5 liters of water) during severe summer months; and Completed TMBP, funded research project on Breeding for resistance to *Phytophthora* foot rot of black pepper. Report being prepared.

Processing Technology

The higher growth rate in coleus was observed between 135 to 150 days after transplanting. The starch and polyphenol content increased with the maturity of tubers, whereas the soluble sugars increased upto 135days after transplanting and there after declined. A particular fungus strain *Trichoderma hazianu5m* was found to produce enzyme pectinase in solid state fermentation of fruit wastes viz., grape, mango, jackfruit and cashew apple.

Agronomy

The black pepper yield in the State, which is affected due to the periodic dry spell from October to May can be managed by two approaches. One is by cultivating drought tolerant varieties. Second is by judiciously scheduling irrigation depending on the availability of water resources. Panniyur-5 possesses the best morphological, physiological, biochemical and anatomical adaptations to tolerate water stress and Panniyur 1 has poor adaptations. In drought prone areas, Panniyur 5 may be preferred over Panniyur 1 both for bush as well as vine pepper.

Irrigation may be scheduled for field grown bush pepper considering the root zone as 30 cm around and 60 cm deep from the plant and optimum depletion of available soil moisture as 50 %. Drip irrigation @ 8 l/ha/day during October to May is better in bush pepper than pot watering @ 10 l/plant/day.

Microbial inoculation with *Glomus fasciculatum* and *Azospirillum lipoferum* is beneficial for the growth and development of black pepper in the initial stages.

It was revealed that potting mixture containing cowdung as organic manure along with sand and soil inoculated with *Azospirillum*, PSB and AMF was the best for growth of cashew root stocks. Soil application of decanted extract of ground nut cake and 17:17:17 mixture at one month after grafting and foliar application of 2% 17:17:17 mixture at three months after grafting was the best for the successful growth of cashew grafts.

The study conducted on agrotechnological practices for quality crude drug production in Nilappana showed that the primary metabolites like sucrose, crude fibre and

crude fat decreased initially probably due to their utilisation by the plant but it increased during later stages and the active growth period is till seven MAP. It requires deep planting and regular earthing up and a spacing of 10 x 10 cm at 25 % shade. This crop can be cultivated in rubber and coconut plantations. It responds upto 30 t of FYM ha⁻¹ in terms of yield, glucose, protein and curculigoside contents in the rhizome. The yield level is over 2.5 t per ha.

In rice raising mat nursery using soil + cowdung in the ratio of 1:2 in wet system and soil + chaff in the ratio of 2:1 in dry system can be recommended for manual and mechanical planting.

The study on methane emission from wet land rice fields of Kerala revealed that the methane efflux from the laterite rice soils was in general low to the tune of 1.64 mg m⁻² hr⁻¹ during the first crop season and 3.5 mg m⁻² hr⁻¹ during second crop season.

A change in the N source from urea to ammonium sulphate improved productivity of rice mainly due to the effect of sulphur fertilisation. Green manure application along with lime, ash and N:K (1:1) in the fertilizer recommended resulted in the highest B:C ratio of 2.25.

Study on nutritional constraints of rice – legume system in laterite soils of humid tropics showed that the low yield obtained from these soils could be due to nutritional constraints owing to excesses imbalances or metabolic unavailability of elements. The high content of available iron in the soil causes poor utilisation of N and recycling of paddy straw and continuous addition of silica were effective in improving yield.

It was revealed that concurrent growing of horsegram up to the onset of SW monsoon was superior to cowpea in semi dry rice. Pendimethalin and pretilachlor were observed to be the best herbicides in terms of safety and effectiveness for rice and green manure crop system.

The study on weed dynamics in rice fields showed that changes in weed community occur both at regional scale and at field scale. A few weeds could be identified which can be used as indicators of the soil conditions and offers scope for ameliorative management for better weed control and crop growth.

Plant Pathology

Integrated management of *Phytophthora* foot rot in black pepper nursery revealed that solarization of potting mixture, application of *Trichoderma* spp. and fungicide like Akomin-40 and Ridomil-MZ can be used for managing the incidence of disease. In field application, *Trichoderma* spp and Akomin recorded maximum effect in reducing the disease.

Two promising antagonists viz. *Trichoderma longibrachiatum* and *T. viride* isolated from the rhizosphere of black pepper and *T. harzianum* (standard culture) were incompatible with Bordeaux mixture, copper hydroxide, captaf and chlorothalonil while, they were compatible with mancozeb, Ridomil-Mz and potassium phosphonate. Further, antagonists were compatible with phorate and carbofuran whereas monocrotophos, quinalphos, endosulphn dimethioate, cypermethnin and higher concentration of

chlorpyrifos were inhibitory to them. Among the fertilizers, urea, rajphos, ammonium sulphate and muriate of potash were compatible with antagonists while factomphos and higher concentration of urea did not support good growth of the antagonist.

For the management of bacterial wilt of solanaceous vegetables under field condition, treatments with antagonists *T.viride*, *T.pseudokoningii*, *P.aeruginosa* root dipping with Adathoda extract (20 per cent), mulching with Eupatorium, application of urea + lime, Streptocycline + copper oxychloride were more effective as compared to control plots. Further, *Glomus* spp. isolated from Ozhalapathy and Vellanikkara showed effectiveness in delaying wilt incidence in tomato.

Application of copper oxychloride, copper hydroxide, garlic extract, *Trichoderma viride* were found effective in management of leaf spot of ivy gourd caused by *Cercospora coccinea* and, *Colletotrichum gloeosporioides*. Extracts of *Plumbago rosea* showed maximum inhibitory property against pumpkin mosaic virus.

Radio Tracer Laboratory

- a. Crop-standard interaction in black pepper (Ph.D. research work from Dept. of plantation crops and Spices)
Complementary/competitive interaction between pepper and seventeen different species of standard trees (including teak pole as a dead standard) were studied by ³²P soil injection to the effective forage space (EFS) of pepper.
- b. Another study on root level interaction between mangium trees and ginger as an inter crop was carried out during November, 2003 as part of Ph.D. work from College of Forestry.
- c. Gamma irradiation for inducing mutation in crops and ornamentals, for inducing male sterility in insects, for chemical changes in chemicals and for disinfestations.
The following materials were irradiated in gamma chamber as detailed with the objective of either inducing mutation, or disinfestation or inducing some chemical change or inducing male sterility.
- d. A collaborative study was carried out with Godrej Agrovet Ltd., Mumbai on absorption, translocation and metabolism of a new herbicide - Pyriithiobac sodium - in cotton using ¹⁴C labeled herbicide.
- e. At present Department of Genetics, College of Veterinary and Animal Science is conducting externally funded, radiotracer aided research on Micro-satellite loci in cattle and goat genome.
- f. Network Project on improvement of selected spices through biotechnological tools. This project from CPBMB, CoH aims to assess the genetic variability among Piper species.
- g. Postgraduate research at M.Sc. and Ph.D. levels from the faculties of Agriculture, Veterinary and Fisheries and Forestry are being conducted at RTL utilizing different isotopes.
- h. RIA are being done as part of P.G and other research projects in Veterinary faculty.

BCCP

Orthogalumna terebrantis Wall Work, the galumnid mite pest of water hyacinth established all over the release sites in Kerala and spread far and wide giving partial suppression of the mat, it certainly helped to reduce the vigour and health of the plant thereby making the plant susceptible to other pests and diseases and thus reducing its competitive advantage.

Cyrtobagous salviniae weevils continue to maintain its ability in suppressing and maintaining a balanced population of the *Salvinia* weed over the vast areas of paddy fields and back water regions covering an extent of 1000 km square in Kuttanad and Kole lands of Kerala.

Evaluation of *Trichogramma* parasites management of rice pests indicates that there was no significant difference in yield between treatments and control. It indicates the effective role played by natural control/natural enemies in the paddy ecosystem. It also indicated the need for restricting the use of chemicals for pest epidemics only and the practice of wider scale use of chemicals for plant protection for paddy pest management is unnecessary and should be discouraged by all means. The message is already being conveyed through the IPM programme in the State and our trials helped to generate additional data to substantiate the IPM concepts.

The efficacy of entomofungal pathogens viz., *Metarhizium anisopliae* and *Beauveria bassiana* were evaluated for two seasons for the management of leaf and plant hoppers. During rabi season *B. bassiana* was found effective in reducing hopper population.

Survey for relative abundance and parasitism levels of natural enemies of important rice pests was conducted during 2003-04. The major spiders recorded during the rabi and kharif were *Tetragnatha javana*, *T. mandibulata* and *T. andamanensis*. There was no significant difference in the population of entomophages in different locations during kharif. In situ collections were also made in the two seasons and the major parasitoids collected from stem borer egg mass was *Tetrastichus schoenobii* and *Telenomus* sp. *Platygaster malabaricus*, *P. oryzae* and *P. inderdaadi* were the parasitoids of rice gallfly.

A field trial on organic farming was laid out during kharif and rabi seasons 2003-04 and the results showed that the natural enemy population viz., coccinellid and spider population was significantly high in organic farming plot.

Mycohit evaluation against coconut mite through frequent sprays was carried out during August, 2003 to February 2004. The live mite count was significantly low in the nuts of second bunch collected from mycohit-applied palms when compared to the untreated control. Pre and post treatment assessment of the nut characters was also done, but there was no significant difference in the nut characters between the two treatments.

The release of *Goniozus nephantidis* against *Opisina arenosella* was evaluated by conducting a field trial. After III, IV, V and VI releases of parasitoid, the population of *Opisina* came down and it was significantly low in the parasitoid released palms when compared to control palms.

Field evaluation of *Cardiastethus exiguus* against *O. arenosella* was carried out during the year and resulted in significant reduction of the *Opisina* population after release of the predator when compared to control. However, there was no significant difference in the number of predators released 50 vs 100.

Monitoring and evaluation of the biocontrol agents of weeds was also carried out and found the presence of the bio-agents in all the locations surveyed.

NATP/CGP on coconut mite

Under the NATP project on coconut mite, extensive survey was undertaken in Kerala, and specific fungal pathogen *Hirsutella thompsonii* was recorded from all the three-agro ecological situations. In addition to *H. thompsonii* a number of other fungi were also found associated with dead coconut mite collected from the field. They are *Acremonium*, *Fusarium*, *Sporothrix*, *Paecilomyces*, *Verticillium* and other unidentified species. Based on the preliminary studies on cultural, morphological and biological properties, different isolates of *H. thompsonii* are being maintained for further studies.

ICAR ad-hoc project on spiders

Spider survey: To find out the diversity and abundance of spiders, survey is continuing in the vegetable and rice agro-ecosystems of Thrissur and Palakkad districts.

Total species recorded from various agro-ecosystems are given below; Thrissur district; Rice – 31; 2. Bitter gourd – 26; 3. Ivy gourd – 24; 4. Cowpea – 19; Palakkad district Rice – 32; 2. Snake gourd – 27; 3. Ivy gourd – 30

Guild structure: In both the districts, major spider guild represented in all the crops are orb weavers, next highly recorded guild was stalkers.

ICAR ad-hoc project “Forewarning Tea mosquito bug (*Helopeltis antonii*) in Cashew

Collected nine species of predatory spiders from cashew ecosystem.

Plant Breeding & Genetics

A study on morphological, biochemical and molecular markers for the genetic analysis of cashew revealed that almost all characters had significant variation. H 1593 was the most genetically divergent phenotype with the lowest phenol content. The morphological, biochemical and molecular studies indicated proximity of Indian accessions with those of South America.

A stability analysis of fourteen mutants of coleus comprising of eleven promising mutants, two released varieties and one local cultivar was conducted at four locations. The study revealed that the ideal plant architecture in coleus should have optimum tuber number, white coloured delicious non gravy tubers with optimum starch and protein content, good texture and medium flavour. Mutants 641 and 352 were the most stable, high yielding and well adapted over locations.

The F2 and F3 generations of these selected crosses and parents in bitter melon were evaluated for yield attributes and resistance to bitter melon distortion mosaic virus (BDMV). High yield was obtained by higher sex ratio, higher fruit weight, long fruit, optimum number of female flowers and low incidence of BDMV. The progenies from the crosses IC 68335 x Preethi and IC 68263 B x Preethi have high yield and resistance to BDMV in both generations.

The stability analysis of seven rice cultures obtained from a previous study was conducted at three locations. Out of these cultures, C 26 T (b) (Mashuri x Vyttila - 3) gave maximum grain yield and was stable for most of the yield contributing characters. C-80 (PK 3355-5-1-4 x Bhadra) was the second stable culture with high yield. These two cultures can be developed into two varieties for release.

Home Science

The study entitled Household food security and nutritional status of women agricultural labourers indicated that about 88% of the households in the organised sector are food secure. Food insecurity was more in the households with children in both organised and unorganised sectors. None of the families in the organised sector experienced food insecurity with hunger while 40% in the unorganised sector had food insecurity with moderate hunger.

Value added products of breadfruit were standardised and evaluated for quality attributes. Among the primary products with breadfruit, the fresh fried chips was more acceptable when stored in polyethylene bags of 250 gauge which remained acceptable for more than 45 days of storage. Breadfruit flour could be used as a composite flour for the preparation of wafers due to its high starch content. Among the different combinations of wafers prepared the breadfruit flour in combination with rice flour and ginger garlic paste in the ratio of 40:40:20 was found to be the best.

In the study conducted among preschool children of fishermen, it was found that more than 40% had height deficit for their age. As per weight for age classification most of the children had grade I and II malnutrition showing the prevalence of current malnutrition.

Seven Nendran types and their products were evaluated for quality attributes. Significant variation in all the physical characters and chemical constituents was observed between the Nendran types. Acceptability studies indicated that Attunendran is the most acceptable for table purpose while Chengalikodan is the best to prepare porridge and chips. A gradual decrease in the quality attributes and overall acceptability of chips and porridge was noticed during storage.

Agricultural Statistics

A study was conducted to find out the distribution of weekly rainfall, to estimate the assured weekly rainfall at different probability levels and to identify the rainfall pattern of different agroclimatic zones of Kerala. Pilicode, Ambalavayal, Vellanikkara, Pampadumpara and Vellayani. The weekly rainfall probabilities and assured rainfall were computed by fitting appropriate probability models.

Normal, lognormal, gamma and exponential distributions were selected based on the Kolmogorov-Smirnov test and fitted to weekly rainfall. At Pilicode, Ambalavayal, Vellanikkara and Vellayani, lognormal and exponential distributions could represent the distribution of rainfall in majority of the weeks while exponential and gamma distributions at Pampadumpara. Weekly rainfall probabilities for 10 mm, 20 mm, 30 mm and 40 mm at 75 per cent and 90 per cent were computed from the best fitted distribution for all the five selected locations.

The maximum mean weekly rainfall of 275 mm (June 11th-17th), 138 mm (July 23rd-29th), 194 mm (June 11th-17th), 94 mm (July 23rd-29th) and 98 mm (June 4th-10th) are observed at Pilicode, Ambalavayal, Vellanikkara, Pampadumpara and Vellayani, respectively. The mean annual rainfall at these stations is 3557 mm, 2492 mm, 2751 mm, 1895 mm and 1515 mm, respectively. The probability of getting more than 10 mm, 20 mm, 30 mm and 40 mm rainfall during South West monsoon followed a better trend at Pilicode, Ambalavayal, Vellanikkara and Pampadumpara. Therefore, it can be inferred that rainfed crops can successfully be grown during *kharif* season while growing of *rabi* crops in winter without supplementary irrigation could be risky. At Vellayani, crops could be grown round the year with assured irrigation facilities unlike at other four locations. The results of the analysis also suggest the need for introducing drainage systems during the South West monsoon, when rainfall is very high.

Entomology

ICAR- UK DFID Project on integrated management of fruit flies in india

1. Monitoring of fruit flies were done using methyl eugenol and cue lure traps.

Fruitflies were found to vary with different season

a. Field single killing point study

Mango - Synthetic (Protein hydrolysate and Methyl eugenol) and Natural attractants (Ocimum and Banana) were tried to check their effectiveness in fruit fly control. There is no significant difference between fruit fly infestations between these treatments.

Bittergourd- Different treatments like jaggery, banana, ocimum, protein hydrolysate, jaggery+ banana were tried. Jaggery+ banana performed better than all the other treatments

b. Wide area control- The initial studies for wide area control, which is expected in 2004, were done in farmers fields at farm level.

Comprehensive coconut and coconut mite management

Coconut mite management was done at Mapranam covering thousand palms and five rounds of treatment applications were completed with Neemazal crown spray and Hexaconazole spindle drenching. The results so far indicated substantial reduction in mite population and substantial recovery in terms of reduction in nut damage which is appreciated by the farming community at large in the experimental and adjoining area.

Action research on mite control in coconut in kau campus

Efforts are being made to manage the pest through root feeding of botanicals. Management of *Helicoverpa armigera* by the use of newer molecules of insecticides and in combination with fungi, bacteria and viruses, is completed.

Ainpao

Survey conducted in different agro-climatic zones showed that in the rice fields more than one hundred birds visit at different crop stages. The predominant depredatory birds on rice are the baya weaver, parakeets, teals, moorhen, pigeons etc. damaging the crops in the nursery as well as in the reproductive stage of the crop. The main beneficial birds being the cattle egret, house crow, swift, terms, myna, etc, were actively feeding on insect and other organisms which could be enemical to the crop at one stage or the other way.

Mapping of the ecosystem with the cropping pattern and the abundance of birds helped in identification of potential sites of the feeding areas of birds like baya weaver bird, parakeets and pea fowl. Damages by different birds have been recorded, banana by small green barbet (21%), rice by baya weaver bird, parakeets and teals (9.1, 19.7, 5.0% respectively), pulse by parakeets (15.6%) and pepper by koel, bulbul and barbets (15.9%).

All the tested plant extracts viz, *Andrographis*, cassia, Lantana, Annona, Ipomoea, *Ocimum* sp. at 10 per cent level had the feeding repellency in the captive birds viz, parakeets and passerines. Integrated management practices utilizing the bio-bird repellent and the reflective ribbon could effectively reduce the parakeet damage when compared to unprotected field.

Role of insectivorous birds was documented in rice where the yield of rice was about half compared to the field with bird perches and open due to the infestation by pests, viz, rodents, crabs, insects, scorpion, etc. The owls started colonizing the mud pots.

The population of house sparrow was recorded in the urban area, village hamlet and the agricultural fields. The bird was predominant in the commercial places and only in the hilly areas, they were found in the agricultural fields.

Pesticides poisoning was recorded in the agricultural fields in birds, fishes, snakes, snails, etc.

In the ecological studies on *Megalaima viridis*, additional food sources were identified viz, jamun, sweet lovi, termites, etc.

Platygasterid parasitoids in rice and vegetables

Six species of *Platygaster* namely *P. coorgensis*, *P. minimus*, *P. oryzae* and *P. sasii* were recorded as pupal parasitoids of rice gall midge. *Platygasterid* population was significantly higher during Mundakan season. All the species except *P. oryzae* are new reports. Seven species of other hymenopteran parasitoids were also recorded from galls.

Economics

Co-ordination group : Agro Economic studies

The ICAR project on Agribusiness opportunities in Kerala - Constraint analysis to ensure sustainable efficiency was aimed at studying the problems and prospects of selected agribusiness enterprises in Kerala. The results indicated that processing and vermicomposting had very high sustainability status whereas poultry business was highly unsustainable.

The study on market behaviour of spices in Kerala worked out the trade competitiveness of pepper, cardamom, ginger and turmeric using nominal protection coefficient. The study showed that trade competitiveness of cardamom, ginger and turmeric was lowered due to globalization.

A study on production and trade competitive advantages of natural rubber in India was completed. The trends in area, production and productivity of natural rubber in India were worked out and the trade competitiveness for export assessed.

A study on economics of commercial production and utilization of Medicinal rice, Njavara was completed. The study was undertaken in Thrissur, Malappuram, Palakkad and Wayanad districts of Kerala. The study showed that cost of cultivation of Njavara was 14059 per hectare and the BC ratio found to be 2.03.

Soil Science & Agricultural Chemistry

The unsieved Oushadi wastes with 2.03% N, 0.33% P and 0.85% K when enriched with cow dung – quail mixture and the biotic agent *Eisenia foetid* gave a high quality nutrient rich compost of N (3.62%), P (0.85%) and K (0.89%).

Pomology & Floriculture and AICFIP

Fruits (PC group)

NATP founded plant biodiversity project on mango and minor fruits was concluded during December, 2003. Through survey conducted all over Kerala, 47 accessions of mangoes and 108 accessions of minor fruits were located. Planting materials collected are maintained for further evaluation. IC numbers for the above accessions were obtained from NBPGR, New Delhi.

Varietal evaluation studies done in sapota revealed that highest yield was recorded in PKM 1 and Cricket ball and PKM-1 variety registered the best fruit qualities. Inter varietal hybridization programme showed that maximum fruit set was in crosses between Co.2 x Gavarayya and Cricket ball x Co.2.

In jack, wide genetic diversity existed among the surveyed accessions in Thrissur district and the accessions were grouped into ten clusters. Pruning trials in jack trees resulted in reduction in number of days taken for flushing, flowering and yield with

decreasing order of severity, that is light turning treatments resulted in easy flushing and fruiting followed by medium and severe pruning treatments.

Floriculture (PC group)

Evaluation of twenty seven foliage plant species for use as cut foliage revealed that *Asparagus setaceus* has immense potential followed by ferns (*Nephrolepis cordifolia*, *N. exaltata*) and grass species (*Scirpus cernuus*) and *Ophiopogon jaburan* 'Variegatus' as cut foliage. Tap water is sufficient to hold the foliage both at producers and consumers level. Storage at lower temperature extends the post harvest period. Plugging with wet cotton and packing without any lining were enough to transport the foliage.

Five cultivars of gerbera (*Gerbera jamesonii* Bolus) namely Essandse, Juvena, Lindessa, Tamara and Yanara were evaluated. Varieties differ significantly with respect to plant height plant spread and number of leaves. For all the varieties studied, slight reduction in vegetative growth and flower production was observed in June and July. Var. Essandse produced maximum number of flowers where as flower diameter was maximum for var. Yanara.

Bio fertilizer application along with inorganic fertilizer influenced the growth characters of *Dendrobium* orchid var. Sonia 17. Plants which were inoculated with *Azospirillum* at the time of planting and sprayed with 20:10:10 NPK at 0.2 per cent concentration, came to flowering early, produced large flowers, lengthy spikes and more number of flowers per spike.

Investigations on dry flower/foliage production revealed that crops like aster, gerbera and celosia can be dried and stored without affecting their shape and other flower qualities. Oxidative bleaching was the best method for dry flower production. Dried flowers and foliages can be used for bouquets, pot pourri and card preparations and flower arrangements.

Investigation on 'Improvement of *Anthurium andreanum* by *in vivo* and *in vitro* methods' were carried out to evolve new varieties and to standardize the age of seed and media for *in vitro* seed culture. Out of the 42 combinations of hybridization tried, 17 were found compatible. All the self and inter specific crosses were incompatible. Among all the combinations, 'Lima' produced the largest number of compatible crosses as well as the highest seed set and germination percentage. The protocol for immature hybrid seed culture (*in vitro*) in anthurium was developed. Seeds, 40-45 days before field maturity could be used for *in vitro* culture, thus reducing the time lag for production of hybrid seedlings. Germination and further development were good in $\frac{1}{2}$ MS + 1 mg l⁻¹ BA. For callus initiation, $\frac{1}{2}$ MS with BA 6 mg l⁻¹, NAA 3 mg l⁻¹ was effective. For rooting and growth enhancement, $\frac{1}{2}$ MS with BA 0.5 mg l⁻¹ and IAA 1 mg l⁻¹ and proved good.

In *Dendrobium* 'Sonia Bom Jo' a treatment combination of tile bits + charcoal as media improved flowering and the floral characters.

Tissue cultured plants of *dendrobium* responded positively to high doses (more than double the recommended) of fertilizers during the pre-blooming stage.

In *Dendrobium* 'Sonia 17' the plants treated with *Azospirillum* at the time of planting and sprayed with fertilizer solution 20:10:10 @0.2% recorded earlier flowering and improved floral characters.

Dendrobium the vase life could be extended from 15 days (control) to 32 days by holding in a solution containing 8 HQC (300 ppm) + sucrose (6 per cent).

In anthurium, river sand as well as coconut pith along with cowdung were found to be the superior media resulting in earlier flowering and improved floral characters.

In anthurium variety Tropical, NPK @ 30:10:10 as well as NPK@15:0:10 + Azospirillum + Phosphobacteria + VAM sprayed twice a week @0.2% along with GA 200ppm gave superior growth and flowering.

Anthurium flowers packed in boxes with the spathe kept in polythene sleeves after waxing and with $KMnO_4$ lasted very long without any senescence symptoms.

The monthly planting studies in tuberose revealed that the best planting time at Vellanikkara was March - April and October - November.

Nutritional studies in tuberose indicated that higher levels of NPK induced good vegetative growth and flowering.

Tuberose spikes kept in $AgNO_3$ 25 ppm + sucrose 2% as well as in citric acid 300 ppm + sucrose (2%) gave good vase life. Spikes packed in brown paper for 24 hour duration resulted in maximum vase life.

Centre for Gender Studies

1. The Centre has implemented an ICAR sponsored networking project on "Engendering Agricultural Research and Education" in collaboration with the NRCWA, Bhubaneswar. Identification of gender issues of selected farming system and training module preparation and in progress.
2. The Centre in the period under report has an ongoing NATP in the CGP mode "Gender Analysis of Farming Systems for sustainable technologies, programmes and livelihoods". Data collection and tabulation of the seventeen identified Panchayaths of three districts are completed. Gender Impact Assessment index is completed.
3. The Centre is implementing a KAU plan project titled "Adoption and suitability of mechanical paddy transplanter for the farm women labour in the paddy cultivation of Thrissur and Palakkad districts". The threat of displacement of women labour and drawbacks of the machine for the use of women labourers are being studied and improvements suggested.
4. A KAU plan project titled "Gender Analysis of Farming Systems for Sustainable Technologies, Development Programmes and Livelihood" is also currently under progress.
5. Two field observation studies on gulf migration and its impact on women and Kudumbasree units are ongoing in Kadavallur Panchayath
6. A DBT sponsored project entitled "Women Empowerment networking in Kerala through science and technology" was initiated on 15.3.2004 for duration of three years. Identification of problems of women entrepreneurs and sustainable units are in progress.

Centre for Plant Bio-technology and Molecular Biology

- Completed AFLP analysis for 48 varieties and 9 species of black pepper
- Identified 5 *in vitro* derived clones of vanilla a superior and distributed to farmers for field evaluation.
- A portion of β 1, 3-glucanase gene was cloned and sequenced from *Piper nigrum* and *Piper colubrinum*. cDNA library of both species has been constructed.

Agricultural Meteorology

AICRP on Agrometeorology

Leaf and spadix phenology of coconut (*Cocos nucifera* L.)

The biotic events in coconut such as functional leaves, leaf shedding, spathe emergence and its duration, spadix emergence, female flowers and button shedding were recorded weekly from February 2002 to June 2003 in ten palms each of eight-year-old cultivars viz., Tiptur Tall, Kuttiadi (WCT), Kasaragod (WCT) and Komadan (WCT)

Growing degree day (GDD) versus spathe duration indicated that there is a close linear relationship between them in all the cultivars. The spathe duration was high if GDD was also high and vice versa. It revealed that it took less number of days to open in South West monsoon while more in winter.

The average annual button shedding was high (58%) in Komadan, followed by Tiptur Tall (55%) and Kuttiadi (55%) while the least (53%) in Kasargod. It indicated that Komadan was more prone to button shedding when compared to other test cultivars. On an average, the mean annual percentage of button shedding was 55.

Seasonal variation in button shedding in different cultivars of coconut

Cultivar	Summer (Mar-May)	SWM (June-Sep)	PM (Oct-Nov)	Winter (Dec-Feb)	Mean
Tiptur Tall	62 (77)	52	37	69	55
Kuttiadi	55 (73)	53	46	65	55
Kasargod	59 (71)	50	43	58	53
Komadan	69 (72)	53	39	72	58
Mean	61 (73)	52	41	66	55

Figures in parenthesis indicate the percentage button shedding in summer 2003
DST project on Experimental agromet advisory services

Extension and other activities

Olericulture

The scientists of the College participated in Agricultural Extension activities related to Plant Protection methods and offered training on vegetable cultivation to the farmers of Thrissur, Palakkad and Ernakulam Dists. and handled classes to Department on various

methods in agriculture. They have also attended to phone in programme of vegetable cultivation conducted by the AIR.

Training was given to the Agricultural Officers in Cocoa processing, Elaneer processing, Copra processing and Fruit and vegetable processing. Training was given to Department of Agriculture about Biocontrol measures and supplied biocontrol agents to farmers.

Scientists of the College took classes on integrated disease management in vegetables and organised training programme on mushroom cultivation.

A National Seminar on Floriculture was convened during the report period at College of Horticulture, Vellanikkara.

Radio talks

Name	Topic	Date
Dr. Salikutty Joseph	Perennial vegetables	8.7.03
	Organic cultivation of vegetables	1.3.04
Dr. K. P. Prasanna	Snakegourd cultivation, AIR, Devikulam	
Dr. Baby Lissy Markose	Cultivation practices of tuber crops	24.3.04
Dr. T. R. Gopalakrishnan	Cultivation of bitter gourd at AIR, Devikulam	1.3.04
Dr. T. R. Gopalakrishnan	Question answer in vegetable cultivation Phone in programme	25.1.04

Processing Technology

Dr. P. Jacob John

- a) Attended one day clinic in Food Processing and gave a talk 'Available Technologies in Food Processing' at Hotel Palace, Malappuram on 17-3-03, organized by KITCO & SIDBI.
- b) Attended a meeting of the Board of Studies as the chairman of Board of MSc examination on 19-9-03 and 3-2-03 at Calicut University campus.
- c) Gave a talk on various technologies available to start "Food Processing Industries" to selected trainees at District Industrial Management Centre at Thrissur on 25-3-04.

Dr. K. B. Sheela

Training Programme handled Classes on: -

- (1) Tender coconut processing
- (2) Farm level value addition of cocoa
- (3) Training Programme on fruit & vegetable preservation.
 - (a) Cherpu Krishibhavan – July 2003
 - (b) Manalur Krishibhavan- October 2003
 - (c) College of Horticulture, Dept. of Processing Technology
 - (d) RATTC. Malampuzha on 10th & 11th Dec.
 - (e) RATTC Vytilla 19th & 20th Dec.

- (4) Training programme on spice processing – RATTC Malampuzha August 2003.
- (5) Training programme on Vanilla Processing - RATTC Malampuzha March 2004.

Dr. P. B. Pushpalatha

- I Training was given to the Agrl. Officers, Agrl. Assistants and to farmers, Kudumbasree units and entrepreneurs on the following aspects at RATTC Malampuzha and Vyttila and at different block Panchayaths.
 1. Fruit and vegetable preservation
 2. Elaneer processing
 3. Copra processing
 4. Cashew apple and nut processing

Radio talks

Dr.Sally.K.Mathew attended the phone in program on *Summer vegetable cultivation* at AIR, Thrissur on 25.1.2004.

Gender Studies

Trainings organized

1. Two weeks refresher training for the Facilitators of Women in Agriculture Programme of the State Department of Agriculture was imparted from 3rd to 17th March 2004.
2. Brainstorming session on Engendering Agricultural Education for the Deans, Directors and Associate Deans of KAU with Ms. Mina Swaminathan, Director, Gendeavour, MSSRF, Chennai as the Resource person
3. Nine NATP training programmes for rural farm women on women friendly technologies were organized.

Statistics

Staff of the department provided consultation facilities for researchers of the college and others on design and analysis of experiments.

Dr. V.K.G.Unnithan functions as Secretary-cum-treasurer of the Parent-Teacher Association of College of Horticulture.

Agricultural Extension

Members of the Department participated in many extension activities and handled classes for various training programmes. RAWE programme for 1999 batch students was conducted.

As part of this, many extension activities like farmers seminars, agro clinics, exhibitions, discussions, quiz programmes, on-farm demonstrations and agricultural

competitions were organised. The village stay was organised at Ayilur Panchayath in Palakkad district.

Farmer groups, Student groups from different Colleges, Vocational Higher Secondary Schools and High Schools from various districts of Kerala visited the various departments of the College.

Soil Science & Agrl. Chemistry

A lot of extension activities are being undertaken from the department. The services of many scientists are being utilized as resource persons by the Department of agriculture for training their officials as well as farmers. Participation in the Multidiagnostic team, attending Monthly workshops organized by the department, attending RAWE programmes are being undertaken regularly. Organising classes for farmers and students from other institutions are being regularly done. The vermi – compost unit attached to the Department is attracting a lot of enquiries and visitors from all over the State. The services of Dr. Sushama, P.K. and Dr. Sam T. Kurumthottical, Associate Professors are mostly utilized for the above purposes.

All India Radio and TV programmes

Scientist of the department delivered talks on the following scientific topics through TV and Radio programmes to farmers.

Name of the scientist	Topic	Details of the training programme
Dr. T. Radha	Mango propagation and cultivation aspects (5 episodes)	Harithakeralam programme in Jeevan, T.V. during May, June, July 2003
Dr. P.K. Rajeevan	Commercial floriculture (25 episodes)	Harithakeralam programme in Jeevan, T.V. during June, July, August, 2003
Dr. P.K. Rajeevan	Dry flower and cut foliage production	Harithakeralam programme in Jeevan, T.V. during October, 2003
Dr. A.K. Baby latha	Propagation of fruit crops	Dooradarsan, Palakkad
Dr. K. Lila Mathew	Propagation and nursery management	Phone in programme - live - AIR, Thrissur, February, 2004

Distribution of planting materials

Planting materials of fruits and flowers worth of Rs. 2.6 lakhs were sold from the Department during the period under report.

Agri. Engineering

Under the leadership of the Dept. a model 'Roof top water harvesting system was constructed in the college. About 13 lakh litres capacity ground level open tank with a cost effective lining material is a significant achievement.

A model roof top rain water harvesting system was demonstrated in the Thrissur Pooram Exhibition stall.

Supervision and technical support for various repair and maintenance works in the College are carried out from this dept.

Workshop at Mannuthy developed an Agro Engineering Service Centre under the ABARD Programme of the University is being maintained by the Staff of the Dept.

Agricultural Meteorology

The department extends all the support for setting up a new agromet observatory including maintenance of various agromet instruments at the various research stations under KAU. Training on recording of weather observations and maintenance of agromet registers are also imparted to the needy.

During the year, the observatory at the KCAET, Tavanur was shifted to a more suitable location and the instruments installed under the supervision and guidance from the experts from the department.

This principal agricultural meteorological observatory at Vellanikkara is the cooperating centre registered with the IMD, Thiruvananthapuram and the synoptic weather data recorded is transmitted to the IMD through weather telegrams to be used by the IMD for weather forecasting purposes.

The weather data recorded here are being used by the staff and students of the University for conducting research. Government departments like the Department of Agriculture, CADA, Rubber Board, NGOs and others also use the data. During the year the weather data were supplied to nearly 75 individuals/organizations.

Important visitors

During the report period, Principal Scientists of the National Institutes visited College of Horticulture, Vellanikkara.

Research Publications

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Anila, R and Radha, T. 2003. Studies on fruit drop in mango varieties. *J.Tropical Ag.* 41(1&2) : 30-32

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- Anu G. Krishnan, Geetha, C.K., Rajeevan, P.K., Valsalakumari, P.K. and Saifudeen, N. 2003. Induced mutation in tuberose *Polianthes tuberosa* Linn. by gamma rays. *One hundred Research Papers in Floriculture: National Symposium on Recent Advances in Indian Floriculture. ISOH, IARI, New Delhi.* p. 255-259.
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- Jyothi, R and Indira, V. 2003. Nutritional status of women agricultural labourers. XXXV Annual Meeting of Nutrition Society of India, 12-13, Dec.2003. National Institute of Nutrition, Hyderabad. Abstract : 44

- Latha, A and Salam, M.A. 2003. Response of Cashew seedlings to soil moisture regimes. *Cashew J.* 17 (3) : 17 – 21
- Manimala, R., Mathew, S.K., Binimol, K.S and K, Surendra-Gopal. 2003. Effect of culture filtrates of microbial antagonists on different strains of *Ralstonia solanacearum* causing bacterial wilt in solanaceous vegetable crops. 25th Annual Conference on current technologies for plant disease management and future strategies. Udaipur, 8-10 Oct 2003.
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Finance (2003-04)

Head of Account	Provision for the year Rs. In lakhs	Expenditure (Rs.)	Station receipts
Non-plan	488.090	454,53,728	
Plan	84.235	50,29,295	
ICAR	23.930	27,91,012	
OEAP	30.070	8,31,270	
Total			15,75,283

COLLEGE OF AGRICULTURE, PADANNAKKAD, KASARAGOD

Introduction

The college was started in 1994 with the admission of the first batch of students under the B.Sc.(Agri.) Programme. This is the third agricultural college under Kerala Agricultural University. This college fulfils the aspirations and the long-cherished wish of the people of Northern Malabar to have an agricultural college in the region. The main factors which influenced this decision are the backwardness of the area and its peculiar agro climatic conditions.

Nine batches of UG students have been admitted so far. Out of this, two batches have successfully completed the course. The first batch came out on 6th April 1999 and the second batch on 18th March 2000. The college was functioning in the Regional Agricultural Research Station, Pilicode, from its inception till August 1998. As the construction of the academic building and two hostels were completed, the college was shifted to Padannakkad campus on 3rd August 1998. However, the facilities of R.A.R.S. Pilicode are still being utilized for conducting certain courses such as Animal husbandry and Agricultural facilities. Appointment of staff is a major priority area as the present strength is quite inadequate. The Instructional Farm of the college needs further development and strengthening of staff for effective functioning.

Mandate of the institution

This college functions to fulfil the general mandate of the University namely, agricultural education, research and extension. However, some of the important objectives and purposes were considered to justify the establishment of this college in the northern most region of the state.

A few memorable events of the institution

The most important memorable event of this institution is the formal inauguration of the new academic building and the two hostels by the Hon'ble Chief Minister, Sri.E.K. Nayanar, with the Honorable Minister for Agriculture, Sri. Krishnan Kaniyamparambil presiding over the function, on 27-2-99 which was conducted with grandeur and fervor.

The visit of the eminent agriculture scientist Dr. M.S.Swaminathan, on 3rd February 2000 is engraved in the history of this college in golden letters. He addressed the students and staff of this institution on the occasion.

The passing out ceremony of the first batch UG students of this college, arranged in April 2000 is a day to commemorate with pride. 21 students completed the course with good academic performance and three of them secured JRF for higher studies.

Seminars/ summer Institutes/ symposia/ trainings attended

Joy, M., Asst. Professor (Plant Pathology) attended Biotechnological Approaches for the Management of Plant pathogen in export oriented Horticultural crops from 2-12-2003 to 22-2-2003 at TNAU.

Academic Programmes

a (i) UG Programme on rolls

Year-of Admn	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
2000	15	23	38	2	2	4	15	23
2001	4	7	11	-	4	4	4	7
2002	7	7	14	3	2	5	7	7
2003	6	21	27	1	6	7	6	21

Study Tour

South India tour for 2001 admission and North India tour for 2000 admission.

Students union activities

Activities of Students union 2003-04 started with onam celebrations. Formal inauguration was done by renowned playback singer Kanhangad Ramachandran. A colourful cultural programme followed. A coaching camp for basketball was organized and students took part in basketball and volleyball meet at Mannuthy. Students union took lead to organize the trip to Kannur for visiting *National Agrifest*. Students from nearby schools were invited for Krishidarshan programme. Sent off for the 1999 Batch students was arranged in a befitting manner. Scintillating programmes were organized to welcome the New Year. A *Ganamela* troop was formed by bunching several enthusiastic singers selected from the college. A training programme on *Yoga* was organized. Kanhangad Ramachandran presented musical extra vaganza – 'Tarang 2004' on March 15th. Students were given a chance to articulate their response and observations on current social development in an open discussion organized in collaboration with Kerala Sastra Sahithya Parishad..

Extra curricular activities

Students initiated a novel programme titled "Village reach" under the guidance of the Department of Agricultural Extension.

N.S.S. activities

An elocution was conducted on the eve of Independence day. Campus cleaning was done and awareness was given on the dangers of unhygiene, plastic use, smoking etc. Farmers day and Gandhi Jayanthi were celebrated in a befitting way. A 10-day special camp was held at Cheriakkara area of Kayoor-Chemeni Grama Panchayath on the theme **Youth for Rural Re-construction** with the active participation of 40 NSS volunteers of this unit. The camp

was inaugurated on 3-3-2004 at 3PM by the Grama panchayath President Sri. M. Rajagopalan. The Associate Dean welcomed the gathering. NSS programme officer read the NSS activities to be carried out during 10 days period. NSS student secretary delivered vote of thanks.

Ongoing projects

NATP entitled "Analysis and development of homestead farms of Kerala-A farmer participatory approach" with a budget outlay of Rs.86.64 lakhs (this centre was allotted an amount is Rs.15.02 lakh), with Farming Systems Research Station, Sadanandapuram as the Lead Centre (CCPI: Dr.Jacob John).

Progress of the work in the previous year: Database creation incorporating the details of 660 homesteads surveyed in Thrissur, Palakkad, Wayanad and Idukki districts as part of work at this centre was completed. A total of 24 homesteads spread over Thrissur and Palakkad districts were selected and technical intervention related to crop, tree, livestock, soil management, plant protection etc. were implemented. The team of FAO scientists that visited the homesteads under the project were highly impressed and intend to adopt similar *modus operandi* for development of homestead farms in its proposed future programme, in African countries.

NATP (CGP) entitled "Monitoring of soil organic matter (SOM) dynamics and synchrony of nutrient release in coconut based farming system" (PI: Dr. P.R. Suresh).

Progress of the work in the previous year : The study envisages to examine the dynamics of SOM and the synchrony of nutrient release in different farming systems in three major soil types of Northern Kerala, wherein coconut is extensively cultivated. Soil samples collected from different locations representing the above soil types were analysed and the SOM was portioned to various pools. The labile Carbon was very low (0.3%) indicating poor nutrient reserves. The pattern of composition of different organic fractions of the soil viz: humic acid, fulvic acid, humin in the three soil types were not uniform. The response of mineral nitrogen in depleting the SOM was this most prominent in sandy soils (48%) as compared to other soils types, 23% in red loam and 18 % in laterite soils. Monitoring of leaf nutrient status of the palms is in progress

Progress of the work in the previous year: The bioassays with fresh leaf leachates, fresh leaf extracts, bark leachates, dry leaf leachate, dry leaf extract, root leachate, root extracts and powdered leaf litter of test trees on cowpea, bittergourd and brinjal were completed. In general, the various parts of the trees exhibited varied allelopathic effects when compared with control. The effects on shoot and root growth were more pronounced. The pH of the leachates and extracts of different plant parts were low when compared to the distilled water used in control.

Extension and other activities

The scientists of the college attended Workshop on viral disease of black pepper, plant protection and interface communication with farmers of Kannur and Kasaragod district Panchayats

Important visitors

Deputy Speaker of Lok Sabha, Sri. P.M. Syed visited this college on 14-07-2003 and inaugurated the Computer club for the student.

Finance

Head of Account	Provision for the year (Rs. in lakh)	Expenditure (Rs.)	Station receipts (Rs.)
Non plan	1.502	1,14,589	3,44,845 (income from fee)
Plan	148.530	1,25,77,555	4,90,044 (Income from College properties)
ICAR	1.780	1,55,417	
Other EAPs	1.050	1,22,642	
Revolving Fund			
(a) Earn while you Learn Programme	0.200	-	
(b) Planting material Production programme	1.000	-	
Total			8,34,889

COLLEGE OF FORESTRY, VELLANIKKARA

Introduction

The College of Forestry was established in 1986 as per the Govt. Order No. 12-10/85 Edn. dated, 28-7-1986. It is located in the Main campus of the Kerala Agricultural University, Vellanikkara.

The college has five statutory departments, namely;

1. Dept. of Tree Physiology and Breeding
2. Dept. of Silviculture and Agroforestry
3. Dept. of Forest Management and Utilization
4. Dept. of Wood Science
5. Dept. of Wildlife Sciences

Academic Programme in the college includes both four-year B.Sc. (Forestry) and two-year M.Sc.(Forestry) courses with an intake capacity of 20 and 8, respectively. Primary emphasis of these programs are to impart theoretical and practical knowledge on various aspects of management and maintenance of Forest and Wildlife. In addition to regular classes, these programs include frequent visits to forest areas, sanctuaries, national parks and forest research institutes to provide on hand training to the students on various aspects of forestry. Besides, the faculty members of the college, the teachers of the sister institutions of the Kerala Agricultural University are also handling courses on forestry related subjects for both UG and PG students of this college.

In addition to the regular teaching work, the faculty members are engaged in research and extension activities related to forestry. Presently about five research projects funded by various external agencies are at different stages of implementation in the college. Well-equipped laboratories are available in all the departments for conducting practical classes and research work of the faculty and students.

Mandate of the institution

The mandate of the College of Forestry is to carry out teaching and research in forestry and make Forestry professional rather than protective forestry.

Lead functions

- (a) To train the students in various subject matter areas of forestry to make them competent to maintain and manage the forests in the most professional manner.
- (b) To award B.Sc. (Forestry) and M. Sc. (Forestry) degrees.

Auxiliary function

- (a) To carry out research in the various fundamental and applied aspects of Forestry
- (b) To carry out extension programs in Forestry

Seminars/summer institute/symposia/trainings attended

The scientists attended 7 International seminars, 3 National seminars and three training programmes on refresher course during the period.

Academic programmes

Admission (No.of students as on 31/03/2003)

Year of admission	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
A (i) U.G programme (on rolls)								
1996	1	0	1	0	0	0	1	0
1998	2	0	2	1	0	1	2	0
2000	10	4	14	1	0	1	10	4
2001	9	3	12	0	2	2	9	3
2002	10	2	12	1	0	1	10	2
2003	9	8	17	0	1	1	9	8
A (ii) P.G. programme (on rolls) (discipline wise)								
2001								
Dept.of Silvicultural and Agro-forestry	0	0	0	0	0	0	0	0
Dept.of Tree Physiology and Breeding	0	0	0	0	0	0	0	0
Dept.of Wildlife Sciences	1	0	1	1	0	0	1	0
2002								
Dept.of Silviculture and Agro-forestry	0	0	0	0	0	0	0	0
Dept.of Tree Physiology and Breeding	2	1	3	0	1	0	2	1
Dept.of Wildlife Sciences	0		0	0	0	0	0	0
2003								
Dept.of								

Silviculture and Agro-forestry	0	0	0	0	0	0	0	0
Dept.of Tree Physiology and Breeding	2	0	2	0	0	0	2	0
Dept.of Wildlife Sciences	0		0	0	0	0	0	0
Dept. of Forest Management and Utilization	1	1	2	0	0	0	1	1

Study tours :

South India study tour for 2001 admn. BSc Students from 28.8.03 to 31.8.03.

Field trip to Elanad forest station, Machad forest range, Thrissur forest division on 13th January 2004 for 2000 admn. students.

Study tour to Nelliampathy for 2000 & 2002 admission students from 26 to 29 December 2004.

Study tour cum trekking to Vazhani forest from Pattikad for 2003 & 2002 admission students on 3 January 2004.

Study tour to Silent Valley National Park for 2000 & 2001 admission students from 29 to 30 January 2004.

Study tour to Wayanad Wildlife sanctuary for 2001 & 2002 admission students from 10 to 12 February 2004.

Study tour to Waynad Wild life Sanctuary from 16.2.2004 to 19.2.2004 for 2003 batch B.Sc students.

Field trip to A.R.S., Chalakudy on 9.3.2004 for 2001 batch B.Sc students.

Field visit to Mangroves of Chettuva, Thrissur for 2002 batch B.Sc students on 12 December as part of their Forest Ecology course.

Students Union activities

1. The college union was inaugurated by Com.T.Caandran, KAP Camp, Ramavarnapuram on 3/03/04.
2. As part of the Planning Forum activity, students were on one day Trekking in Peechi – Vazhani Wild Life Sanctuary on 3.1.2004.

Sports and games

Conducted the interclass Sports meet 2003 from 5 to 12 April 2003.

Research programme

On going EAP Projects

1. Human Utilization on the forests of Western Ghats and its effect on Biodiversity funded by Kerala Forest department.
2. Distribution and abundance of bamboos in the homegardens of Kerala and studies on bamboo root distribution pattern funded by ICAR, New Delhi.
3. FIST (2001-2005) Department of Science and Technology, Govt. of India.
3. Provenance evaluation for *Acacia mangium* Willd funded by ICAR, New Delhi
4. Stand density manipulation and pruning strategies for *Acacia mangium*. Wild funded by ICAR, New Delhi.

Major research achievements

Department of Tree Physiology and Breeding

1. Work is being carried out with the objective of standardizing the micropropagation protocol of bijasal (*Pterocarpus marsupium*). Appropriate surface sterilization procedure is standardized for the production of contamination free cultures. Shoot induction as well as multiple shoot production to the extent of up to nine shoots per explant was achieved. Method of callus induction from internodal segments has been standardized. This is being used for indirect organogenesis. Rooting of shoots and plantlet production are attempted.

Department of Forest Management and Utilization

2. A good instructional farm with an area of about 3 ha is being maintained in the department for research, instruction and demonstration purposes. Two blocks of arboretums, sandalarium, woodlot etc form the important components of the farm.
3. Among 150 tree species that are being maintained in the arboretum, *Albizia falcataria*, *Acacia mangium*, *Cassia renigera*, *Gmelina arborea* and *Melia dubia* were fast growing while *Dalbergia latifolia*, *D.sissoo*, *Saraca indica*, *Hollarhena antidysenterica* were slow growing.
4. A tree nursery with facilities for manipulating sunlight and shade and sprinkler and misting facilities was established in the department. More than 2 lakh seedlings of most of the tropical tree species are being produced in the nursery every year for distribution to research institutes, educational institutions and general public.
5. Garbage was found rich in nitrogen and phosphorus and was very good for the growth of tree seedlings like teak, rosewood, mahagoni, mangium, thanni, thembavu, jack and Anjili. Cost of six month old seedling produced in standard potting media was worked out Rs.4.50/- while the media containing garbage is coated only Rs.1.90.

6. Among various growth regulators used, GA (50ppm) was the most effective in breaking seed dormancy in most of tree species.
7. The timber production was maximum in *Acacia mangium* (0.61cu.m) followed by *Bridelia retusa* 0.38 (cu.m), *Terminalia bellirica* (0.31cu.m) , *Terminalia tomentosa* (0.28cu.m) and teak (0.22cu.m) at the end of 12th year growth.
8. An excellent museum with a large number of exhibits like seed of tree species, propagation media, non timber forest produce, forest insects, display systems depicting research highlights, Info systems, tripanel systems, prestosigns, blowups, magnetic display units etc were maintained.
9. An instrumentation laboratory equipped with visible spectrophotometer, UV spectrophotometer, flame photometer, lux meter, pH meter, Electrical conductivity bridges, semi automatic nitrogen analyzer, electronic balances, noise level meter, centrifuge etc is maintained in the dept.
10. Imported Power saw, power pruner and wood moisture meter as part of undertaking practical of B.Sc and M.Sc students.
11. A Herbarium (preservation of dried plant specimens) was established in the college for benefit of the students of the college as well as visitors who have taxonomic interest.

Department of Silviculture and Agroforestry

Project on Phenology and Regeneration of shola – grassland edge tree species on Mangaladevi, Periyar Tiger Reserve, Thekkady was started to find out the important edge tree species and their phenological aspect and artificial regeneration possibilities. Phytosociological studies revealed 47 species of trees across 27 families along the shola grassland edge over an area of 5950 m². *Psychotria elongata* at a higher density of 588 individuals/ha followed by *Mamasa indica*, *Lingustrum robestrum* and *Litsea wightiana* are seen. Though artificial regeneration studies were conducted in the shola forest edge and in the adjoining grassland edge, they were not successful due to high animal activity in the study area.

List of publications

Scientific articles:

- 1 Nanay.K.M.and Sudhakara K. (2003). Studies on the phenology and regeneration of shola-grassland edge tree species . Paper presented at the Instructional Conference on Ecorestoration, conducted by National Institute of Ecology at FRI, Dehradun, from 14th to 21st October, 2003.

- 2 Sudhakara K. and Seena Bhaskar (2003). Standardization of rooting medium of root seedlings of selected agroforestry species. Paper produced at National Symposium on agroforestry and sustainable production on October 7-9 , 2003.
- 3 Vinod.M., Sudhakara.K. Jayaraman. K. and C.Sunanda (2003) Effect of soil-leaf factors on the productivity of teak (*Tectona grandis*) in Kerala State, India. Paper produced at International Conference on Quality Timber Products of teak from sustainable forest management held at KFRI, Peechi from 2-5 December 2003.
- 4 Vidyasagan, K, Gopikumar, K and Ajithkumar, M (2004). Phytosociological analysis of selected shola forests of the Nilgiri hills of Western Ghats *Indian Forester* 130. (3) 283 – 290.

Popular articles

Vidyasagan , K and Ani Anna Elias (2003) Karuvapatta valarthiam. *Spices India* 16 (9) 4 - 6

Mr. K. Vidyasagan, Asst.Professor provided consultancy service for selection of species and Tree Planting designs to Carbon Black Company at Karimughal, Ernakulam as part of their environmental protection activities. Associate Dean, COF has received Rs.1000/- as consultancy charges.

Important visitors

Mike Birkhead, Ambassador of Environment Programme, The British Council on 15-10-2003. Dr.P.Rai, Project Coordinator (AICRP) on Agroforestry) and Director, National Research Centre on Agroforestry, Gwalior Road, Jhansi – 284 003., UP. on 8th to 11th May 2003. Prof.Jaime Fernando Sales Luis, IUFRO Officer., C1.05.15, Silviculture and Management of Pines and Associate Professor., Vila Real, Portugal on October – November, 2003 (Two months). Yosoi Oikawa, Assistant Professor, Department of International Environmental and Agricultural Science, Tokyo University of Agriculture and Technology (TUAT), Fuchushi, Tokyo 183-8509, Japan on 25/02/2004 to 3/03/2004. Ms Ellyn Damayanti, Researcher, University of Tsukuba, Japan on 8/03/2004 to 10/03/2004. Mr.M.Dhakal, Researcher, University of Tsukuba, Japan on 8/03/2004 to 10/03/2004

Finance

Head of a/c.	Provision for the year	Expenditure	Receipts
Non plan	63.640	6306216	
Plan	41.890	1381510	
ICAR	7.493	694106	
Other EAPs	18.370	1759248	
Revolving Fund			
TOTAL	132.643	10141080	305243

COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT VELLANIKKARA

Introduction:

The Kerala Agricultural University Act (Section 5 of Act 33 of 1997) provides for imparting education in Co-operation along with different branches of study. Accordingly, the proposal for starting a new four year degree programme in Co-operation and Banking was presented at the 21st meeting of the General Council held on 20-21 November, 1980. The programme was approved by the 22nd meeting of the General Council held on 30-1-1981 under the Faculty of Agriculture. The Government sanction for the programme was received in 1982.

Mandate of the Institution:

To assist in meeting the rapidly growing needs of managerial manpower for formal and informal co-operatives, financial institutions, agri-business enterprises and other rural development organizations; To undertake research on organizational, managerial and operational problems of co-operatives, financial institutions, agri-business enterprises and other rural development organizations; To foster the entrepreneurial ability and to extend management and organizational skills to the rural commodity. To offer training for policy makers and administrators in the development departments, enterprises, organizations and institutions.

The following scientists presented papers

Presentation of papers

Dr. M. Mohandas, Associate Dean

- i. Discussion in connection with inauguration of 'KISSAN Kerala Project' at Techno Park on 1st November, 2003.
- ii. Workshop on Job Creation through Enterprise Development among Returning Migrants in Kerala. Jointly organized by International Labour Organization and ISED on 9-10, 2003 at Cochin
- iii. 31st Marketing Congress on the theme CIS – East Europe and India : Strategies and Economic Co-operation; organized by Indian Institute of Marketing and Management at New Delhi, 3-5 February, 2004.
- iv. "Youth characteristics : Changing Profile" at the *Regional Workshop on Youth Development : Vision and Focus*. 8-9 April 2003 at Palakkad. Organized by Nehru Yuvak Kendra Sangedham and Planning Commission.
- v. "Globalization Debate : The Conceptual Framework", Keynote Address at the *Interdisciplinary National Seminar on the Socio-economic impact of Globalization on Indian Economy*, organised by Vimala College, Trichur on 28 to 29 August, 2003. Also chaired the 1st Technical Session.
- vi. Theme paper on "An Approach to National Vision on Economic Development" presented at the *Orientation Course on Research for National Resurgence* organized by NAAC, MG University, Calicut University and CUSAT and Bharatheeya Vichar Kendra on 21-23 August 2003 at Aluva. Also chaired one session.

- vii. "Micro credit and Women Empowerment" – *Inter disciplinary National Seminar on Women Empowerment* – organized by St. Josephs' College, Irinjalakuda on 7 October, 2003.
- viii. Paper on "Approach for improving competitiveness of coconut and coconut products in the context of Emerging Free Trade under WTO" – at the *National Seminar on Augmentation of Marketing of Coconut and its Products (NASAMAC)* at Hyderabad by Coconut Development Board at Hyderabad, 11-12 October 2003. Chaired one session.
- ix. Invited papers on "Food Security and Food Stock Management in India: Emerging Issues" at the *National Seminar on Agri-business Management: Opportunities and Challenges*, organised by Indian Institute of Rural Management at Jaipur on 20-21 November 2003 (Also chaired one Technical Session).
- x. "Karshikolppannangalude Bhavi Vipanaana Sadhyathakal" Paper presented at the seminar in connection with the 2nd anniversary of Kerala Agricultural Development Society, Thodupuzha on 14th November, 2003.
- xi. "Virtual University for Agrarian Prosperity in Kerala", presented at the *Workshop on Knowledge Management in Agriculture* organized by KAU at IITMK at KAU on December, 10, 2003.
- xii. "Lokavyapaara Samkhadanayum Kerala Kaarshika Mekhalayum – Dr. M.S. Swaminathan Report" – organized by the Association of Agricultural Officers at Kottayam on 3rd January, 2004.
- xiii. "Food Security and Food Stock Management under Liberalization" – Keynote address at the National Seminar on the Impact of Indian Economic Reforms, organized by the PG Department of Economics, M.D. College Pazhanji on 20-21 January, 2004.
- xiv. Presented the theme paper of the State level inauguration of the 39th All India Co-operative Week Celebrations held at Cannanore on 14-11-2002
- xv. Represented the University at all the 5 sittings of the WTO commission chaired by Dr. M.S. Swaminathan
- xvi. "Market Potential for India's Coconut Products" www.commodityindia.com, Vol.4, Issue No.4, April 2004. pp.22-24

Dr. U. Ramachandran, Associate Professor & Head, Dept. of Development Economics

- i. Workshop on Dissemination of census data organized by the Ministry of Home Affairs and Directorate of Census operations, Kerala at Thiruvananthapuram on 15-09-2003
- ii. Orientation course-cum-Seminar on Research for National Resurgence organized by Bharathiya Vichara Kendram under the sponsorship of NAAC, UGC, CUSAT and MG University
- iii. Workshop on Patent Awareness organized by the State Committee on Science, Technology and Environment at Thiruvananthapuram on 26-05-03.
- iv. Discussion on the Report of the Commission on WTO concerns in agriculture in the Chamber of Minister for Agriculture and Coir, Thiruvananthapuram on 02-08-2003.
- v. WIPO (World Intellectual Property Organization, Geneva), National Seminar on Patents, the Patent Co-operation Treaty and the commercialisation of inventions for Academic Institutions organized at National Law School of Indian University, Bangalore on 25 to 26 March 2004.

Others:

1. Head of the Department of Development Economics
2. University (KAU) Co-ordinator, National Youth Parliamentary Competitions (Ministry of Parliamentary Affairs, Government of India New Delhi for 2003-04)

Dr. K.M. George, Assistant Professor (Sr. Scale)

1. Attended UGC Sponsored National Seminar on "Impact of Liberalization, Privatization and Globalization on Indian Commerce and Trade" at Khadir Moideen College, Adirampattinam, Thanjavur, Tamil Nadu on 1st and 17th August, 2003. Also presented a research paper entitled "Privatization of Public Sector Banks" and was Chairman of the technical session on Liberalization of Indian Industries.

Dr. Molly Joseph, Associate Professor & Head

Seminar on "Changing Landscape of the Indian Financial Sector" on 11th November, 2003 – jointly organized by College of Co-operation, Banking and management, Department of Rural Banking and Finance Management and the South Indian Bank Ltd., Students Economic forum.

Dr. A. Sukumaran, Associate Professor & Head

National Workshop on Job Creation Through Enterprise Development Among Returning Migrants in Kerala, December 9 to 10, 2003. Organized by International Labour Organization and Institute of Small Enterprise Development (ILO & ISED)

CIS – East Europe & India : Synergies and Economic Co-operation, New Delhi, February 3-5, 2004. Organized by Institute of Marketing & Management, New Delhi.

Academic programmes

Admission (No. of students as on 31-03-2004)

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

Year of Admission	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
2002	13	27	40	1	3	4	13	27
2003	6	34	40	1	3	4	6	34

a(ii) P.G. Programme (on rolls) (Discipline-wise)

Year of Admission	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
2002 Rural Banking & Finance	0	1	1	0	0	0	0	1
2003 Co-operative Management	0	2	2	0	0	0	0	2
Rural Marketing Management	1	2	3	0	0	0	1	2

Study tours

All India study tour Dr. A. Sukumaran, Dr. K.A. Suresh and Sri. Sakeer Husain – Tour officers from 24-09-2003 to 13-10-2003.

Students Union activities

During the report period as a part of Students Union activities, quiz programme and Inter class arts and Sports festival conducted.

NSS activities

During the report period, Gandhi Jayanthi, Independence Day and Republic Day were celebrated.

Extension and other activities

(a) HRD Training for Non-Academic Staff

Category	Course programme	Course Co-ordinator	Duration	No. of batches
Executive Assistants	Human Resource Development	Dr. K.P. Mani	23 to 25 March, 2004	Three
Supporting Staff	Human Resource Management	Dr. E. Vinaikumar	24 & 25 March, 2004	Two

Publication

Dr. M. Mohandas, Associate Dean : Approach for improving competitiveness of coconut and coconut products in the context of Emerging Free Trade Under WTO” in H.P. Singh and G. Ramany (ed.) *Coconut Marketing in India : Issues and Strategies*, Coconut Development Board, Ja. 2004, pp.33-39

Finance

Head of account	Provision for the year (lakhs)	Expenditure (lakhs)	Station receipts (Rs.)
Non-Plan	85.930	75.72	
Plan	38.200	21.64	
ICAR	0.058	-	5.29
Other EAPs.	0.170	0.04	

FACULTY OF VETERINARY AND ANIMAL SCIENCES

COLLEGE OF VETERINARY AND ANIMAL SCIENCES MANNUTHY

Introduction

The College of Veterinary & Animal Sciences was established in 1955 with a view of training sufficient veterinary personnels. For the first few years the institution was directly under the administrative control of Kerala Government but subsequently brought under Department of Animal Husbandry. The post graduate programmes leading to MVSc and PhD degree were started in 1962 and 1965 respectively. The College became a constituent unit of the Kerala Agricultural University in February 1972. The College has associated with it a Livestock Farm, a Poultry Farm, a Pig Breeding Farm, a Goat Farm, a Dairy technology unit and Meat Technology Unit in the campus. Two Veterinary Hospitals, one at Mannuthy and another at Kokkalai are also attached to the College. In addition to teaching, a number of research projects aided by the University and external agencies are being operated in the College. Importance was also given for transfer of technology.

The following research stations - Livestock Research Station Thiruvazhamkundu and Cattle Breeding Farm, Thumburmuzhi are also attached to the college.

Mandate of the Institution

To train sufficient number of veterinary personnels to meet the expanding needs of the state; To train Livestock and poultry farmers; To conduct need based and problem oriented research in the field of Animal husbandry and Veterinary Science; To update scientific knowledge of the field staff and disseminate the same to developments in the field of Veterinary science; To disseminate current scientific information in Veterinary and Animal Husbandry subjects with authenticity to the farmers and public and To function as a referral institute in catering to the demands of veterinary practitioners.

Academic Programmes

A(I) UG Programme

Year of Admn.			SC	ST	Total
	Male	Female	Male	Female	
Ist year(03 admn)	42	39	2	4	81
IIInd year (02 admn)	31	42	2	4	73
IIIrd year (01 admn.)	38	36	2	3	74
Ivth year(00 admn)	33	30	6	2	63
Vth year (99 admn)	32	41	4	5	73
Internship(98 admn.)	56	56	6	6	112
Total	232	244	22	24	476

a(ii) P.G. Programme(M.V.Sc)

2002 Admn.	12	20	--	--	32
2003 Admn.	26	30	2	1	56

a(iii) P.h.D Programme(except 2003 admission)

99 Admn.	2	1	--	--	3
2000 Admn.	1	4	--	--	5
2001 Admn.	2	--	--	--	2
2002 Admn.	--	1	--	--	1
2003 Admn.	1	1	1	--	2

Extra curricular activities

A. The following KAU Athletic Meet and Games were organized.

1. KAU Athletic Meet on 25 to 26 April 2003
2. KAU Basketball and Volleyball tournament from 19 to Sept 2003.
3. KAU Football tournament from 6 to 8 November 2003.
4. KAU cricket tournament from 1st to 4 December 2003.

B. The college teams participated in the following KAU Athletic Meet & Tournaments

- | | |
|--|---|
| 1. KAU Athletic Meet on 25 & 26 April 03 | a). Men team secured II Position |
| 2. KAU shuttle Badminton on 27 & 28 August 2003 at K.C.A.E.T | b) Men team becomes runners-up
Women team becomes runners-up. |
| 3. KAU Table Tennis at KC.A.E.T on 27 and 28 August 2003 | a) Men team won First Place.
b) Women team secured second position |
| 4. KAU Volleyball tournament from 19 to 21 September 2003 at Vety.College. | a) Men team won 1st position
b) Women team won 1st position. |
| 5. KAU Basketball tournament from 19 to 21 September 2003 at Vety.College | a) Men team was winner
b) Women team was runner-up.. |
| 6. KAU Football tournament from 6 to 8 November 2003 at Vety.College | Our college team was the winner. |
| 7. KAU conducted tournament from 1st to 4 December 2003 at Vety.College. | The college team was the winner. |

C. Participation of our students in the inter-University tournaments organized by A.I.U.

The following students represented the KAU in the South -Zone Inter University Football tournament held at Annamalai during 2003-2004.

Shiby Thomas, Balachandran.M.K., Rajeeque Rehman Alye Modi, Saijuddin.P., Dilip.M.S.,Ajithkumar.G.S.Lukhuman Kamarath and Aravind.S.

D. Participation of our students in the Inter- Agricultural Sports meet held at Bangalore from 25th to 29th March 2004.

i) Volleyball (Men)

1. Anoop Raj.R.
2. Rajasekhar.R.
3. Prince C.Kurian
4. Anto Manual
5. Arunji Joy.T.K.

ii. Athletics

Men

1. Prince.C.Kurian

Badminton

Men

- Shiras.A.

Volleyball (Women)

1. Arlama S.Nair
2. Anju.R.Nair
3. Binci Joseph
4. Remya.V.
5. Manjula V.James
6. Rani Chacko
7. Chinchu Jose

Women

- Bincy Joseph
Priya.K.T.

Women

- Linitta Mathew.

Major research achievements

Studies revealed that the vegetable fat (coconut) filled milk can be utilized for misty dabi preparation. The quality of the product was similar to that using cow milk. The product contained more total protein. This can be used as supplement for under nourished people. It is an economically feasible product.

The studies on polyvinyl chloride splints for immobilization of long bone fracture in dogs were carried out. In the fracture of radius and ulna, it was found as effective as that of Plaster of Paris cast but was found advantageous in managing compound fractures, as frequent dressing of the wound was possible with PVC splint.

A detailed study was conducted on the prevalence of canine dirofilariosis in Thrissur, feasibility of microfilarial antibody detection by ELISA and comparison of sensitivity of indirect ELISA and dot ELISA in the detection of dirofilariosis. Out of a total number of 2435 blood samples from dogs screened by wet film examination 7 percentage were positive for microfilaris. An indirect ELISA and dot-ELISA conducted in three groups of animal using microfilarial antigen indicated that both the tests were feasible for detection of the microfilarial antibodies through they are less specific.

Cattle from different parts of Thrissur with symptoms of Baberiosis was screened using different diagnostic techniques. Examination of Giemsa-stained blood smear could detect Baberia bigemime organisms in 9 percentage of the total samples. The IFAT detected Baberia bogemime antibodies in 52.11% and slide ELISA in 54.93% of serum samples screened. These two serological techniques were equally efficient with slide ELISA proving more suitable for field diagnosis. Serology and examination of tick tissues were equally effective in diagnosis of Babesiosis.

Rendered animal fat, as an energy source for Large White Yorkshire sows, can be added extra at 1.5% level of the standard ration during late gestation and lactation to improve the performance of sows and the litter to have a better economics of gain.

In the case of crossbred dairy cattle of Kerala, having a peak daily production of 7.8 kg milk/day, a dietary protein level of 17% in the concentrate mixture (13% in the ration) with 25% of the protein as rumen undergradable protein is sufficient and economical.

NRC(1989) requirements of Ca,P,Mg,Cu and Zn is applicable to crossbred lactating cattle of Kerala under both grass and straw based feeding system. From studies it is inferred that the requirement of P,Mg,Cu and Zn can be met from their content in the feed ingredients and Ca is the only element that needs to be supplemented under both the feeding systems.

Baker's yeast can be included at 0.5% level in the diet for growing pigs for better growth and feed conversion efficiency and live yeast culture can be used as an alternative feed additive to antibiotics in swine production.

Inclusion of 3.0% of either citric acid or phytase (700U/Kg feed) or its combination (1.5% citric acid + 350U phytase/Kg feed) in low available P diet (0.3 %) resulted in better utilization and growth performance in chicks.

Dried cuttle fish silage can be used economically as a substitute for unsalted dried fish in the ration for growing and finishing pigs without any adverse effects.

Study on "Effects of Trisodium citrate in the treatment of mastitis in cattle" revealed that there was significant decrease in the level of citric acid, lactate and calcium in the milk from affected quarter in sub clinical and clinical mastitis. Treatment with Trisodium citrate in sub clinical mastitis and trisodium citrate along with antibiotics in clinical and sub clinical mastitis was found to be partially effective in managing mastitis.

Study on "Ultrasonographic evaluation of canine hepatic disorders" suggested that ultrasonography is a valuable tool for diagnosing hepatopathies along with clinic pathological and ultrasound gloried biopsy.

Study on "Fluid and electrolyte status in diarrheic condition in dogs" revealed that Ancylostome ingestion was the major parasitic cause for diarrheic and effected animals revealed low level of Hb. Sodium bicarbonate, plasma protein, serum potassium and albumin was unattended and there was drastic reduction in the plasma volume in diarrheic animals.

An investigation was carried out to evaluate the bacterial quality of chicken carcasses collected after the removal of head and feet (ARHC) and after evisceration(AE) from the meat processing plant. A high TVC of more than $6 \log_{10}$ cfu/ml was observed after the removal of head and feet. The higher CC and FSC at the level of 310g and ECC at the level of $1 \log_{10}$ cfu/ml was observed in samples after evisceration. The *E. coli* isolated from 36.6% and 76.6% of the former and latter groups were grouped into

15 serotypes. Ten percent of samples of ARHF and 36.6% of AE samples reveal presence of *Salmonella enteritides* and *Staphylococcus aureus* respectively.

Forty beef carcasses were randomly collected from a meat processing plant to evaluate the bacterial quality. The overall mean TVC,CC,ECC and FSC was at the level of 7 log, 3 log, 1 log and 3 log₁₀ cfu/cm². 15 isolates of *E coli* were grouped under 9 serotypes and *E coli* O 157 was isolated from one sample each of source A and B. The CCPs were also assessed.

The bacterial profile of seven brands of retail pasteurized toned milk was analysed. 7.1% of the samples had *E.coli*. *Enterobacteraerogenes* was isolated from 25%,33.3% and 8.3% of the samples each from brands A,B and C respectively. *S.aureus* was isolated from 8.3% of samples from brand A and 16.6% of the samples from brand B.*A.hydrophila* was isolated from 75%, 33.3%, 16.7% and 25% samples of brands A,B,C and E respectively. *P.aeuruginosa* was isolated from 25% of the samples from brand A and 8.3% from brands B and C respectively.

The bacterial quality of bottled drinking water retailed in and around Thrissur was analysed. The mean TVC of the samples belonging to brands A,B,C,D and E was at the level of 2 log₁₀ cfu/ml. Staphylococci were detected in 50% of samples in brand E and 40% of samples belonging to C and D brands. Faecal streptococci were detected in 70, 50, 40, 40 and 30% respectively. *Pseudomonas aeruginosa* was only isolated from brand E.

Storage period up to one and three days in refrigerator (4° C ±1° C) for pork and beef respectively could satisfactorily maintain the meat quality. Beef and pork quality was acceptable for a storage period of 45 and 60 days respectively in freezer (-18oC±10C). The shelf life of beef frankfurters was 6 days. The quality of salami was under acceptable limit up to 8 days of storage.

Acetic acid at one and two percent levels considerably reduced the bacterial load of chicken carcasses. Potassium sorbate with hot water was effective in reducing growth of spoilage organisms. However organic acids and hot water treatment were effective in inhibiting the growth of pathogenic organisms. Acetic acid at two percent level was another sanitiser after lactic acid to produce antibacterial effect on the organisms on the pork carcass. Two percent lactic acid was effective in reducing the bacterial counts and also had anti microbial effect on the pathogenic and spoilage organisms under study. The concentration of the acid did not produce any deleterious effect on the appearance of the pork carcass. The most effective sanitiser on beef carcass was 200 ppm chlorine. This level of chlorine did not produce any taint/off odour on the carcasses. Lactic acid at two percent level was also effective against organisms on beef carcass.

Broiler chicks under standard managerial condition and overcrowding stress were fed with different types of growth promoters (Stafac-20,Protexin, HSF liquid and steroids- Combination of Estrogen and Progesterone). The results revealed that the birds fed with steroids were poor in growth performance, proved with the evaluation of various physiological and biochemical parameters.

Research work was done to analyse the efficacy of supplementing anti stress agents Zeetrus and Ascorbic acid on stress induced broiler chicken. Results showed that there was marked immunosuppression in stress induced birds. The anti stress agents Zeetrus and Ascorbic acid were equally effective in the reversal of stress induced alterations.

A study was conducted to evaluate the haematological as well as hormonal changes in Alpine Cross bred kids from birth to puberty and to determine its correlation with body weight, sex and age. Haemoglobin, VPRC and RBC count were significantly higher on the day of birth compared to later periods. The MCV was lower in both male and female kids at birth. The specific gravity and icterus index followed a decreasing trend with age. WBC count increased with age in both sexes. Thyroid hormone revealed a positive correlation with age and body weight. In both sexes of kids, bodyweight showed negative relationship with RBC count, Hb, VPRC and lymphocyte number. Body weight had a positive relationship with ESR, MCV, WBC Count, Neutrophil number and thyroid hormone concentration.

Research done to evaluate the efficacy of Spirulina (Blue Green Algae) supplementation in male Austro white chicken indicated that spirulina had positive haematopoietic, hypolipidaemic and antioxidant properties. It has a positive influence on the fertility of birds.

The pathophysiological changes in mice bearing Ehrlich's Ascites carcinoma (EAC) was studied during the first 20 days of tumour progression. It was found that mice bearing EAC in the peritoneum showed altered physiological and pathological changes from day 12.

The action of levamisole on immune system of normal mice was tested. It was found that levamisole brought about immuno potentiative action in normal mice. The findings confirmed that levamisole can be used in immuno defective patients to improve the immune status.

Prevalence of leptospirosis in animals and man in and around Thrissur was studied. The study revealed presence of antibodies against *Leptospira* in human being, dogs, cattle, pigs and rodents by MAT, PHA and indirect IgG ELISA. *Leptospira* could be isolated from a human patient.

Study was undertaken to standardize the PCR technique for diagnosis of leptospirosis and to compare the efficacy of PCR with DEM and culture in the diagnosis of leptospirosis. The PCR technique was more sensitive, specific and rapid over conventional methods as it detected 41.6%, compared to 25.6% by DEM and 2.4% by culture of the samples tested.

The immunogenic potential of inactivated yolk sac and elementary body vaccines of *Chlamydomphila abortus* was tested in rabbits. The sera were collected from vaccinated rabbits for PHA and SNT. Both vaccines elicited good immune response. The greater humoral immune response of the rabbits that received EB vaccine suggested its slight superiority over the yolk sac vaccine.

Comparative study on super ovulatory response and viability of embryos in peri puberal and adult malabari goats was done in both groups.

The study revealed that peripuberal Malabari goats are as suitable as adult goats for multiple ovulation embryo transfer programme.(MOET).

PGF2 treatment immediately after insemination is preferred to treatment with GnRH or LCG or double insemination at 24 hours interval and that administration of Gn RH is found better than H C G in repeat breeding due to ovulatory disturbance in cattle.

Occurrence of metoestral bleeding was 6.09% in cross bred cows and beifers and their conception rate was only 18.75%.

Treatment with prostaglandin in animals with the history of metoestral bleeding resulted in an enhanced conception rate of 66.66%.

It is recommended that induction of oestrus using prostaglandins can be employed for enhancing the conception rate in animals with the history of met oestral bleeding.

Controlled breeding in goats was standardised by oestrus synchronization and application of frozen semen technology. Oestrus synchronization protocols were capable of induction of oestrus in 95.33% in does. Tris diluent was better application as bck semeun extender and conception rate among the oestrus synchronized does insemination with frozen semen was 21.68%

A study was undertaken to know the bacterial etiology, antibiogram and to evaluate efficiency of two antibiotics namely enrofloxacin and florfenicol in the treatment of bovine respiratory tract infections. The animals in the experimental groups were categorized according to a clinical illness index score system. Clinical data and haematological parameters of diseased animals showed significant difference. The major bacteria isolated from the respiratory tract of diseased bovines were *Staphylococcus aureus*, *Streptococcus pyogenes*, and *Mannheimia haemolytica*. Antibiotic sensitivity pattern of the isolates showed maximum sensitivity to enrofloxacin (94.87%). Recovery of the animals in both groups was assessed on the basis of statistically significant reduction in pyrexia, respiratory rate and overall improvement of clinical signs and illness index score. Efficiency of both enrofloxacin and florfenicol was comparable in counteracting bacterial bovine respiratory tract infection.

Among the 927 dermatological problems in canines presented at the University Veterinary Hospitals, Mannuthy and Kokkalai, 51 (5.50%) was positive for demodicosis and three (0.03%) for scabies. The highest rate of infection was noted in 6 to 12 months age group followed by three to six months, the difference being statistically significant. Among the different breeds, highest rate of infection was observed in Boxers. Papules and pustules were the most frequent primary lesions and erythema and alopecia, the predominant secondary lesions distributed mostly on the face, neck and extremities. A significant reduction in haemoglobin, PCV and albumin-globulin ratio and elevation in absolute eosinophil count and globulin content was observed in the affected dogs. Ivermectin at 200 mcg per kg subcutaneously, fortnightly cured only localized cases.

Weekly per cent improvement and demodicosis index analysed statistically showed no significant difference between treatment groups. 1) Ivermectin. 2) Amitraz 3) Ivermectin + Amitraz and 4) Ivermectin + Amitraz + Levamisole, but faster healing and greater per cent improvement was observed in the fourth group.

An investigation was carried out on 1602 cattle and buffaloes of Kerala including 1535 cattle and 67 buffaloes to assess the seroprevalence of brucellosis using serological tests like Rose Bengal Plate Test, Standard Tube Agglutination Test, 2-mercaptoethanol test, and Avidin-Biotin ELISA. Fifteen percent gave positive result for Brucella antibodies. Of these, cattle showed a seropositivity of 14.72% and buffaloes showed 28.35% seropositivity. The study concluded that RBPT can be used as a preliminary screening test and ELISA as a confirmatory diagnostic test.

A comparative study on seroconversion of two different foot and mouth disease vaccines in goats was conducted. Group I was vaccinated with a gel vaccine and Group II with an oil adjuvant vaccine. The antibody titre against FMD virus types O,A,C and Asia-I were assessed by liquid phase blocking ELISA. The study revealed that both the groups of vaccines provided sufficient protective titre for FMDV types O,A,C and Asia-I and gel vaccine was equally good as that of oil adjuvant vaccine. However, the latter is preferred owing to reduced labour cost, low number of visits and less stress to the animals. The study also revealed that the maternal antibodies protect the kids, which were born to vaccinated does up to 1-4 weeks of age, regardless of the adjuvant used in the vaccine.

Significant positive correlations were observed between knowledge and skill: attitude and job satisfaction: knowledge and job performance and skill and job performance. Absenteeism had significantly negative correlation between attitude towards job and still birth per litter. Farm Worker's skill and knowledge had significant negative correlation with preweaning mortality, skill had positive correlation with conception rate and job satisfaction had significant negative correlation with weaning weight and weight gain of piglets. Absenteeism had significant positive correlation with preweaning mortality and mortality of pigs.

Force field analysis revealed that the only weak driving force is the lack of enough youth and women participants in the animal husbandry development projects. More strong inhibitory force were delayed clearance of projects, delayed funding, delayed and defective beneficiary selection, lack of proper arrangement for training development staff, inability of Panchayath authorities in decision making and in adequate monitoring and evaluation. The results of the study indicated general dissatisfaction of the veterinary surgeons with the prevailing work environment to perform extension work

Studies revealed that information technology is the most preferred major subject matter domain for training followed by milk and milk products, dairy cattle production and management, dairy extension, professional management and fodder production and management. Amongst the socio-personal characteristics, the role perception and training need of most of the respondents were found medium whereas the training exposure and role perception of the respondents had significant relation with the training need. For all the domains studied, the trainers preferred demonstrational method and institutional type of training by trainers from outside the parent organization but within the state, which

lasts for 1 to 7 days in the case of short-term trainings and 15 days to one month in the case of long-term trainings. An equal percentage of theory and practical training sessions in the training institutes within Kerala are preferred for all the domains except milk and milk products technology and information technology which needed more practical sessions and trainings in selected premier institutes outside Kerala.

Studies revealed that most of the pig farmers are marginal farmers, middle school educated and of medium income group who rear exotic breeds located in the homestead, feeding them with hostel and butchery wastes and depend on other farmers for information about pig farming. Among the eight major domains to identify the training needs of pig farmers, diseases and prevention were the major subject matters as far as the knowledge and skill aspects were concerned which was followed by housing, breeding, management, integrated farming, marketing and economics of pig farming etc. It was also recognized that they need training in minor farm operations like deworming, vaccination, scientific construction of cage, selection of animals for breeding, disposal of excreta and waste, marketing and loan for pig farming. Pig farmers preferred one day training at Veterinary College pig farm and training through print media and electronic media.

The breed description for Attappady Black goats was developed and the need for conservation of this meat type goat was explained.

In the field Progeny Testing scheme, a superiority for progenies born to sires under the scheme over contemporaries from the bulls in the field by 500 Kg was established.

In the molecular studies in Malabari goat, four highly polymorphic markers have been identified which could be used for genetic studies in Malabari goats.

The characterization of four dwarf breeds of Kerala was carried out viz. Kasaragode Cattle, Vatakara Cattle, High Range Dwarf & Vechur cattle. The adaptability of the breed to the socio economic status available in various parts of the state was analysed.

A unit to conserve and maintain high quality Malabari goat was initiated. A programme to improve this native breed of goat was initiated with the involvement of farmers.

EXTENSION AND OTHER ACTIVITIES

Postmortem examination and disease diagnosis and Clinico pathological Examinations of bio samples are the important activities of the Centre of Excellence in Pathology. All the animals and birds that die in the University farms at Mannuthy campus are brought to the department daily for postmortem diagnosis. Besides this, a large number of birds, pigs, rabbits and other animals from various private farms are also brought to the department for postmortem diagnosis. A large number of carcasses of dogs is brought for confirmatory diagnosis of Rabies..

Histopathological examination of tissues is another major work of the department. The staff make field visits for disease investigation and diagnosis by conducting autopsy throughout the state. Feed analysis for mycotoxins is another important routine work of the department. Feed samples are received from various farms of the University and also from other private farms.

Staff members of Dairy Science Department participated in seminars for the farmers organized by Dairy Development Department/Milma/Animal Husbandry Department of Kerala Govt.

Twenty-nine milk samples brought by the farmers were analysed for quality and suitable advice was given to improve the quality of milk.

Other activities of the Dairy Science Department

Dr.P.I.Geevarghese, attended RAWE programme at Ayiloor Palakkad on 31-10-2003. Classes were taken at St.Mary's HS, Kainikosa, Alleppey on 22-11-2003. Detection and control measures of pollutants and contaminants in dairy and food industry was the title of seminar attended at Madras on 28 to 29 November 2003. Published popular articles on quality control of milk - Vanitha-October 2003, 2nd Volume. Attended Kollam Dist. Ksheerolsava on 23rd February 2004.

Dr.C.T.Sathian attended RAWE programme at Aliyoor, Palakkad on 31-10-2003, participated and put up a poster at IFCON at Mysore from 5 to 8, December 2003. Attended a seminar at Thodupuzha on 07.02.2004.

Conducted three months long Advanced Clinical Training for Veterinary officers of Animal Husbandry Department for a period from 1-12-2003 to 28-2-2004.

Dr.Syam.K.Venugopal accompanied the third year BVSc and AH students for South India study tour for 13 days from 29-11-2003 to 11-12-2003.

Dr.C.B.Devanand, Assistant Professor (Senior Scale), attended sterilization camp of dogs in connection with Animal Birth Control Programme conducted at Veterinary Hospital, Guruvayur on 10-2-2004 and at Engandiyoor on 21-3-2004.

Dr.C.B.Devanand, Assistant Professor (Senior Scale) and Dr.Syam.K.Venugopal, Assistant Professor, presented papers on "Setting up of operation theatre" and "Equipping operation theatre" respectively on 15-3-2004 in a one day workshop organized under the joint auspices of Department of Animal Husbandry and Indian Veterinary Association, Kerala at Thrissur.

Conducted Animal Birth Control training on sterilization of dogs to 86 field veterinarians during January 2004.

Total of 568 faecal samples were examined for parasitic infection and 326 samples for blood parasites

Training to field veterinarians on laboratory techniques in parasitology was conducted.

Taken classes to the farmers as well as the veterinary surgeons regarding scientific feeding and management of different classes of livestock at Extension Training Centre, Mannuthy, Cherthala, Kattilapoovam, Madakathara, Vellangallore and Panancherry.

During the period under report, a total of 179 samples of feed received from both private and government sector were analyzed for their proximate principles and mineral content.

A total number of 2672 rats, 2351 mice, 118 rabbits, 43 guinea pigs and 717 kg feed were sold from the Small Animal Breeding Station, the total cost realized for the above being Rs. 243427/-.

Dr.G.Girish Varma and Dr C.M.Aravindakshan are acting as Asst.Wardens in the Men's hostel (U.G.).

Services rendered to farmers:

A total of 597 clinical specimens from various species of animals and birds were subjected to bacteriological/virological/mycological investigation and results communicated. Suitable control/treatment measures were also suggested.

Managed 2,A.I.Centres, Bull stations and Semen bank at campus and one A.I.Centre at Kokkalai;

Attended to Mobile Sexual Health Control Unit catering the need of farmers on call, for A.I., infertility and obstetrical cases; Imparted Gynaecological and A.I. works at Cherumkuzhy and Valakkavu Milk Societies through Veterinary Ambulatory Clinics; Imparted obstetrical and gynaecological help to University Livestock Farms; Managed Obstetrical and Gynaecological cases at both Vety.Hospitals at Mannuthy and Kokkalai; Treatment and inspection of animals at various KAU farms for gynaecological problems. Attending to infertility camps and seminars being organized by government/organizations; Participated in extension programme by radio talks and TV programmes. Worked as referral unit for referred cases of field veterinarians. Managed two infertility units at Kokkalai and Mannuthy and maintained a stationery infertility clinic at Mannuthy; Regular immunization is being done against RD, Rabies, C.D., I.C.H., Leptospirosis and Parvo at University Veterinary Hospitals,Kokkalai and Mannuthy. Immunized animals belonging to different KAU farms. Also these animals are being screened for Tuberculosis,John's disease,Brucellosis and Mastitis periodically.

Vaccinations done in KAU farms.

FMD	1526
HS	1290
BQ	1047
Anthrax	85
Brucellosis	11

Number of animals screened for various diseases in KAU farms

Tuberculosis	146
Johne's disease	404
Brucellosis	174

Clinical materials examined from the field

Blood smear	30
Dung sample	27
Serum sample	10
Rabies diagnosis(FAT)	117

Conducting seminars for farmers on prevention and control of various infectious diseases.

Disease investigation on outbreak of infectious diseases. Conducted antirabies vaccination camp at Veterinary Hospitals, Mannuthy and Kokkalai and vaccinated 525 dogs. 310 and 500 dogs were vaccinated against Rabies at camps conducted in Arimboor Panchayath and Manaloor Panchayath respectively.

Human Antirabies prophylactic vaccination held in collaboration with Indian Immunologicals, Hyderabad at Department of Veterinary Epidemiology and Preventive Medicine, College of Veterinary and Animal Sciences, Mannuthy on 193 volunteers. About 3400 visitors (school) college students and farmers visited the college and classes on various aspects of animal husbandry were taken for them depending upon their category. Prepared video film & C.D. of Extension teaching methods in connection with Dairy diploma students training in September & October 2003.

1. Five infertility and vaccination camps were conducted in Avannur, Chempamkandam, Puzhakkal, Marottichal and Chirackakode under the auspices of ICAR Field Progeny Testing Scheme.
2. A study class was organized for the dairy farmers of Chirackakode for the promotion of Azolla cultivation by the farmers to reduce their feed cost.

Important visitors:-

Dr.M.Sathyanarayana Rao, Prof November; 2003. Dr.Nem Singh Joint Director I.V.R.I & Dr.S.K.Srivasthava I.V.R.I. Izatnagar; Dr.M.S.Oberoi Dean Veterinary College Ludhiana, January 2004; Dr.N.Dorairajan Professor Microbiology Madras Veterinary College and Dr L Muniyappa Professor of Microbiology Veterinary College Bangalore in January 2004; Dr.N.P.Melkania, Project Co-Ordinator, ICAR, Jhansi. Justice K.K.Denesan, Judge, High Court of Kerala, Ernakulam.; Dr.S.J.Vinoji Rao, Sr.Scientist, L.R.S., Palamana (PO), Chittoor, A.P.; Dr. Y. V. Krishnamoorthy, Veterinary Surgeon, Badiadha, Kasarkod, Co-Ordinator, KAMADUGHA, Shivamoga, Karnataka; Sri Sankaracharya Shree Raghaveswara Bharathi Swamigal. Sri. Ramachandrapura Madam, Shimoga, Karnataka.

Other activities

Took classes to the farmers as well as the veterinary surgeons regarding scientific feeding and management of different classes of livestock at Extension Training Centre, Mannuthy, Cherthala, Kattilapooam, Madakkathara, Vellangalore and Panancherry.

During the period under report, a total of 179 samples of feeds received from both private and government sector were analyzed for their proximate principles and mineral content.

A total number of 2672 rats, 2351 mice, 118 rabbits, 43 guinea pigs and 717 kg feed were sold from the Small Animal Breeding Station, the total cost realized for the above being Rs.243427/-.

Monthly Report of the cases treated at the College Hospital at Mannuthy during April 2003 to March 2004

Year & Month	Bovine	Others	Total	Lab test	Costat ratem	Major surgical operation	Minor surgical operation	Anti Rabies vaccine	Proplax	Amt. Raniket vaccine
2003 April	312	1630	1942	62	1	7	34	88	85	503
May	356	1651	2007	162	1	5	49	89	41	260
June	225	904	1130	193	2	2	36	67	58	133
July	321	1476	1797	208	3	22	9	62	70	167
August	344	2013	2357	108	-	6	16	75	66	236
Septem	945	1218	2163	109	-	4	9	75	49	271
Oct.	350	1472	1822	2	1	11	17	30	15	277
Nov.	307	1836	2143	NIL	2	4	17	69	34	310
Dec.	317	2292	2609	86	4	5	29	75	45	412
Jan2004	285	2299	2584	338	1	16	15	98	86	525
Feb	246	1949	2195	120	-	7	3	107	102	447
March	375	1485	1860	227	Nil	10	15	125	69	190

COLLEGE OF VETERINARY & ANIMAL SCIENCES POOKOT, WAYANAD

Introduction

The office of the new Veterinary College at Pookot in Wayanad District under Kerala Agricultural University started functioning at Mannuthy with the effect from AN of 28-10-1998. Dr.P.P.Balakrishnan is the Associate Dean of the College of Veterinary & Animal Sciences, Pookot, Wayanad. As the infrastructural facilities are not completed at Pookot, the courses for the students of B.V.Sc & AH from 1999 batch onwards, are being offered at the College of Veterinary & Animal Sciences, Mannuthy. As and when the facilities required for the effective functioning of the college are met, the students will be shifted to the College of Veterinary & Animal Sciences, Pookot, Wayanad.

Mandate of the Institution

The mandate of the College is to impart quality veterinary education and to provide qualified veterinary personnel to meet the demands of the Animal Husbandry sector in the state.

Lead function

To impart veterinary education as per the norms of Veterinary Council of India for BVSc & AH degree programme.

Auxiliary function

Produce sufficient Veterinary professionals to cater to the needs of Animal Husbandry Department and to impart Animal Husbandry extension activities for Northern Malabar area, especially Wayanad district.

A few memorable events of the institution:

- 9.6.1999 Taken over 100 acres of land for the new college from the revenue authorities at Pookot.
- 17.11.1999 : Admitted 35 students for Pookot College(1999 batch Ist BVSc& AH)
- 7.8.2000 : Death of Dr.K.M.Ramachandran, Special Officer.
- 10.10.2000 : Dr.P.P.Balakrishnan took charge as Special Officer
- 29.3.2001 : Government of Kerala accorded sanction for creation of teaching and non-teaching posts for Pookot College.

23.8.2001 : University created 13 teaching positions (12 disciplines) for this College and accorded sanction to engage teaching assistants on daily wages.

27.11.2003 : V batch (2003) admitted 40 students (+ 13 earlier admissions).

Faculty improvement programme

The teachers have participated in two symposia, two workshops, three training programmes and four Science Congress at different institutions inside and outside the state.

Admission (No. of students as on 31.03.2004)

Year of admission	M	F	Total	SC/ST		
				M	F	Total
a (1) UG Programme on rolls 2003	24	16	40	1	1	4

Extra curricular activities

Actively participated along with the students of COVAS, Mannuthy in students union activities, sports and games, NSS activities, cultural programmes etc.

Finance

Heads of account	Provision for the year	Expenditure	Station Receipts
278-26-4400(PLAN)	76.950	68,94,600	5,99,747.60
278-26-4401(PLAN)	01.150	00,14,899	-
Development Grant	03.000	02,80,53	-

COLLEGE OF DAIRY SCIENCE AND TECHNOLOGY, MANNUTHY

Introduction

The College of Dairy Science and Technology was started initially as a degree programme attached to the College of Veterinary and Animal Sciences. Now the college is functioning at the ground floor of the Directorate of Extension with inadequate facilities. The Government of Kerala has already decided to relocate the college from Mannuthy campus to Idukki district. The land available at the KLDB farm at Kolahalamedu has already been transferred to University for the same. The action for building basic infrastructure facilities at the new campus has already been taken. However, no progress in construction has been made presumably due to want of required fund. Under these circumstances, it is high time for the University to decide on the existing project of establishing the college at Kolahalamedu.

Mandate of the institution

A) Academic Programmes.

Offering degree programme – B.Tech. (D.Sc. & Tech.)

B) Research and Development

1. Milk production augmentation activities
2. Fodder research and development of low cost feed for milch animals
3. Utilization of agro based products for value addition in dairy products
4. Development of dairy products incorporating dairy by products (whey)
5. Total Quality Management in dairy sector (including quality control, quality improvement and quality assurance of various dairy products)
6. Fabrication of low cost dairy equipment meant for the preparation of indigenous milk products
7. Utilization of non-conventional energy sources in the field of dairying

C) Extension

1. Offering training programmes to different categories of people in dairy husbandry and dairy processing
2. Consultancy services for the establishment of dairy farms and plants.
3. Organization of seminars and exhibitions in the field of dairy production and processing
4. Arranging television/ radio programmes and publishing articles in the field of dairying
5. Participation in peoples programme activities

Lead function

Teaching undergraduates of B.Tech (D.Sc & Tech.). Other important functions include research in the field of economic milk production, processing and value addition. Extension activities to keep the farmers in the dairy field and also by undertaking fodder development activities by mass education/ people participation.

A few memorable events of the station

Under the initiative of Dr. V Prasad, Associate Dean of the College of Dairy Science and Technology, the Kerala chapter of IDA was inaugurated on 17th of March, 2004 by the distinguished President of the Indian Dairy Association, Sri. Animesh Banerjee.

Seminars/Summer Institute/Symposia/Trainings attended

The teachers of the college attended 3 Seminars and 2 National trainings at College of Veterinary and Animal Sciences, Mannuthy.

Academic programmes

Admission/ No. of students as on 31/03/2004

Years of admission	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
a) UG programme (on rolls)								
2000	6	12	18	-	2	2	6	14
2001	8	11	19	1	-	1	9	11
2002	5	18	23	-	1	1	6	19
2003	9	11	20	1	1	2	10	13

Study tours

All India tour for 2000 admission
South India 2000 & 2001

Research programme

- a) Improvement of nutritional qualities of fermented milk using wild strains of Bifidobacteria. ICAR project -1/4/2002 to 31/03/2003.

The project was undertaken to isolate therapeutically important Bifidobacterium from wild sources particularly from new born babies and to improve the nutritional, antibacterial activity, high tolerance to acid and bile and the capacity to form lactic acid at a faster rate. The isolated organisms were utilized for the production of various fermented milk products. Various nutritionally superior fermented milk products were developed in the project and the report has been submitted to ICAR.

- b) "The determination of real standards of milk marketed in Kerala" – as per instructions of High Court of Kerala – project completed in March 2003.

The project on real quality of milk marketed in Kerala was undertaken as per the direction of Hon. High Court of Kerala. This study was undertaken considering the widespread complaints about the quality of milk marketed in Kerala particularly milk brought from neighbouring states. The study found that sizeable percentage of the packet milk were not having required qualities. Some of the milk was adulterated with agents like sugar, ammonium sulphate, detergents etc. The bacteriological quality of market milk was also found very poor and high count of *E.coli*, Coli forms and *Staphylococcus aureus* were observed. It was also found that the milk brought in the State in tankers were of inferior quality and immediate attention of authorities is required in this aspect to safe guard health of consumers. The report were presented to the Government and to the Hon. High Court of Kerala.

Extension and other activities:

The College of Dairy Science and Technology is offering free consultancy services for the establishment of Dairy processing units, chilling units etc. Seminars were organized for facilitating interaction between milk producers, technologists and consumers. Staff from the college participated in various seminars, workshops etc organized by different departments. However, research and extension in a wider way can be done only after posting required staff for the college

Organized a National level Winter school on "Recent development in fermented milk" of 21 days duration with the financial assistance of ICAR under the directorship of Dr. V Prasad, Associate Dean of the College.

Important visitors

Sri. Animesh Banerjee, President, Indian Dairy Association, New Delhi

Finance

Head of Account	Provision for the year	Expenditure	Station receipts
Non plan			
Plan	111.536 lakhs	43.53 lakhs	4. lakhs
ICAR	2.5 lakhs	2.5 lakhs	

FACULTY OF FISHERIES

COLLEGE OF FISHERIES, PANANGAD

Introduction

The College of Fisheries, Panangad is the only institution in the State offering professional degree programme in Fisheries. The college was established as the third one in the country after the establishment of the College of Fisheries at Mangalore and the College of Fisheries, Tuticorin among the 12 Fisheries College in the country. The college is located in Panangad and the campus has a total area of 30 hectares.

Mandate of the Institution

The mandate of the College of Fisheries, is the development of Fisheries Sector of the State and the country. The college forms the nucleus of the establishment of the Fisheries University in the State to undertake and co-ordinate active programmes in teaching, research and extension in Fisheries. The mandate of the college is also to evolve new and cost effective technologies for product development so as to bring in much desired value addition and consumer preference for fishery products.

A few memorable events of the Institutions

An International Symposium on Freshwater Prawns was organized by the College at Kochi from 20th to 23rd August, 2003. Around 500 dignitaries from 13 countries took part in the event.

Seminars/summer institute/symposia/trainings attended

The teachers of the College attended three workshop for training, one refresher course and one International conference at different institutions inside and outside the state.

Academic Programmes

Admission (No. of students as on 31-3-2004)

Year of Admn.				SC/ST			Total	
	M	F	Total	M	F	Total	M	F
2002-03	73	97	170	3	7	10	73	97
a(i) UG programme (on rolls)								
2000	18	22	40	2	1	3	18	22
2001	15	24	39	--	3	3	15	24
2002	18	23	41	1	1	2	18	23
2003	14	23	37	--	2	2	14	23

A (ii) P.G. Programme (on rolls) Discipline wise

2002	5	2	7
2003	3	3	6
2002 Admission:-	Aquaculture - 2 Fish Processing- 1	Fishery Hydrography- 2} Fishery Biology - 2}	7
2003 Admission:-	Aquaculture - 2 Fish processing - 1	Fish Hydrography - 1} Fishery Biology - 2 }	6

Study tours

An all India Study tour was conducted from March 23 to 9 April for the 2000 batch B.F.Sc students which consisted of 22 girls and 18 boys. The tour leader was Dr. B. Manoj Kumar, Asst. Professor.

Extra curricular activities

Students Union activities

The Students participated in the University arts festival held at Vellanikkara from 27.4.2003 to 30.4.2003. The best drama, best actor and best actress awards were won by the students of this college.

New office bearers of the students union 2003-04 were elected unanimously. Sri. Selvan T.S of 2001 batch and Sri. Prasanth S of 2000 batch were elected as President and General Secretary respectively.

N.S.S Activities

World environment day was observed in the college by organizing programmes such as planting of saplings putting up posters with a view to creating an awareness regarding the protection of environment and its bio-diversity.

An eye care camp was conducted on 19th January 2003 in the College. It was organized in co-operation with the General Hospital, Ernakulam, Primary health centres of Panangad and Nettoor. In all, 58 patients turned up for the camp. Ten persons were directed to the General Hospital, Ernakulam for free surgery. As a follow up, 49 spectacles were also distributed to poor patients on 12th February 2004 under the sponsorship of the Federal Bank, SBT, Vyttila and Nippon Toyota, Nettoor.

A debating club inaugurated by Mr. K.N. Pradeep Kumar, Manager, UTI Bank, Ernakulam. was organised in the college on 19th March 2004.

A cancer awareness seminar was organized on 26th March 2004 at the College for the people of Kumbalam Panchayat. Dr.V.P. Gangadharan, Chief Oncologist, Lakeshore Hospital, Nettoor was the Chief Resource Person.

In all 30 volunteers donated blood during this period:

Sports and Games

In the KAU athletic meet this college has emerged winners in both Men & women and overall championship was awarded to this College. The Women's basket ball team emerged as Champions and Women volley ball team secured second position in the KAU Athletic meet. In other events this college has put up a good performance. The College teams in cricket and football played all their league matches. Besides, the boys table tennis players participated in the Ernakulam District Table Tennis tournament. A few of Foot ball players were selected in the KAU Foot ball team for Inter University tournament and two students represented the KAU team in the All India Inter Agrimeet held at Bangalore in March 2004.

Research programmes

Major Research Achievements

Department of Aquaculture

- 1 *In vitro* and *in vivo* studies demonstrated that herbal preparation "Murivenna" could be successfully used for the treatment of fungal and bacterial diseases of different species of ornamental fishes. It was the effective for treating finrot and ulcers in exotic species of ornamental fishes.
- 2 Pilot study showed that the use of homeopathic preparation during the larval rearing of *Macrobrachium rosenbergii* helped in maintaining water quality tanks through control of algae and the larvae were healthier and bigger in size compared to control. In the wake of the ban of antibiotics in hatchery management, use of such homeopathic preparations will pave the way for producing disease free and healthy larvae.
- 3 First trial run in the Kumta hatchery, Karnataka, which the Department has taken as a consultancy project for the Government of Karnataka was successfully completed during October 2003 January 2004.
- 4 Low cost and locally available protein sources are prawn head meal and squilla meal. Silkworm pupae can be incorporated as the main animal protein source in the feed formulation of *Cyprinus carpio* and *Labeo rohita*. Best results in terms of growth rate, survival and F.C.R. were obtained in the feed formulated from prawn head meal.
- 5 Substrate based bio-film was effective in promoting growth and survival of *M.rosenbergii*. Of the three bio-degradable substrates evaluated paddy straws, sugar cane bagas and bamboo strips, growth rate was the best in the treatment using bamboo strips.

Department of Fishery Hydrography

- 1 The zoo plankton density showed significant seasonal variation and was higher during pre-monsoon. Copepods were the dominant group.
- 2 Significant positive correlation existed between zoo plankton and salinity.
- 3 Polychaetes formed the most common group in the benthos. Maximum benthic production was noticed in post-monsoon season.
- 4 Benthic production varied significantly between stations and between seasons.
- 5 Harmonic analysis of tides at different locations in estuary indicated predominance of semidiurnal component during post monsoon season. The reflection of tidal waves appears to be important in south of Thanneermukkam bund.
- 6 The nutrient concentration to higher during monsoon season because of heavy freshet.
- 7 Primary production was maximum during postmonsoon and minimum during pre-monsoon. Primary production showed bimodal trend with primary perk at monsoon as secondary peak during post monsoon.

Papers

- 1 Renjith K.R., K.K. Varma (2003). Dissolved oxygen measurements during ARMEX phase II. Abstract of ARMEX Workshop on Data Analysis and Initial Scientific Results: 91-92.
- 2 N.N. Raman: K.K. Varma: K.R. Renjith: P.S. Mrithunjayan (2003). Turbulent fluxes and surface nutrients in Lakshadweep waters – Initial findings. Abstract of ARMEX Workshop on Data Analysis and Initial Scientific Results: 75.
- 3 Haridevi c.K: K.H. Houlath: Varma K.K., Renjith K.R., Vijayakumar C.T and Prabha Joseph. (2004). Seasonal variation of Zooplankton in Relation to Hydrographic Parameters in the Panangad Region of Vambanad Lake. Proceedings of National Seminar on new Frontiers in marine Biosciences Research: 501-510.

Dept. of Processing Technology

1. Antiatherogenic activity of cuttlefish liver oil was demonstrated by rat feeding studies.
2. A proteoglycon was purified from cuttlefish by inkion exchange chromatography and gel filtration.
3. Solar tent and solar cabinet driers were developed for drying fish without contamination, pest infestation and hence with minimum loss.

4. A technology was developed for curing fish using irradiated salt to control halophilic spoilage and insects.
5. Using standard recipe available for prawn pickle, value added product for undersized freshwater prawn was made.
6. Value addition was also done by developing products such as 'prawn stick' and prawn cutlet using the meat of undersized freshwater prawns.
7. From low cost freshwater fishes such as mrigal, silver carp and tilapia various paste products such as fish cake, ball, burger, sausage, ham and paste were developed. It was found that treatments such as battering, breeding, smoking and curry addition further improved the taste panel acceptability of the products.
8. Storage studies showed that the quick frozen products could be stored for more than 4 months, slow frozen for 2-3 months, chilled for two weeks and vacuum packed and chilled for 3 weeks and canned for over six months.

Extension and other activities

1. Scientists from the College visited various colleges and Govt. institutions and acted as resource persons in the field of freshwater farming, brackish water farming, ornamental fish farming, fish diseases etc.
2. During the severe outbreak of whitespot diseases, the scientists from this college visited the farms located in and around the college and collected specimen for further studies.
3. An ICAR sponsored Training Programme on Biodiversity and Taxonomy of Fishes and crustaceans was organized from September 11 to 16, 2003 for the Scientists and Teachers from different institutions.
4. A Training Programme on ornamental fish farming was organized from November 11 to 14, 2003 for the officials and farmers.

Finance

Head of Account	Provision for the year (lakhs)	Expenditure (Rs)
Non Plan	237.684	20278088
Plan	53.530	2186017
ICAR Adhoc schemes	5.664	470955
ICAR development Grant	7.500	748996
Other EAPS	2.671	152368
	307.049	23836424

Station receipts

Income from fees	:	Rs. 5,61,696/-
Income from College properties		
(a) Farm Revenue	:	Rs. 91,731/-
(b) Fish	:	Rs. 65,908/-
Miscellaneous receipts	:	Rs. 2,78,506/-
Interest	:	Rs. 1,872/-
Total	:	Rs. 9,99,713/-

FACULTY OF AGRICULTURAL ENGINEERING & TECHNOLOGY

KELAPPAJI COLLEGE OF AGRICULTURAL ENGINEERING & TECHNOLOGY TAVANUR

Introduction:

The College Campus is located in Tavanur Village on the south bank of Bharatha Puzha in Malappuram Dist., 7 km west of Kuttippuram. The campus was the seat of Rural Institute established in July 1963. The Institute was taken over by the KAU on 12th December 1975, under section 59 of KAU Act of 1971. The Institute was renamed as Institute of Agrl. Technology and it was functioning as one of the Campuses of the University. The University subsequently opened the Faculty of Agrl. Engg. & Technology on 2nd October, 1985 and the Institute was upgraded and renamed as 'Kelappaji College of Agrl. Engg. & Technology' after the famous Gandhian Social Worker and Sarvodaya leader Sri. K. Kelappan. The total area of the campus is 40 hectares.

Dr. K. John Thomas retired as the Dean on 20.10.2013 and Prof.C.P.Muhammed is acting as Dean i/c since then.

Mandate of this Institution:

To impart education at UG & PG level in the Faculty of Agricultural Engineering, to conduct Research in the various disciplines of Agricultural Engineering and to provide Extension support to Department and farms,

Faculty Improvement Programme:

Scholarship awarded to staff/deputation of staff for higher studies

Smt. Mary Regina, F, Asst. Prof. was deputed for M.D programme at TNAU., Coimbatore

Seminar/Summer Institutes/Symposia/Trainings attended

The scientists of the station attended the Review meeting of VATP, Course on Remote sensing and Geographical Information System application to water resources, Indo-Israel Training on Farm Machinery of Horticulture, Research work AICD on FIM, Workshop on Environment Energy and development challenges and opportunities, Summer School, Training programme, refresher course and presentation of Draft Syllabus on biomass energy and wind energy.

Academic Programme

Admission (No. of students as on 31-3-2003)

Year of Admission	M	F	Total	SC/ST			Total	
				M	F	Total	M	F
2000	7	20	27	-	3	3	7	20
2001	10	10	20	-	1	1	10	10
2002	10	9	19	1	1	2	10	9
2003	10	15	25	2	1	3	10	15
a (i) U.G Programme (on rolls)								
2000	7	20	27	-	3	3	7	20
2001	10	10	20	-	1	1	10	10
2002	10	9	19	1	1	2	10	9
2003	9	15	24	2	1	3	9	15
a(ii) P.G Programme (on rolls) (discipline wise) M.Tech. (Ag.Engg.) : Nil								
2003	1	-	1	-	-	-	1	-

Study tours conducted

All India Study Tour of the B.Tech. (Ag.Engg.) students of 1999 Admn. was conducted during 24.9.2003 to 15.10.2003. 27 Students participated. Two teachers, Dr. K.P. Sudheer, & Smt. D. Sasikala, Asst. Professors, accompanied the students. A study visit of the B.Tech. Agri. Engineering students was conducted to CESS, Trivandrum, ISRO and College of Engineering, Trivandrum during 27.1.2004 to 30.1.2004.

Students' Union Activities

A farewell was given to former Dean, Dr. K. John Thomas on 18.10.2003 under the auspicious of Students' Union. The Students' Union activities were formally inaugurated on 23.10.2003. Women's Day Celebration was conducted on 8.3.2004. Arts Festival – Rhythm 2004 – was conducted during 21 to 24 April 2004. A free blood group testing camp was organized together by NSS and Students' Union. Sports Club of the Students Union organized a Yoga Class for students, staff and family members. Literary club of the Students' Union is publishing a Wall Magazine. Nature Club is making a garden in front of the College gate and takes part in campus beautification. A film festival was organized from 15.3.2003.

NSS Activities

The following programmes were conducted under NSS unit of this college from 1.4.2003 to 31.03.2004.

1. Observed World Environment Day with a procession on 5.6.2003 to enlighten the public on the importance of environment protection.
2. A workshop on Watershed Based Development Model of AHADS was organized during July, 2003.

3. A poster making competition on Communal Harmony was held on 22.11.2003 as a part of *Quami Ekata Week*.
4. A campaign on Environment Protection through wall magazine was organized. A poster on "ma" was displayed to create awareness about judicious use of rain water.
5. Two Volunteers participated in the State Level 10 days Special Camp to construct a Check Dam in Kozhikode District from 19th to 28th December, 2003.
6. A free blood group identification camp was organized on 21.2.2004.

Sports & Games

College team participated in the KAU Inter collegiate tournaments and Malappuram District Championships and won the following championship in the inter collegiate tournaments

Table Tennis	-	Women	1 st Place
Table Tennis	-	Men	2 nd Place

The College team won the Malappuram District Championship in Table Tennis – Women. The following students participated in the KAU Inter University Competition

Athira, S.	-	Table Tennis (Women)
Chithra, G	-	Table Tennis (Women)
Shylesh Kumar Sing	-	Foot Ball (Men)
Edwin Benjamin	-	Athletics (Men)
Varu Jose	-	Athletics (Men)
Anup Madhu	-	Athletics (Men)
Arun Jose	-	Volley Ball (Men)

Edwin Benjamin won Gold medal in Shot put and Silver medal in Discus Throw in the All India Inter Agricultural Universities Sports and Games held at UAS Bangalore. The following students represented Malappuram District in the Kerala State Championship in Table Tennis.

Chithra, G., Athira, S. and Srivishakh KL

Annual Sports, Olympus 2003, was conducted on 4th and 5th March, 2004.

Research Programmes

NATP on "Development and Testing of Farm Machinery for Plantation Crops of Kerala"

This project was sanctioned by the NATP- Project Implementation Unit, ICAR, New Delhi. It was started on 26.08.2000 with a total outlay of Rs. 50.96192 lakhs.

Achievements of the Project:

Self centering basin lister for tree crops.

A power tiller mounted basin lister for the coconut plantations was designed and fabricated. The time taken for making a basin of 2½ m dia radius is only two minutes under moist condition.

Direct drive micro tiller/weeder.

A petrol engine operated micro tiller cum weeder is developed. The overall weight is 65 kg, forward speed (in average weed condition) is 0.2 m/s and field capacity is 0.024 ha/hr. The machine is not self-propelled; instead it is pushed by the operator. Action to reduce its weight is going on.

Large diameter pit digger

A simple tool for making large diameter pit mainly for planting saplings of trees is developed. This soil counter sinking attachment is replaceable as a unit on a co-operating auger of a post-hole digger attached to the tractor of 35hp. With this, the time required to take a pit of size 80 cm deep and 100 cm diameter at the top is nearly 3 minutes only.

Powered Palm Climber

The first working model of power operated direct drive climber available already was redesigned and tested. The machine worked satisfactorily. It took 1 minute to climb up a palm of 6 metres height and 50 seconds to climb down. The major draw back of the machine is its heavy weight of 102 kg.

Rotary Coconut Husker

The first prototype of the power operated machine available already is refined and modified for intensive field-testing and evaluation. This machine consisted of an arcuate stationary concave with a rotating drum. The space between the drum and concave was shaped to accept the coconut at the inlet and to get the kernel at the outlet. A 3 hp electric motor with 10:1 speed reduction unit was used as power source. On continuous rotation of the drum, coconut fed through the mouth of the concave got dehusked and thrown out. The output of the machine is 450 nuts/hr.

Tractor operated ditcher cum bed former

A tractor operated pineapple ditcher cum bed former was developed. The equipment was found capable of forming a ditch of 867mm width, 177.5mm depth and two half beds each of 340mm width. The mean effective field capacity of the implement is 0.336ha/h and the mean field efficiency is 59.8%. The cost of operation per hour is Rs. 300/-. The production cost of the equipment is around Rs. 6000/-

Revolving Fund Scheme- Farm Machinery Production & Popularization

The Indian Council of Agricultural Research has sanctioned a project entitled "Farm Machinery Production and Popularization" as Revolving Fund Scheme.

A paddy harvester mounted on Mitsubishi Power Tiller was supplied to the Kerala Livestock Development Board for field-testing. As per the suggestions of the Kerala Livestock Development Board, the necessary modifications are being incorporated. It aimed to develop a better economic machine than the imported Swiss machine.

Refinement and popularization of Power driven Coconut Climber and Manual harvesting Pole

A motorized palm climber has been designed and its fabrication is nearing completion; It will be field tested soon.

A study on coconut oil as an I. C. Engine Lubricant

Under this project studies were conducted to compare five varieties of engine oils based on their viscosity and it was found that coconut oil is almost equal to the SERVO 2 T oil available in the market. More research in this direction is in progress; the instruments needed for the project are being procured.

AICRP on Farm Implements and Machinery (ICAR)

1. During May-July, 2003 a large scale introduction and demonstrations of rice transplanters at Anakkara Panchayath, Palakkad District was taken up at Farmers Fields. Chinese Yanji, Japanese Yanmar, Korean, LG, Kukje, Asia and Tong Yang transplanters were demonstrated in 18.5 ha. The ICAR High Level Team also witnessed the evaluation of various transplanters. Yanji transplanter was suitable to local conditions. The performance of the transplanter was good. Yield of paddy was higher compared to manual transplanting.
2. Farmers, Peoples representatives and Agrl. Officers from various districts were given training on rice transplanter, harvester, thresher and mini tillers.
3. Large-scale demonstrations of rice transplater, cono weeder, paddy harvester and thresher were conducted in Malappuram, Palakkad and Thrissur Districts with the co-operation of locally trained rural unemployed girls.
4. Imported mini tiller of Asia brand from Korea and Africa from Spain with several attachments were evaluated for plantation and homestead farming.

ICAR Ad hoc Project on Development and Testing of a Simple Riding type Paddy Transplanter

An inertially operated planting finger for transplanters is designed. This new type of planting fingers were fabricated and tested at fields to replace the complicated and costly transplanting system. These performed satisfactorily.

NATP on Alleviating Occupational Stresses imposed on Women Agricultural Workers of Kerala – An Ergonomic Approach

Energy cost of operating different tools and implements that can be used by female workers of the region, have been estimated during the report period. Possible modifications for these systems were identified with a view to make them more handy and friendly with female workers.

Under an initiative to introduce improved implements and machinery among the female workers of the region, seven trainings programmes were arranged on the operation and maintenance of agricultural machinery like tractors, power tillers, harvesters, threshers, Trans planters and coconut dehuskers.

Sixteen female workers, trained under the project, have already obtained license for driving tractors. The female workers trained under the project are forming cooperative groups to perform various agricultural operations on a commercial scale on payment basis. Two groups have already registered under the name of "Sthree Sakthi" and "Vanitha Sakthi".

These groups are in demand for performing mechanized agricultural operations in Malappuram and the nearby districts. In the last crop season, they got work for more than one and a half month and transplanted, harvested and threshed paddy on daily wage basis. They were paid Rs. 150/- per day, an equal amount paid to the skilled male workers.

Precision Farming Development Centre (PFDC)

Various experiments were done to study the effect of fertigation in coconut, effect of drip irrigation and crop geometry in red banana, organic farming in pineapple and plastic mulching in bush pepper. An experiment was done to find out the effect of rain shelter cultivation of chilli, which resulted in increase in yield about 53 % more than that at outside.

Extension Activities:

Under the PFDC Scheme, trainings for Agricultural Officers, farmers and staff of RAIDCO on different subjects such as green house technology, use of plastics in agriculture and different aspects of drip irrigation were conducted. Survey was conducted in different districts of Kerala to study the popularity and applicability of drip irrigation, sprinkler irrigation and green house.

Under FIM scheme, Farmers, Peoples representatives and Agrl. Officers from various Districts were given training on rice transplanter, harvester, thresher and mini tiller and large scale demonstrations of rice transplanter, paddy harvester and thresher were conducted in Malappuram, Palakkad and Thrissur Districts with the co-operation of locally trained rural unemployed girls.

Important Visitors

Members of QRT of AICRP on FIM (ICAR) consisting of Prof. K.N. Singh, Director (Farms), GBPUAT, Panthnagar, Prof. Prathap Singh, Director of Research, MPUAT, Udaipur, Dr. M.M. Pandey, Project Co-ordinator, CIAE, Bhopal, Dr. S. Ganesan, PS, CIAE, Bhopal and Ex. Baldev Singh Kunjan, Director BIC, Muga, Punjab visited the College from 2nd to 5th June 2003. Dean's Committee on Research on Research Facilities comprising of Dr. E. Vadivel, Dean (Ag.), Prof. R. Maniyan, Dean (Ag. Engg.), Dr. S. Kombai Raju, Dean (SPGS), and Dr. R. Krishnaswami, Dean (Horti), all of TNAU, Coimbatore visited the College on 20.9.2003. Site Selection Committee of KVK, Malappuram comprising Dr. O.P. Singh, Retired Vice-Chancellor, Delhi University, Delhi and Dr. S. Prabhu Kumar, Zonal Co-ordinator, KVK, Bangalore, visited the College on 17.11.2003. Sri. G. Karthikeyan, Hon'ble Minister for Culture visited the College on 9.2.2004..

Finance

Head of A/c	Provision for the year (in lakhs)	Expenditure (in lakhs)	Station Receipts (in lakhs)
Non Plan	203.320	1,75.85	15.33
Plan	57.820	33.86	..
ICAR	17.118	12.36	..
Other EAPs	37.720	10.85	..
Revolving Fund	1.000	0.54	0.36

K.A.U. HIGH SCHOOL, VELLANKKARA

Introduction

It was started in 1981. There are classes from I to X Malayalam & English Medium. Besides this there is a crèche for children below three years and Nursery section- L.K.G & U.K.G. It is a mixed school.

Services of teachers appointed through employment exchange were terminated on 31-3-2004.

Academic Progress

S.S.L.C. Examination March 2003

Total students	:	77
Students passed	:	77
Distinction	:	20
First Class	:	23
Second Class	:	13
Third Class	:	21
% age of result	:	100

Extra curricular activities

Scout

Rastrapathy winners - Master Balesh.M.B., Jijo Lukose.

Science & Maths

In Science State Level Exhibition, we got Consolation Prize in project. Smt.Najeema Unnikammu got first prize in Teacher Project and Third Prize in Teaching aid. In State Science Congress, Master Anand.R participated and was selected for participation in the National Children's Science Congress and got 'Young Scientist' Award and Cash Award Rs.1000. In Southern India Science Fair Kum.Resmi.A.C. got First Prize and Cash Award Rs.1200. Smt.Najeema Unnikammu got Third prize in Teacher Project and got Cash Award Rs 400.

In Maths, State Level Exhibition Master Boaz Vincent got First Prize in Single Project and Cash Award Rs.500. Kum.Saranya.S. got Third Prize in Working Model and Cash Award Rs.300. In Southern India Science Fair. Master Boaz Vincent got Industrial Award. In State Balaganitha Sasthra Congress Sruthy.K.Mohan & team got Second Prize.

Sanju.K. Vargheese & team got Third Prize. They got Cash Award of Rs.300 . In Maths Talent Scholarship Examination Sarah Alexander got Third Rank. Resmi. A. C., Ambily. P. M. and Vivek. C. P. got Fourth Rank. Smt. Magy.T. J., Teacher got the award of best Maths Club co-ordinator in the State.

KAUHS attained the Award of 'Best Unaided School In Rural Area' which was sponsored by Vidhyabhyasa Vikasana Samithi.

Strength of students 2003-04

S.T.D.	B	G	Total	S.C.		Total
				B	G	
IM	10	3	13	-	2	15
IE	25	18	43	2	1	46
IIM	11	10	21	-	1	22
IE	24	12	36	5	2	43
IIIM	11	5	16	-	-	16
IE	27	15	42	1	3	46
IVM	12	11	23	1	-	24
IE	26	17	43	1	-	46
VM	16	12	28	3	1	32
VE	24	17	41	2	3	46
VIM	26	15	41	2	-	43
VE	32	7	39	2	-	41
VIIIM	32	17	49	3	1	53
VIE	25	15	40	2	1	43
VIIIM	21	12	33	1	2	36
VIII E	28	11	39	1	1	41
IXM	29	23	52	3	7	59
IXE	23	19	42	-	-	42
XM	21	16	36	3	6	45
XE	31	7	38	2	1	41

Finance 2003-04

Head of account	Provision for the year (lakhs)	Expenditure (lakhs)	Station receipts
Non plan 104-20-0005	32.340	33.35	4.23

CHAPTER III
RESEARCH
FACULTY OF AGRICULTURE
SOUTHERN ZONE
NARP (SOUTHERN REGION), VELLAYANI

Introduction

The NARP (Southern Region), Vellayani is situated 13 km away from Thiruvananthapuram and is located at 8.5°N latitude, 76.9°E longitude and at an altitude of 29 m above mean sea level. It is about 12 km south of the capital city of Thiruvananthapuram and 4 km west of the famous Kovalam Beach Resort. The NARP (SR) headquarters is presently attached to the campus of College of Agriculture, Vellayani. The Southern Region comprises of the districts of Thiruvananthapuram, Kollam, Alappuzha, Kottayam and Pathanamthitta excepting the problem areas of Alappuzha and Kottayam districts. The NARP (Southern Region), Vellayani is headed by the Associate Director of Research.

Mandate of the institution/station/unit

The mandate of the station is to undertake research on crops for partial shade conditions and export oriented vegetables and cutflower production.

Satellite stations

CSRC, Karamana, CRS, Balaramapuram, FSRS, Sadanandapuram, KVK, Sadanandapuram and SCRS, Konni.

A few memorable events of the Institution

Organized the National group Meet *Kharif* 2003 of AICRP on Forage Crops at College of Agriculture, Vellayani from 9th to 11th May 2003.

Organized the 2nd Review Meeting of the "Integrated-management of fruit fly in India" (ICAR-UK-DFID Project) on 10th to 12th February 2004.

Faculty Improvement Programme :

Seminars/summer institute/symposia/trainings attended

The scientists attended a total no. of 15 group meetings, 25 seminars and 15 workshops during this period.

Major research achievements

Agronomy

AICRP on Forage Crops (Agronomy)

1. Remunerative forage based cropping system for sustained productivity under irrigated condition

The trial is being continued in the third year. The results indicate that the highest net return (Rs 1,10,287 / yr) is obtained from the sequence hybrid napier throughout the year followed by the sequence Fodder maize + fodder cowpea-vegetable cowpea- bhindi (Rs: 64,145/ yr)

2. Production potential and quality of guinea grass at varying fertility levels under shaded conditions of trees

Fertilizer application @400:100:100 kg NPK /ha produced the highest green fodder yield (691.0 q/ ha) and dry fodder yield (186.4 q/ ha) of guinea grass while the net returns obtained by the application of NPK @ 400:200:200 kg/ha (Rs: 21434 /ha) was on par with the application of 350:175:175 kg NPK per ha (Rs.20034/ ha).

3. Identification of fodder rice bean for southern region

Evaluation of 70 accessions of fodder rice bean was done during *khariif* 1999. Fifteen accessions selected from the Initial Evaluation Trial were evaluated in CYTs during *khariif* 2000, 2001 and 2002. These accessions were also evaluated during summer in rice fallows. The fodder yield was maximum in LRB 41 under open and partially shaded conditions (28 and 22 t/ha respectively). The accession LRB 75 recorded the maximum fodder yield in summer fallows (30 t/ha). The project is continuing.

4. Ecofriendly techniques for enhancing productivity of vegetables

Mineralization study was conducted with 5 different organic manures (FYM, poultry manure, neemcake, coirpith compost and vermicompost) for a period of 4 months. Initial nutrient status of the soil and organic amendments were analysed by standard procedures and the results indicated that available nitrogen status of the soil increased with incubation time upto 15 th week in poultry manure , FYM and coir pith compost. In vermi compost and neem cake a progressive increase was observed upto 18 th week. In general, an increase in P_2O_5 , K_2O and S availability was observed with time.

The result of the mineralization study showed that recommended level of organic manures is not sufficient for short duration crops since only 18 - 28% of nitrogen was released by 12 weeks after application of organic manures.

5. NATP Project - Identification of shade tolerant genotypes and study of nutritional alterations under shade in guinea grass (*Panicum maximum*)

There are two experiments under the project.

With an objective of utilizing the area under coconut for fodder cultivation, the project was undertaken with 41 accessions which were tried for their response to different levels of shade. The accessions differed widely in their response to shade.

On an average green fodder yield was maximum under 25% shade followed by open, 75% and 50% shade. Plants grown under 25% shade also had higher dry matter yield than those under other shade levels.

Number of tillers was found to be decreasing with increase in shade levels the highest number of tillers was in plants grown under open conditions. Plant height, leaf length and leaf width showed an increasing trend with increase in shade intensity. High leaf stem ratio was observed for plants grown under 75% shade level.

Chlorophyll content showed an increase in shade intensities. Plants grown under 25% shade showed high values for fibre content and crude protein content. Proline content showed a decreasing trend with increase in shade suggesting that water stress was reduced under shaded conditions.

The plants under heavy shade had tall, lanky and thin stalks compared to short and stout tillers of plants grown in full sun. Flowering was also influenced by shade. Flowering commenced early in the plants grown in full sunlight followed by 25% shade, 50% shade and 75% shade. A few accessions (MS 4688 and Hamil) failed to flower under heavy shade.

The observations revealed that the variability among guinea grass accessions with respect to shade suggesting scope for improvement through selection of high yielding shade tolerant genotypes. Among shade tolerant genotypes, MS 4732, PGG 205, MS 4733, FR 600 and Haritha with higher yields and other desirable characters were found suited for growing in Kerala conditions. Similarly, a few accessions among the shade susceptible group with less yield reduction under shade viz MS 4691, MS 4685, MS4688 and Hamil were found suited to our conditions. However, as the experiment is still in progress, conclusive results have not yet been obtained.

SOIL SCIENCE AND AGRICULTURAL CHEMISTRY

Network Project on soil characterization and resource management of acid soil regions for increasing productivity :

- 1) The lime requirement (1/10 LR) based on SMP method ranged from 575 to 1200 kg/ha.
- 2) Addition of lime @ 1/10 LR resulted in 25% increase in farmer's practice and 37% increase in soil test based fertilizer application.
- 3) All treatments receiving lime recorded lower values of exchangeable acidity, higher pH and exchangeable calcium and potassium.
- 4) Limed plots had a lower organic matter content and higher available nitrogen levels suggesting, the beneficial effect of lime on N mineralisation.
- 5) The soil test based fertilizer application based on, POP along with lime was the best treatment recording and highest yield confirming the favourable influence of lime on pulse crops.

- 6) The high cost of liming materials (only lime shell CaCO_3 is available) @ Rs. 6.50/kg and high labour cost (Rs. 160/-) has offset the beneficial effects of liming and the practice is not found to be cost effective.

OLERICULTURE

Identification of vegetable chilli (*Capsicum* spp.) genotypes suitable for the homesteads of the southern region

Genotypes of chilli (*Capsicum annuum*, *Capsicum frutescens* and *Capsicum chinense*) collected from different sources were evaluated both under shade and open conditions. The genotype CA38 of *Capsicum annuum* was identified as high yielding both under shade and open and farm trial was conducted.

Comparative yield trials were conducted in the other two species *Capsicum frutescens* and *Capsicum chinense* during 2002 and 2003. The genotypes CF 51 and CC 30 were superior in yield.

Evolving heat tolerant and bacterial wilt resistant tomato for Southern Kerala

48 genotypes of tomato collected from different parts of the world were evaluated for bacterial wilt resistance and heat tolerance. The lines LE 45 LE 34, and LE 38 were superior. Farm trials were conducted using the lines LE 45 and LE 38.

Identification of vegetable amaranths (*Amaranthus* spp.) with high yield and leaf blight resistance

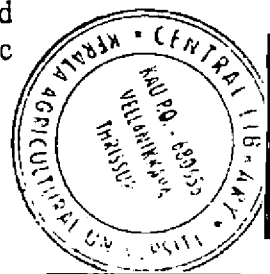
Thirty two accessions of *Amaranthus dubius* were evaluated during summer 2001 and 2002. Analysis of data revealed that A 23 was the highest yielder with 382 g/plant which is on par with A 13, A 18, A 32, A 29 and A 34. Days to bolting ranged from 50.93 to 73.92. In the second trial yield ranged between 155.90 (A 34) to 464.8 g (A 30). The highest yield was recorded by A 30 followed by A 23. Scoring for incidence of leaf blight revealed that all accessions were resistant but under artificial epiphytotic conditions, 14 were immune, 15 highly resistant and 3 moderately resistant. A 23 was immune whereas, A 30 recorded a PDI of 9.31. The least oxalate content was recorded in A 23 (0.62 %).

Development of hybrid varieties of bitter gourd

The objective is to develop hybrid varieties of bitter gourd with high yield potential suitable for southern region of Kerala. Six genetically divergent parents were selected from a germplasm of 53 accessions. Inbreds of the six parents were developed and they were crossed in a diallel manner for the development of hybrids. The 30 hybrids were evaluated in two CYTs. MC 53 x MC 23 gave the highest yield of 1.9 kg/plant followed by MC 18 x MC 17 in the first CYT and in the second CYT, MC 53 x MC 23 gave an yield of 1.0 kg/ plant followed by MC 23 x MC 40 and MC 18 x MC 17.

Development of hybrid varieties of pumpkin

The project aims to develop hybrid varieties of pumpkin with high yield potential suitable for southern region of Kerala. The parents selected based on genetic



divergence were subjected to inbreeding till the parental lines attained homozygosity. The inbreds were crossed in diallel pattern and the hybrids developed were evaluated in two CYTs. In the first CYT, P1 x P4 gave the highest yield.

Collection, Evaluation, Morphological and Molecular Characterisation, Cataloguing and Genetic Improvement of Ivy Gourd (*Coccinia grandis*)

The Objectives were to collect and conserve the genetic diversity in Ivy Gourd *Coccinia grandis*; to study the clonal variation and to identify superior gynoeocious clones; to study parthenocarpy and apomixis and the effect of pollination in fruit set and fruit quality; evaluation of hybrid clones and to identify superior one and molecular characterization of gynoeocious, androeocious and hybrid clones of Ivy Gourd.

To study the variability among different clones of *Coccinia* grown in different parts of South India, cuttings were collected from different parts of Kerala, Tamilnadu and Karnataka. Seventy five accessions including ten accessions from NBPGR sub-centre, Vellanikkara were collected and raised in the field for initial evaluation. The observations are being recorded on days to first flowering, number of flowers per plant, number of fruits per plant and weight of fruits per plant. The preliminary investigations showed a lot of variability for morphological and biometric characters. The observations are in progress.

PLANT BREEDING AND GENETICS

AICRP on Forage Crops (Plant Breeding)

Breeding trials with forage bajra

- i. Advanced varietal trial on multicut bajra

Out of the twelve entries tested, ISB-10 recorded the maximum green and dry fodder yields (132.3 and 39.7 t/ha) in two cuts.

Advanced varietal trial on guinea grass

Out of the nine entries tested green fodder yield was maximum in IGG- 2002-5 (836.6 g/ha).

Breeding trials with forage cowpea

- i. Initial varietal trial on forage cowpea

Out of the eleven entries tested, IVC-6 recorded the maximum green and dry fodder yields (30.3 and 9.1 t/ha respectively).

- ii. Advanced varietal trial on forage cowpea

Out of the five entries tested, green fodder yield was maximum in AVC-2 (18.3 t/ha).

- iii. Performance evaluation of the released varieties of cowpea

Out of the nine entries tested, the green and dry fodder yields were maximum in PETC-1 (31.2 and 9.3 t/ha respectively).

Breeding trials with forage maize

The entry IVM-2 recorded the maximum green and dry fodder yields (17.3 and 6.0 t/ha respectively).

Breeding for commercial orchid hybrids

Evaluation of hybrids from the previous concluded project was continued. Out of a total of 298 flowering hybrids, 40 hybrids were promising, exhibiting considerable novelty, distinctiveness, uniformity and stability in floral features.

Evaluation of seedling variability in selected varieties of *Anthurium andreanum*

Mother plants belonging to 18 floral varieties and hybrids of more than 40 cross combinations were maintained in the germplasm. The morphological and floral characters of the varieties were multiplied vegetatively through natural suckers and induced suckers through top cuttings. Genetic improvement of selected hybrids is being carried out by way of backcrossing and secondary crossings.

Agro techniques for sustainable mediculture in the Western Ghats

The following experiments are in progress

Effect of cropping system, organic manure and soil moisture on yield and biochemical constituents of medicinal plants used for the preparation of 'Sathavarigulam'; Productivity and quality of medicinal plants constituting 'Pushharahwathi kasha yam' as influenced by planting geometry, organic manure and soil moisture; Agro techniques for intercropping medicinal plants used for the preparation of 'Neelabringadhi hair oil' in coconut gardens

HORTICULTURE

Crop improvement in Orchids via *in vitro* mutagenesis

Protocorm like bodies (PLBs) of the orchid- *Dendrobium var. Sonia* were subjected to irradiation with different doses of gamma rays. The doses tried were 1KR, 2KR, 3KR, 4KR, 5KR, 10KR, 15KR and 20KR. The irradiated cultures were kept under observation for four weeks. The cultures were observed closely for signs of any variation/lethality/reduced growth rate or any other detrimental effect. They were then sub cultured and transferred to a multiplication medium. Half strength MS medium (Murashige and Skoog) supplemented with benzyl adenine (2mg/l) and coconut water (15 per cent) was used for the multiplication of the irradiated protocorms.

The multiplication rate was maximum on irradiation with 2KR of gamma rays followed by 3KR of gamma rays. Though multiplication rate of PLB's was very high at 2KR, the numbers of shoots produced were not proportionately high. At the same time, the shoots produced were healthy and vigorous. At 3KR, the multiplication rate of PLB's was less, but the number of shoots produced was comparable to those irradiated at 2KR. However, the shoots were not as healthy as those cultures irradiated at 2KR. At higher doses of gamma rays, the multiplication rate was very much reduced. At 20KR, most of the PLB's did not survive.

Collection and evaluation of *Heliconias* as potential cut flower crop and standardisation of Agro techniques

Heliconia varieties of commercial significance having cut flower value are included in the experiment. Twenty two accessions were collected.

Intercropping medicinal plants in oil palm plantations

In the study of the pattern of distribution of solar energy indicated that there was considerable variation in the interception of sunlight by palm canopies of different age groups. The experiment revealed the feasibility of growing medicinal plants as intercrop in oil palm plantations of all age groups studied. Among the ten medicinal plant species evaluated, kacholam emerged as the most profitable intercrop for oil palm plantations under South Kerala conditions. The spacing trial of kacholam under different shade levels prevailed in oil palm plantations of various age groups revealed that 20x10 cm spacing was the ideal planting distance in young, medium and mature plantations for getting the highest yield and profit.

Standardization of techniques for quality enhanced production and value added post harvest handling in Anthurium (*Anthurium andreanum* Lind.)

Commercial Anthurium growers of Thiruvananthapuram, having more than a thousand flowering plants were identified. From selected growers of this category, details of growing media combinations used and manurial practices followed by them for plants in the pre flowering and flowering stages were collected.

Studies on the utilization of under-exploited *Curcuma* spp. of Western Ghats of Kerala as alternate crops through participatory approach

Survey with regard to the status of cultivation, utilization and marketing of kashuri turmeric (*Curcuma aromatica* Salisb.), zedoary (*Curcuma zedoaria* Rosc.) and mango-ginger (*Curcuma amada* Roxb.) is being conducted among farmers, common consumers, retailers, cosmetic shop owners, local herb merchants and doctors and *Vaidhyans* of the small and big ayurvedic pharmacies and other marketing personnels.

Performance evaluation of Curcuma spp. for growth, yield and quality

The promising morphotypes/accessions of kashuri turmeric are being evaluated for growth, yield and quality characters for identifying the suitable ones for cultivation.

Characterization of Curcuma aromatica accessions/collections

Ten accessions of kashuri turmeric were collected from various parts of Kerala and subjected to morphological, biochemical and molecular characterization studies.

Post-harvest studies

Cosmetological evaluation of the Kashuri turmeric in comparison with zedoary is being continued.

BIOTECHNOLOGY

Network project-improvement of spices by biotechnological interventions (DBT)

Field evaluation of Inter-specific hybrids of vanilla (39 hybrids), developed through embryo culture, is in progress. Significant variations in morphological traits (vine length, vine width, leaf size, number of nodes etc.) have been observed.

Random amplified Polymorphic DNA analysis of Banana clones

Twenty eight banana clones belonging to different genomic groups (AAA, AAB, ABB, AA, AB and BB) and ploidy groups (triploids and diploids) were analysed using RAPD markers in relation to morphological/yield characteristics.

Agrobacterium mediated genetic transformation in Dendrobium

The protocorms obtained on germination of Dendrobium seeds and the protocorm like bodies (PLBs) were transformed using *Agrobacterium tumefaciens* strains LBA 4404 and EHA 105 harboring the binary vectors pBI 121, pCAMBIA 1301 and pCAMBIA 2301 encoding two reporter genes viz. nptII (neomycin phosphotransferase) and GUS (β -glucuronidase). The PLBs recovered following co-cultivation were screened further by subculturing in selection medium and the transformants were found GUS positive.

PLANT PHYSIOLOGY

Screening for water stress tolerance in coconut (*Cocos nucifera* L.) through pollen selection

Sandardisation of media

The medium containing 15% sucrose + combination of micronutrients were ideal for maximum pollen germination. The media along with different concentration of poly ethylene glycol (PEG) were used for screening the critical water potential.

Water Potential of coconut pollen

Chardakov's method was used to estimate the water potential of coconut pollen. The water potential of WCT coconut pollen was found to be between -5 and -6 bars.

Critical water potential for germination

PEG 6000 was added to pollen germination media to obtain water potential ranging from 0 to -20 bars (Michel and Kautmann, 1973). The percentage of pollen germinated was recorded to identify the critical water potential where only 25 - 30 % of pollen germinated. The critical water potential identified for WCT pollen was 6 bars.

Analysis of variation in photosynthetic characters and light tolerance mechanisms in varieties of pepper (*Piper nigrum* L.) :

Effect of light intensity on black pepper:

Bush pepper variety Karimunda was exposed to different light intensities for 15 days. Extent of damage to the leaf tissue was examined by assessing the

membrane integrity. Fifty percent membrane leakage was noticed in plants exposed to open condition.

Effect of light on the stomatal frequency and stomatal resistance

Black pepper is a hypostomatous, *i.e.* most of the stomata were seen on the lower surface of the leaves. Stomatal frequency and stomatal resistance was reduced with decrease in light intensity

Effect of light on the quantity of carboxylating enzyme Rubisco

Quantity of Rubisco key enzyme involved in photosynthesis was the least in the plants exposed to open condition. Maximum Rubisco content was in the leaves exposed to 35 percent light.

Effect of light on free radical scavenging enzymes:

Two enzymes namely Super Oxide Dismutase (SOD) and peroxidase activity and isozyme pattern were analyzed in plants exposed to different light intensities. The SOD activity per gram fresh weight of the leaf was slightly higher in the leaves exposed to full light than in the leaves exposed to 55 or 35 percent light.

FOOD SCIENCE AND NUTRITION

Viable technology for exploitation of jack fruit for product diversification and by-product recovery

Physico-chemical characteristics of the two varieties of jack fruit were analysed in terms of pH, moisture, acidity, total soluble solids, total sugars, reducing sugars, vitamin C, b-carotene and polyphenols.

Trials for the standardization of jack fruit nectars were carried out with two varieties of jack fruit. The products formulated were evaluated by a panel of judges and based on the organoleptic scores, best combinations were screened.

Plain and blended jack fruit bars were standardised using two varieties of jack fruit. Best combinations were identified based on the sensory evaluation. Quality analysis and shelf life study of the products are being conducted.

Preliminary trials for the standardisation of "varikka bulb preserve" was also taken up during the period under report.

Pectin and fibre were extracted from jack fruit waste and its quality characterization was carried out.

Technology for developing diversified food products based on minor tubers of Kerala

A survey was conducted among 100 farm women to assess the method of utilization of minor tubers and to create an awareness regarding suitable processing technologies.

The method of preparation of flours from *Dioscorea*, *Coleus*, *Taro*, *Arrowroot* and *Elephant yam* were standardized. The flour has a high shelf life period

of more than 9 months. The technologies developed were transferred to 30 farm women at Mannvila through 5 days training programme.

AGRICULTURAL METEOROLOGY

Project on an "Experimental agrometeorological advisory service" is functioning very effectively at Vellayani. The weekly weather data are faxed to the Centre for Medium range weather forecasting in New Delhi and prediction is received every week.

AGRICULTURAL ENTOMOLOGY

AICRP on Pesticide Residues

The results of the monitoring of pesticide residues in six market samples of brinjal indicated presence of endosulfan, quinalphos and malathion. Of them the level of quinalphos exceeded the MRL in one sample while malathion and endosulfan residues were below their MRL values.

Results of the monitoring of pesticide residues in market samples of chilli indicated presence of dicofol, endosulfan, malathion, Lambda cyhalothrin and mancozeb residues. However, their levels were below MRL values.

The residues of gamma HCH, dicofol, endosulfan, malathion and Lambda cyhalothrin were present in market samples of cabbage at levels below their MRL value.

The results of the monitoring of pesticide residues in market samples of cauliflower indicated presence of gamma HCH, endosulfan, quinalphos, monocrotophos, and Lambda cyhalothrin. However, their levels were below MRL values.

The results of the monitoring of pesticide residues in market samples of okra indicated presence of gamma HCH, endosulfan, malathion, monocrotophos, chlorpyrifos and quinalphos of which the level of monocrotophos exceeded the MRL in one sample.

Out of the 30 samples of fish analysed, the residues of alpha HCH, gamma HCH, endosulfan and fenvalerate were detected from anchove, sardine and mackerel.

Five samples of pepper collected from different farmers of Thiruvananthapuram district were analysed for the residues of pesticides. Out of five samples analysed, none was contaminated with pesticides.

Five samples each of surface and underground water samples collected from Thiruvananthapuram district revealed that one sample each were contaminated with gamma HCH residues to the tune of 0.003 and 0.001 ppm respectively.

Development of an integrated pest management package for the eriophyid mite *Aceria guerreronis*, of coconut in Southern states

Studies on effect of mite infestation on quality parameters of coconut viz. reducing sugars, Total Soluble Sugars and acidity indicated significant variation in the reducing sugar content in tender coconut water of nuts of different categories. Reducing sugar content decreased as the intensity of damage increased.

While testing the toxicity to the major pollinators like stingless bees *Trigona iridipennis* and honey bees, *Apis cerana indica*, insecticides viz. ethion, carbosulfan, triazophos and dicofol were found highly toxic while fenazaquin, neemazal and neem oil were safe.

Experiments on the effect of irrigation indicated the lowest mean intensity score(1.42) in palms receiving microsprinkler irrigation.

Results of studies on influence of intercropping indicated that maximum yield and the least mite damage was in coconut intercropped with guinea grass. This was followed by coconut + black pepper and coconut + tuber crops+ medicinal plants. The yield was the lowest and mite damage was the most severe in coconut palms grown alone which received only inorganic fertilizers. The mite intensity score was lower in the coconut gardens intercropped with guinea grass, black pepper, tubers + medicinal plants and banana compared with coconut grown alone.

Comprehensive coconut management and coconut mite management :

The treatments applied were :

Neem Azal T/S 1% Azadirachtin @4ml/l sprayed on bunches. Contaf (Hexaconazole) drenched on the crown. Manuring -cow dung @ 25 kg/palm. Fertilizers- NPK at average dose (recommended in POP, KAU)

The fifth round of spraying has been completed.

The extent of economic damage was negligible for the nuts which were classified in category one. The data revealed that more than 50% of harvested nuts of treatment plots were in categories 1&2 (26.43% & 31.73% respectively) while in the control palms only 11.68% of nuts fell in category 1 and 25.14% in category 2. The nuts which fell in ranges 4&5 exhibited severe damage. In the treated palms 11.88% and 10.41% nuts were in 4&5 categories respectively. At the same time, observations indicated that economic damage was more severe in the control palms than treated palms with 27.73% nuts in category 4 and 15.05% nuts in category 5.

Application of Sterile Insect Technique (SIT) to control red palm weevil in coconut

1. Survey of Red palm weevil in coconut plantations.

Completed survey in Thiruvananthapuram, Kollam, Kottayam and Alappuzha districts. Hot spots identified for the release of sterile insects.

2. Mass culturing of red palm weevil

Standardised a new cost effective method for mass culturing red palm weevil for irradiation work.

3 . Irradiation of red palm weevil adults (One day old) at RTL, KAU.

Standardised the dose for irradiation.

Integrated management of fruit flies (Diptera : Tephritidae) in India

Monitoring studies covering four southern districts of Kerala could record species like *B. cucurbitae*, *B. dorsalis* complex, *B. correcta*, *B. zonata* and *B. verbascifolia* from trap catches. There was increasing trend in the populations of *B. dorsalis* during March-April and *B. cucurbitae* during August-September. Plywood blocks soaked in parapheromone lures like methyl euginol could effectively be used for trapping males of *B. dorsalis* and plywood blocks soaked in culture could be used against *B. cucurbitae*. These parapheromone lures (MAT) along with food baits (BAT) were ideal eco-friendly package for management of fruit flies.

AICRP on Plant parasitic nematodes with integrated approach for their control

1. Identification of hot spots and agro-ecologically conducive areas for key nematode pests

a. Paddy

Survey conducted at Kasaragod, Kannur, Wayanad, Palakkad and Idukki districts of Kerala revealed that cyst nematode, *Heterodera oryzae* infestation was widely distributed in Kannur, Wynad and Palakkad districts with a frequency of occurrence of 70 per cent. In Kasaragod, the distribution was less ie, 60 per cent and the lowest distribution of 40 per cent was recorded in Idukki district. The hot spot areas identified were Pullari in Kannur, Karimbil and Kodenchery in Wynad, Alathur, Pattambi and Palamcode in Palakkad, Puttadi and Anakkara in Idukki district. In addition to cyst nematode, root-knot nematode, *Meloidogyne graminicola* was also widely distributed in Kannur, Wynad, Palakkad and Idukki districts. Hot spot areas of infestation of this nematode was identified as Perumpadavu in Kannur, Kodenchery and Tharuvana in Wynad, Nenmeni, Alathur, Palamcode and Pattambi in Palakkad and Puttadi, Anakkara and Chettukuzhi in Idukki district. Other predominant nematodes recorded were *Hirschmaniella oryzae*, *Helicotylenchus* sp., *Hoplolaimus* sp., and *Caloosia*.

b. Banana

The infestation of *H. oryzae* was uniform in Kasaragod, Kannur, and Wayanad districts, though the population was low in certain locations.

2. Demonstration of integrated nematode management of *Hirschmaniella oryzae* in rice by nursery bed treatment and field application

The demonstration trials conducted in two locations revealed that the highest yield was given by nursery treatment + main field treatment giving 21.7 and 14.6% increase over untreated in location one and two respectively. Nursery treatment alone gave 5.34% to 13.35% increase in location one and two respectively.

- 3 Demonstration of seed dressing treatment in okra for management of root-knot nematode *Meloidogyne* sp.

The demonstration trial revealed that there was 51 per cent increase in the yield of bhindi due to seed dressing with carbosulfan 3% w/w.

- 4 Demonstration of biological control of root-knot nematodes infesting brinjal with *Pseudomonas fluorescens* and *Glomus fasciculatum*.

Result revealed that there were 13 and 20 per cent increase in yield over control in nursery treated with *G. fasciculatum* and *P. fluorescens* in location 1 and 7.8 and 23.44 per cent increase in location 2.

- 5 Demonstration of management strategies with seed treatment in pulse crop against phyto parasitic nematodes

Demonstration of management strategies (seed soaking and seed dressing) in farmers field revealed that seed soaking with carbosulfan 25EC @ 0.1% for four hours recorded maximum yield in cowpea in two locations. The percentage increase due to this treatment was 22.5 and 47.4% respectively.

- 6 Management of root-knot nematodes in banana by bio control agents

The experiment on management of root-knot nematode in banana by biocontrol agents showed that application of *Trichoderma viride* @ 2.5 g/plant at the time of planting + 45 days after planting was very effective in managing the nematode population and increasing the yield and this treatment was on par with the recommended practice of paring + hot water treatment of suckers + neem cake (1 kg/plant) + carbofuran (16.6 g/plant).

Host parasitic relationship and management of important nematodes associated with medicinal plants

The pathogenicity and crop loss due to root-knot and burrowing nematode were worked out in Chethikoduveli, Thippali and Kacholam. The avoidable yield loss due to *M. incognita* ranged from 32-48% in above crops at an initial population level of 1000-10000 J₂ levels. The histopathological and biochemical changes due to the above nematodes were also investigated.

Mass production and field evaluation of biocontrol agents for the eco-friendly management of nematodes associated with vegetables

Four field and lab experiments were completed during the period. The field experiments to assess the effect of bioagents gave the following results on the management of nematodes associated with brinjal. Results revealed that application of *Bacillus macerans* in the nursery plus drenching the same seven days after sowing the brinjal seeds in the nursery gave maximum effect in terms of improvement in biometric characters and yield and reduction in nematode population in two experiments conducted at Instructional Farm, College of Agriculture, Vellayani. *B. macerans* drenching alone and *Pseudomonas lilacinus* nursery application plus drenching appeared to be next promising treatments.

AICRP on Honeybee Research and Training Centre, Vellayani

1. Role of honeybees in the pollination of coconut *Cocos nucifera* and yield increase

The experiment is planned to find out the increase in yield due to honeybee pollination

In coconut plantation, 15 nos. of 10 years old coconut palms having regular bearing characters are selected and numbered for the experiment at the Instructional Farm, Vellayani. Five colonies each of *Apis mellifera*, *A. cerana indica* and *T. iridipennis* were shifted to the experimental plots with coconut palms. The different type of insects visiting the spadix are being observed and recorded. The experiment is being continued.

2. Selective breeding of *Apis cerana indica* resistant/ tolerant to TSBV in Kerala.

To assess the resistance / tolerance of *Apis cerana indica*, 40 numbers disease free colonies were procured from beekeeping pockets of the state and brought to the centre and maintained at Coconut Research station of the Kerala Agricultural University at Balaramapuram. Three colonies were prevailing without virus infection. All the 43 Indian bee colonies are existing without TSBV infection till June 2002 and three colonies got infected with TSBV during July 2002 and eight colonies during August, 2002 and remaining 32 colonies were in healthy condition and 25 healthy strong colonies were divided during July – August 2002. Out of the 57 colonies, five numbers were got infected with the virus during December 2002 and deserted during January 2003. The percentage of infestation increased to 13-16 and a decline in the population build up is noticed in the colonies.

3. Augmentation, conservation and management of stingless bees, *Trigona iridipennis*

Identification of stingless bee flora in Kerala

Seventy plants could be identified as stingless bee flora in Kerala till July 2002. The following six more plants were identified during the period. Brinjal provides both nectar and pollen to stingless bees where as black gram and gladiolus provide nectar to them and papaya, sage and sweet gourd provide only pollen to them.

Bioecology, domestication and management of stingless bees in Kerala

1. Hiving of feral colonies of stingless bees to find out suitable hives.

The feral stingless bee colonies could be successfully transferred to hives with equal quantity of brood cells, pollen pots and honey pots along with a queen and could be domesticated in it. Different hives viz., wooden, bamboo and earthen pot with 3750 cc, 3000 cc, 2250 cc and 1500 cc capacities each were tried to find out the suitability. The bees established in all three different types of hives. Maximum brood development was noticed in bamboo hive with a volume of 1500cc during February and March and minimum brood development during June and July.

2. Qualitative analysis of stingless bee honey

The *Trigona* honey collected from different tracts of Kerala varied widely in colour from light yellow to dark amber colour with all intermediate shades. This is reflected to the availability of flora in different location, which attributes to the colour of honey stored by bees. The percentage of moisture varied from 18.96 to 20.48% which was significantly lower than *Apis* spp, where the moisture percentage accounted 23%. Honey of stingless bee with less moisture content inhibits the growth of bacteria and makes it viable for long term storage without processing.

PLANT PATHOLOGY

Etiology and Management of Important Diseases of Anthurium

Survey on Anthurium disease was conducted in Thiruvananthapuram, Kollam, Pathanamthitta, Allappuzha and Kottayam districts. Most important diseases observed were Bacterial blight and Anthracnose. The pathogens associated with these diseases were isolated and identified as *Xanthomonas axonopodis* pv. *dieffenbachiae* and *Colletotrichum gloeosporioides* respectively.

Antibiotics, plant extracts and products, oils and ecofriendly materials were evaluated under *in vitro* conditions against *Xanthomonas axonopodis* pv. *dieffenbachiae*. Streptocycline (100 ppm), Turmeric powder impregnated in Sodium bicarbonate (0.15%) and crude extract of neem cake were effective under *in vivo* conditions for the management of bacterial blight of anthurium.

Fungicides and neem products were evaluated against anthracnose disease both under *in vitro* and *in vivo* conditions. Tricure @ 0.2% and Indofil M45 @ 0.2% were effective for management of anthracnose of anthurium.

Utilization of pepper phylloplane mycoflora for the biocontrol of foliar diseases of pepper

Soil application @ 10g/kg of potting mixture of black pepper nursery followed by foliar spray with one per cent suspension of talc based formulation of the biocontrol agent viz., *Trichoderma harzianum* and *A. niger* twice @ 15 days interval was very effective for the management of black pepper anthracnose and to boost the plant growth in the nursery.

Management of viral diseases of cowpea utilizing genes for resistance

Screening the sources of resistance to CABMV & BICMV in 133 accessions were done

Breeding for resistance was carried out with 6 combinations to transfer disease resistance. F₅ generation is now in field for evaluation.

Development of AMF and *Azospirillum* inoculants for nursery disease management and growth enhancement in transplanted vegetables

Ten native AMF cultures were screened for suppression of damping off in chilli and tomato. AMF cultures M8 and M9 were the most efficient in suppressing damping off in chilli while M7 and M10 were effective for tomato.

Of the different methods of inoculation of AMF tried, inoculation in nursery furrows gave the maximum percentage colonization.

Native isolates of *Azospirillum* were from healthy chilli and tomato roots. In all 43 numbers of isolates were obtained for chilli and 20 numbers for tomato. These isolates were screened for *in-vitro* nitrogen fixation and IAA production. Isolates AZ-1 and AZ-2 from chilli produced maximum IAA and nitrogen fixation while AZ-16 and AZ-17 were the best for tomato. *In-vitro* and *in-vivo* studies confirmed the efficiency of the isolates.

Under field conditions, maximum disease suppression was obtained in the treatment consisting of dual inoculation of AMF and *Azospirillum* in chilli and tomato. Treatment M9AZ-2 gave 73.8 % reduction in damping off over control. Maximum yield was also recorded in this treatment.

Biocontrol of water hyacinth [*Elechhornia crassipes* (mart) solms]. using mycoherbicide

Work is in progress to test the efficiency of the mycoherbicide under different field conditions. Among the three formulations prepared, WP which was best under glasshouse condition was tested on plants grown in troughs (1 x 1 x 0.4 m). CNSL was applied 30 minutes before spraying. Observation on extent of damage was recorded 10 DAS using score chart and disease index was calculated. When WP alone was sprayed, mean disease intensity ranged from 32 – 46.67 per cent. Similarly when CNSL alone was sprayed intensity of scorching ranged from 20 – 27.33 per cent. However when the formulation was applied on CNSL sprayed plants a marked increase in disease intensity was observed (98.67%). The most effective concentration of WP @ 5g/100 ml was tested on water hyacinth plants at Akkulam lake near Thiruvananthapuram. The plants were sprayed with CNSL 5 per cent, @ 50 ml per sq.mt. and was allowed to dry for a period of 30 minutes and then sprayed with WP @ 5g/100 ml, @ 50 ml/sq.mt. Higher concentration of CNSL (5%) was used in the lake as the water hyacinth plants were much more robust than under trough condition. The plants exhibited typical blighting symptom on the fourth day of spraying. The disease gradually spread from the leaves to the swollen petiole and by the seventh day the plants started sinking to the bottom of the lake and the disease intensity ranged from 83.4 to 94.5%. Cent per cent control of the weed was achieved when the plants were sprayed with the formulation for a second time, two weeks after the first spraying. It was also observed that spraying of *F. pallidroseum* (5% WP) and CNSL (5%) did not show any toxicity to the aquatic fauna and flora.

Development of efficient low cost techniques for composting of coir pith

1. *Pleurotus* sp. and *Schizophyllum commune* were found very efficient decomposers of both retted and non retted coir pith.
2. *Pleurotus sajor caju* was an efficient decomposer of non retted coir pith
3. Pre-treatment with cowdung slurry enhanced the decomposition of coir pith

All India Coordinated Mushroom Improvement Project

1. A total 11 native cultures are deposited in the National mushroom culture Bank at NRCM, Solan for which accession numbers were issued.
2. Among the three *Calocybe* strains tested, C-1-3 yielded top (38.75 % B:E) followed by the strains, CBE and TVM-2 (38.6 and 29.69% B:E respectively)
3. Among the seven *Volvariella* strains tested, the strain namely, OE – 210 recorded the maximum yield of 303 g/bed.

Development of vermicompost based mycoinoculants for plant disease control

Among the different combinations of vermicompost tried for mass production of mycoinoculants, VC alone, VC+FYM (1:1), VC+NC (5:1), the combination of VC+NC was the best carrier material for mass production of both *T. harzianum* and *G. fasciculatum*.

Biodegradation of coir pith with fungi for converting it into compost and standardization of technique for mushroom production on coir pith

Four lignocellulolytic fungi, viz.; *Aspergillus niger*, *A. ochraceous*, *Trichoderma harzianum* and *Rhizopus stolonifer* were isolated from retted coir pith. Three mushrooms viz.; *Pycnoporus sanguineus*, *Ganoderma applanatum* and *Pleurotus tuber-regium* were collected during survey, among which *P. tuber-regium* was a new record for India.

Trichoderma harzianum was the fastest colonizer and degrader of coir pith, which reduces organic carbon, C:N ratio, cellulose and lignin content and increased nitrogen content to the maximum extent.

Among the different substrates used for mushroom production, the maximum yield of oyster mushroom *P. florida* was realized in a substrate containing 1:1 combination of retted coir pith and spent mushroom substrate while the maximum yield of milky mushroom, *Calocybe indica*, was observed in a substrate containing 1:3 combination of non-retted coir pith and paddy straw. Composted coir pith was an unsuitable substrate for large-scale production of oyster and milky mushrooms.

Pest and disease management of Oyster mushrooms in Kerala

Oyster mushroom cultivation was done in mushroom house of Instructional Farm, Vellayani after collection of materials for bed and spawn preparation. Two new pests were identified. They are a Dipteran fly called *Mycordrosophila* sp. and a staphylinid beetle (*Scaphisoma nigrofasciatum*).

Centre for development of microbial inoculants

The microbial inoculants and production technology developed have been transferred to private entrepreneurs, Govt. organisations and RARS under KAU for commercial production.

AGRICULTURAL STATISTICS

Information Management on Agricultural Research in Kerala

A classification of the research programmes of this department based on various crops has been done. It can be seen that many works concentrate on cereals and, rice being the major crop of Kerala about 40 experiments pertaining to various aspects of this crop were conducted in this institution during the last forty years.

Among the cereals, 41 research works were conducted on rice in various aspects like nutrient management, varietal trials, irrigation trials, weed management, intercropping, etc

AGRICULTURAL EXTENSION

Socio-technical system analysis of tribal and settler farmers in the Western Ghat regions of Wayanad district of Kerala

Literature collection pertaining to the selected variables of the project from College of Agriculture, Vellayani, Central Library, College of Horticulture, Vellanikkara and Centre for Development Studies, Ulloor was carried out; and Collection of statistics regarding information about the tribal population of Wayanad with specific emphasis for selection of Panchayats of three major Blocks of Wayanad viz., Kalpetta, Sulthan Bathery and Mananthawady from the Directorate of Tribal Welfare, Vikas Bhavan, Bureau of Economics and Statistics, Thiruvananthapuram, Integrated Tribal Development Office, Kalpetta and Public Relations department, Kalpetta was carried out.

VETERINARY SCIENCE

Revitalization of ethnoveterinary medicine and nrigayurveda practices among the tribal population of western ghat for the management of animal diseases

To satisfy the above mentioned objective, the following activities were carried out

- 1 As part of the survey on herbal formulations used by the tribal communities, visits were made to various tribal settlements at Njaraneeli, Mottamoodu (Thiruvananthapuram), Mazhuvadi (Idukki), Thumiranpara (Kottayam) and Mullumala (Kollam) inhabited by tribes like Kani, Mannan and Ulladan. Essential information pertaining to various medicinal herbal preparations for the treatment of animal diseases were obtained by way of interviews held at the settlements.
- 2 Ethnoveterinary practices popular among tribals were recorded and documented.
- 3 Attempts are in progress to collect medicinal plants used by tribal community for the treatment of animal diseases.

Efficacy of entnoveterinary medicinal plant formulations in the management of udder disorders of cattle

Regular visits have been made to Peringammala, Vithura, Kulathadivila, Maranalloor, Moolakonam (Thiruvananthapuram district) and Vilavankode

(Kanyakumari) to contact traditional practitioners, ayurvedic physicians and farmers as part of survey and documentations of herbal formulations used for treatment of udder disorders.

Extension and other activities

A four day training was given by Dr. S. Naseema Beevi, Associate Professor (Entomology) on "Pesticide Residue Analysis in Water" to the scientists of the Directorate of Ground Water, Govt. of Kerala.

Dr. P.C. Jessykutty, Asst. Professor (Horticulture) handled classes for vocational training programme on Commercial cultivation of medicinal plants; and Plant propagation and nursery management.

Dr. S. Lakshmi, Assistant Professor (Agronomy) organized training programme on Fodder cultivation to 20 dairy farmers and also handled class on "Profitable Milk Production through fodder cultivation" to 40 trainees .

Dr. Roy Stephen, Assistant Professor (Plant Physiology) participated in crop contingency plan during unfavourable weather condition at the Directorate of Agriculture, Thiruvananthapuram.

Dr. C. Lekha Rani, Assistant Professor (Plant Breeding and Genetics) conducted Vocational Training Programme on "Cultivation and Management of Orchids" for unemployed youth, housewives and entrepreneurs.

Farm advisory work is being rendered by Dr. M. S. Sheela, Assoc. Professor, Entomology.

Dr. S. Devanesan, Associate Professor, Entomology handled classes in the training programme on apiculture to beekeepers organised by KHDP, Ernakulam.

Radio Talks

A total no. of 7 Radio talks and one TV programme were conducted by the scientists.

Training programme/classes conducted/handled

A total no. of 6 trainings were conducted on topics like Commercial cultivation of Medicinal plants, Plant propagation and Nursery management, Cultivation of mushroom etc. by the scientists.

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- Devanesan, S. and Shailaja, K.K. Rubber thoppilum thene kalam. Karshkashree 8:7 p 60
- Devanesan, S., Shailaja, K.K and Premila, K.S. Theneechavalartham Kasumavu Ulpadanam Uyartham. Kerala Karshakan 49:6 (December) p 5
- Devanesan, S., Anitha, N., Shailaja, K.K. and Premila, K.S. Varroa Mandari Italianu Sathru. Karshakashree 9: 5 p 67 (January)
- Devanesan, S. Shailaja, K.K. and Premila, K.S. Adayamerum Aushadha Thene. Karshakashree 9:8 p 52-54
- Devanesan, S., Shailaja, K.K. and Premila, K.S. Yelam Vilavukoottan Theneechakal. Karshakashree 9:8 p 55.

Field visits to farmer field

The scientists of the station conducted a total of 12 farm/field visits to the farmers field and given advice on their needs.

Important Visitors

- National group Meet *Kharif* 2003 of AICRP on Forage Crops was held at College of Agriculture, Vellayani from 9th to 11th May 2003. Dr. G. Kalloo, DDG (CS&H), ICAR was the Chief guest during the inaugural session. Dr. P.S. Pathak, Director, IGFR and Dr. Edison, Director, CTCRI also attended.
- Dr. N.P. Melkania, Project Co-ordinator (Forage Crops) participated in the National group Meet *Kharif* 2003 of AICRP on Forage Crops at College of Agriculture, Vellayani from 9th to 11th May 2003.
- Dr. Ramesh, Project Co-ordinator (India), ACIAR Project on "Stylosanthes" visited the AICRP Vellayani Centre for Forage Crops from 6th to 7th January 2004.
- Dr. G.B. Singh, DG, UPCAR, Lucknow (Ex. DDG-NRM, ICAR) visited AICRP Vellayani centre as the Chairman of the QRT team on 15-3-04, 16-3-04 and 17-3-04. Also Dr. R.P. Singh, Ex-Director, CRIDA, Hyderabad. Dr. V.D. Mudugal, Ex-Director, Central Research Institute for Buffalo, Hissar. Dr. R. Deb Roy, Ex-Director, NRC for Agroforestry, Jhansi. Dr. G.P. Lodhi, Ex-Dean (PG), CCSHAU, Hissar. Dr. V.K. Mishra, Ex-Managing Director, SPWD, New Delhi. Dr. P.S. Pathak, Director, IGFR, Jhansi. Dr. S.A. Faraqui, Scientist, IGFR, Jhansi visited as members of the station.

Dr. T.N. Rao, Deputy Director, PPIC visited the experimental site of "Nutrient management in coconut based banana intercropping systems in the homesteads of Kerala" at the farmers field at Venganoor and evaluated the project performance.

Finance

Head of Account	Provision for the year	Expenditure	Station receipts
Non Plan	76.55	6.57	44
Plan	9.99	4.76	29
ICAR	104.42	19.39	11
Other EAPs	55.83	37.51	--
TOTAL	246.79	187.25	85

INSTRUCTIONAL FARM COLLEGE OF AGRICULTURE, VELLAYANI

Introduction

The agricultural college farm located 11km South of Thiruvananthapuram city and 5 km North of the international Kovalam tourist resort was established in 1955. The royal family of erstwhile Travancore state contributed 78 ha of garden land and 165 ha of kayal land for the setting up of agricultural college farm at Vellayani. The Northern, Southern and Western sides of the farm are surrounded by the Vellayani fresh water lake which also serves as an alternate source of drinking water for the capital city of Kerala. In 1972, with the formation of Kerala Agricultural University, the agricultural college farm, Vellayani was redesignated as Instructional Farm, Vellayani with the major objective of imparting field training to the undergraduate, post graduate and diploma students in agriculture. It was equipped with the infrastructure facilities needed for conducting agricultural research and extension education programmes for the whole state. Additionally, this farm serves as a major revenue earning station under the Kerala Agricultural University. Production and distribution of quality seeds and planting materials suited to the humid tropics satisfy the social commitment of this station.

Mandate of the institution / station / unit

- Providing basic instructional facilities for the UG and PG students in the agricultural field
- Providing research facilities for post graduate and other research programmes
- Production and distribution of quality seeds and planting materials
- Participation in exhibitions and State Agricultural Fairs
- Liaison with development departments and other government departments
- Organising and conducting agri tour in the Vellayani Campus

A few memorable events of the institution

- Visit by His Excellency Justice Sukh Dev Sing Kang, the Governor of Kerala and the Chancellor of Kerala Agricultural University on 21.8.1999
- Visit by His Excellency Dr. Julius Nyerere, Former President of Tanzania and Chairman, South Centre on 10.2.1996.
- For the first time in the history of Instructional Farm, the revenue increased to 73 lakhs during the year 2003-04.

Seminars/Summer Institutes/Symposia/ Trainings attended

The scientists of the station participated in 14 National seminars during the period.

Research programme

Major research achievements

EAPs in operation

1. Pests and disease management of Oyster mushrooms in Kerala (STED, Kerala)
2. Biodegradation of coir pith into compost and standardization of techniques for mushroom production on coir pith (STED, Kerala)
3. Sustainable techniques for domestication and commercial cultivation of medicinal plants (STED, Kerala)
4. Agrotechniques for sustainable mediculture in the Western Ghats (State Planning Board, Kerala)
5. Central Sector Scheme on Medicinal Plants (Directorate of Cocoa, Arecanut, Spices and Medicinal and Aromatic plants)
6. Collaborative project to test the suitability of coir pith manure for Anthurium (Coir Board, Cochin)

Extension and other activities

Radio talks

Dr.D.Geetha conducted a question answer program in Karshakavedi on 19th October 2003. Dr.M.Suharban conducted a question answer program in Karshakavedi on 9th August 2003.

Publications

Sherin, A.S., Geetha, D. and Suharban, M. 2004. Degradation potential of mycoflora and it's impact on coirpith. Proceedings of the 16th Kerala Science Congress 29-31 January 2004, KSCSTE, Kozhikkode, 662.

Geetha, D., Sherin, A.S., Gokulapalan, C. and Suharban M. 2003. *Pleurotus tuberregium* (Fr.) Singer – a new promising mushroom for the tropics. Mushroom Research 73-76.

Ansu, O. Geetha, D. and Suharban, M. 2003. Enzyme production and yield characteristics of four species of *Pleurotus* on paddy straw, nonretted and retted coir pith. Current vistas in Mushroom Biology and Production. (Eds) Upadhyay, R.C., Singh, S.K. and Rai, R.D., Mushroom Society of India, pp 75-80.

Harikrishnan Nair, K.; Geetha, D.; Suharban, M., Rajamony, L. and Vijayaraghavakumar 2003. A promising short duration cultivar of Cassava. (*Manihot esculenta* Crantz), South Indian Horticulture, 50(4-6):589-91.

Deepthi, S.; Suharban, M.; Geetha, D.; Vijayan, M. and Nair, H.K. 2003 Incidence of basal stem rot of cocnonut caused by *Ganoderma* spp. Indian Coconut Journal 34(8):10-11.

Sherin, A.S., Geetha, D. Suharban, M and Nair, H.K. 2003. Strategies for mushroom production on coir pith. Sym. Recent devt in the diagnosis and management of plant diseases. 18-20 December 2003. Dharwad.

Sajitharani, T. 2003. Under exploited spices of Kerala. Kerala Calling, November, 2003.

Agro Advisory Service

Agro advisory services were rendered to a large number of cultivators through the Agro-Clinic attached to the Sales Counter. More than 5000 visitors comprising school children, college students and officials both from and outside the State visited the farm to learn the recent trends in crop production.

Extension lectures

Scientists working in the centre handled classes relating to soil science, agronomy, plant protection, agri. engineering, mushrooms and medicinal plants to trainees of the Dept. of Agriculture and VHSE.

Participation in exhibitions

The Instructional Farm participated in the Fruits & Vegetable Show, 2004 and other exhibitions organised by Government and non-Government agencies in the Thiruvananthapuram District.

Linkages

Instructional Farm provides guidance, design and supervision in the renovation of the Kerala Raj Bhavan Gardens and the Government Secretariat Gardens, Thiruvananthapuram.

Important visitors

Date of visit	Name and address
3.9.03	Dr.N.P.Tiwari, Director, NRCM, Solan (Himachal Pradesh)
17.10.03	Sri.Holkomang Haskip, MP (Lok Sabha), Outer Manipur.
5.11.03	Sri.K.Subramaniam, Manager(Training), SBT staff Training Centre, TVM
29.12.03	Zuzana Figerova, Prage, Czech Republic
17.01.04	Smt.Sudha Pillai, Principal Secretary (Finance), Govt. of Kerala.

Finance

Head of A/C	Provision for the year (in lakhs)	Expenditure (in lakhs)	Station receipts (in lakhs)
Non Plan	338.040	315.271	37.297
Plan	19.72	16.670	
Other EAPs	0.280	0.255	
Revolving Fund	-	9.793	35.743

CROPPING SYSTEMS RESEARCH STATION, KARAMANA

Introduction

The Cropping Systems Research Centre, Karamana, was established in 1955 under the auspices of the Fertilizer Use and Soil Fertility Project sponsored by the ICAR. The set up of the station underwent a change both in its technical programme and in the staff pattern in 1968, when the All India Co-ordinated Agronomic Project was initiated. The mandate of the station is based on reprioritisation of the thrust areas of research with lead function of maximising the productivity levels of rice and rice based cropping system. The verification functions are the multilocation trials and integrated production trials, bio-energy conversion and organic recycling and water requirement of crops. The on farm research components involve verification and testing of developed technologies to conduct simple fertilizer trials in the farmers' field in a phased manner.

During the period under report (2003-'04), the AICRP on Cropping Systems is operating at Karamana as the main centre with the objective to study the production potential under adequate and limiting resources, judicious use of fertilizers, irrigation and weed management. The ECF unit is operating at Vadakkanchery in Palakkad district.

Mandate of the Institution/Station/Unit

The mandate of the station is to conduct experiment on rice and rice based cropping systems. The main objective is to study the production potential of the systems under adequate limited resources, judicious use of fertilizers, integrated management of nutrients, efficient use of irrigation water and management of problematic weeds.

Satellite Station

Cropping System Research Centre, Vadakkanchery.

Seminars/summer institutes/symposia/trainings attended

Sri. R. Balakrishnan Asan, Assoc. Professor (Stat.) attended the Training Programme on Cropping Systems Management from September 29-30, 2003 at PDCSR, Modipuram, Meerut. Dr. Kuruvilla Varughese, Assoc. professor & Head attended All India Group Meeting of AICRP in Cropping Systems Management from November 20 to 23, 2003 at UAS, Bangalore. Dr. B. Babu, Asst. Professor (SS&AC) attended Training programme on 'Organic farming' sponsored by ICAR for 21 days from December 23, 2003 to January 12, 2004 at GB Pant University, CAS, Agronomy Agrl. Science & Technology, Uttaranchal. Dr. Kamala Nayar, Assoc. Professor (Plant Patho.) attended 16th Kerala Science Congress for 3 days from January 29 to 31, 2004 at CWRDM, Kozhikode. Dr. Kuruvilla Varughese, Assoc. Prof. & Head and Dr. Kamala Nayar, Assoc. Prof. attended XXIV Zonal Workshop of NARP (SR) from 20-21, February 2004 at College of Agriculture, Vellayani.

Research programme

Rice and rice based cropping systems

AICRP Projects

Multiple use of cowpea and nutrient balance in a rice based cropping system

The results of the experiment, was conducted to find out the impact of summer crop on the succeeding rice crop revealed that the biomass yield of summer crop varied significantly and the highest yield was noticed in green manure crop of sunhemp followed by green manure crop of cowpea. The economic yield of cowpea grain and cowpea vegetable gave a gross return of Rs.31500/ha and Rs.28888/ha respectively. The biomass was incorporated to the field after the summer crop. The luxuriant weed growth in the fallow field was also incorporated in the treatment. The treatments which had a summer crop of greenmanure or cowpea in which either the 'bhusa' and root portion or the root portion alone were incorporated to the field registered significantly higher grain yield than fallow treatments during *kharif*. Though the straw yield in fallow treatment was comparable to other treatments, partition of dry matter to grain was poor and recorded lower grain yield. During *rabi* the residual effect of summer crops was not noticed and the fallow treatment also gave yield on par with other treatments.

Permanent plot experiment on integrated nutrient supply system for a cereal based crop sequence

This experiment is intended for developing a suitable integrated nutrient supply system for a cereal based crop sequence involving more efficient use of fertilizers. During *kharif* 100% of NPK either as fertilizer or 25% or 50% with organics viz., green manure, farmyard manure and crop residues resulted in higher grain yield. However in *rabi*, a fertilizer dose of 75% NPK with 25% substitution of organics during *kharif* gave comparable results. Thus a saving of 25% fertilizer is possible during *rabi*.

Long range effect of continuous cropping and manuring on soil fertility and crop productivity

The study aims at finding out the long term effect of NPK on rice production. There was a significant increase in grain yield during *kharif* with increasing levels of N and P. During *rabi* increasing the level of P significantly increased grain and straw yields. However increasing levels of N gave significant increases in straw yield only. Application of K did not influence grain or straw yields. During *kharif* the uptake of N and K was significantly increased by increasing levels of N whereas increasing levels of P significantly increased the uptake of N and P by the plants.

Effect of Azospirillum in rice based cropping system.

Pooled analysis of grain yields from 1997-'98 to 2002-'03 revealed that the mean grain yield was higher for the treatment substituting 25%nitrogen with Azospirillum as seedling dip. Economic analysis of the different treatments also indicated that the total returns from treatment plots receiving 100%N P K as fertilizer as well as plots receiving 25S% N as Azospirillum are higher than the other treatments. This also leads to the conclusion that N can be substituted by Azospirillum to the extent of 25%. Hence it can be inferred that by applying Azospirillum either as seedling dip or as field application, it is possible to bring down the application of nitrogen by 25%, thus decreasing the impact of chemical fertilizers on soil and crop growth.

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

Pooled analysis of data of eight seasons revealed that the enhancement of fertilizer or manurial dose and spacing above the POP recommendations are not beneficial in the production of grain yield. A perusal of the data indicated that the highest net income and cost benefit ratio was obtained when manure was skipped and other practices were given at optimum levels. The short term benefit of manuring is not reflected in the net returns or the cost : benefit ratio even though there was a slight decrease in the gross income as compared to the treatments which received moderate or high levels of manure application. Enhancement in fertilizer application to the tune of 25 or 50% above the recommended levels slightly increased the gross and net returns but the returns per rupee invested on treatment resulted in a lower cost benefit ratio. The plant population either above or below the normal recommendation reduced the gross and net returns. Increase in plant population above 25% recorded the lowest net returns and cost benefit ratio.

Integrated weed management in rice based cropping system

The effect of cropping systems and weed control methods exerted significant influence on the grain and straw yield during both *kharif* and *rabi* and the interaction effect reached the level of significance only during the *kharif*. The cropping system involving bhindi after two crops of rice recorded the highest grain and straw yield during both the seasons. The green manure crop during summer also showed its superiority. The cassava crop, though a heavy exploiter of soil nutrients also gave higher yield than the fallow crop. This indicates the advantage of a third crop during summer for enhanced rice yield during the subsequent seasons. The weed count was lesser in the plot in which a green manure crop was raised during *kharif* with a major reduction of the obnoxious weed species of *Echinochloa crusgalli*.

The weed control methods either through chemical or cultural means showed its impact on weed count and reflected in the final grain and straw yield. The unweeded control gave the lowest yield. During *kharif*, the pre-emergent application of Pertilachlor 50 % EC at 1 kg ai/ha followed by 2, 4-D sodium salt 80% WSP at the rate of 1 kg ai/ha gave the highest grain yield and was on par with all the chemical weed control methods. In *rabi*, the pre-emergent application of Anilophos + 2, 4-D ethyl ester gave higher grain yield. The stale seed bed preparation alone recorded lower yield during *kharif* and *rabi*. The unweeded control recorded the lowest grain yield during both the seasons. The straw yield was also appreciably influenced by the treatments. Cropping system with bhindi crop and chemical method of weed control enhanced the straw yield.

The analysis of uptake of nutrients during *kharif* and *rabi* 2002-'03 showed that there was no significant difference among the treatments.

7) Kerala Agricultural University project

A project of Kerala Agricultural University was conducted based on the AICRP project on 'The effect of the different levels of NPK on the incidence of major rice diseases', by taking observations of diseases at different stages of crop growth. Results indicated that there was no significant effect due to varying levels of the nutrient application on the incidence of sheath blight or sheath rot diseases in the rice variety 'Aiswarya' which was tested in the experiment. However there was a trend of decrease in incidence of brown spot

disease with increasing levels of potassium, although it was not statistically significant. This disease was observed to occur only during *rabi*.

Revolving fund scheme on 'Planting banana along the suburbs of rice fields

Utilising the revolving fund this scheme was initiated during 2001, starting with a minimum number of plants and gradually increasing the area during the successive years. During 2002-2003 subsidiary revenue of rupees one lakh was obtained from the banana crop.

A pilot project on the utilisation of a bacteria based biocontrol/biofertilizer agent *viz.* the fluorescent pseudomonads strain P11, which has been developed from a STED project that was undertaken in this station during the previous two seasons, was applied on the banana plants for the initial six months of growth, to assess its impact on disease incidence and yield parameters. The experiment is in progress.

PG students of the Departments of Agronomy and Entomology conducted field trials in the station under the supervision of Associate Professor and Head.

Extension and other activities

Distribution of seed and planting materials to farmers

Seeds of rice varieties Kanchana, Aiswarya and Uma as well as banana suckers of Nendran variety were distributed.

T&V Workshop and meetings

Associate Professor (Plant Pathology) served as resource person in the monthly T&V workshop programme conducted by the Department of Agriculture, Thiruvananthapuram district and diagnostic field visits were made in connection with this programme; attended a Workshop on grass root level support system conducted by Department of Agriculture on 15-07-03.

Radio Talks

Radio talks were delivered by the Associate Professor (Plant Pathology) on 'Microbial bio-control agents used in plant disease management' during August 2003 and on 'Randamvila Nelkrishiyil eppol cheyyenda krishi Paricharana murakal' on 25-09-03..

Farm Development

Farm Advisory Committee Meeting was convened. Apart from the representatives of labourers, the Municipal Councillor also attended the meeting. It was decided to strengthen the activities of the farm and to provide drainage facilities in the second block of the farm.

Classes for Extension workers and farmers

Associate Professor & Head took classes for Agricultural Officers and Assistant Directors of Departments of Agriculture on 24-04-03 and on 1-10-2003 on diseases of rice for farmers belonging to Peringadavila Panchayat.

Interaction with rice growers

A sample survey was conducted by scientists and technical staff of the station to collect details regarding impact of AICRP on rice and rice based cropping system in the southern district of Kerala.

On 20-02-04, Dr. Kamala Nayar, Associate Professor (Plant Pathology) attended the annual meeting of Parent Teachers Association in which the book on 'Advances in the Diseases of Plantation Crops & Spices' edited by Dr. Santha Kumari, College of Agriculture, Vellayani, in which a chapter on 'Diseases of rubber' co authored by her, was released.

Associate Professor (Plant Pathology) attended workshop conducted by Income tax Department on 03-02-04

Important visitors(One paragraph)

The Director, PDCSR, Modipuram visited the Station, to monitor the experiments conducted.

Research papers

Heera, G., Kamala Nayar, 2003. Evaluation of rice plant isolates of fluorescent *Pseudomonas* sp. on the management of bacterial blight disease of rice. In Abstracts of Sixth International Conference of plant growth promoting rhizobacteria held at IISR Kozhikode, from Oct. 1-6, 2003.

Heera, G., Kamala Nayar and Nair,S.K. 2004. *Chromobacterium violaceum* – a new record from Kerala. In Abstracts of 16th Kerala Science Congress held at CWRDM, Kozhikode from January 29 – 30, 2004.

Kuruvilla Varughese and Rani,B. Integrated nutrient mangement of rice – rice cropping system in Coastal Ecosystem – *Journal of the Indian Society of Coastal Agricultural Research* – accepted for publication.

Rani,B. and Kuruvilla Varughese. Feasibility of substitution of muriate of potash by common salt in lowland rice. *Journal of the Indian Society of Coastal Agricultural Research* – accepted for publication.

Finance

Head of Account	Provision for the year (in lakhs)	Expenditure (in lakhs)	Station receipts (in lakhs)
Non Plan	15.740	11.99	2.05
Plan	2.000	1.85	
ICAR	12.500	15.18	
Revolving Fund			1.05

COCONUT RESEARCH STATION, BALARAMAPURAM

Introduction

Research on coconut in the southern most part of Kerala was started in January 1948 at Pachalloor , about 8 kms South of East Fort, Thiruvananthapuram near College of Agriculture , Vellayani in 15 hectares of land leased out for the purpose . The venue of this station was later shifted to Kattachalkuzhi, three km south of Balaramapuram – Vizhinjam road early in 1963 – 64 . The site of this station comprised of 14.13 hectares of land acquired for this purpose by the Department of Agriculture, Kerala state. With the inception of Kerala Agricultural University in 1972, this station was transferred to the KAU . The very intention of locating this research station at the southern most region of Kerala was to carry out research on coconut in the typical red loam soil tract of Kerala distributed over in Trivandrum and Neyyattinkara taluks of Thiruvananthapuram District extending up to 32000 hectares.

Mandate of the Station

The development of sustainable agro- techniques for coconut in the red loam soils of Kerala.

Lead station

National Agricultural Research Project, (SR) Vellayani.

A few memorable events of the institution.

1. The station has developed a mother palm collection of dwarf palms, (Gangabontham, Malayan Yellow Dwarf and Malayan Green Dwarf) which started flowering leading to the scope of producing D x T hybrids in the future.
2. The waiting shed of the visitors in front of the station has been repaired and developed in to a visitor's parlour.
3. The station fulfilled long pending need for a vehicle for official purposes by getting allotted a light motor vehicle to the station.

Research programme

Major Research Achievement

Agronomy

Summary of NPK nutrient studies in Coconut revealed that: Effects of Potassium levels were statistically significant. Nitrogen and Phosphorus levels as well as their combination effects were not significant. There was antagonism in N and P fertilizer levels. Increase of Nitrogen does not result in yield. There was drastic decline of nut yield with increase of nitrogen in the absence of potassium which was statistically significant. There is response to potassium even at the highest level tried which gives information that higher levels of potassium than 900 g/palm/year may give a higher yield of nuts. The N x K interaction indicates that for 680 g of nitrogen, the level of 900g potash is the best.

Spacing-cum-manurial trial showed that: Closer planting with out fertilizer application will drastically affect growth and yield of palms. Closer spacing will induce the tendency of leaning in search of light with higher vegetative growth at the expense of nut production.

Nutritional Management of Clove intercropped in the coconut gardens of Southern Kerala showed that 125 % of the recommended dose of fertilizer gave the highest significant yield.

Extension and other activities

Farmers from Kerala and Tamil nadu who visited the station for purchase of planting materials and to discuss with Scientists on coconut cultivation technologies were given technical information supported with power point presentations.

Farm visits were made as per request from Krishi Bhavan officials to guide Agricultural Department officials on identifying and diagnosis of field problems and to recommend solutions.

Supplied seedlings to farmers by producing good quality seedling in coconut and pepper.

Finance

Head of a/c	Provision for the year (in lakhs)	Expenditure (in lakhs)	Station receipts (in lakhs)
Non plan	26.56	24.48	6.32
Plan	5.25	2.14	
Revolving Fund	1.30	0.21	2.83

FARMING SYSTEMS RESEARCH STATION, SADANANDAPURAM, KOTTARAKKARA

Introduction

This station originally known as NARP Special Station was established in 1986 under National Agricultural Research Project. The station started functioning w.e.f. 14.5.1986. The jurisdiction of the station was in consonance with the zonal concept of NARP, Southern Zone of Kerala comprising of Thiruvananthapuram, Kollam, Alappuzha and Pathanamthitta districts excluding problem areas of Onattukara, coastal saline tract, Kuttanand and the high ranges. Upon completion of NARP and considering the special mission to undertake Farming System Research, the station was rechristened "Farming Systems Research Station" on 13.1.1993.

The station is situated at Sadanandapuram, Vettikkavala village, 4 km. the South of Kottarakkara on the Main Central Road towards Thiruvananthapuram. Geographically the station is located at 9°16'N latitude and 76°37'E longitudes at an elevation of 91.44 m above MSL. Two pieces of land together forming 8.96 ha. lying on the same side of Main Central Road separated by private holdings, form the landed property of the station.

Research on homestead farming and soil and water conservation

1. To conduct detailed survey and analysis of the homesteads of the State.
2. To develop suitable homestead models for holdings of different size and different farming situations and to conduct detailed economic analysis of the same.
3. To evolve agro-techniques on a whole-system approach for various perennial crop combinations and crop-livestock/crop-poultry/crop-livestock-fish combinations.
4. To identify and study the ecology of weed flora in the homesteads.
5. To identify complementary and supplementary enterprises for augmenting the income of farmers.

Verification functions

Tubers, coconut, horticulture, cashew, agro-forestry

Seminars/summer institute/symposia/trainings attended

The scientists attended National Workshop on Homestead farming and Training-cum-Workshop on Project Monitoring and Impact assessment.

NATP Project

1. Analysis and development of Homestead farms of Kerala – A farmer participatory approach

The project is extended upto September, 2004. As a part of horizontal expansion of the project, ten more homesteads were included. Monitoring and recording observations are in progress. Soil samples are being analysed.

2. Studies on the effect of different irrigation methods on mite incidence

The experiment is progressing. Observations are being recorded.

KAU Projects

Integrated Farming System and increasing productivity of homesteads (IFS)

1. Development of homesteads through scientific planning and interventions in technology and management. – An action research and analysis

Japanese quail introduced in the homestead has started laying eggs. Azolla cum ornamental fish unit is introduced in the homestead.

2. On –farm research on existing homesteads for optimizing farm business income

Completion report is being prepared.

3. Occurrence and severity of plant disease in homesteads as influenced by component crops and density

Final report is under preparation.

4. Efficacy of Haritha Super on banana in comparison with Farm Yard Manure and different doses of chemical fertilizers

The experiment was concluded. Tabulation of data is over. Statistical analysis is in progress.

5. Nutrient Management in banana (Musa) [AAB] Palayankodan under homestead situation in Kollam District

The experiment was concluded. Statistical analysis is pending.

6. Collection, conservation, cataloguing and biochemical characterization of medicinal plants in homesteads of Southern Regions of Kerala

Experiment is in progress.

7. Effect of manurial practices and sequential intercropping on crop yields and soil physico-chemical properties.

Second year experiment was concluded.

8. Economics of production and marketing of orchids and anthurium in South Kerala
Survey and data collections are in progress.

Data collection in Thiruvananthapuram and Kollam is nearing completion.

SPICES (SPC)

1. Effect of irrigation and fertilizer application on growth and yield of pepper
Crop is well maintained and the experiment is in progress.
2. Nutritional requirement of bush pepper grown in pots
The experiment is in progress.

Observational Trials

Performance evaluation of coconut varieties. The trial is in progress

Effect of different irrigation methods on the growth and yield of banana. Trial was concluded. Statistical analysis is pending.

Performance evaluation of sub surface dyke. Data analysis in progress.

Major Research achievements

Under the project "Comparative economics of homestead farming with and without livestock in and around Sadanandapuram".

The average family size of the sample was 4.25. Nineteen respondents in the category "raising crops alone" and 28 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.

Perennial crops dominated the cropping pattern and the sample had a very high cropping intensity of 168%. The average milk production per day was 3.25 liters for the local breeds and 5 liters for the crossbreds. Average lactation period was 272 days and 327 days, respectively for the two breeds.

A field experiment was conducted in banana based cropping system to identify the most suitable tuber crop as intercrop of banana and to assess the nutrient requirement of the system at the Farming System Research Station, Sadanandapuram, Kottarakkara, during

1999-2002. The experiment was laid out in split plot design with four replications with the main plot treatments viz., Banana alone (T1), Banana+Elephant foot yam (*Amorphophallus companulatus*) (T2), Banana + Tannia (T3) (*Xanthosoma sagittifolius*), Banana + Greater yam (T4) (*Dioscorea alata*), Banana+Lesser yam (T5) (*Dioscorea esculenta*) and sub plots with three nutrient levels, 100% (F1), 75% (F2), 50% (F3) of the POP recommendations of KAU.

The results revealed that inter cropping banana var. Njalipoovan with tuber crops in general increased the banana yield. Among the different intercrops tried, lesser yam was proved the best companion crop of banana followed by elephant foot yam. The increase in banana yield was to the tune of 12 to 64% over control (Banana alone).

Nutrient management studies in intercrops revealed that 50% of the recommended dose was sufficient for elephant foot yam, greater yam and lesser yam when grown as inter crop of banana. Hence for banana tuber crop-intercropping system, the fertilizer recommendations of tuber crops as intercrops can be reduced to 50% level (NPK 40:30:50 kg ha⁻¹) for elephant foot yam and 40:30:40 for greater yam and lesser yam, along with the recommended nutrient for banana.

STED PROJECT

Management of Soil related constraints for increasing the productivity of laterite soils of Kollam District.

The effect of application of powdered rock material viz. khondolite collected from the nearest quarry was studied on the yield of cassava in the laterite soil of Kottarakara. The highest yield of 21.32 tons ha⁻¹ was recorded in the treatment where 75 % of KAU POP recommended dose of NPK @ 38:38:38 kg ha⁻¹ was applied in conjunction with khondolite @ 1 ton ha⁻¹ and Farm yard manure 12.5 tons ha⁻¹. This was on par with the treatment where 50% of the recommended dose of NPK ie @ 25:25:25 kg ha⁻¹ was applied along with khondolite 1 ton ha⁻¹ and FYM 12.5 ton ha⁻¹. This shows that the present recommended dose of NPK for cassava can be reduced upto 50% of khondolite @ 1 ton ha⁻¹ and FYM @ 12.5 ton ha⁻¹ are applied along with chemical fertilizer.

Full substitution of chemical fertilizers with khondolite is possible only if we apply khondolite at a higher ratio of 2 ton ha⁻¹.

Extension and other activities

1. Superior quality planting materials like grafts of cashew, mango, jack, sapota, coconut and arecanut seedlings, vegetable seeds, pepper varieties, teak seedlings and ornamental plants are regularly distributed through sales counter functioning in the station.
2. Farm advisory services were catered to the agricultural needs of the farmers of Kottarakara as well as the adopted village Ummannoor on matters relating to the fertilizer application, weed control and disease/pests of various crops like vegetables, banana, coconut, arecanut, pepper, paddy etc. The scientists of the station visited farmer's field periodically and offered technical advice to the farmers.

Extension lectures delivered by Scientists

Name of Scientist	Topic	Venue	Date
Dr. S. Ravi Assoc.Prof& Head	Pest and disease management in pepper	Edamon	07.06.03
„	Mushroom cultivation	FSRS/KVK	19.06.03
Dr. S. Regeena Assoc. Professor	Agricultural marketing and project planning	„	20.06.03
Dr. S. Ravi Assoc.Prof& Head	Mushroom cultivation	„	28.06.03
Dr. S. Regeena Assoc. Professor	Integrated farming system	„	28.06.03
Smt.G.S.Jayasree Asst.Professor	Water harvesting, mist house and meteorological equipment	FSRS, Sadanandapuram,	18.10.03
	Techniques in rain water harvesting	„	22.10.03
Dr. S. Regeena Assoc. Professor	Vegetable cultivation	KVK, Sadanandapuram	22.11.03
	Participatory rural approach	Chadayamangalam	27.11.03
Smt. G.S. Jayasree Asst. Professor	Micro irrigation system	„	„
„	Water harvesting structures	FSRS, Sadanandapuram	11.12.03
Dr. S. Regeena Assoc. Professor	Techniques of PRA	FSRS/KVK, Sadanandapuram	04.12.04
Smt. G.S. Jayasree Asst. Professor	Nursery structures and equipments	„	03.03.04
Dr. S. Regeena Assoc. Professor	Integrated Farming Systems	CoA, Vellayani	17.03.04
Smt. G.S. Jayasree Asst. Professor	Mechanisation in paddy	FSRS/KVK, Sadanandapuram	25.03.04

B. Training/symposia/workshop conducted in the station

One day training on 'Integrated farming for profitability' was conducted for unemployed youth on 28.06.2003 under NATP on homestead farming. Twenty unemployed youth attended the training.

One day training on 'Integrated farming for profitability' was conducted for 28 unemployed youth on 30.07.2003. Three classes were arranged on Mushroom cultivation, poultry rearing and integrated farming.

RAWEP was conducted for 17 B.Sc.(Agri) students of College of Agriculture, Vellayani from 24 to 27th September, 2003.

Two weeks training was conducted to three facilitators of women in agriculture scheme of Department of Agriculture from 1st December to 14th December 2003..

Two days training on 'Scientific management of coconut based homestead farming system' was conducted for 28 farmers on 10 and 11 December 2003 under NATP on homestead farming.

Two days training programme on Scientific management of livestock was conducted on 18 and 19 of December 2003 for 15 participants under NATP for homestead farming.

Five training programmes were conducted at this station as a part of the NATP on Homestead Farming

Two days training programme on Cultivation and processing of vanilla was conducted on 21st and 22nd January 2004. Two days training programme on Floriculture as an income generating activity was conducted on 30th and 31st January 2004. Two days training programme on Vanilla as an intercrop in homegardens was conducted on 27th and 28th February 2004. One day training programme on Processing and preservation of fruits and vegetables on 26th March 2004.

Workshop/meeting

1. Group meeting of PIs, CCPIs and Associates of the NATP on homestead farming was held on 10 and 11 November 2003. Ten members participated in the meeting.
2. Training-cum-workshop on project monitoring and impact assessment was conducted in this station under NATP on homestead farming on 29.12.2003. Forty participants attended the workshop.

List of publications

Regeena S., Ravi S., Shehana R. S., Jayasree G. S., Shanat K. M. and Nishant T.S. (2003). Homestead farming models for the South zone of Kerala. Proceedings of NATP Workshop in Homesteads held at CARI, Port Blair on 12 & 13 September. pp:84-88.

Radio talks and Doordarshan Programme

Radio talks on Dr. S. Regeena, Assoc. Professor by 'Modern practices in homestead farming' on 18.09.2003 and on 'Prospects of apiculture on 30.10.2003.

Radio talk on 'Need based mechanisation' by Smt. Jayasree G. S., Asst. Professor on 23.01.04.

NURSERY

The nursery attached to the station contributes to a major share of farm revenue. Under the nursery programme main emphasis is given to the multiplication of improved varieties of cashew, mango and jack grafts, coconut and arecanut seedlings, vegetable seeds and ornamental plants. These superior quality planting materials are regularly distributed from the station. The rapid multiplication of pepper has been started and rooted cuttings of Panniyoor-1, 2,3, 4 & 5 of pepper are being supplied from the station.

Important visitors

Dr. Prabhukumar, Zonal Co-ordinator, ICAR, Bangalore, Dr. G.N. Nagaraja, Assoc. Prof., EEU, UAS, Bangalore and Dr. B. V. Chinnappa Reddy, Assoc. Prof., UAS, GKVK, Bangalore visited the station to study about Integrated Farming Systems on 18.03.2004 and 19.03.2004.

Finance)

Head of account	Budget provision for the year (in lakhs)	Expenditure (in lakhs)	Station receipt (Rupees)
Non Plan Total	42.860	37.39	
Plan Total	36.070	35.55	3,14,950
OEAP	3.000	3.00	

SOIL CONSERVATION RESEARCH STATION, KONNI

List of Research Schemes/Projects terminated during the period

1. Use of Coir geotextiles in varying slopes
2. Use of coir geotextiles for template planting and as a soil mulch
3. Use of Coir geotextiles for canal bank protection and assessing biodegradability
4. Use of Coir geotextiles for regeneration of exposed rock patches

Externally aided projects : Collaborative Project between Kerala Agrl.University & Coir Board

Papers published : 2 Nos.

Infrastructural facilities developed

In order to conduct soil erosion studies various slopes ranging 80%-100% were laid out in the farm with the financial support of Coir Board, Cochin.

Farm implements/Machinery : Bush cutter

Following measures were taken to increase the farm revenue:

Crop

Coconut

Recommmendations as per the package of practices have been followed.

Arecanut

600 hybrid varieties of cashew were planted in the additional area of the station in consultation with the Associate Professor, Cashew Research Station, Madakkathara. The crop is in good condition. Results are expected after 3 years.

Tapioca

In consultation with the Associate Professor, College of Agriculture, Vellayani the newly released variety Hraswa was planted approximately in 2.5 ha. After the harvest of the first crop a second crop of tapioca was planted during the period under report. Taking in to consideration of its short duration nature, the yield is satisfactory. The stems as seed materials can be distributed to the local farmers for the next year.

Banana

15 varieties of banana suckers were collected from Banana Research Station, Kannara and planted in the farm for exhibition, multiplication and distribution purposes. In addition 500 Nos. of Nendran suckers were planted for increasing the farm revenue.

Ginger

Three high yielding varieties of ginger namely Varada, Mahima, and Regitha collected from IISR, Calicut were planted in an area for 0.4 ha. The rhizomes harvested were stored as seed material for next year for multiplication and distribution.

Medicinal plants

A live herbarium of medicinal plants collected from various sources are being maintained at the station. 250 nos. of different species were collected on this account.

Pepper

The pepper cuttings of seedlings planted during 2000-01 have started yielding and production of 28 kg. black pepper was achieved and disposed off.

Apart from the drought, 12 nos. of coconut trees were damaged due to lightning. Over and above due to the attack of wild animals like elephant and boar the crops had damaged significantly. It is estimated that crops worth approximately Rs. 20,000/- were destroyed due to natural calamities. In order to protect the crops from wild animals, a provision of Rs.2 lakhs may be provided in the next year budget.

Seed & Nursery Programme

Items	Quantity Produced	Quantity distributed	Receipt(Rs.)
Bittergourd	15.4 kg.	15.4 kg.	15400
Amaranthus	9.25 kg.	9.25 kg.	6475
Cucumber	1.7 kg.	1.7 kg.	1190
Bhindi	250 g.	250 g.	150
Cowpea	1.7 kg.	1.7 kg.	251
Ashgourd	1 kg.	1.kg.	700
Pumpkin	100 g.	100 g.	70

Extension activities and service rendered to the farmers

: 9 Farm seminars

3 Nos. of Classes/Seminars attended

5 Nos of Radio talks

Finance

Head of account	Provision (Rs)	Actual Expenditure.(Rs.)
Plan projects	37.340	34,63,126
Externally aided projects	17.450	8,85,918
Total		43,49,918

CENTRAL ZONE

REGIONAL AGRICULTURAL RESEARCH STATION

PATTAMBI

Introduction

The station started functioning in 1927 with the name Paddy Breeding Station in an area of 33.28 ha and the then mandate was to improve the local bodies of the erstwhile Madras Presidency. With the intensification of research activities in other crops such as cotton, sugarcane, sesamum, pulses and oil seeds, the station was renamed as Agricultural Research Station in 1930. With the acquisition of 30.36 ha of land in 1945 additionally, the research activities of the station were further intensified. The station was taken over 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.

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

The station has so far released 57 rice varieties. Of this 37 strains were evolved through pureline and mass selection and the remaining through hybridisation and selection. The two high yielding cowpea varieties released by the station are PTB-1 (Kanakamony) and PTB-2 (Krishnamony).

Mandate of the station

Generation and transfer of technology related to rice and rice based cropping system, pulses, vegetables, organic farming and seed technology.

Satellite Stations

1. Cashew Research Station, Anakayam
2. Agricultural Research Station, Mannuthy
3. Cashew Research Station, Madakkathara
4. Banana Research Station, Kannara
5. Agronomic Research Station, Chalakkudy
6. Aromatic and Medicinal Plants Research Station, Odakkali
7. Pineapple Research Station, Vazhakkulam
8. Cropping System Research Centre, Wadakkumcherry

A few memorable events of the institution

The Annual workshop of the All India Co-ordinated Pulses Improvement project was held at RARS, Pattambi on 17.5.03. The farm day was organized on 11-02-04. Nearly 100 farmers participated in the mela.

Faculty improvement

Scholarships awarded /deputation

K.Karthikeyan, S.Anitha and S.Helen Asst.Professors are doing part time Ph.D by availing eligible leave and study leave

Details of deputation for seminars/workshops/symposia etc.

The scientists of the station has attended 9 group meetings, 6 trainings, 14 seminars, 7 workshops and 2 refresher courses on various subjects of Agricultural importance during the period.

Radio talks :

- Phone in Programme on *Rice Cultivation* on 23-11-03 by Dr.P.Raji
- Ponds to beautify your garden* by Dr. M.L. Jyothi at AIR , Kozhikkode.
- New varieties of papaya* by Dr. M.L. Jyothi at AIR , Kozhikkode.

Dr.P.Raji, Dr.Vimi Louis, Dr. S.M.Purushothaman, Dr. M.L. Jyothi and Dr. M.C. Narayanan kutty attended to several extension programmes and activities.

Research programme

Plant Breeding and Seed Technology

Ninety eight accessions of short, medium and long duration group were maintained *in situ*, characterized, catalogued and transferred to Long term storage facility at NBPGR Reg. Centre, Thrissur. During 2003, 48 and 13 TRV's accessions were multiplied during *Kharif* and *Rabi* respectively. These will be characterised and catalogued in the next season. A promising dwarf photoperiod sensitive culture, *Cul. 20 D1* (a mutant of Chitteni) forwarded to farm trials to out-yielded the check at all the 7 locations at Thrissur and Ernakulam dts. The average grain yield of the culture over 7 locations is 3582kg/ha. This entry was in national testing .

IET15829 out -yielded the check Pusa Basmati during *Kharif* 2003. Varietal combinations Swarnaprabha +Makaram and C3-2+Makaram have out-yielded the check (farmers combination) Chenkayama + Chettadi and the other three varietal combination in the trial during 2003. *Cul. C3-2 -KM* out-yielded the traditional first crop component viz., Chenkayama in the Kootumundakan system of cultivation over three consecutive years in the station trial. Promising selections (Munda Sel. 1 to 4, Chuvanna chettadi Sel. 1, Mundakakutty Sel. 1, 3 to 5, Konna Sel. 1 to 4) were multiplied and evaluated during *Rabi* 2003-04 for utilization in further breeding programmes. The mean performance of Cultures Swarnaprabha Sel 3-1 followed by C3-2-49-2 over three years (*Kharif* 2001 to 2003) was the highest compared to all other entries including check Aiswarya and Kanchana under upland eco-system .

The seed quality of 812 samples submitted by the Dept. of Agriculture and Seed production centres of the University were analysed during 2003-2004. The experiment

was conducted in long duration paddy variety –Swetha . The objective of the study was to determine the commercial suitability of the packaging materials, like Jute canvas bag (JC), HDPE Non laminated interwoven bags (HDPE) and Polylined jute canvas (PL – JC bags) for bulk seed storage. Results revealed that the viability of the stored seeds is to be retained above the minimum standard level of 80 % for a period of 14 months from harvest when stored in PL – JC bags as against 9 months in case of HDPE and Jute canvas bag . The seed stored in Polylined jute canvas (PL – JC bags) is still viable. A total of 103.97 quintals of Breeder seed of various HYV's popular in the state was produced and distributed for multiplication in the seed production chain during 2003 – 2004.

Horticulture

Nutrients were applied in different doses in coleus variety Nidhi. Maximum yield was obtained in T2 (NPK 40:20: 100 kg ha⁻¹+FYM 10t ha⁻¹) Pruning was done at fortnightly intervals but during the year, it was found that better yield is realized when no pruning was given. Planting of two varieties and three pre release cultures of coleus was undertaken at fortnightly intervals. Planting was done from June and continued up to September. It was found that planting done in July – Aug. gave the maximum yields in all the varieties tried.

Seed materials produced are coleus 300 kg, bitter gourd 9 kg and ash gourd 12 kg.

Technology Assessment and Refinement through Institution Village Linkage Programme (TAR-IVLP):

The TAR-IVL Programme was implemented in two villages *Sankaramangalam* and *Mavundiri*. Rice variety *Harsha*, assessed during first crop season as a dry sown crop gave 2.70 to 3.57 t/ha grain yield compared to 2.0 to 2.40 tons obtained from varieties like Kattamodan and *Kunjukunju*. In *Sankaramangalam*, farmers under one *padasekharam* (Farmers group) adopted HYVs of rice bringing 50 ha under different varieties. This included varieties like *Aiswarya*, *Kanchana*, *Jyothi* and *Kairali* during first crop season and *Karuna* and *Uma* during second crop season. Bush type of cowpea (variety *Pusa Komal*) when sown along with rice under dry sowing conditions provided green matter of 1.8t/ha. This technology along with use of pre emergent herbicide Pretilachlor @1kg ai/ha could save costs upto Rs. 650 per hectare.

Use of *Trichogramma* egg cards for management of rice stem borer and leaf folder was effective in managing the pest problem and the cost benefit ratio was 1.17 against 1.20 in chemical control. Assessment of improved varieties of tuber crops showed promising results. Short duration tapioca varieties *Sree Vijaya* and *Vellayani Local* gaves 2.8 to 4 kg per plant in 7 months. Indian honey bee colonies were established in three villages after giving training on management of bee colonies.

Division of Pulses

Plant breeding Experiments

Co-ordinated Varietal Trial on Cowpea AVT-II and IVT(NMG)

In this trial, 12 AICRP entries were evaluated during 2002 *kharif*. Result of the trial showed that the yield was significantly different. The genotype DCP-7 recorded the

highest yield (828.89 kg/ha) and found to be resistant to anthracnose disease followed by DCP-9 (506.4 kg/ha).

Horsegram Advanced Varietal Trial

Thirteen AICRP entries were evaluated during 2002 *rabi*. The genotype AK-22 recorded the highest yield (962 kg/ha) and found moderately resistant to powdery mildew and yellow mosaic diseases followed by AK-1(934 kg/ha)

Effect of thiourea application on cowpea

The experiment was started in 1999 to assess the effect of thiourea seed treatment on seedling emergence and crop establishment and to study the role of thiourea in improving seed set and yield of cowpea. Result of the trial conducted during 2002 *Rabi* showed that the yield was significantly different. TU seed soaking 500 ppm + TU sprays at vegetative stage and at flowering stage (927kg/ ha) recorded the highest yield followed by water soaking + TU sprays at vegetative stage and at flowering stage (906kg/ha). From the pooled data it was observed that seed yield was significantly influenced by thiourea application TU seed soaking 500 ppm + TU spraying at vegetative and at flowering stage increased the yield of cowpea by 26% and net return by 50 %. Thiourea application does not affect the palatability of grains

Effect of humic substances on cowpea

The experiment was started in 2001 to assess the effect of humic substance on nutrient use efficiency, to assess the effect of humic substance seed treatment on seedling emergence and crop establishment and to study the role of humic substance in improving seed set and yield of cowpea. Result of the trial conducted during 2002 *khariif* showed that yield was significantly different. All the treatments were significantly superior to control. Seed treatment of humic substance combined with two foliar sprays recorded the highest yield.

Effect of thiourea application on horsegram

The experiment was started in 1999 to assess the effect of thiourea seed treatment seedling emergence and crop establishment. and to study the role of thiourea in improving seed set and yield of horsegram. Result of the trial conducted during 2002 *rabi* showed that there is significant difference among the treatments. T9-500 ppm TU seed soaking + TU spray one at vegetative and another at flowering stage recorded the highest yield. From the pooled data, it was observed that seed yield was significantly influenced by thiourea application. T9-500 ppm TU seed soaking + TU spray one at vegetative and another at flowering stage recorded the highest yield i.e., 57% more yield compared to control. Thiourea application does not affect the palatability of grains.

Pathology Experiments

Efficacy of different seed treatment fungicides and bio-control agents to control seedling rot of cowpea

This experiment was initiated during *Kharif* 2000 to control the seedling rot of cowpea caused by *Colletotrichum lindemuthianum* (Sacc. and Magn.). The seeds were treated with different fungicides and bio-control agents namely Carbendazim, Thiram,

Mancozeb, Copper oxychloride, *Trichoderma viride* and *Pseudomonas fluorescens* and seed treatment with Thiram followed by 0.1% Carbendazim spray at 15, 30 & 45 days after seedling emergence. The pooled data of *Kharif* 2000, 2001 and *Rabi* 2002 showed that the seed treatment with Thiram @ 3g/kg of seed followed by three rounds of spray with Carbendazim (0.1%) at 15, 30 & 45 days after seedling emergence, recorded significantly lower disease incidence (7.56%) and higher yield (584.93 kg/ha).

Effect of different soil amendments and bio-control agents on dry root rot of cowpea

This experiment was initiated during *Rabi* 2000 to control dry root rot of cowpea caused by *Macrophomina phaseolina* (Tassi.). The treatments included were *Trichoderma viride* seed treatment @ 4 g/kg of seed, *Pseudomonas fluorescens* @ 10g/kg of seed, Carbendazim @ 2g/kg of seed, soil application of Farm yard manure @ 2t/ha, Neemcake @ 20kg/ha, Vermicompost @ 1t/ha, combination of the bio-control agents with the above amendments and a control. The pooled data of *Rabi* 2000, 2001 and 2002 seasons showed that the seed treatment with *Trichoderma viride* @ 4 g/kg of seed recorded significantly lower disease incidence (5.9%) which was found on par with Neem cake soil application @ 20kg/ha).

Evaluation of Contaf (0.2 %) dust against black gram powdery mildew

Bavistin 50 WP @ (0.1%) as spray application was effective in reducing the powdery mildew incidence followed by the application of Contaf 0.2% Dust @ 25Kg/ha. The grain yield obtained from Contaf 0.2% Dust @ 25 Kg/ha was found on par with that of Bavistin 50 WP applied as (0.1%) spray.

Agronomy

Evaluation of herbicides for transplanted rice: It was observed that there were no significant differences among the treatments with respect to the yield. Nitrogen response trials on AVT-2 (medium early hybrid rice cultures) under high and low input management: applied doses of N (50, 100 & 150 kg of RFD) as well as varieties did not exhibit any significant variation. However at the national level, the culture IET 17664 was promising and has been recommended for further promotion.

Cultural management practices for enhancing grain yield of rainfed upland rice (Var: Swarnaprabha): The line sowing with 100% NPK is found significantly superior to all other treatments under the rainfed upland conditions.

Soil science & Agril. Chemistry

Permanent manurial trial (Tall and Dwarf indica)

PMT (T) has completed 43 years and PMT(D) has completed 30 years of experimentation. In permanent manurial trials, both in tall and dwarf varieties, maximum grain and straw yield were obtained in virippu season for the treatment which received cattle manure alone @ 18 t/ha (for dwarf) and 8.97 t/ha (for tall) to supply 90 kg N/ha. But in mundakan season, the highest grain and straw yield were obtained for the integrated use of fertilisers and cattle manure; on nitrogen equivalent basis to supply 1/2

N as per POP. Continuous application of nitrogenous fertilisers alone or green leaves alone had found to have detrimental effect on the growth and yield of rice.

Long Term Fertilizer Experiment

This experiment has completed 6 years. In LTFE, as in the previous years, in both the seasons, the highest grain and straw yield were recorded by the treatment T₈ which received 100 % NPK (as per POP of KAU) along with FYM @ 5 t/ha. However this was on par with T₃ (150 % NPK) and T₁₀ (100%NPK + *in situ* growing of *Sesbania aculeata* green manure crop for *kharif* rice only). Lowest yield was recorded by T₁₂ (absolute control) followed by T₁ and T₇ where there is continuous application of N alone. The uptake of nutrients followed the same trend as in yield. The uptake of N, P, K, Ca & Mg was higher for T₈ which received 100% NPK (as per POP of KAU) along with FYM @ 5 t ha⁻¹ in both *kharif* and *rabi* seasons.

Plant Pathology

Evaluation of new fungicidal formulations for sheath blight control

As part of the generation of new fungicides in controlling sheath blight, this trial was conducted with the inclusion of new fungicides like Amistar, RIL 010 and RIL 011. Among the fungicides tested, Rhizolex 50WP (2.0g/l), Amistar (0.75 ml/l) and RIL 010 (1.5 ml/l) formulations were superior in checking the disease and increasing the yield.

Evaluation of new fungicides against blast

New fungicide formulations, Amistar (strobilurin group), RIL (methoxy acrylate) formulations and Sumi (diniconazole) were tested against blast. All the fungicidal sprays were found to be effective in reducing the leaf infection and increasing the yield. Among the new formulations RIL 010 @ 1.5 ml /l was superior to standard check fungicide.

Evaluation of fungicides against brown spot

Commonly available fungicides having broad spectrum of action were tested for their efficacy against brown spot of rice. Contaf 5 EC (hexaconazole), Result 25EC (propiconazole), Kitazin 48 EC (Kitazin) and Antracol 70WP (propineb) were effective in controlling the disease and increasing the yield.

Evaluation of botanical formulations against sheath blight of rice

Six botanicals *viz.*, Ahook, Neem Azal, Neem gold, Spictaf, Tricure and Wanis were evaluated against sheath blight of rice in comparison with the standard check fungicide Tilt 25EC (propiconazole). The botanical Neem gold was good at decreasing the per cent disease severity and increasing the grain yield.

Evaluation of Antracol 70WP (propineb) against brown spot and narrow brown spot of rice. (Product Testing – Bayer India)

The fungicide propineb (Antracol 70WP) was tested against brown spot. Different doses of the fungicide (2.5g/l, 3.0g/l and 4.0 g/l) were tested in comparison with the check fungicide mancozeb (Indofil M 45). All the three doses of the fungicide tested were equally effective in controlling brown spot.

Evaluation of Green Manures for the Control of Sheath blight of Rice

Incorporation of the green manures daincha (2.5 and 5 t/ha) , green gram (2.5 t/ha), vengai (5t/ha) and sunhemp (2.5 t/ha) showed significant reduction in sheath blight severity . Yield was maximum in the daincha (5t/ha) incorporated plot followed by vengai (2.5 and 5 t/ha), green gram (2.5 and 5 t/ha) and sunhemp (2.5 and 5 t/ha). The treatment, FYM plus inorganic fertilizers produced significantly higher yield even with high incidence of sheath blight.

Management of Blast, Brown spot and Sheath rot of Rice using Plant Extracts

The efficacy of different plant extracts on Brown spot of rice was studied during Rabi, 2003. The treatments were applied as seed treatment and foliar spray at a concentration of 10% (Plant extracts) and 1% (Sulphur).

All the botanicals showed significant reduction in the severity of Brown spot infection of leaf and Brown spot incidence of seed. Bael extract and Neem leaf extract showed maximum effect for reducing the leaf and seed infection respectively. Plant extracts delayed flowering except Nuxvomica which recorded early flowering. The yield was maximum in the Sulphur treated plot and the yield of other plant extracts and control were on par.

Bioinoculants production Unit

The mass production of bioagents, *Pseudomonas fluorescens*, *Trichoderma viride*, *Trichogramma japonicum*, *Trichogramma chilonis*, *Azolla*, and earthworms werestarted. Production of vermicompost was also initiated.

Entomology

National Screening nursery

Among 473 entries screened, 104 cultures showed complete resistance to thrips with a score of '0'while 157 cultures showed moderate resistance with score of '1'.For gallmidge, 68 entries and varieties like Jaya, Narendra, Pooja, Jalmugna and Dinesh showed resistance at 30 and 50 days after transplanting.64 entries and cultures like pusa basmati, Tararori, Pooja, Triguna, Thulsi, Dinesh, and PR 162 showed resistance to yellow stem borer . 26 entries and cultures Jaya , Goyinda , Pooja and Salivahana showed damage less than 10% damage for Whorl maggot. For Blue beetle entries IET 17895, 17898, 18183 and 18311 showed moderate resistance with less than 10 % leaf damage. 78 entries and cultures like Annada, Pooja, Salivahana, Vanadana, Jalm agna and PR 162 showed no damage to caseworm while entries IET 17669, 18529, 18534 and 18537 was highly susceptible to the pest.

Gallmidge screening trial

Among 110 entries screened , 36 entries showed complete resistance to gallmidge and they are comparable to resistant check varieties like W1263 and Phalguna.

Gallmidge biotype studies

Among 14 entries screened under four set of differentials, the reactions were 0.00 & 0.00 , 0.00 & 9.33 , 1.50 & 6.72 and 7.90 & 17.92 showing R-R-S-S pattern of gallmidge biotype 5 reaction.

Donor identification against potential and sporadic pests

Among 25 entries screened, seven showed complete resistance to thrips with a score of '0' . For bluebeetle and whorlmaggot , entry ARC 14378 showed complete resistance. Entries ARC 5764 , ARC 7080 and INRC 2489 showed resistance to thrips and rice bug. For caseworm, 16 entries showed complete resistance.

Insecticides evaluation trial

Among 13 treatments including control, for stemborer carbofuran @ 1000g ai /ha was superior over all treatments in checking both dead heart and white ear. For blue beetle , Imidacloprid @ 25 g ai / ha , Clothianidin @ 10 g ai / ha , Nurelle D 505 @ 344 g ai/ha and Lambdacyhalothrin @ 10 g ai / ha were on par with carbofuran in checking the damage. For whorlmaggot , Clothianidin @ 10 g ai / ha was effective and was on par with carbofuran.

Social Sciences

Evaluation of agricultural projects under peoples plan campaign in malappuram district (EAP)

The project was concluded on 30-8-2003 and the final report was sent to the KRPLLD Project Directorate .

Study on the job satisfaction of extension personnel

An observational trial was undertaken to assess the level of job satisfaction among extension personnels and to identify the problems faced by extension personnels in Malappuram district.

It was found that 27% of the respondents expressed low level of job satisfaction , 52% medium level and 13% high level of job satisfaction . It was found that organizational communication, clarity of task, team work and task identity showed a positive and significant relationship with job satisfaction of extension personnel.

Extension and other activities

The Station maintained close linkage with various departments and other agencies for effective transfer of technology generated by the scientists. Scientists assisted the State Agri. Dept. in conducting monthly T&V workshops which finalise the messages to be transferred to farmers based on research results, feed back from the farmers and extension personnel. Scientists of the station functioned as Resource Persons in the T&V monthly workshop of Palakkad & Malappuram Districts and monthly workshop of NARP of Malappuram District. The scientists of the station actively took part in the meetings, discussions and various activities related to Pattambi Grama Panchayath and Block Panchayath. The scientists functioned as resource persons

in the on-campus and off-campus training programmes conducted by State Dept. of Agriculture and voluntary organisations.

Important visitors :

Dr.S.Edison, Director, Central Tuber Crops Research Institute visited the station to review the NATP programmes .

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- Purushothaman, S.M., Anitha, S., Sreenivasan, E. and Karthikeyan, K.(2004). Evaluation of horse gram genotypes to major diseases.Paper presented in National symposium on“ Crop surveillance: Disease Forecasting and Management” held at IARI,New Delhi from 19th to 21th Feb 2004.p 37

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- Purushothaman S.M.and Karthikeyan, K. 2003. Seed- borne diseases of cultivated crops and their management. Indian farming :53.p 27-28
- Karthikeyan, K. and Purushothaman, S.M. 2003. Pheromone traps: an effective tool in rice stem borer management. Indian farming :53.p 14.
- Raji, P., Sukumara Varma, A. and Rajendran Pillai, M.V.2003.Efficiency of native Arbuscular Mycorrhizal Fungi in saving phosphorus fertilizer and enhancing growth and yield of tomato, Abstract of papers, National Seminar on Advances in agricultural Resource Management, 22nd September 2003, Agricultural College and Research Institute Killikulam, TNAU.
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Finance 2003-2004

Head of Account	Budgetprovision (lakh)	Expenditure (Rs)	Station receipts(Rs.)
Nonplan	147.415	133.92	1177818
plan	10.650	5.07	-
ICAR	52.210	42.66	142220
other EAPs	2.89	2.11	-
Revolving fund(corpus)	4.00	4.18	621153

CASHEW RESEARCH STATION, ANAKKAYAM

Introduction

The station was founded in 1963 under a scheme included in the third five year plan. It is situated on the western side of the Malappuram – Manjeri road about 9 km from Malappuram. Nearest railway station is Tirur which is 40 km away. The station spreads an area of 9.92 ha, out of which 8 ha are under cashew and 0.5 ha under coconut cultivation. Rest of the area is set apart for buildings and roads. Soil in the station is red laterite. The elevation is 106.8 m above MSL. The land is sloppy and uneven terrain.

Mandate of the station

The prime objective of the station is to evolve materials, methods and means to increase the yield of cashew. This is achieved through breeding, selection and recommending proper manurial schedules, cultural practices and measures to control pests and diseases.

Research Programme

Collection and maintenance of cash types

Thinning was done. The original spacing was 4m x 4m. To accommodate maximum number of types, every alternate tree was cut. Thus the planting became triangular, with a spacing of 8 m between trees in the same row and 5-7m between trees in adjacent rows.

Breeding improved varieties of cashew by hybridization

The following 35 hybrids were retained for further study based on yield and nut size. All the other trees were cut.

Hybrid name	No. of progenies
H-86 X Ank-1	6
K-22-1 XH-8-6	10
H-8-1 X K-22-1	16
Ank-1 X H-8-6	1
H-8-6xT505	1
UL-28-1 X H-8-6	1
H-8-6 XK-22-1	1
Ank-1XH-8-1	1

Observational Trial: Demonstration of plant protection measures in cashew farmers' fields.

Six farmers in Kavanur and Wangdoor Panchayats of Eranad Taluk were selected. Spraying quinalphos and mancozeb against tea mosquito bug and dieback were done.

Extension and other activities

The farm advisory committee of the station was re-constituted with Sri.A.P.Anil Kumar, MLA and Member, Kerala Agricultural University General Council as a special invitee. The first meeting of the reconstituted committee was held on 12.1.04. A women complaint committee was also formed in the station with Smt.Pathummakutty Teacher, Member, District Panchayath, as a special invitee. The first meeting was held on 3.4.04 at the station. Spraying on cashew trees was undertaken under the scheme "Farm trails/adaptive trials" during Dec. 2003. Demonstration and training were conducted. Field visits were made as when required. Farmers were given advice on all aspects of cashew cultivation.

Other details if any:

The demand for softwood grafts of cashew seedling is very high. The station has produced 55245 seedlings earning an income of Rs.11,04,900/- . A compound wall was constructed in blocks XI and XIV

Finance

Head of account	Provision for the year	Expenditure	Receipt
Non-Plan	18,65,000	18,19,445	
Plan (Total)	9,31,000	2,71,988	94,163
Revolving Fund	3,00,000(Corpus)	4,28,559	15,07,450

AGRICULTURAL RESEARCH STATION, MANNUTHY

Introduction

The Agricultural Research Station, Mannuthy was started in 1957 as Rice Research Station, Mannuthy in the then Central Farm, Ollukkara, with administrative control vested with Rice Specialist. After several transformations this station was renamed as Agricultural Research Station, Mannuthy in 1983. During 1988 Instructional Farm, Vellanikkara, which was a part of this station was de linked and since then the station is functioning as an independent unit.

Several research projects of the University are implemented at this Station. The station participates in the academic programmes of Kerala Agricultural University by way of providing land and labour facilities as well as guidance for post graduate thesis work and undergraduate work experience programme of College of Horticulture, Vellanikkara. It is a main centre for the production and distribution of quality planting materials of fruit plants, spices plantation crops, nursery plants, vegetable seeds, and breeder and foundation seeds of paddy especially of those varieties suited to kole lands. This station imparts training in the Commercial Nursery Management and Vegetable seed production Technology as well as mechanised paddy transplanting on specific occasions.

Mandate of the station

- a) Research on rice, vegetables, coconut, tree crops, kole land and crop management studies under stress situation
- b) Providing field and labour facilities for undergraduate as well as Post-graduate research programme
- c) Seed, seedling and plant propagation materials production programme
- d) Under NARP, the station has verification function with respect to field testing of rice production technology.

A few memorable events of the institution

The Station conducted a vocational training programme on Mechanised Paddy Transplanting for 20 *kudumbasree* women members from Tholur and Kodakara *Grama panchayath* for 22 days from 27th November 2003; A fifteen days vocational training programme on "Commercial Nursery Techniques" to beneficiaries under PPP from 27th November 2003; Two days Farmer-Scientist Interaction programme on "Commercial Nursery Techniques" to beneficiaries under PPP from 27th and 28th June 2003.

Research Programme (Major Research Achievements)

Plant Breeding & Genetics

Among 15 short duration rice cultures evaluated at Agricultural Research Station, Mannuthy, Culture 102 recorded significantly superior grain yield compared to the check varieties during three seasons.

Selection index was formulated based on characters viz; productive tillers per plant, thousand grain weight, grain density, flag leaf area and leaf area index at the time of flowering which were highly correlated with grain yield and grain production per day. Based on the selection index formulated, varieties viz; Adt38, Swarnaprabha, Aiswarya, Kanchana, MO4, Ahalya, Jyothi, Ptb 2, Ponmani, Ptb15 and Mahsuri were selected as parents for further hybridisation programme.

Forty-eight high yielding rice varieties released from different rice research stations were evaluated for their adaptability in kole lands for one season.

Three rice cultures viz: C 26 T(b), C 80 and C 28 were recommended for farm trial

Short duration rice varieties collected from various sources were screened for drought resistance during late rabi season of 2003

Two promising rice cultures viz; Cul. 7711 and Cul. 10-15-1 are in the releasing stage.

Large scale production of foundation and truthfully labelled seeds of rice

Organising Farmer Scientist Interaction programmes for farmers of Trichur district during kharif and rabi crop seasons.

In cowpea six different cross combinations of pulse beetle resistant varieties were obtained

Horticulture

Snake gourd accession TA5-1 is in the release stage.

Development and maintenance of germplasm of jack, mango and cashew orchards and progeny orchards of mango, sapota, jack and other fruit trees

Production of planting materials of fruits, ornamentals, plantation crops and spices

Large scale production and distribution of vegetable seeds

Bacterial wilt resistant tomato line (LE -66) is undergoing national level testing under the All India Co-ordinated Vegetable Improvement Project

Descriptors are developed for 90 lines of cowpea and 50 lines of oriental pickling melon under NATP on plant diversity

Eleven lines of vegetable cowpea from the NATP collections were promising including the check *Vijayanthi*

In Oriental Pickling Melon thirty five genotypes were evaluated and characterized for 13 quantitative and 14 qualitative characters

In snake gourd thirty six genotypes were evaluated and characterized for 13 quantitative and 8 qualitative characters.

In bitter gourd twenty-eight genotypes were characterized for 18 qualitative and 14 quantitative characters.

Agronomy

Popularisation of rice transplanter, combine and harvesters through working demonstrations and adaptive trials

Procurement and demonstration of all improved farm implements and machinery for mechanised cultivation

Production technology for mechanised transplanting of rice is developed

Standardisation of mat nursery production

Twenty five days vocational training programme for mechanised transplanting of rice

Extension & other activities

Organised *Farmer-Scientist Interaction programme* to farmers for two days on 27th and 28th June 2003.

Produced and distributed seeds of paddy (11.2 tonnes) and vegetables (188 kg) Organised *training programmes* to progressive farmers/ Unemployed youths under Commercial Nursery Management

Scientists conducted training class in the training organized by CTI for Agricultural Officers and Agricultural Assistants of Department of Agriculture

Produced & distributed seedlings, grafts, layers and other planting materials fruit crops, cash crops, ornamentals, nursery plants etc worth of Rs. 4.9 lakhs.

Conducted *Farm trials / adaptive trials* in kole lands

Active participation in *Research Extension Interphase Programmes* organised by Department of Agriculture- Dr. U. Jaikumaran and Dr. C. Narayanankutty are resource persons to Monthly workshops.

Imparted work experience programme in rice to undergraduate students of College of horticulture

Demonstration in the use of modern agricultural implements

Farm Advisory service

Monthly package of practices for various crops are published serially in *Karshaka sree and Karshakasena* by Dr. P.A. Joseph, Associate Professor Agronomy of the Station

Dr. C. Narayankutty, is acting as the member of the Task Force created for evaluation of Schemes under Macro Management in Agriculture

Finance

Head of account	Provision for the year	Expenditure (Rs)	Station Receipts
Non Plan	58.380	56.330	12.213
Plan	4.910	3.035	
EAPs	0.110	0.048	Nil
Revolving Fund)		5.649	4.867
Total	63.400	65.062	17.070

CASHEW RESEARCH STATION, MADAKKATHARA

Introduction

The Cashew Research Station, Madakkathara under the Kerala Agricultural University was established on 1.5.1973. Initially, this station was working as one of the four research centres under the All India Co-ordinated Spices and Cashew nut Improvement Project (AICSCIP) of the ICAR. The World Bank aided multistate cashew research project was implemented at this station from 15.2.1982 to 3.9.1986. Presently this is one of the eight centres of All India Co-ordinated Cashew Improvement Project.

Mandate of the station

The mandate of Cashew Research Station, Madakkathara is, in general, to bring about scientific improvement in the cropping and management of cashew in Kerala and undertake appropriate transfer of technology measures to disseminate the scientific information among the farmers. The lead functions of the station are:

To evolve high yielding varieties of cashew; To identify varieties resistant/tolerant to pests; To develop agro techniques for achieving higher production and productivity; To standardize vegetative propagation techniques; To evolve effective control measures against the major pests of cashew; To transfer cashew production technology to farmers and extension agencies; To distribute quality planting materials of elite varieties; To develop methods for diversified use of cashew apple.

A few memorable events of the institution

Cashew Research Station, Madakkathara produced 845 cashew hybrids during 2003-2004, which is the highest among all the AICRP on cashew centres.

Commercialisation of cashew apple syrup produced at the cashew apple processing unit of this station was initiated and "Kudumbasree" has taken right for distribution of cashew apple syrup throughout Kerala on a commercial basis.

Seminars/ summer institute/ symposia/ trainings attended

Dr. Mini. C, Asst. Professor attended Winter school on exploitation of under utilised horticultural crops from Nov. 5-25 2003 at Rajasthan College of Agrl. MPUAT, Udaipur (21 days). Attended 16th Kerala Science Congress from Jan 29-31 2004 at CWRDM, Kozhikode and National conference on seed: a global perspective from March 26-28, 2004 at National Agriculture Science Centre, New Delhi.

Research programme - Major research achievements

A superior hybrid P-7 having a bold nut of 7.8g was identified which is a cross between Anakkayam-1 and Panama accession P-3-2.

A cashew germplasm consisting of 150 accessions collected from different parts of India and abroad are maintained at this station. During 2003-2004, five more accessions were added to the germplasm.

A total of 348 cashew hybrids obtained from different parts of the country are being maintained and evaluated at this station. Out of the 842 new hybrids were produced at Cashew Research Station, Madakkathara. 635 hybrids are planted and evaluated at Soil

Conservation Research Station, Konni. A total of 1314 cashew hybrids are now under evaluation.

The technology for the production of cashew apple syrup was modified. The clarification agent PVP, which is a costly chemical, was substituted by the natural product "Sago" which is very cheap and a more efficient clarifier compared to PVP. The modified technology is being adopted in the production of cashew apple syrup in the cashew apple processing unit of the station.

Scions can be stored for 10 days under ambient conditions by keeping wet cotton at the cut end and wrapping in newspaper. This facilitates storage and transport of scions to distant areas for exchanging germplasm.

Research conducted on the utilisation of the residue of the cashew apple from cashew apple processing unit and those left after extracting the kernel showed that these can be a very good source material for vermicompost.

Extension and other activities

Three training programmes on cashew graft production technology and four training programmes on cashew production technology were organised for the Agricultural officers and Agricultural Assistants of Department of Agriculture. The scientists have taken classes on various aspects of cashew production technology in 14 farmers seminars. Eleven farmers groups have visited the station and classes and video presentation on cashew production technology were conducted for them.

About 300 farmer's queries were answered over phone, post and personal consultancy during the year under report. Twenty five demonstration plots laid out in farmers fields were visited by the scientists.

Radio Talks

Prospects of cashew cultivation in Kerala : Dr. P.S. John
Pest management in cashew : Dr. Susannamma Kurien

Participation in farmer's seminar, exhibitions and flower shows

Stalls are opened wherever possible in connection with exhibitions and flower shows, in order to transfer information on cashew to farmers and also for the selling of softwood grafts and cashew apple syrup.

Farm advisory service

Farmers are advised about the problems in cashew cultivation in the research station as well as in the farms.

Important visitors

Dr. Ramakrishna Mulay, Director of Horticulture, Government of Maharashtra, Dr. S.R.K. Varshney, IFS, Director (Finance), Department of Agri.& Co-operation, New Delhi visited this station on 10.4.2003; Dr. H.P. Singh, Commissioner of Horticulture, Govt. of India on 14.4.2003; Dr. S.K. Sharma, Project Director, Project Directorate for Cropping System Research, Modipuram on 5.8.2003.

25 farmers from Assam on 2.9.2003; 64 students and 5 teachers from KMGVHSS on 15.10.2003; 33 students and 3 teachers from College of Agriculture, Vellayani visited this station on 23.10.2003

Finance (2003-2004) (in Rs)

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	18,57,000/-	16,16,149/-	8,50,082/-
Plan	3,70,000/-	2,58,115/-	
ICAR	16,35,000/-	14,81,704/-	
Other EAPs	1,47,300/-	1,08,030/-	
Revolving fund		6,13,739/-	4,73,337/-

AICRP ON WEED CONTROL, COLLEGE OF HORTICULTURE, VELLANIKKARA

Introduction

In order to conduct research on the biology and management of problem weeds of the state, the Trichur Centre of AICRP on Weed Control started functioning at the College of Horticulture, Kerala Agricultural University, Vellanikkara, on 14-10-1985. It started functioning as an ICAR/USDA project financed by FERRO, USDA under PL 480 funds. After the originally approved period of four years, the project was extended to 31-3-1990 by the ICAR. From 1-4-1990 the project is being continued as part of the AICRP on weed control under ICAR co-ordinated Project.

Mandate of the Unit

To conduct survey of weed flora, their distribution, ecology and habitat and to prepare weed map of the state; To study the ecology and control of problem weeds including aquatic and parasitic weeds; and to standardize analytical techniques for estimating herbicide residues in soil, crop and water systems and to monitor the fate of important herbicides used in Kerala.

Seminars/Summer institutes/Symposia/Trainings attended

Dr.C.T. Abraham, (Assoc. Prof.-Agronomy) and Dr.K.M. Durga Devi, Asst. Prof. (Soil Science & Agricultural Chemistry) attended National Seminar on Alien invasive weeds in India & workshop of AICRP from April 27-29, 2003, at Jorhat, AAU, Assam. Dr.T. Girija, Asst. Prof. -(Plant Physiology) attended Summer institute on "Physiological and molecular basis of productivity in sugarcane" from 16-6-03 to 15-7-03 at IISR, Lucknow and Refresher course on Bioprocess Technology from 2-12-03 to 24-12-03 at Cochin University of Science and Technology.

Research Programme

Weed Survey and Surveillance

Merrimia vitifolia (Burn.f.) Hallier f., a climber belonging to family Convolvulaceae is seen spreading fast in Kerala. Being a climber, it can grow over the trees and bushes and smother them.

Marsilia quadrifolia has become a major problem in low land rice fields, where 2,4-D application was being regularly done for many years. When other broad leaf weeds like *Monochoria vaginalis* and *Ludwigia parviflora* were controlled by 2,4 -D, Marsilia, which is not affected by the herbicide, got chance to become dominant.

Wild rice (*Oryza rufipogon*) is a serious problem in the areas where semidry rice is grown during *kharif* season.

Weed management in cropping system

Rice- rice cropping system

It is observed that the weed management practices followed in the preceding crop has a profound influence on the weed problems of the next crop, through addition of seeds to the soil seed bank. In this trial the plots receiving UWC (no weed control) during *rabi* season had very high incidence of weeds in the succeeding *kharif* season

Permanent herbicide trial

Long term herbicide trial in rice-rice cropping system

Butachlor residue persisted in soil to detectable limits only up to 15 DAS. During the first crop season, quantity of butachlor residues remained in the soil at 15 DAS was higher in FYM treated plots. Residues of pretilachlor were not detected even at 15 DAS

Biology and control of problem weeds

a. Mimosa invisa

The giant sensitive plant, an alien weed from the neotropics, has become a problem in many parts of Kerala. Evaluation of herbicides for control of this thorny weed showed that glyphosate @ 0.8 kg/ha is effective against the weed. However 2, 4-D was not effective. Paraquat could give only temporary control and regrowth occurred soon.

A few insects infesting the weed have been noticed. They are being identified. Toxicity of *Mimosa invisa* to cattle

Mimosa invisa contains an alkaloid, (Mimosin), which is poisonous to cattle feeding on the weed. As the weed has invaded many pasture and gras lands, there is chance of the weed getting mixed with the fodder and subsequently being used as cattle feed in the form of fresh or ensilaged or dried straw. Plant toxicity to animals is likely to occur.

Observations in the experiment confirmed the presence of toxic principle in *M.invisa*. All the three forms in which *M. invisa* was given to the rabbit resulted in weakness in the animals followed by alopecia (hairfall). The animals had Coccidiosis which may be due to the loss of immunity and weakness resulting from the consumption of *M. invisa*.

It is seen that ensiling *Mimosa* significantly reduced the toxic effect of the plant as revealed by the lack of any gross lesions in the internal organs of the animals. The dried powdered materials resulted in only mild changes in the kidney and liver, where as, when fresh juice was fed to the animals it resulted in severe hepatotoxicity and nephrotoxicity leading to death indicating that the toxicity can be reduced to some extent by drying the material and to a greater extent ensiling.

Control of lotus in canals

Wild growth of lotus (*Nilumbo* sp.) which has infested a large stretch of aquatic area including the canal used for irrigation/drainage to the paddy fields could be controlled by spraying glyphosate (10ml Round/litre of water) or 2,4-D (5g of sodium salt). Roots uprooted one month after spraying were decaying and black in colour in the herbicides sprayed plants whereas in the control plant roots were healthy and cream coloured.

Management of parasitic weed, Loranthus

¹⁴C studies on translocation of photosynthates between the host plant and the parasitic weed loranthus revealed that the photosynthates are being translocated not only from the host plant to the loranthus but also from the parasite to the host plant. This gives an indication that systemic herbicides not selective to the host plant may not be safe for the control of loranthus.

Effect of Ethrel on control of loranthus

The trial conducted with ethrel at concentrations ranging from 1000 to 5000 ppm showed that the concentrations 3000 ppm and above resulted in the complete defoliation of the parasite. Drying of twigs of the parasite from tip downwards was also noticed. The regrowth of the weed was observed from the basal portion nearer to the host plant after 2-3 months of spraying indicating that the control was only temporary.

Testing of new herbicides

For control of *Eichhornia crassipes* the dry powder formulation of glyphosate (MON 14420) @ 3.25 kg ha⁻¹ was found effective. It resulted in 100% drying of the weed by 45 DAS, without any regrowth.

The herbicide Algrip 20 WP (metsulfuron methyl) at 50 g ha⁻¹ (10 g ai/ha) was also effective in controlling *Eichhornia crassipes*

Field Demonstrations

Control of grass growth in riverbeds

The grass growth has become a problem in the riverbed of Bharathapuzha, near the famous Thirunavaya temple, preventing access to the river for the devotees coming to pay the last rites to the diseased relatives. As per the request of the temple authorities, an observational trial was conducted to evaluate the efficacy of herbicides for controlling the grass growth. The herbicides tested were paraquat (5 ml/l), and glyphosate (10 ml/l and 15 ml/l). They were sprayed on 10.4.2003. Observations on 22.5.03 showed that both doses of glyphosate were effective in killing the grasses without any regrowth. Even though paraquat dried the grasses initially, further regrowth occurred by 45 days.

Control of lotus (nilumbo sp.) in waterbodies

Wild growth of Lotus (*Nilumbo* sp.) and water lily (*Nymphaea* sp.) area problems in a few back water areas. They may cover extensive areas in low land rice fields and irrigation drainage channels and canals causing problems for water transport, movement of water and raising rice.

An on-farm trial was taken up in the farmers' field at Kochipadam kole, in Mapranam in Thrissur district. A long stretch of the irrigation canal and adjacent paddy field seriously infected with lotus was taken as the trail area. Application of herbicides glyphosate (10 ml roundup/litre of water) or 2, 4-D (5g of sodium salt) was effective for controlling the weed.

Other activities

One radio talk and 6 training classes were conducted during the perion.

Finance (2003-2004)

Head of account	Provision for the year	Expenditure	Station receipts
ICAR	14.130 lakhs	14,67,036	5,831

AICRP ON MEDICINAL & AROMATIC PLANTS, COLLEGE OF HORTICULTURE, VELLANIKKARA

Introduction

ICAR established a coordinating centre at College of Horticulture, Vellanikkara in Thrissur District, and the cultural capital of Kerala on 01-04-1987. This centre stands with an experience of a decade of research under co-ordinated programme. The Centre maintain a medicinal plant museum and a nursery centre attached to it. Besides educational value, this is useful in providing quality-planting material to the farming community at large. A high yielding accession of long pepper, the first of its kind in India, is evolved from this centre. Nearly 75-80,000 rooted cuttings of this variety "Viswam" area being produced annually. By the sale of planting materials of MAP the centre is generating an income of nearly rupees two lakhs every year.

Sufficient stock population of crops like Adhatoda, Plumbago, Alpinia, Strobilanthus etc. is available at the centre for production of planting materials. Hence there is potential for nearly doubling the production rate using this stock population itself. Students of Ayurvedic Colleges and other institutions are visiting the herbal museum of this centre. It is pertinent that this project has helped in expanding the interest on Medicinal and aromatic plants among public.

Mandate of the institution and lead function

Its aim is to carry out Crop improvement, Standardization of agro techniques, and Quality analysis of MAP and also to conduct Plant exploration and maintain germplasm of MAP; Co-ordinated trials allotted to the centre; and Collection and conservation of those species threatened with extinction.

The entire scientific staff was changed with effect from 1-2-2004 and new project proposals were sent to the Coordinator for approval. Dr. Ahemmed Bavappa, FAO consultant and former Director CPCRI visited the centre and offered necessary advice. The Matha Amrithanatha May Trust visited the centre and requested to render helps in establishing a medicinal garden at Vallikave, Kollam.

Research programmes

Reproductive biology of long pepper, a dioecious plant was elucidated and hybridization work initiated to accelerate the genetic variability in the species. The hybrid progenies of Kanjoor x Nilambur of various crosses utilizing the selected parents from each cluster are being evaluated.

In vitro mutation breeding was also resorted in long pepper and promising results were obtained. Germplasm evaluation in Kacholam identified a better variety which is quantitatively and qualitatively superior among other genotypes. The standardization of production physiology of *Kaempferia* has been done. Investigations in the scheme have opened new vistas for successful cultivation of patchouli accessions in coconut garden.

A pre requisite for popularization of superior accessions is ensuring easy multiplication techniques. This was successfully formulated in *Gymnema*, *Indigofera*, *Adhatoda* and *Cassia*. Experiments have revealed that the difficulty of rooting in *Gymnema* can be circumvented by confining to semi-hardwood laterals and or by using riboflavin as growth regulator which is superior to IBA in monetary terms. The prolonged dormancy of *Indigofera* which is hampering commercial cultivation by staggered germination can be broken by Conc. sulphuric acid treatment for 4 minutes before sowing followed by washing well in water. The dormancy of *Cassia fistula* can also be broken by Conc H_2SO_4 treatment of four minutes. The roots of *Adhatoda beddomei* the raw drug in the market could be identified from *A. vasica* by the presence of cystoliths in cortical region. The rooting and establishment of different propagules in *Holostemma* revealed that the hardwood cuttings with 88% rooting were the best.

The crop production trials in long pepper have revealed that *Azospirillum*, PSB and VAM have a positive influence on most of the root characters. High density planting at 30/90 cm x 30 cm combined with application of vermicompost and mulching resulted in maximum dry spike yield under irrigated conditions. Integrated nutrient management involving application of FYM @ 10 t/ha and NP @ 37.5:20 kg/ha and *Azospirillum*/*Azotobacter* was beneficial for economizing oil production. FYM @ 20 t/ha and NPK @ 40:20:20 kg/ha was beneficial for higher yield in *Kaempferia galanga*.

Extension Programme

1. Conducted radio talks; Field visit to farmers to give technical guidance and recommendation on cultivation of medicinal plants. Training classes on medicinal plants cultivation to farmers, Herbal garden is visited by students, farmers and officers of various departments; Participation in Thrissur Pooram Exhibition; Organized training programmes to various units.

Other activities

The planting materials of important medicinal plants are being produced and distributed from this project earning annual revenue of Rs. 1 lakh and above. Trainings are given to unemployed youths, tribes, medicinal plant growers etc. in the identification and cultivation of important medicinal plants. Attempts are also being made for the popularization of herbal home gardens as a means of germplasm conservation.

Important visitors

Dr. Bavappa, Retire Director, CPCRI, Kasargod and Dr. Satyabrata Maiti, Project Co-ordinator on Medicinal and Aromatic Plants visited the Station.

Finance (2003 – 2004) (lakhs)

Head of account	Provision for the year	Expenditure
ICAR	22.15	21.34
Other EAPs (CSS)	1.2	1.2

ALL INDIA CO-ORDINATED RESEARCH PROJECT ON BIOLOGICAL CONTROL OF CROP PESTS AND WEEDS, COLLEGE OF HORTICULTURE, VELLANIKKARA

Introduction

Kerala Agricultural University sanctioned a Scheme for ascertaining the feasibility of biological control of *Salvinia* on 25th January 1972. The Scheme commenced work on 4th October, 1972, at Mannuthy, Trichur. Later this scheme was merged with the Kerala Agricultural University Centre of All India Co-ordinated Research Project on Biological Control of Crop Pests and Weeds on 1st April, 1977.

Mandate of the station

To evolve biocontrol techniques against weed problems of Kerala, to survey and identify natural enemies of crop pests, to evaluate promising biocontrol agents of pests of crops like rice, vegetables, fruits and coconut.

A few memorable events of the Institution

Award of KAU for outstanding contribution on biological control of African payal in Kerala using the insect *Cyrtobagous salviniae*. Award of PDBC, Bangalore for the significant contribution made by the Centre in the field of biological control of weeds.

Details of deputation for Seminars/Workshops/ Summer Institutes/Symposia

Dr. S. Pathummal Beevi and Dr. K.R. Lyla participated in the XIIth Biocontrol workers group meeting held at GAU, Anand during 3rd to 5th July, 2003. They also attended national training programme on "Mass production technology of biocontrol agents", at NCIPM, IARI campus, New Delhi during February, 18th to 26th, 2004.

Major research achievements

- a. *Orthogalumna terebrantis* Wall Work, the galumnid mite pest of water hyacinth established all over the release sites in Kerala and spread far and wide giving partial suppression of the mat, it certainly helped to reduce the vigour and health of the plant thereby making the plant susceptible to other pests and diseases and thus reducing its competitive advantage.
- b. *Cyrtobagous salviniae* weevils continue to maintain its ability in suppressing and maintaining a balanced population of the *Salvinia* weed over the vast areas of paddy fields and backwater regions covering an extent of 1000 km square in Kuttanad and Kole lands of Kerala
- c. Evaluation of *Trichogramma* parasites for the management of rice pests indicates that there was no significant difference in yield between treatments and control. It indicates the effective role played by natural control/natural enemies in the paddy ecosystem. It also indicated the need

for restricting the use of chemicals for pest epidemics only and the practice of wide scale use of chemicals for plant protection for paddy pest management is unnecessary and should be discouraged by all means. The message is already being conveyed through the IPM programme in the State and our trials helped to generate additional data to substantiate the IPM concepts.

The efficacy of entomofungal pathogens viz; *Metarhizium anisopliae* and *Beauveria bassiana* were evaluated for two seasons for the management of leaf and plant hoppers. During *rabi* season, *B. bassiana* was effective in reducing hopper population.

Survey for relative abundance and parasitism levels of natural enemies of important rice pests was conducted during 2003-04. The major spiders recorded during *rabi* and *kharif* seasons were *Tetragnatha javana*, *T. mandibulata* and *T. andamanensis*. There was no significant difference in the population of entomophages in different locations during *kharif* season. *In-situ* collections were also made in the two seasons and the major parasitoids collected from stem borer egg mass was *Tetrastichus schoenobii* and *Telenomus* sp. *Platygaster malabaricus*, *P. oryzae* and *P. inderdaadi* were the parasitoids of rice gallfly.

A field trial on organic farming was laid out during *kharif* and *rabi* seasons 2003-04 and the results show that the natural enemy population viz., coccinellid and spider population were significantly high in organic farming plot.

Mycohit evaluation against coconut mite through frequent sprays was carried out. The live mite count was significantly low in the nuts of second bunch collected from mycohit-applied palms when compared to the untreated control. But there was no significant difference in the live mite count in the nuts of third bunch of mycohit applied palms and control. Pre and post treatment assessment of the nut characters was also done, but there was no significant difference in the nut characters between the two treatments.

The release of *Goniozus nephantidis* against *Opisina arenosella* was evaluated by conducting a field trial. After III, IV, V and VI releases of parasitoid, the population of *Opisina* came down and it was significantly low in the parasitoid released palms when compared to control palms.

Field evaluation of *Cardiastethus exiguus* against *O. arenosella* was carried out during the year and resulted in significant reduction of the *Opisina* population after release of the predator when compared to control. However, there was no significant difference in the number of predators released, 50 vs 100.

Monitoring and evaluation of the biocontrol agents of weeds were also carried out and found the presence of the bio-agents in all the locations surveyed.

NATP/CGP on coconut mite

Under the NATP project on coconut mite, extensive survey was undertaken in Kerala, and specific fungal pathogen *Hirsutella thompsonii* was recorded from all the three-agro ecological situations. In addition to *H. thompsonii* a number of other fungi were also found associated with dead coconut mite collected from the field. They are *Acremonium*, *Fusarium*, *Sporothrix*,

Paecilomyces, *Verticillium* and other unidentified species. Based on the preliminary studies on cultural, morphological and biological properties, different isolates of *H. thompsonii* are being maintained for further studies.

ICAR ad-hoc project on spiders

Spider survey: To find out diversity and abundance of spiders, survey is continuing in the vegetable and rice agro-ecosystems of Thrissur and Palakkad districts.

Total species recorded from various agro-ecosystems; In Thrissur district Rice – 31; 2. Bitter gourd – 26; 3. Ivy gourd – 24; 4. Cowpea – 19; Palakkad district; Rice – 32; 2. Snake gourd – 27; 3. Ivy gourd – 30.

Guild structure: In both the districts, major spider guild represented in all the crops are orb weavers, next highly recorded guild was stalkers.

ICAR ad-hoc project “Forewarning Tea Mosquito Bug (*Helopeltis antonii*) in Cashew

Collected nine species of predatory spiders from cashew ecosystem.

Extension and other activities

Supplied biocontrol agents to farmers and visited farmers fields and suggested remedial measures for weed and pest problems.

Dr. S. Pathummal Beevi and Dr. K.R. Lyla took classes to the Agricultural Officers, Department Agriculture, Govt. of Kerala on Biological control on 16/5/2003, 28/5/2003, 18/6/2003 & 28/6/2003.

Important visitors

The fourth QRT of PDBC, Bangalore headed by Dr. C.P.S. Yadav, Former Vice Chancellor, RAU with Dr. B.L. Jalali, Former Director of Research, HAU., Dr. G.J. Patel, Professor & Head, Department of Nematology, GAU., Dr. B. Senapathy, Professor, Department of Entomology, Central Agrl. University, Imphal and Dr. N.S. Rao, Principal Scientist, PDBC, Bangalore, visited on 22nd and 23rd August, 2003 to review the work of the project.

Dr. D. Rajagopal, Scientist, IICT, Hyderabad visited on 23/9/2003 in connection with water hyacinth management in Kerala.

Dr. R.J. Rabindra, Project Director, P.D.B.C. Bangalore visited the Centre to review the research work on 17-12-04.

Finance: 2003-2004 (in lakh)

Head of a/c	Provision for the year	Expenditure
ICAR	13.05	13.85
Other EAPs		
a. ICAR Ad-hoc project on spiders	0.40	0.36
b. NATP/CGP on Coconut mite	4.40	4.04

AGRONOMIC RESEARCH STATION, CHALAKUDY

Introduction

The Agronomic Research Station, Chalakudy was established on February 14, 1972 by shifting the farm established in 1962 at Pariyaram by the Department of Agriculture, Kerala. The Kerala Agricultural University took over the station in 1973 for implementing the Co-ordinated Research Project on Water Management sponsored by ICAR. The Scheme started functioning from July, 1974. The sub project for water management studies in the Central Region of Kerala started under NARP in 1983-84 and completed in April, 1988, continued as a sub centre of this station at Vellanikkara. A new Project entitled "Onfarm Water management studies-Pilot Project" financed jointly by the Ministry of Water Resources Development, Government of India and CADA, Kerala was functioning in the station from April, 1989 to March, 1994. From 1989, Annual Plan projects were started at Chalakudy and established a Water Management Unit on Tree Crops at Main Campus, Vellanikkara.

The research station is located at 10° 20' North latitude and 76° 20' East longitude at an elevation of 3.25 m above mean sea level. The station is situated on the Chalakudy-Sholayar Road, 400 m away from Chalakudy town on way to Athirappilly and Sholayar tourist Centre.

The total area of the farm is 8.89 ha consisting of 4.51 ha wet land and 4.38 ha upland. The soil in the farm is sandy loam and contains 75-80% sand, 4-12% silt and 7-11% clay. The bulk density varies from 1.3-1.7 g/cc. The soil is acidic in reaction having pH of 5 to 6.1. The EC varies from 0.2 to 0.5 mmhos/cm. The sub unit at Main Campus, Vellanikkara, has an area of 6.92 ha.

Mandate of the station

The mandate of the station is to develop a low cost high tech water use and high profit land use pattern by evolving production technologies for utilising scarce moisture resources and to serve as a model centre of crop production for the command area of Chalakudy Irrigation Project.

Lead Functions

Water Management and irrigation scheduling in crops and cropping systems.

Auxiliary functions

To develop cropping pattern suitable for varying water management and fertility situation., To test new crops and varieties for their adaptability and performance under different moisture conditions, To estimate the water requirements and water management studies on annuals like rice, pulses, oil seeds, vegetables, banana, tuber crops and perennial like coconut, arecanut etc., To evolve suitable measures to increase water use efficiency of important crops of the area and to work out the economics of cultivation, To find out cheap and efficient methods of irrigation for different crops, To evaluate water conveyance losses through seepage and to develop economically viable design to reduce these losses, To conduct onfarm water management in cultivators' field with improved water management technologies developed in the research centre and To produce quality seeds and seedlings.

Satellite Station

Water Management Research Unit on Tree crops - Sub Unit Vellanikkara.

A few memorable events of the institution

In order to commemorate the "Fresh water year", 2003, the Ministry of water resources, Government of India, decided to organise a Jalyatra in the co-operative centres of AICRP(WM). A 'one day' seminar on 'Jalyatra' was conducted at this Station on 18th December, 2003. Dr. K.V. Peter, Vice Chancellor, KAU inaugurated the function, presided over by Mrs. Mary Nalan, Municipal Chair person, Chalakudy Municipality. Dr. A.I. Jose, Director of Extension, KAU delivered the key note address. The publication on insitu water harvesting and efficient use of water were released by Mrs. Mary Nalan. Classes were organised on the theme "Fresh Water conservation and its judicial and efficient use" aimed at creating a general awareness among the participants. The participants were mainly women from Kudambasrees, school teachers, house wives and other Government and Non-government organisation. All the participants actively involved in the discussions.

Seminars/summer institute/symposia/training attended

Scientists of the station attended seminar on potential and prospects of protective cultivation, biennial scientist meet, winter school on waste land management and summer school on use of modern tools for increasing on-farm water use efficiency.

Major Research Achievements

Trial on yield maximisation in rice

Studies on production potential of rice under different moisture regimes in farmers field revealed that application of Silica(100 Kg ha⁻¹) and higher dose of K(120 kg ha⁻¹) under irrigation at 3 days after disappearance of ponded water significantly increased the rice yield by 21 to 78% over control(40 kg K₂O + No silica + continuous submergence). N and P were applied @ 90:45 Kg N P₂O₅ ha⁻¹ respectively. Pest and disease pressure were also low in treatment plots.

Trial on KAU microsprinkler

Each treatment consisting of 20 trees were selected for the experiment and the LEPA irrigation systems were installed @ 4 units per tree. Observations on nut yield and performance of the system are being assessed.

In view of the advantages noticed and the acceptance by the farmers, demonstration programme is proposed in collaboration with CADA.

Comparative study of drip method of irrigation on soil water status, growth and yield of coconut.

The main objective of the experiment is to study the effect of drip irrigation on soil water status and yield of coconut. The crop was planted during September 1996. The drip systems were installed and irrigation treatments have started as per technical programme.

Development and evaluation of a Cablegation system for semi-automization of surge irrigation in furrows.

The design of the system is over and fabrication of the unit has been started.

Effect of irrigation and mulching on growth and yield of coconut.

The objective of the experiment is to study influence of different levels of irrigation and mulching husk burial and coir pith burial on growth and yield of coconut. Planting of the

coconut seedlings was done during 1992-93 and the irrigation as per the technical programme was scheduled from January, 1994 onwards. The biometric characters did not show significant variation between treatments. It is too early to draw definite conclusions as majority of palms have not yet stabilised the yield. The effect of irrigation and mulching could be ascertained only during subsequent years.

Effect of irrigation on growth and yield of cashew (Anacardium occidentale)

The objective of the experiment is to study the response to irrigation on growth and yield of cashew and to evolve an optimum irrigation schedule for the crop. The experiment was started during June 1996. Treatment-wise irrigations were given from January to April during summer months. Seventy five percentage of the trees flowered during the period. Observations on nut yield show positive response to irrigation, though the effects were not statistically significant.

Comparative studies on wetting front advance of soil moisture under surface and sub-surface drip irrigation for different discharge rates

The experiment was conducted to enrich the data base on micro irrigation. Emitters of 2,4,6, and 8lph were tested for their wetting front advance when installed at the surface as well as at 30cm below surface. Quantity of water applied was the same in all the treatments. Soil profiles across the point of application were opened 24 hours after irrigation and were traced out. Soil samples at grid points of 15cm x 15cm were taken and analysed for soil moisture distribution pattern.

The results showed that lower the discharge rates, wider was the area wetted. Subsurface application to conserved 3% moisture more than that under surface application. The distribution pattern was almost the same (bulb shaped) in all the cases. Mathematical models were also developed for horizontal and vertical wetting front advance for various discharge rates.

Water Management practices for coconut based cropping systems

The experiment started during summer 2002. Planting of nutmeg, arecanut and pepper were completed. Irrigation systems were installed as per the technical programme. General performance of crops was good.

Effect of irrigation and organic manure on the growth and yield of Long Pepper as inter crop in coconut gardens.

The experiment was started during July, 2003. Organic manures as per treatments were given at the time of planting. Life saving irrigations were given upto December. Treatment wise irrigations will be started from January 2004.

Studies on the effect of mulching and water regimes on growth and yield of betelvine

Cuttings of betelvine were planted during September 2003. Organic manures (Neem cake+ FYM + Bonemeal) were applied at the rate of 50 tons per hectare per year in different splits. Uniform irrigations were given for establishment of the crop. First lowering of vines was done during December 2003.

Integrated Nutrient Management (INM) for rice

Among the sources of organic manure, vermicompost showed significant influence on yield. Levels of fertilizers and bio-fertilizers did not show any significant effect on yield.

Irrigation cum nutrient requirement of cowpea

Sprinkler irrigation is found very effective and economic in increasing the yield both in bush and trailing type cowpea grown in summer fallows in light soils. Irrigations are to be

given at an interval of 6-8 days through sprinkler at an intensity of 0.63 cm/hr (0.63 litres/hr./sq.cm) for two hours. This scheduling gives 36.4% increase in yield over channel/flood irrigation. This is recommended for inclusion in the zonal package of central region.

Irrigation cum nutrient requirement of sesamum

Sesamum is usually cultivated as summer crop in rice fallows utilizing the residual moisture after rice crop. In sesamum, Sprinkler Irrigation at an intensity of 0.63 cm/hr(0.63 liters/ hr./Sq. Cm.) for two hours is found very effective and economic in increasing the yield in light soils. An increase in yield of 16.5% is realized over flood/channel irrigation through this system. This is recommended for inclusion in the zonal package of central region.

Research highlights

Studies on production potential of rice under different moisture regimes in farmers field revealed that application of Silica (100 Kg ha⁻¹) and higher dose of K(120 kg ha⁻¹) under irrigation at 3 days after disappearance of ponded water significantly increased the rice yield by 21 to 78% over control(40 kg K₂O + No silica + continuous submergence). N and P were applied @ 90:45 Kg N P₂O₅ ha⁻¹ respectively. Pest and disease pressure were also low in treatment plots.

Studies on fertigation in ladies finger through Bubbler Irrigation System(KAU micro sprinkler) is very effective compared to channel irrigation. Irrigating the crop at 60% PE(7 lit/Sq.m approx.) in alternate days is sufficient to realize an yield increase of 31% over control in light soil. Fertigation is effective and economic and can save 50% of N recommended to the crop (75 kg N ha⁻¹).

Comparative study of irrigation in coconut garden using KAU Micro sprinkler (Bubbler)

In view of the success in the performance of KAU micro sprinkler in farmers field, more demonstration plots are proposed to be laid out by CADA in four irrigation commands of the state in 2004-05.

Comparative study on surge and continuous furrow irrigation in tapioca revealed that WUE was increased by surge method. A saving of 17% water could be attained in surge flow technique with an increase of 29% yield over continuous furrow irrigation.

Comparative studies on wetting front advance of soil moisture status under surface and sub surface drip irrigation showed that the lower the discharge rates, the wider was the area wetted. Sub surface application(30 cm depth) to conserved 3% moisture more than that under surface application. The distribution pattern of moisture was same(bulb shaped) at all the discharge rates 2, 4, 6 and 8 lit/hr).

Sprinkler irrigation is very effective and economic in increasing the yield both in bush and trailing type cowpea grown in summer fallows in light soils. Irrigations are to be given at an interval of 6-8 days through sprinkler at an intensity of 0.63 cm/hr (0.63 litres/hr./sq.cm) for two hours. This scheduling gives on increase in yield of 36.4% over channel/flood irrigation. This is recommended for inclusion in the zonal package of central region.

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Training programme

Sl. No.	Training/seminar	Beneficiaries	Venue	No. of Participants
1.	Jalyatra seminar on fresh water conservation on December 18, 2003	Farmers, House Wives, School teachers & officials	ARS, Chalakudy	60
2.	Farmer-scientist interaction programme on kharif rice growing on July, 23&24, 2003	Farmers	ARS, Chalakudy	50

Field visit to farmer fields

Name	Date/period	No. of visits	Main problems tackled
Smt.G.Santhakumari Professor.	4/2003 3/2004	22	Coconut cultivation. Irrigation. Vegetable cultivation, Tapioca management.
Dr. S. Pushkala, Assoc. Professor	"	32	Nutmeg disease, Coconut irrigation. Vegetable diseases. Banana irrigation & Management, Summer fallow cowpea.
Dr.T.K Bridgit, Asst.Professor.	"	56	Summer fallow rice vegetables cowpea. Sesamum cultivation Cowpea management. Bittergourd cultivation & diseases. Paddy management.
Dr. K.P Visalakshi Assoc. Professor	"	10	Irrigation Practices. Selecting proper methods of irrigation to increase water use efficiency.
Smt. Reena Mathew, Asst. Professor.	"	25	Paddy cultivation & Management Cowpea & other Vegetable Cultivation.
Dr. Mini Abraham, Asst. Professor.	"	18	Vegetable Cultiva-tion, Management of perennial crops like coconut.
Dr. V.S. Devadas, Assoc. Professor	"	12	Vegetable cultivation and floriculture, management of fruit plants and plantation crops.

Dr.K.P. Visalakshi took class on use of plastics in micro irrigation to the Agricultural Officers at Regional Agricultural Technical Training Centre, Vyttila.

Finance (2003-04) (in lakhs)

Expenditure

Head of A/c	Provision for the year	Expenditure	Receipts
Non Plan	23.84	22.32	-
Plan	2.61	1.89	-
ICAR	31.35	32.49	-
Other EAPs	-	.0587	-

Receipts

Revolving Fund	1.65	1.68*	1.91
KAU/Station A/c	3.00	2.85**	3.53

* Expenditure under Revolving Fund Scheme.

** Total withdrawals (amount transferred to Comptroller) from the Non-operating SB account for station receipts.

AROMATIC AND MEDICINAL PLANTS RESEARCH STATION, ODAKKALI

Introduction

The station was established in 1951 as "Lemongrass Breeding Station" under the Department of Industries of the erstwhile Travancore-Cochin Government. The centre was brought under the Department of Agriculture with effect from 1-8-1954 and was baptised as "Lemongrass Research Station". Consequent to the formation of the Kerala Agricultural University in 1972, the station became an integral part of the University's research network. Diversifying the research emphasis of the centre to cover all other tropical aromatic and medicinal plants, the station was renamed as Aromatic and Medicinal Plants Research Station (AMPRS) in 1982 and was brought under direct administrative control of the Associate Director of Research (Central Region) of the University.

Aromatic and Medicinal Plants Research Station, Odakkali lies between 10°5'40" and 10°6'0" North latitude and between 76°32'35" and 76°32'55" East longitude in the Asamannoor village of Kunnathunadu taluk in the Ernakulam district of Kerala. The station is located 27 km east of Aluva (nearest railway station) on the Aluva-Munnar road, 16 km from Cochin International Airport, Nedumbassery and 50 km from Cochin (harbour), the main centre of essential oil trade in the country. The station is situated at an elevation of 60 m above MSL and represents the typical soil and agroclimatic features of the mid lands of the state.

Mandate of the Institution

To provide research and development support to the medicinal and aromatic plants cultivation in the state.

1. intensification of research on aromatic and medicinal plants
2. transfer of technology to the targeted group
3. supply of good quality planting materials
4. quality testing and evaluation
5. germplasm collection and maintenance of selected mandated crops

A few memorable events of the station

Golden Jubilee year of the station's establishment was celebrated during October 2000 in a befitting manner with scientific seminar, farmer training programmes and exhibitions. Considering the significant contribution of the centre, Ministry of Health and Family Welfare, Govt. of India, identified the centre for large scale cultivation and development of selected endangered species of medicinal plants widely used in indigenous systems of medicine.

Ministry of Agriculture, Government of India recognized the phytochemical laboratory of the station as one of the Regional Analytical Laboratories for medicinal and aromatic plants in the country.

An Information and Sales Centre of the University was established at this centre to cater to the needs of the farmers of Ernakulam and Idukki districts.

Major research achievements

Conservation of medicinal tree species in large area plots was undertaken. Agrotechniques for *Curcuma aromatica* were developed. Quality evaluation techniques for stevia were developed. A new project for the development of flavouring substances from lemongrass was started. Efficacy of the surfactant AP5A-80 in reducing the dosage of insecticides applied to vegetables was studied. Socio-economic studies of selected subjects in the Eramalloorthodu watershed area was undertaken.

Extension and other activities

Being one of the pioneer institutions engaged in the research on aromatic and medicinal plants, good liaison is maintained between producers, traders, and the user industry. Dissemination of technology is efficiently carried out through regular farmer contact programmes, correspondence, newspapers, audio and visual media. The station functions as a quality testing centre for essential oils and important medicinal plants & crude drugs thereby enabling the farmers to fetch the maximum price for their produce based on quality. Agrilinic and training programmes are integral part of our extension activities. We have participated in local agricultural fairs and exhibitions. On-farm demonstration and adaptive trials with medicinal plants and on control of coconut perianth mite were conducted in farmers' fields in Ernakulam district. The station meets the demand of planting materials from potential cultivators not only from within the state but also from places everywhere. In addition, the following activities also were undertaken.

1. Classes arranged for farmers on cultivation and crop protection practices of different crops.
2. Classes were handled by the scientists of this station to the Extension officers and Agril. Assistants of the Dept. of Agriculture on Integrated management of pests and diseases and different agrotechniques.
3. Dr. Baby P. Skaria served as a resource person in the monthly T&V Workshop programme of the Ernakulam District
4. Karshaka Dinam on Chingam 1 was celebrated under the joint auspices of the Dept. of Agriculture and this station.
5. Diagnostic field visits, identification of field problems brought by the farmers and recommendations and follow up were done by the scientists of the station.
6. A state level seminar on "Cultivation of Aromatic and Medicinal Plants" was conducted.

Finance (in lakhs)

Head of Account	Provision for the year	Expenditure	Receipts
Non Plan	28.80	28.38	23.01
Plan	9.61	8.85	
ICAR	8.48	6.88	
OEAPs	15.73	15.33	
Revolving fund	1.00	2.76	4.19
Total	63.62	62.20	27.20

PINEAPPLE RESEARCH STATION, VAZHAKULAM

Introduction

The Pineapple Research Station was established on 2.1.1995 at Vazhakulam, located 10 km east of Muvattupuzha towards Thodupuzha, to give research and development support to pineapple farmers. Vazhakulam is the heartland of pineapple production and marketing in Kerala. Fresh pineapple is being regularly supplied to about ten states in India and also exported to some countries from Vazhakulam. The area under pineapple in Kerala is increasing every year and the farmers are adopting intensive farming practices. This has necessitated the management of new problems arising out of it and also the development of new technologies to meet the new challenges. The station is undertaking research on crop improvement and development of sustainable farming technologies in pineapple. During this year, the station has taken up research on passionfruit also as an additional fruit crop in cooperation with the Nadukkara Agro Processing Company Ltd.

Mandate of the Station

Mandate of the station is to undertake research on pineapple for crop improvement, for development of sustainable farming technologies, to undertake pest and disease surveillance in pineapple and to render farm advisory services to the pineapple farmers.

A few memorable events of the Station:

The station was formally inaugurated and started functioning on 2.1.1995 in a rented building. Research projects in crop improvement and crop management were started during 1995 itself in farmers fields with their cooperation and area still continuing. The land required for the office building (15 cents) was received on 24.6.1996 in which the office building was constructed and occupied on 27.6.1998.

Seminars/ summer institutes/ trainings attended

Kuriakose, K.P., Assistant Prof.(Pl. Br.) attended Group discussion of scientists of AICRP on Tropical Fruits from 7.2.04 to 10.2.04 S.V. Agricultural College, Tirupati, Andhra Pradesh.

Research Programme

Crop improvement

1. *Improvement of pineapple var. Mauritius through hybridization and induced mutation.*

Objective of the project is to develop a high yielding short duration variety suitable for both fresh fruit market and processing industry and acceptable to farmers. There are four experiments under this project.

i) Hybridization

The parents included in the hybridization programme are Kew, Mauritius, Reply Queen, Seln-1, Pampakuda Local and Kakkoor Local. About 10000 hybrid seedlings developed from a six parent crossing programme and are in the process of field evaluation. At present, there are about 5000 hybrids in field. Harvesting of fruits and evaluation for various quality parameters are continuing. About 1000 hybrid seedlings are in the primary and secondary nursery.

ii) Induced mutation

Irradiated suckers at five doses are planted for evaluation. About 150 plants are in the field.

Hybrid seeds irradiated at five doses are planted and about 500 plants are in the field and are at various stages of evaluation.

iii) *In vitro* mutation:

Irradiation of *in vitro* pineapple cultures are done at six doses and about 1500 tissue culture plants were planted out in the main field.

2. *Intra clonal variability in pineapple var. Mauritius.*

The objective of the project is to identify a superior clone of pineapple utilizing the natural variability available, if any. Surveying and collection of plant types is in progress and already collected four types. One plant type with plant characters of the Mauritius variety and fruit characters of Kew variety was located in farmers field. Its fruit quality is comparable with that of Kew. The duration of the type is shorter than Kew and is around 12 months. The selected type is under multiplication and evaluation for confirmation of the findings.

3. *ICAR ad-hoc scheme "Evaluation of pineapple hybrids for higher yield, quality and suitability for intercropping"*

This scheme started on 1-1-2002. About 1700 hybrids were evaluated individually for yield and quality, so far. All the hybrids once harvested are multiplied and planted for further evaluation. Promising hybrids for yield and quality identified in the initial evaluation are under multiplication for detailed evaluation. Eleven promising hybrids were evaluated thrice in which a few hybrids are found to be better.

4. *Collection and evaluation of passion fruit germplasm for selection of varieties suitable for low altitudes.*

This project was started in cooperation with the Nadukkara Agro Processing Company Ltd. The objective is to identify a passion fruit variety suitable for low altitude

areas in Kerala. The scheme started on 1.4.2003. Survey and collection in passion fruit growing areas in Kerala and Tamilnadu were made. The hybrid variety from IHR, Bangalore was also collected. Altogether about 125 collections are planted and the harvesting and quality analysis of the fruits are going on.

Crop management

1. " *Evaluation of organic manures with bio fertilizers for maximizing the yield and quality in pineapple var. Mauritius* ".

Influence of various organic manures and bio fertilizers are compared to select the most suited manure for maximum yield and quality of pineapple var. Mauritius. This trial was planted on 14 June, 2000. Farm yard manure (600g/plant), poultry manure (250g), vermi compost (250g), neem cake (50g), azospirillum (625mg) and phospho bacteria (625g/plant) were tested along with the recommended dose of chemical fertilizers (N, P₂O₅, K₂O @ 8:4:8 g /plant), against a no-organic manure control (N, P₂O₅, K₂O @ 8:4:8 g /plant alone) treatment. Datas were recorded on the growth and yield parameters. Yield of the planted crop and two rations were recorded.

Yield and average fruit weight were not statistically significant, except the fruit yield of second ratoon. In the second ratoon, yield of plots applied with Farm yard manure (600g/plant), poultry manure (250g), and vermi compost (250g), gave the highest yields, and they were on par. The trial was completed. Cumulative yields over the three years were also high for these treatments, though not statistically significant.

2. *Nutrient requirement of pineapple var. Mauritius:*

Objective of this trial is to standardize the optimum requirement of N, P and K, and the trial was planted on 24.11.2000. This trial compares 64 nutrient combinations- four levels each of N, P and K in all combinations- along with a no-fertilizer control. Data were recorded on were growth and yield parameters. Yield of the planted crop and two rations were recorded.

Yield and fruit size did not statistically vary for different dosages tested. The lowest level of N, P and K @ 8:2:8 g/ plant /year was on par with the higher doses.

3. *IPL Project on "Studies on the use of potassium fertilizers for improving yield and quality of pineapple on main production sites of Kerala state "*

The objectives of the project are to study the response of increasing potassium rates on pineapple yield and quality, to study the effect of two different sources of potassium- MOP and SOP- on pineapple productivity and quality and to study the impact of balanced nutrients – potassium, sulphur and magnesium on pineapple growth and quality. The trial is conducted in garden land and in wet land conditions using var. Mauritius

Treatments: Nine, as detailed below:

- T1 - 8g N, 4g P₂O₅ and 8g K₂O as MOP per plant per year
- T2 - 8g N, 4g P₂O₅ and 8g K₂O as SOP per plant per year
- T3 - 8g N, 4g P₂O₅ and 16g K₂O as MOP per plant per year
- T4 - 8g N, 4g P₂O₅ and 16g K₂O as SOP per plant per year
- T5 - 8g N, 4g P₂O₅ and 24g K₂O as MOP per plant per year
- T6 - 8g N, 4g P₂O₅ and 24g K₂O as SOP per plant per year
- T7 - 8g N, 4g P₂O₅ and 24g K₂O as MOP + 1g Mg SO₄ per plant per year
- T8 - 8g N, 4g P₂O₅ and 24g K₂O as SOP + 1g Mg SO₄ per plant per year
- T9 - 8g N, and 4g P₂O₅ alone (control, no potash) per plant per year

Results of the experiment in Garden land (second year, first ratoon crop)

Yield and number of fruits were influenced by the treatments. Higher yield was observed from plots receiving SOP, than MOP in every level of K₂O. Yield of fruits received from T₉ – no potash control (53.2 kg) and T₁ - 8g K₂O as MOP/plant (57.2 kg) were on par. Yield of fruits received from T₅, T₃, T₇, T₄ and T₈ were on par with T₂ (8g SOP/Plant). The lowest yield was from T₉ no-potash control plots (53.2 kg) and the highest from T₆ (101.27 kg) ie. plots receiving 24 g K₂O as SOP/plant.

Results of the experiment in Wet land (first year, plant crop)

The highest yield of 67.27 kg/plot was obtained from plots receiving 24 g K₂O as SOP + 1 g MgSO₄/plant and the lowest yield was from T₉ – no potash control (48.13 kg). T₉ (no potash control) and T₁ (8 g K₂O as MOP) were on par and T₁, T₂, T₃, T₅ and T₇ were on par. T₁ (8g MOP/Plant) had 13.59% higher yield and T₂ (8g SOP/plant) had 17.66% higher yield over T₉ control plots.

4. Standardisation of agro techniques for pineapple in a farmer-participatory approach

During 2003-04, three trials were conducted in farmers' field, in three different locations (Myloor – Pallarimangalam Krishi Bhavan; Vazhakulam – Vazhakulam Krishi Bhavan; and Airapuram – Mazhuvannoor Krishi Bhavan).

i) Standardisation of pre-planting sucker treatments:

Five treatments – as per POP; BM+ Quinalphos, Chlorpyrifos + mancozeb; Pseudomonas; and untreated fresh suckers as control – were tested in four replications in all the three locations. Results indicated 0.63- 2.5% root rot incidence in the POP treatment (weathering of suckers and removal of dried scaly leaves at bottom). No other pest / diseases noted. Treatments were not statistically significant for root rot incidence, yield and average weight of fruits.

ii). Suitability of Green manure crops in pineapple

Daincha, sun hemp and cowpea were grown in the interspace against a control (4 treatments) in five replications in all the three locations. Seeds were broadcast after planting of the pineapple, and were uprooted and put as manure on attaining maximum vegetative growth. Total biomass yield of the green manure crops varied statistically in all the three locations. In two locations, cowpea gave the highest biomass yield. Low

weed growth due to heavy smothering effect was also observed in cowpea plots. Total fruit yield and average weight of fruits varied statistically in two locations; and these were higher when compared to control plots. Considering the yield and weed smothering effects, cowpea is found to be a suitable green manure crop for pineapple.

iii) Selection of Inter crops for pineapple :

Bhendi (in one row, and in two rows), brinjal (in one row, and in two rows), cowpea (in two rows and in 4 rows), coleus (in two rows and in 4 rows) and ginger ((in 4 rows) were grown in inter spaces (9 treatments) in 3 replications in 3 locations. The inter crops were grown during June- November in the inter spaces after planting pineapple.

Yield of intercrops varied significantly. Bhindi and brinjal (2 rows each) and coleus (4 rows) gave the highest yields. Considering the additional returns, coleus, brinjal and ginger would be beneficial to farmers.

Yield of pineapple and fruit size were not effected significantly.

Extension and other activities:

<i>Sl. No.</i>	<i>Item/ activity</i>	<i>Place</i>	<i>Total cases attended</i>	<i>Scientists attended</i>
1.	Farm advisory services rendered	PRS, Vazhakulam and field visit to farmers' plots	49	Dr. V. S. Devadas, Associate Professor K. P. Kuriakose Assistant Professor
2	Participation in the monthly workshop of Emakulam Dist.	RATTC, Vyttila	seven	Dr. V. S. Devadas, Associate Professor

Classes handled in agril. seminars/ training

V.S.Devadas, Assoc. Professor took 13 Classes related to pineapple and vegetable cultivation in various Agril. Seminars and training programmes; K.P.Kuriakose, Asst. Professor took 6 Classes related to pineapple cultivation in various Agril. Seminars and training programmes.

Finance 2002-03

Head of account	Revised Budget (2003-04) (Rs. Lakh)	Total Expenditure (Rs.)
Plan	11.538	8.101
ICAR	1.436	1.603
Other EAPs	1.450	1.399
STATION TOTAL	14.424	11.103

CSR SUB CENTRE (ECF UNIT), VADAKKENCHERY

Introduction

The CSR Sub-Centre (earlier known as ECF Unit) is the on-farm research unit of the Cropping Systems Research Project Network, financed by the ICAR and the KAU; and co-ordinated by the Project Directorate of Cropping Systems Research Project at Modipuram, Meerut, UP. The ECF Unit started in 1971, had functioned in various districts of State with 3 year duration. The period of operation was fixed as five years from 1988, and area of operation extended to an agro-ecological zone. During 1988-93, it covered the Central Zone with HQ at Mannuthy; during 1993-98 in the Problem zone with HQ at Kayamkulam and at present, in the Central zone with HQ at Vadakkenchery and Alathur, since August, 1999.

Mandate of Station

The main mandate of the station is to conduct on-farm research under the actual farming situations on location specific problems by researcher-extension workers-farmers participatory research. The area of operation of the station is now the Central Zone. The main goal is to evaluate and refine/develop client-oriented need-based technologies under different bio-physical and socio-economic conditions existing on farms, and transfer the fully baked technologies for large scale adoption.

Workshops and Seminars attended

The Scientists of the sub centre attended to one training course, one short course on recycling of organic and Industrial Waste and also attended the 16th Kerala Science Congress.

Research programmes

NPK response

In general, during *kharif* the response for N and K was comparatively less in Palakkad, when compared to Ernakulam and Thrissur districts. For P, the response was the lowest in Ernakulam district. N response was the highest in Thrissur (12.34), followed by Ernakulam (9.51) and the lowest in Palakkad (6.83). The response to P was highest in Ernakulam (9.93) followed by Palakkad (6.2) and Thrissur (3.11) K response was almost similar in Thrissur and Ernakulam (7.98 and 6.82 respectively) and it was the lowest in Palakkad (3.64). The zonal average gave higher values for N and P (9.82 and 8.76 respectively) and for K it was 6.89.

During *rabi*, the response to N was the highest in Palakkad (14.56) and for Thrissur and Ernakulam, it ranged from 9.04 to 9.8. For P, it was the highest in Thrissur (5.09) and for Palakkad and Ernakulam, it ranged from 3.31 to 3.82. K response was the highest in Ernakulam (10.84) followed by Thrissur (7.16) and

Palakkad (4.71). The zonal average, gave the highest value for N (11.13) and it was followed by K (7.58) and the lowest for P (4.07).

Site specific identification of rice varieties

At Nenmara, during *kharif*, the varieties tested namely, Harsha, Varsha, Aishwarya, Kanakam and Jyothi were on par Harsha, Kanakom and Jyothi the advantage of having less duration (105 days) compared to other varieties. At Alathur, Harsha gave significantly higher yield than other varieties and with the advantage of less duration (114 days) compared to other varieties (119 days and 125 days respectively).

At Chelakkara, Jyothi gave the highest yield and it was on par with Harsha, Varsha, Kanchana and Mattathriveni. Among these, Harsha matured with the shortest duration. At Mulamthuruthy, Uma gave significantly the highest yield, superior to all others. The performance of other varieties were poor.

During *rabi*, at Nenmara, Uma gave the highest yield (3496 kg/ha). The performance of Harsha, Pavizham and Bhadra were poor. At Chelakkara, Dhanu gave significantly higher yield (4697 kg/ha). Duration was only 125 days. At Mulamthuruthy, Karuna gave the highest yield where as the yield of other varieties Dhanu, Makaram and PTB-20 were lower. Karuna took 125 days for maturity. At Rayamangalam, during *Rabi*, there is no yield difference between Dhanu, Makaram, Karuna and Mundadan.

Drum seeding – cum – minimum tillage

The experiment was conducted at Nenmara, Chalakudy and Mulamthuruthy during *Rabi*. At Nenmara, drum seeding under normal land preparation gave the highest yield (4800 kg/ha), and under drum seeding with minimum tillage, yield decreased by 240 kg/ha. The yield in broadcasting, whether at normal cultivation or minimum tillage was comparatively less. At Chalakudy also, a similar trend was observed. At Mulamthuruthy there was no appreciable difference between the treatments.

Seed drill and cono-weeding

Placement of seeds by Tractor Drawn Seed Drill and weeding by cono-weeder gave the highest yield. Efficiency of the machine is 20 hrs/hectare and cono-weeding took 3 man days / hectare where as hand weeding would take 60 mandays/hectare. Among the plots where broadcasting was done, manual weeded plots gave higher yield than chemical weed control.

Weed management in dry sown rice

The highest grain yield of 5500 kg ha⁻¹ was recorded when Refit 50 EC (2 ml/l) followed by Clinchor 10% (2 ml/l) was sprayed. This treatment was on par with Clinchor (2 ml/litre) and Stomp (10 ml/litre) + Almix (0.04 g/litre). *Ishemum*, *Sacciolepis* and *Echinochloa* spp. were the predominant weed species of the experiment site. All the herbicides used in the study were equally effective in controlling these weeds. The weed population as well as dry weight were the

highest in control plot where, weed control measure was not adopted. The population of grassy weed *Ishemum* and sedge *Sacciolepis* was more in T5, where Clinchor (2 ml/l) as sprayed during 15-20 DAS. But Clinchor in combination with other herbicides could effectively control these weeds. In hand weeded plot also, the population of grasses and sedges were high.

Weed management in wet sown rice

Sathi (0.3 g/l) followed by Almix (0.04 g/l) recorded the highest grain yield i.e., 3467 kg ha⁻¹ and controlled almost all weeds.

SPAD and LCC based experiments

The results of SPAD based N management in rice at Chittur showed that during *khariif* SPAD based N at 35 with basal N or at SPAD 37 without basal would be desirable in medium fertile soils for higher grain yield and better N use efficiencies. During *rabi* SPAD based N at 35 after 20 days of basal N dose (at planting) till heading was better for higher grain yield and N use efficiency. In Chithali, during *rabi* with medium duration varieties under transplanted situation SPAD 35 based nitrogen top dressing after basal application of 30 kg N ha⁻¹ at planting was highly effective in producing better grain yield, yield attributes and N use efficiencies.

It was also found that in acidic kole lands of Thrissur at Adat with rice variety Uma under broadcasted situation the highest grain yield was observed, when 20 kg N topdressed at 10 days interval, based on LCC threshold 4. Considerable reduction in fertilizer N consumption was noticed in this treatment.

At Chittur during *khariif* variety Pavithra was superior to other varieties tested, with high grain yield, PFPN and per day production. During *rabi*, variety ADT-38 performed better. Effect of basal application of N varied with variety. But N top dressing based on SPAD threshold 35 was better than recommended scheduled splits in both seasons at Chittur.

Extension and other activities

a. Front line demonstration on oil seeds

Sl. No.	Location	Block	Cropping system	No. of replications
1.	Kunissery	Alathur	Rice-Sesamum	2
2.	Chelakkara	Pazhayannoor	Rice-Sesamum	2
3.	Annanad	Chalakydy	Rice-Sesamum	2

Doordarshan

Dr. I. Johnkutty participated in the special programme during the first anniversary of LPT – Narrow Casting on 17.10.2003.

Farmers-Scientist Interfaces

Sl. No.	Name	Date	Venue
1.	Dr. I. Johnkutty	28.06.2003	ARS, Mannuthy
2.	Dr. I. Johnkutty	22.10.2003	Communication Centre, Mannuthy
3.	Dr. I. Johnkutty	23.03.2004	College of Horticulture on World Environment Day

Important visitors

Dr.S.K.Sharma, Project Director, PDCSR, Meerut visited the Unit on 15-08-2003.

Finance

1. AICRP on Cropping Pattern

Sl. No.	Item	Budget (Rs. lakhs)	Utilization (Rs. lakhs)
1.	Pay and Allowance	14.05	18.50
2.	TA	0.20	0.19
3.	Contingencies	1.00	1.09
	Total	15.25	19.79

II. Paddy Unit (KAU Plan)

Sl. No.	Item	Budget	Utilization
1.	Pay and Allowance	0.00	0.00
2.	TA	0.15	0.11
3.	Labour	0.80	0.70
4.	Res. Materials	0.80	0.64
5.	OE & M	0.50	0.60
6.	Vehicle	0.35	0.34
7.	Exhibitions	0.04	0.03
Non-recurring			
8.	Furniture/fittings	0.10	0.08
9.	Equipments	0.50	0.36
	Total	3.24	2.90

III. ICAR Adhoc Scheme

Sl. No.	Item	Budget	Utilization
1.	Salaries	1.296	1.50
2.	Contingencies	1.200	1.20
	Total	2.496	2.70

IV. FLD on Oilseeds

Sl. No.	Item	Budget	Utilization
1.	TA	0.03	0.02
2.	Contingencies	0.52	0.49
	Total	0.55	0.52

BANANA RESEARCH STATION, MARAKKAL, KANNARA

Introduction

Banana Research Station, Kannara and Pineapple Research Centre, Vellanikkara are the leading centres in Kerala where systematic research on these crops are undertaken. Banana Research Station was started at Marakkal, Kannara 1963. The station was taken up by the Kerala Agricultural University from 1-2-1972. The Banana Research Station is located at Marakkal, Kannara, Pananchery Panchayat of Thrissur Taluk, 20 km away from Thrissur town and has an area of 17.3 ha. The Pineapple Research Centre is situated 10 km away from Thrissur town at the main campus, Vellanikkara and has a total area of 6.3 ha.

Mandate of the station:

- ◆ Collection, conservation and evaluation of genetic resources of banana, pineapple and jackfruit.
- ◆ Developing superior cultivars or clones of banana and pineapple through introduction, selection and hybridization and of jackfruit through selection.
- ◆ Developing suitable agro techniques for achieving higher production and productivity.
- ◆ Formulating intercropping and rotation schedules in banana and pineapple to increase the returns from unit area
- ◆ Identification of major pests and diseases of banana, pineapple and jackfruit through regular survey.
- ◆ Formulating control/management measures for pests and diseases of banana, pineapple and jack.
- ◆ Formulating small scale post harvest processing techniques in banana, pineapple and jack fruit.

Satellite stations: Pineapple Research Station, Vellanikkara

Seminars/summer institute/symposia/trainings attended

The Scientists attended a total of 4 workshops, 3 meetings including ZREAC meeting, one winter school and the training workshop on Musa Germ plasm Information system at MARDI, Malaysia.

Research programmes

BANANA

Crop Improvement

The field gene bank of 256 accessions comprising indigenous (cultivars, land races, endangered varieties and wild *Musa* spp.) and exotic material was conserved. It is considered one of the best field collections of banana germplasm in the country. Seven accessions were collected from NBPGR, New Delhi. Characterization of germplasm using molecular markers is

in progress. Polymorphism in respect of enzymes and RAPD among distinct cultivars based on morphological characterization was observed.

A clonal selection of Nendran termed 'Manjeri Nendran II' with higher bunch weight, tolerance to Sigatoka leaf spot and suitable for annual cropping was identified and is under farm evaluation.

Hybridization work was continued. Female fertility of Nendran clones assessed by hand pollination with Calcutta - 4. Seed set was recorded in 7 out of 10 clones. Seeds were produced by crossing Nendran with Calcutta - 4, Pisang Lilin and Sikuzani as pollen sources. Seeds germinated better under mist. The seedlings are under evaluation. A hybrid progeny from the cross Nendran x Calcutta-4 recorded plant height of 360 cm, pseudostem girth of 62 cm and 12 leaves at shooting. It had a bunch weight of 13 kg with 8 hands and 90 fruits. It also exhibited very high resistance to Sigatoka leaf spot. Suckers obtained from this progeny have been planted for multiplication.

Crop Management

Trials on spacing cum planting system, fertigation and chemical manipulation of yield on different banana varieties were initiated.

Under high density planting system, accommodating three plants per pit recorded higher plant height in both Nendran and Robusta. However, days to flowering and duration were much lower and bunch weight the highest for one plant per pit in both varieties. B:C ratio was highest for the spacing 2m x 3m with three plants per pit in Nendran and 1.8m x 3.6m with three plants per pit in Robusta.

The trial on effect of biofertilizers on yield and quality of banana var. Nendran revealed that bunch weight was the highest for 100% Recommended Dose of Fertilizers (RDF) + AMF + PSB + *Azospirillum* + *Trichoderma*, followed by 100% RDF + Vermicompost (2 kg /plant). B:C ratio was the highest for 100% RDF + PSB (50g /plant), followed by 100% RDF + Vermicompost 2 kg /plant.

Use of different nitrogenous fertilizers did not affect the vegetative characters. The highest bunch weight was obtained for 25% CAN + 50% Urea + 25% Ammonium sulphate (AS). Duration was also the lowest for this treatment. The highest B:C ratio was observed for 25% CAN + 50% Urea + 25% AS.

In chemical manipulation for yield and quality, plant height was affected by main plot treatments. Application of 200g N recorded increase in plant height. Bunch weight was higher for 200g N. Among sub-plots, BA (25 ppm) and 2,4-D (25 ppm) gave the highest bunch weight. Days to flowering and days to harvest were not affected by main plot treatments. Ethrel (500 ppm) showed early flowering and harvest. The highest B:C ratio was observed for 200g N + urea (2% per plant) as main plot treatment and 2,4 -D (25 ppm) as sub-plot treatment.

Fertigation with different levels of the recommended dose of N and K was found beneficial in banana var. Robusta.

Crop Protection

Diseases

Regular surveys were conducted to identify the major diseases affecting banana in the state. It revealed that the important diseases was Sigatoka leaf spot, Panama wilt, Rhizome rot, Banana bunchy top disease, Banana bract mosaic, Banana streak and Infectious Chlorosis. The

crop disease calendar was updated for the period. New additions to the germplasm are being screened for resistance/tolerance to all major diseases.

Among the new chemicals for control of Sigatoka leaf spot disease, Companion (Mancozeb + Carbendazim) 75% WP and Tebuconazole (Folicur 250 EW) (1 ml/litre) were equally effective in terms of infection index and yield. These results were advanced to Farm Trials in four districts of Kerala- Thrissur, Palakkad, Ernakulam and Kottayam. The trials are in progress.

Effective management measures were formulated for Panama Wilt disease. Drenching of carbendazim (0.2%) or carbendazim - 2% (3 ml) injection at 5th, 7th and 9th month after planting was found to be effectively controlling the disease. Studies on etiology and management of Rhizome rot disease were conducted.

Intensive studies were carried out on the four important viral diseases recorded in Kerala viz., Banana Bract Mosaic, Banana Bunchy Top disease, Banana Streak and Infectious Chlorosis. The molecular detection of Banana Streak Virus and Cucumber Mosaic Virus were standardized.

Pests

Regular surveys revealed the population dynamics of the important pests affecting banana. The period May – July recorded the maximum infestation of pests. Crop pest calendar developed at the station was updated. The important pests of banana noted were pseudostem borer, rhizome weevil, sap sucking insects and leaf feeding caterpillars. Minor pests like mirid bug, lacewing bug and whiteflies showed marked increase in population.

The effectiveness of neem based insecticidal preparations in controlling the pseudostem borer was confirmed. Neemazal 1% EC @ 5 ml/l is comparable to the recommended chemical, carharyl 0.2%. These results were advanced to Farm Trials in four districts of Kerala- Thrissur, Palakkad, Ernakulam and Kottayam. The trials are in progress. Evaluation of botanicals against the pseudostem borer was initiated. *Acorus calamus* and neem seed kernel extracts are good repellents and feeding deterrents and show promise.

Screening of new additions to the germplasm collection was continued and their resistance /tolerance was assessed. Sunhemp and marigold proved to be effective intercrops in controlling the nematode population.

JACKFRUIT

Comprehensive survey of jackfruit types was conducted so as to study the variability in relation to vegetative, flowering and fruiting characters and select promising types to establish high yielding superior clonal stocks. 211 trees have were evaluated so far. Detailed descriptors were prepared for each tree according to the IPGRI descriptors for jack.

Wide variation was observed in almost all the characters studied, indicating better chance for selection of superior types. From among the trees surveyed, two were good for all purposes. i.e., as table purpose, for chip making and for culinary purpose. Nine were found best for table purpose, four for making chips and two for culinary purpose.

Among the different grafting methods, inarching gave better results.

The different pests noted were leaf feeding caterpillars (*Margaronia bivitalis*), stem borer (*Batocera rufomaculata*) and spittle bug (*Cosmoscarta releta*). The major diseases recorded were leaf spot diseases (anthracnose) and Rhizopus Fruit Rot.

PINEAPPLE

Twenty four indigenous and exotic varieties were collected and maintained at PRC, Vellanikkara. These include varieties in Cayene, Queen and Spanish groups; indigenous types and one ornamental type of *Ananas bracteatus*.

Large scale multiplication of the selected clones is in progress and these are ready for farm trials. The two promising hybrids H7 and H8 are also being multiplied on a large scale.

Extension and other activities

The Scientists have conducted classes on various aspects banana cultivation for farmers (15 classes). They have also participated in group discussions in Karashakadinam.

Besides handling classes, about 1,000 farmers' queries were also answered through phone, post and personal consultancy during the year under report.

Important visitors

The Honourable members of the General Council, Kerala Agricultural University visited the station on 16.3.2004. They reviewed the work done and problems faced at the station.

The Director of Research, Kerala Agricultural University, Dr. C.K. Peethambaran visited the station on 24.3.2004. He critically reviewed all the research projects in operation at the station and visited the experimental plots. He also had detailed discussions about various aspects of work conducted and constraints faced at the station.

Several groups of farmers and students of agriculture from different parts of the State visited the station to see the germplasm collection and discuss various aspects of banana cultivation.

Finance

Head of A/c	Provision for the year (lakh)	Expenditure (lakh)	Station Receipts
Non plan	37.75	29.53	} 13.00
Plan	2.70	1.30	
ICAR	23.58	26.50	
Other EAP's	2.01	1.10	--
Revolving Fund	--	.80	0.46

INSTRUCTIONAL FARM, VELLANIKKARA

Introduction

The Instructional Farm, Vellanikkara was established in 1973 as part of the ARS, Mannuthy and became the IF of the College of Horticulture, Vellanikkara in 1983. Coconut, mango, cocoa, cinnamon, guava, sapota and vegetables are the crops grown here.

Mandate of Institution

The Farm was established to impart training to UG and PG students on agro-techniques for conducting PG and departmental research programmes and work experience courses. The mandate includes research on horticultural crops and production of seeds and planting materials.

Extension and other activities

Students and farmers visited the farm. The agro-techniques for various crops and nursery management are explained to the visitors.

Finance (2003-04)

Head of account	Provision for the year (In lakhs)	Expenditure (In lakhs)	Station receipts (In lakhs)
Non-Plan	36.61	33.72	14.55
Plan	2.85	0.99	-
Revolving fund		2.53	6.41

CADBURY-KAU CO-OPERATIVE COCOA RESEARCH PROJECT, COLLEGE OF HORTICULTURE, VELLANIKKARA

Introduction

The Cadbury-KAU Co-operative Cocoa Research Project started in April 1987 with funding from Cadbury India Ltd initially for a period of ten years. Following the cessation of the ten-year tenure, there was a technical assessment of the research work under the project by Cadbury India and based on this, the project was extended for a further period of five years upto 2002.

The important activities at present in hand are continuance of the breeding programme with the object of yield improvement and continuance of resistance breeding against vascular streak die back in addition to the work on diseases of the crop. Introduction of germplasm material, its maintenance, evaluation and utilisation also are in progress.

In addition to the above Cadbury-funded research programme, a Central Sector Scheme for production and distribution of vegetatively propagated high yielding clones was also sanctioned during 1993. This scheme now has an annual budget of about Rs 20 lakhs and a target for distribution of 1.5 lakh budded plants annually.

A DBT funded project for standardisation of protocol for micropropagation in this crop was implemented from 1990-1995. An ICAR *ad hoc* project on "Genetic analysis of cocoa (*Theobroma cacao* L.) hybrids" was implemented from 17.11.1999 to 15.5.03.

An ICAR *ad hoc* project on "Development of technology for farm level secondary processing of cocoa" was started with effect from 12.3.03.

A DBT funded project on "Women empowerment through farm level value addition of cocoa" was commenced from 24.2.03.

Mandate of the station

The main objective is to conduct research on genetic improvement agrotechniques and plant protection in cocoa.

Major Research Achievements

The germplasm was enriched through imports from the University of Reading, UK enhancing the number of accessions to 525.

Evaluation of germplasm confirmed the superiority of the clones GVI 35, GVI 44, G VI 50 and GVI 33 with mean yields of 94.4, 5.9, 60.4 and 55.7 pods/ tree/year respectively over fifteen year period.

The hybrids recorded significant superiority over the clones in terms of yield, desirable plant shape and tolerance to VSD.

The studies to explore the possibility of reducing the acidity of cured beans indicated that soaking beans in sodium bicarbonate (0.5- 2%) for different durations (1-3h) helped to increase pH from 4.97 to 5.5. Treatment of 2% sodium bicarbonate for 2 h. increased the pH to 5.50.

Roasting duration varied markedly with size of beans. Small beans (100g) took only less time (3 minutes under 100% microwave power as against 4 minutes by big beans) for roasting. Using microwave oven, small quantities upto 500 g can be roasted effectively. When the quantity ranges from 500 g to 5 kg, roasting can be done using traditional kitchen pans. The time for roasting varies with the quantity. Uruli roaster is the most suitable for roasting beans upto 10kg. Grading and use of beans of uniform size help to retain the quality of cocoa products.

The method of extracting cocoa butter on farm scale (upto 31%) was standardized using the cocoa butter extractor fabricated in this project. The cocoa powder separated contained 26- 5% cocoa butter.

Extension and other activities

The technology for farm level value addition of cocoa was popularized among the cocoa farming community by handling classes, participating in exhibitions, entertaining visitors to the unit and by publishing articles.

Handling classes : Classes on different topics of cocoa processing and value addition were conducted to 13 batches of farmers, 3 batches of scientists, 2 batches of extension officers and one batch of leaders of kudumbasree units.

Participation in exhibitions : The technology for farm level secondary processing of cocoa was exhibited in agricultural and agro based industrial exhibitions held in Thrissur and neighbouring districts of Idukki, Malappuram, Kozhikode and Palakkad. About one lakh people visited the stalls established in six locations during the year and the technology for farm level processing was transferred.

Publications: A folder on cocoa processing at primary and secondary levels was prepared in Malayalam and distributed to the visitors of the project. The folder was also supplied to those visiting the stalls in exhibition. A hand book on cocoa processing was prepared in Malayalam incorporating the lecture notes of all the course teachers. This book was distributed to the participants of the training programme and also entrepreneurs visiting the project.

Training of women in developing cocoa products

During the year training was arranged for six batches of women (farm women, students, unemployed women, entrepreneurs and members of Kudumbasree units). The duration of the training programme was one month. Out of 80 women participated in the training, 25 were entrepreneurs, 11 students, 11 farm women and 33 active members of the kudumbasree units.

Important visitors

58 Women entrepreneurs visited the station on 23-7-03 (Self Help group under Women in Agriculture Scheme (A central government sponsored scheme implemented by Department of Agriculture, Thrissur District.), 25 Scientists from all over India (Delegates from ICAR short course) 31 farmers from the department of Agriculture Karakkal, Pondichery on 7-11-03, Dr.Chandra Gauda, Zonal Co-ordinator ICAR on 2-12-03. Father Mathew Vadakkemury in-farm Karunagappally and staff (3 numbers) visited on 8-12-03, 40 women entrepreneurs from RATTTC, Malampuzha visited on 12-12-03. Dr. Haridas Professor Botany Kannur University on 4-2-04, 50 farmers from the department of Horticulture Tamilnadu on 17-2-04 and 8 farmers from Kerala Horticulture, Project, Ernakulam visited the station on 23-2-04.

Finance (2003-04) Rs. Lakhs

Head of a/c	Provision for the year	Expenditure(Rs)	Receipts (Rs)
CCRP	28.00	29.97	3,37,823
ICAR		0.53	
PLAN	0.55	0.55	
ICAR	5.90	5.90	
DBT	4.65	4.01	

NORTHERN ZONE

REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

Introduction

Under NARP scheme, this station was reorganised as a Regional Agricultural Research Station for the Northern region comprising the districts of Kasaragod, Kannur, Kozhikode and Malappuram with effect from 1-6-1980. The present area at Regional Agricultural Research Station, Pilicode is 57.87 ha and that of Nileshwar 17.25 ha. Pepper Research Station, Panniyur is the satellite station under NARP (Northern) Zone.

Mandate of the station/ unit

Lead function

The main objective of the station is to perform a state-wide lead function for research on coconut based cropping systems.

Auxiliary function

To serve as a commodity verification and testing centre for rice, pulses and oilseeds and to supervise and guide the work at Pepper Research Station, Panniyur in the Northern zone Kerala. The scientists of this station would work with selected villages to understand of farmers' constraints and reactions towards adopting the recommended practices. It is also mandatory to test and evaluate the promising experimental results in farmers' fields under different soil types and climatic conditions prior to their inclusion in package of practices recommendations.

Faculty Improvement Programme

Both Smt. Jayasree P. K., Asst. Professor (Agronomy) and Smt. Lily Levin, Asst. Professor were deputed for Ph.D. course.

Seminars/Training /Summer Institute/Symposia attended

Name of Scientist	Seminar/Symposium/ Workshop/ Summer Institute to which deputed	Institute, Period of deputation, Name and duration of the course etc.
Dr.G.V.Sudarsana Rao, Asst.Prof.	Physiological and molecular approaches for improving sugarcane productivity	IISR, Lucknow June 16 – July 15, 2003
Dr.Shashikanth, Asst.Prof.	National training programme on optimum breeding plans for genetic improvement of farm animals	NDRI, Karnal 15 th Jan- 4 th Feb.04
-do-	National Symposium on conservation of domestic animals diversity	NBAGR, Karnal 11 th Feb-12 th Feb. 04
	National Seminar on diversification of agriculture through horticultural crops	Indian Agricultural Research Institute, Karnal, Haryana 21 st – 23 rd Feb 04
Dr.M.P.Giridharan, Asst.Prof.	'Ahaar' – The International Food Festival	ITFF, New Delhi 11- 15 March

Research Programme

Crop Improvement

The research station maintains a unique collection of coconut germplasm consisting of 35 exotic and 40 indigenous types.

Philippines Ordinary, Lakshadweep Ordinary, Cochin China, Java, New Guinea, and Spicata were found to be highly suitable for cultivation in the northern zone under rainfed conditions. Philippines Ordinary and Lakshadweep Ordinary ranked first in yield of copra and number of nuts, respectively.

The coconut hybrids viz., WCT x CGD, Lakshaganga (LO x GB), Keraganga (WCT x GB), Anandaganga (AO x GB), Kerasree (WCT x MYD) and Kerasoubhagya (WCT x SSA) were released. Kerasree ranked first in copra yield (216 g/nut). It produced 250 nuts/palm/ year and copra out turn of 30 kg/palm/ year while Kerasowbhagya produced 217 nuts/palm/year with copra out turn of 25 kg/palm/ year under good management conditions.

The exotic type 'Seychelles' was superior in cumulative nut yield for the last 12 years followed by St. Vincent and indigenous type Andaman Ordinary. The Seychelles also expressed prepotency when the progeny trial was conducted at this station.

From the trial of promising seed materials, the Lakshaganga had the highest nut yield followed by Kerasankara and Keraganga. Lakshaganga also exhibited superiority on setting percentage and annual copra yield/ palm. Cumulative nut production was the highest for Chandrasankara followed by Kerasankara, Keraganga and Lakshaganga. KOD, Cochin China and Java are found most suitable for tender nut purpose.

Forty-two bold nut and promising types of cashew were identified from Kozhikkode, Kannur and Kasaragod districts. They are being maintained at the station for conservation and evaluation.

Out of 14 promising and released cashew types, Damodar (H-1600) was superior. Technique for growth enhancement of cashew graft by CO₂ enrichment was developed. Fertilizer application trials in high density cashew plantation are in progress.

Out of 206 pickling type of mangoes identified in the northern districts of Kerala as well as north and south Kanara districts of Karnataka, 68 are promising. 44 types of pickling mangoes were located and described, among them 4 were promising. The physical and chemical analysis like acidity, sugar, fibre content were also done.

Forty species of medicinal plants were planted under Central Sector Scheme on Medicinal

Plants for evaluation and multiplication .

Post harvest technology

Processing techniques were standardised for preservation of sweet toddy into soft drink (RTS) concentrate and granules. The processing method of jaggery was improved. The storage life of the soft drink was extended up to 1 year. Quantitative and qualitative analysis and standardisation procedure for preservation of toddy were conducted. Biotic abiotic factors influence toddy yield. The wide variation observed among palms grown under identical soil and climatic conditions indicated the role of biotic factors in toddy production. Spadix to spadix variation in toddy yield within a palm was also high. The daily and monthly average yield of toddy also showed variation which were higher during June and July than May. Variation in sap flow ranged from 0.85 to 2.4 litres in May and 1.2 to 5 litres in June.

Rice cultures were tested for their performance and Cul. M-61-6-1-1 recorded the highest grain yield and local cultivar Allikkannan recorded the highest straw yield.

Crop Management

To enumerate population of *Azospirillum* and to determine seasonal variation of population, soil samples were collected from the paddy fields of RARS, Pilicode and Kypad soils during the September 1995, December 1995 and April 1996 from different depths. Various morphological and biochemical characters were studied and found that population was more in surface soils than deeper layers during September. A pot culture experiment was conducted to evaluate the response of strains in plant growth promoting effect using 13 strains. Local isolate S-10 and a commercial strain performed better. Rhizosphere population was higher than endorhizosphere. Effect of *Azospirillum* inoculation on growth and yield of rice was studied over 3 seasons and found that inoculation enhanced crop yield significantly.

When *Azospirillum* was inoculated on seeds of melon, maximum vigour index was recorded with the isolate PIL M-11. Inoculation of this isolate on pot culture experiment enhanced the length of vine, number of leaves, number of female flowers and yield. Field experiments were conducted for 3 years with and without inoculation at different levels of nitrogen. PILM-11 and a commercial strain were used as inoculants. Local strain PILM-11 was better than the commercial strain and inoculation favoured better bacterial establishment in root system, enhanced root development and plant growth.

Occurrence of virus diseases of black pepper (stunted disease and yellow mottle virus disease) was studied in Kannur and Kasaragod districts. Both the virus diseases are seen in pepper gardens in varying extent. A Workshop was conducted and training programmes were given to Agricultural Officers to identify the diseases.

A project on ITK in farming systems of Kerala was been implemented (funded by State Planning Board). Data on various indigenous technology were collected.

Crop protection

Studies on impact of mite attack on seed nut qualities indicated positive correlation between the level of incident and germination percentage, but no correlation between the former and quality of seedlings, once germinated.

Studies on efficacy of APSA-80 as a wetting agent in control of leaf rot disease of coconut as well as black headed caterpillar of coconut being continued.

Agrometeorology

The Agrometeorological Field Units (AMFU) at RARS, Pilicode was set up during 1995-96. The agro advisory committee constituted with scientists from various disciplines and Agricultural Officers of Pilicode, Cheruvathur, Krishibhavans function under the Chairmanship of Associate Director of Research, RARS, Pilicode.

The advance information on daily weather is received at RARS, Pilicode every Tuesday on the following variables:

(1) Cloud amount (okta) (2) Precipitation (mm) (3) Wind speed (km/hr)

(4) Wind direction (5) Maximum temperature (°C) (6) Minimum temperature (°C).

Based on weather forecast received every Tuesday for coming three days (Tuesday, Wednesday and Thursday), the Agromet advisory members will discuss the impact of weather on various crops grown in Kasaragod District. After thorough analysis, the Agro advisory is prepared to disseminate the same to farmers, selected for getting feed back. The Agro advisory is prepared in Malayalam and English. A copy of the Agro advisory is sent to nearby Krishi

bhavan also and to the District Information Officer, Kannur. The Agroadvisory will enable the farmers to take steps for timely farm operations so as to sustain crop production of the region.

Animal Science

Under the scheme of conservation and evaluation of *Malabari* breed of goats, observations were recorded for growth, reproduction and milk yield traits. The peak milk yield of Malabari does were 512.60 ± 12.58 ml. The peak yield was the highest during post monsoon months. Average age at first kidding was 545 ± 15.09 days. The kidding interval of does reduced as the age advanced.

Observations are being recorded with respect to various economic characters for other livestock, ie, cattle, pigs and rabbits. The mean litter size at birth for large white Yorkshire pigs and cross bred rabbits was 7.41 ± 1.48 and 3.64 ± 0.83 respectively. The mean litter size at weaning was 7.2 ± 1.30 and 3.24 ± 0.64 for pigs and rabbits respectively.

The unit sold 116 piglets, 130 goat kids and 62 rabbits during the year to the farmers. The Unit also provided practical facilities to the students from College of Agriculture, Padannakkad. The Veterinary Hospital provided artificial insemination and veterinary consultation services to the farmers. Altogether 611 animals were inseminated during 2003-04.

Extension and other activities

The scientists attended a total number of thirty Training Programmes. They have actively participated in the Agricultural Interface Programme arranged by the Dept. of Agriculture and XXV Zonal Workshop of NARP Northern zone.

Important visitors

The members of Board of Management, UAS, Dharwad visited the Station on 21.2.2004 and Dr. M. G. Bhat, Director, NRCC, Puthur on 20.3.2004.

Farmers under various organizations and students of various institutions visited the station during this period

Academic activities

Scientists of this Station served as faculty members for handling courses for B.Sc (Ag.) students of CoA, Padannakkad

Sl.No.	Scientist	Courses offered
1	Dr.P.C.Balakrishnan	Pbgn 203 & Pbgn 204
2	Dr.M.Govindan	Pl.Path. 101 Microbiology I Pl.Path. 102 Microbiology II
3	Dr.M.P.Giridharan	Hort 408
4	Dr.K.Shashikanth	AnHs 301, AnHs 302
5	Dr.G.Sudarsana Rao	Pl.Phy. 201 & 202.

Details of coconut seedlings produced

Sl.No	Item	Opening balance as on 1.4.2003	Production	Distribution	Balance
1	WCT @ Rs.20/each	265	1200	1004	461, nos.
2	Hybrid @ Rs.45/each	3249	3000	4733	1516

Finance

Head of a/c	Provision for the year (lakhs)	Expenditure	Station receipts
Non plan	104.75	89.32	17.74
Plan	12.65	4.96	
ICAR	4.55	3.92	
Other EAP s	4.16	1.41	
Revolving fund		8.97	9.14

PEPPER RESEARCH STATION, PANNIYUR

Introduction

Pepper Research Station, Panniyur, was started in 1949, to improve pepper cultivation and was uplifted to the status of a research station in 1952 and became a constituent institute under the Kerala Agricultural University in 1972. Since then, research on crop improvement, crop management and crop protection aspects of black pepper were carried out in this station. It is an important coordinating centre of the All India Coordinated Research Project on Spices of the ICAR. Nine research projects of AICRP are being carried out in this station. Besides research, nucleus planting materials of released varieties of black pepper, viz., Panniyur 1 to Panniyur 7, Karimunda, bushpepper, arecanut seedlings of high yielding varieties, cashew grafts of released hybrids and vanilla cuttings are being produced and distributed to the farmers.

Mandate of the station

The station is unique among all the agricultural research stations in India, in that it is the only station solely devoted to the research on black pepper. The station was started with a mandate to conduct research on various aspects of pepper industry in the country so as to give it a firm footing and confidence to face competition from other pepper producing countries of the world. Research programmes on crop improvement, crop management and plant protection of black pepper are undertaken right from the days of inception. The first black pepper hybrid, Panniyur 1 was released from this station in 1967, which has since then become synonym of pepper. This variety gave a fillip to the development of pepper cultivation in the state and had aided most in the increase of pepper production not just within the state, but the whole of India and even in some pepper producing countries of the world. A total of seven high yielding pepper varieties Panniyur 1 to Panniyur 7 were released for cultivation till date.

A few memorable events of the institution:

The new Krishi Vigyan Kendra of ICAR for Kannur district was sanctioned to Pepper Research Station, Panniyur and the KVK site selection committee of ICAR visited the proposed site of new KVK sanctioned for the Kannur district on 18-11-03.

Seminars/ summer institute /symposia/ training attended

The scientists of the station attended 5 Workshops including an International Workshop, 3 Trainings, one Science Congress and one National Seminar on new perspectives on spices, aromatic and medicinal plants of ICAR Complex, Goa.

Research Highlights

- In the germplasm collection Valiyaramundi recorded the maximum green berry yield of 6.42 kg / vine followed by Chendayar (4.075.kg).
- Intervarietal, Inter specific hybridization and open pollinated progeny evaluation are in progress.
- Cultures 1558 & 5128 are the promising cultures in the multilocational trial .
- Irrigation @ 2 litres / day / vine contributed more towards spike number, green berry yield and spike length .
- Metalaxyl Gold MZ + *Trichoderma* was effective in controlling the foot rot disease.
- In the nursery, *Phytophthora* disease incidence was very less, when rooted cuttings were planted in solarised soil amended with *Trichoderma* and Vesicular Arbuscular Mycorrhiza (VAM) with the drenching of potassium phosphonate.

Summary of results

CROP IMPROVEMENT

In the germplasm collection, at present 137 accessions of cultivated types of black pepper and 10 wild types are being maintained. Among the 89 accessions flowered during the year, the variety Valiyaramundi recorded the maximum green berry yield of 6.42 kg/vine followed by Chendayar (4.075 kg). The maximum spikes/vine were also recorded in Valiyaramundi (2366 nos.) and Chendayar (1790).

Intervarietal hybridization and open pollinated progeny evaluation are in progress. Fifteen cross combinations were made during the year and the seeds were sown in pots. Seeds of sixteen germplasm accessions were sown for OP progeny evaluation.

Among the hybrids planted during 2000, KM III x P. 5 is promising with regard to number of laterals, early spiking, more number of spikes and compact setting of berries.

Inter specific hybrids of promising pepper varieties with *Piper colubrinum* were planted in the field and the hybrids are being evaluated.

Coordinated Varietal trial on black pepper - Nine released varieties viz., Sreekara, Subhakara, Panchami, Pournami, Panniyur 1,2,3,4,5 and four promising cultures Kottanadan Acc. 2426, Acc.2445, culture 1558, Culture 5128 and Karimunda as local check were evaluated. The results of the trial indicated the superiority of the cultures 1558 and 5128. The Culture 1558 was released as Panniyur 7.

Among the four cultures evaluated for green berry yield from 1998-2002, Panniyur cultures, Cul 1558 and Cul 5128 recorded the maximum yield of 2.438 kg/vine and 1.858 g/vine. Among the varieties tested the highest mean yielder was Panniyur 4 (2.234 kg/vine) followed by Panniyur 5 (2.163 kg/vine) .

The top yielder, Cul. 1558 was statistically on par with P4, P5, cul 5128, Kottanadan 2445, Panchami, P2 and P3.

Evaluation of black pepper varieties for growing as bush pepper

Lateral cuttings of the varieties, Panniyur 1, Panniyur 2, Panniyur 3, Panniyur 4, Panniyur 5 and Karimunda were rooted in mist chamber and planted in mud pots (one cutting/pot). The initial evaluation showed that lateral shoot and spike production are high in bush peppers irrigated with water spray than without water spray.

CROP PRODUCTION

Trial on drip irrigation in black pepper varieties

Among the different levels of irrigation on varieties Panniyur 1, 3 and 5 evaluated from 1999-2002, irrigation at 2 litres / day contributed more towards spike number, green berry yield and spike length. There was no significant difference between the different levels of irrigation and the varieties. The mean green berry yield of 1.739 kg/vine was recorded for irrigation @ 2 litres/vine. Among the varieties, Panniyur 5 recorded the maximum green berry yield of 2.076 kg/ vine.

Partial substitution of nitrogen requirement of black pepper through organic manures

Among the treatments T1 (100% N + full P&K) recorded the maximum spike yield of 5720 kg/ vine followed by T3 (50% N+ vermicompost @ 2.0kg/vine) with 3600 kg/ha. T1 was significantly superior to all other treatments.

CROP PROTECTION

The results of the trial *Phytophthora* foot rot disease management in black pepper indicated that Metalaxyl Gold MZ and *Trichoderma* were effective in controlling the foot rot disease followed by application of Akomin and *Trichoderma*. The disease incidence was very low when Metalaxyl gold MZ fungicide was combined with the soil application of *Trichoderma*.

Phytophthora foot rot incidence in black pepper under different density in an Arecanut garden.

Less disease incidence was observed on pepper vines where the vines are planted as an intercrop in the arecanut garden under different density. The maximum number of seedlings were established in the treatment where the pepper vines are planted in the 25 % population of Areca.

Use of biocontrol for checking *Phytophthora* disease

The foot rot disease incidence was very less when biocontrol agent was combined with Potassium phosphonate. Application of Potassium phosphonate twice in combination with *Trichoderma* was very effective in managing *Phytophthora* foot rot of black pepper.

Incorporation of biocontrol in nursery plants for checking *Phytophthora* disease

In the nursery, the disease incidence was very less, when rooted cuttings were planted in solarised soil amended with *Trichoderma* and Vesicular Arbuscular Mycorrhiza (VAM) with the drenching of potassium phosphonate. Maximum germination percentage, number of leaves, shoot length and root length were also observed in the treatment receiving soil solarisation for 30 days + *T. harzianum* + potassium phosphonate +VAM .

Extension and other activities

National Agri Fest – held at Kannur

The Mega National Agricultural Festival and Exhibition on Science and Technology conducted by the auspicious organizing committee comprising of MPs, MLAs, Industrialists and eminent experts of various field, at the historical city of Kannur from December 20th 2003, to 15th February 2004. Kerala Agricultural University also participated in the National Agri FEST. The KAU pavilion was arranged by Pepper Research Station, Panniyur and was inaugurated by Sri. M.V. Govindhan Master, M.L.A. of Taliparamba constituency. Pepper Research Station conducted Agricultural seminar at the Agrifest for three days from 12.1.2004 to 14.1.2004 in association with National Agri FEST. Dr. A.I Jose, Director of Extension, Kerala Agricultural University inaugurated the seminar which was presided over by Sri. C.K. Padmanabhan, former member of General council of KAU. Dr. P.C. Balakrishnan, Associate Director of Research, RARS, Pilicode and Sri. C. Abdul Rasheed, Deputy director of Agriculture, Kannur felicitated the occasion. The scientists handled classes on different crops. Class schedules were as follows. Black pepper- recent cultivation techniques (Dr. K.P. Mammooty), Vanilla cultivation(Sri. E.K. Jose, Spices board), Scientific coconut cultivation (Dr. P. C. Balakrishnan), Crop protection in coconut (Dr. Madhu Subrahmanian), Product diversification in coconut (Dr. M.P.Giridharan), Profitable cashew cultivation (Dr. P.S.John) and Vegetable cultivation (Dr. T. R. Gopalakrishnan). About 500 farmers from different parts of Kannur district attended the seminar.

Nearly four lakh people including various dignitaries like Mr.P.K. Kunhalikutty, Hon. Minister for industries, Kerala, MLAs, MPs, DIG (Northern region), Ashwametham artist Sri. Pradeep and various other dignitaries visited the exhibition and the KAU pavilion. Arrangements were made for selling seeds, planting materials and KAU publications during the exhibition. The KAU pavilion bagged second prize in the exhibition.

Training programme

A Training Programme on Nursery preparation and propagation methods of pepper, arecanut, fodder grass and multipurpose trees was held from 9-2-2004. The training programme coming under NWDpra was organized by the Department of Agriculture in collaboration with Kerala Agricultural University. Twenty farmers from

different blocks of Kannur district participated in the programme. The training was sponsored by Dept. of Agriculture.

A Training Programme on Diagnosis of Diseases of Black pepper was held on 3.3.04. Fifteen Agrl.Officers of Taliparamba block participated in the programme.

In addition the following regular extension activities are also undertaken by the scientists of the station.

Taking classes in agricultural seminars organized by agriculture department

Diagnostic team visit in the farmers' field .

Agroclinic in the station to clarify the doubts of visiting farmers and farmer groups

Attending workshops and interface organized by agriculture department

Research papers

Sivakumar, G., Mammooty, K.P , Neema, V.P. and Vanaja, T. 2003. Integrated management of *Phytophthora* disease in pepper nursery. National seminar on New perspectives in spices medicinal and aromatic plants , held at Goa.

Vanaja, T and Gurinder Jit Randhawa. 2004. DNA finger printing of rice varieties of Kerala using microsatellite molecular markers and indication of molecular markers for kernel colour in rice. Proceedings of Kerala Science Congress held at CWRDM, Calicut from 28-1-04 to 31-1-04.

Important visitors

The KVK site selection committee of ICAR visited the proposed site for the new KVK sanctioned to PRS, Panniyur for the Kannur dt on 18-11-03 .The team comprised of Dr. O. P. Singh, Chairman, Sardar Vallabha Bhai Patel University of A&T, Meerut, U.P and Dr. S. Prabhu Kumar, Zonal Coordinator (TOT), ICAR, Bangalore. Dr. K.V. Peter, Vice Chancellor, KAU visited the station during January 2004.

Other details if any

Dr.Vanaja,T., Asst. Professor bagged Young Scientist Award in the field of Biotechnology in 16th Kerala Science Congress 2003 held at CWRDM, Calicut from 28-1-04 to 30-1-04

Dr.K.P.Mammooty , Associate Professor & Head was awarded PhD degree in Plant Pathology from KAU.

Finance

Head of Account	Provision for the year (in lakhs)	Expenditure (in lakhs)	Station receipts (in lakhs)
Non plan	36.240	29.303	9.666
Plan	3.070	2.1932	
ICAR	11.852	15.865	
Other EAPs	3.990	3.963	

HIGH RANGE ZONE

REGIONAL AGRICULTURAL RESEARCH STATION AMBALAVAYAL

Introduction

The High Range Zone is a sub region of Western ghats lying at an elevation of 750 metres above mean sea level. The region comprises of the hill districts of Wayanad, Idukki, Nelliampathy and Attappady ranges of Palghat, Thannithode and Seethathode panchayats of Pathanamthitta, Aryankavu, Kulathupuzha and Thenmala Panchayaths of Kollam district, Peringamala, Aryanadu, Amboori, Vithura and Kallikadu Panchayaths of Thiruvananthapuram District. The total geographical area of the zone is 1140.67 sq. km. representing 28.67% of the total geographical area of the state. The zone is mainly agrarian in nature with a predominance of high value perennial crops. The major crops grown are spices and plantation crops, fruits and vegetables both tropical and subtropical, hill paddy including aromatic and medicinal rice. The climate prevailing in the zone is by and large mild subtropical, conducive for growing both tropical and subtropical fruits/vegetables.

The NARP phase I sub project for this zone was launched in Nov. 1983 and was completed in Nov. 1988 and the Phase II project was in operational between April, 1988 and April, 1992. Under the National Agricultural Research Project, the Regional Agricultural Research Station at Ambalavayal functioned as the lead station with the Cardamom Research Station at Pampadumpara as its sub station.

The station was established on 5th July, 1945 as a part of the Wayanad Colonization Scheme to supply seeds and planting materials, to impart training on improved agriculture and to conduct research on crops pertaining to this area. With the formation of Kerala state in 1956, it was brought under the Department of Agriculture. It was upgraded to the status of a Central Horticultural Research Station in 1966 and transferred to Kerala Agricultural University in 1972. It was elevated to the status of a Regional Agricultural Research Station in 1983 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 altitude of 974 metres above Mean sea level in Sultan Bathery Taluk of Wayanad District, 100 km North-East of Kozhikode.

Lead Functions

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

Auxiliary function

Essential oils and medicinal plants and ginger.

Seminars/Summer Institute/symposia/ training attended

The scientists of the station have attended various training programmes of National importance in Plant Breeding and Plant Pathology.

Research programme

Major research highlights

Black pepper: Studies on clonal variations in Panniyur-I revealed that clone No-35 is superior to all others clones. Evaluation of 13 pepper varieties revealed that

Panchami, Panniyur- 4 & Panniyur - 3 are suitable for high ranges of Kerala. Application of *Trichoderma* @ 1g + VAM 100 cc in 1 kg of potting mixture effectively controlled *Phytophthora capsici* in pepper nursery with maximum percentage of germination and higher survival rate. There was no significant yield difference in Panniyur-1 due to application of biofertilizers like *Azospirillum* and Phosphobacteria. Application of Potassium Phosphonate / Ridomil MZ along with *Trichoderma harzianum* + Neem cake is effective in controlling the foot rot disease in pepper.

Cinnamon: Evaluation of seven cinnamon types for the high ranges of Kerala revealed that SL-203 and SL-53 recorded higher yield and found suitable for Wayanad. Maximum leaf oil of 4% was obtained in SL-44 and Bark oil of 2% was obtained in SL-53.

Nutmeg: The grafts, A9/4, A9/20, A9/25, A9/71 and A9/50 were planted in the field to find suitability to high ranges.

Cassia: The four cultures obtained from IISR, Calicut viz., C1, D1, D3 and D5 were planted.

Ginger: Germplasm collection consisting of 25 ginger varieties is maintained at the Station. Varieties, Maran (46.25 t/ha) and Jamaica (43.75 t/ha) were found to be higher yielders. The studies on the efficacy of *Azospirillum* on ginger with V2 E5-2 showed that plots which received 100 % N + 50 g *Azospirillum* + 5 Kg FYM gave maximum yield of 20.5 t/ha.

Turmeric: Among the 43 turmeric cultivars in the germplasm PTS-9 registered the maximum yield of 44.3 t/ha. Kanthi, Sobha, Sona and Varna were added to the germplasm collection.

Rice: Among the seventy accessions maintained in the rice germplasm, Intan recorded the highest grain yield of 6910 Kg/ha followed by Puttabetta 5955 Kg/ha. Chenthondi recorded the highest straw yield of 7350 Kg/ha followed by Chennellu 7300 Kg/ha. During previous year also, Intan and Puttabetta recorded higher grain yields of 6183 and 5186 Kg per hectare respectively. Duration of the accessions ranged from 134 to 187 days. Scented rice varieties Pusa Basmati-1, IET 12606 and Jeerakasala were found promising for the high ranges of Kerala.

In the project on evolution of short duration rice vars. for the high ranges of Kerala by hybridization and selection, F1 hybrids were raised to F2 and selection was done in F2. The selected combinations raised during the first crop season of 2004 and further selection will be done.

Vegetables: Seed production of capsicum, cauliflower, bittergourd, bottlegourd, cowpea, beans, tomato and chillies are being carried out.

Mixed cropping: The studies on arecanut, cardamom and pepper mixed cropping in the garden lands of high ranges showed that arecanut at a spacing of 4x4m with cardamom at 2x1.5 m spacing gave higher yields both in arecanut and cardamom. Panniyur-2 is more suitable than Sreekara for mixed cropping situation in Wayanad.

Medicinal and Aromatic plants:

More than 175 medicinal and aromatic plants were so far collected and maintained at this station.

Studies on the efficacy of APSA-80 as a wetting agent against pests and diseases of selected crops:

Application of Quinalphos 25 EC @ 2ml/l + Apsa-80 @ 0.033% (T5) showed the maximum reduction of 70.65% marginal gall thrips damage over absolute control

and 19.25% over insecticide alone (T4) followed by Quinalphos@ 2ml/l + Apsa-80@ 0.01% (T6).

Spraying Quinalphos 25 EC @ 2ml/l + Apsa-80 @ 0.01% (T6) showed the maximum reduction of 61.36% pollu beetle attack over absolute control and only 7.27% reduction over check.

Against the *Phytophthora* and *Colletotrichum* (fungal pollu) infection of black pepper Panniyur-I:

The treatment T5 (Copper oxychloride @ 0.02% + Apsa-80 @ 0.033%) showed the maximum reduction of 73% and 78% of *Phytophthora* and *Colletotrichum* infection respectively over absolute control and 39.20% and 53% reduction over the fungicide alone (T4) which was followed by Copper oxychloride @ 0.02% + Apsa-80 @ 0.01%. Addition of Apsa-80 @ 0.01% along with COC @ 0.02% have 31.8 and 20.99% reduction of *Phytophthora* and *Colletotrichum* foliar infection respectively over fungicide check.

Against the mealy bug and berry borer of coffee:

Spraying of carbaryl 50 WP @ 4g/l + APSA-80 @ 0.033% reduced the shoot mealy bug and berry borer infestation by 86.6 & 81.5 percent respectively. However, there was no significant difference in infestation by mealy bug due to different treatments. Application of carbaryl 50 WP @ 4g/l with APSA-80 @ 0.033% and 0.01% showed 43.6% and 32.7% reduction of coffee berry borer infestation over the insecticide alone.

Against the leaf rust in coffee:

Spraying of COC resulted in decreased rust incidence from 28 to 62% over absolute control. Addition of Apsa-80 @ 0.033 % to COC @ 0.02 % resulted in 24% decreased severity of rust disease in coffee even though there was no significant difference between T4 to T8. There was 62% reduction of rust incidence due to T5 treatment over control which was followed by T6 (51%).

Evaluation of TC pepper Panniyur - 4 in farmers field under DBT project:

Tissue cultured pepper variety of Panniyur-4 plants were distributed to ten selected farmers in the district and the growth of the plants was satisfactory.

Scientific articles

1. T.Pradeepkumar, D.Sajith Babu and K.C.Aipe. 2002. Adaptability of cauliflower genotypes in the high ranges of Kerala. J. Tropic. Agri. 40 (1&2). 45-47.
2. T.Pradeepkumar, D.Sajith Babu and K.C.Aipe. 2002. Performance of strawberry varieties in Wayanad District of Kerala. J. Tropic. Ag. 40 (1&2). 51-52.

Radio talks

Name of Scientists	Topic	Date	Station
Smt. Susamma P George, Asst. Professor (Plant Breeding & Genetics)	Medicinal Rices and their cultivation.	14-1-2004	AIR, Calicut

Important visitors

Name and address	Date	Purpose of visit
Sri. K.Byjunath, Magistrate Sultan Bathery, Wayanad.	23-8-'03	Acquainting with various research and other activities of the station
Justice Sri. Raman High Court of Kerala	2-10-'03	Acquainting with various activities of the station

Sri.P.K.Borghai Dept. of Agri., Assam state.	17-10-2003	Acquainting with various activities of the station
Smt. C.S.Sujatha District Panchayat President, Alappuzha, Kerala	17-10-2003	Acquainting with various activities of the station
Advocate Multor Gopalakrishnan Chairman, Veliyanad Block Panchayat, Kuttanad.	17-10-2003	Acquainting with various activities of the station
Sri. R.Basu, DIG, CBI Mumbai	19-12-2003	Acquainting with various activities of the station
Sri. Nithin Agarwal, DIG Kannur range, Kerala	31-1-2004	Acquainting with various activities of the station
Sri. Jose George, IPS Supdt. of Police, Wayanad	7-2-2004	Acquainting with various activities of the station
Bishop Thomas Martimathias, Calicut	1-3-2004	Acquainting with various activities of the station

The station was actively involved in the project formulation of RSVY (Rastriya Sam Vikas Yojana) of the District, a Central Planning Board project meant for development of backward districts in India and DTPC activities.

The Associate Director is a member of the Programme Advisory Committee of All India Radio, Calicut nominated by the Director General, New Delhi. The Associate Director is also member of the Research Advisory Committee of Regional Coffee Research Station, district level farm advisory committee of the Agriculture Department, All India Radio farm and home consultative panel, District tribal subplan and District Consultative Committee for banking development.

Finance

Head of Account	Provision for 2003-2004 (lakhs)	Expenditure incurred (lakhs)	Station receipts (lakhs)
Non-Plan	111.535	105.74	19.72
Plan	5.770	3.16	
ICAR	3.350	3.20	
Other EAPs	9.855	9.33	
Revolving Fund	--	4.43	5.99
Total	130.510	125.88	25.71

CARDAMOM RESEARCH STATION, PAMPADUMPARA

Introduction

Cardamom Research Station, Pampadumpara is situated in the Cardamom hill reserve of the Western Ghats at an elevation of 1100m above MSL with a temperature ranging from 12^oC to 32^oC, in the Pampadumpara Village of Udumbanchola Taluk in Idukki Dist. The cool breezy climate lends a unique atmosphere to any man of aesthetic sense. This station is encircled by network of State and National highways that link Munnar and Thekaddy, the well known tourism centers of Kerala. Misty mountains, wide variety of vegetation, natural evergreen forest with extra large trees and extended meadows add beauty and glamour. This station was established in 1956 under the State Department of Agriculture, Government of Kerala and later transferred to Kerala Agricultural University by virtue of KAU Act 1971 with effect from February 1972. This station was selected as one of the coordinating centers for spices under the All India Coordinated Research Project in 1972.

The queen and king of the spices viz., Small cardamom and Black pepper are the mandate crops of the station.

Mandate of the station

The mandate of the station were to Evolve high yielding varieties of cardamom; Standardise location specific agro-techniques for successful cultivation of cardamom, black pepper and cool season vegetables; Formulate effective management strategies for major insect pests and diseases of cardamom and black pepper; Supply superior quality planting materials of cardamom, black pepper, coffee, rose and other ornamental plants; Serve as a centre for agricultural extension and education activities in Idukki district through the organizational participation of farmers training programmes, field demonstrations, farm advisory services etc.; Pest surveillance during epidemics of insect pests as well as diseases in the district and Issual of phyto-sanitary certificate to rooted black pepper cuttings in notified nurseries.

Memorable events of the station

- 1) About 900 suckers of the newly released variety of Cardamom PV2 were sold to farmers of Idukki and Wyanad Dt. of Kerala.
- 2) A District level Seminar on spices under IPDS(Intensive program for development of spices) was conducted at Kattappana Service Cooperative Bank hall on 5th March 2003 funded by Directorate of Cocoa, Arecanut & Spices, Calicut. More than 250 farmers participated in the seminar and problems on cardamom, black pepper and vanilla were deliberated.
- 3) An yield of 2712 kg. of black pepper was obtained during 2003 from the farm which is the record yield of black pepper in the history of the station.

Seminars/Summer Institutes/Symposia/Training attended

The scientists of the station, participated in one National Seminar on Advances in Genetics and Plant Breeding and Impact of DNA revolution and attended AICRP Workshop on spices.

Major research achievements

Plant breeding

a) Germplasm collection and description of types and varieties of cardamom

Germplasm collections of cardamom continued during 2003-2004 in search of superior clones with special emphasis on yield and tolerance to biotic and abiotic stresses in Cardamom Hill Reserves of Idukki district. Seventeen accessions were collected during the report period. A total of 121 accessions are presently conserved in the gene bank. The highest wet yield (3054 g/plant) and dry yield (588 g/plant) of capsules was recorded in S-1, which was also found tolerant to thrips (6.5%). PS-27 stood second in terms of yield (2964 g/plant) and dry yield (552g/plant) of capsules. The volatile oil content was maximum in accession S-1 (7.2%) and PPK-2 (7%). The oleoresin concentrations were high in accession PS-27 (11.2% and BEP-1 (11%).

b) Coordinated varietal trial on black pepper

All the entries survived to more than 55% and the survival percentage was the highest in Cul 5489 (100%). Significant and the highest number of leaves was observed in Col 1041 (90.07) and the lowest in HP 105 (22.13). Height of vine ranged from 94.9 to 177.67 cm and the maximum was registered in PRS 22. Infestation by marginal gall thrips ranged from 5.6 to 13.36%. Panniyur1 recorded the maximum damage by thrips and the values did not show significant difference with other entries.

d) Evolution of high yielding varieties of cardamom

PS12 (115g) recorded the highest 100 capsule weight. Among 12 entries, PS 27 registered maximum wet (3366g) and dry (657.7g) yield of capsules than local check (Green gold). PS 21, PS 9, PS 10 and PS 31 recorded the highest wet and dry yield than our released variety PV 1. PS 27 recorded an increased dry yield of 64.42% and 5.54 % over PV 1 and Green gold respectively.

e) Coordinated varietal trial on cardamom 2000 – Series IV

Tiller number was maximum in Cl. 692 (45.66) closely followed by MCC (43.88). Tiller height ranged from 162.55 to 309.44 cm. S-1 and PS-44 were the tallest accessions and were significantly superior to other entries. Tiller height was the least in RR-1 (162.55 cm). There existed significant difference in number of panicles among the entries evaluated. The highest and significant number of panicles was observed in SKP 117 followed by S-1 and Cl 692. Though a couple of entries did not yield capsules during the period under report, the highest dry yield was recorded in Cl 692 followed by S-1.

Agronomy and Soil Science

Effect of biofertilizer, *Azospirillum* on yield of cardamom

Four treatments such as T₆ (FYM 10 kg + *Azospirillum* 50g), T₅ (FYM 5kg alone) T₇, (FYM 10 kg alone) and T₁ (Inorganic nitrogen 100% + *Azospirillum* 50g+5kg

FYM) which were on par with each other produced significantly higher yield than others. The highest dry yield of cardamom was reported in T₆ (FYM 10 kg + *Azospirillum* 50g -- 0.361 kg/plant) followed by T₅ (FYM 5kg alone -- 0.337 kg/plant), T₇ (FYM 10 kg alone -- 0.298 kg/plant) and T₁ (Inorganic nitrogen 100% + *Azospirillum* 50g + 5kg FYM -- 0.252 kg/plant).

Plant Protection

Entomology

a) Survey for incidence of insect pests on black pepper at high altitude

A total of thirteen panchayats were investigated for occurrence of insect pests of black pepper in high ranges of Idukki district. Scale insects and marginal gall thrips were predominant insect pests at high ranges of Idukki district and were recorded from all panchayats surveyed. Incidence of marginal gall thrips ranged from 8.87% in Vandenmedu to 30.93% in Erattayar. Infestation by scale insects (Mussel scale) was very severe occurring to a maximum of 100% at Nedumkandam. Foliar two-tailed mealy bug was observed in eight panchayats, the maximum being at Vandenmedu (6.93%). Though the intensity of leaf miner and leaf gall incidences were lower, those of which were registered in seven and five panchayats, respectively. Bagworm was registered in Karunapuram and Nedumkandam panchayats at a meagre intensity of 1.33%. Aphids were observed at Chakkupallam and top shoot borer was noticed at Pampadumpara panchayat.

b) Management of root grubs of cardamom

The maximum reduction of cardamom root grub was observed in Imidacloprid (0.75ml/litre) treated plots (89.67%) followed by those plots treated with Chlorpyrifos (0.07%) (83.33%) and Carbofuran @150g/plant (74.74%). All the insecticide treatments at higher concentrations were effective in reducing the grub population to more than 74.4%. The highest yield of cardamom (466.67 g/plant) was realized in Imidacloprid 0.75ml/litre treated plots.

c) Bioecology of natural enemies of major pests of cardamom

Cardamom shoot and capsule borer larvae, *Conogethes punctiferalis* was naturally parasitized by two types of dipteran parasitoids and ichneumonid parasitoids. The highest parasitization was observed in July (91.7%) and the lowest in September (50%).

Plant Pathology

a) Biological control of *Phytophthora* foot rot of black pepper - nursery trial

Planting in solarized soil fortified with *Trichoderma* and VAM gave maximum number of sprouted cuttings, number of roots and length of roots. Incidence of nursery rot was also less in this treatment. The soil temperature under the polyethylene cover raised up to 52°C compared to 41°C in the control.

b) Incidence, epidemiology and management of anthracnose disease of black pepper

Thirteen panchayats were surveyed for occurrence of foliar infection of anthracnose on black pepper at high ranges of Idukki district during the period.

Occurrence of the disease ranged from 0.7 to 13.6%. Incidence of anthracnose was the highest in Vandenmedu panchayat. (13.6%) followed by Chackupallem, 12.3%). Disease occurred mainly on the older leaves and the new flushes and spikes were not infected. The disease was more prevalent at altitudes 1100 meters above MSL. Percentage reduction of foliar anthracnose ranged from 16.8 to 95.3%. The highest reduction of the disease was recorded in T5 Carbendazim @ 0.1% foliar spray (5.30%) followed by T3 Mancozeb @ 0.2%. Twice foliar spray (92.7%), which is reflected from reduced spike infection also. The least spike infection was recorded in T6 (Combination of Carbendazim and Mancozeb) 0.1% foliar spray (3.83%).

Extension and other activities

Scientists of the station visited Kattappana, Mumar, Vandipperiya, Kumily and Udumbanchola and offered recommendation of controlling cardamom yellowing.

Training programmes

Scientists of the station conducted training programme on IPM, IDM on cardamom, pepper and vegetable cultivation.

List of publications

Sainamole Kurian, P., Backiyarani, S. and Josephraj Kumar, A. (2003) Effect of soil solarization on plant growth promotion and biocontrol agents in black pepper nursery. *Proc. Sixth International Workshop on PGPR, 5-10 October 2003, Calicut, India* pp47-52.

Murugan, M., Miniraj, N., Josephraj Kumar, A., Pradeep, K. P. and Yosuf, L. (2003) Analysis and forecast of winter monsoon based on Pre-vedic literature and simulated model. *Asian Agri-History* 7(3): 219-231.

Other details, if any

Dr. A. Joseph Rajkumar, Asst. Professor (Agr. Entomology) bagged ICAR's prestigious Lal Bahadur Shastri Young Scientist Award for the biennium 2001-2002. An Ad hoc scheme entitled "Biological suppression of cardamom root grub through entomopathogenic nematodes" was also granted at an outlay of Rs.7.32 lakhs as part of the award.

Finance

Head of a/c	Provision for the year (lakhs)	Expenditure (lakhs)	Receipts (lakhs)
Non plan	45.740	41.07289	Farm revenue: 5.57573
Plan	9.200	4.97007	Revol. fund : 0.65924
ICAR	7.640	5.98253	
Other EAPS	3.955	0.86123	
Revolving fund	1.000	0.49030	

SPECIAL ZONE OF PROBLEM AREAS

REGIONAL AGRICULTURAL RESEARCH STATION KUMARAKOM

Introduction

The Coconut Research Station, Kumarakom was established in 1947 with the liberal financial support of the Indian Central Coconut Committee to cater to the research needs of coconut in the reclaimed alluvial soils of Kuttanad. Initially, the land required for establishing the station was obtained on lease from the late R.B.A. Baker, an enterprising European planter. However, in 1958, an area of 23.23 ha was acquired from him by the Government of Kerala and the station was brought under the State Department of Agriculture. With the establishment of the Kerala Agricultural University in 1972, the Coconut Research Station, became one of the constituent institutions of the University. In 1982, the station was upgraded to the status of a Regional Agricultural Research Station (RARS) under the National Agricultural Research Project (NARP) funded by the IBRD/ICAR with a mandate for research on crops and cropping systems. This Special Zone of Problem Areas was demarcated to represent geographical areas where agriculture is hazardous and exposed to the vagaries of nature. Encompassing an area of 5254 square km, it comprises parts of the districts of Alappuzha, Kottayam, Ernakulam and Thrissur. Several distinct farming situations are identified in the zone, *viz.*, kayal, karappadam, kari, and pokkali.

Mandate of the Station

The main objective of the station was originally to conduct research on coconut and coconut based cropping systems with special reference to coconut diseases. However, with the implementation of the NARP, the station became the lead station to conduct problem oriented location specific research on all crops in the special zone of problem areas. The main mandate of the station is research on coconut and coconut based farming systems, integrated farming and also :

- ◆ to serve as a Regional Center for solving location specific problems in the Special Zone of Problem Areas comprising Kuttanad and Pokkali tract.
- ◆ to take up research on integrated farming systems incorporating crops, livestock and fish.
- ◆ to promote research efforts in respect of food grains
- ◆ to evolve agronomic practices and land use patterns in the influence area of the station *viz.*, Special Zone of Problem Areas.
- ◆ to co-ordinate research efforts in the control and management of the dreadful disease, root (wilt) of coconut.
- ◆ to co-ordinate and guide the research activities of the sub stations in the Special Zone.
- ◆ to promote the extension of technology to the farming community.

Lead Station	:	R.A.R.S., Kumarakom
Satellite stations	:	1) R.R.S., Moncompu 2) R.R.S., Vytila 3) S.R.S., Thiruvalla 4) AICRP on Agrl. Drainage, Karumady

A few memorable events of the institution.

- ◆ During the period under report the scientists of the station achieved a break through in captive breeding of two endangered endemic fish species of Western Ghats viz. Nadan Mushi (*Clarias dussumieri*) and Kooral (*Gonoproctopterus koorali*). This is the first report on induced breeding of this species. With this accomplishment, the center could contribute three new species to the National Aquaculture system.
- ◆ The bio-control unit established for the commercial production of bio-control agents such as *Pseudomonas* and *Trichoderma* could sell 30 tonnes which fetched Rs.15 lakhs. This unit was established as a participatory programme involving women self help group (SHG).
- ◆ Two farmer -scientists interaction programmes of two days duration were conducted on 25-4-2003 to 26-4-2003 and 5-5-2003 to 6-5-2003 for the farmers of Kottayam District in collaboration with the Department of Agriculture at RARS, Kumarakom.
- ◆ Twenty sixth Zonal Research and Extension Advisory Council (ZREAC) Workshop was held on 16th Jan., 2004.
- ◆ A Farm and Farmers Day was celebrated in a befitting manner on 1st January 2004. Best labourer of the farm, Best Block of the farm and Farm Assistant and Labourer in charge of this Block were given Cash Award and Ever Rolling Trophy respectively. A Seminar on the Farm Development of RARS was also convened on this Day.
- ◆ Organized the first attempt to inventorise the fish bio diversity of the entire Meenachil River System with the active participation of Stake holders and Environmentalist during March 2004.
- ◆ Research - Extension Interface of Kottayam district on 23-5-03

Seminars/Summer Institute/Symposia/Training attended

During the report period scientists of the station attended 2 International Seminars on Giant Fresh Water Prawns and 12 National Seminars on Problem related to fish culture, Pampa river, Kuttanad, Etiology, ORP etc. and Workshop on wetland projects and interface with farmers of Kottayam and Alappuzha districts.

Major research achievements

Department of Plant Breeding

- In a trial for the evaluation of three coconut hybrids (WCT x MYD, WCT x CGD and WCT x COD) with WCT as check variety, WCT x CGD was found the best in production of nuts.

- In the study on the “Variability and character association in Chowghat Green Dwarf” a survey was conducted in three districts viz. Alappuzha, Kottayam and Pathanamthitta to locate promising CGD palms in root (wilt) affected areas. Ninety promising palms were located for further observation and experimentation. Nut characters including oil content were studied with respect to these selected mother palms. The study revealed that the oil content of the CGD palms ranged from 61 to 71%. The progeny performance of the selected palms were also studied. Based on the seedling vigour, progenies of 44 selected mother palms were planted in the farm for further studies.
- Efforts were taken to impart cowpea aphid borne mosaic virus resistance to the vegetable cowpea variety KMV-1 released from this station through a back cross breeding programme involving KMV-1 and CO-6. Through the study, 10 promising selections having mosaic resistance were identified and are under experimentation.
- An externally aided project on Medicinal plants was undertaken to study the suitability of medicinal plants for the Kuttanad tract and popularize its cultivation. An area of 1.5 ha. was planted with *Garcinia* as the pivotal crop and medicinal plants like ‘Chittaratha’, ‘Chethikoduveli’, ‘Chakkarakolli’, ‘Pathimugham’, ‘Chittatalodakom’, ‘Stevia’, ‘Safed musli’ were planted as intercrop.
- An experiment for the evaluation of ‘*Caesalpinia sappan*’ (Pathimugham) was also laid out.

Department of Horticulture

Stevia

- Propagation of this medicinal plant using macro cuttings to standardize from both the apical and lower portion. When cuttings from lower portion are used it is ideal to activate buds by pinching the upper part, activating the axillary buds and using the activated cuttings as planting material.
- *In vitro* studies were taken up during the period revealed that multiple shoot could be induced both from the stem apices and first internode. Healthy callus production both from stem and leaves were obtained.
- Post harvest studies in stevia revealed that dryage varies from 9.5% to 11%. The powdered leaf sample was efficient and cheap method of storing stevia. Stevioside content reduced under storage. This method of extraction proved good only for a very short period of time. Alcohol extraction retained better characters after seven days. But after one month of storage the product lost its colour and taste. Stevioside content varied with position of leaves, with maximum levels from third to sixth leaf and relatively higher level were observed even after one month of storage.

Vanilla

- Rapid multiplication using one metre vine and for the production of one metre cutting of vanilla was standardized. Four metres of cuttings could be produced this year using the betel vine type of cultivation.

- Two improvements in quality of multiple shoot production and cheap and efficient method of planting of tissue culture plantlets using locally available quarry powder and granite pieces were standardized.

Bamboo

- Preliminary studies on *in vitro* culture techniques in *Thyrstostachys oliveri* (bamboo used for making lathi) were also attempted.

Banana

- Observations on studies on salinity tolerance in banana revealed that "Njalipoovan" was the most tolerant. However, this clone failed to produce quality bunches.
- Spraying of 3% potassium sulphate solution on Nendran bunches two weeks and four weeks after bunch emergence gave higher yields.

Department of Agronomy

Utilisation of aquatic weeds for composting and Vermicomposting

- Trials of composting aquatic weeds were continued in the second year also.
- Local species of earthworms were collected and multiplied. Their composting efficiency was tested. None of these species had composting efficiency.
- Vermicomposting efficiency of *Eudrillus eugineae* and *Eisania foetida* were tried. It was found that both species were efficient in vermicomposting.
- Vermicomposting using earthworms is found to be beneficial than ordinary composting using trichoderma in aquatic weeds since it hastens the composting process. Fresh aquatic weeds could be used in vermicomposting.
- The ratio of 10:1(10kg aquatic weeds +1kg cow dung), which were suitable for ordinary composting was found suitable for vermicomposting also.

Analysis and development of homestead farms of Kerala – A farmer participatory approach

- The homesteads of Kottayam, Alappuzha and Ernakulam were surveyed and database formed. From these homesteads 50 were selected. From these homesteads 45, were selected for the development of homesteads. Various interventions including development of integrated farming system models, intercropping coconut gardens with vanilla, banana, pepper and vegetables were made in these selected homesteads. Rain water harvesting structures and vermi-composting units were built in the homesteads.
- Trainings were conducted for homestead farmers. Self-help groups were created making the homestead farmers as group leader or nucleus of the group. Thus the modern agricultural technologies are made available to actual participating farmers.

- A project funded by the Coir Board entitled "Bio-efficacy evaluation of coir pith manure on coconut" started during the previous year was continued and yield of nuts was recorded. Project is in progress.
- "Nutrient Management of *Garcinia* grafts for reclaimed alluvial soils" is in progress. Height of plants and number of primary branches were more in fertilizer applied treatments compared to FYM applied control plot. Three year old grafts started yielding in all the treatments in the year under report. Percentage of plants started bearing in control plot was less compared to the treatment plots.

Department of Agricultural Economics

Economic analysis of rice based cropping system in coastal agro-ecosystem of India

The project aims to analyse the existing farming systems in the rice growing coastal districts of the state and develop, test and popularize optimal crop plans with rice as the base crop for the different coastal districts of the state. For primary data generation, a multi stage random sampling procedure was followed for selection of blocks, panchayats and respondents and the total sample size for detailed investigation was $10 \times 2 \times 50 = 1000$. Interview schedules were structured, pre-tested, revised and multiplied to collect primary data through personal visit from different types of rice based integrated farming systems in the state. Data generation and tabulation work were completed. Farmer-Scientist interactive sessions were conducted in the districts during the investigation period to get the feed back of integrated farmers on the problems faced by them in farming. Scientists of the station from relevant disciplines attended such sessions. Econometric analysis of data to find out farm efficiency has been undertaken for all the districts. Data analysis for tabular presentation was completed for four districts and nearing completion for another two districts. Workshop involving all stakeholders of the project was conducted during 26-27 December 2002. The work done so far in the project, future strategy and expected results and policy options were presented, discussed and deliberated upon under the guidance and moderation of officers of the University and project team leaders. A public meeting was organized in the forenoon of 26th to mark the inauguration of the workshop. Preliminary analysis of data collected from six coastal districts was presented during the workshop. A field trip to the rice based farming systems in the low-lying fields of Kuttanad, one of the rice bowls of the state, also conducted during the workshop. Scientists and extension staff working at the other centers of the project in Tamil Nadu (Coimbatore), Andhra Pradesh (Bapatla) and Maharashtra (Karjat) participated and shared their experiences. One booklet entitled 'Coastal economy of Kerala: a profile' was brought out during the month of January 2003, incorporating the published data on agricultural, demographic and related variables of the coastal districts for the last 15 years and initial findings obtained in the project.

Department of Plant Pathology

Different species of Oyster mushroom-like *Pleurotus* *sojorcaju*, *P. florida*, *P. citrinopileatus*, *P. plantypus*, *P. cous*, *P. opuntia*, *P. djamor* and *P. ostreatus* were evaluated for their performance and quality attributes. The study revealed that all the species except *P. ostreatus*, *P. opuntia* and *P. cous* can be successfully grown. However, *P. florida* and *P. citrinopileatus* were more accepted due to their white colour, texture and

keeping quality. Paddy straw is the well accepted medium for growing oyster mushroom. *Eliocharis plantogens* an aquatic gramineae weed was a substitute for paddy straw to grow oyster mushroom. It can also be used in combination with paddy straw at 1:1 ratio. Another study revealed that softwood sawdust, rubberwood sawdust was an excellent medium for growing oyster mushroom especially *P.florida* and *P.citrinopileatus*. Several growers who had undergone training on oyster mushroom cultivation at R.A.R.S., Kumarakom are now using rubberwood sawdust for commercial cultivation of oyster mushroom.

Studies on wilt disease of bittergourd and cowpea showed that they are caused by *Ralstonia solonacearum* and the disease can be managed by regular use of bleaching powder in the basin, by proper sanitary measures and controlled irrigation.

Study on diseases of vanilla revealed that the crop is affected by a number of fungal and viral diseases. The major fungal diseases and their causal organisms identified are given below:

- | | | |
|----------------------------|---|---|
| 1) Root rot | - | <i>Verticillium</i> sp., <i>Sclerotium rolfsii</i> |
| 2) Foot rot | - | <i>S.rolfsii</i> |
| 3) Wilt disease | - | <i>Fusarium oxysporum</i> of sp. <i>vanillae</i> |
| 4) Stem rot | - | <i>F.oxysporum</i> , <i>F. semitectum</i> |
| 5) Shoot tip rot | - | <i>F.oxysporum</i> , <i>Colletotrichum gleosporioides</i> |
| 6) Leaf rot | - | <i>F.oxysporum</i> |
| 7) Leaf blight | - | <i>C.gleosporioides</i> , <i>F.oxysporum</i> |
| 8) Flower rot | - | <i>Fusarium oxysporum</i> , <i>C.gleosporioides</i> |
| 9) Bean rot | - | <i>Fusarium oxysporum</i> , <i>C.gleosporioides</i> |
| 10) Immature bean shedding | - | High temperature, hormonal imbalance |
| 11) Thread blight | - | <i>Marasmius</i> sp. |
| 12) Red rust | - | <i>Cephaleuros parasiticus</i> (algae) |

The virus diseases studied were Vanilla mosaic, vanilla leathery mottle and vanilla necrosis. All of them were transmitted by sap inoculation. For the time being 3-5% of vanilla plants are affected by virus under field conditions. Techniques for field identification of infected plants based on symptoms and pruning were standardized and communicated to the growers. They were also educated on the necessity of immediate rouging of virus infected plants. A comprehensive disease management strategy including the precautions to be taken while planting manuring, mulching, slurry application, necessity of timely phytosanitation followed by soil and foliar application of 2% *Pseudomonas fluorescens* and basal application of Trichoderma were worked out and well accepted by the growers. Studies on the use of alternate media for mass multiplication of Trichoderma and *Pseudomonas* showed that they can be successfully multiplied in coconut water/jaggery (5%) and pepton (0.5%). Another great achievement is the compatibility studies of *P.fluorescens* with commonly used chemical pesticides. It is compatible with Quinalphos, Triazophos, Imidacloporid, Carbaryl, Chlorpyrifos, Etofenprox, Dichlorvos, Dimethoate, Malathion, Acephate, Mancozeb, Hexaconazol, Propeconazol, Carbendazim

and Potassium phosphonate. It is not compatible with antibiotics, bleaching powder and copper based pesticides.

Fisheries Division

- Under the NATP - Germplasm Inventory, Evaluation and Gene banking of Freshwater Fishes, captive breeding of five endemic fish species viz. *H.brachysoma*, *L.dussumieri*, *C.dussumieri*, *G.curmuca*, *E.suratensis* were accomplished.
- With the standardization of technology for captive breeding, there has been demand from the farmers for new species. Moreover, during this year the embryonic development of all these species were documented.
- As *in situ* conservation by protecting biodiversity rich reaches and natural habitats of vulnerable species is the ultimate objective of the project, a fish reproductive protection zone or fish sanctuary for *Etroplus* constructed in the Vembanad lake was utilized for conservation and recruitment promotion of *E.suratensis*. This simulated and engineered fish sanctuary, the first of its kind in the country is maintained with active support and involvement of the local self government. Identifying the benefits of the system to the local fishers, the Grama Panchayat has come forward for maintenance support to the sanctuary.
- The ultimate aim of the project being the conservation of biodiversity rich regions and hotspot area in the river system, with the participation of the local people, a river watch programme and awareness campaign named 'Meenachil Fish Count 2004' was organized under this project. The 79 km stretch of the Meenachil river was surveyed for endemic fish species and were inventorised. 51 fish species were recorded in the study. This is the first time in the country that such a River Fish Count was organized on a single day with the involvement of scientists, environmentalist, naturalist and general public. The environmental conditions of different river reaches were also evaluated. This programme has received wide coverage in the mass media.
- During the year breeding protocols of all the earlier species bred were fine tuned and confirmed.

Extension and other activities

Krishi Vigyan Kendra

The remandated ZRS KVK functioning at Regional Agricultural Research Station (RARS), Kumarakom, Kottayam, Kerala has been actively involved in the process of transfer of technology to the grass root level beneficiaries.

Vocational Training Programmes

Vocational training programmes form the basic mandate of this KVK. Several areas have been identified, based on the needs of the farming community, in the areas of

Agronomy, Horticulture, Plant Protection, Aquaculture, Agricultural Engineering and Home Science, for imparting training.

No. of training programmes - 63

Total No. of trainees - 1505 (Male - 869, Female - 636)

Front Line Demonstrations

FLDs are conducted in Farmer's field to demonstrate the latest technology or technology still in the pipeline, for which co-operating farmers are selected to try out the technology in their field. The following five FLD's have been laid out in farmers' fields during this period.

- | | |
|--------------------------------|------------------------------------|
| a) Organic Vanilla Cultivation | b) Rapid Multiplication of Vanilla |
| c) Composite fish culture | d) Ornamental fish culture |
| e) Biofungicides on Vanilla | f) Biofungicides on Betelvine |
| g) Biofungicides in Vegetables | h) Rice - Fish Rotational Farming |

On-farm trials

The KVK is vested with the important responsibility of conducting OFTs in different fields of Agriculture. OFTs are important since the research recommendations cannot always be adopted as such by farmers. Often such research findings require refinements and modifications to suit local conditions. Currently KVK is conducting OFTs in the following areas

- a) Management of cowpea aphid using *Fusarium pallidorozeum*
- b) Management of Paddy Sheath Blight & blast using *Pseudomonas fluorescens*
- c) Management of foot rot disease in pepper using bio-fungicides

Demonstration units

The KVK is maintaining demonstration units like Red Palm Weevil Pheromone traps, Spirulina Culture unit, Ornamental fish culture unit, bio-fungicide production unit etc. for the benefit of farmers and visitors, which will serve as an effective demonstration tool during the trainings.

Production Units

Bio-fungicide Production Unit - This unit is manned by the members of the all women self help group *Haritha* who were trained under the KVK. Production of *Pseudomonas fluorescens* and *Trichoderma* is taken up on a commercial basis. The sales proceeds have crossed Rs. 15 lakh as on date. As per the MOU with KAU, the members were given 20 percent of the sales proceeds as wages for labour. The produce is marketed through the sales centre of this KVK.

Horticultural Nursery - This unit is also manned by the members of the all women self help group *Haritha* who were given six month long vocational training on *Nursery Management* under the KVK. Production of grafts of cashew, elite seedlings of nutmeg, ornamental foliage and flowering plants, medicinal plants etc. are taken up on a commercial basis. The sales proceeds have crossed Rs. 0.55 lakh as on date. As per the MOU with KAU, the members were given 30 percent of the sales proceeds as wages for labour. The produce is marketed through the sales centre of this KVK.

ATIC cum Sales Centre

Krishi Vigyan Kendra has started an ATIC centre with the aim of effective dissemination of agricultural technology along with popularizing the different products of the Kerala Agricultural University. This centre was started during July 2003 with the cooperation of the members of a women self-help group *Aiswarya* who were trained under this KVK for a period of three months on Scientific Fruit and Vegetable Preservation. This centre serves as the Information cum Sales Centre of the remandated ZRS. Currently different products of KAU viz, publications, bio-fungicides, planting materials, ornamental fishes, dairy products etc. are being sold through this centre. Besides the SHG members also produce processed fruit and vegetable items and are sold through the refreshment centre associated with the ATIC centre.

Trainings/ Seminars attended by the Scientists

Training on different aspects like IPM, Organic Farming, Azola culture, Vegetable cultivation, Bio-fertilizers, Vanilla cultivation, Coconut cultivation, Paddy Production Technology, High Tech Agriculture, Vermi culture, Mechanisation in Agriculture, Bio-control of plant diseases etc. were imparted by the Scientists to farmers in different Krishi Bhavans, Co-operative Banks etc. 136 such off campus trainings were conducted.

Other Extension Literature)

- 1) Handouts – 2 nos.
- 2) Popular articles – 20 nos.
- 3) Research Papers – 4 nos.
- 4) CD on Vanilla Cultivation
- 5) Radio Talks – 6 nos.

Important visitors

1. Dr. S.P. Singh, Mission Leader, NATP, National Bureau of Fish Genetic Resources visited the station on 25.4.2003.
2. A group of scientists on Taxonomy training, College of Fisheries visited the station, to visit the fish sanctuary established by the centre in the open Vembanad lake, on 24.9.03
3. Dr. K. P. Agrawal, National Coordinator (MM), NATP visited the centre on 8.1.2004

4. Dr. K.V. Peter Vice-Chancellor, KAU visited the Station on 26th April 2003.
5. Director of Research and Director of Extension visited the station on 16th Jan. 2004.

Production and sale of seeds and planting materials

Quality Seeds and Planting materials, Mushroom spawn, Vermi compost and earthworm worth Rs. 8.4 lakhs were sold during the year under report.

Finance

Head of Account	Provision (Rs. In lakhs)	Expenditure (Rs. In lakhs)	Station Receipts
Non Plan	106.843	97.894	11.068
Plan	23.500	21.273	-
EAPs	1.400	0.560	-
Revolving Fund	-	11.581	11.115

RICE RESEARCH STATION, MONCOMPU

Introduction

The Rice Research Station, Moncompu caters to the Kuttanad ecological zone with the mandate to serve the farming community in Kuttanad by evolving suitable high yielding medium and short duration rice varieties resistant to pests and diseases, finding solution to the problems associated with the management and crop protection aspects of rice and to transfer the technology developed by conducting training programmes for the extension personnel. Other objectives include the standardisation of management practices, integrated management of pests and diseases of rice and evolving low cost production technology for Kuttanad.

Lead station : RARS, Kumarakom

Seminars/summer institute/symposia/trainings attended

The scientists of the station attended Annual meeting of AICRIP held at Ludhiana and National Seminar on Gassifier.

Research Programme

Major Research achievements

Crop Improvement

a) Farm Trials with four short duration cultures along with Jyothi were conducted in cultivator's fields at Alappuzha and Kottayam dt. (5 locations each) during Puncta 2002-2003. Among the early duration group, culture M9 (mutant of MO 6) with 4615 kg/ha out yielded the check variety Jyothy (4177 kg/ha). Among the cultures belonging to the maturity group of Jyothy, Culture SD 6 showed superiority over the check variety in pooled mean with a grain yield of 5573 kg/ha. Multi locational trials will be conducted in the next first crop season in various Research Stations for conclusive results.

b) Farm trials with three cultures with resistance to important rice diseases of Kuttanad were conducted during Puncta 2002-2003 in cultivators fields (5 locations each) at Alappuzha and Kottayam Dist. Culture M 95-1 with a grain yield of 5322 kg/ha performed better compared to the other cultures as well as the check variety Jyothy (4177 kg/ha).

c) Advanced Variety Trial-1 – Early was laid out in RBD (3 replications) with 26 entries received from DRR, Hyderabad. Out of the twenty six entries tried, entry no. 401 (HRI 119) recorded the maximum yield of 7900 kg/ha followed by 413 (MTU 1063) with 7247 kg/ha and 407 (CSRC(S)32-5-B-B-1) with 6980 kg/ha.

d) Twenty two cultures belonging to Advanced Variety Trial-2 – Early, received from DRR, Hyderabad were laid out in the field. Out of the twenty two entries tried, entry no. 303 (RP 3522-44598-2592) recorded the maximum yield of 7137 kg/ha followed by 308 (NLR 3367) with 6710 kg/ha

e) Advanced Variety Trial-1 – Irrigated Mid Early was laid out in RBD (3 replications) with 16 entries received from DRR, Hyderabad. The entries include cultures and hybrids developed at various research stations throughout India. Out of sixteen entries tried, entry no. 1009 (EXPH 257) recorded the maximum yield of 8580 kg/ha followed by 1010 (EXPH 258) with 8333 kg/ha.

f) Out of thirteen entries tried under Advanced Variety Trial-2 – Irrigated Mid Early during 2002, entry no. 907 (PRH 122) recorded the maximum yield of 8513 kg/ha followed by 904 (EXPH 209) with 7937 kg/ha

g) Out of the sixteen entries received from DRR, Hyderabad under Advanced Variety Trial-1 – Slender Grain, entry no. 2302 (R 1072-360-1-1) recorded the maximum yield of 7147 kg/ha followed by 2315 (PR 106) with 7097 kg/ha

h) Seven advanced cultures and hybrids belonging to Advanced Variety Trial-2 – Slender Grain were received from DRR Hyderabad and put under RBD with three replications. Entry no. 2206 (PR 106) recorded the maximum yield of 6170 kg/ha followed by 2205 (IR 64) with 5900 kg/ha

i) Under the project “Collection, Maintenance and Evaluation of rice germplasm”, 430 accessions were maintained during the period

j) F5 & F6 material from the project “Genetic analysis of gall midge resistance in rice and evolving resistant varieties for gall midge biotype 5” were screened against gall midge biotype 5 and selections were made.

k) One hundred rice accessions including AICRIP cultures, released varieties of KAU and traditional rice varieties of Kerala were tested for tolerance to water submergence for more than 10 days and 18 tolerant lines were selected for further evaluation and utilization.

l) Forty seven rice accessions including released varieties of KAU and traditional rice varieties were tested for tolerance to adverse soil conditions in farmers fields at Karumady and 13 lines gave good phenotypic acceptability and tolerance and were selected for further evaluation and utilization

Seed production programme

Breeder and Foundation seeds of the varieties released from the station were produced during Additional Crop 2003 and Puncta 2003-2004

Sl. No	Variety	Quantity produced (kg)	
		Breeder seeds	Foundation seeds
1	Mo.4	225.0	-
2	Mo.5	28.0	-
3	Mo.6	157.5	909.0
4	Mo.7	32.5	-
5	Mo.8	25.0	-
6	Mo.9	23.0	-
7	Mo.10	15.0	-
8	Mo.11	94.0	65.0
9	Mo.12	24.5	-
10	Mo.13	21.0	82.5
11	Mo.14	132.5	-
12	Mo.15	272.5	830.0
13	Mo.16	1975.5	7381.5
14	Mo.17	22.5	-
15	Mo.18	11.5	-
16	Mo.19	15.5	803.5
17	Mo.20	508.5	1706.5
18	Jyothi	-	4509.0
	Total	3584.0	16287

Crop management

a) The results of the Permanent Manurial Trial in rice conducted at RRS, Moncompu for the seventeenth year, showed that there was no response to potash in the intensive double crop rice in Kuttanad where straw recycling is practiced, where as the response to nitrogen is 2.3 tons/ha. Skipping phosphorus reduced rice yield, even after 16 years. There is depletion of soil organic carbon and potash, but phosphorus increased. In seasons of kharif crop failure by flood there was little response to phosphorus also indicating the possibility of reducing P and K. A farm trial has been started to confirm this result:

b) Three trials were laid out under crop management during the period as per AICRIP (Agronomy) programme, and one as per KAU programme. The studies "To develop appropriate techniques for growing direct seeded rice under puddled condition" revealed the advantages of line sowing using the 8 row drum seeder for crop stand establishment and yield, over the conventional practice of broadcasting sprouted seeds and even transplanting. The grain yield was significantly higher in drum seeding and that

too with a significantly lower seed rate of only 50 kg/ha., when seeding was done 48 hrs. after puddling.

c) The trial on "Weed control of transplanted rice" with new herbicides indicated that, pre-emergence sprays of Butachlor (1.0 kg ai/ha), Bensulfuron methyl (0.050 kg ai/ha) and 2,4-D (0.8 kg ai/ha) followed by hand weeding at 40 Days After Transplanting (DAT). were equally good in controlling weeds in transplanted rice, all recording grain yield on par with that of two hand weedings at 20 and 40 DAT. However, the pre-emergence spray of the versatile herbicide 2,4-D Na (0.8 kg/ha) at 5 DAT followed by a post emergence hand weeding recorded the lowest weed dry matter production and weed incidence.

d) The trial to evaluate the "Effectiveness of herbicides for direct seeded rice under puddled conditions" highlighted the effectiveness of the pre emergence spray of Butachlor+safener 1.0 kg ai/ha, Pretilachlor+safener 0.4 and 0.5 kg ai/ha early post emergence spray of Pyrazo sulfuron ethyl at 10 days after sowing (DAS), and also the singular spray of Almix (0.004) kg/ha. at 25 DAS in controlling weeds, having recorded grain yield on par with that of Hand Weeding Twice.

e) The nutrient response studies on the Moncompu variety MO 16 revealed that neither the higher levels of nutrients above the recommended dose of 90-45-45 kg/ha of NPK nor increasing the seed rate above 100 kg/ha had any significant effect on grain yield, the range being 7.0 - 7.9 tons/ha.

f) To realize the full potential of higher sink in hybrid rice, synchronization of potassium supply at late growth stages for rice hybrid was assessed. The short duration hybrid, KRH-2 (5.91 t/ha) recorded significantly higher grain yield (60% more) over its check, Rasi (3.69 t/ha). Whereas, the medium duration hybrid, DRRH-1 (5.70 t/ha) was on par with its check, Jaya (5.36 t/ha) unlike previous year, where it was superior to Jaya. All the K treatments (100% and 150% recommended K as basal and in splits) recorded significantly higher grain yield over control, Ko, recording maximum grain yield at K3 (5.62 t/ha) where 100% K was given in 2 splits (75% basal+25% at PI). In the silty clay soil of Moncompu with medium K status (194 kg/ha), there was no response to additional K application beyond the recommended dose.

Crop Protection

a) Studies on sheath blight control by using new fungicidal formulations was carried out during *Kharif* 2003 and *Rabi* 2003-'04. The results showed that result 25 EC @ 500ml, Kitazin 48 EC @ 1000 ml and Saaf 75 WP @ 750g/ha were highly effective and showed promise in checking spread of the disease. Of the new formulations evaluated for the blast disease, Amistar 25 SC @ 500 ml and RIL-010/F1 25 SC @ 750 ml/ha were highly effective and on par with the tricyclozole formulation in checking the leaf blast infection, though it was not reflected in the grain yield. During *Kharif* 2003, 903 AICRIP entries were planted for screening of blast, sheath blight, brown spot and

sheath rot disease resistant cultures. Out of 903 entries, 118 were multiple resistant to all above important diseases.

b) Rice production oriented survey was conducted at 27 villages of Alappuzha, Pathanamthitta and Kollam districts during *Kharif* 2003. Rice crop was comparatively good since there was no flood during this season and low pest/disease incidence. Most of the farmers were progressive in nature and go for high yielding varieties and the variety Jyothi covered maximum area. Human labour is mainly used for all operations and mechanization has not reached the area except tractors/tillers and threshers in Kuttanad area.

c) Pest surveillance surveys were conducted in various padasekharams and visits made on demand to assess the crop loss as well as to give advice on plant protection aspect during *Kharif* and *Rabi* season. Wide spread incidence of leaf folder occurred through Kuttanad coinciding with overcast sky during the last week of August and the first fortnight of September and October 2003.

d) Monitoring of stem borer species showed dominance of Yellow Stem Borer over the White Stem Borer during maximum tillering stage (65-67%) and heading stage (85-100%).

e) Gall midge population pressure was too low to get any significant result in the 513 lines screened under five trials and it also affected Gall Midge Population Monitoring trial.

Extension and other activities

Dr. Abraham Varghese, Associate Professor - As Co-ordinator for GALASA Programme of Kuttanad, Uma variety was tried in 144 acre padasekharam at kavalam kizhakkumpuram using one time revolving fund of Rs.1750/ha, with the group activity of Farmers, Agrl. labourers, Scientists, peoples representatives. In this programme, under the single crop system (puncha) an yield of 7.4 ton. (2000-2001) and 8-8.5 ton (2001-2002) and 8 tons (2002-03) and 5 to 6 tons (2003-2004) could be produced with all package of practices of KAU including FYM @ 2ton/ha, water management, IPM, INM IWM and with out any pesticide applications using 'UMA' variety. He handled 14 Nos classes to Agrl. Officers and Farmers; and Participated in the Research-Extension Interface conducted by Department of Agriculture at Kottayam, Alappuzha and Pathanamthitta.

Dr. Leena Kumary. S., Associate Professor - Participated in the State Level Research-Extension Interface held at Trivandrum and led discussions on Rice Varietal Improvement Programme and Seed Production programmes of KAU. She participated in the Farmer Scientist Interaction programme, Agricultural Extension Training Programme for grass root level officers of the Department of Agriculture and quality seed production programme of the Department of Agriculture and took classes on Varietal aspects of rice, Hybrid Rice Technology and quality seed production in rice for Agricultural

Officers, Asst Directors of Agriculture and Agricultural Assistants. She rendered farm advisory services to farmers in person, through letters and also through telephone at Rice Research Station, Moncompu; and Visited salt water affected fields at Karumady and Ambalappuzha taluks in Alappuzha district and suggested remedial measures to farmers.

Important Visitors

S. V. Subhaiah, Head, Crop Production Section, DRR, Rajendranagar, Hyderabad and N. Shobha Rani, Principal Scientist, DRR, Rajendranagar, Hyderabad visited on 20-10-2003 and on 5-3-2004 Bhohani Sankar Mahapatra, Water Management Specialist, DDA, Boloqyer, Orissa visited the station.

Finance

Head of a/c	Provision for the year (in lakh)	Expenditure (in lakh)	Receipts (in lakh)
Non Plan	50.405	45.887	
Plan	6.550	3.653	
ICAR	16.650	15.202	
Other EAPs	0.170	0.144	
Station Total	73.775	64.886	348883/-

ONATTUKARA REGIONAL AGRICULTURAL RESEARCH STATION KAYAMKULAM

Introduction

The Regional Agricultural Research Station for Onattukara, Kayamkulam, the then Rice Research station was established in 1937 under the erstwhile Travancore University for the improvement of rice and sesamum crops in Onattukara region. On 28th May 1958, it was transferred to the State Department of Agriculture. With the formation of the Kerala Agricultural University on 1st February 1972, this institution was transferred to Kerala Agricultural University as its constituent unit. In 1981, the station were declared as a sub centre for conducting research on root (wilt) disease of coconut. On 12th April 2000, the status of the station was raised to Onattukara Regional Agricultural Research Station with the idea of implementation of comprehensive coconut care project in the Onattukara region. The station is located 1.6 km east of Kayamkulam town, 3.05 m above MSL. The station has a total area of 11.65 ha. comprising of 9.45 ha. of wet land and 2.2 ha. of garden land.

The soil type is loamy sand with 83-89% sand, 5% silt and 5.8% clay with a field capacity of 16.05. The soils contain Nitrogen 0.145 %, P_2O_5 0.121%, K_2O 0.0185, Calcium 0.098% and Magnesium 0.035%. Flooding is a problem during rainy days and crops experience drought during summer season.

Mandate of Institution /Station/Unit

The mandate of the station is to develop improved varieties of paddy, sesamum, groundnut and pulses suitable for Onattukara; Standardize production and processing technology for paddy, sesamum, groundnut and pulses; Maintenance of germplasm of the crops viz., paddy, pulses and oil seeds; Studies on mushroom production technology; Develop suitable agro-techniques for improving the physical condition and nutrient status of the soil; Conduct front-line demonstrations and on farm trials and Implementation of comprehensive coconut care project.

A few memorable events of the institution

The Joint Parliamentary Committee on Agriculture comprising of 18 Parliamentary Members from Lok Sabha and Rajyasabha headed by G. L. Bharga, MP along with Sri P.D.T. Achari, Additional Director General, Lok Sabha visited the station on 18-09-03 at 4.00 pm. They were received by Hon'ble Vice Chancellor Dr K. V. Peter, along with Dr A. I. Jose, Director of Extension, Adv. A. Thriyakraman Thampi, Accounts Committee Chairman and staff members of the station. They went round the farm and visited the exhibition on traditional agriculture of Onattukara organized at the station in connection with their visit.

Seminars/summer institute/symposia/trainings attended

Name	Designation	Seminar/symposia/ workshop/ Summer institute for which deputed	Period of deputation	Institution to which deputed and duration of course
Dr.Sveup John	Associate Professor	Annual workshop on oilseeds- sesamum & niger	21-4-03 to 30-4-03	JNKVV, Junagadh
Dr.P.Sushama Kumari Dr.M.Indira Dr.G.Suja	Associate Professor Asst.Professor Asst.Professor	Computer Applications	4-11-03 to 24-11-03	Academic Staff College, Kerala University, Kariyavattom
Dr.S.Shailaja	Associate Professor	Multidisciplinary IT	31-12-03 to 27-1-04	Academic Staff College, Kerala University, Kariyavattom
Dr.G.Suja	Asst:Professor	Life science	2-1-04 to 24-1-04	Academic Staff College, Kerala University, Kariyavattom
Dr. M.Indira	Asst:Professor	Micro organisms in phosphorus nutrition and crop growth	3-03-04 to 23-03-04	Tamil Nadu Agricultural University, Coimbatore

Major research achievements

Rice and rice based cropping system

Crop improvement

Three promising rice cultivars viz, OM₂, OM₃ and OM₄ were found to be suitable orumundan tract of Onattukara. In the multilocal trial, these cultures performed better than the variety Sagara.

Under the experiment on short duration rice varieties for virippu season and photosensitive semi tall high yielding varieties for mundakan season, mutants and segregants of rice were isolated

Crop management

Application of cattle manure to supply 25% of the total recommended dose of nitrogen along with balance nitrogen and recommended dose of P and K as inorganic fertilizers gave optimum rice yield in loamy sand soils of Onattukara

Pulses and Oilseeds

Cowpea

Two cultivars viz. Cul 1 and Cul 2 having synchronized maturity performed well in the summer rice fallows of Onattukara.

Sesamum

Under the ICAR Adhoc scheme on breeding *in vitro* techniques for incorporation of stress tolerance in sesame, three wild species viz. *Sesamum radiatum*, *S. mulayanum* and *S. malabaricum* were identified.

Under AICRP experiments on sesame, mutants Thilak and Kayamkulam-1 were isolated.

Crop Management

Sesamum

The data from the trial on integrated weed management in sesame revealed that seed yield was maximum (682kg/ha) with two hand weeding (at 15 & 30 DAS). Among the herbicide treatments Alachlor @1.5 kg /ha coupled with hand weeding at 30 DAS gave higher seed yield (586 kg /ha) than other treatments.

Biotechnology

In *Garcinia compogea*, in order to standardize the media for further regeneration, protocols other than embryo culture, initial attempt was made to regenerate the embryo from seed, which was successful in Mitra basal medium supplement with PVP (100mg/l, sucrose 30g/l, agar 0.8% with pH 5.8). Multiple shoots were obtained from the nodal segment/meristems.

Indirect organogenesis was attempted using pieces of endosperm tissue. The callus developed from the endosperm tissues and further success was obtained with organogenesis of the callus with BA (5mg/l) and NAA (1mg/l) in Mitra basal medium.

Extension and other activities

Scientists of this station are regularly participating in different agricultural seminars organized by the Department of Agriculture, FACT and other organizations related to Agriculture in Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta, Ernakulam and Kottayam districts for handling classes.

Scientists of this station serve as resource personnel in the monthly training and visit programme (T&V) organized by the Department of Agriculture, Kollam District.

Scientists of the station participate regularly in the Research and Extension interface programme of Kollam, Alappuzha and Kottayam Districts to transfer the latest research technologies in various crops as first hand information to the Agricultural Officers and farmers and also to get feed back on the adoption of the technologies and existing problem confronted by the farmers.

The station is imparting advisory/consultancy services to farmers visiting the station. Students from various schools and colleges are being trained on the improved technologies developed in the station.

Under the AICRP on oil seeds, a frontline demonstration in sesame in an area of 6 hectares for comparing the farmers practices and improved technologies developed by the station is being carried out during 2003-04 at Aryanpadam, Thodiyoor.

The Farm and Home Division of AIR, Thiruvananthapuram identified different topics in their consultative panel meeting held once in three months which was attended by the Project Director & Head-in-charge as the member of the panel.

Scientists of this station are regularly attending to radio talks, interviews and group discussions on an average of one per month on various topics concerning the agricultural production techniques.

The scientists of this station as members of the diagnostic team of Kollam District visited farmers fields for on the spot study of the problem raised by the departmental officers and suggest remedial measures.

Training classes on tissue culture was conducted for unemployed youths. Three such trainings were conducted during the period under report.

Two workshop on indigenous knowledge (ITK) financed by the State Planning Board were conducted under the leadership of the station on 03-01-04 & 10-02-04 at ORARS, Kayamkulam, Kuzhamathumukku and Nooranad respectively.

Finance

Head of Account	Provision for the year (Rs. lakhs)	Expenditure (Rs.lakhs)	Station receipts (Rs.lakhs)
Non plan	49.805	41.146	4.951
Non plan	5.885	4.733	
CCCP	19.700	16.575	
Plan	0.500	0.316	
Plan	0.250	0.197	
Plan	0.400	0.339	
Plan	0.600	0.363	
Plan	1.850	1.947	
ICAR Adhoc	0.241	0.216	
AICRP	10.250	9.332	
ICAR	3.214	7.235	
ICAR	5.904	3.848	
(Plan) Trg	-	0.149	
Grand Total	98.599	86.394		3.460

RICE RESEARCH STATION, VYTILA

Introduction

The Rice Research Station, Vyttila is situated in a representative site in the centre of the pokkali tract. This station started functioning during the year 1958 in a leased land in Kunnara, and was shifted 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. At present the station has a total area of 8.91 ha of which 4.25 ha are wet land. In march 1982 the station was brought as a sub-centre for National Agricultural Research Project of the special zone of the problem areas.

Mandate of the Station

- i) To evolve high yielding saline resistant rice varieties suited for the low-lying coastal areas and to find out suitable agronomic practices for the cultivation of rice in this area.
- ii) To evolve cropping system practices by which the annual income per unit area from pokkali fields increased to be optimum level by adopting integrated farming of rice fish and prawn.
- iii) To evolve semi intensive cultural practices for fishes and prawns in brackish water ponds.

Lead Station : RARS, Kumarakom

Major research achievements

Rice and rice based farming system:

The saline tolerant culture CIRJ-7 evolved at this station were recommended for state wide release.

The tall statured culture 1007 and the medium statured culture 1009 were recommended for farm trial under different water regimes.

Arresting of the tidal flow in the pokkali field influences the rice production negatively.

Initial studies indicated that wet seeding of rice is also possible under pokkali farming system ensuring adequate water control.

The results of more than two decades of Permanent Manurial Experiments conducted in the pokkali tract indicated the necessity for re-scheduling of existing practice of lime application. Instead of applying lime 50 – 50 at sowing and dismantling, the entire quantity applied at the time of sowing is more preferred in terms of reduction of toxins and better establishment.

Fisheries

Monoculture of *Etroplus suratensis* (Pearl spot) in pokkali ponds when stocked at a density of 5000 nos/ha yielded a production of 820 kg/ha of fish and 3000nos of fingerlings within a period of one year. Individual fishes attained a marketable weight of 125 g.

In trials with *Chanos chanos* (milk fish) as MONO spp. in pokkali ponds when stocked at a density of 5000 nos/ha yielded a production of 1600 kg/ha in a period of 12 months, individual fishes attained a weight of 500-700 g.

Extension and other activities

Scientists of the station attended monthly T&V workshop organized jointly by Kerala Agricultural University and Department of Agriculture. They also participated in various agricultural seminars and group meetings organised by the Department of Agriculture, Karshaka Samithis, Panchayats and input agencies. The scientists of the station have been nominated as members of the District Level Diagnostic team. The Head of station has been nominated as the Member of the Pokkali Land Development Agency.

Important visitors

Principal Scientist (Soil Science) of CSSRI, Karnal visited the station and impressed by the research achievements of this institute and promised for collaborative work in saline soils.

The technical officers of the Dept. of Agriculture, of the Governments of Tamil Nadu, Karnataka and Meghalaya visited the station and expressed their curiosity on the agro techniques practiced in this tract.

Finance (In lakhs)

Head of a/c	Provision for the year	Expenditure	Station receipts
Non plan	49.805	34.322	2.657
Plan	6.935	4.452	
Other EAPs	1.770	1.367	
Total	58.510	40.141	

SUGARCANE RESEARCH STATION, THIRUVALLA

Introduction

The station was established during 1976, with the complete assistance from ICAR under the All India Co-coordinated Research Project on Sugarcane. The experimental farm comprises an area of 10.25 ha. The Kerala Agricultural University strengthened the research efforts of this station during 1979 by providing more infrastructure facilities and manpower. The research programme was later strengthened by the funds provided by NARP Phase II. A sub centre is located at Menonpara in Palghat district where the research work is conducted in the area of Co-operative Sugars, Chittoor. Breeding programme was initiated in this station in 1979. The research efforts led to the evolution of a number of high yielding, high sugared clones, viz. *Madhuri*, *Madhurima*, *Madhumathi* and *Thirumadhuram* suited for varying agro ecological situations in Kerala State. The yield range of these clones is 65-125 t/ha. of millable cane. In vegetables, one variety each in snake gourd *Kaumudi* (Sel.No.2009) and one variety in bitter gourd *Priyanka* (Selection No.1010) were developed.

Mandate of the station

The mandate of the station is to function as a lead station for sugarcane in Kerala state; To breed high yielding sugarcane varieties tolerant to red rot disease; To formulate agro techniques for realizing the yield potential of the crop under varying agro- ecological situations; To develop sugarcane based cropping systems suited to Kerala; To identify high yielding varieties of cucurbitaceous vegetables suited to different agro-ecological situations of Kerala; To formulate suitable agro techniques and crop protection measures in cucurbitaceous vegetables and To produce and distribute elite planting materials of sugarcane and vegetables.

Satellite station

Sugarcane Research Centre, Menonpara

A few memorable events of the institution

Visit of ICAR monitoring team on 20-08-2003

Academic programme:

Dr. Babu George and Dr.Thomas Mathew served as members of post-graduate student advisory committee.

Major research achievements

From the project "Evolution of sugarcane varieties for the different agro climatic tracts of Kerala and fluff exchange programme," 1992 series, two cultures viz., 1358/92 and 1153/92, found promising in the station trial, are now entered in zonal varietal trial. From 1995 series, Culture 16/95 was selected for zonal varietal trial. From 1996 series 12 promising cultures were evaluated in II CYT and ratoon. From 1997 series seven cultures were evaluated in II CYT and ratoon. 1998 series, 9 cultures were selected for CYT based on reaction to red rot, quality and yield. From 1999 series, 10 cultures were selected for initial evaluation trial based on reaction to red rot, quality and yield. From 2000 series, 50 cultures

were selected for clonal multiplication and evaluation based on reaction to red rot, quality and yield. From 2001 series 199 cultures were selected for progeny row trial. From 2002 series, 968 seedlings were transplanted to main field. From 2003 series, 1316 seedlings were obtained in seedling nursery.

CoTI 200216 evolved in this station was accepted for the AICRP-IVT trials and CoTI 1153 and CoTI 1358 were accepted for the Inter zonal trial at the various centres of the country. Two plant breeding zonal trials were laid out during the period under report as per the technical programme of AICRP. These experiments are in progress.

Results of the trial on mineral nutrition with promising varieties revealed that among the early varieties, Co 93078 performed well and recorded the highest cane yield. While in the midlate varieties Co 94011 and CoTI 93116 showed superiority with reference to cane and sugar yield. It was also observed that the varieties evaluated require an optimum dose of NPK at the tune of 165:82.5:82.5 kg/ha. Studies with herbicides showed that chemicals metribuzin applied at 1 kg ai/ha as pre-emergence application followed by a hand weeding at 60 DAP or post-emergence application of 24D at 2 kg ai/ha controls weeds effectively in sugarcane. In the black soils of Palakad sulphur applied in the form of gypsum at 60kg per ha. enhanced the cane and sugar yield. Ratoon management with stubble shaving + trash application in alternate rows + cultivation + irrigation + gap filling with poly bag settlings increased in cane yield appreciably. Studies with integrated nutrient management mineral nutrition with NPK at 75% of the recommended dose combined with press mud application and bio fertilizer inoculation produced maximum cane and sugar yield both in plant and ratoon crop. Trial on planting geometry and N nutrition indicated that paired row planting at 60/120 cm and N application 125% of the recommended dose recorded the highest cane yield. The variety Madhumathi was superior and recorded the highest sugar and jaggery yield even at the sixth ratoon of the crop.

For both bitter gourd and snake gourd, a spacing of 2 x 2 m is appropriate for the acidic alluvial soils of south Kerala. In the bitter gourd, a nutrient dose of 70:25:25 kg NPK/ha. and in snake gourd, 150% recommended dose of NPK recorded the highest returns.

The soil samples from Kottayam district showed two levels of available nitrogen while that of Pandalam and Eramalikkara showed medium levels of available nitrogen. The organic carbon content of the soil was on the higher side in all the places.

Extension and other activities

Scientists of this station had acted as resource person in the agricultural seminars/training programme held at different Krishi bhavans in Pathanamthitta district.

Important visitors

Dr. P. G. Bhoi, Sugarcane Specialist, CSRS Padagon and Dr. K. V. Makwana, Asst. Res. Scientist, RSRS (GAU) Navasari visited the station.

Finance

Head of a/c	Provision for the year (lakhs)	Expenditure (lakhs)	Station receipts (lakhs)
Non-plan	35.02	32.82	3.21
Plan	2.39	1.91	
ICAR	14.15	14.80	
Other EAP	2.00	1.17	
Revolving Fund	0.37		

AICRP ON AGRIL. DRAINAGE, KARUMADI

Introduction

The coastal saline soils in the country are estimated to be 5.5 million ha. The acid saline soils (*Kari lands*) are in coastal low lands of Kerala, is estimated 9000 ha. These coastal lowlands are characterised by dark charcoal coloured peaty soil, registering a pH as low as 4 and EC as high as 6 dSm⁻¹.

The coastal wetlands in the *Kari* lands are distinguishable into homogeneous entities called 'Padasekharam' or Polder, each forming a farming unit comprising holdings of several farmers. These 'Padasekharams' lie 1 to 2 meters below mean sea level and bounded by earthen dykes and delineated by channels or rivulets. Individual farming concept is not feasible in Karilands owing to its peculiar hydrologic condition and therefore, group farming is practiced. These polders were engineered to present system of plots of varying size (5-500ha) with dwellings (purayidams) on the dykes. Paddy is cultivated on the low lands with perennial coconut forming the pivotal crop component on the dykes. Along with coconut and inter crops, every homestead invariably raises livestock/poultry etc. on the raised lands. However, a system approach to farming that ensures integration of enterprises and material recycling is largely wanting in these places.

Mandate

The situation calls for urgent need to develop a farming strategy that ensures efficient utilisation of these rice lands and polder dykes. A farming system approach that integrate various inter related enterprises viz. rice and fish/prawn farming, in the low lands and poultry/ livestock rearing along with suitable crops on the raised dykes can be an efficient strategy to utilise the available resources. This will not only minimize risks in investment but also reduce cost of production through utilisation of bye products and waste products. The project is to augment the productivity of the main crop i.e. rice in the lowlands through sub surface drainage interventions and promote diversified agriculture through regenerative farming practices.

Achievements

Perceptible improvement in soil conditions and productivity by introducing subsurface drainage. An additional paddy yield of 1.36 t/ha could be obtained by introducing subsurface drainage. Subsurface drainage could control acidity and salinity and remove spatial variation in its occurrence. Subsurface drainage system could arrest upward movement of water (field are below mean sea level) and thereby the replenishment of salinity and toxicity from underneath. Utilization of abundant water resources for fish cultivation during off-season. Savings in the cost of pesticides @ Rs.520/ha. Savings in the cost of land preparation @ Rs 948/ha, which was facilitated by Common carp (*Cyprinus*). Stocking of fishes like macro vegetation feeders such as Grass carp resulted in substantial reduction in cost of weeding (Rs. 410/ha). Reduction in the doses of fertilizer application @ Rs. 707/h. Integration of aquaculture facilitated an overall reduction of Rs. 2585/ha in cost of cultivation of rice. The integrated farming

model could generate an additional income of Rs. 19700/ha/year by an additional crop of fish during flood fallow period, increasing the rice productivity and reducing the cost of cultivation. Integration of aquaculture along with tall salt tolerant varieties of rice is an appropriate farming model suitable to the area compared to the prevalent practice of raising high yielding but non tolerant varieties. There is a perceptible increase in the organic status of the soil consequent to the integration of aquaculture.

Finance

Head of account	Provision for the year (in lakhs)	Expenditure (in lakhs)	Station receipts (in lakhs)
Non plan			
Plan	1.50	1.18	
ICAR	5.61	5.27	0.07
Other EAPs	2.00	1.38	
Revolving fund			

FACULTY OF VETERINARY AND ANIMAL SCIENCES

CENTRE FOR PIG PRODUCTION AND RESEARCH, MANNUTHY

Introduction.

This Centre was started on 12-05-1965 as a small Pig Breeding Unit along with an Auxiliary Pork Production scheme under the Department of Animal Husbandry. It was taken up by Kerala Agricultural University in 1972 and was renamed as Kerala Agricultural University Pig Breeding Farm.

At present, the Centre has a total holding capacity of 4000 pigs including growers and piglets with 5 farrowing houses and five open styes constructed in a land area of 4ha. Hec.

So far, the Centre completed about 50 research projects including Masters', Doctoral and station projects and there are 7 ongoing projects on various aspects of pig production.

A few memorable events of the institution

The All India Co-ordinated Research Project on Pigs was started in 1993 with the objective of studying the performance of indigenous pigs and to produce a cross bred between indigenous and exotic pigs with a total financial outlay of Rs. 49.148 lakhs.

The Massive Livestock Development Programme (MLDP) was started in 1993 in collaboration with Department of Animal Husbandry, Kerala with a financial outlay of Rs. 70 lakhs with the objective of distributing 20000 piglets to the farmers in Kerala both as breeding and fattener units.

The Farm was upgraded to Centre for Pig Production and Research in 1995. The Centre has been identified as the Lead Institution for the World Bank funded National Agricultural Technology Project "Strategies for enhancing the productivity of pigs for the farming community" with four co-operative Institutions at Kattuppakkam, Bangalore, Port Blair and Goa with a total financial outlay of Rs.1.5 crores for 1999-2003.

Major research achievements

The Centre has developed a hybrid pig (Durowhite) incorporating the germplasm of existing Large White Yorkshire and also Landrace and Duroc which is having 40-50% more growth rate and 30 % less fat. This hybrid is proved more suited to the farmers with better economic gain, productivity and carcass quality which attain about 100-150 kg body weight at an age of 7-10 months and back fat thickness less than 1 cm against the existing values of 70-90 kg body weight and 2.5-3 cm back fat thickness. These hybrid pigs are being produced and supplied to the farmers for improving their economy during this year also. This centre has developed a three breed combination (Large White Yorkshire, Duroc) with the incorporation of Desi pigs for better disease resistance and mothering ability and were supplied to the different field units and is getting promising

results such as better weight gain, faster growth, less fat and better disease resistance when compared to Durowhite pigs. On getting more data from the field and farm this three breed combination may prove worth to be released as a promising variety of pig.

A project on conservation of germplasm of Desi pigs of Kerala which is in the verge of extinction was also undertaken.

Extension and other activities

The Centre supplied 1644 numbers of quality piglets to farmers during the period. Technical advice was given to progressive farmers for establishing piggery units and project reports were issued to them for availing financial assistance. Self-employment training was given to unemployed women for starting their own piggery units. Different units of Kudumbasree programme were given short-term training on piggery. Field units of pig were established for motivating farmers in the field. Field visits were undertaken and technical advice to the farmers provided.

Finance (2002-2003) (lakhs)

Head of a/c	Provision for the year	Expenditure	Station receipts
Non plan (UPBF)	34.215	32.12	22.17
Plan	10,000	8.90	--
ICAR (AICRP)	30.090	30288	2.77

UNIVERSITY LIVESTOCK FARM AND FODDER RESEARCH DEVELOPMENT SCHEME, MANNUTHY

Introduction

This centre was started by Government of Kerala as a part of Veterinary College, Mannuthy later taken up by KAU from its very inception.

Mandate of the station

Livestock Production and Management, supply of fodder materials, instruction of students and research.

Three Units, 1 Cattle farm, 2. Buffalo farm and 3. Fodder research and development station are functioning.

Research programme

All functional supports are provided for the research activities in cattle and buffaloes under College of Veterinary and Animal Sciences, Mannuthy that are carried out in this farm.

Finance 2003-2004 (lakhs)

Head of Account	Provision for the year	Expenditure (Rs)	Station receipts
Nonplan	106.5	69.17	30.08
Plan	26.65	2.48	-

KAU DAIRY PLANT , MANNUTHY

Introduction

The KAU Dairy plant is an experimental dairy plant established in 1986. The Dairy plant became fully functional with the distribution of pasteurized milk in pouches from April 1994. The plant is equipped with facilities for processing 4000 liters of milk per day. Facilities are provided for the manufacture of various milk products like khoa, Ice cream, paneer, milk powder, butter, ghee etc. The products prepared in this dairy plant are sold through the sales counter in the dairy plant and also through the university sales counter at Mannuthy.

Seminars/summer institutes/training attended

The Scientists of the station has attended the International Food Convention at Mysore during the report period.

Other details

Measures taken to increase plant revenue

Emphasis was given for manufacture of milk products to increase the revenue. During the period the Dairy plant procured 137771 liters of cow milk and 22658 liters of buffalo milk. An amount of Rs 22,62,443 was collected by sale of milk and milk products. An amount of Rs 17050 was collected from external agencies towards charges for utilizing the facilities in the dairy plant. During the financial year an amount of Rs 4,00,000 was transferred to the university account from the revolving fund of the Dairy plant.

Finance

<i>Head of Account</i>	<i>Provision for the year</i>	<i>Expenditure</i>	<i>Receipts</i>	<i>Amount transferred to University Account</i>
Non plan 272-26-004	Rs 20,000	Rs 16,930	Rs 10,55,000	
Plan 272-26-222	Rs 12,61,000	Rs 10,47,763		
Revolving Fund	Corpus amount Rs 2,00000	Rs 19,66,414	Rs 22,62,443	Rs 4,00000

AICRP ON POULTRY, MANNUTHY, THRISSUR

Introduction

All India Co-ordinated Project on Poultry Breeding was established by the Indian Council of Agricultural Research in different agro-climatic zones in the country. A centre on Layer Breeding was established at Mannuthy in 1976.

Mandate of the Institution / station/unit:

To develop a commercial layer of average yield of 270 eggs of standard size during 500 days of age with less than 1% laying house mortality per month.

Lead Station

Monitored by the Project Directorate on Poultry (ICAR), Rajendranagar, Hyderabad.

A few memorable events of the Institution:

AICRP on Poultry Improvement Project was started in the 1976 with ICAR as the sponsoring agency. This project is engaged in pureline breeding of IWN & IWP Strains of White Leghorn as per the technical programme assigned by the ICAR from time to time. Since its inception, twenty generations of breeding have been completed and the testing of 21st generation was started during the year under report.

With a long successful history in Poultry breeding by strictly adhering to the technical programme, this centre has evolved a Layer Strain called 'ILM-90' which was released for commercial exploitation in 1990. This Centre is participating the Random Sample Laying tests conducted by the Govt. of India every year with encouraging results. Among all the entrants inclusive of commercial strains, ILM-90 stood first in Random Sample testing conducted by the Govt. of India. This bird was christened as 'Athulya' by the Kerala Agricultural University and popularized throughout the State. The bird has also been tested for its suitability in the homesteads by this Centre, which was well received by the rural masses.

Major research achievements

The selected population in both IWN and IWP strains of S20 generation were maintained to produce next generation. Hatching operations to produce S21 generation were started in June 2003 through July 2003. Achieving very good fertility and hatchability percentages in IWN and IWP populations, the required chicks for S21 generation were obtained from 12 hatches. The mortality (%) in S20 generation was well within the normal limits, registering only 1.44, 0.72 and 4.32 during chick, growing and laying (17 to 64 weeks), stages respectively. The 64-week egg number in the generation under report was 237 and 246 for IWN and IWP Strains, respectively. An improvement of around 58 and 55 eggs at 40 weeks of age in IWN and IWP strains was obtained from that of first generation and it is the maximum over all generations. The 40-week egg number in IWP strain under report is the best among all the 20 generations.

In S21 generation, Age at Sexual Maturity (ASM) obtained was 139 and 136 days in IWN and IWP strains respectively. This showed an early maturity of 38 and 43 days over first generation in both the strains. The 28th week egg weight reported in

this generation (51.44 & 51.34 in IWN and IWP, respectively) is the best among all the previous generations.

A total of 840 hatching eggs of ILM 90 (NP cross) were sent to the Random Sample Testing Centre at Hessarghatta.

In cages, ILM90 recorded very good production in terms of HDEP (287.72 eggs), which is only around 12 eggs lesser than that of the competitor ranked first. It is noteworthy that the egg weight of ILM90 in cages is reasonably high (57.05g) than all other competitors placed above in egg production. In terms of egg weight (in cages) and production, ILM90 is the best among all the entrants. Notwithstanding its good egg size, the feed efficiency exhibited by ILM90 (1.96kg. per dozen eggs) is also appealing. The margin of receipts over feed cost in case of ILM90 is Rs.5.01.

In deep litter, ILM90 ranked third, scoring 288.08 eggs on hen housed basis, which is only around 7 eggs lesser than that of the competitor in the first slot. The production performance under deep litter system is highly better than cage system in case of ILM 90. While the feed efficiency and average egg weight are well matching with other best performers, the feed consumption per bird per day is perhaps the lowest in case of ILM90.

It is also obvious that ILM90 has performed consistently well both in cage and deep litter. ILM90 has also bettered its standing record both in terms of egg number and egg weight (the previous record was 282 eggs HDEP and 58.2g egg weight).

Extension and other activities

This centre is involved in the supply of hatching eggs and day old chicks to farmers for rearing. Hatching eggs are also being supplied to the Farms under the Animal Husbandry Dept., Govt. of Kerala, as and when required. Farmers' counselling is regularly conducted for the needy farmers. Literatures on Poultry rearing both in English & Malayalam are made available to the farmers from this Centre.

Finance (2003-2004)

Head of A/C	Expenditure	Receipts
ICAR	50,11,366	9,91,616

GOAT & SHEEP FARM, MANNUTHY

Introduction

Goat production is a major Animal Husbandry enterprise in the State due to unique socio-economic and agro-climatic constraints of the State. Goat milk and meat have high economic value and are relished by all sections of the State. With this background, an All India Co-ordinated Research Project in milk production was instituted in KAU, Mannuthy for developing a dairy strain of goats capable of yielding 200 kg. in 150 days of lactation. Local Malabari breed of goat was crossed with Swiss dairy breeds namely Saanen and Alpine to develop the crossbred synthetic goats. This project continued for about 20 years and was not successful to the level of expectation. The project continued as a part of Network project of ICAR and was terminated in 1995. Both these schemes did not achieve the level of performance and the available lactation yield was below 0.5 kg/day/goat.

University Goat and Sheep Farm was established in 01/08/1995 with the infrastructure available in the terminated AICRP and ICAR projects. The animal stock consisted Alpine-Malabari and Saanen-Malabari crosses and the labourer strength consisted of 26 labourers. The farm has around one hectare of land and sheds to accommodate 500 goats. Right from the time of inception to the present day non availability of sufficient grazing land is a major constraint of this farm. Currently work is in progress for the development of dual and meat strains of goats suited to the humid tropics of the State. Research work on the development of synthetic Meat strain has yielded promising results and might lead to the development of intensive goat meat production programmes in Kerala.

Mandate of the institution/station/unit

Lead functions

- (1) Major mandate of the farm is to provide instructional facilities for the BVSc & AH degree programme in accordance with the VCI regulations.
- (2) To provide research facilities and to undertake research activities in small ruminant production.
- (3) To maintain and provide high quality goat and sheep to State's farming community.

Auxiliary function

- (1) To provide training/extension expertise in goat production to farming community.
- (2) To provide packages for sustainable goat production in State.

A few memorable events of the institution

During the last four years goat mortality could be considerably reduced. Milk recording and growth recording could be started. Based on the milk recording and growth recording, selection of bucks could be achieved. Selected bucks had a dams yield of 1.5 kg./day and a growth rate of 15 kg at 6 months. This would facilitate laying the foundation for development of a dual type goat strain endowed with meat and milk production potential. During the last five years, milk production, sale of goat kids and manure sale has substantially increased.

The farm has successfully tested Boer half breeds in an attempt to develop meat strain of goats suited to the State. Boer X Alpine Malabari (AMB) crosses reached a body weight of 17-28 Kg at 6 months compared to an average of 8-10 Kg in Malabari X Alpines. Mortality rate and incidence of neonatal diseases were significantly lower in AMB crosses.

University Goat and Sheep farm functions as nodal centre imparting Internship training programmes to Vety. Surgeons on completion of BVSc & AH programme. During the year 140 students completed their internship programme in University Goat and Sheep Farm and seven dissertation works were carried out at this station in different aspects of goat production, breeding and management.

P.G. Programme

Seven Masters thesis works were conducted at University Goat and Sheep Farm.

- (1) Genetic and Environmental factors influencing the growth rate and body weights up to six months in Malabari goat.
- (2) Controlled breeding in Goats.
- (3) Computerized data management in goat farm.
- (4) Evaluation of Boer half breeds for development of meat strain of goat.
- (5) Haematological studies on growing Alpine cross bred kids.
- (6) Haematological profile of Alpine Malabari kids upto puberty.
- (7) Immune response to FMD vaccination in crossbred goats.

Major research achievements

Alpine Malabari crosses were further crossed with purebred Boer by oestrus synchronization with the aid of frozen semen technology. This was to test the suitability of Boer half breeds as meat strain suited to Kerala. Boer half breeds were superior in body weight right from birth. At about 3-4 months there was a 100% superiority in body weight and growth compared to Alpine Malabari crosses. This would aid in the development of meat strain of goats suited to Kerala.

Meat goat production programmes of Kerala are seriously hampered by the non availability of meat goat strains suited to the state. In an attempt to develop meat goat strains suited to the state, performance of Alpine Malabari goats were compared and evaluated with Alpine Malabari x Boer developed at University Goat and Sheep Farm, Mannuthy. Litter traits, growth, adaptability and viability of Alpine Malabari and Alpine Malabari x Boer crosses were evaluated.

Average litter size at birth (LSB) among Alpine Malabari (AM) and Alpine Malabari x Boer (AMB) kids was 1.79 ± 0.48 . Alpine Malabari kid had a significantly ($P \leq 0.05$) higher litter size at birth of 2.12 ± 0.16 . Month of birth had a highly significant ($P \leq 0.01$) effect on litter size at birth with the highest litter in July (2.2 ± 0.17). Sire influences were highly significant on litter size at birth while sex had no significant influence on litter size at birth. Mean litter weight at birth was 3.77 kg and it was not found significantly affected by genetic group and sex. Month of birth and sire had highly significant association with litter weight at birth

Alpine Malabari x Boer kids had a highly significant ($P \leq 0.01$) and higher body weight from birth to sixth month of age. Body weight in AMB kids was 2.38 kg, 6.01 kg, 8.92 kg and 11.65 kg while AM kids had only 1.8 kg, 2.87 kg, 3.05 kg and 4.30 kg respectively at birth, one, two and three months respectively. Buck had a highly significant influence on birth weight of kid and body weight at first, second and third month. Month of birth had a significant influence on birth and body weights at first, second and third month.

Incidence of enteritis was 0.31, respiratory infection 0.08 and pre-weaning mortality 0.07. Effects of genetic group and sire were significant on respiratory infection and not on incidence of enteritis and pre-weaning mortality. Month of birth did not exert significant influence on respiratory infections, enteritis or pre-weaning mortality.

The mean body weights at fourth, fifth and sixth month in AM and AMB crosses were 10.34 kg, 11.96 kg and 13.68 kg respectively. Effect of genetic group on body weights at fourth, fifth and sixth month was highly significant and superior in AMB crosses was 13.62 kg, 15.73 kg and 17.79 kg respectively while it was only 5.76 kg, 5.84 kg and 6.81 kg respectively in AM crosses. Sire effects were highly significant on the body weights at fourth, fifth and sixth month. Month of birth contributes to the body weights to a highly significant level and kids born in April and December had higher body weights from fourth to fifth month. Sex of the kids did not influence the body weights from fourth to sixth month. The mean average daily gain in body weight (ADG) from birth to third month was 71.36 g, from third to sixth month was 65.7 g and zero to sixth month was 66.7 g. AMB crosses had a highly significant ADG of 104.89 g and 86.58 g compared to 35.19 g and 39.1 g during zero to third month and zero to sixth month respectively. Sire influences were highly significant on ADG from birth to third month and birth to sixth month. Month of birth had a highly significant effect on ADG and the highest ADG was for kids born during April. Birth weight had a highly significant positive correlation with ADG from zero to third month and ADG zero to sixth month and body weights from one to sixth month.

Extension and other activities

Hundreds of farmers visited the goat farm to learn about sustainable goat farming. More than 350 improved goat kids were distributed to farmers from different parts of State as an aid to development of goat production in the State.

There has been a continuous increase in milk and manure sales for the last five years. Comparative performance of the Farm during 2002-2003 and 2003-2004 are shown below.

Sl.No	Particulars	Year 2002-03 (in Rs)	Year 2003-04 (in Rs)
1	Total Expenditure	26,71,350	25,94,790
2	Pay and allowances of PLs	15,84,602	16,04,557
3	Pay and allowances of Staff	3,47,203	3,55,135
5	Receipts	3,39,183	4,59,349
6	Quantity of Milk sold	11,111 Litre	12,174 Litre
7	Goat Manure sold	Rs 50,400/=	Rs 67,650/=
8	Number of Animals sold	Kids : 362 nos. Goats: 55 nos. Sheep: 16 nos.	Kids : 304 nos. Goats: 33 nos. Sheep: 4 nos.

Scientific publications

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Thomas M., and Nandakumar, P. (2000) Factors influencing litter traits and body weight at 12 weeks among temperate rabbit breeds in humid tropics. *Wld. Rabbit science*. 8(2): 67-70.

Nandakumar P, and Dilcep Kumar, M. (2000) *Muyal Valarthal (Rabbit Production)* a booklet in Malayalam published by DC Books, Kottayam

Rajkumar, K; Nandakumar, P; and Sasendranath M.R (2000) Prevalence of Caseous lymphadenitis among crossbred dairy goats maintained under semi intensive production system. Presented at the International Conference on small holder livestock production systems in developing countries held at Kerala Agricultural University, Thrissur, Kerala, India.

Sebastian, R.S; Saseendranath, M.R; Vijayakumar, K; Usha N.P and Nandakumar, P; (2000) Haematology and Biochemical changes in Jhones disease among goats. Presented at the International Conference on small holder livestock production systems in developing countries held at Kerala Agricultural University, Thrissur, Kerala, India.

Sabarish, V.I, Santhosh, M; Justin Davis, Dileep Kumar, K.M; and Nandakumar, P; (2000) *Sesbania grandiflora* – a tropical leguminous fodder tree for sustainable small ruminant production in humid tropics. Presented at the International Conference on small holder livestock production systems in developing countries held at Kerala Agricultural University, Thrissur, Kerala, India.

Participated in Trichur Pooram Exhibition and exhibited improved varieties of goats. Based on this there was a heavy demand for these types of goats. There is a heavy and sustained demand for dual as well as meat type goats from throughout the State and it would desirable to develop the infrastructure and capability of the farm so as to meet the heavy demand for high quality Meat and Dual types of Goats, This would also ensure that farmers of the state get the right type of high quality animals for their production activities.

Finance

Head of account	Expenditure (in Rs.)	Receipts(in Rs.)
Plan	25,94,790	4,59,349
TOTAL	25,94,790	4,59,349

CENTRE FOR ADVANCED STUDIES IN POULTRY SCIENCE, MANNUTHY

Lead station:

Lead Centre of NATP on Productivity Enhancement of Ducks

Satellite Stations

1. TANUVAS, Kattupakkam
2. CARI, Port Blair

Major Research achievements

Effect of probiotic supplementation on the performance of White Pekin ducks:

Effect of probiotic 'Livesac' (Lactic acid bacilli, live yeast cells and traces of enzymes) supplementation on the performance of Vigova variety of White Pekin ducks for a period of 8 weeks was carried out. Ducklings in T₁ were fed with control ration T₂ control + 0.025% probiotic and T₃ control ration with 0.05% probiotic. Ducklings fed with 0.05% probiotic recorded significantly higher body weight and body weight gain upto 8 weeks of age.

The weekly feed consumption was significantly higher in 0.05% probiotic supplemented group. The cumulative feed conversion ratio was statistically significant between treatments and the group supplemented with 0.05% livesac recorded superior values. The serum cholesterol level was not affected by probiotic supplementation. The serum protein level was significantly higher in 0.05% probiotic supplementation. The processing yields and livability percentage were not affected by probiotics. The total feed cost per kg body weight was lower in the 0.05% probiotic supplementation group up to 6 weeks of age. Probiotic supplementation at 0.05% level was beneficial in the overall performance of White Pekin ducks.

Performance of crossbred colour line and austra-white chicken for layer traits

An experiment was conducted to evaluate and compare the production traits of Austra-White and Colourline under farm conditions. One hundred pullets of each crossbred were housed in identical pens (ten birds each) and production performance was evaluated for five periods (each 28 days) from 21 to 40 weeks of age. Standard feeding and managerial practices were followed throughout the study.

The colourline birds were heavier than Austra-White at 20 and 40 weeks of age. The mean body weight for Colourline and Austra-White was 1493.65 ± 14.02 g vs. 1215.60 ± 20.61 g and 1813.15 ± 13.46 VS. 1424.40 ± 28.01 at 20 and 40 weeks of age, respectively. The age at first egg was similar in Austra-White (158.9 ± 2.26 days) and Colourline (158.9 ± 1.96 days.) The age at 50% production was 177.7 ± 1.37 days in Austra-White and 175.1 ± 1.28 days in Colourline. The overall mean hen housed number up to 40 weeks of age was 74.31 in Austra-White and 77.59 in Colourline. The hen day production was 74.88 in Austra-White and 77.71 in Colourline. The overall mean egg weight was 47.12 ± 1.05 g in Austra-White and 44.76 ± 1.29 g in colourline.

The mean daily feed consumption from 21 to 40 weeks of age was 104.07 ± 4.16 g in Austra-White and 106.46 ± 4.37 g in Colourline. The feed conversion ratio was

2.07 ± 0.18 (per dozen eggs) in Austra-White and 1.98 ± 0.18 (per dozen eggs) in Colourline, 3.59 ± 0.33 (per kg eggs mass) in Austra-White and 3.59 ± 0.35 (per kg egg mass) in Colourline. The shape index was 76.25 ± 0.37 in Austra-White and 77.67 ± 0.33 in Colourline. The albumen index was 0.1080 ± 0.004 in Austra-White and 0.1142 ± 0.002 in Colourline. The yolk index was 0.4257 ± 0.007 in Austra-White and 0.4439 ± 0.007 in Colourline. The shell thickness was 0.3889 ± 0.117 mm in Austra-White and 0.3638 ± 0.006 mm in Colourline. The Haugh Unit score was 88.06 ± 1.39 in Austra White and 90.52 ± 0.91 in Colourline. Austra-White had uniform plumage pattern with black spots on a dull white background on all parts of the body and Colourline were multi coloured with various feather patterns. Egg shell was tinted in Austra-White while Colourline eggs were brown. The livability was 97% in Austra-White and 99% in Colourline. The cost of feed consumed per egg was 181 paise in Austra-White and 176 paise in Colourline. The results indicated that the Colourline might be utilized for rearing in backyard.

NATP on productivity enhancement of ducks.

Many biological trials of varying durations were carried out for bringing out package of practices with the major objective of enhancing the productivity of ducks. Studies on the economic viability of lean season feeding of ducks under foraging system indicated that farmers can earn a minimum net profit of Rs.50/- per day from a flock of 250 birds if they are fed with 125-150 g. of grains, preferably Jowar/maize per bird per day. Layer ducks received a ration having 12% crude fibre supplemented with 0.1% enzyme preparation was beneficial with respect to production traits. It was scientifically proved that pith of *Corypha umbraculifera* can be used as a cheap lean season feed, if mixed with cereal grains in definite proportions and fed to ducks. Probiotic supplementation at 0.05% level was beneficial in the overall production performance of broiler ducks. Pesticide residue analysis in crop content and body fat of foraging ducks revealed presence of organochlorine compounds, but its levels were low and well below the safety margin prescribed. A comparison of Omega-3 fatty acid profile in duck eggs under intensive and extensive system of rearing indicated that its levels are higher among eggs collected from the field than those obtained from caged ducks. The technology for the production of duck *Pasteurella* vaccine developed successfully with the active collaboration of the Dept. of microbiology of College of Veterinary and Animal Sciences. The vaccine produced had high degree of protection against Duck *Pasteurella*. Transfer of technology programmes viz. farmers training, trainers training, farmer's counselling, field visit, publication and distribution of pamphlets and leaflets were carried out.

Extension and other activities

From the Revolving Fund Hatchery the following number of chicks were sold.

Commercial broiler	:	870
Athulya	:	5281
Australorp	:	331
Gramalakshmi	:	77014
Gramasree	:	59165
Quail chicks	:	70852

Consultancy services to farmers

Consultancy services were rendered to 425 farmers during the period.

Seminars/Symposia/Trainings attended

Dr. A. Jalaludeen attended Swadesi Science Congress, Kalpetta from 6.11.03 to 8.11.2003.

Dr. Leo Joseph attended the National Symposium on conservation and propagation of Indigenous breeds of cattle and Buffalos from 26.2.2004 to 28.2.2004 at Pant Nagar, Uttaranchal.

Dr. Amritha Viswanath gave a talk on Broiler farming in a seminar conducted by Keraka Broilers Ltd. at Sahithya Academy Hall, Trichur.

Technical publications

P. Veeramani, Selvan S.T. and Viswanathan K. Effect of acidic and alkaline drinking water on body weight and feed efficiency in Commercial broilers *Indian J.K.* (2003) (1) 42-44.

Dr. S.Ravi, Dr.P.A.Peethambaran, Dr.A.Jalaludeen and Dr.Leo Joseph. Production performance of Desi Layer ducks in cage system of rearing. *Indian J. Poult. Sci.* (2003)38-(1)70-73.

Popular articles

Quail Diseases (Karshakasree Sept.2003 - 63-64)

Finance (2003-04) (in lakhs)

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan CASPS	8.87	8.11	-
NATP on PED	-	10.77	1.03
Revolving fund	-	20.16	24.73

PED = Productivity Enhancement of Ducks

CATTLE BREEDING FARM, THUMBURMUZHI

Introduction

The farm started as a dry Cattle Salvage Farm in 1957 under the Animal Husbandry Department, Government of Kerala. It was taken over by the KAU on 1-2-1972 and continued to function as Dry Cattle Breeding Farm till 1992. From 1993 onwards, the farm is functioning as a full fledged Milch Cattle Breeding Farm.

The total area of the farm is 63 acres and is existing in four plots in a hill tract area of Pariyaram village, Mukundapuram Taluk, Thrissur District at about 13 km east of Chalakudy town in Chalakudy – Sholayar route. About 181 numbers of Cattle belonging to Holstein–Friesian, Brown Swiss and Jersey crosses and 23 vechur are reared here. Seventy five percent of the total area of the farm is used for forage cultivation.

Mandate of station

Mandate of station is (1) To develop the farm as a model dairy farm, (2) To provide facility for P.G. research on large animals, (3) To provide on farm training to Veterinary and Dairy Science students, Transfer of technology to farmers, (4) To extend facility of artificial insemination to local cattle, Supply of improved varieties of fodder slips to farm.

Research Programme

Routine Research activities like recording birth weight and body weight of calves at specified intervals and breeding of heifers/cows using semen from high pedigreed bulls were continued. Other than this, the farm provided facility for many P.G. Research Programmes.

External by Aided Projects

Progeny Testing schemes for bulls – ICAR - Department of Animal Breeding & Genetics.

Net work Programme on micronutrients ICAR – Department of Animal Nutrition.

Extension and other activities

Providing artificial insemination and first aid care to the local cattle population and supply of improved variety of fodder slips to farmers are the major extension activities of the farm.

No. of A.I. done	:	210
Other cases attended	:	132
Fodder slips supplied	:	440

In addition to the above, farmers were given advises on various aspects of profitable cattle rearing and given opportunities to witness routine farm operations. Demonstrations and one day training were given to Ex service Personnels and farmers on

various aspects of livestock farming and fodder cultivation. Field visits are made occasionally as part of first aid service.

Finance 2003-2004

Head of Account	Provision for the year (lakhs)	Expenditure (lakhs)	Station receipts (lakhs)
Non Plan	73.735	70.90	17.99
Plan	4.6	3.14	

LIVESTOCK RESEARCH STATION THIRUVAZAMKUNNU

Introduction

The Madras Government in 1950 started this Station as Government Livestock Farm under the post-war development scheme of Animal Husbandry Department with Head Office at Perinthalmanna. This was transferred to Kerala State Animal Husbandry Department in 1956 and subsequently to Kerala Agricultural University in February 1972. The Station was renamed as Livestock Research Station on 14.8.1978 with the aim of field oriented research and extension in the areas of livestock and fodder cultivation.

Mandate of the Station :-

- a) To evolve the elite crossbred dairy cattle suitable to agro-climatic conditions in Kerala by scientific breeding, feeding and management practices.
- b) To hold problem oriented and adaptive research projects in animal nutrition, breeding and management.
- c) To advise local farmers on recent advancements in scientific management of livestock and technology transfer to villages in the form of providing artificial-insemination facilities, veterinary aid etc.
- d) Fodder production and associated research.
- e) Tree and agricultural crops nursery management.
- f) Conservation of the natural forest ecosystem, attached to the station.
- g) All India Co-ordinated Research Project on Agroforestry.

Lead Station:

College of Veterinary & Animal Sciences, Mannuthy

A few memorable events of the institution

The inauguration of Bio-gas plant and Seed and Nursery Programme was done on 18.6.2003 in the presence of the Director of Research, Dean i/c, COVA&S Mannuthy. The members of the local bodies of the locality were special invitees.

Research Programme

All India Coordinated Research Project on Agroforestry (The AICRP on Agro-Forestry includes seven research projects in progress. They include one trial on selection of suitable support trees for pepper, two experiments on screening suitable multipurpose trees and two trials on stand density management and pruning in mangium and other on understory herbage yield under different stand densities in mangium and two provenance evaluation trials-one each in teak and mangium.

Brief Research results of AICRP on Agroforestry

In another pepper support trial (trees raised from seedlings) the usefulness as a good support tree for training black pepper is best manifested in *Acacia auriculiformis*. (1.17 Mg/ha/yr). This species stand out as the single best support tree for training black pepper.

Another informative observation we made from the trial is that the pepper vines trained on trees with smooth and/ or ex-foliating bark (like ceiba, macaranga and ailanthus) may not go straight and will be falling from the support trees. Hence, these tree species are physically less suitable for training pepper vines.

In the provenance evaluation test with *Acacia mangium* Willd. obtained from Australian Tree Seed Centre, CSIRO, one year field growth revealed that maximum height growth was recorded by Binaturi provenance followed by Lake murray. Binaturi provenance sustained the best growth in terms of collar diameter also. In the current year the observation showed that the local provenance is also advancing with other Australian promising provenances

In the teak provenance evaluation trial, many of the accessions from the Nilambur region like Nellikkutha-4, Káralai, Nedumkayam-1 and Cherupuzha are found better and are on par compared to provenances from other regions. At two and a half years of field growth, Nellikkutha-4 recorded maximum height of 3.70m and collar girth of 4.81 cm.

The effect of initial population density and pruning on growth of *Acacia mangium*. Willd is being studied in a field trial. Height growth generally showed a closer trend with the high density treatment giving maximum height. The lowest planting density (625 trees/ha) registered comparatively the lowest value in terms of height.

The fuel wood characteristics of 45 tree species available in the home gardens of Kerala were tested. Based on the study the species that can be recommended for developing high calorific value energy plantations or for integrating in homestead agroforestry under Kerala conditions include *Acacia auriculiformis*, *Anogeissus latifolia*, *Casuarina equisetifolia*, *Eucalyptus tereticornis*, *Pterocarpus marsupium*, *Tamarindus indica* and *Xylia xylocarpa*. The heat of combustion of all the above tree species were high (ie. 18.75 kJ g⁻¹)

Veterinary Division.

1. Number of calving : 110
- 2) Number of inseminations : 667
- 3) Nunber of cases treated : 2844

A quantity of 191790 Kg milk, 101 tons of cow dung and 89 animals were sold during this period .

Services rendered to Farmers

- 1) Number of inseminations : 150
- 2) Number of cases treated : 350

Finance (2003-2004) (in lakhs)

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	127.495	117.71	30.14
Plan	17.450	3.69	
Seed & Nursery programme	2.000	1.55	
ICAR	11.000	14.04	
Other EAPs	157.945	136.50	30.14

CENTRE FOR ADVANCED STUDIES IN ANIMAL GENETICS & BREEDING, MANNUTHY

Introduction

This Centre acts as an efficient tool in both Academic and research activities. This Centre expertises on genetic analysis of animals including detection of abnormalities at molecular level. This centre also became responsible for the formulation of appropriate breeding policies of the state from time to time. Breed characterization, germplasm conservation and breed improvement became major challenges taken up by the centre. The centre at present handle schemes: To conduct research with a view to evolve appropriate breeding policy for improving the genetic potential of livestock for increased production and efficient growth and reproduction. To undertake research in immuno- genetics, cytogenetics and molecular genetics to support the livestock breeding programme.

Satellite stations

1. Vechur-Farm
2. Rabbit Farm

A few memorable events of the institution

1. The native cattle of Kerala – Vechur Cattle was conserved and maintained as nucleus stock at this centre.
2. The cytogenetics laboratory established at this centre extended service to screen for chromosomal anomalies of domestic animals.
3. A full fledged molecular laboratory was established and functioning at this centre.
4. A Radio Tracer Laboratory was sanctioned for this centre.
5. The importance of bull selection in improvement of cattle production was established in Progeny Testing Programme functioning at this centre.
6. A unit to maintain the well known dual purpose breed of goat–Malabari was started under AICRP on Goat Improvement Scheme.
7. The meat type goat of Kerala–Attappady Block was surveyed and recommended for conservation.
8. The dwarf cattle of Kerala – Kasaragod cattle, High Range dwarf cattle, Vechur Cattle, Vadamakara cattle and Kuttanad Buffalo were studied for its adaptability to socio-economic conditions existing in Kerala.

Seminars/Summer Institute/Symposia/Training conducted/attended

Scientists of the centre have conducted national training on molecular technologies in animal sciences and also attended National symposium on conservation and propagation of indigenous breeds of cattle and buffaloes .

Publications

Anilkumar, K (2004), Physical profile of dwarf cattle of Kerala, Proceedings of National symposium on Livestock biodiversity vis-à-vis resource exploitation; an Introspection NBAGR, Karnal, Haryana February 11-12. 2004. pp139.

Anilkumar.K, The relevance of Vechur and other dwarf breeds in livestock sector Souvenir & Abstracts National symposium on conservation and propagation of indigenous breeds of cattle and buffaloes Feb 26-28 2004 G.B.Pant University of Agriculture and Technology Pantnagar Uttaranchal pp 9-16

Anilkumar.K., Strategies to improve the productivity of Kuttanad buffaloes. Chapter (in) Book on Buffalo production under different climatic regions, Kundu S S, Misra, A.K. and Pathak, P.S International book distributing Co-NewDelhi pp. 191-196 Eds.

Suprabha P and Anilkumar K, Delineation of genetic relationship between dwarf cattle of Kerala, Proceedings 16th Kerala Science Congress , Kunnamangalam, Calicut 28-30th January 2004.

Molecular genetic characterization & Genetic improvement of Malabari goats.

As a part of this project, a gene bank of Malabari goats consisting of DNA from 300 animals was established. Data on milk yield, body measurements, fecundity and other important traits were collected and recorded. Milk components such as fat (%), total solids (%) and total protein (%) were estimated. The protocol for microsatellite typing using radioisotopes and autoradiography was developed. Microsatellite typing was carried out at five loci known to have association with production traits. Association between different genotypes and production traits has been attempted and superior genotypes were identified. Four highly polymorphic microsatellite markers have been identified which could be used for genetic studies including parentage testing in Malabari goats. Typing protocols using PCR-RFLP were developed for Growth hormone, Kappa casein, GLA-DRB3 and Prolactin gene loci in Malabari goats.

Conservation & Evaluation Malabari Breed of goats.

Goats are mainly white or a combination of white with other colour like black brown and pink. Generally, they have short hairs at fore quarters and on hindquarters. These animals are long eared and horned and have convex forehead. Only 12% have tassels and 6% are bearded. Horizontal and drooping ears are found in equal proportions. Generally udder is round with funnel shaped teats.

The overall mortality rate was 9.89%. This was 10.9% for males and 8.7% for females. Average lactation length was 129.39 days. A selective breeding programme will be useful for increasing milk production.

Immunogenetics:

The humoral and cell mediated immune response are being assessed in different groups by estimating serum antibody levels using sheep RBC as test antigen. Total protein and serum globulin levels are also being estimated. The cell mediated immune response is being assessed by skin reaction to nonspecific mitogen phytohaemagglutinin.

AICRP on goat Improvement (Malabari Unit)

The overall average body weight was 4.53 ± 0.08 , 8.95 ± 0.20 , 14.27 ± 0.47 , 20.46 ± 1.35 and 27.25 ± 3.17 kg. at the age of 1, 3, 6, 9 and 12 months respectively. The body weights recorded at all the age groups were comparatively lower in Thannur Centre than the other two centres. The average interkidding interval was minimum at Thannur Centre (265.41 ± 8.13 days) followed by Vadakara (269.70 ± 12.11 days) and Thalassery Centre (285.02 ± 12.01) with an overall average of 274.09 ± 6.49 days. Totally, 27 bucks were selected and distributed among the farmers for breeding. So far 90 kids were born out of these bucks in 46 kiddings with an average of 1.96 kids per kidding. The breeding efficiency of the bucks was calculated as 76.47%. The tugging percentage of does was 98.18 and the breeding efficiency was calculated based on the does available and on the does tugged and the values were 50.46 and 51.39 respectively.

NATP on Animal genetic resources bio diversity

The survey and characterization work of Kuttanad buffaloes, Kasargode cattle, Vatakara cattle and Highrange dwarf cattle under the NATP on Animal Genetic Resources Biodiversity was completed. The breed descriptor for the four genetic groups of animals is prepared. The production and reproduction traits of these animals were recorded. The milk composition of the four groups of animals were analysed and compared with those of other cattle. Genetic characterization of the animals with RAPD markers established the existence of four genetic groups of dwarf cattle in Kerala. The collection of semen for conservation of the valuable resources is in progress. The project got extension upto December 2004.

Molecular characterization and adaptability studies of Vechur cattle of coastal areas and other dwarf cattle of high ranges of Kerala financed by ICAR.

The response of Vechur cattle to various environmental factors causing stress to animals were analysed. The heat tolerance of two genetic group was calculated using the Heat Tolerance Index (HTI) and Dairy Search Index (DSI). Body weights and measurements were recorded at regular intervals and the growth and feed intake were analysed at different age groups. About 2000 doses of frozen semen belonging to nine bulls are available for use. 54 field units were established by supplying animals from the nuclear herd to interested farmers. A gene bank consisting of Genomic DNA from 129 Vechur and 69 Kasargode cattle has been established and are available for molecular studies. PCR-RFLP typing protocols have been developed for genotyping Growth hormone (GH), κ -casein (K-CN), β -lactoglobulin (β -LG), prolactin and DRB3 loci in Vechur and Kasargode cattle. The protocol for microsatellite typing using radioisotopes and autoradiography has been developed.

Field progeny testing scheme financed by ICAR

Technical Report: The field progeny testing scheme, funded by the ICAR, has been functioning in the centre for advanced studies in Animal Genetics and breeding, since 1992 with simultaneous objective of evaluating highly pedigreed crossbred bulls under field conditions and increasing the milk yield of the cows reared by the farmers. So far three batches of bulls were tested and evaluation reports were sent to ICAR. The cows born in the farmers' sheds under the scheme produced 500 kg. m milk in lactation than their contemporaries born from other bulls in the field.

During the period from 1/4/2003 to 31/3/2004, 6498 artificial inseminations with semen of highly pedigreed HF bulls in the scheme have been carried out in cows reared by farmers in Avannur, Chuvannamannu, Chempamkandam, Marottichal and Puzhakkal areas of Thrissur district. During this period 397 good female calves have been born from the bulls of the scheme. The milk yield their dams are being recorded every month to assess the genetic improvement consequent to the implementation of the scheme. Analysis of the data on the milk yield of cows in the field areas have shown that the average milk production of cows reared by the farmers was 1800 kg

Network project on Attappady Black Goats financed by ICAR.

Net work Project on Attappady Black Goats funded by the National Bureau of Animal Genetic Resources of ICAR has started functioning since 6/8/2001 in the Centre for Advanced Studies in Animal Genetics and Breeding. The Attappady Black Goats are found exclusively in Attappady area of Palakkad District and are reared mainly by the tribal of that area. The main objective of the scheme was to develop the breed descriptors for Attappady Black Goats for getting the recognition for the breed. This research project has been completed by 30/9/2003 and the final report was submitted to the ICAR.

The work was carried out in Attappady Block Panchayats in 21 wards of the total 37 wards. It was found that out of the 15,000 goats enumerated, only 40 % belonging to this specific group. Studies on physical, productive, reproductive traits, and feeding and management by the tribes were completed. Adult bucks weigh 35 kg. and females weigh 31 kg. The average age at first kidding of this breed is 13.5 months, the average kidding intervals is 8.1 months and the average litter size is 1.28. Attappady Black goats have the potential to be developed into an excellent meat breed. This group of goats reared by the tribes of Attappady without any sophisticated management is under the threat of extinction and therefore suitable steps for conserving this precious germplasm of our state are to be taken up urgently.

NATP "Microsatellite markers for genetic improvement of cattle"

The genotyping of four markers were done in different breeds. PCR-conditions have been standardised for nine different microsatellite loci. The size range, allele frequency, Polymorphic information content (PIC) and heterozygosity were calculated. The size range of the alleles for the DRB3 locus varied from 116-176 base pairs (bp) for DRB3 locus, 94-128 bp for ETH131, 144-174 bp for FSH β , and 263-295 bp for HEL6 locus. The PIC and the heterozygosity of the markers typed were 0.9282 and 0.9286 for DRB3; 0.8568 and 0.8599 for ETH131, 0.7926 and 0.85195 for FSH β , 0.8840 and 0.8849 for HEL6 respectively.

Important visitors (One paragraph)

Dr.N.P.Melkania, Project Co-ordinator, ICAR, Jhansi.

Justice K.K.Dinesan, Judge, High Court of Kerala, Ernakulam.

Dr.S.J.Vinoji Rao, Sr.Scientist, LRS, Palamana (PO), Chittoor, A.P.

Dr.Y.V.Krishnamoorthy, Veterinary Surgeon, Badiadha, Kasarkod, Co-ordinator, KAMADUGHA, Shivamoga, Karnataka.

Sri.Sankaracharya Shree Raghaveswara Bharathi Swamigal, Sri.Ramachandrapura Madam, Shimoga, Karnataka, Visited the Station, visited the station.

Finance (2003-2004)

Head of a/c	Provision of the year (in lakhs)	Expenditure In (lakhs)
Non plan	10.79	9,45,767
Plan	05.52	5,13,341
ICAR	51.901	42,12,765
Other EAPs	02.48	2,36,499

VETERINARY HOSPITAL, KOKKALAI

Introduction

This station started functioning in August 1904, as Cochin State Veterinary Hospital, adopted by KAU in 1972, situated in the heart of Thrissur town and provide services to the people in Thrissur and neighbouring districts.

Mandate of the Institution

To function as teaching and clinical training hospital for both U.G. and P.G. students of Veterinary Faculty.

Lead function

The hospital has rendered various veterinary services and advice for problem cases. It is also a centre for clinical training for veterinary students.

A few memorable events of the institution

Inaugural function of the Centenary Celebration of the Hospital was held on 24th September, 2004. A Free Anti-Rabies Vaccination Camp for Pets(dogs & cats) was organised on the same day. More than 300 pets were vaccinated in this Camp

Extension and other activities

Experts from this institute participated in various clinical camps and sterility camps organised by Animal Husbandry Department and actively involved in activities of Elephant Study Centre.

Finance (2003 – 2004)

Head of Account	Provisions for the year (in lakhs)	Expenditure (in lakhs)	Station receipts (in lakhs)
Non – plan	14.540	13.43	----
Plan	0.400	0.25	----
Revolving fund	*Corpus Amt. not recd.	0.78	1.35

REGIONAL CATTLE INFERTILITY RESEARCH CENTRE KOZHIKODE

The Cattle Infertility Scheme was initially started in 1979 attached to the District Veterinary Hospital, Kozhikode. In 1984 the Scheme was shifted to the present centre at Vellimadukunnu, Kozhikode.

This Centre carried out the study of incidence, nature, magnitude and prevalence of infertility conditions in cross breed cattle of northern districts, investigates the nutritional cause of anoestrus in cross breed cattle and the incidents of clinical endometritis and its therapy based on antibiogram.

Extension Activities

In the Centre Veterinary aid was given to the public. In addition, infertility camps arranged by the Animal Husbandry Department and Grama Panchayaths were attended by the Scientists of this Centre.

Cases treated	—	1802
Lab examination	—	999

Sale of planting materials/publications

Seeds	—	97283
Planting materials	—	18060
Processed food	—	5177
Publications	—	8636

Finance

Head of account	Provision for the year (in lakhs)	Expenditure (in lakhs)	Station receipts (in lakhs)
Plan	17.15	16.94	1.10
Revolving Fund		1.27	1.28

FACULTY OF FISHERIES

FISHERIES STATION, PUDUVEYPU

Introduction

The Fisheries Station, Puduveypu is located at a distance of about 2Km west of Murikkumpadom in Vypeen Island.

The station started functioning since July 1979 with a total area of 330 acres of the then accredited wetland assigned free of cost by the Revenue Department, Govt. of Kerala.

The campus is mostly a saline marsh with mangroves and other salt resistant varieties of grass and shrubs. In selected locations, part of the land is converted into pond-bund systems for aquaculture and agricultural research. The rest of the land, which is mostly subjected to diurnal tidal inundations, forms the site of natural shellfish and finfish seed collection. The bunds and other suitable areas are planted with 850 coconut palms of which about 637 are nut bearings. Seasonal raising of vegetables and other intercrops are practised. Side by side, the demonstration garden containing coconut palms set up under the NWDB project is also maintained inexpensively. These palms are coming up very well on account of the care and attention bestowed.

Mandate of the station

The station imparts practical training on brackishwater fish culture and mangrove conservation programmes for B.F.Sc./M.F.Sc. students of the College of Fisheries, Panangad and B.Sc. (forestry) students of the university. The station also involves in research works to develop appropriate farming techniques for better production from unit area. In addition, it is also the mandate of the station to supply commercially important brackishwater fish seed during season to farmers and research institutions. Conversion of mangroves and supply of its seedlings are also attended to. Training programmes on brackishwater aquaculture and utilization of marshlands for agricultural purposes are also routinely conducted.

A few memorable events in the institution

The technological innovations towards development of brackishwater aquaculture evolved have also elevated the Station as a prime centre of learning. It is a fact that this aspect is being appreciated by the authorities and public alike.

Seminars/summer institute/symposia/trainings attended

The Scientists of the station attended various seminars and symposia on fresh water prawn cultivation at National Level and have also actively participated in the development of Kumbalangi and nearby areas.

Research programmes

Major Research achievements

Research programmes towards developing broodstock of *Penaeus indicus* under farm reared conditions, developing nutritionally efficient feeds for promoting proper growth under disease free conditions, testing of varied feeds and its management efficiency to enhance better growth and production of brackishwater fishes and the effect of an eco-friendly feed on the growth and production of *Chanos chanos* during monoculture were carried out during the

period under report. Of the several useful data collected and analysed during observations, the following research highlights are furnished.

1. The different eco-friendly management techniques adopted in grow-outs one proved very effective to maintain broodstock specimens of *Penaeus indicus* disease free.
2. Formulated and compounded diets of nutritional efficiency supplied in the grow -outs significantly enhanced shrimp growth in experimental grow-outs.
3. The combined effect of fertilizer-manure and feed in appropriate doses has a well defined role to enhance fish production substantially from eco-friendly farming systems.
4. Of the varied treatments on monoculture of *Chanos chanos* the application of eco-friendly feed at optimum dose and frugal quantity of manuring could attain a mean growth of 348.0 g resulting in an appreciable production @ 1785.0 kg/ha/yr.

Extension and other activities

The station renders need-based services to the benefit of vocational fishery students. Promotion of mangrove conservation is taken up in association with local Panchayat and Fisheries Developmental institutions.

Finance (in lakhs)

Head of account	Provision of the year	Expenditure	Station receipts
Non plan	26.19	24.48	2.32
Plan	3.35	2.54	-
Other EAPs (NATP)	0.85	0.85	-

REGIONAL FISHERIES RESEARCH AND EXTENSION CENTRE, KOZHIKODE

Introduction

The Regional Cattle Infertility Scheme was started in 1979. The Regional Fisheries Research and Extension Centre (RFREC) is functioning attached along with this Centre.

The RFREC was inaugurated on 28-12-96 by the Honourable Vice-Chancellor Dr. A.M. Michael to bridge the gap in Fishery Research in the Northern Regions of Kerala. The KAU decided to have a centre on Fisheries Management emphasizing on problems of management of fish at selected docks in the region. It is also proposed to have a production centre of fingerlings of culturable fishes of commercial importance and also the Indian Major Carps. It is also envisaged to undertake extension programmes relating to fresh water and also marine fisheries.

Research Projects

The Kerala State Council for Science, Technology and Environment, Trivandrum sanctioned an amount of Rs. 5.016 lakhs as financial assistance to the research project Assessment of the fishery of resources of Kadalundi Estuary and impact of stake nets on its ecology submitted by Dr. G.S. Narayanan, Associate Professor. The project has been implemented with effect from 21-4-04.

Finance

Head of account	Provision for the year (lakhs)	Expenditure (lakhs)	Station receipts (lakhs)
Plan	17.150	16.93	1.09
Revolving fund (Sales Centre)	No corpus fund has been recorded	1.27	1.28

CHAPTER IV

EXTENSION

Dr.A.I.Jose continued as Director of Extension.

The Directorate of Extension was actively involved in the dissemination of technological information catering to the needs of farmers, experts and other personnel in the farming/agro community. It was also responsible in nurturing the extension personnels of the various departments under the Govt. of Kerala. These objectives were operationalised through the various extension oriented institutions of the Directorate spread through out the State. The five Krishi Vigyan Kendras situated in each of the agro-ecological zones served as a light house for both the laymen and professionals in the field of Transfer of Technology. The constituent units, viz, the Communication Centre, Central Training Institute, KAU Press, ATIC and Public Relations with their concerted efforts helped in identification, streamlining and organizing the extension activities of the KAU as an organic whole. The Directorate of Extension also rendered Ycoman's service in every walk and sphere of the extension activities for all the Research and Teaching Institutions under KAU.

The ATIC (Agrl. Technology Information Centre) paved new avenues for the entrepreneurs in agri based enterprises, imparting transfer of technology and also to the farming community through the single window approach, providing access to Information Technology to the rural farmers even from the remote and hilly districts of Idukki, Waynad and Kasaragod.

The Communication Centre, one of the major components of the Directorate was responsible in rendering Farm Advisory Services, media publications and conduct of seminars, workshops and exhibitions for the benefit of the farming community, under the Technology Transfer Commitment of the KAU. Technical advises were offered to hundreds of farmers with respect to diagnosing and tackling on-farm problems. The Centre was also instrumental in imparting technical know-how to the farmers through farm clinics, exhibitions and field visits by the Scientists. More than 300 farmers were benefitted through the Farm Advisory Services of the centre. Another constituent, the KAU Press was actively involved in the publications of the KAU like bulletins, periodicals, pamphlets and technical books etc, especially popular publications like Kalpadhenu. The two research journals of the KAU Journal of Veterinary & Animal Sciences and Journal of Tropical Agriculture were also published during the period. Moreover, the research update and seasonal crop cultivation practices were aired on all Fridays, under the auspices of the Communication Centre.

The Central Training Institute and Centre of Excellence in Training for Plantation Crops co-ordinated the teaching/learning skills for the Agro technical and Extension Personnels belonging to the Development Departments, Commercial & Rural Banks, Boards etc. In addition, various vocational, inservice, sponsored and stipendiary were organised for the farmers, unemployed youths and Village Extension Officers.

The five Krishi Vigyan Kendras, viz., KVK Pattambi, KVK Ambalavayal, KVK Manjeswaram, KVK Sadanandapuram and KVK Kumarakom situated in the nerve of the major agro-ecological zones catered to the specific socio-economic, local oriented requirements of the respective zones. The KVKs played a major role in organizing various Vocational Trainings and Melas.

In addition to the aforesaid activities, Directorate of Extension also coordinated the various NATP Projects and also the NSS activities of the constituent colleges under the KAU, where the extension activities disseminated to the rural folk through the students. The activities of the Public Relations Unit of the KAU were also co-ordinated by this Directorate, especially in the publication of KAU News Letter which is an in-house publication.

COMMUNICATION CENTRE, MANNUTHY

Introduction

Communication Centre under the Directorate of Extension of the University at Mannuthy disseminates new and useful farm technologies to the extension personnel of the development departments, voluntary agencies, co-operative societies, commodity boards and farmers through a variety of media. The function of information communication is performed through its sub units namely information unit, publication unit, exhibition and graphic services unit and farm advisory service unit.

Mandate of the institution

The major responsibility of Communication Centre is to provide technical information support to the extension personnel of the state development departments and farmers. Information communication through various mass media publications, exhibitions, seminars and farm advisory and consultancy services are also the functions of Communication Centre. Teaching and research are the auxiliary functions of the station.

A few memorable events of the institution

The pavilion of KAU arranged by the Communication Centre at the Thrissur Pooram All India Exhibition 2003 won the prize for the best pavilion. The inauguration of ATIC and Kissan Call Centre during the period under report are worth mentioning.

Seminars/Summer Institute/Symposia/Trainings attended

The Scientists attended two seminars, 3 symposia, 4 workshops and also one summer school on various topics of national and international importance.

Research Programme

a) NATP on Participatory Extension System on Technology generation, refinement and dissemination

Principal Investigator Dr. Binoo P. Bonny

CO-PIs Dr. Sujana Paulose

Dr. S. Estelitta

Dr. P. Pramcela

Dr. G. Jayalekshmi

The programme was implemented as an action research carried out through Farmer Research Groups (FRGs) formed in 12 padasekharoms of the selected blocks of the Central and problem Agro-climatic zones of Kerala (NARP, 1989). Critical technologies

were identified for the different rice production systems of Kerala. Popularization of farm waste recycling through the establishment of Vermicompost units helped to overcome the non-availability of organic manures.

- b) A project on Monitoring and Evaluation of Macro Management schemes implemented by the Department of Agriculture was sanctioned for KAU at an amount of Rs.15 lakhs. Task force for the monitoring and evaluation work was constituted under the leadership of Dr.R.M.Prasad, Professor & Head, Communication Centre, Mannuthy.
- c) A project on Indigenous Technical Knowledge (ITK) in Farming Systems of Kerala, funded by the State Planning Board, is in the process of completion.

Extension and other activities

Celebrated Chingam as Karshakadinam on 1st August 2003. Seminar and exhibition on the topic "Rodents- Agricultural and health hazards and measures to overcome" was arranged for the benefit of farmers of nearby panchayaths.

Organised training on "Ornamental Fish culture" and a seminar on "Organic food production - marketing and potential.

Three exhibition and two short video programmes were arranged and writers' workshop was also conducted during the period. Training on nursery management was also conducted.

Radio talk

Dr. Jose Joseph	I) Need for livelihood base in World Trade Agreement.	AIR, Thrissur, 18-10-03
Dr. S.Estelilta	II) Contract Farming	AIR, Thrissur, 26-01-04
Dr.R.M.Prasad	Monsoon diseases of Banana.	AIR, Thrissur, 15-05-03
	WTO	AIR, Thrissur, Dec'03
Dr.R.M.Prasad & Dr.K.N.S.Nair	Agricultural Archives	AIR, Tvm, Jan..04

Farm Advisory Service

In Person	Kissan Call Centre	Over phone	Letters	Field visits	Farm clinics
200	70	353	140	145	18

Other details

Scientists of Communication Centre participated as resource persons in the seminars organised by the State Dept. of Agriculture for the benefit of farming community in the districts of Thrissur, Palakkad, Kozhikkode and Ernakulam.

They also have handled technical sessions in the in-service training programme arranged for the officials of Dept. of Agriculture and Village Extension Officers through the Central Training Institute, Mannuthy, Extension Training Centre, Mannuthy and RATTCs at Malampuzha, Kozhikkode and Vyttila.

Scientists also attended to Farmers' Field School arranged for 10 continuous weeks in selected Padasekharams of Thrissur and Palakkad.

Finance (lakhs)

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	72.10	61.01	8.76
Plan	28.95	6.88	-
Other EAPs	10.00	3.34	-

CENTRAL TRAINING INSTITUTE, MANNUTHY

Introduction

The Central Training Institute (CTI) is the nodal point of Kerala Agricultural University's training activity. The institute co-ordinates training on agriculture and related subjects to the technical personnel of the State Departments such as Agriculture, Animal Husbandry, Dairy Development, Fisheries, Forestry, Commodity Board, Banks and such other agencies. The institute is recognised by the Government of India as a Centre for National Training Courses in specialised areas such as Farm Journalism and Plantation Crop Production Technology. Stipendiary training programmes are conducted on subjects related to meat and dairy technology.

Central Training Institute, Mannuthy is also identified as a venue of a series of two months training programme for graduates and allied subjects so as to promote the establishment of Agriclincs and Agribusiness Centres with the financial assistance from the NABARD and continued handholding service from the Kerala Agricultural University.

Mandate of the institution

The training programmes undertaken by the Central Training Institute are classified as sponsored training, vocational training, stipendiary training and staff training.

Lead function

To identify training needs and organise specialised training activity. To co-ordinate, monitor and evaluate training programmes undertaken by the KAU.

Seminars/summer institute/symposia/training's attended:

The Scientists of the station attended national seminar on Alternative Extension Approach at Trivandrum and presented extension theme papers. They also acted as Chairman, Member of Advisory Committee of PhD Students and PG Students of the University.

Extension and other activities

During the report year this institute has conducted 46 Inservice training programmes, 4 HRD Training programmes, 3 Stipendiary training programmes, 3 Sponsored training programmes, 64 Vocational training programmes and 23 NATP training programmes.

Important visitors

Sri. Jose Kattookkaran, Mayor, Thrissur Corporation, Dr. V.M. Gopalakrishna Menon, District Collector, Thrissur, Dr. Sharma, Deputy Director, ICAR etc. visited the station in connection with inauguration of KAU's 1st Video Conferencing Unit.

Finance (2003-2004) (lakhs)

Head of a/c.	Provision for the year	Expenditure	Station receipts
Non plan	33.160	31.86	9.92
Othe EAPs	9.00	5.80	4.5 lakhs from MANAGE, endorsed to the Comptroller, KAU

KERALA AGRICULTURAL UNIVERSITY PRESS

Introduction

The KAU Press was established at the pavilion building of the Veterinary College, Mannuthy during 1976 with a very few technical staff and one HMT Printing Machine. The Professor and Head, Communication Centre was put into additional duties as Press Manager till 1979.

Sri. K. Rajappan assumed charge as Press Manager on 12-4-1979. The Press was subsequently shifted to the present building at Mannuthy (old Small Animals Breeding Station) during 1981 after making necessary alterations. KAU Press is planning ahead to introduce Offset facility in the press, for which the orders were already placed and the unit is expected to start functioning from July 2004 onwards. During 1999, we installed Risograph printing facility in the press to undertake short run printing requirements.

Mandate of the station

The Kerala Agricultural University Press, established as a unit of the Directorate of Extension, is functioning with the following objectives at present:

Publication and documentation works of KAU were undertaken by the Press.

KAU can be very proud in the sense that we are already having 87 Malayalam publications and 34 technical bulletins and 68 books on different subjects in English for distribution to the public and priced very reasonably.

Finance (in lakhs)

Head of account	Provisions for the year	Expenditure	Station Receipt
Non-plan	59.44	36.22	1.40
Plan		11,65,033	-
Total	59.44	50.89	1.40

AGRICULTURAL TECHNOLOGY INFORMATION CENTRE (ATIC), MANNUTHY

Introduction

The Information and Sales Centre (I&SC), Mannuthy started functioning on 10-07-1993 as an independent unit under the administrative control of the Directorate of Extension. The primary objective of the centre was to act as the centre of excellence in the sphere of dissemination of technologies and distribution of quality products developed by the University akin to a super market approach. The potential clientele may also get access to various activities of the University. They are provided with brochures and literature related to agriculture. The Centre was intended to work on a no profit-no loss basis. Recognizing the importance of such a centre, the ICAR made it a National model and conceptualized the concept of ATIC.

Mandate

To provide a single window delivery system for agricultural information as well as products and technologies developed by the University with a view to deliver quality services to the clientele.

To strengthen the farm advisory services by adopting a multi disciplinary approach to problem solving.

To provide mechanism for feedback from the end users to the research system.

To function as a repository of agricultural information pertaining to farming skills and practices, farm inputs and agricultural education.

To offer consultancy services to the different stakeholders in the state.

To offer training to unemployed youth to make them job providers, rather than jobseekers as a part of the ABARD project.

A few memorable events of the institution

Sale of quality planting materials, veterinary products, processed products worth Rs. 1.02 crores to the public, training of 150 unemployed educated youth on 15 different agro-biotechnology, options for empowering them to start self sustainable agri business enterprises (ABARD), self empowerment of women entrepreneurs (64) through Small Agro Industrials Units (SAIU's) by adopting rural technological innovations of the University.

Inauguration of New ATIC Building

The new ATIC Building constructed with the NATP Funding of Rs.30 lakhs was completed and the same was inaugurated on 1st December 2003. A total sum of Rs. 37,29,497 has been incurred towards the construction of the building. The building has got a plinth area of 6480 sq.feet as against 4200 sq.feet areas in the ICAR Plan. The building presently houses ATIC office, Farm advisory services, agro clinic, farm library and video conferencing facility.

ATIC on the Internet

The details regarding services and sale of quality planting materials, seeds, publications and other value added products can be accessed in the website of KAU website - www:kau.edu/extension/atic.

Involving students in ATIC Technology dissemination process

The Veterinary & processed fruit and vegetable counter of ATIC is being run by students of College of Veterinary & Animal Sciences as part of their Earn While You

Learn Programme (EWYL) w.e.f 2/12/2000. The stall is open from 8 am to 8 pm on all days including holidays. The students are paid @ 2.5% of the total turnover per month for their services and as such the public gets better services through this counter as it is run by qualified hands.

Finance (2003-2004)

Head of Account	Provision for the year	Expenditure in Rs.	Station receipts
NATP	---	3.09	1.06 crores
Revolving Fund	---	10.38	

SUB CENTRE OF RARS PILICODE, MANJESHWAR
(Formerly Krishi Vigyana Kendra)

Introduction

The Krishi Vigyana Kendra, Manjeshwar was started functioning at Vorkady Manjeshwar as a project of the Kerala Agricultural University from 22.10.1984 at Thimmangore in Vorkady Village which was later shifted to Majiripalla, Vorkady Manjeshwar. Then it was shifted to newly constructed building since 28.11.2001.

This area is mostly inhabited by Tulu and Kannada speaking population in Malayalam majority state. Due to language barriers, farmers were cut off from the main stream regarding transfer of technology in Agriculture and allied aspects, which subsequently contributed to a sharp decline in agricultural productivity.

Very recently this station is renamed as substation of RARS Pilicode, Manjeshwar.

Lead function

The specific objective of KVK Manjeshwar is to impart up-to date knowledge to farmers, farm youths and farm women on crop planning, crop production technologies, animal husbandry, dairying, forestry, home science and understanding in scientific farming.

Auxiliary function

1. To conduct socio-economic surveys in order to assess the impact of training on the Economic conduction of the farms.
2. To act as potent instrument for transferring modern farm technology to the farming community through various extension media.
3. To conduct in-service training programme for the personnel of the development department.
4. Establishing rapport with various social organizations, functioning in this area of operation.
5. Strengthening the linkage with various developments in the district.

Trainings attended

R. Sendil Kumar, Asst Professor (Agrl. Extension) Refresher course in Extension Education at Annamalai University, Chidambaram. With the limited scientific manpower available with the station, 5 training programme, were conducted.

Field visit

Regular need based field visits were carried out to tackle the field problems of coconut, arecanut, vegetable and paddy farmers.

Finance (2003 – 2004) (lakhs)

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	13.430	12.747	
Plan	0.050	0.050	
Total	13.480	12.797	0.015

KRISHI VIGYAN KENDRA, AMBALAVAYAL

Introduction

The Krishi Vigyan Kendra, Ambalavayal started functioning as a University project attached to the Regional Agricultural Research Station from October, 1982. ICAR started financing the Kendra from 1984 and thereafter the Kendra is functioning as per the guidelines of the Council. The area of operation comprises the entire Wayanad district, where tribes constitute a significant portion of population. *Kurumas, Kurichias, Paniyas* and *Naikkas* are the major tribal groups here. The entire district is in the high range region at an elevation of 900 - 1200 m. above MSL and enjoys a mild sub tropical climate. The district does not have any major industries and the economy is based on Agriculture and Animal Husbandry. Rice is grown in the valleys, whereas spice and plantation crops like Coffee, Pepper, Cardamom, Vanilla etc. are grown in the uplands. Marginal and Small Farmers constitute a major portion of the farming community. The Kendra conducts training programmes for practising farmers, extension functionaries and unemployed rural youths in the fields of Agriculture and Animal Husbandry. The Kendra is maintaining a very good linkage with the developmental departments and various NGOs functioning in the district.

Mandate of the unit

Extension activities in agriculture and allied fields aimed at serving for primarily the tribal population and non-tribal farmers of Wayanad.

Lead function:

Training programmes for practising farmers, rural youths and extension functionaries.

Auxiliary function:

Front line demonstration, On-farm testing, Vocational training programmes and other extension activities.

A few memorable events of the station

World Food Day '2003'

The Kendra celebrated the World Food Day this year with a difference at Begur tribal colony consisting of economically backward tribal people. The Gram Panchayat President of Thirunelli, Sri. Sahadevan presided over the function and emphasised the need for food security for this downtrodden people. Incidentally, the District Panchayat President of Alappuzha District, Adv. C.S. Sujatha was also present and she inaugurated the celebration. Many dignitaries spoke on the occasion. More than 300 tribal people participated in the celebration and the function has raised some hope among these people that the Kendra would certainly do some long term benefits to get rid of their problems.

Training on Vegetable cultivation to SHG members:

The Kendra in collaboration with the Department of Agriculture conducted a long term training on vegetable cultivation to the members of a women self help group. They were imparted training on cultivation of both cool season and summer vegetable crops in a scientific manner and they were involved in practical sessions also - right from land preparation, sowing to plant protection operations and harvest. This instilled in them the self confidence in cultivation of vegetables scientifically. Now they grow vegetables on their own, thereby obtaining fresh and nutritious vegetables from their own back-yard.

Animal Health Mela:

Two Animal health melas were organised by this Kendra during this year in hands with the State Department of Animal Husbandry, Indian Veterinary Association and College of Vety. and Ani. Sciences, KAU, Mannuthy. It received a wide appreciation from all corners of the society. Seminars, exhibitions and camps were arranged as part of the mela.

Seminars/Summer Institute/Symposia/Training attended

The Scientists attended meetings, Science Congress, National Seminar and winter school.

Extension and other activities

The mandates of the Kendra are extension oriented and it conducts training programmes, demonstrations and other extension activities like exhibition, field day.

Demonstrations and OFTs

- Stall feeding of Goats
- Effect of feeding balanced ration for backyard poultry rearing system
- Evaluation of fodder grasses in Wayanad
- Evaluation of different methods of feeding of goat
- Evaluation of high yielding variety of vegetable crops
- Integrated management of *Phytophthora* foot rot and slow decline diseases of Black Pepper
- Integrated Nutrient Management in *Nendran* Banana
- Scientific management of crossbred calves
- Demonstration of high yielding variety of vegetables - Oriental pickling melon, Cowpea, Bitter gourd, Amaranth
- Pest and Disease management in rice
- Control of leaf rot diseases of coconut
- Yellow leaf disease management of arecanut
- Introduction of good quality layer bird '*Athulya*' for Wayanad

Training programmes

329 Training programmes were conducted for practising farmers numbering 8284; 22 training programmes for rural youths numbering 457 and 35 training programmes for extension functionaries numbering 629.

Important visitors

Justice Raman, Sri. P.K. Borguhai, Dept. of Agriculture, Assam, Sri. Nithin Agarwal, DIG, Kannur

Other details

Animal Health Camps

Besides conducting training programmes and demonstrations, the Kendra conducted several Animal Health and Vaccination Camps. During this year, vaccination camps for goats were conducted. A total of about 350 birds and animals were taken care of during these camps.

Flower Show 2004

The Kendra and RARS arranged a stall in the Flower Show 2004 held at Kalpetta from January 24 to 30, 2004 under the auspices of Wayanad Agri-Horti society. It received an over whelming response and wide appreciation from the public. The staff members besides participation, did serve as judges in adjudging the best stalls and produces displayed by the farming community and various agencies.

Popularisation of Floriculture

There is good scope for floriculture crops in Wayanad District, especially for Anthurium and Orchids. Farmers are now showing a good amount of interest towards cultivation of these crops. About 10 training programmes were conducted so far in these aspects. The Wayanad Fruits and Vegetables Marketing Cooperative Society also collaborate with the Kendra in popularising the floriculture crops.

Spice Production Technology – Vanilla Cultivation

There exists a tremendous response from the farming community for vanilla cultivation. The farmers are very much interested in growing vanilla in all possible avenues. Within a short span of around 6 months, about 20 training programmes were organised in vanilla cultivation.

Activities on Gender Concerns

The Kendra serves as the Zonal Centre of the Centre for Studies on Gender Concerns in Agriculture (CSGCA) of the KAU. Under the auspices of the Kendra, a two day orientation training was given to the staff of KVK and RARS on various gender issues during February 2004. Besides, the Kendra assisted by carrying out survey activities on gender issues. Dr. A. Radhamma Pillai is serving as Co-Principal Investigator for a project entitled 'Network Project on Engendering Agricultural Research and Extension'.

Finance (2003 - 2004)

Head of account	Provision for the year (Rs.)	Expenditure (Rs.)	Station receipts (Rs.)
ICAR(405-40-5504)	32,20,000/-	29,13,660/-	-
Revolving Fund		2,69,636/-	1,60,178/-

KRISHI VIGYAN KENDRA, SADANANDAPURAM

Introduction

The KVK, Sadanandapuram was established at the FSRS, Kottarakkara, Kollam district on 1st October 1994.

The main objective of KVK is to benefit the farming community of Kollam district through its various activities. The beneficiaries include small, marginal farmers, farm labourers, unemployed youth etc.

Mandate of the institution

KVK aims at the testing and transfer of agricultural technologies so as to bridge the gap between production and productivity and to increase self employment opportunities among the farming community. The KVK carries out the following activities in order to fulfill its mandate.

- i) On campus and off campus trainings to farmers, farm women and extension functionaries
- ii) Vocational training programmes in agriculture and allied enterprises.
- iii) On farm testing in crop production, horticulture, live stock production etc.
- iv) Front line demonstrations on major cereal crops and horticultural crops

Seminars/summer institute/symposia/trainings attended

The Scientists of the station participated in seminars on Technology transfer and farm information.

Extension and other activities

Various training programmes are organized and conducted under Crop production, Horticulture, Plant Protection, Animal Science, Home Science and other important topics like Sericulture, Mushroom cultivation and Bee keeping. Training programmes, both on campus and off campus were organized according to the needs of the farmers, farm women rural youth and field level extension personnel. "Teaching by doing" and "learning by doing" are the principles followed for imparting skill training. Specific trainings were conducted to enable the farmers to tackle field problems as and when such problems arise. During the year, 47 on campus trainings and 31 off campus training programmes were organized and conducted for 1071 and 993 trainees respectively, comprising practicing farmers, farm women, rural youth and field level extension personnel.

Finance (lakhs)

Head of account	Provision for the year	Expenditure	Station receipts
ICAR	32.35	21.61	
Other EAPs	Nil	Nil	
Revolving Fund	0.50 (core)	5.00	78289

KRISHI VIGYAN KENDRA, PATTAMBI

Introduction

KVK, Pattambi caters to the needs of Palakkad district of Kerala. Palakkad has a lot of uniqueness compared to other districts of Kerala. This is the only district that doesn't have a mountain cover on the eastern side owing to a large gap of around 25 kms in the Western Ghats. Western Ghat gap popularly called the "Palghat gap" has a profound influence on the climate, ecosystem, cropping, social and cultural diversity in this district. The district has lands that fall into the rain shadow regions of Western Ghats at Attapadi with characteristic low scrubs as well as the wet evergreen forests of the Silent Valley.

Palakkad is called the rice bowl of Kerala owing to the predominance of rice cultivation in this tract. This district has the maximum number of irrigation projects catering principally to this need. Crops like maize, sugar cane, ground nut, ragi, cotton etc., which are not grown elsewhere in Kerala find a place in the agricultural scenario here.

Mandate of the Unit

Lead functions

Vocational Training Programmes To Practicing Farmers To Rural Women and Youth

Front Line Demonstration, On Farm Testing of Technologies, Training to Field Level Extension Personnel

Auxiliary functions Collaborative Training Programmes, Seed and Nursery Programme, Extension Activities like Seminar, Exhibitions, Field Days, Village Survey, Case Studies etc.

Training Programmes

The Scientists of the Kendra attended various trainings viz. Training Programme on feeding, breeding and management of dairy animals, National Training Programme on Gender perspectives and issues, Market led Extension Management and Training on management for subject matter specialists of State Agricultural Universities at various institutions inside and outside the state.

This Kendra conducted 22 on campus training on various subjects with 118 male and 323 female participants and also conducted 37 off campus training with total of 1879 participants.

Front Line Demonstrations

1. Popularization of newly released variety of Rice

Varsha, a recently KAU released high yielding rice variety having red kernel with medium plant height and duration of 115 – 120 days producing an average

grain yield of 4500 to 5000 kg/ha and suitable for both direct seeding as well as transplanting was demonstrated in 50 cents fields of 8 farmers at Shornur, Vaniyankulam, Pattambi, Chalissery, Kulukkallur and Vattankulam during the virippu season 2003. The results are presented below:

Sl. No.	Name of the Farmer	Method of planting	Crop period	Yield	
				Kg/50 cents	Tons/ha
1	Sri. T. Ummikrishnan, Kunnamkattu (H), Mannanur, P.O.,	Direct seeding	119 days	870	4.35
2	Smt. U. Nanikutty Amma, Ullattil (H),	Direct seeding	112 days	890	4.45
3	Sri. K. Devadas, "Pushpa Vihar", Vaniyankulam	Transplanting	Crop failed	-	-
4	Sri. P. Achumani, Puthanthodiyil (H), Panayur, P.O.	Transplanting	108 days	1140	5.7
5	Sri. M. Kunhikrishnan, Krishna Vilas, Kezhayur, Pattambi	Transplanting	105 days	960	4.8
6	Smt. P.I. Mary, Kollannur (H) Chalissery, P.O.	Transplanting	109 days	1080	5.4
7	Sri. Kunjunni Nair, Malathi mandiram, Vanduthara	Transplanting	114 days	1200	6.0
8	Sri. A.K. Prabhakaran, Arayilkadathu Valappil, Vattankulam, P.O.	Transplanting	105 days	960	4.8

2. Popularization of Vermicomposting in Homesteads

Vermicomposting of homestead and household wastes of organic nature utilizing efficient species of earthworms (*Eudrilus eugineae*), was demonstrated in 7 homesteads of Gopalakrishnan (Vilayur), K. Suresh and A.K. Sureshkumar (Vaniyankulam), P.K. Arunkumar (Choorakkode), V.P. Khalid (Ongallur), P.M. Hari Embrandiri (Muthuthala) and Mrs. Suhara Poothari (Panamanna). The programme was successfully conducted and all the farmers are satisfied with the technology. They have planned to go on with the technology to extent the technology among the farmers and to earn income through the production and sale of vermicompost as well as the earthworms.

3. Nutrition Gardening

In order to make available quality vegetables and fruits and to popularize the concept of nutrition gardens demonstration units were established in the homesteads of 30 rural families at Vaniyankulam, Palappuram and Lakkidi. The programme envisaged demonstration of nutrition garden using vegetable crops- Bhindi, Amaranthus, Cucumber, Cowpea, Bitter gourd, curry leaf, Drumstick and Chekkurmanis and fruit crops -Papaya and Banana. Sufficient quantities of seeds/planting materials were supplied to the families and they were given an orientation training programme on nutrition gardening. The programme was quite successful with the result that these families could meet their vegetable needs and that too produced in an organic way. The programme was linked with active monitoring of the Ottappalam Welfare Society.

4. Homestead Medicinal Garden

Even though a spurt exists in the use of medicinal plants most of them are becoming extinct, primarily due to the lack of proper knowledge in their scientific cultivation. Hence, to bring an acquaintance to the farmers 25 demonstration units of medicinal plants which can be used for home remedies, were established at Vilayur, Pattambi, Ongallur, Vallappuzha, Kulukkallur, Koppam, Thiruvegappura, Vaniyam-kulam, Ottaplam, Lakkidi Perur, Muthuthala and Paruthur. The 25 selected families were supplied with 5 planting materials each of 10 medicinal plants viz. Adalodagam, Chittaratha, Kiriyaatha, Brahmi, Panikoorkka, Iruveli, Changalamparanda, Murikoottipacha, Patcholi and Palmudhukku. These plants are suitable for home remedies and can be included as intercrops in the homesteads. And as such, they were raised by the farmers in the homesteads.

The performance of the plants was quite satisfactory and the farmers used various plant parts for home remedies especially of their children. A few farmers multiplied the planting materials and distributed to the neighbouring farmers. And some are planning for area expansion of selected items, but how to find a market is creating a barrier for their wishes.

5. Introduction of *Pseudomonas* against Bacterial Leaf Blight of Paddy

Bacterial Disease affected areas of Anakkara and Varode were selected and 10 kg. of *Pseudomonas fluorescence* were given for mundakan crop of rice. In Varode, seed treatment was given (10 g. of *Pseudomonas* culture/kg. of seed for 12 hours). In Anakkara, just before the process of mechanical transplanting, the mats of seedlings were dipped in *Pseudomonas* solution (20 g/litre of water) in a small tank for one hour. It was found that both bacterial and fungal disease incidence was very less in the current season.

6. Management of model nutrition cum medicinal units at work places of field level extension workers/institutions of Health Dept. and Education Dept.

The programme started with the establishment of nutrition cum medicinal unit at Govt. U.P.School, Keezhayur on 15th August. The Kendra supplied the planting materials of vegetables, medicinal plants, tree species, fruit plants etc. and demonstrated the planting and management aspects. They are maintaining the garden very well with the participation of the students as well as the youth club of the locality. The programme has been planned for the institutions under the Health department also.

On Farm Testing

1. Efficacy of Organic Manures in Amaranths

An OFT to study the efficacy of various organic manures in Amaranths was organized in the fields of Sri. M.T. Prakasan (Koppam), Sri. K.P. Kari (Thiruvegappura) and Sri. M.K. Sudhakaran (Muthuthala). Results showed that by Vermicompost treatment farmers got 7 cuttings of Amaranthus compared to 5 cuttings in Poultry Manure treatment and 4 cuttings in Poabs Green manure and cow dung treatments. Also the vegetative growth and yield were maximum in Vermicompost treatment with less incidence of pests and diseases.

2. Feasibility of Value added products in Ragi

The feasibility of production of ragi based foods was studied with reference to shelf life, viability of production in terms of movement of the products and profit generation, among the four women groups who are already running their own processing units at Sreelakshmi Vanitha Sangham, Subhalakshmi Group (Nellaya), New Happy Group (Panamanna) and Aiswarya (Maruthur). The result showed that ragi on value addition

through mixing of some pulses like green gram and groundnut could get more acceptances among the society when compared to the ragi feed alone. The difference in taste as well as the awareness given to the beneficiaries on the importance of pulses and oil seeds in the weaning may be the reason for a wider acceptance for the new product.

3. Feasibility of different substrates in the cultivation of Oyster mushroom

For the cultivation of oyster mushroom (*Pleurotus sp.*) paddy straw is considered to be the most suitable substrate. But due to the limited availability and moderately high cost of paddy straw we can select one alternative substrate, which is available in plenty and at low cost. Therefore, this trial was conducted for testing the feasibility of different substrates in the Oyster mushroom cultivation, participating 3 farmers namely P. Gopalakrishnan and Smt. Radha (Vilayoor) and Smt. Vimala (Sankaramangalam). Paddy straw was most effective substrate for cultivation of oyster mushroom.

4. Management of Downy mildew in Cucumber

Downy mildew of cucumber is becoming a serious disease for some of the vegetable farmers in Pattambi, causing about 50% loss. Therefore one trial is proposed for the effective management of downy mildew in cucumber using eco-friendly measures. The programme was organized in the fields of Sri. K. Kunjayamu (Vallappuzha), M.T. Prakasan (Koppam) and K.P. Kari (Thiruve-gappura). Percentage of disease incidence was noted and average values were calculated. Garlic and Tulsi extracts were not effective. Neem leaf extract was effective but cowdung treatment had almost similar effect as Dithane M-45 treatment.

5. Management of foot rot disease of pepper

Foot rot disease in pepper caused by *Phytophthora capsici* is a serious disease in the area. Recommended management practice involving control by fungicide application is being practiced at present by the farmers with limited results. This trial attempts to manage the disease through organic supplements. The programme was organized in the fields of Sri. Kunhimohammed Haji (Vallapuzha), Babychan John & Anish Thomas (Perumadiyoor) and M.G. John & Markose George (Aamayur). Bordeaux mixture spray was the most effective followed by Fytolan drenching and Trichoderma application. But, in Trichoderma treatments, plants were greenish and healthy.

Other extension activities

Extension activities and service rendered

Activities	Number	No. of Participants		
		M	F	Total
Farmer meetings	18	529	114	643
Farmers' visits	-	400	203	603
Field visits	39	163	112	275
Kissan mela	3	260	112	372
Field day	3	123	63	189
School program	2	76	91	167
Exhibitions	1	126	60	186

Radio Talks	:	8 nos.
T.V. Coverage (Local)	:	26 nos.
Newspaper coverage	:	31 nos.
Extension Literature Published	:	4 nos.

Important visitors

Dr. K.V. Peter, Vice Chancellor, KAU, Dr. A.I. Jose, Director of Extension, KAU, Dr. S. Prabhukumar, Zonal Coordinator, Bangalore and Dr. M.J. Chandra Gowda, Senior Scientist, Zonal Coordinating Unit, ICAR, Bangalore visited the Kendra during the period.

Some Important events/programs

1. Celebration of Chingam 1st as Farmers Day:

The farmers' day was celebrated at KVK premises on August 17th 2003 to mark the beginning of the prosperous harvesting season. The Scientists from RARS & KVK participated as resource persons in the celebration at different Krishi Bhavans organized by the State Department of Agriculture.

2. World Food Day 2003

Krishi Vigyan Kendra, Pattambi organized a one-day seminar-cum-group discussion to observe the World Food Day 2003. The program was organized in collaboration with the Ottappalam Block Panchayath at the Block Panchayath Hall. The theme of the day was "International alliance against hunger". The Block Panchayath President, Mr. A. Radhakishnan gave an introductory talk on the day's program. Dr. A.I. Jose, Director of Extension, KAU addressed the gathering. An interesting talk on the importance of the day and statistics about the food situation in India and Kerala was elaborated. The meeting was then inaugurated by Mr. Ajaykumar, Member of Parliament from Ottappalam. The Newsletter published by KVK and a pamphlet on KVK was released during the function. Later on other invited dignitaries facilitated the meeting. The session concluded by about 5 pm.

3. Catch Them Young Program

The program aimed at creating an interest in farming among the school students, started two years back was continued during the current year. The program took a new turn with KVK adopting a school to serve as a front end in dissemination of technologies for the general public through active social collaboration. Keezhayur Government U.P. School, which was shifted to a new campus, was selected for this program. As a part of the FLD program, KVK is establishing a garden, vegetable cultivation unit, Medicinal and fruit plants demonstration in the otherwise barren campus. The plan is to make the school self sufficient by using the manpower and resources available with the school and community. KVK organised two meetings followed by a "sramadhanam" on August 15th to involve local community in the activity. KVK has already liasoned with the women group and youth in the locality for further activities using the school as a front end.

4 Association for Non-Traditional Employment of Women/Ottappalam Welfare Society.

ANEW is an NGO working in the field of imparting training for women and micro-credit. KVK has tied up with ANEW in training all beneficiaries of ANEW in opening up new ventures with the credit available through ANEW. KVK has adopted Varode - a micro watershed near Ottappalam and ANEW has extended their credit facility to this area to compliment our activities. KVK has also prepared projects for development of a horticulture nursery, vegetable demonstration unit and Model Homestead at the ANEW farm. The over riding objective of the programmes is to strengthen linkages with NGOs on Credit Plus activities in Agriculture.

5. Mahila Vedhi

A Mahila Sangamam, *vis a vis*, ladies forum, comprising of the women centered production units of KVK were invited to the Kendra on 1.8.03 to evaluate their activities in connection with the trainings received from the center. In addition motivation for women empowerment and assessment of the group's training needs was also the idea behind organizing this camp. The Block Panchayath President Smt. C. Sujatha, presided over the function.

6. RAWE Programme

As a part of the Rural Agricultural Work Experience programme of the B. Sc.(Ag)course field trainings for two batches of students from College of Agriculture, Vellayani (18 students) and College of Horticulture, Vellanikkara (23

students) were organized by the Kendra. The schedule of the one-week long training programme composed of farmers field visits, farmer interactions, conduct of PRA, village surveys, training need assessment, organization of training programmes, preparation of training materials, conduct of method demonstrations in the farmers fields, interaction with KVK entrepreneurs etc. The batch from the College of Agriculture, Vellayani conducted a village survey at Varode, a micro watershed and assessed the training needs of the farmers and rural women and youth and based on this the second batch organized a training programme for the farmers in that area. The students prepared a report of their activities during the training period and presented in the last session of the programme.

Finance 2002-2003 (lakhs)

Head of a/c (ICAR)	Provision for the year	Expenditure	Station Receipt
ICAR	37.10	34.77	6.77
Revolving Fund	NIL	0.78	0.79

TRAINING SERVICE SCHEME COLLEGE OF AGRICULTURE, VELLAYANI

Introduction

The Training Service Scheme, Vellayani is a sub centre of Central Training Institute under the Director of Extension, Kerala Agricultural University. It started functioning since 1986.

Mandate of the unit

To organize need based training programmes for the inservice personnel of Development departments and selected progressive farmers.

Seminars/Summer Institute/Trainings attended

The Scientists of the station have attended Seminars and Symposia conducted at IARI New Delhi.

Finance (lakhs)

Head of Account	Provision for the year	Expenditure	Station receipts
Nonplan	15.18	14.64	1.47

CHAPTER V

CENTRAL LIBRARY AND INFORMATION SYSTEM, VELLANIKKARA

Introduction:

Central Library started functioning in the new building in 1997. Smt. M.C. Lalitha, Assistant Librarian, College of Horticulture, Vellanikkara took charge as University Librarian with effect from 15.5.2000.

Mandate of the Institution/Station/Unit

To provide Library and Information support for Education, Research and Extension programmes of the University.

Faculty Improvement programme

ICAR sanctioned NATP Sub Project on Lib. Information System under O&M component with a budget provision of Rs. 95 lakhs for the report period

Extension and other activities

Central Library offers services like Reference service, Books circulation service, Compilation of Bibliographics, Database service using CD ROMs, Online search, Documentations, User education programmes, Internet service, Multimedia and Audiovisual services.

Board of Apprenticeship training, Govt. of India has approved Central Library as an Institution for providing one year Apprenticeship training in Library and Information Science. Three apprentices are being trained at this Library in every year. Central Library also offers Technical and Project advices on Library Automation, Information technology application and other aspects of Library Management to various Educational institutions.

Other details, if any

Under the present NATP Project, we have successfully completed the digitization of catalogue of all documents in Central Library and most of the College Libraries. The main works undertaken in digitization project were classification of documents, coding sheet preparation, database creation, bar coding, Ph.D thesis abstracts digitization, bar coded membership card preparation and training.

Finance

Head of account	Provision for the year (Rs. in lakhs)	Expenditure (Rs. in lakhs)	Station Receipts (Rs. in lakhs)
Plan	32.940	26.66	0.79
ICAR- NATP	95.000	93.47	-

CHAPTER VI

DIRECTORATE OF STUDENTS WELFARE

Mandate of the Institution

The main objective of this Directorate is to provide welfare measures to students and monitor the same especially the sports and games, cultural activities, NCC activities and supervision of the Employment and Guidance Bureau.

University supports the NCC programme to instill discipline, sense of patriotism and social commitment among the students. Our cadets are actively participating in social service, adult education programme and campus cleaning. In addition, there is an Employment Information system and placement counselling to our Graduates.

Academic Programmes

Necessary support is extended to impart instruction in the Physical Education courses in the College of Co-operation, Banking & Management.

Other activities

The Students Union activities, Sports & Games programmes, Management of the transport system in the Vellanikkara and Mannuthy campuses, I(K)R&V NCC Sqn., Employment Information & Guidance Bureau are monitored by this Directorate.

Students Union activities

KAU Union 2002-2003 conducted the Inter-collegiate Arts Festival "Kavya 2003" in a befitting manner from 27th to 30th April 2003 at Central Auditorium, Vellanikkara and the valedictory function of KAU Union 2002-03 was held on December 15th, 2003.

The office bearers of the Kerala Agril.University Union 2003-04 have been elected and the inauguration of the KAU Union 2003-04 was conducted on 6-1-2004.

Sports & Games

(a) All India Inter Agricultural University Sports & Games Meet.

KAU team participated in the All India Inter Agril.University Sports & Games meet at UAS, Bangalore from 25th March 2004 to 28th March 2004.

(b) Inter University Tournaments of Association of Indian Universities

KAU Football team participated in the All India Inter University South Zone tournament held at Annamalai University on 18th November 2003.

KAU Table Tennis Women team participated in the All India Inter University South Zone Table Tennis tournament held at Anna University Chennai from 6 to 9 December 2003 and won 2nd position.

KAU Table Tennis Women team also participated in the All India Inter University Interzone Table Tennis tournament held at Jiwaji University Gwalior from 21 to 24 December 2003.

(c) Inter Collegiate Programme

KAU conducted the Inter Collegiate Athletic meet on 25 to 26 April 2003 at Vety. College ground, Mannuthy and Inter Collegiate Men & Women Table Tennis tournament and shuttle Badminton tournament at KCAE&T, Tavanur on 27 and 28 August 2003.

Also the KAU Inter Collegiate Basket ball and Volley ball tournament was held at Vety. College ground, Mannuthy on 19 to 21 September 2003 and KAU Inter Collegiate Football tournament was conducted at College of Vety. & Animal Sciences, ground Mannuthy from 6 to 8 November 2003.

KAU conducted the Inter Collegiate Cricket tournament at Vety. College ground from 1 to 4 December 2003.

Employment Information & Guidance Bureau

During the period 2003-04 the Employment Information & Guidance Bureau, Mannuthy provided information regarding employment opportunities and different courses being conducted at various Universities within India and abroad through News Bulletin. Large number of students and parents contacted the bureau directly and also through letters for getting the information.

Also Employment Information & Guidance Bureau, Mannuthy conducted career seminar in various colleges of KAU as well as in other colleges in Thrissur District.

NCC Unit-I(K)R&V Squadron NCC, Mannuthy

NCC is a triservice premier youth organization including Army, Navy and Air Force, R&V Squadron is a part of Army Wing. This technical squadron is one among the ten such units in selected Veterinary colleges in India with emphasis on training in adventurous equestrian activities. Besides, the basic military training and horse riding, the cadets are trained in various equestrian sports like show jumping, tent pegging, cross country and trucking the horseback. The cadets are trained in equine managerial

aspects like feeding, grooming, farriery, harness maintenance, transportation of horses, veterinary care, meat inspection, etc.

In the current training year out of the total 200 cadets, 119 were from the College of Veterinary & Animal Sciences, 43 from College of Forestry, 11 from College of Horticulture and 27 from the College of Co-operation, Banking & Management, Vellanikkara. The Commanding Officer Maj. Sanjay Malik was transferred and Maj. B.S.Nara took over charge in June 2003. In four different Combined Annual Training camps, 60 cadets participated. 95 cadets took part in the firing practice. 10 cadets attended the Anti-rabies Vaccination campaign conducted at the Veterinary Polyclinic, Ottappalam in collaboration with the State Animal Husbandry Dept. Anti corruption week was observed and rally was conducted with the mounted troop in Mannuthy on Nov, 2003. Trekking on foot to Vellanippacha Hills of Pattikkad Forest Range in which 20 boys and 10 girls participated. Six cadets attended the guard of Honour and Horse show at the Southern Naval Command at Kochi. On 26th January 2004, 60 Cadets and the mounted column joined with the Mannuthy Poursamithy to celebrate the Republic Day and won trophy for March past.

In the Republic Day Camp 2004 at New Delhi, 6 cadets, viz., UO.Raimon Mathew, Cpl.Vinod Panavlla, Cpl.Prince C.Kurien, Cpl.Rony Sunny, UO Roon Mariam Mathai and Cpl.Athulya, M, Participated and bagged 4 silver medals. Sgt.Sonika. S won the Best Cadet Cash Award of Rs.3,000/-at Group Level and Sgt. Ani Anna Elias won the Cadet Welfare Society Cash Award of Rs. 4,000/-. 24 Cadets passed the 'B' Certificate and 20, the 'C' Certificate Examinations.

National Day Celebrations

The Independence Day 2003 and Republic Day 2004 celebrations were conducted at the University Headquarters by this Directorate on 15th August 2003 and 26th January 2004 respectively.

CHAPTER VII

DIRECTORATE OF PHYSICAL PLANT

During the report period Sri. P.R.Govindan, Executive Engineer, Engineering division, Panangad was holding full additional charge of the post of the Director of Physical plant.

Sri. K.Chandramohanan continued as Financial Assistant during the period under report Smt.K V Ajitha, also continued as Personal Assistant to Director of physical plant

Expenditure.

A total of Rs. 550.000 lakhs was expended towards Civil/Electrical works taken up during the report period inclusive of part and final payments.

Engineering Sub Division, Mannuthy

Sl.No.	Details of work	Agt. PAC	Stage of work
1	Closing the damaged portion of the existing compound wall at Western side of Vety. College, Mannuthy	62,370/-	Work completed
2	Special repairs to the KAU Co-op.Society building at Mannuthy	61,997/-	Work completed
3	Urgent leak proofing and allied works to the sump at Main Pump House, Mannuthy	1,83,434/-	Work completed
4	Urgent repairs and maintenance of Class IV quarters at UVH- Kokkalai	20,094/-	Work completed
5	Urgent repairs to Poultry Shed No.4 at KAU Mannuthy	66,436/-	Work completed
6	Urgent repairs of A6 quarters at Mannuthy	18,521/-	Work completed
7	Urgent repairs and maintenance of wooden platform in Goat Shed at Goat & Sheep Farm, Mannuthy	1,51,279/-	Work completed
8	Urgent repair works of the compound wall in front of ATIC building at Mannuthy	65,818/-	Work completed
9	Construction of approach road and improvements to the existing road at ATIC-ABARD Complex at Mannuthy	2,16,243/-	Work completed

10	Urgent repairs of UG Men's Hostel (Main) at KAU, Mannuthy, Providing fibre glass sheet at roof after removing the existing damaged sheet and damaged water supply fittings for 5 blocks	5,26,116/-	Work completed
11	Black topping to the roads at Vety. College Campus, Mannuthy	7,36,418/-	Work in progress
12	Maintenance of calving shed No.5 at ULF, Mannuthy	2,70,928/-	Work completed
13	Renovation to the laboratory shelves in the Dairy Science Department at College of Vety. & AS, Mannuthy	1,14,469/-	Work completed
14	Inauguration of ATIC building – Urgent maintenance work of CTI, Press building and compound wall of Vety. College, Mannuthy	1,04,399/-	Work completed
15	Centenary celebration of University Veterinary Hospital, Kokkalai – Urgent maintenance and repairs of buildings, compound wall, existing road etc.	2,43,637/-	Work completed
16	Remodelling and converting the existing rooms to the Genetics Department to Radio Tracer Lab	98,509/-	Bill submitted
17	Maintenance to the water supply system – replacing damaged 40HP, 4" G.I. line with PVC pipes at Mannuthy	99,592/-	Bill submitted
18	Modification to the Shed No.7 at ULF, Mannuthy (Balance work)	1,07,136/-	Work completed
19	Maintenance and repairs of Ladies Hostel (Priyadarshini) at KAU, Mannuthy – Construction of leach pit	64,002/-	Bill submitted

Engineering Sub Division,, Vellanikkara

Sl.No.	Details of work	Agt. PAC	Stage of work
1	Providing separate toilet facilities for Gents and Ladies at COH, Vellanikkara	1,61,957/-	Work completed
2	Construction of a lab room for (NATP-Medicinal Plants) at COH, Vellanikkara	1,18,648/-	Work completed
3	Remodelling of the Reading room for Bio-diversity museum at the College of Forestry, Vellanikkara	1,15,351/-	Work completed
4	Urgent repairs to the Crèche Building at Main Campus, Vellanikkara	62,427/-	Work completed

5	Maintenance to the Canteen building at Main Campus, Vellanikkara	60,659/-	Work completed
6	Construction of a culvert near Estate Office at Main Campus, Vellanikkara	43,895/-	Work completed
7	Providing Examination Hall in the 3 rd floor of Acad. Block No. III at COH, Vellanikkara	7,16,403/-	Work completed
8	Providing staircase and G.I. sheet roofing to the existing High School building of KAU School	5,22,885/-	Work in progress
9	Maintenance to the ceiling of Estate Office building at main Campus, Vellanikkara	22,157/-	Work completed
10	Providing G.I. sheet roofing to the (balance portion) of Acad. Block No. III at Main Campus, Vellanikkara	6,56,926/-	Work started
11	Urgent replacement to the water supply lines to the quarters at ARS Chalakudy	15,794/-	Work completed
12	Urgent replacement of damaged water supply lines to various quarters and cattle sheds at CBF, Thumburmuzhi	1,17,020/-	Work started
13	Urgent replacement of damaged water supply lines to various quarters and cattle sheds at CBF at Thumburmuzhi	1,17,020/-	Work started

Engineering Sub Division,, Pookot

1	Construction of Acad. Block No. II at College of Vety. & AS, Pookot	1,90,65,436/-	Work under termination
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Electrical works

Sl.No.	Details of work	Agt. PAC	Stage of work
1	Installation of TOD meter and availing electrical works including standardization of existing electrical installations and providing power capacitors in CDST Campus, Kolahalamedu	7,70,849/-	Work completed
2	Maintenance and repairs to KAU Co-op. Society building, Mannuthy – Rewiring to the existing installations and providing additional facilities	22,652/-	Work completed
3	Providing power plugs and power distribution arrangements in the lab, Dept. of Plant Breeding & Genetics, COA, Vellayani	56,524/-	Work completed
4	COF, Vellanikkara – Remodelling of the Reading room as original Bio-diversity lab/museum – electrification works	42,771/-	Work completed
5	Maintenance and repairs to the street lights from Main Gate to Administrative building at KAU Main Campus, Vellanikkara	94,942/-	Work completed

6	Providing electrification to Acad. Block No.I, College of Vety. & AS, Pookot	25,28,022/-	Nearing completion
7	Construction of type I quarters (2 Nos.) and type II quarters (6 Nos.) at College of Vety. & AS, Pookot	2,49,454/-	Work completed
8	Annual maintenance of 160 KVA DG set at Central Auditorium, KAU Main Campus, Vellanikkara	7,560/-	Work completed
9	Maintenance of Acad. Block No.I – Annual maintenance of contract for 2 Nos., 40 KVA, DG set	21,600/-	Work completed
10	Providing electrification to type III quarters (Flat type) at College of Vety. & As, Pookot	1,50,665/-	Work in progress
11	Providing electrification to cattle sheds (5nos.) including yard at College of Vety. & AS, Pookot	2,22,183/-	Work in progress
12	Implementation of Local Area Net works at KAU Headquarters – Providing common UPS system	1,25,014/-	Work in progress

Mandate

The Directorate of Physical Plant headed by the Director of Physical Plant is a Statutory Department of the University under KAU Act (Act 33 of 1971). The Director of Physical Plant is the general custodian of all the properties of the University. All construction works and maintenance of buildings and other infrastructural works is under the supervision and control of the Directorate of Physical Plant.

501-50-0055

120	815605
130	2897999
152	30834
300	74248
Total salaries	3818686
CONTINGENCIES	
222	38600
332	94668
821	23345
840	2985
Total	159598
Total expenditure	3818686 + 159598
	3978284

ENGINEERING DIVISION, PANANGAD

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	25,92,900	21,82,212	1,74,939

ENGINEERING DIVISION, TAVANUR

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	19,61,000	15,80,409	1,39,325
Plan (works)	50,30,000	19,56,000	-
Non Plan (Works)	2,00,000	-	-
Other EAPs (works)	13,95,000	12,19,900	-

ENGINEERING SUB DIVISION, VELLANIKKARA

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	22,63,000	17,33,479	3,304

ENGINEERING SUB DIVISION, VELLAYANI

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	15,50,000	13,09,152	-

ENGINEERING SUB DIVISION, MANNUTHY

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	26,89,500	25,62,901	10,722

ENGINEERING SUB DIVISION, POOKODE

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	7,56,500	7,22,238	-

ENGINEERING SUB DIVISION, KOLAHALAMEDU

Head of account	Provision for the year	Expenditure	Station receipts
Plan	5,90,000	5,32,315	1,942

ELECTRICAL SUB DIVISION, VELLANIKKARA

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	17,59,000	14,48,263	-

ELECTRICAL SUB DIVISION, VELLAYANI

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	9,50,000	7,40,000	250

MECHANICAL SUB DIVISION, VELLANIKKARA

Head of account	Provision for the year	Expenditure	Station receipts
Non Plan	23,05,000	17,10,120	5,100

CHAPTER VIII

KAU ESTATE

Introduction

The present tapping area is 30 ha. only with 12,000 tapping trees. Overmatured Rubber Trees near the College of Forestry and college of Horticulture (near central orchard) were cut and sold for Rs. 9,10,301 and the area allotted for the research programmes of the concerned colleges, 13,175 kg rubber was produced and 28,520 kg (DRC) latex were produced during the year valued Rs. 20,62,866. Since the Rubber Factory is not in working condition now, the field latex is disposed off through RPS.

Mandate of the unit

Instructional purposes of students of COH.

Details of Rubber produced and sold

Items	Quantity	Rate and amount received
PLC - I	2,650 kg	@ Rs. 61.69 Rs. 1,63,478.00
PLC - II	2,650 kg	@ Rs. 60.69 Rs. 1,57,794.00
PLC - III	300 kg	@ Rs. 58.69 Rs. 17,607.00
EBC	750 kg	@ Rs. 42.69 Rs. 32,019.00
Shell Blanket	750 kg	@ Rs. 37.69 Rs. 28,267.00
Cup lump	4,375 kg	@ Rs. 33.00 Rs. 1,42,725.00
Scrap	1,800 kg	@ Rs. 35.19 Rs. 63,342.00
Field Latex	28,520 kg	@ Rs. Rs. 14,57,634.00
Total		Rs. 20,62,866.00

Finance

Head of Account	Provision for the year (lakhs)	Expenditure (Rs)	Station receipts(Rs.)
Nonplan	Rs.25,964	Rs. 25,88,556	Sale of Rubber - Rs.20,62,866.00 Overmatured sale of Rubber trees - Rs. 9,10,301.00 Other Receipts - Rs. 40,452.00
			Total - Rs.30.13.619.45

PLANT PROPAGATION AND NURSERY MANAGEMENT UNIT, VELLANIKKARA

Introduction

The office of Campus Development was opened in the year 1990 with an objective of creating a beautiful landscape for the main campus of KAU by a harmonious combination of buildings, roads and crop fields. Development of a cropping plan and irrigation system for the whole campus is also under its purview. The station is now undertaking bulk production and sale of planting materials.

Mandate of the unit

Large-scale production of planting materials of horticulture and agriculture crops including vegetable seeds and general development and beautification of the Vellanikkara campus.

Research programme

Project on "Sustainable management of proven technology on control of insect pests and diseases in coconut" and "Establishment of demonstration-cum-seed production technology" funded by Coconut Development Board.

Extension and other activities

Technical advise is being given to the farmers visiting the station. Scientists are participating in the Agricultural Seminars, offering PG & UG courses to BSc. (Ag) & Forestry Students and guiding PG students.

Dr. K.E. Usha participated in a phone in programme conducted by the All India Radio on 23rd February 2004 regarding the nursery techniques.

Production & Distribution of Quality planting materials

Items	Number / quantity produced	Number / quantity distributed
a. Planting Materials (no.)	322158	247941
b. Vegetable seedsNo.)	3387	3217

Finance 2003-2004

Head of Account	Provision for the year	Expenditure (Rs)	Station receipts
Plan	66.580	63.31	0.15
Other EAPs	14.925	14.33	-
Revolving Fund	-	49.26	51.43

CHAPTER IX

FINANCE AND ACCOUNTS

Smt. P. Chandramathi Amma, Joint Secretary to Government of Kerala continued as the Comptroller of Kerala Agricultural University in the reporting financial year. Three audit circles viz., Northern, Central and Southern Zones headed by Assistant/Deputy Comptrollers also functioned during the period

Budget Estimate

The University formulated a Budget Estimate for 2003-2004 showing 13278.47 lakhs as receipts, 14627.576 as expenditure in anticipation of grant-in-aid of 8014 lakhs (Rs. 5914 lakhs under Non-Plan and Rs. 2100 lakhs under Plan) from the State Government, ICAR assistance of Rs. 958.884 lakhs Rs. 475 lakhs towards the UGC package 01-01-1996 (20% State Share) from the State Government Rs. 100.769 lakhs from Other External Aided Projects, Rs. 769.9 lakhs from Internal Resources, Rs. 500 lakhs from institutional funding. Though, the budget was formulated with the expectation of Rs. 8489 lakhs as grant-in-aid from the State Government, Government released Rs. 6300 lakhs only (Rs. 4400 lakhs under Non-Plan and Rs. 1900 lakhs under Plan).

The details of Receipt and Expenditure for 2003-2004 are as follows: (The figures are subject to change on finalisation of accounts)

Receipts

Item	Amount (Rs. in lakhs)
Grant-in-aid from Government (Plan)	1900.000
Grant-in-aid from Government (Non-Plan)	4400.000
ICAR	729.366
NATP	358.110
Other Agencies	305.157
Other Miscellaneous Receipts	41.519
Internal Receipts	650.084
Total	8384.236

Expenditure as per Revised Estimate

Item	Amount (Rs. in lakhs)
Non Plan (Including Pension)	7096.347
Plan	2152.414
ICAR	1025.051
Other Agencies	413.177
Total	10686.989

INTERNAL AUDIT CIRCLE (SR), VELLAYANI

Finance

Head of Account	Provision for the year (lakhs)	Expenditure (lakhs)	Station receipts(Rs.)
Non-Plan	18.39	17.26	-

INTERNAL AUDIT CIRCLE (NR), VELLIMADUKUNNU

Finance

Head of Account	Provision for the year (lakh)	Expenditure (lakhs)	Station receipts(Rs.)
Non-Plan	20.52	19.16	-

APPENDIX - I

LIST OF GENERAL COUNCIL MEMBERS

Ex-officio members

The Chancellor

The Pro-chancellor.

The Vice-Chancellor,
Kerala Agricultural University,
Vellanikkara, Thrissur.

The Agricultural Production
Commissioner,
Government Secretariat,
Thiruvananthapuram.

The Secretary to Government,
Department of Agriculture,
Government Secretariat,
Thiruvananthapuram.

The Secretary to Government,
Department of Finance,
(Expenditure)
Government Secretariat,
Thiruvananthapuram.

The Secretary to Government,
Department of Fisheries,
Government Secretariat,
Thiruvananthapuram.

The Secretary to Government,
Department of Animal Husbandry,
Government Secretariat,
Thiruvananthapuram.

The Director of Agriculture,
Thiruvananthapuram.

The Director of Animal Husbandry,
Thiruvananthapuram.

The Director of Dairy Development,
Thiruvananthapuram.

The Director of Fisheries,
Thiruvananthapuram.

The Principal Chief Conservator of Forests,
Thiruvananthapuram.

The Chairman,
Rubber Board,
Kottayam – 686 002.

The Chairman,
Spices board, Sugandha Bhavan,
NH By Pass, PB No. 2277,
Palarivattom (P.O.) Kochi – 682 025.

The Chairman,
Marine Products Export Development
Authority,
Panampilly Nagar,
Kochi.

The Director,
CPCRI,
Kasargod – 671 124.

The Director,
KFRI, Peechi,
Thrissur – 680 653.

Dr.B.S. Bisht,
ADG (HRD – I)
ICAR, KAB – II,
Pusa, New Delhi – 110 012.

Shri. P.P. George MLA.,
Pulikkal House, Zion Road,
(P.O.) Pudukkad, Thrissur

(The MLA representing the constituency in
which the Headquarters of the University is
situated)

ELECTED MEMBERS

(Four members of the Legislative Assembly of whom one shall be a member belonging to a SC/ST)

Shri. A. K. Balan, MLA,
"Janani".

Parakkunnam, P.O.
Palakkad - 678 001.

Shri. T.H. Musthafa MLA,
Bismillah Manzil,
Thottathil Kottappurath,
Marampally, P.O.,
Ernakulam - 683 107.

Shri. Umesh Challiyil MLA,
Challiyil Veedu,
Kodungallur, P.O.
Thissur - 680 664.

Shri. A.P. Anilkumar, MLA,
Akkarappurackal House,
Downhill,
Malappuram - 676 519.

(One member elected by the Deans of Faculties of the University)

Vacant

Four members from the Constituency of Teachers of the University

Dr. C.M. Aravindakshan,
Associate Professor,
College of Vety. & Animal Sciences,
Mannuthy.

Dr. Jose Joseph,
Assistant Professor,
Communication Centre,
Mannuthy.

Dr. Kaleel F.M.H.,
Associate Professor,
College of Horticulture,
Vellanikkara.

Shri. P. Sudheer Babu,
Assistant Professor,
College of Vety. & Animal Sciences,
Mannuthy.

Shri. Muhammed Aslam (98-03-90),
College of Vety. & Animal Sciences,
Pookot (Mannuthy).

Kum. Shyma, V.H. (2000-03-254),
College of Vety & Animal Sciences,
Pookot (Mannuthy).

(Two members from the Constituency of Non-Teaching Staff of the University)

Shri. P. Sreejith,
Section Officer,
KAU Headquarters, Vellanikkara.

Shri. S. Sudhakaran Nair,
Section Officer,
Directorate of Students Welfare,
Mannuthy.

(Two members from the Constituency of Permanent Labourers of the University)

Shri. N.V. Chandran,
Permanent Labourers,
College of Horticulture,
Vellanikkara.

Shri. P. Sethumadhavan,
Permanent Labourer,
Livestock Farm, Fodder Research &
Development, Mannuthy.

MEMBERS NOMINATED BY THE CHANCELLOR

(Four eminent Scientists in the field of Agriculture and allied subjects from the concerned University or from outside)

Dr. Ananthakrishnan, T.N.,
Fellow, National Academy of Agricultural Sciences,
Flat 6, No.22, Kamdar Nagar,
Nungambakkam,
Chennai - 600 034.

Dr. Udaya Kumar M.,
Fellow, National Academy of Agricultural
Sciences,
Professor, Department of Crops Physiology,
University of Agricultural Sciences,
GKVK Campus,
Bangalore – 560 065,
Karnataka.

Dr. M.K.Sheela,
Assoc. Professor (Entomology),
Communication Centre,
Kerala Agrl. University, Mannuthy,

Dr. S.P.Suresan Nair,
Professor & Head, Dept of Animal
Husbandry, College of Agriculture,
Vellayani, Thiruvananthapuram – 695 522

(Four farmers of whom one shall be a
member belonging to a scheduled Caste or
Schedules Tribe and one shall be a woman)

Smt. V.L.Lalitha,
C/o.Gourishankar,
Lakshmi Nivas,
HPO College Road, Palakkad – 678 001

Smt. Ambika Ramesh,
Vaishnaveeyam,
Paropady,
Malaparambu PO., Kozhikode.

Shri. Thomas.T.V.
Vettath House,
P.O. Vettilapara,
Malappuram District.

Advocate Vellavoor Sukumam,
Peerumedu, Idukki Dt.

(One member from the Association of
Planters Kerala)

Sri. N.Dharmaraj,
Vice-President,
Harrison Malayalam Ltd.,
Wellington Island, Kochi 682 003

(Two Presidents of the Grama Panchayat)

Prof. K.P.Mukundan,
President,
Avanoor Grama Panchayth,
Avanoor PO., Thrissur

Adv. C.S.Vidyasagar, (Upto 15.3.2004)
President,
Vithura Grama Panchayat,
“Aiswarya”. Chennanpara,
Vithura PO., Thiruvananthapuram.

OTHER NMEMBERS

(Three members to represent the University
of Calicut, cochin and Kerala, elected by the
Senates of the respective Universitees)

University of Calicut

Adv. K.V.Mani,
Kalluvelil house,
Mannarkad PO., Palakkad

Cochin University of Science & Technology

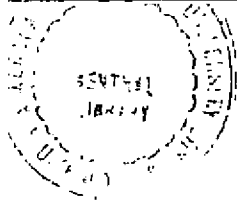
Sri. K. Mohanachandran,
Assistant Librarian,
Cochin University Library,
Cochin University PO., Kochi – 682 022

University of Kerala

Sri. A. Thrivikraman Thampi,
Ampadiuyil,
Puthiyidom, Kayamkulam, Alappuzha

(Four meetings of the General Council
were held during the report period)





MEMBERS OF THE EXECUTIVE COMMITTEE

- I. Ex-Officio Members
 1. The Vice-Chancellor, K A U, Vellanikkara
 2. The Agricultural Production Commissioner, Govt. of Kerala, Thiruvananthapuram
 3. The Secretary to Government, Dept. of Finance (Expenditure), Govt. of Kerala, Thiruvananthapuram
- II. The Member representing the ICAR
 4. Dr. B.S. Bisht, ADG (HRD I), ICAR, Pusa, New Delhi
- III. Dean of Faculties
 5. Vacant
- IV. One elected teacher
 6. Dr. Kaleel F.M.H. Assoc. Professor, College of Horticulture, Vellanikkara
- V. Non Official Members
 - a. General
 7. Adv. C.S. Vidya Sagar, (upto 15.3.2004), President, Vithura Grama Panchayat, Vithura P.O., Thiruvananthapuram.
 8. Prof. K.P. Mukundan, President, Avanoor Grama Panchayat, Avanoor P.O., Thrissur.
 9. Sri. Umesh Challiyil MLA Challiyil Veedu, Kodungalloor P.O., Thrissur.

- b. SC/ST Reservation
 10. Sri.A.P. Anilkumar, MLA Akkarappurackal House, Down Hill, Malappuram.
- c. Women Reservation
 11. Dr.M.K. Sheela, Assoc. Professor, Communication Centre, K A U, Mannuthy
- VI The MLA representing the constituency in which the Headquarters of the University is situated.
 12. Sri.P.P. George MLA Pulikkal House, Zion Road, Pudukkad P.O., Thrissur (Fifteen meetings of the Executive Committee were held during the report period)

SUB COMMITTEES OF EXECUTIVE COMMITTEE

I. Finance Committee

1. Vice Chancellor - Chairman
2. Finance Secretary - Member
3. Agrl. Prodn, Commissioner - Member
4. Adv. C.S.Vidyasagar - Member
5. Comptroller - Convenor

(Two meetings of the Committee were held during the report period)

II. Planning and Development Committee.

1. Prof. K.P.Mukundan - Chairman
2. Sri. P.P.George, MLA - Member
3. Sri. Umesh Challiyil, MLA - Member
4. Dr. F.M.H.Kaleel - Member
5. Director of Extension - Convenor

List of Members of Academic Council of KAU Executive Officer
Members.

1. The Vice-Chancellor, Kerala Agricultural University, Vellanikkara –
Chairman
2. The Registrar, Kerala Agricultural University, Vellanikkara – Members
3. The Dean, College of Agriculture, Vellayani – Members
4. The Dean, College of Vety. & AS, Mannuthy – Members
5. The Dean, College of Fisheries, Panangad - ”
6. The Dean, KCAE&T, Tavanur – ”
7. The Director of Research, Kerala Agricultural University, Vellanikkara –
8. The Director of Extension, Kerala Agricultural University, Mannuthy-‘
9. The Director of Students Welfare, Kerala Agricultural University,
Mannuthy-‘
10. The Librarian, Kerala Agricultural University, Vellanikkara-‘
11. The Director of Agriculture, Thiruvananthapuram
12. The Director of Animal Husbandry, Trivandrum

Co-opted Members

1. The Associate Dean, College of Agriculture, Padannakkad – Member
2. The Associate Dean, College of Horticulture, Vellanikkara– Member
3. The Associate Dean, College of Forestry, Vellanikkara– Member
4. The Associate Dean, College of Co-operation, Banking & Mgt,
Vellanikkara - Member
5. The Associate Dean, College of Dairy Science & Technology, Mannuthy-
Member
6. The Associate Dean, College of Vety. & Animal Sciences, Pookot.
7. The Director (Acad & PG Studies) Kerala Agricultural University,
Vellanikkara- Member

ELECTED MEMBERS

PG Students

1. Sri.K.P. Suresh (2001-11-25) CoH, Vellanikkara – Member
2. Sri.Renjith (2001-13-24)CV&AS, Mannuthy-Member

Research Student

1. Sri.Allan Thomas (2000-21-23) COH,Vellanikkara-Member

Faculty of Agriculture

1. Dr.T.E. George, Associate Professor,Department of Olriculture,CoH,Vellanikkara-Member

Faculty of Veterinary & Animal Sciences

1. Dr.Aravinda Gosh, Associate Professor,UVH,Kokkala – Member

Faculty of Fisheries

1. Dr.C.G. Rajendran,Associate Professor, RRS,Vyttila.

Faculty of Agricultural Engineering & Technology

1. Sri. Jippu Jacob, Associate Professor, KCAET, Tavanur

III. Research Review Committee.

1. Vice Chancellor - Chairman
2. Prof. K.P.Mukundan - Member
3. Adv. C.S.Vidyasagar - Member
4. Dr. M.K.Sheela - Member
5. Director of Research - Convenor

IV. Establishment Committee

1. Sri. P.P.George, MLA - Chairman
2. Umesh Challiyil, MLA - Member
3. Sri.A.P.Anilkumar, MLA - Member
4. Adv. C.S.Vidyasagar - Member
5. Prof. K.P.Mukundan - Member
6. Dr. F.M.H.Kaleel - Member
7. Dr. M.K.Sheela - Member
8. Registrar - Convenor

(Five meetings of the Committee were held during the report period)

V.Students Welfare Committee.

1. Sri. A.P.Anilkumar, MLA - Chairman
2. Sri. P.P.George, MLA - Member
3. Adv. C.S.Vidyasagar - Member
4. Dr. M.K.Sheela - Member
5. Dir. of Students Welfare - Convenor

VI. Works Committee

1. Sri.Umesh Challiyil MLA - Chairman
2. Sri.P.P.George, MLA - Member
3. Sri.A.P.Anilkumar, MLA - Member
4. Dr. F.M.H.Kaleel - Member
5. Director of Physical Plant - Convenor

(Six meetings of the Committee were held during the report period)

VII Legal Monitoring Committee

1. Adv. C.S. Vidyasagar - Chairman
2. Sri.P.P.George, MLA - Member
3. Dr. F.M.H.Kaleel - Member
4. Dr. M.K.Sheela - Member
5. Prof. K.P.Mukundan - Member
6. Registrar - Convenor

(One meeting of the Committee was held during the report period)

SUB COMMITTEES OF GENERAL COUNCIL

I. Statute Sub Committee

1. Adv. Vellavoor Sukumaran - Chairman.
2. Dr. Jose Joseph - Member
3. Dr. C.M. Aravindakshan - Member
4. Sri. P. Sudheer Babu - Member
5. Sri. S. Sudhakaran Nair - Member
6. Dr. S.P. Suresan Nair - Member
7. Sri. P. Sreejith - Member
8. Sri.A. Thrivikraman Thampi - Member
9. The Registrar - Convenor

(Six meetings of the Committee were held during the report period)

II.Accounts Committee

1. Sri.A. Thrivikraman Thampi - Chairman
2. Sri. A.K. Balan MLA - Member
3. Sri. S. Sudhakaran Nair - Member
4. Sri. T.V. Thomas - Member
5. Dr. Jose Joseph - Member
6. Sri. N.V. Chandran - Member
7. Sri. Mohammed Aslam - Member
8. Smt. V.L. Lalitha - Member
9. The Comptroller - Convenor

(Fourteen meetings of the Committee were held during the report period)

III. Assurance Committee

1. Smt. Ambika Ramesh - Chairperson
2. Sri. P. Sethumadhavan - Member
3. Sri. K. Mohanachandran - Member
4. Sri. K.V. Mani - Member
5. Kumari. V.H. Shyma - Member
6. Dr. C.M. Aravindakshan - Member
7. Sri. N. Dharmaraj - Member
8. Dr. Jose Joseph - Member
9. The Registrar - Convenor

(Six meetings of the Committee were held during the report period)

APPENDIX – II

**LIST OF STAFF AT KERALA AGRICULTURAL UNIVERSITY
HEADQUARTERS AT VELLANIKKARA**

Designation	Name of the incumbent	Remarks
Vice-Chancellor	Prof. K.V. Peter	
Registrar	Sri. O.P.Kaler,I.F.S	
Comptroller	Smt.P.ChandramathiAmma	
Director of Extension	Dr.A.I. Jose	
Director of Research	Dr.R. Vikraman Nair i/c	1.4.2003 to 17.9.2003, 20.10.2003 to 13.2.2004
	Dr.C.Sundaresan Nair i/c	18.9.2003 to 19.10.2003
	Dr.C.K.Peethambaran i/c	14.2.2004 to 31.3.2004
Dir. of Physical Plant	Sri.P.R. Govindan i/c.	
Dir. of Students Welfare	Dr.J. Abraham i/c.	1.4.2003 to 7.5.2003
	Sri.O.K.Paul i/c	8.5.2003 to 31.3.2004
Deputy Director of Students Welfare	Sri.O.K. Paul i/c.	
Director (Acad & P.G. Studies)	Dr.M.Achuthan Nair	1.4.2003 to10.4.2003 16.5.2003 to 6.9.2003
	Dr.P.A.Wahid	11.4.2003 to 15.5.2003
	Dr.K.Pushkaran	7.9.2003 to 31.3.2004
University Librarian	Smt.M.C.Lalitha i/c. (Asst. Librarian)	
Assoc. Director of Research (V & AS)	Dr.R. Vikraman Nair i/c.	1.4.2003 to 8.2.2004
	Dr.K.V.Athman i/c	9.2.2004 to 31.3.2004
Assoc. Director of Research (Planning)	Dr.R. Vikraman Nair.	1.4.2003 to 13.2.2004
Assoc. Director of Research (AR & T)	Dr. Sundaresan Nair	1.4.2003 to 11.12.2003
	Dr. R.Vikraman Nair i/c	12.12.2003 to 5.2.2004
	Dr.C.K. Peethambaran i/c.	6.2.2004 to 31.3.2004
Assoc. Director of Research (Farms)	Dr.R. Vikraman Nair	1.4.2003 to 2.2.2004
	Dr.M.Achuthan Nair i/c	3.2.2004 to 31.3.2004
Assoc. Director of Research (M & E)	Dr. R. Vikraman Nair i/c.	1.4.2003 to 13.2.2004
Assoc. Professor (Agronomy) Directorate of Research	Dr. K.P. Prameela	

LIST OF STAFF AT K A U HEADQUARTERS.
LIST OF DEPUTY REGISTRAR/DEPUTY COMPTROLLER/ASSISTANT
COMPTROLLER/ASSISTANT REGISTRAR/ADMINISTRATIVE OFFICER
GR.II/RECRUITMENT OFFICER/LABOUR OFFICER/PUBLIC RELATIONS OFFICER

Designation	No. of Posts				
	Sancti- oned	In position	Name of the incumbent	Vacant	Remarks
Deputy Registrar (Acad)			Smt. S. Vanaja		9.4.03 to 31.3.04
Deputy Registrar (AdmnI)			Sri.K.K. Subramanian		4.03 to 3.04
Deputy Registrar (Admn II)			Sri.K.A. Mohammed		6.5.03 to 31.3.04
Asst. Registrar Admn I			Sri. K.N. Pushpangathan		12.5.03 to 31.3.04
Asst. Registrar Admn II			Sri. K.R. Dileepkumar		25.4.03 to 31.3.04
Labour Officer			Sri.P.M. Cherukutty		7.5.03
Recruitment Officer			Sri.C. Arumughan		1.4.03 to 4.3.04
			Smt. A.D.Omana		6.3.04 to 31.3.04
Asst. Comptroller (P&L)			Sri.K. S. Natarajan		11.6.03 to 31.3.04
Asst. Comptroller IAC (CR)			Smt. P.V. Nalini		4.03 to 3.04
Asst. Comptroller (DD&A)			Smt. T. Remadevi		"
Deputy Comptroller I			Sri.M.N. Sasidharan		"
Deputy Comptroller II			Sri.K.I. Chakunny		5.9.03 to 31.3.04
Admn. Officer Gr.II Directorate of Research			Sri. P.M. Balakrishnan		22.1.03 to 31.3.04
P R O			Sri.V. Viswambharan		Deputy Cadre from 22.1.04

LIST OF SECTION OFFICERS

Designation	No. of Posts				
	Sancti- oned	In position	Name of the incumbent	Vacant	Remarks
Section Officer			Smt. K.P. Saramma		1.4.03 to 31.3.04
"			Smt. P.E. Haleema Beevi		
"			Smt. M. Jaseentha		
"			Sri.K.S. Paul		27.5.03 to 31.3.04
"			Sri.V.S. Skandakumar		1.4.03 to 31.3.04
"			Smt. A. Subhalakshmi Ammal		
"			Smt. Shirly Mathew		
"			Smt. Usha Rani		
"			Smt. V. Chellamma		
"			Sri.M.E. Rajan		24.4.03 to 31.3.04
"			Sri.K.R. Suresh		4.03 to 3.04

"			Sri.K. Dinesan		
"			Sri.P.V. Sreekumaran		
"			Sri.N.V. Unnikrishnan Nair		10.4.03 to 31.3.04
"			Smt. M.A. Sujatha		11.7.03 to 31.3.04
"			Sri.P. Krishnaprakash		25.6.03 to 31.3.04
"			Smt. R. Thankamony		1.4.03 to 3.04
"			Smt. P.T. Thankamony		
"			Sri. T. Jagadeesan		
"			Smt. Shirly Bai George		
"			Smt.P.K. Pushpaja		
"			Sri.K. Subramanian		5.5.03 to 31.3.04
"			Sri. K. Haridasan		4.03 to 3.04
"			Sri.V.R. Santhakumari		
"			Smt. C. Sobhanakumary		
"			Smt. K.S. Vijayalakshmy		
"			Sri.Jacob Simon V.		
"			Smt. K.K. Gouthamy		
"			Smt. A.K. Lyla		
"			Sri.C.P. Padmakumar (on working arrangement at NARP (SR). Vellayali		
Section Officer			Sri.A.Shah		
"			Sri. N. Vijayakumar		19.5.03 to 31.3.04
"			Smt. Susy Mathew		1.4.2003 to 31.3.2004

DIRECTORATE OF STUDENTS WELFARE MANNUTHY

Designation	No. of Post				
	Sancti oned	In position	Name of the incumbent	Vacant	Remarks
Section Officer			Sri.S. Ramachandran Nair		from 3.6.03 to 31.3.04

DIRECTORATE OF EXTENSION

Designation	No. of Posts				
	Sancti oned	In position	Name of the incumbent	Vacant	Remarks
Section Officer			Smt. C. Usha		
"			Sri.J.R. Fathima Malar		26.5.03 to 31.3.04

DIRECTORATE OF RESEARCH

Designation	No. of Posts				
	Sanctio- ned	In position	Name of the incumbent	Vacant	Remarks
			Sri. S. Ramachandran		1.4.03 to 2.6.03
Section Officer			Sri.K.F. Mathew		4.03 to 3.04
"			Smt. E. Hymavathy		2.6.03 to 31.3.04

LIST OF TYPISTS

Designation	No. of Posts				
	Sanctio- ned	In position	Name of the incumbent	Vacant	Remarks
Pool Officer			Sri.V.T. Kurian		1.4.2003 to 31.3.04
Section Officer (FC & D)			Sri. V.P. Ashokan		
			Sri.P. Haridas		
			Smt.P. Subhashini		
			Sri.R. Sadan		
			Smt.P.K. Kalliani		
			Smt.Sathiavathi Bai		
			Sri.G. Shanmughan		
			Sri.K.C. Mohandas		4.12.03 to 31.3.04
			Smt.M. A. Bhargavi		4.03 to 31.10.03
Office Supdt			Smt.B. Leela Bai Amma		
			Smt.T.K. Sukumari		
Seln. Gr. Typist			Smt.L. Sobhanakumari		on WA at NARP, Vellayani 5/03
			Smt.K.R. Nirmala		4.03 to 3.04
			Smt.V.A. Umaiva		
			Smt.P. Prasannakumari		
Sr. Grade Typist			Smt.M.A. Rajini		
			Sri.T.A. Vincent		
			Smt.M.K. Parukutty		
			Smt.Lalitha.V.		
			Sri.K.S. Xavier		
			Smt.Mariamamma Mathew		24.05.03 to 31.03.04
Typist Gr.I			Smt.Sudhila L.		1.4.03 to 28.01.04
			Sri.P.K. Radhakrishnan		4.03 to 3.04
			Smt.Ambujam M.R.		
			Smt.Remani P.		
			Sri.Salim A.K.		30.05.03 to 31.3.04
			Smt.Padmaja B.K.		4.03 to 3.04
			Sri.T.P. Narayanan		1.3.03 to 27.11.03
			Smt. Mini.S.		4.03 to 3.04
Typist Gr.II			Mr.Sreejith K. Balan		
			Mr.Sabarish V.		

DIRECTORATE OF RESEARCH

Designation	No. of Posts				Remarks
	Sanctio ned	In position	Name of the incumbent	vacant	
Section Officer (FC & D)			Smt.K.N. Santhakumari		1.4.2003 to 31.10.2003
			Sri.V.M. Sulaiman		1.11.03 to 31.3.04
Office Supdt.			Smt.S. Geetha Bai		4.03 to 3.04
			Smt. Sreedevi Amma		10/03/03 to 31/3/04
			Smt. Mājida Beevi		1.8.03 to 31.3.04
Sel. Grade Typist			Sri.B. Shiras		4.03 to 3.04
Sr. Gr. Typist			S. Fathima Beevi		
Grade I Typist			A.K. Saleem		1.4.2003 to 29.05.2003
			V.O. Varghese		30.5.03 to 31.3.2004
			T.D.Baby		4.03 to 3.04
			T.P. Narayanan		28.11.03 to 31.3.2004
DIRECTORATE OF EXTENSION, MANNUTHY					
Section Officer (FC&D)			T.D. Jose		1.4.03 to 31.01.04
			K.M. Mary		4.03 to 31.3.04
Office Supdt.			V.C. Mariamma		
Sel. Gr. Typist			Manjula Mercy Patrick		
DIRECTORATE OF STUDENTS' WELFARE, MANNUTHY					
Section Officer (FC & D)			Sudhakaran Nair		(Office Supdt. from 1.4.03 to 30.4.03) 1.5.03 to 31.3.04
Sel. Gr. Typist			I.A.Surendran		

**KAU HEADQUARTERS, VELLANIKKARA
LIST OF ASSISTANTS**

SELECTION GRADE ASSISTANTS					
Sunitha . K.K					
Narmada.M.P					
Abdul Muthalavi					
Sreekumar. P					

Sreekumar K				
Harinath K				
Sudha K.B.				
Radhakrishnan K.N				
Lathika M.V				
Ramesh P.N				
Krishna Prakash				4.03 to 5.03
Mohini P				
Sethumadhavankutty				1.4.03 to 31.5.2003
Latha- T.B				
Narayanan V.N				
Sreejith. P				
Jayasankar K.V				
Anithakumari A				
Pradeep A				
Dalika E.A				
Madhusoodhanan P.G				
Girindra Babu K				1.4.03 to 29.2.2004
Sudha P-				
Vijayalekshmy. P.				
Rajeswari.A				
Amminikutty K.V				
Sheela Attokaran				
Meera K				
Unni. V				
Jose T.C				
Bobby Abraham				
Chamunny P.V				
Ajithkumar B				
Sathyaseelan V.S				
Annamma Scaria				
Sureshkumar P.S				
Komalam M				

II. SENIOR GRADE ASSISTANTS

Preleema Peter C				
Jayanthi M.N				
Rathidevi A.V				
Antony Joseph E.X				
Abdul Kader P.B				
Babu Varghese M				
Jitha K.S				
Kumaranandan N.S				
Ajayakumar M.K				
Sarada P.M				
Raveendranathan : C				
Anitha Venugopal				
Sivadasan C				
Shaibu E.M				
Kochupaul P.K				1.4.2003 to 9.7.2003
Beena V.K				
Ally T				

Toney P.D				
Saraswathy P.A				
Symon P.J				19.12.03 to 31.3.04
Ajayakumar P.K				
Santhamma K.N				
Radhakrishnan-N				
Joy M.V				1.4.03 to 19.5.03
Davis G.O				
Asokan T.M				
Manikandan M.B				
ASSISTANT GRADE I				
Haridas P.C				18.9.03 to 31.3.2004
Manikuttan C				
Babu K.D				
Joy Paul				
Arun Sankar				
Devalal K.R				
Vijayan K				
Manojkumar K.C				
Kanthi T.R				
Raphijan P.H				
Narayani T.R				
Sundararaj C				
Shakila Beegum M				
Shanmukarajan. S				
Gopakumar C.S				1.4.03 to 2.5.2003
Baby K.P				
Denriy C.V				
Valsala P.V				
Jayan N.B				
Santhosh P				1.4.03 to 7.5.03
Noushad K.I				7.5.03 to 3.04
Mini T				
Sobha K.S				
Anju M.L.				
ASSISTANT GR. II				
Jyothi S. Sharma				
Dileep T.K				11.11.03 to 13.2.2004
Anjali. R				LWA for study purpose
Deepa V.D				8.5.03 to 31.3.2004
Priyalekshmy M				
Malathy T.V				
Abdul Manaf A.P				
Vidya Rani N				

**DETAILS OF LAB ASST GR.III/CLERICAL ASST., EDP MANAGER/SYSTEM
MANAGER/PROGRAMMER/JR.PROGRAMMER ETC.**

Lab Assistant/Clerical Assistant	V. Sreedevi	
	T.Sasi	
	Vinu Solomon	
	V.A. Ittiara	
	K.T. Rajan	
	P.Christy John	
	C.G.Sumesh	
	K.A.Vinod	
	Sumesh .P.B.	
	Jayarajan T.K.	
EDP Manager/System Manager	Sri.Viswanathan Nair	
Programmer	Sri.Viswanathan Nair	
	Sri.T.A. Sebastian	

**DETAILS OF DUPLICATING MACHINE OPERATORS/BUS
ATTENDANTS/CLASS IV EMPLOYEES/DRIVERS**

Designation	Name of the incumbent	Remarks
Duplicating Machine Operator	Manikkan A.P.	
	T.R. Vilasini	
	Poulose A.V.	
Bus Attendants	Beer Bahadur Singh	Expired on 27.1.2004
	Saji Antony K.	
	P.M. Ouseph	
	P.B. Anilkumar	
	S. Sasi	
	N.P. Chandran	
	K.A. Abdul Rasheed	
	C. Govindan	
	N.T. Francis	
	K. N. Somasekharan	
Daffedar	Annamma P.D.	
Class IV	Ramankutty K.K.	
	Santha O.G.	
	Raveendran T.R.	
	Thankappan P.E.	
	Vasu M.N.	
	Saseedharan	
	Abdulla T.K.	
	Unni V.R.	
	Ponnumon K.M.	
	Santhakumari P.A.	
Indira P.N.		
M.K. Mukami		
Mary P.A.		

	Chandru K.K.	
	Indira P.S.	
	Rajan M.K.	
	Santha T.V.	
	Ramachandra Bahadur A.	
	Unnikrishnan T.A.	
	Shylan A.K.	
	Sumesh P.B.	
	Lakkkshmi Bai A.V.	
	Kochammu A.	
	Thressia K.V.	
	Velayudhan P.B.	
	Binesh N.V.	
	Biju S.	
	Sineesh E.M.	
	Lakshmikutty M.	
	C. Mukundan Nair	
Vehicle Supervisor (HDV Branch	Sri.V.N. Sankarankutty	
HDV Driver	K.S. Jayan	
	P.N. Benny	
	Sri.P.V. Sudhakaran	
	Sri.P.K. Sasidharan	
	Sri.M.V. Karappan	
	Sri.K.K. Thankappan	
	Sri.G.Balachandran Nair	
	Sri.L. Vasudevan	
	Sri.A.N. Mohanan	
LDV Driver	Mathai Kurian	
	C. Balakrishnan	
	Sri.V.R. Chandran	
	Sri. P.K. Santhosh	
	Sri.K.C. Chinnan	
	Sri.K.M. Abookbacker	
	Sri.T.M. Chacko	
	Sri.T.R. Manjithkumar	
	Sri.Sudhakaran P.M.	
	Sri.N.A. Sukumaran	
	Sri. Biju N. Baby	
	Sri.K.M. Davy	
Binder	R.Vijayan	

- APPENDIX III -
LIST OF STAFF IN VARIOUS CAMPUSES
COLLEGE OF AGRICULTURE, VELLAYANI

Staff position (as on 31st March 2004)

Scientific Staff

Department & Designation	No. of Posts				Remarks
	Sanctioned	In position	Name of the incumbent	Vacant	
Dean	1	-	Dr.C.Sundaresan Nair	-	Wef.12.12.2003
Professor (RC)	1	1	Dr.S.Balakrishnan	-	
Agronomy					
Professor	1	1	Dr.Annamma George	-	
Assoc. Professor	4	5	Dr.M.Achuthan Nair* Dr.S.Janardhanan Pillai Dr.V.L.Geetha Kumari Dr.S.Chandini Dr.Shahul Hameed	-	*Transferred to the CoH., Vellanikkara
Asst. Professor	9	9	Dr.K.Elizebath Syriac Dr.V.Jayakrishna Kumar Dr.Kumari Swadija.O Dr.M.Meerabai Dr.R.Pushpakumari Dr.L.Girija Devi Dr.Sansamma Geroge Dr.K.R.Sheela Smt.T.Sajitha Rani	-	
Plant Breeding & Genetics					
Assoc. Professor	7	6	Dr.D.Chandramony Dr.D.S.Radhadevi Dr.S.G.Sreekumar Dr.Sunny K Oommen Dr.P.Mayadevi Dr.V.G.Jayalekshmy*	1	*From 20.11.03
Asst. Professor	4	4	Dr.C.Lekha Rani Smt.C.Seeja Dr.D.Wilson Dr.K.B.Soni (Bio technology)	-	
Soil Science & Agrl.Chemistry					
Professor	1	1	Dr.V.K.Venugopool	-	
Assoc. Prof.	4	3	Dr.M.Subramonia Iyer* Dr.Sumam Susan Varghese Dr.Komala Amma.E	1	*under suspension
Asst. Professor	7	5	Dr.K.Usha Kumari Dr.Usha Mathew Dr.Thomas George Dr.Manorama Thampatti Dr.Sumam George	2	

Agri.Entomology					
Assoc. Professor	4	2	Dr.T.Nalina Kumari Dr.C.Nanda Kumar	2	
Asst. Professor	5	3	Dr.K.Sudharma Dr.R.Krishna Kumar Dr.N.Anitha	2	
Plant Pathology					
Professor	1	1	Dr.C.K.Peethambaran*	-	*Transferred on 4.2.2004
Assoc. Professor	3	3	Dr.Lulu Das Dr.B.Rajagopalan Dr.A.Naseema	-	
Asst.Prof.	12	11	Dr.C.A.Mary Dr.P.Siyaprasad Dr.P.Santhakumari Dr.K.K.Sulochana Dr.K.Umamaheswaran Dr.P.J.Joseph Sri.K.P.Jagan Mohan Dr.V.K.Girija Dr.C.Gokulapalan Dr.B.Balakrishnan Dr.K.N.Anith	1	
Agri.Engineering					
Professor	1	1	Dr.A.N.Rema Devi* Dr.Anil. K.R **	-	*Retired on 31.10.2003 **wef 1.1.04
Assoc. Prof.	1	1	Dr.V.Ganesan	-	From 20.11.03
Asst. Prof.	1	1	Dr.Xavior K Jacob	-	
Animal Husbandry					
Assoc. Prof.	1	1	Dr.S.P.Suresan Nair	-	
Asst. Prof.	2	2	Dr.M.O.Kurian Dr.R.Vijayan	-	
Agri.Extension					
Professor	1	1	Dr.Anilkumar		
Assoc. Prof.	3	3	Dr.C.Bhaskaran* Dr.R.Prakash Dr.V.B.Padmanabhan	-	*wef 31.7.03.
Asst. Prof.	3	4	Dr.N.Kishore Kumar Dr.B.Seema Dr.N.P.Kumari Sushama Dr.A.K.Sherief* Dr.Motilal Nehru**	-	*Transferred on 31.7.03 ** From 5.6.03
Agri.Statistics					
Professor	1	-		1	
Assoc. Prof.	1	-	Sri.Balakrishnan Asan	-	From 13.1.04
Asst.Prof.	5	1	Dr.Vijayaraghava Kumar	4	
Agri.Economics					
Assoc. Prof.	2	-		2	
Asst. Prof.	3	2	Dr.A.M.Santha Dr.Elsamma Job	1	

Microbiology					
Assoc. Prof.	1	1	Dr.Sasikumar Nair	-	
Horticulture					
Professor	1	1	Dr.V.L.Sheela*	-	Wef 21.10.03
Assoc. Prof.	1	1	Dr.C.S.Jaychandran Nair (Pomology & Floriculture)	-	
Asst. Prof. (Plantation Crops)	9	9	Dr.B.K.Jayachandran Dr.P.C.Jessykutty Dr.G.R.Sulekha Dr.B.R.Reghunath Dr.V.A.Celine (Olericulture) Dr.Abdul Vahab (Olericulture) Dr.Philipose Joshua (Processing Technology) Dr.K.Rajmohan (Pomology & floriculture) Dr.Sabeena George Thekkayam (Pomology & Flori.)	-	
Plant Physiology					
Asst. Prof.	4	4	Dr.M.M.Viji Dr.B.T.Krishna Prasad Dr.R.V.Manju Dr.Roy Stephen	-	
Home Science					
Professor	1	1	Smt.Beela@	-	@From 9.5.03 Against the Post of Prof.
Assoc. Prof.	2	2	Dr.N.K.Vimala Kumari Dr.Mary Ukkuru	-	
Asst. Prof.	8	8	Dr.S.Chellammal Smt.M.Rajani Dr.C.Nirmala Smt.Rari John.K Dr.S.Syamakumari Smt.S.Subaida Beevi Dr.Suma Divakar* Smt.N.E.Safia** Smt.Prasannakumari # Dr.P.V.Nandini+	-	*Till 10.6.03 **Till 16.6.03 \$From 16.6.03 +From 16.6.03
Physical Education					
Asst. Prof.	2	1	Sri.S.Pazhania Pillai Dr.T.I.Manoj*	-	* wef 19.12.03
Administrative & Supporting Staff					
Senior Admn. Officer	1	1	K.Ravi Kumar	-	
Section Officer	9	9	Smt.N.Sujatha* Sri.C.Chandran**	-	*Till 31.5.03 ** From 27.6.03

Section Officer			Smt.S.Saraswathy-Amma Smt.P.Jameela Sri.B.Sukesan Smt.P.Vijayakumari Smt.T.Mridula Kumari Sri.N.K.Mohankumar Smt.K.Vasanthakumari Amma T.Sasi Kumar		
Assistants	22	18	Sri.K.Suresh Kumar Sri.N.R.Sajan Sri.S.Raveendra Nath Sri.I.Manoj Sri.S.V.Sunil Det Smt.R.Kamala Smt.C.D.Sreekala Sri.M.S.Noble* Sri.Sangeeth Thomas Sri.S.Suresh Kumar Sri.S.Anil Kumar Sri.M.Suresh Kumar Sri.N.L.Siva Kumar Smt.S.Hema Smt.P.Krishna Kumari Sri.S.K.Ajith Kumar Smt.M.Subaida Beevi Sri.V.Sriram	4	*On working arrangement at FSRs, Sadanan dapuram from 16.9.2002
Section Officer FC&D	5	5	Smt.S.Valsala Devi Sri.V.Bhagaval Singh Smt.S.Vasundhara Smt.P.Lalitha Smt.P.Radha		
Typists	15	15	Smt.K.Roida Smt.B.Lalitha Kumari Sri.Abdul Azeez Sri.G.Hareendran Smt.S.Rose Mary Smt.S.Remani Sri.P.Natarajan Pillai Sri.R.Vijayan Smt.B.Retnavally Amma Smt.P.Sarojini ammam Smt.Indiramma.S Smt.P.Vasantha Kumari Smt.A.Asha Kumari Smt.A.Vasantha Smt.Lilly Bai		

Class IV	39	34	Smt.S.Sobha Sri.K.Maniyan Nadar Sri.D.Kesavan Nair* Sri.C.Appu** Smt.K.Valsala Kumari Sri.M.Sloman Sri.B.Rajasekharan Sri.P.Sukumaran Sri.S.Sasidharan Asari Smt.T.Jagadamma Sri.G.Velappan Nair Sri.K.P.Viswambharan Sri.P.Viswambharan Sri.N.Thankappan Nadar Sri.C.Raju*** Sri.K.Mohanan Nair Sri.M.Enose Smt.B.Vasantha Kumari Sri.K.Rajan Smt.G.Pushpaleela Sri.G.Rajendran Smt.G.Grancis Sri.K.Gopi Sri.K.Jayakumar Sri.J.Alexander Sri.M.Santhosh Kumar Sri.T.Saji Smt.S.Sindhu Sri.M.S.Sunil Sri.M.Anil Kumar Sri.Krishna Kumar Sri.Sujith Sri.E.Manoharan Sri.T.Biju	5	*Till 31.1.04 ** Till 31.10.03 *** Till 31.5.03
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Duplicator Operator	2	2	Sri.K.Sambasivan Sri.R.Vikraman Nair* Sri.C.Madhusoodan Nair**	-	* **
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Technical & Supporting staff

HDV Driver	3	3	Sri.G.Chandrasekharan Nair Sri.P.Vijayakumar Sri.S.Sureshkumar	-	
LDV Driver	4	3	Sri.K.S.Radhakrishnan Nair Sri.A.Gopa Kumar Sri.Vincent	1	
Tractor Driver	1	-	-	1	
Bus Attenders	3	3	Sri.V.Soman Nadar Sri.M.Solaman* Sri.S.Venugopalan Nair**	-	* wef 14.9.03 ** wef 26.2.04
Farm Asst./Farm Sup.(Agri.)	9	6	Sri.V.T.Bose Sri.M.Kamarudeen Smt.K.S.Sujatha Sri.H.Gopinathan(F.S.)	3	* wef 30.9.03

Farm Asst./Farm Sup.(Agri.)			Sri.K.S.Ajayakumar(F.S.Gr.I) Sri.D.Sivaprasad*		
Farm Asst./Farm Sup.(Vet.)	5	3	Sri.G.Venu (F.S.) Sri.J.Sudha Kumar (F.S.) Smt.P.Valsala Kumari, FA	2	
Trg./Tech.Asst.	2	-	-	2	
Pump Operator	4	4	Sri.R.Soman Sri.B.Appukuttan Sri.K.Maniyan Nadar Sri.P.K.Mohanan*		*wef 22.4.03
Lab Asst.Gr.I & II	6	4	Sri.P.Thankaappan Sri.R.Sankar Ram Sri.M.Sreedharan Nair* Smt.K.Prasannakumari	2	*Till 31.1.04
Lab Asst.Gr.III/ Cler.Asst.	18	13	Sri.J.David Sri.C.Premakumaran Thampi Sri.S.Janardhanan Nair Smt.S.Lalitha Sri.A.Anil Kumar Smt.R.Remani Sri.P.Chandran Smt.R.Sreelatha Sri.S.Shaji Kumari Latha.S Smt.S.Kalarani Smt.D.Vijayakumari Smt.V.Mini	5	
Technicians	7	4	Sri.K.Thankappan Sri.B.S.Suresh Sri.V.Gopinatha Kurup Sri.Thomas Scariah	3	
Tech.Asst./ Tech.Officer	1	1	Smt.P.Saraswathy	-	
Librarian/ Asst. Librarian	2	2	Smt.B.Leela Sri.R.Manohar* Sri.P.Sanjeev**	-	*Till 18.6.03 ** From 2.7.03
Reference Asst./Tech.Asst.	4	2	Sri.S.Sreekumaran Smt.Sherley.B	2	
Cook-cum-Care taker	1	-	-	1	
Hostel Manager	2	1	Sri.K.Gopakumaran Nair	1	
Matron	1	-	-	1	
Artist	2	2	Sri.V.Chandranandan Sri.P.K.Surendran	-	
Photographer	1	-	-	1	
Programmer	1	1	C.E.Ajith Kumar	-	
Junior Programmer	1	-	-	1	
Asst.Chemist	1	-	-	1	
Graduate Lab Asst.	1	-	-	1	
Audio Visual Operator	1	-	-	1	

COLLEGE OF HORTICULTURE, VELLANIKKARA

Staff position (as on 31st March 2004)

Scientific Staff:

Department & Designation	Number of Posts				Remarks
	Sanct- ioned	In position	Name of the Incumbent	Vacant	
AssociateDean	1	1	Dr.GLSHV Prasada Rao	-Nil-	
8Agronomy: Professor	1	Nil		1	
Assoc.Professor Asst.Professor	1 4	1 Assoc.Prof.3 Asst.Prof. 1	Dr.R.Gopinathan Dr.Jose Mathew Dr.K.E.Savithri Dr. Mercy George Dr. Mera V. Menon	-Nil- -Nil-	
Agro-Meterology: Asst.Professor	2	Prof. 1 Assoc.Prof.1	GSLVHV Prasada Rao Dr.E.K.Lalitha Bai Sudeesh M.V.	-Nil-	
Plant Breeding & Genetics: Professor 1	1	1	Dr.Achamma Ommen	Nil	
Asst.Professor	6	Prof. 1 Assoc.Prof.2 Asst.Prof.4	Dr.K.T.Prsannakumari Dr. K. Nandini Dr. K., Arya Dr.C.R.Elsy Dr.Dijee Bastin		
AICRP on Medicinal Plants	3	Assoc.Prof.1 Asst.Prof.2	Dr.V.V.Radhakrishnan Dr.A.Latha Dr.Mini,S		
Agri.Economics: Professor	1	-Nil-		1	
Assoc.Professor Asst.Professor	1 4	1 Assoc.Prof.1 Asst.Prof.3	Dr.E.K. Thomas Dr.Jessy Thomas.K. Dr.P.Indira Devi Dr.K.Sathees Babu Dr.T.Paul Lazarus	-Nil- -Nil-	
Entomology: Professor	3	- Nil -		3	
Assoc.Professor Asst.Professor	1 2	1 Assoc.Prof.2 Asst.Prof.1	Dr.Jim Thomas Dr. A.M. Renjith Dr.Sosamma Jacob Dr.Maicykjutty.P.Mathew Dr.R.Ushakumari	-Nil-	

Agri.Engineering: Professor Asst.Professor	1 2	1 Assoc.Prof.1 Asst.Prof.1	Sri.M.R.Sankara Narayanan Dr.Jobi.V.Paul Sri.P.K.Sureshkumar		
Agri.Extension: Assoc.Professor Asst.Professor	3 3	3 2	Dr.F.M.H.Kaleel Dr.P.Ahamed Dr.P.S.Geethakutty Dr.Joy Mathew Dr.Jayasreekrishnankutty	-Nil- -Nil-	
Olericulture: Professor	1	-Nil-		1	
Asst.Professor	7	Assoc.Prof.6 Asst.Prof.4	Dr.T.R.Gopalakrishnan Dr.Salikutty Joseph Dr.BabyLissyMarkose Dr.K.P.Prasanna Dr. P. Indira Dr.P.G.Sadankumar Dr.T.E.George Dr.K.V.Suresh Babu Dr.K.Krishnakumari Dr.S. Nirmaladevi	-Nil-	3 Posts excess
Plantation Corps: Professor	1	-Nil-		1	
Assoc.Professor	1	1	Dr.E.V. Nybe		
Asst.Professor	8	Assoc.Prof.3 Asst.Prof.5	Dr. Alice Kurian Dr.M.R. Shylaja Dr.P.C.Rajendran Dr. P.V. Nalini Dr. V.S. Sujatha Dr.Lissamma Joseph Dr.M.Asha Sankar Dr. N. Mini Raj Dr. B. Suma	4 -Nil-	
Processing Technology: Professor	1	-Nil-		1	
Asst.Professor	7	Assoc.Prof.5 Asst.Prof.3	Dr.P.Jacob John Dr. V.K. Raju Dr. K.B.Sheela Dr.V. Indira (Home Science) Dr.V.Usha (Home Science) Dr.P.B.Pushpalatha Smt.Omana Pavunny (H.Sc.) Dr.Norma Xavier (H.Sc.)		On working arrange ment On LWA.

Pomo. & Flori. & AICFIP Professor	1	-Nil-		1	
Assoc. Professor	1	1	Dr.P.K.Rajeevan	-Nil-	
Asst. Professor	8	Assoc. Prof. 8	Dr.P.K.Valsalakumari Dr.K.Laila Mathew Dr.N.K.Parameswaran Dr.K.Aravindakshan Dr.T.Radha Dr.A.K.Babytlatha Dr.Sarah. T.George Dr.C.K.Geetha Dr.A.Sobhana Dr. U.Sreelatha Dr.Jyothi Bhaskar		
Asst. Professor		Asst. Prof. 3			
Phy. Education: Asst. Professor	1	Assoc. Prof. 1	Dr.E.Soman	-Nil-	
Plant Pathology: Professor	1	-Nil-	Dr.Koshy Abraham	1	
Assoc. Professor	2	2	Dr.M.V.Rajendran Pillai		
Asst. Professor	4	Assoc. Prof. 3	Dr.T.Sheela Paul Dr.Saly.K.Mathew Dr.T.J.Rehmat Niza. Dr.Surendra Gopal Dr. S.Beena	-Nil-	
		Asst. Prof. 2			
Soil Sci. & Ag. Chem. Professor	1	-Nil-	Dr.K.A. Mariam	1	
Assoc. Professor	3	3	Dr.K.C. Marykutty		
Asst. Professor	5	Assoc. Prof. 3	Dr.P.K. Sushama Dr.C.S.Gopi Dr.Sam.T.Kurumthottickal Dr.Betty Bastian Dr.A. Augustine	- Nil -	
		Asst. Prof. 2			
Agrl. Statistics Professor	1	-Nil-		1	
Asst. Professor	6	Assoc. Prof. 1 Asst. Prof. 5	Dr.V.K.G. Unnithan Dr. Graceamma Kurian Dr. S. Krishnan Smt. P. Soudhamini Smt. T.K. Indira Bai Smt. Laly John, C.	-Nil-	
Vegetable Seed Production Complex Asst. Prof. (Oleri)		Assoc. Prof. 1	Dr. S. Rajan	-Nil-	

Soil Chemical & Radio Ecological Investigation (Plan Scheme) Professor	1	Assoc.Prof 1 -Nil- 1 1	Dr. P. Sureshkumar Dr. Saifudin	-Nil- 1 -Nil- -Nil-	
Radio Tracer Lab (Soil Science & Agrl. Chemistry) Professor	1				
Soil Science & ... Assoc. Professor	1				
Agronomy Assoc. Professor	1		Dr. P. Sreedevi		
Instrumentation Centre Assoc. Professor	1	1	Sri. K. Madhavan Nair	-Nil-	
All India Network on Agrl. Ornithology Entomology Asst. Professor	2	2	Dr. Mani Chellappan Dr. Haseena Bhaskar	-Nil-	
Bio Technology & Molecular Biology at COH Horticulture Asst. Professor	2	Assoc.Prof.1 Asst. Prof. 1	Dr. P.A. Nazeem Dr. D. Girija Dr. P.A. Valsala	Nil	
AICRP On Soil Test Crop response Correlation Soil Science & Agri University Assoc. Professor Asst. Professor	1 1	Assoc.Prof.1 Asst.Prof. 1	Dr. M.A. Hassan Dr. Betty Bastian	Nil Nil	
DISC Computer Science Asst. Professor	1	Assoc.Prof.1	Dr. R. Keshavachandran Dr.Ajitha	Nil	
AICRP on Weed Control	3		Dr.C.T.Abraham Dr.Girija,T Dr.DurgaDevi		
CCRP	3		Dr.V.K.Mallika Dr.S.Prasannakumari Amma Dr.George Thomas		

BCCP					
Agri.Entomology Assoc. Professor	1	Assoc.Prof.1	Dr.S. Pathummal Beevi	-	-
Agri. Entomology Assoc. Professor	1	1	Dr. K. R. Lyla	-	-
Instructional Farm			Dr.K.P.Pradeep		
Associate Professor	1	1		Nil	
Assistant Professor	1	Nil		1	
Administrative and Supporting Staff:					
A.O. Grade-I	1	1	Smt. L. Syamala Sri.Arumugham	Nil	Retd.in February
Section Officer	5		1. Smt. V.R. Chandrika		
			2. Smt. G. Santhakumari	Nil	
			3. Smt. P.A. Geetha		
			4. Smt. Syamaladevi		
			5. Smt. C.P. Padmakumari		
Assistants	17	14	Smt. Alamelu, K. V.	2	
			Smt.Valsalakumari, M.S.		
			3. Smt. Ammalukutty, K.V.		
			4. Sri. I.K. Venugopalan		
			5. Smt. Annie, T.D.		
			6. Sri. William, C.T.		
			7. Smt. Sathy, V.C.		
			8. Smt. K.S. Beena		
			9. Smt. C. Chandrika		
			10. Sri. Bennet Thomas		
			12. Sri. Pradeep, K.		
			13. Sri. Asokan		
			14. Smt. Ambika, P.V.		
			15. Sri. Wilson Raj, M.W. (Olericulture)		
Section Officer (FC&D)	2	2	1.Sri.Joy K.A.	Nil	
Office supdt.			1. Smt.K.T.Vijayalakshmi		
Typist	8		1. Smt. Sareena, Z.		
			2. Smt. Ratnamma		
			3. Smt. Sarojini Amma		
			4. Smt. A.J. Mary		
			5. Sri.T.S. Krishnankutty		
			6. Smt. V.K.Remma	2	
Class IV	11			9	
			1. Sri.Sujeesh		
Technical					
Duplicator Operator	2	21	1. Smt. Santhakumari, G		
			2. Sri. K.V. Ramachandran		

HDV Driver	1	Nil	-	1
LDV Driver	5	2	1. Sri. Paul, M.P. 2. Sri. Kuttikrishnan, V.	3
Tractor Driver	1	Nil		1
Farm Assistant/ Farm Supvr. (Agri)	15		1. Sri. A.G. Rajendra Babu 2. Smt. Valsamma George 3. Sri. K.M. Vijayakumaran 4. Sri. M.M. George 5. Smt. S. Nazeema 6. Sri. P.K. Haridas 7. Sri. P.K. Ramachandran 8. Sri. N.T. Satheesh babu 9. Sri. P.K. Kumaran 10. Sri. Gopi, V.N. 11. Sri. P.K. Sreekumar	4
Lab Assistant Grade I & II Lab Assistant Lab Asst. Gr.III/ Clerical Asst.	19	6	1. Sri. P.B Sivadasan 2. Sri. M.D. Roy 3. Smt. P.K. Savithri 4. Sri. T.K. Ismail 5. Smt. Sali, P.A. 6. Sri. K. Govindankutty	13
Technician	2		1. Sri. .K.P. Sudarsanakumar 2. Sri. P. Balakrishnan	Nil
Lib/Asst.Librarian	2	2	1. Smt. Lalitha, M.C. 2. Sri. Abdul Razak, C.	Nil
Library Assistant	1	0		Vacant
Ref./Tech./Lib Asst	1	Nil	-	Vacant
Hostel Manager	1	1	Sri. N.P. Chandran	Nil
Matron	1	Nil		1
Junior Programmer	2	Nil		2
Proc. Tech. Asst.	1	Nil	-	1
Network Project of Agrl. Ornithology				
Class IV	1	1	Sri. Ouseph, P.M.	Nil
Technical Asst.	1	Nil		1
AICRP on Agro. Meterology				
F.A.Agrl. Gr.II	1		Sri. Paulose, P.M.	Nil
Lab Assta.Gr.III	1	Nil		1
AICRP on Soil Test Crop response				
Lab Asst. Gr.III/ Clerical Asst.)	1 No		Smt. P.K. Kamalakshy	Nil
F.A. Gr.I			Sri. P.R. Sathyan	Nil
F.A. Gr.II			Sri. M. Ananthakrishnan	Nil
DISC			Detached from COH	
Technical Asst.	1			
Typist	1			

I.F.Vellanikkara					
Section Officer	1		Sri. Vijayakumar		
Assistant	2		U.P.Davis V.I.Suresh Kumar		
Typist	1		K.Chandrakumar		
FA/F.S. Asst.	4				
Technician	1				
Dept. of Agri. Meterology, Vellanik kara					
Farm Supervisor Gr.I	1	1	V.N. . Gopi		
Farm Supervisor Gr.II	1	1	P.M. Poullose		AICRP
Technical Assistant	1	1	C.S. Gopakumar		AICRP
1	2	3	4	5	6
BCCP					
Tech. Officer (Gr.II)	1	1	Sri. K.V. Dinesan	-	
Farm Asst.	2	2	Sri. A. X. George Sri. K. K. Reghuraj,	-	
Driver	1	1	Sri. K. V. Kumaran	-	
Instructional Farm					
a) Senior Farm Supervisor (Ag.)	1	1	M.J.Kochappan	-	-
b) Farm Supervisor Gr.I(Ag.)	1	1	K.Kesavan	-	-
c) Farm Supervisor Gr.II(Ag.)	1	1	K.S.Thankappan	-	-
d) Farm Assistant Sr. Gr.(Ag.)	1	1	C.Gireesan	-	-
e) Technician Sel. Gr.	1	1	P.Balakrishnan(till 8-01-03) K.O.Porinchu(from 9-01-03)	-	-

COLLEGE OF AGRICULTURE, PADANNAKAD

Staff position (as on 31st March 2004)

Scientific Staff:

Department & Designation	Number of Posts			Remarks
	Sanct- ioned	In position	Name of the Incumbent	
AssociateDean	1	1	Dr.Joseph Philip	-Nil-
Agronomy: Professor	2	Nil		2
Assoc.Professor Asst.Professor	1 4	- 3	- Dr.Jacob John Dr. Sheeba Issac Sri. P.K.Ratheesh	- 1

Agro-Meterology: Asst.Professor	1	-		1	
Plant Breeding & Genetics: Professor	2	-		2	
Assoc..Professor Asst. Professor	1 3	- 2	Dr.R. Sujatha Smt. J. Minimol	1 1	
Agri.Economics: Professor	1	-	-	1	
Assoc.Professor Asst.Professor	1 2	1 1	Dr.Latha Bastine Sri. Chitra Parayil	1 1	
Entomology: Professor	1	-	-	1	
Assoc.Professor Asst.Professor	1 5	- 4	- Dr. K.M. Sreekumar Dr.G. Mohapatra Dr.Sai Ramkumar Mr. Ramesha	1 1	
Agri.Engineering: Assoc. Professor Asst.Professor	1 1	- 1	- P.K. Mini	1 -	
Agri.Extension: Professor Assoc. Professor Asst.Professor	1 1 3	- 1 1	- Dr.Abdul Kareem Smt. Mercykutty	1 1 2	
Plant Pathology Professor Assoc.Professor Asst.Professor	2 1 -	- - 1*	- - M..Joy	2 1	
Horticulture Professor Assoc.Professor Asst.Professor	1 3 3	- 2 3	- Dr. A. Rajagopalan Dr. N. Satheesan Dr. T. Predeepkumar Dr. A. Anitha	1 1	
Soil Science Professor Assoc.Professor Asst.Professor	1 1 2	- - 1	- - Dr.P.R. Suresh	1 1 1	
Phy.Education: Asst.Professor	2	1	Sri. E.U. Rajan	1	

Plant Physiology					
Assoc.Professor	1	-	-	1	
Asst.Professor	1	-	-	1	
Bio Technology					
Assoc.Professor	1	-	-	1	
Asst.Professor	1	1	Dr.Swapna Alex		
Agrl.Statistics					
Asst. Professor	2	-	-	2	
Home Science					
Asst.Prof. (Oleri)	2	-	-	2	
Computer Science					
Asst. Professor	2	-	-	2	
Animal Husbandry					
Asst. Professor	1	-	-	1	
Administrative and Supporting Staff:					
A.O.	1	1	Smt. S.Droupadi	-	
Section Officer	3	2	Sri.V.V. Kunhambu	1	
Assistants	6	1	Sri.Rajagopalan	5	
Steno to AD	1	1	Sri.K. Ravindran*	-	Office supdt.
Typist	3	2	Smt. V.P.Shyamala	1	„
			Smt. P. Sarasu		SG. Typist
Driver	2	1	Sri. Unnikrishnan	1	
Class IV	3	1	Sri.Kuttan	2	
Technical					
Duplicator Operator	1	1	Sri. Pradeep kumar		
Part Time Sweeper Scavanger	2	-		2	
Farm Supvr.	1	-		1	
Farm Assistant	3	3	Sri. Surendran Sri. Suresh Karayil Sri.Saseedharan	-	
Lab Assistant	5	2	Sri. Asokan Smt. Anitha	3	
Technician	1	1	Sri. Umesh Nandakumar	-	
Library Assistant	2	-	-	2	
Data Entry Operator	1	-	-	1	

COLLEGE OF FORESTRY, VELLANIKKARA

Staff position (as on 31st March, 2004)

Scientific staff

Dept. and designation	No. of posts			
	Sanctioned	In position	Vacant	Remarks
<i>Dept. of Silviculture and Agroforestry:</i>				
Professor	Nil	Nil	Nil	
Assoc. Professor	2	2	Nil	
Asst. Professor	Nil	Nil	Nil	
<i>Dept. of Tree Physiology and Breeding :</i>				
Professor	2	2	Nil	
Assoc. Professor	1	1	Nil	
Asst. Professor	Nil	Nil	Nil	
<i>Dept. of Forest Management and Utilization</i>				
Professor	Nil	Nil	Nil	One Asst. Prof. on leave for study purpose
Assoc. Professor	1	1	Nil	
Asst. Professor	3	3	Nil	
<i>Dept. of Wood Science :</i>				
Professor	Nil	Nil	Nil	One Asst. Prof. is on leave for study purpose
Assoc. Professor	Nil	Nil	Nil	
Asst. Professor	2	2	Nil	
<i>Dept. of Wildlife Sciences:</i>				
Professor	Nil	Nil	Nil	One Asst. Prof. is on leave for study purpose
Assoc. Professor	Nil	Nil	Nil	
Asst. Professor	3	3	Nil	

Administrative and supporting staff:

Administrative Officer	1	1	Nil	
Section Officer	1	1	Nil	
Office Assistant	3	2	1	
Typist	2	2	Nil	
Stenographer	1	1	Nil	
Driver	2	1	1	
Office Peon	2	1	1	

Technical staff:

Laboratory Assistant				
Farm Assistant				
Asst. Librarian				
Reference Assistant				
Caretaker (Hostel)	1	Nil	1	On daily wages

List of members of staff as on 31-03-2002 (Department/discipline wise)

Department of		
Name of post	Name of the member of staff	Remarks if any
Scientific:		
Professor	Dr. Luckins C Babu Dr. NK Vijayakumar	Associate Dean i/c.
Assoc.Professor	Dr. PK Ashokan Dr. B Mohankumar Dr. K Sudhakara Dr. K Gopikumar	
Asst.Professor	Dr. Sonney George Mr. K. Vidyasagaran Mr. K. Premkumar Mr. EV Anoop Mr. PO Nameer Dr. B Ambika Varma Mr. MM Animon Mr. Suman Jacob Mr.Gopakumar.S. Mr.Kunhamu	On leave for study purpose On leave for study purpose On leave for study purpose On leave for study purpose
Administrative:		
Administrative Officer	Smt. V.J.Rosely	
Section Officer	Smt. C.K. Prabhavathy	
Office Assistant	1. Sri TA Thilakan 2. Smt. K.K. Ramani 3. vacant	
Stenographer Typist	Smt. P.K. Easwary Smt. P.K.Babitha Sri. A.G. Radhakrishnan	
Supporting:		
Driver	1. Sri.M.K. Sundaran - HDV Driver 2. Vacant - LDV Driver	
Para-technical	- Nil -	- Nil -
Ministerial:		
Peon	1. Smt. K.V. Sujana 2. Vacant	
Permanent Labourers	1. Smt.Kadheeja, V.A. 2. Smt. Sarada, I.R 3. Sri Davis, KV 4. Smt. C.K. Padmavathy 5. Smt. MR. Sarada 6. Smt. KV Subhadra	*On working arrangement from College of Horticulture, Vellanikkara
Other positions	- Nil -	- Nil -

**COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT
VELLANIKKARA**

Staff position (as on 31st March, 2004)

Scientific Staff

Department & Designation	No. of posts				Remarks
	Sanctioned	In position	Name of the incumbent	Vacant	
Associate Dean	1	0	Dr. M. Mohandas	1	Associate Dean i/c.
1. Department of Co-operative Management					
Professor	1	0	Nil	1	
Assoc. Professor	2	0	Nil	2	
Asst. Professor	5	5		0	3 on LWA for foreign employment
			1. Dr. Philip Thomas		i. Associate Professor through Career Advancement ii. On Leave without Allowance for taking employment abroad
			2. Dr. A.M. Jose		i. Asst. Prof. (Sr. Scale) through Career Advancement ii. On Leave without Allowance for taking employment abroad
			3. Dr. E. Vinaikumar		Asst. Prof. (Sr. Scale) through Career Advancement, Head of Department i/c.
			4. Dr. G. Veerakumaran		On Leave without allowance for taking employment abroad
			5. Sri.E.G. Ranjithkumar		
2. Department of Rural Banking and Finance Management					
Professor	0	0	Nil	0	
Assoc. Prof.	1	0	Nil	1	
Asst. Professor	5	4		1	One Asst. Prof. Resigned with effect from 15-11-1997

Asst. Professor			1. Dr. Molly Joseph		i. Assoc. Prof. through Career Advancement ii. Head of the Department
			2. Dr. E.V.K. Padmini		Assoc. Prof. Through Career Advancement
			3. Dr. K.M. George		Asst. Prof. (Sr. Scale) through Career Advancement
			4. Dr. M.A. Lizy		
Department of Rural Marketing Management					
Professor	1	0	Nil	1	
Assoc. Professor	2	0	Nil	2	
Asst. Professor	5	5		0	
			1. Dr. A. Sukumaran		i. Assoc. Professor through Career Advancement ii. Head of the Department
			2. Sri. Philip Sabu		Asst. Prof. (Sel. Grade) through Career Advancement
			3. Sri. M. Mohanan		Asst. Prof. (Sel. Grade) through Career Advancement
			4. Dr. Vanaja Menon		On Leave without allowance for higher studies
			5. Smt. Ushadevi, K.N.		
Department of Development Economics					
Professor	1	0	Nil	1	
Assoc. Professor	2	1 2	Dr. M. Mohandas	0	i. Associate Dean i/c. ii. Head of the Department
			Dr. U. Ramachandran	0	i. Assoc. Professor through Career Advancement, posted in the vacancy of Assoc. Prof. ii. Head of Department i/c. (Development Economics)
Asst. Prof.	4	4		0	
			1. Dr. K.A. Suresh		Assoc. Professor through Career Advancement
			2. Dr. K.P. Mani		Assoc. Professor through Career Advancement
			3. Smt. Shaheena, P.		Asst. Professor (Sr. Scale) through Career Advancement
			4. Smt. K.A. Sunandha		
			5. Sri.Jacob Thomas, M.		Asst. Professor (Sel. Grade) through Career Advancement

Other Disciplines

(a) Computer Science					<i>Attached to the Dept. of Development Economics</i>
Asst. Professor	1	1	Sri. P.J. Boniface	0	
(b) Agricultural Extension					
(c) Attached to the Department of Co-Operative Management					
Asst. Professor	1	1	Sri. Sakeer Hussain, N.	0	
5.1. Administrative and Supporting Staff					
Administrative Officer	1	1	Smt. A.K. Kamala Bai	0	
Section Officer	2	2	1. Smt. E.K. Prabhavathy 2. Smt. T.K. Ambika 3. Sri. P.V. Mohanan		Retired on 29-02-2004 From 05-03-2004
Assistants	6	4		1	One post of Assistant shifted temporarily
			1. Sri. T.J. Babychan 2. Sri. Jayaraj, T.K. 3. Sri. Baburaj, T.P. 4. Sri. K.V. Subramanian		
Typist	5	5		0	
			1. Smt. Girija, V.G. 2. Smt. Sarada, P.		Steno to Associate Dean
			3. Sri. Sukumaran Nair, G. 4. Smt. Thankamany, M.K. 5. Sri. R. Noel		On working arrangement at Onattukara wef. 23-12-2000
Driver	1	1	Sri. John Stempehn, K.O.	0	
Class IV	2	2		0	
			1. Smt. P.I. Kunjumol 2. Smt. Sujatha, S.V.		
Duplicating Operator	1	0	Sri. R.G. Babu		
Hostel Manager	1	1		1	
Permanent Labourers	3	3	1. Smt. K.P. Thanka 2. Smt. K.K. Thanka 3. Smt. K.K. Baby		
Technical Staff					
Asst. Librarian	1	1	Smt. K.R. Salara	0	On leave for study purposes. Sri. Sathyan joined on 05-03-04
Lab Assistant	1	1	Smt. Santhakumari, M.	1	Retired on 31-12-2003

COLLEGE OF VETERINARY AND ANIMAL SCIENCES, MANNUTHY

Scientific Staff

Department and Designation	Number of posts				Remarks
	Sanctioned	In position	Name of incumbent	Vacant	
Anatomy Professor Asso. Professor Asst. Professor	1 3 5	0 3 2	Dr. K.R. harshan Dr. C.K. Sreedharan unni Dr. Jose John Chungath Dr. N .Ashok Dr. S .Maya	1 3	
Animal Genetics and Breeding Professor Assoc. Professor Asst. Professor Centre ASAG Professor Assoc. Professor Asst. Professor	1 2 3 1 1 2	0 2 1 0 1 0	Dr. K.V .Raghunandan Dr .P. Nandakumar Dr. K anilkumar Dr. K.C. Raghavan	1 2 1 2	
Animal Reproduction Professor Assoc. Professor Asst. Professor	3 5 12	0 5 3	Dr. T. Sreekumaran Dr. K.V. Athman Dr. V. Vijayakumar Dr. Joseph Mathew Dr. Aravinda Gosh Dr. Ibrahim kutty Dr .A.H. Vahida Dr. G. Ajith kumar	3 0 9	
Biochemistry Professor Assoc. Professor Asst. Professor	0 1 1	0 1 1	Dr. Sisilamma George Mr .K.Jayavardhanan	0 0 0	
Clinical medicine Professor Assoc. Professor Asst. professor	2 2 5	1 2 3	Dr. P.G. Baby Dr. P.C. alex Dr .K.M. Jaya kumar Dr. Usha narayana Pillai Dr. S. Ajith kumar Dr. Premny Aleyas	 1 0 2	
Dairy Science Professor Assoc. Professor Asst. Professor	1 4 2	0 3 2	Dr. M. Mukundan Dr. R .Rajendrakumar Dr. C.T. Sathian Dr A.K.Beena	1 1 0	

Extension					
Professor	1	0		1	
Assoc. Professor	2	2	Dr. M.R Subhadra	0	
Asst. Professor	4	1	Dr. P.J. Rajkamal Dr. R. Jiji.	3	
Livestock production Management.					
Professor	2	1	Dr. P.C .saseendran	1	
Assoc. Professor	2	2	Dr. Francis Xavier Dr. Joseph Mathew	0	
Asst. Professor	4	1	Dr. K.S. Anil	3	
Livestock Products Technology					
Professor	1	0		1	
Assoc. Professoe	2	2	Dr. P. Kuttinarayan Dr. George T. Ommen	0	
Asst. Professor	1	1	Dr. S. Sunil	0	One on leave
Microbiology					
Professor	2	0		2	
Assoc. Professor	2	2	Dr. V. Jayaprakasan Dr .G. Krishnan Nair	0	
Asst. Professor	5	2	Dr. M. Mini Dr. Koshy John	3	One on leave
Nutrition					
Professor	1	0		1	
Assoc. Professor	3	2	Dr. T.V. Viswanathan Dr .A.D. Mercy	1	
Asst. Professor	6	2	Dr. K. Alley Dr. Syam Mohan	4	
ICAR Project. Professor	1	0		1	
Parasitology					
Professor	1	0		1	
Assoc. Professor	4	1	Dr. H. Subrahmoniam	3	
Asst. Professor	4	2	Dr. Lucy sabu Dr. K. devada	2	
Pathology					
Professor	2	1	Dr. T.Sreekumaran	1	
Assoc. Professor	3	2	Dr. N. Vijayan Dr. Mammen J. Abraham	1	On leave
Asst.professor	6	1	Dr. N. Divakaran Nair	5	
Pharmacology & Toxicology					
Professor	2	0		2	
Assoc. Professor	3	6	Dr. N. Gopa kumar Dr. A.D .Joy Dr. K.Venugopalan Dr.A.M.Chandrasekharan Nair Dr. C.M. Aravindakshan Mr. V.R. Raghunandan	-3	
Asst.Professor	5	1	Dr. Usha P T A	4	

Physiology					
Professor	1	0		1	
Assoc. Professor	3	2	Dr.P.T.Phylomina	1	
Asst. Professor	4	3	Dr. K.P .Sreekumar Dr. Girish varma Dr. V. Ramnath Dr.K.Karthiyani	1	
Poultry Science					
Professor	2	0		2	
Assoc. Professor	4	3	Dr.A.Jalaludin Dr.Amritha Viswanath Dr. V.K.Elizebath	1	
Asst.professor	4	0		4	
Surgery					
Professor	2	0		2	
Assoc. Professor	4	2	Dr. T Sarada amma Dr. K. Rajan kutty	2	
Asst. Professor	6	4	Dr. C.B. Devanand Dr. Syam K Venugopal Dr. John martin Dr K .Nnarayanan	2	
Statistics					
Professor	1	0		1	
Assoc. Professor	1	0		1	
Asst. Professor	4	4	Dr. K.S. Sujatha Dr. K.A. Mercy Dr. P. Gangadharan Dr. U. Narayani kutty	0	
Veterinary Epidemiology & Preventive Medicine					
Professor	1	0		1	
Assoc. Professor	2	1	Dr.M.R.Saseendranath	1	
Asst. Professor	4	2	Dr. K.Vijayakumar Dr. P.V.Tresamol	2	
Vety. Public Health					
Professor	1	1	Dr. E.Nanu	0	
Assoc. Professor	2	0		2	
Asst.Professor	6	1	Dr.C.Latha	5	
Vety. Hospital, Mannuthy					
Assoc .Professor	1	1	Dr. Joseph Mathew	0	
Asst. professor	2	0		2	
Assoc .Professor					
Asst Professor	1	1	Dr. P.C Alex		
Research coordination	1	0		1	
Professor					
Instrumentation centre	1	1	Dr .K. S Sebastian	0	
Assoc. Professor					
Physical education	1	1	Dr. P.R.Chandrasekharan	0	
Assoc. Professor					
Asst.Professor	1	1	Mr. O.K. Paul	0	
	1	1	Mrs Molley cherian		

Administrative and Supporting staff

K.Rungaswamy, Admn. Officer	K.A.Merry, -do-
Baby Surojan, Section Officer	K.S.Ambili, Library Asst.
Mercy John, Section Officer	Anil K.V, Electricition Sln. Gr.
M.Girija, Section Officer	K.Indradevi, Radiographer
Urmiladevi.M.A., Section Officer	T.R.Viswambaran, Technical Supervisor
Sreekumar.D, Section Officer	Gr-I
M.K.Johnson, Section Officer (FC & D)	K.R.Kumaran, Artist
K.V.Ammelu, Section Officer	N.M.Surendran, -do-
K.J.Lommi, Section Officer(FC &D)	K.Chako -do-
T.Valsala, Section Officer(FC &D)	P.K.Ammuni, -do-
S.Akhileswari, Office Supdt.	P.N.Madhavi -do-
Rosy.K.Francis, , Office Supdt	K.R.Chandran -do-
P.H.Joshi, Typist Gr.I.	K.R.Sivaraman, -do-
P.J.Elizabeth, Sr.Gr.Typist	M.V.Kumari, -do-
R.Sasikumar, Typist Gr.I	M.V.Chandran, -do-
Nabeeza.N.P., Typist Gr.I	O.P.Premkumari, -do-
V.Mohandas, Sl.Gr.Typist	U.Ravichandran, Driver (HDV)
Indradevi K. Sln.Gr.Assistant	Biju N. Baby -do-
P.J.Thirugose, Sln.Gr.Assistant	T.G.Mohanan LDV Driver
Yousafji P.A., Sr.Gr.Asst.	Mohammed Mozadiq, Hostel Manager
A.R.Sheela, Sr.Gr.Asst	K.V.Josephi, Hostel Manger
Piusn Felix, Sln.Gr.Asst.	K.K.chandra, Matron
Sujatha Blini, Sr.Gr.Asst.	P.Meenakshy, Lab Asst Gr-I
Sureshkumar V.L., Sr.Gr.Asst.	T.A.Kunjan, Lab Asst. Gr-II
Mohammed Rusheed.V.Y, Asst.Gr.I	Binu.K.Chandi, Lab Asst.Gr.II
Rajalakshmi, Sr.Gr.Asst.	P.S.Santhakumari, Peon
Lalithambika.P.S., Asst Gr -II	T.K.Mariyam, Class IV
M.Daby Clucko, Asst.Gr.II	T.P.Rosily, Class IV
P.K.Anandkumari, Sr.Gr.Asst	P.K.Rosy, Class IV
P.P. Suradi, Farm Asst. Sr.Gr.	V.V.Jayan, Class IV
P.U. Thunkattu, Farm Asst.Sr.Gr.	M.J.Rosily, Class IV
M.M.Kamini, Farm Asst. (Sr. Gr.)	M.B.Chandran, , Class IV
C.N.Soman, Farm Asst. (Sr. Gr.)	A.K.Janaky, Class IV
K.Sivasankaran, Farm Supervisor Gr-II	V.P.Sindhu, Lab Asst.
K.V.Rosily, Farm Supervisor Gr-II	Rajeev.A.R. , Class IV
P.S.Sabeer, Farm Supervisor Gr-II	M.V.Omana, , Class IV
K.P.Sivasankaran, Farm Supervisor Gr-II	Yesodha.P.V., Class IV
K.K.Pushpan, Farm Supervisor Gr-II	Sanilkumar.T.C., , Class IV

Administrative and Supporting Staff

Sl.No.	Name of Department	Farm Asst.(Sl.Gr.)			S	Class IV	
		S	P	V		P	V
1.	Veterinary & Prev.Med	1	1	-	2	1	-
2.	Anatomy	1	1	-	1	1	-

		7					
3.	Bio-Chemistry	--	-	-	1	1	-
4.	Physiology	2	-	-	2	1	1
5.	Livestock Prod. & Mgt.	1	1	1	1	1	-
6.	Extension	1	1	1	2	-	2
7.	Animal Breeding & Genetics	7	6	1	-	-	-
8.	Statistics	-	-	-	1	1	-
9.	Parasitology	1	1	-	1	1	-
10.	Pathology	3	1	2	2	1	1
11.	Microbiology	1	1	-	2	2	-
12.	Pharmacology & Toxicology	1	1	-	1	1	-
13.	Animal Reproduction	4	3	1	2	2	-
14.	Surgery	-	-	-	2	1	1
15.	Clinical Medicine	1	1	-	1	1	-
16.	VPH	1	-	-	1	-	1
17.	Dairy Science	1	1	-	3	1	2
18.	Dairy Plant	1	1	-	1	1	-
19.	Nutrition	2	2	-	2	-	2
20.	Livestock Products Tech.	1	1	-	2	1	1
21.	Poultry Science	1	-	-	1	-	1
22.	Vety. Hospital	-	-	-	-	-	-
23.	Vety. Hospital, Kokkalai	2	2	-	4	2	2
24.	Instrumentation Centre	-	-	-	1	1	1

Technical staff Para Technical staff

Sl.No.	Designation	S	P	V	Remarks
1.	Farm Super/Farm Asst.	33	23	10	
2.	Lab tech/Technician	6	5	1	
3.	Audiovisual Operator	2	2	-	
4.	Attnd	1	1	-	
5.	Driver	3	3	-	
6.	Radiographer	1	1	-	
7.	Office Superintendent	2	2	-	
8.	Typist	2	2	-	
9.	Programmer	1	1	-	
10.	Technical Asst.	1	1	-	
11.	Computer Operator	1	-	1	
12.	Marker	1	1	-	
13.	Steno	1	1	-	
14.	Asst.	4	3	1	
15.	Librarian	1	1	-	
16.	Librarian Asst.	2	2	-	
17.	Reference Asst.	1	-	1	
18.	Class IV	34	17	7	
19.	Filecler	1	-	1	
20.	Permanent Labourer	6	4	2	
21.	Electrician	1	-	1	
22.	Animal Attendant	2	2	-	
23.	Pharmacist	1	1	-	
24.	Sr Section Officer	2	2	-	
25.	Workshop attendant	1	1	-	

**COLLEGE OF VETERINARY & ANIMAL SCIENCES
POOKOT, WAYANAD**

Staff position

Scientific staff

Department Designation	No of Posts				
	Sanctioned	In Position	Name of the Incumbent	Vacant	Remarks
Professor	17	1	Dr.P.P.Balakrishnan Associate Dean	Nil	Nil
Associate Professor	32	Nil	Nil	32	Nil
Assistant Professor	41	6	--	35	Teaching assistants engaged on daily wages
			Dr.M.K.Narayanan (1.4.03 to 25.10.03)	Nil -	On study leave
			Dr.K.Karthiayni (24.9.03 to 31.3.04)	-	Whole period
			Dr.K.S.Anil	-	Whole period
			Dr.K.A.Bindhu	-	Whole period
			Dr.K.M.Lucy	-	Whole period
			Dr.T.V.Aravindakshan	-	Whole period
			Dr.R.S.Jiji	-	on daily wages whole period
Teaching assistants	35	35	--	-	Engaged on daily wages

Administrative & Supporting Staff

Administrative Officer	1	1	Sri.K.I.Chakkuny (11.7.2003 to 6.9.2003) Smt.P.K.Elsy (7.9.2003 to till date)	Nil	Nil
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Section Officer	4	2	Sri.O.Sethumadhavan Kutty (29.8.03 to 31.3.04) Smt.L.SyamalaDevi (28.8.03 to 5.3.04) Smt.K.P.Vasantha Kumari (9.3.04 to till date)	2	Nil
Assistants	13	1	Smt.Brigit Kuruvilla (16.6.2003 to 1.4.2003) Smt.K.S.Anitha (17.6.2003 to till date)	12	3 engaged on daily wages
Steno	1	1	Sri.K.K.Parameswaran (full period)	Nil	Nil
Typist	4	1	Smt.P.V.Seena (full period)	3	Nil
ClassIV/animal attendant/FTS	58	0	-	58	8 engaged on daily wages
Others	23	0	-	23	Nil

Technical Staff

Assistant librarian	1	1	Sri.K.P.Sathian (27.9.2003 to 4.3.2004) Sri.A.T.Francis (5.3.2004 to till date)	0	Nil
Library Assistant	2	0	-	2	1 engaged on daily wages
Data entry Operator	1	0	-	1	1 engaged on daily wages
LDV Driver	1	0	-	1	1 engaged on daily wages
Others	57	0	-	57	Nil

COLLEGE OF DAIRY SCIENCE AND TECHNOLOGY, MANNUTHY

Staff position

Scientific staff

Department and designation	Number of posts				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
Associate Dean	1	1	Dr. V. Prasad	Nil	

Asst.Professor (Dairy Sc.)	2	2	Dr. A.K. Beena Dr.Sreeja Rajmohan	Nil	
Assistant Professor, (Dairy Chemistry)	1	Nil	----	1	--
Assistant Professor, (Electrical Engg.)	1	Nil	----	1	
Computer Engg.	1	Nil	----	1	

Administrative and Supporting Staff

Admn. Assistant	1	1	K.K. Kuttapppan	Nil	
Sln. Grade Typist	1	1	A.N. Malathy	Nil	
Typist Grade II	1	Nil	-----	1	
Assistant Grade II	6	3	P.R. Murali T.R. Manoj E.A.Muhammed Shereef	3	
L.D.V .Driver Gr. II	1	1	K.A. Basheer	Nil	
Duplicating Machine Operator	1	1	M Gopinathan	Nil	
Class IV	2	Nil	--	2	
Data Entry Operator	1	Nil	---	1	
Lab Asst. Grade III	2	1	Shibu Timothy	1	

Technical staff

Dairy Assistant	2	Nil	--	2	
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Scientific staff

Asst.Prof.(Dairy Sc.)	2	Nil	-----	2	
Assistant Professor, (Agrestology)	1	1	Smt. Nimmy Jose	Nil	

Administrative and Supporting Staf

Assistant	2	Nil	-----	Nil	
Typist Grade II	1	Nil	-----	1	

Technical staff

Farm Assistant (Vety)	2	2	M.K.Rajendran Nair Rajeev.S	Nil	
Farm Asst. (Agri)	1	1	Sri.T.V. Kuttichan		

COLLEGE OF FISHERIES, PANANGAD

Scientific staff

Department & Designation	No. of posts				Remarks	
	Sanctioned	In position	Name of the incumbent			Vacant
Dean	1	-	Dr.D.Damodaran Nambudiri		1	Assoc. Prof. i/c of Dean
Aquaculture Dept.						
Professor	1	--	--		1	
Assoc. Professor	3	2	1	Dr.Susheela Jose	1	
			2	Dr.C.Mohanakumaran Nair		
Asst. Professor	7	6	1	Dr. Thresiamma James	1	Officiating 3 Assoc. Professors
			2	Dr.C.Thankappan Pillai		
			3	Dr.M.V.Mohan		
			4	Smt.Aneykutty Joseph		
			5	Dr.S.Syama		
			6	Dr.Devika Pillai		
Asst. Professor (Supernumerary)	1	1	Sri.K.Dinesh			
Fishery Biology Dept.						
Professor	1	-	--		1	
Assoc. Professor	2	2	1	Dr.K.V.Jayachandran		
			2	Dr. J.Rajasekharan Nair		
Asst. Professor	7	3	1	Dr. T.M. Jose	4	
			Dr. T.V. Anna Mercy			
			Dr. K.G. Sunny			
Fish Processing Technology						
Professor	1	-	--		1	
Assoc. Professor	1	1	Dr. D.Damodaran Nambudiri			Acting as Dean i/c
Asst. Professor	7	5	1	Dr. P.M. Sherief	2	
			Dr. M.C. George			

Asst. Professor			Dr. Sajan George		
			Sri. S. Krishna Kumar		
			Dr. Lissy Behanan		
			Smt. Omana Pavunny on working arrangement.		
Fishery Hydrography					
Professor	1				(Re designated post)
Assoc. Professor	2	2	1 Dr. K. Kerala Varma		
			2 Dr. C.J. Cherian		
Asst. Professor	5	2	1 Sri. P.S. Mrithunjayan	3	
			2 Sri. N.N. Ramana		
Fishery Engineering					
Assoc. Professor	1			1	
Asst. Professor	2	1	Sri. George Mathew	1	
Dept. of Management Studies					
Assoc. Professor	1	1	Sri. T.M. Sankaran		
Asst. Professor	7	7	1 Dr. M.S. Raju		
			2 Dr. K.M. Mathew		
			3 Dr. V. Ambilikumar		
			4 Smt. Sucey V. John		
			5 Smt. V. Malika		
			6 Smt. Alphi Korath		on working arrangement
			7 Smt. Dalcy C. Kappen		
			8 Dr. Mathew Sebastian		
Fishing Technology					
Assoc. Professor	1			1	
Asst. Professor	2	1	Dr. B. Manoj Kumar	1	

Administrative and Supporting Staff

Administrative Officer	1	1	Sri. A. Kuriakose		
Section Officers	3	3	1 Smt. M.S. Zulaika Beevi		
			2 P.G. Sreekantha Pai		

Section Officers			3	K.R.Santha		Joined duty on 10/2003
Section Officer (FC& D)	3	3	1	Smt. P.V.Brizitha		
			2	Smt. R. Sarada Devi		
			3	Smt. H.K.Khadeeja Beevi		
Assistants	10	10	1	Smt. M.D. Kunjamma		
			2	Sri. C.S. Baburaj		
			3	Sri. A.S. George		
			4	Sri. K.P.Sajan		
Assistants			5	Sri.P.Santhosh		
			6	Sri. N.Gopinathan Kartha		
			7	Sri.K.M.Mohammed Ikkal		
			8	Sri. P.R. Sreekumar		
			9	Sri. M. Nazeerkhan		
			10	Smt.Elizabeth L. Edward		
Typists	4	4	1	Smt. M.P. Rajani	--	
			2	Smt.K.A.Geetha		Joined duty in 6/2003.
			3	Smt.K.D.Rossily		Joined duty on 1.3.2004.
			4	Sri. A.V. Thomas		
Class IV	7	5	1	Sri. K.N. Sasikumar	2	
				Sri. T.K.Abdul Majeed		
				Smt.K.M.Khadeeja		
				Smt. E. Leelamani		

Technical Staff

Asst. Librarian	1	1		Sri. Manohar.R	-	
Programmer	1	1		Smt. Tessa K. Thomas	--	
Reference Assistant	1 each	2	1	Sri. V.S.Kunjumammed		
Library Assistant			2	Sri.Jayapradeep		
Sr. Farm Supervisor	1	1		Smt. P. Jayamony		
Skipper Gr. II	1	1		Sri. T.R. Ravindran		

Lab Asst. Gr. II	2	2	1 Sri.A.M.Kareem		
			2 Sri.V.R.Lates		
Lab Asst. Gr. III/ Clerical Asst.	4 + 1	5	1 Sri. P.P. Pushpakaran	--	
			2 Sri. A.N. Reghu		
			3 Sri. M.A. Sebastian		
			4 Sri. John Mendez		
			5 Sri. T.K. Kunjumon		
Fieldman (Fisheries)	2	2	1 Sri. K. Balakrishnan		
HDV Driver	1	-	Sri.Balachandran Nair		
LDV Driver	3	2	1 Sri.A.M. Abdul Khader	1	
			2 Sri. M. Aji Kumar		
Bus Attendant	1	1	1 Retnakumar.P.S.	--	
Technician	1	1	Sri. K.P.Sreedharan Nair		
Dup Machine Operator	1	1	Sri.K.J. Jose		
Pump Operator	1	1	Sri.A. Kotha		
Hostel Manager	1	-	--	1	
Matron	1	1	Smt. Santhamma		
Fisherman	5	1	Sri. P.J. Kunjappan	4	
Farm Assistant	2	2	1 Sri. P.A. Mony		
			2 Sri. P.K.Abdul Salan		
			3 Sri.M.C.Sachidanandan		on working arrangement.
Engineer i/c	1	1	Sri. V.C. Sivarajan		
Deck Hand	3	3	1 Sri. K.P. Ponnappan		
			2 Sri. K.B. Karthikeyan		
			3 Sri. P.K. Benny		

**KELAPPAJI COLLEGE OF AGRICULTURAL ENGINEERING &
TECHNOLOGY, TAVANUR.**

Scientific Staff

Dept. & Designation	No. of Post				Remarks
	Sanct	In position	Name of the incumbent	Vacant	
Dept. of LWRCE: Dean	1	0	--	1	On retirement of Dr.K.John Thomas on 20.10.2003
Professor	1	0		1	
Assoc. Professor	2	0		2	
Asst. Professor	5	5	Smt. Renukakumari,J. Smt. Rema K.P. Sri. Sathian, K.K. Smt. Shyla Joseph *Sri. Raju, T.D.	0	On working arrangement at Agrl. Drainage Scheme, Karumady
Dept. of IDE: Professor	1	0		1	
Assoc. Professor	2	1	*Dr.E.K.Mathew – Asst. Prof. working against the post of Assoc. Prof.	1	*On working arrangement at AICRP on Agrl. Drainage, Karumady
Asst. Professor	5	5	**Smt. Mary Regina, F. Sri. Alexander Seth Smt. Asha Joseph Sri. Leven, K.V. Sri. Abdul Hakkim, V.M.	0	**On LWA
Dept. of PIIT & AP: Professor	1	0		1	
Assoc. Professor	2	1	Dr. Santhi Mary Mathew	1	
Asst. Professor	3	2	Sri. Prince, M.V. Dr. K.P. Sudheer	1	
Dept. of FPME: Professor	2	1	Prof. C. P. Muhammad	1	Holding the charges of Dean
Assoc. Professor	3	2	Sri. Jippu Jacob	1	
Asst. Professor	5	5	*Dr. VR. Ramachandran. Dr. Sathyjith Mathew Dr. Shaji James, P. Sri. Preman, P.S. Sri. Manoj Mathew Smt. Geetha Susan Philip	0	*Asst. Prof. working against the post of Assoc.Prof.

Dept. of SAC:					
Mathematics					
Professor	2	2	Dr. K. I. Koshy	0	Assoc. Prof. working against the post of Prof.
Assoc.Prof.	2	0	Dr. Habeeburrahman PV	2	
Asst. Professor (Maths)	18	5	Smt. V. P. Lakshmikutty	13	
(Phy.Edn.)			Sri.M.Velayudhan Kutty		
(Physics)			Dr.K.M.Valsamma.		
(Civil Engg.)			Smt.Sasikala.D		
(Plant Physiology)			Smt.Abida.P.S		
AICRP on FIM					
Assoc.Prof	1	1	Dr.M.Sivaswami	0	
PFDC					
Assoc.Prof	1	1	Dr.Meagle Jose	0	
Asst.Prof	1	1	Sri.B.Vishnu	0	

Administrative and Supporting Staff

Administrative Officer	1	1	Sri. C.Assainar	0
Section Officer	4	4	1. Sri. C.T.Mukundan 2. Smt.S.Girija 3. Smt.Leelamma Augustine. 4. Smt. Indirakumari K.	0
Section Officer (FC&D)	1	1	1. Sri.Abdurahiman,K.P.	0
Assistants	12	9	1. Sri. M. Rajan 2. Sri. C. Gopi 3. Sri. M. Muraleedharan 4. Smt. Radha Gopan, P. 5. Sri. K. Velayudhan 6. Sri. Johnson, P.I. 7. Sri. Suresh Babu K 8. Shanavas Kurunian. 9. Sri. Sivaprasad, P.	3
Typists	5	3	1. Sri. R.Balasubramanyan 2. Sri. Ratnakaran, P. 3. Sri. Sakeer Hussain Karivadan	2
Matron	1	0		1
Hostel Manager	1	0		1
Class IV	13	4	1. Sri.C. Narayanan 2. Sri. Arjunan Nadar, A. 3. Sri. A. V. Dasan 4. Sri. K.Parameswaran	9
*Workshopmate	1	0		1

Technical Staff:

Asst. Engineer (Mech).	1	0		1
Design Engineer	1	0		1
Junior Programmer	1	0		1
Reference Assistant	1	1	Sri. K. Harris	0
Technical Asst.	3	1	Sri Jolly Joseph	2
Draftsman (Civil)	1	0		1
Overseer	1	0		1
Draftsman (Mechanical)	1	0		1
Technical Supervisor	5	2	Sri. C. Velayudhan Sr.Gr. Sri. K.T.Ramachandran Gr.I	3
Trade Assistant	8	1	Sri. Surendran Pillai	7
Pump Operator	2	2	Sri. A. P. Ayyappan Sri.E.Pameswaran Nair	0
Driver (LDV)	3	3	1. Sri. M. V. Ramachandran 2. Sri. M. K. Narayanan 3. Sri. Abdul Majeed, P.P.	0
Technician	11	3	1. Sri. V. K. Asokan 2. *Sri. K. Aravindan 3. *Sri. N. Narayanan	8
Lab. Assistant	7	4	1. Sri. K. K. Subramanian 2. Kum. N. T. Lakshmy 3. Smt. T. Pankajam 4. K.Prasanthkumar	3
Farm Supervisor (Agri)	2	2	1. Sri. M.V.Raveendran. 2. Sri. K. Sethumadhavan	0
Farm Supervisor (Vety)	1	1	1. Sri. K. Shanmughan	0
Farm Assistant (Agri)	4	4	1. Sri. K. Muhammad 2. Sri. T. P. Aboobacker 3. Sri. Alikutty, C.P. 4. Sri. K. Pradeepkumar	0
Farm Assistant (Vety)	1	1	1. Sri. T. Venu	0
Research Assistant	1	0		1
Gardener	1	0		1
Duplicator Machine Operator	1	0	1. Sri. Kunhan, C.	0
Audio Visual Operator	1	1	1. Sri. K.P. Koran	0

K.A.U. HIGH SCHOOL,VELLANIKKARA

Staff position as on 31-3-2004.

<u>Designation</u>	<u>Name of incumbent</u>	<u>Remark</u>
H.M.	Sri. Abraham A.J.	V.R.S. on 31/07/03
H.M. i/c	Smt. Thresiamma. K.P.	
Tr. Eng. Med.	Smt. Deborah Cyril	
Tr. Eng. Med	Smt. Latha Balaraman	
Tr. Eng. Med	Smt. Lilly A.J.	
Tr. Eng. Med	Smt. Indiradevi K.S.	
U.P.S.A Mal	Smt. Magy T.J.	
U.P.S.A Mal	Smt. Najeema Unnikkammu	
U.P.S.A Mal	Smt. Leena K.S.	
L.P.S.A	Sri. Bhaskaran P.K.	
L.P.S.A	Smt. Alli M.A.	
L.P.S.A	Smt. Mary M.V.	Retired on 31/03/04
L.P.S.A	Smt. Mallika M.K.	
Tr Music	Smt. Naseera K.	
N.S.A Mal	Smt. Devika P.	
N.S.A Mal	Smt. Shylaja D.V.	
Ayah	Smt. Sumithra K.R.	
Ayah	Smt. Soudamini M	
Sweeper cum Attendant	Smt. Janaky P.R.	
Peon	Sri. Ali Akbar K.	
Assistant	Smt. Brigit .Kurivilla.	

Designation	Sanctioned	In position	Vacant	Remarks
Headmaster	1	-	-	
Tr. Eng.Med.	7	5	2	Filled through Employment exchange.
U.P.S.A Mal	3	3	-	
U.P.S.A Hindi	1	1	-	Filled through Employment exchange.
U.P.S.A Mal	1	1	-	Filled through Employment exchange.
L.P.S.A	5	4	1	
H.S.A	7	7	-	Filled through Employment exchange.
H.S.A Hindi	1	1	-	Filled through Employment exchange.
Music	1	1	-	
Phy. Edn .	1	1	-	Filled through Employment exchange
Drawing	1	1	-	Filled through Employment exchange.
Nursery School Assistant Mal	2	2	-	
Nursery School Assistant Eng.	2	2	2	
Ayah	4	2	2	
Peon	1	1	-	
Sweeper cum Attendant	2	1	1	

NARP (SOUTHERN REGION), VELLAYANI

Staff position

Scientific staff

Dept. and designation	No. of posts				Remarks
	Sanctioned	In position	Name of incumbent	Vacant	
NARP Phase I					
Associate Director	1	1	Dr. P. Saraswathi		
Associate Professor	3	2	Dr. P. Saraswathi (Prof.) Dr. K.M. Abdul Khader Vacant (SS&AC)	1	Agri. Stat. P.B. & Gen. From 2-3-02
Assistant Professor	9	8	Smt. Susan Thomas Dr. P. Manju (Asso.Prof.) Dr. Sudharmai Devi (Asso.Prof.) Dr. L. Rajamony (Asso.Prof.) Dr. I. Sreelathakumari Dr. Arthur Jacob (Asso. Prof.) Dr. Hebsy Bai (Assoc. Prof.) Dr. M.S. Hajilal (Assoc. Prof.)	1	Comp. Sci. P.B.& Gen. SS&AC Olericulture Horticulture Agri. Entom. Agri. Entom. Agri. Engg. Agri. Extn.
AICRP on Forage Crops					
Associate Professor	1	1	Dr. D.I. Suma Bai		P.B.& Gen.
Assistant Professor	1	1	Dr. S. Lekshmi		Agronomy
AICRP on Nematode Pests					
Associate Professor	1	1	Dr. M.S. Sheela		Agri. Entom.
Assistant Professor	2	2	Dr. T. Jiji Sri. K.D. Prathapan		Agri. Entom. Agri. Entom.
AICRP on Pesticide Residues					
Associate Professor	1	1	Dr. S. Naseema Beevi		Agri. Entom.
Assistant Professor	1	1	Dr. Thomas Biju Mathew		Agri. Entom.
AICRP on Honey Bee					
Associate Professor	1	1	Dr. S. Devanesan		Agri. Entom.
Assistant Professor	3	3	Smt. K. S. Premila Dr. M.H. Faizal Dr. N. Anitha		Agri. Entom. Agri. Entom. Agri. Entom.
DST Project on AAS					
Technical Officer	1	1	Dr. K. Prathapan		Agronomy
AICRP on Mushroom					
Assistant Professor	1	1	Dr. K.S. Meenakumari		Pl. Pathology

Administrative and supporting staff

NARP Phase I					
Admn. Officer	1	1	Smt. J.R. Fatima Malar		
Section Officer	2	2	Smt. A. Mary Philomina Smt. N. Indira Devi		
Section Officer (FC&D)	1	1	Sri. C. Rajendran Nair		
Office Supdt.	2	2	Smt. S. Sudha Devi (Steno) Smt. Ponmani Mohana		
Typist Grade I	1	1	Smt. Ushakumari		
Assistants	6	5	Smt. B. Sulekha (Sr. Gr.) Sri. A. Georgekutty (Sr.Gr.) Smt. Catherine Mercy (Gr. I) Smt. Jayakumari, C. (Gr. I) Smt. S. Sreedevi (Gr.I)	1	
Driver (LDV) Grade II	3	3	Sri. P.S. Vijayakumaran Nair Sri. M. Xavier Sri. V.P. Madhukumar		
Photographer	1	1	Sri. A. Sulaimankutty		
Duplicating Machine Operator	1	1	Sri. P. Kesavan Nair		
Class IV	2	1	Sri. S. Manikantan	1	
Plan Scheme -- Information Data Base					
Technical Assistant (Computer)	1	1	Sri. P. Sreekumar		
AICRP (Forage Crops)					
Assistant Grade II	1	1	Smt. B. Sobhana (Sel.Gr.)		
Typist Grade II	1	1	Smt. Sthanulekshmi		

Technical staff

NARP Phase I					
Farm Supervisor	1	1	Sri. D. Sulochanan		
Farm Asst.(Agri.) Gr. I	1	1	Sri. Jones Charles		
Lab. Assistant Grade I	1	1	Smt. S. Indirakumari		
AICRP (Forage Crops)					
Farm Asst.(Agri.)	3	3	Sri. David Dharmakumar Sri. K. Justin Sri. Sajeew, K.S.		
Technical Assistant	2	2	Sri. Krishnakumar Sri. Prasannakumar (Farm Ast.)		
Lab. Assistant Grade II	1	1	Smt. Santha		
AICRP (Nematode Pests)					
Farm Asst.(Agri.) Gr. II	1	1	Sri. K. V. Valsan		
Lab. Assistant Grade III	1	1	Sri. S. Sanilkumar		
AICRP (Pesticide Residue)					
Lab. Assistant Grade III	2	2	Sri. R. Raveendran Nair Smt. S. Indirakumari		
AICRP on Honey Bees					
Farm Asst.(Agri.) Gr. I	1	1	Sri. C.S. Vijayakumar		
Lab. Assistant Grade II	1	1	Sri. Sudhakaran		

INSTRUCTIONAL FARM, VELLAYANI

Staff position

Scientific Staff

Department / Designation	No. of posts				Remarks
	Sancti- oned	In posi- tion	Name of the incumbent	Vac- ant	
Associate Professor & Head	1	1	Dr.K.Harikrishnan Nair	Nil	
Assistant Professor	4	4	Dr.M.Suharban (Associate Professor) Dr.D.Geetha (Associate Professor) Dr.A.S.Anilkumar Dr.T.Sajitha Rani	Nil	
Associate Professor			Dr.M.S.Hajilal (on working Arrangement from NARP) S.M.Shahul Hameed (on working arrangement from COA)		

Administrative and Supporting Staff

Admn. Officer Gr II	1	1	G.Joice	Nil	
Section Officer	2	2	Raziya Beegum Raghupathy Chettiar	Nil	
Assistants	7	7	Shakela Javad (Sel. Gr. Asst.) P.L.George ,, T.C.Latha(Sr.Gr.Asst) K.Sudharma ,, K.Balachandran Nair (HG) T.Sobhana (AsstGrI) S.R.Salini(Asst.Gr.II)	Nil	
Typist	2	2	A.Lalitha(Typist Sl. Gr) P.Asathy, Typist Gr II	Nil	
Watchman	2	2	A.Santhosh Kumar M.Suresh	Nil	
Peon	1	1	G.Nagappan	Nil	

LDV Driver	2	1	S.Anilkumar T.P.Sankaran(Provisional)	1	
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Technical staff

Tech.Supervisor Gr I	1	1	N.Sambasivan Nair	NI	
Farm Supervisor Gr.I	2	2	G.Raveendran Assari S.R.Rajeevan K.S.Ajayakumar(on WA)	NI	
Farm Assistants	6	4	M.S.Krishna Kumar(Sl.Gr.) Sri.P.G.Ajayakumar(Sl.Gr.) Sri.A.S.Harish Kumar (SrGr) I.Krishnakumari (Sr.Gr) C.S.Vijayakumar (Sn.Gr. on working arrangement) Johnes Charles (FA on working arrangement)	2	
Establishment Farm Worker	21	15	R.Vijayan A.Thajudeen B.Kamalasani Panicker M.Natarajan R.K.Sanal Kumar S.Asokan J.Roby P.Anilkumar R.Sadasivan S.Suresh Kumar S.Usha Kumari Kumari Vimala A.Santhoshkumar M.Suresh P.Baby	6	

CROPPING SYSTEMS RESEARCH CENTRE, KARAMANA

Staff position

Scientific Staff:

Department & Designation	Number of Posts			
	Sanctioned		Name of the incumbent	Remarks
<u>PLAN</u> Professor (Agronomy)	1	1	Dr.Kuruvilla Varughese	- Associate Prof. (i/c)
Asst.Professor (SS&AC)	1	1	Dr.Rani,B	-
Asst.Professor (Agrl..Stat.)	1	1	R.Balakrishnan Asan	- Associate Professor (i/c)(transferred to College of Agriculture, Vellayani w.e.f. 4-1-2004)
			Dr.Anil Kumar, V.	Joined Cropping Systems Research Centre, Karamana, w.e.f.4-1-04
<u>NON PLAN</u> Asst.Professor (Plant Pathology)	1	1	Dr.Kamala Nayar	Associate Prof. (i/c)

Administrative and Supporting Staff

<u>NON PLAN</u> Admn. Asst.	1	1	Parameswaran Nair	-
Senior Gr. Asst.	1	-		1
Peon	1	1	R.Sajikumar	-
<u>PLAN</u> Typist	1	1	Jayamoni,V	-
Messenger (Class IV)	1	1	K.Maniyan	-
<u>NON PLAN</u> Part-time sweeper	1	1	P.Bharathi	-

Technical Staff.

<u>PLAN</u> Farm Asst. (Sr.Gr.)	2	2	Vigrahanadhan Tomy Abraham	-
<u>NON - PLAN</u> Lab.Asst. (Gr.III)	1	1	G.V. Saju	-

COCONUT RESEARCH STATION, BALARAMAPURAM

Staff position

Scientific staff

Department & Designation	No. of posts			Vacant	Remarks
	Sanctioned	In Position	Name of the incumbent		
Associate Professor of Agronomy and Head	1	1	Dr.N.Purushothaman Nair	Nil	...
Assistant Professor of Agronomy	1	1	Dr.K.Viswambharan	Nil	Present incumbents is Asso. Professor of Agronomy
Assistant Professor of Plant Pathology	1	nil	n.a.	1	To be filled

Administrative and Supporting Staff

Administrative Assistant	1	1	S.Vallinayakom Pillai	Nil	
Assistant	2	2	Mrs.Catherine Mercy (up to 8-3-04) Mrs. T.S.Saritha (from 8-3-04 on wards) G.Sivakumari (left KAU on 16-2-04 to accept job inEdn.Dept.)	Nil	
Typist	1	1	T.Santha	Nil	
Peon	2	1	K.Mohanan	1	
Watchman	1	1	J.Soman	Nil	

Technical Staff

Farm Supervisor	1	NIL	-	1	Vacancy to be filled
Farm Assistants	2	1	Mohandas	1	Vacancy to be filled

FARMING SYSTEMS RESEARCH STATION, SADANANDAPURAM

Staff position

Scientific Staff

Department & Designation	Number of posts			Vacant	Remarks
	Sanctioned	In position	Name of the incumbent		
Assoc. Professor (Horticulture)	1	0		0	Vacant from 20.10.2003
Assoc. Professor (Soil Science)	1	1	Dr. R. S. Shehana	0	

Assistant Professors					
Plant Pathology	1	0		1	Vacant
Agricultural Engineering	2	2	*Dr. Noble Abraham Jayasree G. S.	0	*On working arrangement at SCRS, Konni
Agri. Economics	1	1	Dr. S. Regeena	0	
Agronomy	1	0		1	Vacant from 14.10.2003
Entomology	1	0		1	Vacant
Animal Management	1	0		1	Vacant

Administrative and Supporting Staff

Admn. Assistant	1	1	P. K. Mohanan	0	
Asst. Gr. I	2	3	M. J. Najeeb T. F. Ignatius * M. S. Noble	0	*on working arrangement from CoA, Vellayani
Typist Gr. II	1	1	Bhamini Amma	0	
Class IV	1	1	Rachel Thomas	0	
Peon	1	0		1	

Technical Staff

Technician Gr. I	1	1	Raju A.	0	
Lab Assistant	1	1	Mable Mathew	0	From 16.02.04 onwards
Farm Asst (Agri)	3	3	E. N. Raveendran Nair Rajendran (Sr. Gr.) Prabhakaran (Sr. Gr.)	0	
Farm Asst (Vety)	1	1	Thankamani R	0	

SOIL CONSERVATION RESEARCH STATION, KONNI

Staff position

Scientific staff

Cadre	Sanctioned	In position with name and qualification	
Asst. Professor (Sel. Gr.)	Nil	Madhusudan Nair	On working arrangement
Asst. Professor (Ag. Engg.)	-	Dr. Noble abraham	On working arrangement
Asst. Professor (Ag. Engg.)		Anil.K.R.	Principal Investigator

Administrative /Supporting/Paratechnical staff

Farm Asst.	2	Sri.G.Shaji, F.S.Gr.II R.Satheesan, F.S.Gr.II	
Sr.Gr.Asst.	2	N.K.Valsala, Sr.Gr.Asst D.Suprabha, Sr.Gr.Asst.	
Typist	1	S.Kaladevi, Sel.Gr.Typist	
Driver(LDV)	1	C.C.Chacko	
Class IV	1	K.K.Suresh	

REGIONAL AGRICULTURAL RESEARCH STATION, PATTAMBI

Dept. and designation	Sanct- ioned	In. position	No. of posts Name of incumbent	Vacant	Remarks
<i>Scientific staff</i>					
Non Plan					
Associate Professor					
Plant Breeding	2	Nil		2	
Asst. Professor	6	2		4	
„ Agronomy	2	0		2	
„ Plant Pathology	2	0		2	
„ Plant Physiology	1		Dr. Perla Venu on LWA	0	
„ Agrl. Extension	1	1	Helen.S.on leave for P.D.	0	
NARP Phase I					
Professor	2	Nil		2	
„ Soil Science & Agri.Chemistry	1	0		1	
„ Plant Breed. & Genetics	1	-		-	
Associate Professor	4	1		3	
„ Agronomy	2	1	Dr. Madhusudanan Nair	1	On WA at SCRS, Konni from 1-4-02
„ Agri.Engineering	1	0		1	
Agri.Economics	1	0		1	
Assistant Professor	7	5		2	
Agri.Engineering	1	1	Susan Cherian	0	On WA at CIS, Kozhikkode
Agri.Economics	1	1	A. Prema	0	
Agri.Extension	1	1	B. Shanmughasundaram	0	
Biochemistry	1	1	Dr.C.Beena	0	
Horticulture	1	1	Dr.M.C.Narayanankutty		
Plant Breeding & Genetics	1	0		1	
Entomology	1	0		1	
NARP Phase II					
Assistant Professor	2	2		Nil	
Horticulture	1	1	Dr.Jyothi.M.L.		
Agriculture Engineering	1	1	P.E.Deepthi Susan		
NSP/BSP					
Assistant Professor	1	1		0	
Plant Breeding & Genetics	1	1	Dr.Rose Mary Franceis	0	
AICRP on Arid Legumes					
Associate Professor	2	2		0	
Plant Breeding & Genetics	1	1	Dr.Sreenivasan		Asst.Prof.
Agronomy	1	1	Anitha.S.on leave for Ph.D.		Asst.Prof.

342-31-033-NP-120					
Non- Plan. B					
Sr.Fm Supsr.Gr.I	1	1	N.Saidalikkutty	-	
F. S. Gr.I	3	1	CPMA.Azeez	2	
Farm Assistant	5	2	V.P.Ramakrishnan	3	
			C. Subramanian		
Lab.Assistant	5	2	N.Saffiya	3	
			Mohandas		
Driver(HDV)	1	-		1	
Technician	1	1	P.Surendran	-	
Tractor Driver	1	-		1	
Regular Mazdoor\					
Class IV	5	5	M.Narayanan	-	
			A.Mohammedkutty		
			P.C. Koya		
			N. Rugmini		(Class IV)
			K.C.SuryaBahadoor		(Class IV)
Class IV	7	7	Beg Bahadur	-	
			C.Ramakrishnan		
			M.P. Mohanan		
			N.P. Thankamoni		
			A.P. Yesoda		
			C. Muhammedkutty		
			C. Parukutty		
Watchman	2	2	Vasunni	-	(Class IV)
			P.C.Kadeeja		(Class IV)
AICRP on Long Term Fertilizer Experiments					
Class IV	1	1	A.Unnikrishnan	-	
NARP I 342-31-035					
Sr. Admn. Officer	1	1	M.P.Ahammed	-	
Typist	2	2	V.Santhakumari	-	
			K.Vijayalakshmi		
Dupl. Operator	1	1	T. Rugmini	-	
Lab. Asst. Gr.II	1	-	M.Mohammed Shaji Gr.III	1	
Tractor Driver	1	-		1	
NARP II					
342-31-033-036-120					
(Non Plan)					
F. S.(V)	1	1	K.V.Mohanan	-	
Technician	1	1	T.P.Ramakrishnan	-	
Asst.Gr.II	1	1	P.V.Girija	-	
AICRIP					
342-31-033-627-120					
Farm Asst. Gr.I	4	2	PK.Rajasekharan	2	
			M.V.Yusuf		
Tr.Jp.DriverGr.II	1	1	M.V. Arumughan	-	
Tr.& Jeep Driver-I	1	1	C.Unnikrishnan (Provisional from Empl. exchange)	-	

Pulses AICRP on Guar (Arid Legumes) 342-31-033-640					
Farm Asst.Gr.II	2	2	K.Radhakrishnan T. Velayudhan	-	
Lab. Asst. Gr.II	1	1	T.Ramakrishnan	-	
NSP-BSP					
Tech.Assistant	2	2	Johny K. Varghese V.P.James	-	
Fld/Lab Assistant	1	1	Suresh Babu	-	
Driver	1	-		1	
Security guard		1			
Permanent labourers	67				
Casual labourers	25				

CASHEW RESEARCH STATION, ANAKKAYAM

Dept. and designation	Sanctioned	In position	No.of posts Name of incumbent	Vacant	Remarks
<i>Scientific staff</i>					
Statistics					
Assoc. Professor & Head	1	1	M.P. Abdurazak	Nil	Head of Office
Plant Breeding					
Assoc. Professor	1	Nil		1	during the entire period
Horticulture					
Assistant Professor	2	0		2	one post is temporarily shifted to College of Horti.and Dr. P.V. Nalini (Assoc. Prof.) is holding it
<i>Admn.and Supporting staff</i>					
Adm. Assistant	1	1	K.K. Sadeesan	Nil	
Assistant	1	1	B. Hareesh Babu	Nil	
Typist	1	1	Abdul Raheem Machingal	Nil	
Class IV	2	2	K.V. Balakrishnan K.P. Sobhana	Nil	
<i>Technical Staff</i>					
Farm Supervisor Gr I	1	1	K. Aboobacker	Nil	
Farm Supervisor Gr II	1	1	Srinivasan Palasseri	Nil	Till 31-5-02
			K. Mohammedali	Nil	From 3.6.02
Lab Assistant	1	1	K. Abdurahiman	Nil	From 8-4-02
Mali	1	1	M. Aboobacker	Nil	From 30-12-02
Permanent Labourer	10	3	T. Ali T. Nabeesa C.K. Aboobacker C.K. Pathumma	7	Retired on 31-1-03

AGRICULTURAL RESEARCH STATION, MANNUTHY

Dept. and designation	Sanct- ioned	In position	Name of incumbent	Vacant	Remarks
<i>Scientific staff</i>					
Assoc. Professor & Head	1	1	Dr. U.Jaikumaran	Nil	Nil
Assoc. Professor (Agron)	2	2	Dr.P.Sukumari*		*On WA at Directorate of Research
			Dr.P.A.Joseph		
Asst. Professor (Hort)	1	1	Dr.C.Narayanankutty	Nil	Nil
Assoc. Professor (Plant Breeding)	2	2	Dr.C.A.Rosamma Dr.M.T.Kanakamany	Nil	Nil
<i>Admn. and Supporting staff</i>					
Administrative Asst.	1	1	N.Mary Joseph	Nil	Nil
Asst. Sr. Grade	1	Nil	Nil	1	Nil
Asst. Grade I	1	1	T. Vijayalakshmi	Nil	Nil
Asst. Grade II	2	1	T.L. Agnes	1	Nil
Typist	1	1	C.J.Catherine	Nil	Nil
Peon	2	Nil	Temporary hands holding	2	Nil
Jeep Driver	1	Nil		1	Nil
Watchman	2	Nil		2	Nil
<i>Technical staff</i>					
Sr. Farm Supervisor	1	1	P.Bhaskaran	Nil	Nil
Farm Supervisor	2	2	V.Unnikrishnan M.C.Sachidanandan	Nil	*On WA to COF, Panangad
Farm Asst. Sr.Gr	2	1	Shajju D.Ollekkat	1	Nil
Lab Asst.	1	Nil	Nil	1	Nil
Tractor Driver	1	Nil	Nil	1	Nil
Technical supervisor	1	1	K.P.Sdarsanakumar	Nil	Nil

AICRP ON WEED CONTROL, VELLANIKKARA

Dept. and designation	No.of posts	Name of incumbent
Agronomist		
Assoc. Professor	1	Dr. C.T.Abraham
Residue Chemist		
Asst. Professor (Soil Science & Agri. Chemistry)	1	Dr.K.M.Durga Devi
Taxonomist/Plant Physiologist		
Asst. Professor	1	Dr.T.Girija
Farm Asst.Gr.I	1	Mr.C.P.Nandakumar
Asst.Gr.I	1	Mr.K.D.James
LDV Driver	1	Mr. Karthikeyan
Class IV	1	Mr.K.K.Suresh

BANANA RESEARCH STATION, KANNARA

Dept. and designation	No. of posts			Remarks
	Sanctioned	In position	Name of incumbent	
<i>Scientific staff</i>				
AICRP(TF)				
Assoc. Prof (Hort)	1	1	Dr. Rema Menon	-
Asst. Prof. (Hort.)	1	1	Dr. Suma, A.	-
Asst. Prof. (Pl. Path.)	1	1	Dr. Anita Cherian, K.	-
Asst. Prof. (Ag. Ent.)	1	1	Shakunthala Nair	-
NARP				
Assoc. Prof. (Hort.)	1	1	Dr. Sudhadevi, P.K.	-
Asst. Prof. (Agron.)	1	-		1
<i>Admn. and supporting staff</i>				
AICRP (TF)				
Typist Gr. II	1	1	P.K. Gayathri	-
Peon	1	1	R.K.D.B. Singh	-
Watchman	2	2	Security guards	-
KAU				
Admn. Asst.	1	1	P Sreejith	-
Asst. Gr. I	2	2	T.M.Devassy	-
Driver Gr. II			-	1
Pump Operator	1	1	A. Narayanan	-
Peon	1	-	-	1
<i>Technical staff</i>				
AICRP (TF)				
Technical Asst.	2	2	Babu, K.V. Sunny, K.M.	-
Farm Asst. Gr.I	3	3	P.N. Bhashajan (Sl.Gr.) K.G.Sarhisan R. Jayanthi	-
Lab. Asst. Gr.II	1	-	K.Gireesh Kumar	-
Oil Engine Driver	1	-		-
Mali	2	1	P. Subhadra	1
KAU				
Farm Supervisor Gr. II	1	1	Biju Kuruvila	-
Farm Asst. Gr. I	1	1		-
NARP				
Farm Asst. Gr. II	1	1	M.M.George	-

CASHEW RESEARCH STATION, MADAKKATHARA

Staff position

Scientific staff

Dept. & Designation	Number of posts				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
Assoc. Prof.(Agro.)	1	1	Dr. P.S. John	Nil	
Asst. Prof. (Ent.)	1	1	Dr. Susannamma Kurien	Nil	
Asst. Prof. (Plt. Breeding)	1	1	Dr. Mareen Abraham	Nil	
Asst. Prof. (Hort.)	1	1	Dr. Mini. C	Nil	

Administrative and supporting staff

Asst Gr. Seln.	1	1	Sri. K.M. Akberali	Nil	
Lab Asst.	1	1	Smt. P.A. Remani	Nil	
Class IV Employee	1	Nil	Nil	1	
Driver	1	1	Sri. P.I Rappai		Promoted and transferred to Head Quarters, Vellanikkara w.e.f 10.3.04

Technical staff

Farm Supervisor Gr.I	1	1	Sri. T. Ravindran	Nil	
Farm Asst. Sr. Gr.	1	1	Sri. K.G. Sathisan	1	Vacant w.e.f 23 rd May 03 to 31.3.04
Jr. Tech. Asst.	1	1	Sri. M.K. Manoj	Nil	
Grafter	1	1	Sri. S. Sasi		Vacant w.e.f 12.9.03

AGRONOMIC RESEARCH STATION, CHALAKUDY

Staff position

Scientific staff

Department and Designation	No. of posts				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
Professor of Agronomy/Soil Science/Ag. Engg	1	1	Dr. K.P. Visalakshi	-	Assoc. Prof. (Ag. Engg. in position
Assoc. Professors					
1) Soil Physics	1	-		1	
2) Agrl. Engg.	1	1	Dr. P. Suseela	-	Asst.Prof. in position
3) Agronomy	1	1	Dr. Reena Mathew	-	Asst.Prof(SS)in position
4) Pl. Breeding	1	1	Dr. V.S. Devadas	-	Assoc. Prof. (Hort.) in position
Agronomy Asst. Professors	2	2	Dr. T.K. Bridgit Dr. Mini Abraham	-	
Soil Physics	1	-	-	1	

Administrative and supporting staff

Admn. Assistant	1	1	Smt. Prema B. Nair	-	
Assistant Gr. I	1	1	Smt. K. Hemalatha	-	Sel. Grade
Assistant Gr. II	1	1	Smt. N.V. Annie	-	Senior Grade
Typist	2	2	1) Sri.M.C. Devassy	-	Grade I
			2) Smt. Salomi Silas	-	Office Supdt.
Driver	1	1	-	1	
Peon	1	1	-	1	

Technical staff

Farm Assistants	7	7	1) Sri. N.M. Mohanan	-	4 FS & 3 FA in position
			2) Smt. Vasanthy T.A.		
			3) Sri. V. John George		
			4) Sri. P.K. Reghu		
			5) Sri. A.R. Venu		
			6) Sri. M.T. Varghese		
			7) Sri. M.N. Anilkumar		
Lab Assistants	2	2	1) Smt. C.O. Marcy	-	
			2) Smt. Solly K. Jacob		
Pump Operator	1	1	Sri. P.K. Radhakrishnan	-	
Ploughman	1	-	-	1	

AROMATIC AND MEDICINAL PLANTS RESEARCH STATION, ODAKKALI

Category / Designation	No. of posts sanctioned	No. in position	Name of the incumbent	No. vacant	Remarks
Assistant Professor (Entomology)	1	1	Dr. Baby P. Skaria Associate Professor & Head	-	
Assistant Professor (Agril. Chemistry)	1	1	Dr. Samuel Mathew Associate Professor	-	
Assistant Professor (Agronomy)	1	1	Dr. Gracy Mathew Assistant Professor	-	
Assoc. Prof. (Agron.)	1	0	Dr. P. P. Joy Asst. Prof.	1	

Administrative & supporting staff

Section Officer	1	1	Smt. V. K. Pathumma		
Assistant	2	2	Sri. C. C. George		
			Sri. P. K. Bapukutty		
Typist	1	1	Smt. P. S. Shailaja		
Class IV/Peon	5	2	Smt. K. A. Ponnamma (Peon) Sri. M.R. Sudhakaran.	3	

Technical staff

Farm Assistant	4*	4	E. N. Sudhakaran Nair Sri. R. Raghu Sri. K. K. Vijayakumar Sri. K. M. Eldo	0	
*Under working arrangement from Instructional Farm, Vellanikkara					
Lab Asst. Graduate	1	-		1	
Lab Assistant Gr. III	1	1	Smt. E. P. Annakkutty	0	

PINEAPPLE RESEARCH STATION, VAZHAKULAM

Staff position

Scientific staff:

Dept. & designation	Number of posts				Remarks
	Sanctioned	In position	Name of the incumbent	Vacant	
Plant Breeding - Assistant Professor	One	one	K. P. Kuriakose	NIL	
Horticulture- Assistant Professor	One	-	-	One	

Administrative & supporting staff

Casual labourer	One	one	V.P.Thressiakutty	NIL	
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CSR SUB CENTRE, VADAKKENCHERY

Staff position

Scientific

No.	Name and designation	No. of post sanctioned	In position		Vacant
A.	Scientific staff				
1.	Assoc. Prof.(Agron) and Head	1	1	Dr. I. Johnkutty	Nil
2.	Asst. Professor (Hort)	1	1	Smt. Meagle Joseph	Nil

Administrative and supporting staff

1.	Typist Gr. I	1	1	Ms. P.A. Mumtaze	Nil
2.	LDV. Driver	1	1	Shri. C. Balakrishnan	Nil
3.	Class IV	1	Upto 31.05.2003	Shri. T.A. Abdul Mathaleef	Vacant from 1.6.2003
			From 20.08.03 to 13.2.04 employed on temporary basis from employment exchange	Shri. Maney K. Arandapallam	

Technical staff

B.	Technical staff (Field assistants)	6	6		Nil
1.	Farm Supervisor Gr. I	Full period		Shri. K.V. Natarajan	

2.	Farm Supervisor Gr. II	Full period	Shri. K.Vijayanarayanan	
3.	Farm Assistant Sel. Gr.	Full period	Shri. Sreenivasan Palassery	
4.	Farm Assistant Sel. Gr.	Full period	Shri. N.R. Rajan	
5.	Farm Assistant Sel. Gr.	Full period	Shri. P.S. Sanalkumar	
6.	Farm Assistant Sel. Gr.	From 6.5.2003 onwards	Shri. P.C. Girijavallaban	

INSTRUCTIONAL FARM, VELLANIKKARA

Staff position

Scientific staff

Department and section	Number of posts				
	Sanctioned	In position	Name of incumbent	Vacant	Remarks
Professor (Agron0.	1	1	K.P.Pradeep Assistant professor	-	-

Administrative and supporting staff

Administrative Assistant	1	1	N.Vijayakumar Upto FN of 19-05-03		
			G.V.Kumar From FN of 23-5-03	-	-
Assistant Sr.Gr	2	2	V.I.Sureshkumar Upto 20-5-03 AN		
			K.T.Shaji From 28-5-03 FN		
			U.P.Davis Full period	-	-
Typist - (Sel.Gr)	1	1	K.Chandrakumar	-	-

Technical staff

Sr.Farm Supervisor	1	1	M.J.Kochappan		
FS GI	1	1	K.Kesavan	-	-
FS GII	1	1	K.S.Thankappan	-	-
FA Sr.Gr	1	1	C.Girisan	-	-

REGIONAL AGRICULTURAL RESEARCH STATION, PILICODE

Staff positions

Scientific staff

Department	Designation	No. of posts				Remarks
		Sancti- oned	In position	Name of the incumbent	Vacant	
Non Plan						
Plant Pathology	Associate	1	-	-	1	
	Professor	1	-	-	1	
	Asst.Prof.					
Plant Breeding	Associate Prof.	1	-	-	1	
Horti-culture	Professor	1		-	1	Post shifted
	Asst.Prof.	1	1	-		
Training Service Scheme						
Extension	Asst.prof.	1			1	
NARP Ph.I	Associate Director of Research	1	1	Dr.P.C.Balakrishnan	-	Holding full additional charge
Soil science and Agrl.Chemistry	Professor	1	-	1	1	
Plant pathology	Associate Professor	1	1	Dr.M.Govindan	-	
	Asst.Prof	1			1	
Agronomy	Associate Professor	1	-	-	1	on LWA for study purpose
	Asst.Prof	1	1	Smt.P.K.Jayasree	-	
Agrostol-ogy	Associate Professor	1	-	-	1	
Plant Physiology	Associate Professor	1	1	Dr.G.V.Sudarsana Rao (Asst.Prof)	-	
Agrl. Engineer-ing	Associate Professor	1	-	-	1	
Agrl.Met-eorology	Associate Professor	1	-	-	1	
Agrl.Microbiology	Associate Professor	1	-	-	1	
Agrl.Stat-istics	Associate Professor	1	-	-	1	

Agri.Economics	Associate Professor	1	-	-	1	
Plant breed. & genetics	Associate Professor	1	-	-	1	
Agri. Entomol.	Asst.Prof.	2	2	Dr.Madhu Subramanan Smt.Lily Levin	-	On LWA for study purpose
Horti-culture	Asst.Prof.	1	1	Dr.M.P.Giridharan	-	
NARP Ph.II						
Agri.Engineering	Associate Professor	1	-	-	1	
Animal Mgt.	Asst.Prof.	1	1	Dr.Sashikanth	-	
Soil science and Agri.Chem.	Asst.Prof.	1	-	-	1	
Agri.Microbiology	l.Asst.Prof.	1	-	-	1	
AICRP on Cashew						
Horticulture	l.Asst.Prof.	1	1	Dr.B.Jayaprakash Naik (Assoc.Prof.)	-	
Agromet Advisory Service (DST)						
Agronomy	l.Asst.Prof.	1	1	Dr.G.Rajasree	-	(On leave)
		28	11		17	

Administrative and supporting staff

Designation	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
Admn. Officer	1	1	Smt.K.K. Beena	-	
Section officers	2	2	Sri V Narayanan Sri.E.V.Sasidharan	-	
Assistants	7	2	Sri.P.J Simon Sri. Sabu Joseph	5	
Section Officers (FC& D)	1	1	Smt. P.Radha	-	
Typists	3	1	Smt . V. Anitha	2	
LDV Drivers	2	1	Sri A.V.Kunhikrishnan	1	
Class IV	26	7	Sri T Damodharan Sri P Appukuttan Sri K.V Narayanan Sri.Suresan Sri P. Pokkan Sri K.V Ambu Sri K Ambady	19	
Tractor driver	1			1	

PEPPER RESEARCH STATION, PANNIYUR

Staff position

Scientific Staff

Department & Designation	Number of Posts				
	Sancti- oned	In position	Name of the incumbent	Vacant	Remarks
AICRP on Spices (ICAR)					
Assoc. Prof (Pl.Pathology)	1	1	Dr.K.P.Mammootty	0	
Assoc. Prof (Pl.Breeding)	1	1	Dr. Neema V.P	0	
Asst. Prof (Agron/ Hort)	1	0		1	
Asst.Prof (Pl.Pathology)	1	1	Dr.G.Sivakumar	0	
KAU (Non- plan)					
Assoc. Prof , SSAC	1	0	-	1	
Asst.Prof (Bot/ Agron / Ento)	2	1	Dr.T.Vanaja	1	

Administrative and Supporting Staff

KAU (Non- plan)					
Administrative Asst.	1	1	T.Lakshmikutty	0	
Senior Grade Asst	1	1	K.M. Joseph	0	
Assistant Grade II	1	1	K.K.Assootty	0	
Sel.Gr.Typist	1	1	K.Pushavalli	0	
Peon	3	0	-	3	
LDV Driver Sr. Gr	1	1	E.P.Narayanan	0	
Pump operator Sel. Gr	1	1	T.V.Madhavan	0	
AICRP (SPICES)					
Peon Sel.Gr	1	1	K.Rajeev	0	

Technical Staff

KAU (Non- plan)					
Farm Supervisor Gr. I	1	1	P.J.Joseph	0	
Farm Supervisor Gr. II	1	1	T.Muhammed Haneefa	0	
Farm Assistant Sr.Gr.	1	1	M.V.Premarajan	0	
AICRP (SPICES)					
Farm Asst. Gr.II-	3	3	A.Sasidharan , K.A.Kurien, P.P.Muralidharan	0	
Farm Asst. (IPDS)	1	1	K.J.Joseph	0	
Lab Asst. Gr.III	1	1	Nirmala Chellath	0	

Technical Staff

Designation	No. of posts				
	Sanctioned	In position	Name of the Incumbent	Vacant	Remarks
Farm Assistant (Agri)	11	7	Smt. K. Rugmini Amma Sri N.K Muralidharan Sri P. Rathish Sri P. Ajithkumar Sri T.V Rajeevan Sri.Krishnan	4	
Farm Asst. (Vet)	3	3	Sri. V. Bhaskaran Smt. K. Santhakumari Sri. E. Samikutty	-	
Pump Operator	2	2	Sri. P.V Mohanan Sri.Appu	-	
Lab Asst. Gr I & II	1	-		-	
Lab Asst. Gr.III / Clerical Asst.	5	2	Sri V. Narayanan* Sri M.V Radhakrishnan	3	*Retd.in Aug.03
Technician	1			1	
Asst. Engineer (Agri. Engg.)	1	-		1	
Technical Asst.	1	1	Sri P. Vijayakumaran	-	
Programmer	1			1	
Trainees Hostel Class IV	2	-		2	
Cook cum care taker	1	-		1	

REGIONAL AGRICULTURAL RESEARCH STATION, AMBALAVAYAL

Staff position

Scientific staff

Department & Designation	No. of posts				Remarks
	Sancti-oned	In position	Name of the incumbent	Vacant	
NARPI					
Associate Director of Research	1	0	Dr. K.C. Aipe	1	Assoc. Prof. (Agronomy)- officiating
Assoc. Professor -- Agronomy	1	1		0	
Asst. Professor Plant Breeding & Genetics	1	0		1	
Asst. Professor Agri.l Economics	1	0		1	

Asst. Professor – Horticulture	1	0		1	
NARP II					
Assoc. Professor Horticulture	1	0		1	
Assoc. Prof.-Animal management	1	0		1	
Asst. Prof – Horticulture	1	0		1	
Asst. Prof.-Plant Pathology	1	1	Dr.N.V.Radhakrishnan	0	
Asst. Prof.- Farm Machinery	1	1	Dr. E.K.Kurien	0	On working arrangement at AESC, Mannuthy

KAU Non-Plan					
Asst. Prof.- Plant Pathology	1	0		1	
Asst. Prof.- Microbiology -	1	0		1	
Asst. Prof.- Soil Science & Agrl. Chemistry	1	0		1	
AICRP on Spices					
Assoc. Prof.- Plant Breeding	1	1	Smt. Susamma P George	0	
DST on AAS					
Asst. Prof.- Agronomy	1	0		1	
Total	15	4-1		11+1	

Administrative and supporting staff

Administrative Officer (NARP)	1	1	Smt. L.Syamala Devi	0	
Section Officers	2	2	Smt. P.Sulochana Smt. C.Chandrikakumary	0	
Assistants	5	2	Sri N.Raveendran Sri P.R.Ragesh	3	
Stenographer (NARP)	1	1	Sri V.Vijayan	0	
Typists (One NARP)	2	2	Sri Sudhakaran A. Sri. Sarath Soman	0	
Class IV / Pcon / Regular Mazdoor	13	13	Sri P.Saidu Sri T.Saidalavi Sri V.Abu Sri. E.Ayamu Sri. O.Asokan	0	

			Sri. K.P.Mukundan Sri. A.T. Mohammed Smt. K.K.Nabeesa Sri.M.Kunhikrishnan K.P.Pradeep P.Moideen M.Suresh P.Abdul Salam		
Budder	1	1	Sri K.Ramakrishnan	0	
Tractor driver	1	0	Vacant	1	
Driver LD	1	0		1	
Total	16	14		2	

Technical staff

NARP-phase I					
Lab. Assistant Gr. II	1	1	Sri.N.J.Jayesh	0	
Farm Assistant	2	2	Sri K.M.George Sri C.T.Jacob	-	
				-	
NARP-Phase II					
Farm Assistant (Vety.)	1	1	Sri K.Radhakrishnann	0	
Technician (Engg.)					
Non-plan	1	1	Sri. K.Vasudevan	0	
Sr. Farm Supervisor/ Farm supervisor/ Farm Assistant	8	5	Sri V.K.Kumaran Smt.P.Padmavathy Sri A.Imbichi Ali. Sri A.Abdulrahiman Sri K.Lakshumanan	3	
Field supervisor					
Lab. Assistant	1	1	Sri. Raghavan.K.	0	
	2	2	Sri K.K.Velayudhan	0	On
Farm Asst.(CSS on spices)	1	1	Sri K.P.Pradeep Sri T.T.Jacob	0	working
Total					arrangemen t at RCIRC Calicut
	17	13		4	

CARDAMOM RESEARCH STATION, PAMPADUMPARA

Staff position

Scientific staff

Dept and designation	No. of posts				
	Sancti- oned	In position	Name of the incumbent	Vacant	Remarks
AICRP on Spices Assoc. Prof. (Agron/Horti.)	1	1	Dr.K.Vasantha Kumar Assoc.Professor(Hort.)	-	
Asst. Prof. (Ento.)	1	1	Dr.A.JosephRajKumar Asst.Professor(Ent.)	-	
NARP(Non-Plan) Asst. Prof. (Extn.)	1	-	--	1	-
Asst. Prof. (Pl. Breeding & Genetics)	1	-	--	1	-
KAU Non-plan Asst. Prof. (Pl.Path.)	1	1	Smt.Sainamole Kurien (Asst.Professor)	-	
Asst. Prof. (Soil. Sci.)	1	1	Sri.M.Murugan (Asst.Professor)	-	
Asst. Prof. (Hort.)	1	-	--	1	
Assoc. Prof. (Botany)	1	1	Dr.S.Backiyarani (Asst.Professor)	1	On study leave for PDF from 20/11/03.
Assoc. Prof. (Ento.)	1	1	Dr.D.Ambika Devi (Assoc.Professor)		

Administrative and supporting staff

AICRP on Spices Lab Asst. Gr. II	1	1	Sri C.S.Manoj	-	
Peon	1	1	Sri Poulouse Mathew	-	
NARP(Non Plan) Typist (Gr.II)	1	1	Smt. S.M.Haripha	-	Appointed through Employment Exchange
Driver LDV (Gr.II)	1	1	Sri C.A.Alikhan	-	
KAU Non Plan Administrative Assistant	1	1	Smt.Suma Varghese	-	
Asst. Sln. Gr.	1	1	Smt.A.K.Valsala	-	
Asst. Gr.II	1	-	-	1	
Typist Gr.II	1	-	-	1	
Driver Gr.II	1	-	-	1	
Class IV	3	3	Smt.Radhamony P.S.Satheesan R.Anilkumar		
Pump operator	1	1	Sri. M.J.Antony		

Technical Staff

AICRP on Spices Farm Assistant(Sel.Gr.)	1	1	Sri. C.G.Pradeep	-	
NARP(Non-Plan) Farm Supervisor(Gr.II)	1	1	Sri. V.P.Prasadu		
Farm Assistant(Sel.Gr.)	1	1	Sri K.G.Mohandas	-	
KAU(Non-Plan)					
Farm Assistant	2	-	-	2	

REGIONAL AGRICULTURAL RESEARCH STATION, KUMARAKOM

Staff position

Scientific staff

Dept. and designation	No.of posts				Remarks
	Sancti- oned	In position	Name of the incumbent	Vacant	
<i>Associate Director/ Professor of Agronomy (upgraded)</i>	1	-		1	Professor (Ento.) holding charge
<i>Agronomy Associate Professor (Root Wilt)</i>	1	1	Dr. K. Geetha	-	Assistant Professor
Assistant Professor (Weed Sc.)	1	1	Sri K.C. Rajan	-	Associate Professor
Assistant Professor (Agronomy)	1	1	Sri N.K. Sashidharan	-	Associate Professor
<i>Soil Sciences & Agrl. Chemistry Assistant Professor</i>	1	-	--	1	
<i>Biochemistry Assistant Professor</i>	1	-	--	1	
<i>Extension Associate Professor</i>	1	-	--	1	
<i>Agrl. Economics Assistant Professor</i>	1	1	Dr. K.J. Joseph	-	Associate Professor
<i>Horticulture Assistant Professor</i>	1	1	Dr.Sajan Kurian	-	Associate Professor
<i>Entomology Associate Professor</i>	1	1	Dr. P.Joy	-	Professor holding charge of ADR post
<i>Pl. Pathology Associate Professor</i>	1	0	--	1	
Assistant Professor (Microbiology)	2	1	Dr. A.V. Mathew	1	Associate Professor
<i>Pl. Breeding Assistant Professor (Pl. Br.&Gen.)</i>	2	2	1.Smt. Alice Antony 2.Sri K.A. Inasi	- -	Associate Professor Assistant Professor

<i>Pl. Physiology</i> Asst. Professor (Pl. Physiology)	1	-		1	
<i>Agri. Engg.</i> Associate Professor Assistant Professor	1 1	1 1	Smt. Subha Rani Kurien Sri. Joby Bastian	- -	Assistant Professor Assistant Professor
<i>Agri. Statistics</i> Assistant Professor	1	1*	Smt. Alphi Koruth	-	(*Working arrangement, COF Panangad)
<i>Aquaculture</i> Assistant Professor	2	1	Dr. K.G. Padmakumar Dr. Anuradha Krishnan*	1	Assoc. Professor Assoc. Professor (on long leave)*
<i>Animal Reproduction</i> Assistant Professor	1	-		1	
Asst. Professor (Horti.)*	1*			1	Post shifted CoH.
Asst. Professor (Ento.)*	1*			1	Post shifted DoE.
Total	24	13		11	

Administrative and supporting staff

Administrative Officer	1	1	Smt. Lilly Kutty Sebastian	-	
Section Officers	2	2	Sri M.R. Ramachandran Smt. B. Bhanumathy	-	
Section Officer (FC&D)	2	2	Smt.C.B. Merlin Sri.M.C. Jayakumar	-	
Office Assistants	6	6	Sri C.P. Jayakumar Smt. P.N. Shylaja Devi Smt T.K. Thankamma Sri.Anujan, B. Smt. Jayasree R. Warriam Smt Krishna Kumari	-	
Typist	4	4	Smt. Radhamony Smt. Mini Joseph Smt. P. Baby Smt.P.T. Ajith		
Driver (LDV)	2	2	Sri T.M. Francis Sri O.R. Sasidharan	-	

Driver (HDV)	1	1	M.G.Sankaranarayanan Nair	-	
Duplicator Operator	1	1	Sri.K.J.Jose	-	
Class IV	7	3	Sri M.T. Ponappan Sri Anoop Sankara Pillai Sri E.P. Sasidharan	4	
Bus Attendant	1	1	Sri. M.K. Sivaraman		
Tractor Driver	1	-	--	1	
Total	28	23		5	

Technical staff

Senior Farm Supervisor	1	1	Sri Sasidharan.K	-	Post shifted from CRS, Pampadupara
Farm Supervisor	2	2	Sri S. Sukumaran Nair Sri. M.K. Vijayan	-	
Farm Supervisor (Vety)	1	1	Sri O.K. Sukumaran		Post shifted from CoV & A.Sc., Mannuthy,
Farm Assistant	4	4	Sri K.C.Varghese Sri Karthikeyan* Sri K.S. Pratheepan M.V. Sasidharan Nair	-	One post shifted with effect from 1-4-2002 to CRS, Pampadupara,
Farm Assistant (Vety)	1	1	Smt. K.K.Viswambharan	-	
Lab.Assistant Gr.II	2	2	Smt Ratnam, P.S. Sri Madhavan Kutty		
Lab. Asst. Gr.III	4	2	Sri.George A. Muriakan Sri.T.P.James	2	
Technician	1	1	Sri .K.Sreekumar	-	
Pump Operator	1	1	Sri Mohan Kumar, P.N.	-	
Fisherman	2			2	
Artist	1			1	
Total	20	15		5	

RICE RESEARCH STATION, MONCOMPU

Staff Position

<i>Scientific staff</i>				
Dept. and Designation	Sanctioned	No. of posts		Remarks
		In position	Vacant	
Agronomy				
Associate Professor	1	1	0	
Assistant Professor	2	1	1	
Plant Breeding				
Professor	1	1	0	
Associate Professor	1	1	0	
Assistant Professor	2	1	1	
Agri. Entomology				
Associate Professor	1	0	1	
Assistant Professor	2	1	1	
Plant Pathology				
Associate Professor	1	0	1	
Assistant Professor	2	1+1*	0	* - On Leave
Agri. Chemistry & Soil Science				
Assistant Professor	2	1	1	
Statistics				
Junior statistician	1	0	1	
AICRIP				
Technical Assistant	2	1	1	
Administrative and Supporting staff				
Administrative Assistant	1	1	0	
Assistant	4	3	1	
Typist	1	1	0	
Peon	2	0	2	
Sweeper cum Attendant	1	0	1	
Watchman	1	0	1	
Boat Driver	1	1	0	
Boat Syrang	1	0	1	
Jeep Driver	1	1	0	
Technical Staff				
Farm Assistant	4	4	0	
Lab Assistant	5	4	1	

ONATTUKARA REGIONAL AGRICULTURAL RESEARCH STATION

KAYAMKULAM

Staff position

Scientific staff

Department & Designation	Number of posts				
	Sancti- oned	In position	Name of the incumbent	Vacant	Remarks
KAU Non plan Professor (Plant Pathology)	1	1	Dr.Bhavani Devi	-	
Professor (Horticulture)	1	1	Dr.Shyam S. Kurup	-	
Associate Professor (Pl.Breeding)	1	-		1	
Associate Professor (Agrl. entomology)	1	-		1	
Associate Professor (Pl.Pathology)	1	1	Dr.T.N.Vilasini	-	
Assistant Professor (Soil Sci & Agrl.Chem)	1	1	Dr..M.Indira	-	
Assistant Professor (Agrl. Entomology)	1	1	Dr.G.Suja	-	
Assistant Professor (Pl.Breeding)	1	1	Dr.M.R.Bindu	-	
<u>IIAICRP on oil seeds</u> Associate Professor (Pl.Breeding)	1	1	Dr.Sverup John	-	
Associate Professor (Agronomy)	1	1	Dr.P.Sushamakumari	-	
<u>III CCCP Project Director</u>	1	-		1	
Assistant Professor (Agronomy)	1	1	Dr. D.Alexander Professor	-	Incharge of Project Director & Head
Assistant Professor (Soil Sci & Agrl.Chem)	1	-		1	
Assistant Professor (Agrl.Extension)	1	1	Dr.S.Shailaja Assoc.Professor	-	Associate Professor

Administrative and supporting staff

KAU -Non plan Section Officer	1	1	Smt.B. Thankamani	-	
Typist (Sel.Gr)	1	1	Smt.KSobhana	-	
Driver (Sel.Gr)	1	1	Shri.P.S.Babu	-	
Peon(Hr.Gr)	1	-		1	

Regular Mazdoor	2	-	-	2	-
Tractor Driver	1	1	Shri.R.Thankappan	-	-
CCCP Administrative Officer	1	1	Shri K.P.Rajendra Prasad	-	-
Assistant (GrII)	1	1	Smt.T.A.Thahera Beegum	-	-
Steno.cum. Typist	1	1	Smt.B.Sukumari Amma	-	-

Technical staff

KAU –Non plan Farm Supervisor	2	2	Shri.N.Vasudevan Smt.S.Nazeema	-	-
Farm assistant (Sel Gr)	1	1	V.J.Rajmohan	-	-
Farm assistant (Sel Gr)	1	1	.B.Muralidharan Pillai	-	-
Lab Assistant (Sel Gr)	1	1	M.G.Thomas	-	-
Lab Assistant(Sr Gr)	1	1	P. Sunil Kumar	-	-
AICRP on oil seeds Farm Assistant (Sel .Gr)	1	1	.Shahul Hameed	-	-
CCCP Farm Assistant	2	2	Shri.T.K.Vijayan Shri.K.C.Sanuprasad	-	-

RICE RESEARCH STATION, VYTTILA

Staff position

Scientific staff

Dept. and Designation	No. of posts				
	Sancti- oned	In position	Name of incumbent	Vacant	Remarks
Assoc. Professor (Agron)	1	1	Dr. V. Sreekumaran		
Assoc. Professor (SS & AC)	1	1	Dr. K. Anila kumar		
Assoc. Professor (Aqua)	1	1	Dr. C.G. Rajendran		HOS
Assoc. Professor (Pl. Br.)	1	1	Dr. K.S.Shylaraj		
Asst. Professor (Aqua)	1	-		1	
Asst. Professor (Pl. Br.)	1	-		1	

Administrative and Supporting staff.

Administrative Asst.	1	1	M.N. Vijayakumar		
Assistant Sr. Gr	1	1	K.B. Jaya		
Assistant Gr.II	1	1	H. Abdul Hakkim		
Typist Gr. I	1	1	Thresiamma John		
Driver Gr.I LDV	1	1	G. Suresh kumar		
Class IV	2	2	N.G. Helena N.G. Vimala		
Watchman	1	-		1	

Technical staff

Senior Gr. Farm Supervisor	1	1	Haridas		
Farm Supervisor Gr.I	1	1	George P. Puravath		
Farm Assistant Sel. Gr	1	1	Padma Narayana Pillai		
Farm Assistant Sr. Gr.	1	1	P.A. Abdul Majeed		
Lab Assistant Sel. Gr	1	1	P.M.Gopi		
Pump Operator	1	1	P.C. Jayakrishnan		
Fisherman	2			2	

SUGARCANE RESEARCH STATION, THIRUVALLA

Staff position

Scientific staff

	No of posts				
	Sanct- ioned	In position	Name of the incumbent	Vaca-nt	Remarks
ICAR					
Assoc.Professor (Plant Breeding)	1	1	Dr.K.Sreekumar	Nil	
Asst. Professor (Agronomy)	1	1	Dr.Thomas Mathew	Nil	
Assoc. Professor (Plant Pathology)	1	1	Dr. Babu George		
NARP					
Assoc. Professor (Hort.)	1	1	Dr.Jessy.M.Kuriakose	Nil	
KAU					
Assoc.Professor (Plant Breeding)	1	1	Vacant	Nil	
Asst. Professor (Plant Breeding)	1	1	Dr.V.R.Shajan	Nil	
Assoc. Professor (Agron.) Asst. Professor (Agron.)	2	2	Dr.T.M.Kurian Dr.R.Ilangovan*	Nil	*On long leave
Assoc. Professor (Ag. chem.)	1	1	Dr. Sosamma Cherian	Nil	

Administrative and supporting staff

KAU					
Adm. Asst	1	1	Sri.K.P.Rajan		
Asst.Gr.I	2	2	Sri.S.Gopakuamr Sri.P.B.Anilkumar	Nil	
Typist	1	1	AK.Indiradevi Amma	Nil	
Peon	1	1	K.G.Pushpakumari	Nil	
LDV Driver	1	1	Sri.C.A.Chako	Nil	

Technical staff

<i>ICAR</i>					
Technical Asst.	1	1	Sri.G.Jayakumar	Nil	
Farm Asst.	1	1	Sri. Mathew Thomas	Nil	
Lab. Assistant	1	1	Sri.N.Padmakaran Pillai	Nil	
<i>KAU</i>					
Farm Supervisor Gr I	1	1	Sri. E.K.Sukumaran	Nil	
Farm Asst. Gr.II	1	1	Sri. T.K.Omanakuttan	Nil	
Lab Assistant Gr II	1	Nil		1	

AICRP ON AGRIL.DRAINAGE, KARUMADY

Staff position

Scientific staff

<i>Department & Designation</i>	<i>No. of posts</i>				
	Sancti- oned	In position	Name of the Incumbent	Vacant	Remarks
Agri.Engg. Asst. Professor (Sel. Gr.)	Nil	1	Dr. E. K. Mathew	Nil	On working arrangement
Agri.Engg. Asst. Professor (Sel. Gr.)	Nil	1	Sri T. D. Raju	Nil	On working arrangement

Administrative and supporting staff

Security guard	Nil	1	Sri K. K. Sreekumar	Nil	On working arrangement
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Technical Staff

Senior research Fellow (Fisheries)	1	1	Sri P. S. Manu	Nil	
Senior research Fellow (Microbiology)	1	1	Smt. S. Dhanya	Nil	

CENTRE FOR PIG PRODUCTION AND RESEARCH, MANNUTHY

Scientific Staff

Department and Designation	No. of posts				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
CPPR					
Assoc.Professor	1	-	-	1	-
Asst. Professor	1	-	-	1	-
AICRP on pigs					
Assoc.Professor	1	1	Dr. M.R. Rajan	-	-
Asst.Professor	2	2	1. Dr. A Kannan 2. Dr. K. Shyama	-	-

Administrative and supporting staff

CPPR					
Admn. Asst.	1	1	Sri. Purushothaman Nampiathiri K.V.	-	-
Sr. Gr. Asst.	1	1	Smt. Flora C.V.	-	-
Asst. Gr.I	1	--	-	1	-
Typist Gr I	1	1	Sri. Sandeepkumar V.C.	-	-
Pump Operator	1	1	Sri . Somasundaran.C.N	-	-
Pig attendant	2	2	1. Sri. Pushpangadan.V 2. Sri. Lineesh K.R.	-	-
Class IV	2	0		2	-
Labourers	17	17		-	-
AICRP					
Asst. Gr I	1	1	Sri. Joju Paul	-	-
Labourers	6	6		-	-

Technical staff

CPPR					
Sr. Farm Supervisor	1	1	Sri. V.M. Jacob	-	-
Farm Supervisor	1	--		1	-
Farm Assistants	2	--		2	
AICRP					
Farm Asst.	2	2	1. Sri. T.K. Haridasan 2. Sri. C.G. Varghese	-	-
Technical Officer (Stat)	1	1	Smt. Joicy T.John	-	-

**UNIVERSITY LIVESTOCK FARM &
FODDER RESEARCH DEVELOPMENT SCHEME, MANNUTHY**

Staff position

Scientific staff

Department and Designation	No. of posts				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
Professor (Vety)	1	-		1	
Associate professor	2	1	Dr.P.Gangadevi	1	
Assistant Professor	2	1	Dr.T.N.Jagadeesh Kumar (Assoc.Prof.)	1	

Administrative and supporting staff

Administrative Asst.	1	1	Smt.P.P.Annamma	-	
Section Officer	1	1	Smt.S.Sushama	-	
Section Officer(FC&D)	1	1	B.Kumarysathyabhama		
Assistants	4	3	Sri.Samson.J.Kolady, 1 Smt.Anitha.M.P.Gr.1 Asst. Smt.M.P.Rekha Namboodiri		
Typist	1	1	Smt.Sudha.T.		
Class IV	4	2	Sri.E.Narayanankutty Smt.C.Anitha	2	

Technical staff

Farm Supervisor	5	2	Sri.K.K.Sasidharan Nair Sri.John David.		
Farm Assistants	7	7	Sri.V.Gopalakrishnan Sri.K.K.Kuttan Sri.A.P.Peter, Sri.C.I.Surendran, Sri.K.Sachinmayan Sri.M.K.Johnson Sri.V.V.Thulaseedharan		
Lab Assistant	1	1	Smt.P.A.Mini	-	
Pump Operato	1	1	Sri. P.R.Prabhakaran	-	

KAU DAIRY PLANT, MANNUTY

Department and Designation	No. of post				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
<i>Scientific staff</i>					
Professor	1	-		1	
Associate Professor	2	1	Dr. R. Rajend Kumar	1	
Assistant Professor	3	2	P. Sudheer Bai S.N. Rajakumar	1	
<i>Admn. and supporting staff</i>					
Assistant Sel. Gr.	1	1	Sobhana	Nil	
Typist	1	1	K. Vijayalakshni	Nil	
Class IV	1	-		Nil	
Permanent Labour	3	3	C.O Varghese M.J. Devassykty M.S. Radha	Nil	
<i>Technical staff</i>					
Farm Assistant Seln. Gr.	1	1	N. Gopinathan	Nil	
Lab Assistant	1	Nil		1	
Technical supervisor	1	1	K.M. Muraleedaran	Nil	
Plant Maintenance and Processing Associate	4	2	I.N. Sreekumar Rajesh	2	

AICRP ON POULTRY, MANNUTHY, THEISSUR.

Staff position

Department & Designation	No. of Posts				
	Sancti oned	In Positio n	Name of the incumbent	Vacant	Remarks
<i>Scientific Staff</i>					
Senior Scientist	1	1	Dr. K. Narayanankutty		
Farm Manager	1	1	Dr.P.Veeramani		
Assistant Professor	2	1	1.Dr. P. Anitha 2. Vacant	1	-
<i>Administrative and Supporting Staff</i>					
Section Officer	1	1	Sri. C. Prabhakaran		
Assistant (Sel. Gr.)	1	1	Sri.K.M.Mohammed Iqbal		
Typist (Gr. I)	1	-	Vacant		
Peon	1	1	Smt.M.Parvathy	4	-
Poultry Attendant	1	1	Smt. M.K. Vilasini		
Permanent Labourers	17	14	1. Sri.P.K. Sukumaran		

Permanent Labourers			2. Sri. E.R. Mohan 3. Sri. T.T. Jose 4. Sri. T.O. Chacko 5. Sri. P.A. Mohanan 6. Smt. P.K. Kalliani 7. Smt. V.S. Lalitha 8. Smt. M.R. Vilasini 9. Smt. V.V. Sarada 10. Smt. V.V. Sarojini 11. Smt. M.T. Rugmani 12. Smt. T.K. Parukutty 13. Smt. C.K. Radha 14. Smt. T.A. Rajalakshmi		
Technical staff					
Technical supervisor	1	1	Sri. Stijo George		
Farm Supervisor (Gr.II)	1	1	Smt. V. Indira		
Farm Assistant (Sr. Gr.)	2	2	1. Smt. V. K. Graisy 2. Smt. P.K. Majeed	-	-
Driver	1	-	Vacant		

GOAT & SHEEP FARM, MANNUTHY

Staff position

Scientific Staff

Dept. and designation	No. of posts sanctioned	No. of posts in position	No. of posts vacant	Remarks
	NIL	NIL	NIL	

Administrative and Supporting staff

Assistant	1	1	Nil	
Class IV	1	0	1	

Technical staff

Farm Assistants	2	2	Nil	
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List of members of staff

Name of post	Name of the member of staff	Remarks if any
Scientific	Dr. P. Nandakumar, Assoc. Prof.	On WA
PARA-TECHNICAL: Farm Assistants	(1) Smt. K.K. Ushakumari Farm Assistant Sr. gr. (2) Sri. K.V. Vasudevan, Farm Assistant Gr. I	
Sr. Gr. Assistant Typist	Sri. Gopi. K.P Sri. M.K. Muraleedhara karnavar, Office supdt.	on WA from C.A.S.A.G.B., Mannuthy (duty time restricted to afternoon session)

CENTRE FOR ADVANCED STUDIES IN POULTRY SCIENCE, MANNUTHY

Staff position

Department & Designation	No. of Posts				
	Sancti oned	In Position	Name of the incumbent	Vaca nt	Remarks
Scientific Staff					
CAS in Poultry Sci. Director	1	-	Dr. A.Jalaludheen	1	Assoc. Prof.
Assoc. Prof.	1	1	Dr.P.A. Peethambaran		
Assistant Professor	1	1			
Dept.of Poultry Sci. Professor	2	-			
Assoc. Prof.	3	2	Dr.Amritha Viswanath Dr.V.K.Elizabath	1	Dr.Richard Churchil
Assistant Professor	4	1		3	(Study leave)
Administrative and Supporting Staff					
Typist (Sel. Gr.)	1	1	Smt.E.R. Vilasini	-	
CASPS				1	-
Class IV (PS)	1	-			
Technical staff					
Farm Assistant	1	-	Smt. V.Indira	1	

CATTLE BREEDING FARM, THUMBURMUZHI

Name of post	Name of the member of staff	Remarks if any
Assoc. Prof.		
Asst.Prof.	Dr.A.P.Usha	
Admn. Asst.	P.L.Tonny	
Sr.Gr. Asst.	P.A.Sadanandan	
Asst.Gr.I	K.M.Mini	
Typist Gr.II	P.R.Sundaran	
Peon	T. N.Sasi	
Farm Supervisor		
Farm Assistants Sr.Gr.	P.Mohanan Nair	
Farm Assistant Gr.I	Paulson Varghese	
Farm Sup. (Agri) Gr.I	R.Reghu	
Farm Sup. (Agri) Gr.II	P.G.Satheesh	
LDV Driver		
Lab Asst. Gr.III	K.S.Dharmajan	
Class IV	Valsala	

LIVESTOCK RESEARCH STATION THIRUVAZAMKUNNU

Staff position

Department & Designation	No. of Posts				Remarks
	Sancti oned	In Position	Name of the incumbent	Vaca nt	
Professor	1	Nil	Head i/c.		
Assoc. Prof. (Animal Nutrition)	1	Nil	Dr. C.R.Lalithakunjamma	1	
(Animal Reproduction)				1	
Asst.Professor	1	Nil		1	
(Animal Reproduction)	1	Nil	Dr.Thirupathy		On study leave
Asst.Professor (An. Breeding & Genetics)II	1	-	Venketachalapathy		
Asst.Professor (Animal management)	1	1	Dr.A. Kannan Head I/C		
Asst.Professor (Pathology)	1	Nil		1	
Asst.Professor (Dairy Science)	1	Nil		1	
Technical					
Sr.Farm Supvr.(vety.)	1	1	M.K.Vijayakumar	Nil	
Farm Sup.Gr.I (vety.)	1	1	C.Muhammed Usman	Nil	
Farm Sup.Gr.II (vety.)	2	Nil		2	
Farm Asst. (vety.)	1	1	C.C.Vijayamma		
Farm Sup.Gr.I (Agri.)	1	1	K.Aboobakar	Nil	
Farm Sup.Gr.II (Agri)	2	2	M.Ummer	Nil	
			V.M.George		
Farm Asst. (Agri)	4	1	A.Abdurahiman Sl.Gr.	3	
			K.C.Jaimon		
Tech.Supervisor		1	Abdul Hakkim, E	1	
LDV Driver	1	1	N.Sundaran	Nil	
Pump Operator	2	2	Yousuf Kalady	Nil	
			R.K.Mohammed		
Field Supervisor	1	1	K.Girishkumar	1	
Maistry	2	1	K.Mohammedali	1	
Watch man	7	Nil		7	
Mazdoor	2	1	P. Mohammedali	1	
Administrative					
Admn. Asst.	1	1	S.Vasanthakumari	Nil	
Section Officer	1	1	Vijayachandra Babu	Nil	
Assts.	5	2	T.G.Deenamma	3	
			V.N.Srikumar		

Typist	2	2	P.Sowminidevi	Nil
Peon	2	1	M.Geetha P. Veerankutty	1
AICRP ON AGRO- FORESTRY				
Assoc. Prof.(AF)	1	Nil	T.K.Kunhamu	Nil
Asst. Prof.	2	2	Dr. Binisam V Jamaludheen	
Tech. Asst.	2	Nil		2
Farm Asst.	2	2	Thomas Chirakandathil C.Aboobhakar	Nil
Driver	1	1	T.P.Noushad	Nil
Lab. Asst.	2	2	V.Sunilkumar K.Sunil	Nil
Asst.Gr. II	1	1	M.Harigovindan	Nil
Peon	1	1	K.Mammed	Nil

CENTRE FOR ADVANCED STUDIES IN ANIMAL GENETICS & BREEDING

Staff Position

Scientific Staff

CASAG

Dept and Designation	No of posts			Remarks
	Sanctioned	In position	Vacant	
Director	1	1	Nil	
Assoc. Professor	1	0	1	
Asst. Professor	2	Nil	2	

Dept of Animal Breeding & Genetics

Professor	1	0	1	
Assoc. Professor	2	0	2	
Asst. Professor	3	1	2	

Field Progeny testing scheme.

Assoc. Professor	1	1	Nil	
Asst. Professor	2	0	2	

Attappadi Black Scheme

Asst. Professor	1	1	Nil	
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AICRP on goats

Assoc. Professor	1	1	Nil	
Asst. Professor	1	0	1	

Administrative and supporting staff

Designation	No. of posts			Remarks
	Sanctioned	In position	Vacant	
Section Officer (FC&D)	1	1	Nil	
Section Officer	1	1	0	
Office Supdt	1	1	0	
Asst. Gr II	1	0	1	
Dept of ABG				
Farm Asst.	1	1	Nil	
*PT Scheme				
Farm Supervisor	1	1	Nil	
Gr.I Farm Asst.				
Sr.Gr.Farm Asst.	1	0	1	
Gr.II Farm.Asst.				
Attendant	2	0	2	
	2	0	2	
	2	1	1	
Vechur Scheme				
Gr. I Farm Asst.	1	1	0	
AICRP				
Asst. Gr.I	1	1	Nil	
Farm Asst	3	2	1	

Technical Staff**AICRP**

Technical Officer	1	1	Nil	
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Adhoc Scheme

R.A	1	1	Nil	
JRF	2	2	Nil	

NATP Microsatellites

SRF	1	1	Nil	
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Vechur cattle

SRF	2	2	Nil	
RA	1	1	Nil	
JRF	1	0	1	

NATP Animal Genetic resources

JRF	2	2	Nil	
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DBT on Malabari

SRF	2	2	Nil	
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VETERINARY HOSPITAL, KOKKALAI

Staff Position

Scientific Staff

Department & Designation	No. of Posts				
	Sancti oned	In Position	Name of the incumbent	Vacant	Remarks
Assoc. Prof.& Head	1	1	Dr. P.C.Alex	Nil	
Assoc. Prof.(AR)	1	1	Dr.K.N.Aravinda Ghosh	Nil	
Asst. Prof. (AI Centre, Kokkulai)	Nil	1	Dr. G.Ajith Kumar	Nil	

Administrative and Supporting Staff

Asst. Sr.Gr.	1	1		Nil	
Attendant	2	Nil		2	
Peon	1	Nil		Nil	
Sweeper cum scavanger	1	Nil		1	

Technical staff

Pharmacist	1			1	
Farm Supr.Cr.I	1	1		Nil	
Farm Assistant	1	1		Nil	
Lab Asst.	Nil	Nil		Nil	

FISHERIES STATION, PUDUVEYPU

Staff position

Scientific staff

Department & designation	No. of posts				Remarks
	Sanctioned	In position	Name of the incumbent	Vacant	
Aquaculture Assoc.Professor	1	1	Dr.K.S. Purushan	-	-
Aquaculture Asst.Professor	1	Assoc. Prof.	Dr. M.M. Jose	-	-
Aquaculture Jr.Asst.Professor	1	Nil		1	-

Administrative and supporting staff

Admn. Asst.	1	1	V.M. Ammini	-	-
Asst.Gr.I	1	1	N.B. Sudheer	-	-
Asst.Gr.II	1	1	P.J. Clectus	-	-
Typist Gr.II	1	Sr.Gr.	C.V.Dinesan	-	-
LDV Driver	1	1	K.B. Prasad	-	-
Peon (Class IV)	1	1	K.P. Jayapalan	-	-

Technical staff

Farm Asst.Gr.II	1	Sln. Gr	K. K. Reghuraj	-	-
Fieldman (F)	1	Hr.Gr.	K. K. Reghu	-	-
Pump Operator	1	1	T. Chandran	-	-
Lab Asst.Gr.II	1	1	M.S. Moni	-	-

COMMUNICATION CENTRE, MANNUTHY

Scientific staff

Designation	Number of posts			Remarks
	Sancti- oned	In position	Name of the incumbent		Vacant
Prof. (Agronomy)	1	1	Dr. P. Prameela	
Professor (Plant Protection/ Entomology)	1	1	Dr. R. M. Prasad	
Assoc. Professor (Entomology)	1	1	Dr. M. K. Sheela	
Assoc. Professor (Plant Protection)	1	1	Dr. Suma Poulose	
Assoc. Professor (Hort.)	1	0		1
Asst. Professor (Animal Sci.)	1	1	Dr. C. B. Manomohan	
Asst. Professor (Poultry Science)	1	0		1
Assoc. Professor (Extension)	1	0		1
Asst. Professor (Extension)	6	5	K. K. Santha Dr. Sreevalsan J. Menon Dr. Jose Joseph Dr. Binoo P. Bonny Dr. Jayalakshmi, G.	1
Asst. Professor (Aquaculture)	2	1	Dr. A. D. Antony	1
Asst. Professor (Soil Science)	1	1	Dr. Jayasree Sankar	
Asst. Professor (Plant Path.)	1	1	Dr. S. Estalitta	
<i>Administrative and Supporting staff</i>				
Asst. Professor (Animal Science)	1	0		1
Sel.Gr.Asst.	1	1	E.Hymavathy	From 1.06.03
Sr.Gr.Asst.	2	1	Usha R.	1
Asst.Gr.1	2	2	K.R.Santhakumari M.M.Babu	-
Sel.Gr.Typist	1	1	T.M.Meera	-
Peon	3	2	K.G.Gopalakrishnan C.A.Tony	1
Section Officer	1	1	Sophiamma Joseph	-
Administrative Asst.	1	1	K.Thankam	-
L.D.V.Driver	1	1	V.Santhoshkumar	-
H.D.V.Driver			Post shifted to DSW	

Technical Staff

Sel.Gr.FarmAsst.	2	1	V.G.Santha	1	
Farm Supervisor	1	1	T.C.Sidharthan	-	
Sel.Gr.Technician	1	1	M.R.Gopinathan	-	
Photographer	1	1	V.V.Satheesan	-	
Artist	1	-	-	1	
Dark room Asst.	1	-	-	1	
Malayalam Translator	1	1	K.N.Chandralekha	-	

CENTRAL TRAINING INSTITUTE, MANNUTHY**Staff position***Scientific staff*

Dept. & Designation	No. of posts				
	San- ctioned	In posi- tion	Name of the incumbent	Vacant	Remarks
Professor	1	1	Dr.S.Bhaskaran	-	Assoc. Prof. in charge of Prof.
Assistant Professors	2	2	Dr.AlexanderGeorge M.Israel Thomas	-	-

Administrative and supporting staff

Section Officer	1	1	Smt.P.V.Ramani	-	-
Assistant	2	2	Smt.K.N.Sarojini Smt.P.M.Latha Smt.N.Ratnaprabha	-	
Typist	2	1	Smt.K.Padmavathy Smt.K.D.Rossily	- 1	
Duplicating Machine Operator	1	-			Post is shifted to College of Dairy Science&Tech., Mannuthy
Driver	1	-		1	-
Peon	1	-	Sri.P.B.Anilkumar Sri.C.Vijayan	-	
Permanent Labourer	1	1	Sri.P.K.Raveendran		-

AGRICULTURAL TECHNOLOGY INFORMATION CENTRE (ATIC)

Administrative and Supporting Staff

Designation	Number of posts				Remarks
	Sancti- oned	In position	Name of the incumbent	Vacant	
ATIC Manager	1	1	DR. K, Aravindakshan		Officer on Special Duty, ATIC
Asst. Professor	1	1	Dr. Sreevalsan, J. Menon		
Tech. Officer	1	1	U. Divakar		
Farm Asst.	1	1	A.K. Vijakumar		
Farm Sup. Gr. 1	1	1	P.K. Kalyani		
Farm Asst. Sl.Gr.	2	2	M.N. Pavithran C.A. Mathew		
Asst. Gr. 1	1	1	K.N. Raviendran		
Class IV			M.P. Unnikrishnan P. Nikhil		

KVK, AMBALAVAYAL

Staff position

Scientific Staff

Department and designation	No. of posts				Remarks
	Sanctio ned	In position	Name of the incumbent	Vacant	
Animal Science, Training Organizer	1	1	Dr. A. RADHAMMA PILLAI	Nil	-
Horticulture, Training Associate	1	1	Dr. K. AJITHKUMAR	Nil	-
Agri. Extension, Training Associate	1	1	Sri. G.S. ARULARASAN	Nil	-
Agri. Engineering, Training Associate	1	1	Dr. JAYAN P.R.	Nil	-
Training Associates (Plant Protection/ Agronomy/ Home Science)	3	Nil		3	-

Administrative and supporting staff

Office Supt. Cum accountant	1	1	Sri. M. NANDA NANDANAN	Nil	-
Junior steno cum Computer operator	1	1	Sri. M.K. MANOJ KUMAR	Nil	-
Driver cum Mechanic	2	1	Sri. T.Y. DANIEL	1	-
Class IV employees	2	2	Sri. N. CHANDU - Sri. V. MUHAMMED	Nil	-

Technical staff

Training Assistants	3	2	Sri. K.S. RAJAMANI Sri. K.K. GANGADHARAN	1	--
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KVK MANJESHWAR**Staff position***Scientific staff*

Dept. & Designation	No. of posts				
	San- ctioned	In. posi- tion	Name of the incumbent	Vacant	Remarks
Assoc. Professor Agrl. Exten	1-	-		1	
Assistant Professor Agrl. Exten	1	1	R. Sendilkumar	-	-
Asst. Prof. (Fisheries)	1	1	B. Shantharam	-	-
Asst. Professor Soil and water Conservation Engg.	1	-		1	
Asst. Professor Home Science	1	1	Soffi Cheriyan	-	

Administrative and supporting staff

Section Officer	1	1	Sanal Kumar M.S.	-	-
Assistant Gr. II	1	-		1-	
Typist Gr. II	1	1	V.P. Moideen Koya	-	
Class IV	2	-		2	
<i>Technical Staff</i>					
Sr. Farm Supervisor	1	1	Sankaran M.M.		
LDV Driver	1	1	Justin J. Kannamphadam		

KVK, PATTAMBI

Staff position

Scientific staff

Department and designation	No of posts		Name of incumbent	Vacant	Remarks
	Sanctioned	In position			
Training organizer (Associate Professor)	1	1	Dr. P. Rajendran	0	-
Training Associates (Assistant Professor)	6	6	Ms. Premaltha, T. Dr. Metilda Joseph Dr. Suma Divakar Mr. Santhoshkumar, A.V. Mr. Musthafa Kunnathadi Mrs. Yamini Varma, C.K.	0	-

Administrative and supporting staff

Office Supt. Cum accountant	1	1	Sri. A.W. Kishore	0	-
Steno cum typist	1	1	Sri. M. Mohandas	0	-
Driver	2	0		2	-
Supporting staff	2	2	Sri. C. Gopalakrishnan, Sri. M. Sundaran,	0	-

Technical staff

Training Assistants	3	3	Mr. Sreedharan, M.K. Mr. Ambujan, C.V. Mr. Abdussaboer, P	0	-
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KVK SADANANDAPURAM

Administrative and supporting staff

Office Supt. cum Accountant	1	1	Smt.S. Anitha	-	-
Typist	1	1	R. Usha	-	-
Driver cum Machanic	2	1	S. Sasi	1	-
Hort./Ani. Attendede	2	0		2	-

Technical Staff

Training Asst.	3	3	S.J. Joy Ghee S. Sudha Sarojam	0	-
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TRAINING SERVICE SCHEME, VELLAYANI

Staff position

Scientific Staff

Department and designation	No. of posts			Name of the incumbent	Vacant	Remarks
	Sanctioned	In position				
Assoc. Professor	1	1		Dr. G. Sobhana	-	-
Asst. Professor	1	1		Dr. A.K. Sherief	-	-

Administrative and supporting staff

Asst. Gr. II	1	1		G. Reghunath	-	-
Typist Gr. II	1	1		V. Rajayyan	-	-
Peon	1	1		P. Arjunan	-	-

Technical staff

Farm Asst Gr. II	1	-			1	Vacant since 1993
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KERALA AGRICULTURAL UNIVERSITY PRESS, MANNUTHY

Admn. and Supporting staff

Designation	Sancti- oned	In position	No. of posts		
			Name of the incumbent	Vacant	Remarks
Section Officer	1	1	A.D.Ommana		
Assistants	3	2	C.K. Prabhavathy K.P.Vasanthakumari	1	
Typist	1	1	T.K.Ponnamma		
Peon	1	1	V.K.Narayanan		

Technical Staff

Press Manager	1	1	K.Rajappan		
General Foreman	1	-	-	1	
Senior Foreman	1	1	K.M. Thankamma		
Junior Foreman	1	1	P.T.Annie		
Proof Readers	2	2	Sherly Sam K.K.Sadasivan		
Copy Holders	2	-	-	2	
Computer	1	1	K.Santhakumari		
Printers	8	5	C.Viswanathan N.J.Samuel P.R. Aravindakshan T.Krishnankutty	3	(One Printer on leave)
Compositors	5	3	P.A.Elsy V.Rajendran P.M. Santha	2	
Binders	10	7	G.Parvathy Ammal P.Krishanakumari Amma K.M. Chinnamma K.K. Pushpaja A.K.Dasan K.S.Radha	3	
Helper	1	1	V.N. Hassan		

CENTRAL LIBRARY AND INFORMATION SYSTEM, VELLANIKKARA

Scientific Staff :

Department & Designation	No.of posts				Remarks
	Sanct- ioned	In posi- tion	Name of the incumbent	vacant	
Librarian	1			1	Smt. Lalitha, M.C. Asst. Librarian, CoH, Vellanikkara took charge as Librarian w.e.f.15.5.2000.

Administrative and Supporting Staff:

Section Officer	1	1	Sri. M.N.Chandrasekharan	-	
Office Supdt.(Steno)	1	1	Smt. K.M. Mary	-	
Typist	1			1	
Sel Grade Asst.	1	1	Sri. K.M. George	-	
Lab.Asst./ Clerical Asst	1	1	Smt.P. Sakunthala	-	
Class IV	2	2	1. Smt. C.J. Lizy 2. Sri. K.K. Santhosh	-	

Technical Staff:

Reference Asst.	6	4	1. Sri. E.K. Mohanlal 2. Smt. N.B. Nisha 3. Smt. K.J. Jessy 4. Sri. Sebastian Dominic	2	
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DIRECTORATE OF STUDENTS WELFARE, MANNUTHY

Staff position

Category	Name of the Staff/Employee	Sanct-ioned posts	No.of posts in position	Vacant
Director of Students Welfare i/c.	1) Dr.J.Abraham (Retd.on 7-5- 2003) 2) Sri.O.K.Paul	One	One	Holding additional
Dy.Dir.ector	Sri.O.K.Paul	One	One	--
Asst.Professor.	--	One	One	Lying vacant
Steno to DSW	S.Sudhakaran Nair	One	One	Nil
Section Officer	S.Ramachandran Nair	One	One	Nil
Assistants	Annamma Scaria.P Sel.Gr. Abdul Manaf.A.P.(Gr.II)	Three	Two	One
Typist	I.A.Surendran (Seln.Gr.)	One	One	Nil
Peons	T.A.Unnikrishnan	Two	One	One
(a) Drivers (HDV)	1) V.N.Sankarankutty 2) P.V.Sudhakaran 3) P.K.Sasidharan 4) M.V.Karappan 5) L.Vasudevan 6) K.S.Jayan 7) A.N.Mohanan 8) P.N.Benny Biju.N.Baby	Eight	Eight	Nil
(b) Driver (LDV)		One	One	
Bus Attendant	1) K.A.Abdul Rasheed 2) Saji Antony 3) Beer Bahadhur Singh 4) N.T.Francis 5) C.Govindan 6) P.M.Ouseph 7) P.B.Anilkumar 8) S.Sasi – joined duty on 16-2-2004 9) K.N.Somasekharan joined duty 26	Eight	Eight	Nil

ENGINEERING DIVISION, PANANGAD

Designation	No. of Posts				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
Section Officer	1	1	T. Vijayalakshmi		
Assistants	2	2	Sri.C. Pradeep		
			Sri.P.A. George		
Typist	1	1	Smt. T.C. Ajitha		
Peon	1	1	Sri.R. Gopal Singh		

Technical Staff

Executive Engineer	1	1	Sri.P.R. Govindan		
Assistant Engineer	3	3	Sri. Muhammad Irshad		
			Sri.Sabu Paul Mulerikal		
			Sri.P.T.Joy		
Overseer	4	4	Sri.M.K. Devaraja Kurup		
			Sri.M.Y. Sunny		
			Sri.S.R. Antony		
			Sri. Saji Markose		
Driver	1	1	Smt. Sukumaran Marar		

ENGINEERING DIVISION, TAVANUR

Administrative and Supporting Staff

Designation	No. of Posts				
	Sanctioned	In position	Name of the incumbent	Vacant	Remarks
Section Officer	1	1	S. Ushadevi		
Assistant	1	0		1	
Typist	1	1	A. Mohamedali		
Peon	2	1	Bijukumar	1	
LDV Driver	1	1	A.P. Pavithran		

Technical Staff

Executive Engineer	1	1	Suresh Babu K.		
Asst. Exe.Engineer	1	1	T.K. Abdul Khadar		
Asst. Engineer	3	3			
			M. Vijayakumari		
			K.M. Anilkumar		
			P. Manoj		
Overseer Gr.I	1	1	A.V. Kesavan		
Overseer Gr. II	2	0		2	

ENGINEERING SUB DIVISION, VELLAYANI

Administrative & Supporting Staff

Designation	No. of Posts				Remarks
	Sanctioned	In position	Name of the incumbent	Vacant	
Section Officer	1	1	Jeslet Mercy J.		
Office Supdt.	1	1	Sri.K. Gopikuttan Nair		
Senior Grade Asst.	1	1	Sri.Philip George K.		
Class IV	1	1	Smt. T. Shailaja		

Technical Staff

Asst. Exe.Engineer	1	1	Sri.M. Vijayakumari		
Asst. Engineer	2	2	Sri.K.H. Muhammed Abdul Khadar		
			Sri.V.Harikumar		
Overseer Grade I	2	2	K.N. Sathees V.M. Roy		
Driver LDV Hr.Gr.	1	1	P. Raghunathan Nair		

ENGINEERING SUB DIVISION, VELLANIKKARA

Designation	No. of Posts				Remarks
	Sanctioned	In position	Name of the incumbent	Vacant	
Asst. Exe.Engineer			Mohammed Ismail P.M.		
Assistant Engineers			P.A. Meera Bai Sali C.I. P.H. Salim James C.A.		On WA
Overseer Gr.I			C.V. Poulouse K.H. Abdul Rahiman		
Assistant			I. Indira		
Typist			Maney A.C.		
LDV Driver				1	
Peon				1	
Permanent labourers			K.K. Sudhi K.K. Ambikavathy N.V. Padmavathy K.V. Kamala		

ENGINEERING SUB DIVISION, MANNUTHY

Designation	No. of Posts				Remarks
	Sanctio ned	In position	Name of the incumbent	Vacant	
Assistant	1	1	K.L. Liza		
Typist	1	1	K. Girija		
Class IV	1	1	P. Thirumala		

Technical Staff

Asst. Exe.Engineer	1	1	P.M. Vasudevan		
Asst. Engineer	3	3	T.N. Suresh Babu		
			C.K. Nazarudheen		
			E.T. Lal		
Tech. Supervisor	2	2	T.S. Govindan		
			K.V. Johny		
Overseer	3	2	K.V. Sunil Kumar K.K. Anilan	1	
Pump Operator	6	6	T.C. Suresh Babu M.S. Mohanan V.V. Sahadevan P. Radhakrishnan Nair K.M. Sunil K.S. Kuttan		
Per.Labourers	10	3	P. Divakaran K.K. Anandan C.R. Hariharan Thampi	7	

ENGINEERING SUB DIVISION, POOKODE, WYNAD

Technical Staff

Designation	No. of Posts				Remarks
	Sanctio ned	In position	Name of the incumbent	Vacant	
Asst. Exe.Engineer	1	1	K. Savy Joseph		
Asst. Engineer	3	3	K.T. Vasudevan		
			K.T. Baburaj		
			V.K. Girishkumar		

ENGINEERING SUB DIVISION, KOLAHALAMEDU, IDUKI

Designation	No. of Posts				Remarks
	Sanctio ned	In position	Name of the incumbent	Vacant	
Asst. Exe. Engineer	1	1	M. V. Chackochan		
Asst. Engineer	2	2	C. A. James		
Oversear	3		A. P. Satheesan	3	

ELECTRICAL SUB DIVISION, VELLANIKKARA

Administrative and Supporting Staff

Designation	No. of Posts				Remarks
	Sanctio ned	In position	Name of the incumbent	Vacant	
Assistant	1	1	Viju A.P.		
Typist	1	1	O.A. Ushakumari		
Class IV	1			1	

Technical Staff

Asst. Exe. Engineer	1	1	R. Ravindran Nair		
Asst. Engineer	2	1	C.A. James	1	In charge
Senior Technical Supervisor	1	1	C. A. Varghese		
Tech.(Electrician)	3	3	Mercy Mathew T. Subin C. George P. Vasudevan		
Lineman Gr.II	1			1	
Helper to Electrician	1			1	

ELECTRICAL SUB DIVISION, VELLAYANI

Administrative and Supporting Staff

Designation	No. of Posts				Remarks
	Sanctio ned	In position	Name of the incumbent	Vacant	
Assistant	1	1	Ansamma Philip		
Typist	1	1	Savitha Devi B.		
Class IV	1	1	Bijukumar D.		

Technical Staff

Asst. Exe. Engineer	1	1	B. Lukose		
Asst. Engineer	1			1	Posted Temp. through Employment Exchange
Technician (Electrician) Gr.II	1			1	

MECHANICAL SUB DIVISION, VELLANIKKARA

Administrative and Supporting Staff

Designation	No. of Posts				Remarks
	Sanctio ned	In position	Name of the incumbent	Vacant	
Assistant	1	1	Girish Babu K.		
Typist	1	1	E. Sathi Devi		
Class IV employee	1	1	V.B. Geetha		

Technical Staff

Asst. Exe. Engineer	1			1	Full additional charge to AEE, Engg. Sub Division, V'kara
Asst. Engineer	1	1	V. Unnikrishnan		
Overseer	1	1	Rajendra Prasad S.		
Pump Operator	7	7	V.B. Easaf		
			K.S. Pareswaran		
			I.R. Balan		
			M.L. Ramakrishnan		
			K.C. Mathew		
			C.S. Pareeth		
			E.K. Padmanabhan		

PLANT PROPAGATION AND MANAGEMENT UNIT, VELLANIKKARA

Dept. and designation	No. of posts			Remarks
	Sanctioned	In position	Name of incumbent	
<i>Scientific staff</i>				
Associate Professor (Ent.)				
Associate Prof. (Agron)	2	1	Dr. Babu M. Philip	1
Assistant Prof. (Agron.)	1	1	Dr. K.E. Usha	—
<i>Admn. and supporting staff</i>				
Typist Grade II	1	1	T.Kamalam	1
Assistant Grade II	1	1	Maria John C.K.	—
<i>Technical Staff</i>				
Sr. Farm Supervisor	1	1	C.B.Sugathan	—
Farm Assistant Grade II	1	1	P.K.Kalliani	—
Lab Assistant Grade I	1	1	P. Narendran	—

DETAILS OF STAFF AT INTERNAL AUDIT CIRCLE (S R) VELLAYANI

Sl. No.	Designation	No. of Posts				
		Sanctioned	In position	Name of the incumbent	Vacant	Remarks
	Deputy Comptroller	1	1	Smt.V.M. Lalithakumari		
	Section Officer	2	2	Sri.C.N. Radhakrishnan C. Santhakumari		
	Assistants	6	5	N. Bhadrakumar	1	
1.				Sri. P. Indiradevi		
2.				Sri.K. Rajendran		
3.				Sri.A.K. Shajikumar		
4.				Sri.M. Mohamed Hamsa		
	Typist (Gr.II)	1	1	P. S. Sindhu		
1.	Class IV	1	1	Sri.A. Sathyan		

**DETAILS OF STAFF AT INTERNAL AUDIT CIRCLE (N R)
VELLIMADUKUNNU, CALICUT**

Sl. No.	Designation	No. of Posts				
		Sanctioned	In position	Name of the incumbent	Vacant	Remarks
	Asst. Comptroller	1	1	Sri.N.K. Achuthan		
	Section Officer	2	2	Sri.P.V. Raveendran M. Radhakrishnan		
	Section Officer (FC&D)	1	1	Sri.K.K. Damodaaran		
	Assistants	6	6	Sri.P. Muraleedhara		
1.				Sri.V.Mohammed Kunhi		
2.				Sri.M.Manjunathan		
3.				Smt., Treesamma Titus		
1.				Smt.P.V. Meeradevi		
2.				Sri.K. Kishor		
	Typist	1	1	Sri.V. M. Muraleedharan		
	Class IV	1	1	T. Bhaskaran		

APPENDIX IV

**EXTERNALLY AIDED RESEARCH PROJECTS
OPERATED UNDER DIRECTORATE OF RESEARCH AS ON 31-3-2004**

Sl. No.	Title of Project	PI	Funding Agency	Outlay (lakhs)	Date of start	Duration (months)
1	2	3	4	5	6	7
202	<i>College of Agriculture, Vellayani</i>					
1	Comprehensive coconut management and coconut mite management	Arthur Jacob J. Dr.	Dept. of Agriculture, Thiruvananthapuram	29.45	10/10/2001	36
2	Application of sterile insect technology (SIT) to control red palm weevil in coconut	Krishnakumar R. Dr.	Dept. of Atomic Energy, GOI.	16.00	31/03/2000	36
3	Crop improvement in orchids via invitro mutagens	Sheela V.L. Dr.	Dept. of Atomic Energy, GOI.	7.84	09/09/2002	36
4	Analysis of varieties in photosynthetic characters and light tolerance mechanism in varieties of pepper	Krishnaprasad B.T	Dept. of Atomic Energy, GOI.	9.54	06/11/2001	36
5	Bio control of aphids and mites infesting crops	Sudharma. K.Dr.	Dept. of Biotechnology (GOI)	15.00	11/08/1998	36
6	Breeding for commercial orchid hybrids	Lekha Rani C, Dr.	Dept. of Biotechnology (GOI)	19.66	16/04/2002	36
7	Crop weather interaction studeis in sole crops and inter crops in coconut based cropping system	Girija Devi L. Dr.	Dept.of Science & Technology (GOI).	15.19	16/04/2002	36
8	Bio control of water hyacinth(Eichhornia crassipes (mart) solms) using mycoherbicides	Naseema. A. Dr.	Dept.of Science & Technology (GOI)	6.00	07/09/2000	36
9	Technology for developing diversified food products based on minor tubers of Kerala	Chellammal S. Dr.	Dept.of Science & Technology (GOI)	3.50	15/06/2002	24
10	Standardization harvesting post harvest treatments, handling and storage techniques in cut-flower orchids	Sabeena George T. Dr.	ICAR Adhoc	12.97	09/02/2004	36
11	Evolving biocontrol measures for the management of pests of vegetable using Entomopathogenic fungii	Jiji T. Dr.	ICAR Adhoc	8.30	22/01/2004	36

1	2	3	4	5	6	7
12	Soil characterisation and resource management of acid soil regions for increasing productivity (Network Research Project)	Venugopal. V. K. Dr.	ICAR Adhoc	10.00	31/10/2000	60
13	Collection and Evaluation of Heliconias as potential cut flower crops and standardisation of Agro techniques	Sheela V.L Dr.	ICAR Adhoc	5.38	20/02/2003	36
14	Conservation and management of Indian Bee (Apis Cerana Indica Fab.) for sustainable apiculture in Kerala	Devanesan S. Dr.	ICAR Adhoc	13.98	03/11/2003	36
15	AICRP on Nematode Pests	Sheela. M. S. Dr.	ICAR Co-ordinated	14.60	01/04/1997	12
16	AICRP on Mushroom	Balakrishnan. B. Dr.	ICAR Co-ordinated	12.00	20/09/2000	60
17	AICRP on Honey bee	Devanesan. S. Dr.	ICAR Co-ordinated	17.00	01/04/1997	12
18	Impact of dietary counselling and food supplementation on the lipid profile status of population in Thiruvananthapuram	Chellammal S. Dr.	Indian Council of Medical Research	2.74	01/12/2003	12
19	Goitre incidence in Kerala.(Kerala Res. Prog. on Local Level Devt.) (Preparation of status paper)	Nandini. P. V. Dr.	Kerala Res.Prg.on Local Level Development	0.00	14/11/1998	27
20	Etiology and mangement of important diseases of anthurium	Mary. C. A. Dr.	KSCSTE	2.00	31/01/2001	36
21	Exploitation of hypovirulance in Rhizoctonia solani Kuhn. for sheath blight disease supression and growth promotion in rice	Girija. V. K. Dr.	KSCSTE	1.00	31/10/1998	36
22	Collection, evaluation, morphological and molecular characterization, cataloguing and genetic improvement of Ivy Gourd	Wilson D. Dr.	KSCSTE	4.16	20/09/2003	36
23	Cataloguing Ginger cultivars for photo-synthetic efficiency and shade tolerance	Jayachandran B. K.	KSCSTE	2.00	11/05/1999	24
24	Studies on standardisation of organic farming for soil health and sustaianble crop production	Ushakumari K. Dr.	KSCSTE	4.20	29/09/2003	36
25	Nutrient enrichment of vermicompost using low grade nutrient carriers.	Ushakumari. K. Dr.	KSCSTE	1.00	02/05/1998	36

1	2	3	4	5	6	7
26	Eco friendly techniques for enhancing productivity of vegetables	Geetha kumari V.L. Dr.	KSCSTE	191.00	09/06/2003	24
27	Nutrient requirement of annual spices in coconut gardens of Kerala	Meera Bai Dr.	KSCSTE	4.95	27/04/1998	46
28	Efficacy of Ethno Veterinary Medicinal Plant formulations in the Management of Udder disorders of Cattle	Vijayan R Dr.	KSCSTE	4.16	14/01/2003	36
29	Monitoring of residues of insecticides in vegetables collected from the markets of Kerala.	Thomas Biju Mathew.Dr.	KSCSTE	1.00	01/01/1995	36
30	Post harvest studies on processed products made from mango and pappaya	Prema. L. Dr.	KSCSTE	1.00	05/12/1995	36
31	Monitoring of pesticide residues in milk and milk products in Kerala.	Naseema Beevi. S. Dr.	KSCSTE	1.00	01/09/1992	50
32	Organic farming for sustainable vegetable production	Meera Bai. M. Dr.	KSCSTE	2.00	08/05/2000	24
33	Impact of partial substitution of murate of potash by common salt in a coconut based agro-ecosystem	Sudarmaidevi C.R. Dr.	KSCSTE	3.70	26/09/2003	36
34	Influence of microclimate on the productivity of a coconut based cropping system	Girija Devi. L. Dr.	KSCSTE	2.00	18/08/2000	36
35	In vitro production of secondary metabolics of Annona sp. and evaluation of their pesticidal properties	Hebsy Bai Dr.	KSCSTE	4.00	01/12/1999	36
36	Standardisation of techniques for quality enhanced production and value added post harvest handling in Anthurium (Anthurium andreanum LINDE.)	Sabeena George Thekkayam	KSCSTE	4.15	14/10/2003	36
37	Biointensive integrated pest management in vegetable cowpea	Sudharma K. Dr.	KSCSTE	4.62	11/02/2004	36
38	Evolution of vegetable amaranth (Amaranthus sp.) with high yield quality and resistance to leaf blight caused by Rhizoctonia solani)	Celine V.A. Dr.	KSCSTE	4.78	27/01/2004	36
39	Nematode association in Kacholam Kacmpferia galanga. L. & its management	Sheela. M. S. Dr.	KSCSTE	4.00	04/02/2000	36

1	2	3	4	5	6	7
40	Utilization of pepper phylloplane mycoflora for the biocontrol of foliar disease of pepper	Santhakumari. P. Dr.	KSCSTE	1.00	03/06/1999	24
41	Sustainable techniques for domestication and commercial cultivation of medicinal plants in the humid tropics	Anilkumar A.S.	KSCSTE	4.15	06/11/2001	36
42	Development of vermicompost based mycoinoculants for plant disease control	Nair. S. K. Dr.	KSCSTE	1.00	16/08/2000	36
43	Information management on agricultural research in Kerala	Vijayaraghava kumar Dr.	KSCSTE	3.19	23/09/2003	36
44	Development of fluorescent pre-dominant based bio pesticide for the management of important plant pathogens of rice in Kerala	Kamala Nair Dr.	KSCSTE	1.00	21/01/2000	36
45	Viable technology for development value added food products incorporating coconut	Mary Ukru Dr.	KSCSTE	1.94	23/09/2003	24
46	Screening for water stress tolerance in coconut through pollen selection	Roy Stephen Dr.	KSCSTE	4.50	23/09/2003	36
47	Development of arbuscular mycorrhizal fungi & azospirillum inoculants for nursery disease management and growth enhancement in chilli & amaranthus.	Meenakumari. K. S. Dr.	KSCSTE	2.00	26/07/2000	24
48	Studies of standardisation of organic farming for soil health and sustainable crop production	Ushakumari K. Dr.	KSCSTE	4.20	29/09/2003	36
49	Mass production and field evaluation of bio agents for the eco friendly management of nematodes associated with vegetables	Sheela M.S. Dr.	NATP	18.24	01/04/2001	33
50	Development of an integrated pest management package for the eriophyid mite of coconut in the southern states	Saradamma. K. Dr.	NATP	30.00	08/05/2000	36
51	Starting of experimental agrometeorological advisory services(AAS) at Vellayani	Muralidharan Nair. V. Dr.	Other Depts. (GOI)	3.00	17/04/1997	36

1	2	3	4	5	6	7
52	Socio-technical system analysis of tribal and settler farmers in the western ghat regions of Wayanad district in Kerala	Kumari Sushama N.P. Dr.	Other Depts. (GOI)	7.65	20/03/2003	36
53	Revitalization of Ethno Veterinary Medicine and Mrigayurveda practices among the Tribal Population of Western Ghat for the management of Animal Diseases	Vijayan R. Dr.	Other Depts. (GOI)	6.28	28/02/2003	36
54	Exploration of western ghat microbial biodiversity for crop health and growth	Siva Prasad P. Dr.	Other Depts. (GOI)	4.75	28/03/2003	36
55	Agrotechniques for sustainable mediculture in the western ghat	Anilkumar A.S. Dr.	Other Depts. (GOI)	6.88	05/04/2003	36
56	Studies on the utilization of under exploited curcuma spp. of western ghats of Kerala as alternate crops through participatory approach	Jayachandran B.K. Dr.	Other Depts. (GOI)	5.28	27/03/2003	36
57	Functioning of old age homes and its impact in the family structure of Kerala	Shymakumari Dr., Prasannakumari Dr.	Other Depts. (GOK)	0.15	11/02/2004	3
58	Yield maximisation in cassava through Hunters systematic approach in fertilizer use (Ph.D Research Project of Ms.Susan John)	Head, Dept. of Soil Science	Others	0.00	11/10/1999	36
59	Persistence and movement of chloropyrifos in acid soils of Kerala	Thomas George Dr.	Others	0.44	19/11/2002	12
60	Watershed studies in selected districts of Kerala with special emphasis on tribal settlements -CESS, REC(Calicut), & Kerala Agricultural University	Rajendran. P. Dr.	Others	1.00	09/11/1999	120
61	Intercropping medicinal plants in oil palm plantations (Oil Palm India Limited)	Jessykutty. P. C. Dr.	Others	9.00	03/10/2000	36
62	Nutrient management in coconut based fodder production systems in the homesteads of Kerala. (Potash & Phosphate Institute of Canada-India Programme)	Lekshmy S. Dr.	Others	4.71	27/07/1998	48

1	2	3	4	5	6	7
63	Developing new products from Rice and its by products	Ganesan V Dr.	Others	18.64	25/11/2002	24
64	Yield maximisation of banana cv. Nendran through systematic approach of fertilizer use, in the red loam soils of Vellayani	Prakashmany N. (Student)	Potash & Phosphate Inst. of Canada India Program	0.30	05/07/2001	24
65	Nutrient management in coconut based banana intercropping system in the homesteads of Kerala	Prathapan, K. Dr.	Potash & Phosphate Inst. of Canada India Program	4.97	02/09/2002	36
66	Methods to increase the efficiency of directly applied high grade phosphate rock concentrate (JKT) in neutral and alkaline soils	Sundaresan Nair. CDr.	Rajasthan State Mines & Minerals Ltd.	1.00	01/07/1999	19
203 College of C & B, Mannuthy						
67	Capital formation in agriculture - Role of institutional finance in Kerala	Mani K.P. Dr.	Other Depts. (GOK)	1.03	14/07/2003	24
204 Collge of Agriculture, Padannakad						
68	Investigation on the allelopathic effects of certain multipurpose trees commonly planted in the homsteads of Kerala	Jacob John Dr.	KSCSTE	1.05	03/02/2001	36
69	Standardisation of extraction and preservation techniques of palm-sap (toddy) from coconut	Giridharan M.P. Dr.	NATP	11.00	01/04/2001	33
70	Monitoring of soil organic matter dynamics and synchrony of nutrient release in coconut based farming system	Suresh P.R. Dr	NATP	19.40	01/04/2002	36
205 College of Forestry, Vellanikkara						
71	Micropropagation of Bijasal through tissue culture	Vijayakumar N.K. Dr.	ICAR Adhoc	4.13	20/04/2002	36
72	Human utilization of the forest of western ghats and its effect on the bio-diversity	Nameer P.O.	Kerala Forest Development Fund	2.32	26/09/2001	36
73	Development of an anatomical key for the identification of important timbers of Kerala	Anoop E.V.	KSCSTE	2.97	24/12/2003	24
74	Effect of cosmospriming and accelerated ageing treatments on the germination characteristics of teak seeds (Dept. of Forests)	Sudhakara. K. Dr.	Other Depts. (GOK)	3.00	17/03/1998	48

1	2	3	4	5	6	7
75	Conservation strategy for Dipterocarp(Ho pea parviflora Bedd) species thro' storag of seeds using dessication treatment, sy nthetic seeds and cryopreservation tech.	Sudhakara. K.	Other Depts. (GOK)	1.00	17/03/1998	48
76	Wood quality studies of Acacia provenances	Anoop. E. V.	Other Depts. (GOK)	4.00	06/01/2001	36
77	Role of macro and micro fauna in litter decomposition and plant production in natural forest and agroforestry systems (Dept. of Forests)	Ambikavarma Dr.	Other Depts. (GOK)	4.00	21/05/1999	36
206 College of Horticulture, Vellanikkara						
78	Cocoa research collaboration project between KAU and Hindustan Cocoa Products Limited	Mallika. V/ Vikraman Nair Dr.	CAD India Ltd.	109.00	01/04/1997	60
79	Technology mission of balck pepper	Nybc E.V. Dr.	Dept. of Agriculture, Thiruvananthapuram	79.30	22/09/2001	12
80	Improvement of selected spice crops through biotechnology tools	Nazeem P.A. Dr.	Dept. of Biotechnology (GOI)	49.00	03/05/2001	36
81	Establishment of distributed information sub centre at KAU.	Nazeem. P. A. Dr.	Dept. of Biotechnology (GOI)	15.00	04/05/1995	60
82	Triploid production in water melon and Annonas through in vitro endosperm culture	Rajendran .P .C. Dr.	Dept. of Biotechnology (GOI)	10.00	05/03/1997	36
83	Studies on gnetic diversity of teak using AFIP Markers	Nazeem P.A Dr.	Dept. of Biotechnology (GOI)	12.85	31/12/2002	48
84	Women empowerment through farm level value addition of cocoa	Mallika V.K. Dr.	Dept. of Biotechnology (GOI)	11.24	26/03/2003	36
85	On farm evaluation of tissue culture derived black pepper plants	Nazeem P.A. Dr.	Dept. of Biotechnology (GOI)	38.70	29/05/2002	36
86	Establishment of germplasm bank for ayurvedic medicinal plants (Kottakkal AryaVaidya Sala)	Alice Kurien Dr.	Dept. of Biotechnology (GOI)	3.45	08/05/2002	36
87	Tissue culture research in Cashew	Kesavachandran. R. Dr.	Dept. of Biotechnology (GOI)	19.65	19/07/1999	3
88	Genetic transformation for biotic stress tolerance in bell pepper (Capsicum annum .L.)	Girija D Dr.	Dept. of Biotechnology (GOI)	22.56	29/01/2003	36

1	2	3	4	5	6	7
89	CSS on Integrated Programme for Development of Spices	Nybe E.V	Dept.of Agri.& Cooperation (GOI)	14.15	01/04/2003	12
90	Economic impact on agro-advisaries on different crops	Sudheesh M.V.	Dept.of Science & Technology (GOI)	1.43	10/12/2003	5
91	Biochemical investigations of enriched coir pith compost materials	Sushama P.K. Dr.	Dept.of Science & Technology (GOI)	2.97	22/08/2003	24
92	Establishment of a National Centre for medium range weather forecasting on experimental basis at KAU main campus-Start of Agrom- et Services on exptl.basis under NCMRWF	GSLHV Prasada Rao Dr.	Dept.of Science & Technology (GOI)	1.00	08/03/1991	120
93	Bio-ecology conservation and predatory potential of spider fauna in vegetable and rice agro eco system		ICAR Adhoc	3.47	09/05/2002	36
94	Development of Technology for Farm Level Secondary Processing of Cocoa	Prasannakumari Amma S Dr	ICAR Adhoc	9.29	19/02/2003	36
95	Micropropagation & development of seedless Malabar tamarind <i>Garcinia gummigutta</i> var. <i>gummigutta</i> through in vitro techniques	Rajendran. P. C. Dr.	ICAR Adhoc	8.00	14/09/2000	36
96	Forewarning tea mosquito bug <i>Helopeltis antonii</i> Sign (Miridae:Hemiptera) in cashew	Pathummal Beevi S. Dr.	ICAR Adhoc	24.81	16/07/2003	36
97	Nutrient and antinutrient composition of ethnic plant foods consumed by the tribes of Kerala	Indiara V. Dr.	ICAR Adhoc	17.99	16/04/2002	36
98	Economic analysis of vegetable production in Kerala	Jessy K. Thomas, Dr.	ICAR Adhoc	5.47	01/04/2002	36
99	Persistence of herbicides in water bodies and its impact on aquatic life	Durga devi K.M. Dr.	ICAR Adhoc	25.00	26/07/2001	36
100	AICRP on Soil test Crop response correlation	Hassan. M. A. Dr.	ICAR Co-ordinated	9.94	01/04/2002	12
101	AINP on Agricultural Ornithology	Jim Thomas Dr.	ICAR Co-ordinated	8.00	01/04/1997	12
102	AICRP on Medicinal & Aromatic Plants	Prasannakumari. K. T. Dr.	ICAR Co-ordinated	57.00	01/04/1997	120
103	AIC Floriculture Improvement Project	Rajeevan. P. K. Dr.	ICAR Co-ordinated	12.00	01/04/1990	120
104	AIC Vegetable Improvement Project	Rajan. S. Dr.	ICAR Co-ordinated	14.00	01/04/1990	120
105	AICRP on Weed Control	Abraham. C. T. Dr.	ICAR Co-ordinated	36.00	01/04/1997	120
106	AICRP on meteorology	Prasada Rao GSLHV Dr.	ICAR Co-ordinated	7.68	01/04/1997	60

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107	AICRP on BCCP	Pathummal Beevi Dr.	ICAR Co-ordinated	9.28	01/04/1997	12
108	Economics of teak plantations in Kerala	Indira Devi. P.	ICFRE (GOI)	6.00	16/06/1997	36
109	Assessment of hill top agriculture at Vattavada panchayat of the high ranges	Dr. Mini Raj. M. S.	Kerala Res.Prg.on Local Level Development	2.00	29/02/2000	24
110	Transfer of technology and studies on marketing pattern of jack fruits in Thrissur district	Lyla Mathew. K. Dr.	Kerala Res.Prg.on Local Level Development	1.00	01/03/2000	18
111	Survey and collection of elite Mauritius pineapple clones suitable for commercial cultivation in Kerala (KHDP Vellanikkara)	Babylatha. A. K. Dr.	KSCSTE	1.00	14/07/1999	36
112	Yellow leaf of arecanut and its agronomic management	Mercy George, Dr.	KSCSTE	2.92	23/03/2002	36
113	Domestication studies on Jeevakam (Malaxis rheedi Sw.)	Mini Raj N. Dr.	KSCSTE	4.39	02/09/2003	36
114	Commercial rice hybrids for Kerala - Evolution of two line hybrids by using WC genes and TGMS lines	Radhakrishnan V,V. Dr	KSCSTE	5.01	20/01/2004	36
115	Genomic library construction and cloning of gene(s) for PR proteins in black pepper (Piper Nigrum L.)	Girija D. Dr.	KSCSTE	5.61	26/09/2003	36
116	Evolution of popular black pepper cultivars of north and south Kerala for growing as bush pepper	Arya, K. Dr.	KSCSTE	4.29	20/01/2004	36
117	Participatory plant breeding for the development of the rice varieties suited for specific agro ecological situations of Kerala	Elsy C.R. Dr.	KSCSTE	3.02	15/09/2003	36
118	Transfer of technology in commercial production of anthurium	Valsalakumari. P. K. Dr.	National Horticultural Board	9.00	10/05/2000	36
119	Transfer of technology in commercial production of orchids	Rajeevan. P. K. Dr.	National Horticultural Board	9.00	18/05/2000	36
120	Isolation and invitro screening of Hirsutella thompsonii and other fungal pathogens against the coconut mite Aceria guerreronis K	Pathummal Beevi S. Dr.	NATP	18.93	01/04/2002	36
121	Decision support system for Integrated Agricultural Resource Management at Micro-level: Pilot study and capacity Building	Saifudeen N.Dr	NATP	7.06	01/04/2002	21

1	2	3	4	5	6	7
164	Conservation and evaluation of Malabari breed of Goats	Raghavan. K. C. Dr.	ICAR Adhoc	25.00	30/11/2000	36
165	AICRP on Pigs	Viswanathan. T. V. Dr.	ICAR Co-ordinated	30.00	01/04/1997	12
166	AICRP on Poultry	Narayanankutty K. Dr.	ICAR Co-ordinated	32.80	01/04/1997	12
167	AINWP on Haemorrhagic Septicaemia	Krishnan Nair. G. Dr.	ICAR Co-ordinated	4.00	14/03/2001	12
168	NWP on Attapady Black Goats	Stephen Mathew Dr.	ICAR Co-ordinated	21.00	01/04/1997	60
169	AICRP on Goat Improvement	Raghavan K. C. Dr.	ICAR Co-ordinated	13.06	01/04/1997	12
170	Studies on pesticide residues in meat body fat, blood and various organs of animals slaughtered for meat purpose.	Vijayan. R. Dr.	KSCSTE	1.00	21/05/1999	36
171	Meat science and technology in the centre/team of excellence mode	Abraham. J. Dr.	NATP	215.00	01/01/2001	36
172	Productivity enhancement of ducks (NATP)	Jalaludeen. A. Dr.	NATP	31.00	01/07/1999	48
173	Animal Genetic Resources Bio-diversity (NATP)	Anilkumar K. Dr.	NATP	23.00	01/10/1999	48
174	Development of value added products and byproducts from low cost fish and processing wastes from fish and shell fish	Mercy A.D. Dr.	NATP	13.95	01/04/2001	36
175	Physiological evaluation of stress on meat quality induced by growth promoters and its ameluation in broiler chicken	Philomina P.T. Dr.	NATP	12.54	01/04/2002	36
176	Micro satellite markers for genetic improvement of livestock	Usha A.P. Dr.	NATP	19.00	01/04/2001	33
177	Weather based animal disease forecasts	Saseendranath. M. R. Dr.	NATP	12.00	22/09/2000	36
178	Network programme on micronutrients in Animal Nutrition and production	Syam Mohan K.M. Dr.	Network	73.00	01/04/1997	120
179	Monitoring of health status of elephants in Wayanad wild life reserve. Chief Conservator of Forests (Wild Life)	Alex. P .C. Dr.	Other Depts. (GOI)	3.00	28/08/1998	36
180	Study on Anticoccidial efect of herbal formulation AV/PPP19 and AV/PPP20	Subramanian H. Dr.	Others	0.20	02/06/2003	1

1	2	3	4	5	6	7
151	Establishment of plasticulture development centre at Tavanur. Dept.of Agri.& Co-op.,Min.of Agriculture	John Thomas. K. Dr.	Other Depts. (GOI)	14.00	01/04/1995	72
262	<i>College of Fisheries, Panangad</i>					
152	Bio-diversity survey of Palaemonid prawns of Kerala and studies on the biology of <i>Macrobrachium latimanus</i>	Jayachandran V. Dr.	ICAR Adhoc	9.00	08/08/2001	36
153	Studies on circulation and mixing and their influence on productivity of Panangad region of Vembanad Lake	Kerala Varma. K. Dr.	ICAR Adhoc	8.00	18/07/2000	36
154	Survey on the knowledge and practice of processing technology aspects of fish among selected women from Ernakulam and Alleppey districts	Omana Pavunni	KSCSTE	2.56	11/02/2004	24
155	Captive development of brood stock of giant fresh water prawn <i>Macrobrachium rosenbergii</i> (de MAN) for year round production of quality seed in hatcheries	Aneykutty Joseph, Dr.	KSCSTE	4.26	23/01/2004	36
156	Germplasm inventory, Evaluation and gene banking of freshwater fishes (NATP)	Anna Mercy. T. V. Dr.	NATP	14.00	01/11/1999	48
157	Production of bioactive substances from squid and cuttle fish processing waste	Sherief P.M. Dr.	NATP	27.00	01/04/2001	33
158	Modernization of instructional fish/shrimp farm	Suseela Jose Dr,	NATP	59.65	01/11/2003	14
271	<i>College of Vety. An. Sc., Mannuthy</i>					
159	Consumer acceptability studies of coconut based dairy products	Geevargese P.I., Dr.	Coconut Development Board	0.50	28/01/2002	3
160	Molecular genetic characterization and genetic improvement of malabari goats	Aravindakshan. T. V. Dr.	Dept. of Biotechnology (GOI)	19.19	09/05/2000	36
161	Development of molecular genotyping techniques for the diagnosis of genetic disease in diary cattle	Sisilyamma George Dr.	Dept. of Biotechnology (GOI)	36.00	24/02/2000	36
162	Formulation of low cost animal feeds using feed stuffs available in rural areas of Kerala.	Syam Mohan. K. M. Dr.	Dept.of Science & Technology (GOI)	2.00	20/01/1997	36
163	Field progeny testing scheme	Stephen Mathew Dr.	ICAR Adhoc		01/04/1997	60

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137	Padma Shree Paul Pothan IFFCO chair	Mukundan. K Dr. / Thomas E. K.	Others		12/08/1996	48
138	Pricing of irrigation water in Kerala with special reference to environmental management	Indiradevi. P. Dr.	Others	8.00	01/04/2000	30
139	Pesticide use in rice production and human health - a study in Kerala	Indira Devi P.	Others	5.92	10/12/2003	24
140	Integrated management of fruit flies (Diptera: Tephritidae) in India	Jim Thomas Dr.	Others	10.88	01/01/2002	27
210 Instructional Farm, Vellayani						
141	Pest and disease management of oysterm mushroom in Kerala	Suharban M. Dr.	KSCSTE	2.00	30/07/2002	36
142	Bio-degradation of coir pith with funge for converting it into compost and standardisation of techniques for mushroom production	Geetha D. Dr.	KSCSTE	1.89	25/03/2002	36
253 KCAE&T, Tavanur						
143	A study on coconut oil as lubricant for IC engine	Muhammed C.P	Dept. of Agriculture, Thiruvananthapuram	19.00	01/01/2003	24
144	Refinement and popularization of Coconut climber and harvesting pole	Muhammed C.P	Dept. of Agriculture, Thiruvananthapuram	10.50	01/01/2003	24
145	Study relating to formulating long term mechanization strategy for each agroclimatic zone/state	Sivaswamy M. Dr.	Dept.of Agri.& Cooperation (GOI)	2.02	01/04/2001	12
146	Development and testing of a simple riding type paddy transplanter	Sivaswamy M. Dr.	ICAR Adhoc	8.43	10/07/2001	24
147	Farm machinery production and popularisation	Muhammed. C. P.	ICAR Adhoc	12.00	31/08/2000	120
148	AICRP on Farm Implements & Machinery	Sivaswami. M. Dr.	ICAR Co-ordinated	45.00	01/04/1997	120
149	Front line demonstration of agricultural implements and machinery in selected regions of the country.	Sivaswamy. M. Dr.	ICAR Co-ordinated	3.00	02/11/2000	24
150	Alleviating occupational stresses imposed on women agricultural workers of Kerala - An ergonomic approach	Geetha Susan Philip	NATP	28.00	01/04/2001	33

1	2	3	4	5	6	7
122	Performanve analysis of selected medicinal plants in multiple cropping system - PSR model	Prasannakumari K.T. Dr.	NATP	20.73	04/10/2001	24
123	Gender analysis of farming systems for sustainable technologies, development programmes and livelihood	Geethakutty P.S. Dr.	NATP	8.22	01/04/2002	36
124	Network Project on Engendering Agricultural Research and Extension	Geethakutty P.S. Dr.	Network	11.39	07/02/2004	12
125	Induction of variation through tissue culture and evaluation of varieties for phytophthora, footrot tolerance/resistance in black pepper	Shylaja. M. R. Dr.	Other Depts. (GOK)	7.00	12/03/1999	48
126	Identification of location specific varieties	Nybe. E. V. Dr.	Other Depts. (GOK)	6.00	12/03/1999	48
127	Testing of the released pepper varieties in various pepper tracts of Kerala	Nybe. E. V. Dr.	Other Depts. (GOK)	4.00	12/03/1999	48
128	Identification of low input reponsive varieties in relation to local technology in black pepper	S. Dr.Prassannakumari Amma.	Other Depts. (GOK)	5.00	12/03/1999	48
129	Use of organics and biofertilisers in black pepper for yield and quality improvement	Jose Mathew Dr.	Other Depts. (GOK)	5.00	12/03/1999	48
130	Standardisation of low input technology for black pepper	Jose Mathew Dr.	Other Depts. (GOK)	5.00	12/03/1999	48
131	Incorporation of biocontrol in nursery plants for checking phytophthora disease	Koshy Abraham Dr.	Other Depts. (GOK)	21.00	12/03/1999	48
132	BIOTECH- KERALA biotechnological interventions and opportunities towards enhancing crop production in Kerala (BT & IT)	Nazeem P.A. Dr.	Other Depts. (GOK)	60.00	05/02/2004	24
133	Women empowerment networking in Kerala through science & technology	Geethakutty P.S. Dr.	Other Depts. (GOK)	26.74	09/03/2004	36
134	Use of bio-control for checking phytophthora disease	Vilasini. T. N. Dr.	Other Depts. (GOK)	22.00	12/03/1999	48
135	Breeding for resistance to phytophthora foot rot in pepper	Sujatha. V. S. Dr.	Other Depts. (GOK)	6.00	12/03/1999	48
136	Influence of physical and biochemical factors in monsooned coffee	Prasada Rao G.S.H.L.V.Dr.	Others	0.99	30/07/2003	12

1	2	3	4	5	6	7
181	Pharmacological effect of mucuna pruriens baker on reproductive organs of albino rats	Associate Prof. & Head	Others	0.20	30/09/2002	1
274 Meat Technology, Mannuthy.						
182	Processing of pork, broiler and eggs	Kuttinarayanan . Dr.	NATP	16.00	01/04/2001	36
275 University Library, Vellanikkara						
183	Revamping the existing Library and Information System Development Sub-component of the Organization and Management Reforms Component	Lalitha M.C	NATP	99.00	01/04/2002	21
279 College of Dairy Science & Technology, Mannut						
184	Improvement of nutritional qualities of some selected dairy products using wild strains of Bifido bacteria	Prasad. V. Dr.	ICAR Adhoc	10.00	06/03/2000	36
301 AICRP on Agrl. Drainage, Karumady						
185	Productivity augmentation through sub surface drainage and farming system interventions in acid, saline, coastal wetlands, Kerala	Mathew E.K. Dr.	NATP	19.00	01/04/2001	33
304 AMPRS, Odakkali						
186	CSS on M&AP	Baby P Skaria Dr.	Dept.of Agri.& Cooperation (GOI)	13.45	01/04/2003	12
187	Development of lemon grass oleoresin for flavouring	Joy P.P. Dr.	ICAR Adhoc	13.78	16/09/2003	36
188	Development of Agro-techniques for selected medicinal plants used in Ayurveda in Kerala	Samuel Mathew Dr.	Other Depts. (GOI)	13.00	01/04/2002	36
189	Participatory technology development for sustainable natural resource utilization and livelihood support through agriculture related activities in Eramalloor Thodu water shed	Baby P. Scaria Dr.	Other Depts. (GOI)	6.80	01/04/2003	36
305 ARS, Chalakudy						
190	AICRP on Water Management	Head, ARS, Chalakkudy	ICAR Co-ordinated	39.00	01/04/1990	120

1	2	3	4	5	6	7
191	Nutrition management and processing qualities of vanilla (<i>Vanilla planifolia</i> Andrews)	Mini Abraham Dr.	KSCSTE	2.59	27/01/2004	36
	310 BRS, Kannara					
192	AICRP on tropical fruits (Banana)	Rema Menon, Dr.	ICAR Co-ordinated	48.08	01/04/1997	60
	313 CRS, Madakkathara					
193	AICRP on Cashew - Research on Cashew (Madakkathara & Pilicode)	Abdul Salam. M. Dr.	ICAR Co-ordinated	14.00	01/04/1992	96
	314 CRS, Pampadumpara					
194	Biological suppression of cardamom root grub <i>Basilepta fulvicorne</i> jacoby through entomophilic nematodes	Joseph Rajkumar A. Dr	ICAR Adhoc	7.32	03/03/2004	36
195	AICRP on Spices	Head, CRS, Papamdumpara	ICAR Co-ordinated	32.44	01/04/1990	120
196	Invitro production of anti-cancer secondary plant metabolites - captothecia and related alkaloids	Vasanthakumar K. Dr.	KSCSTE	3.00	04/09/2001	36
	315 CSRC, Karamana					
197	AICRP - Project Directorate of Cropping Systems Research - Karamana & ECF Unit, Alathur sub centre	Head, Karamana	ICAR Co-ordinated	64.00	01/04/1997	60
	318 ECF, Palakkad					
198	Site specific nitrogen management in rice based cropping system by Chlorophyll meter and leaf colour chart techniques	Johnkutty I. Dr.	ICAR Adhoc	10.16	08/04/2002	36
	321 PRS Vazhakulam					
199	Evaluation of pineapple hybrids for higher yield quality and suitability of intercropping	Kuriakose K.P.	ICAR Adhoc	4.82	17/12/2001	36
200	Studies on the use of pottassium fertilizers for improving yield and quality of pineapple on main production sites of Kerala State	Kuriakose K.P. Dr.	Others	4.90	10/10/2001	36
	322 Farming System Research Station, Kottarakkara					
201	Management of soil related constraints for increasing production of Cassava in the homesteads of Kollam district	Shehana. R. S. Dr.	KSCSTE	1.00	09/03/1999	36

1	2	3	4	5	6	7
202	Black pepper cultivar Karuvilanchy - survey, characterisation, conservation and genetic improvement	Ajithkumar K. Dr.	KSCSTE	1.57	22/04/2002	36
203	Analysis and development of homestead farms of Kerala - A farmer participatory approach	Vikraman Nair R. Dr.	NATP	57.00	01/04/2001	36
323 Soil Conservation Research Centre, Konni						
204	Providing canal bank protection and assessing the biodegradability of coir geotextiles	Anil. K. R.	Coir Board	9.00	14/10/1999	12
205	Collaborative project on the use of coir geotextiles for template planting and as a soil mulch	Anil. K. R.	Coir Board	15.03	15/10/1999	36
206	Use of coir geotextiles for regeneration of exposed rock patches	Anil. K. R.	Coir Board	13.00	14/10/1999	12
207	Use of coir geotextiles for soil and water conservation at varying slopes	Anil. K. R.	Coir Board	8.51	14/10/1999	12
336 NARP SR, Vellayani						
208	AICRP on forage crops	Suma Bai D.I. Dr.	ICAR Co-ordinated	20.85	01/04/1997	60
209	AICRP on pesticide residues	Nazeema Beevi S. Dr.	ICAR Co-ordinated	13.88	01/04/1997	12
210	Induction of systemic acquired resistance against foot rot (<i>P. capsici</i>) of black pepper in micro propagated and conventionally propagated plants in nursery	Anith K. N. Dr.	KSCSTE	2.00	09/08/2000	36
211	Effective use of fertilizer Phosphorous	Sundareshan Nair C. Dr.	Others	4.95	21/12/2001	36
339 PRS, Panniyur						
212	AICRP on Spices		ICAR Co-ordinated	45.39	01/04/1997	60
213	Breeding for phytophthora foot rot resistance in black pepper (<i>Piper nigrum</i>)	Vanaja T. Dr.	KSCSTE	4.60	11/02/2004	36
340 RARS, Ambalavayal						
214	Starting of experimental agrometeorological advisory services (AAS) at RARS Ambalavayal	Iype. K. C. Dr.	Dept.of Science & Technology (GOI)	1.00	02/03/1996	48
215	Problem and prospects of agro processing units in Wayanad district of Kerala	Chithra Parayil	Kerala Res.Prg.on Local Level Development	0.15	07/05/2001	3

1	2	3	4	5	6	7
216	Evolving an antagonistic microbial mixture formulation for integrated management of multiple disease (Rhizome rot and Bacterial wilt) in Ginger	Radhakrishnan N.V Dr.	KSCSTE	2.60	20/11/2002	36
341 RARS, Kumarakom						
217	Utilisation of aquatic weeds for vermicomposting and composting	Geetha. K. Dr.	KSCSTE	2.00	18/12/2000	36
218	Germplasm inventory evaluation and gene banking of fresh water fishes	Padmakumar. K. G.Dr.	NATP	20.00	01/11/1999	48
219	Economic analysis of rice based cropping system in coastal agro-ecosystem of India (NATP)	Joseph K J Dr. & Padmakumar KG	NATP	15.00	01/11/1999	48
220	Fish ranching and open water fishery management in Vembanad lake. (Dept. of Fisheries)	Padmakumar. K. G. Dr.	Other Depts. (GOK)	63.00	29/08/1997	36
221	Exploiting the genetic variability in Garcinia combogia Desr. for its rehabilitation and mass production of planting materials. (Spices Board)	Inasi. K.A.	Spices Board (GOI)	20.00	22/11/1996	60
342 RARS, Pattambi						
222	NSC -Breeder Seed Production Unit NSP - BSP Project	Leenakumari. S. Dr.	ICAR Adhoc	21.00	01/04/1990	120
223	AICRP on Long term fertilizer experiment	Usha Mathew Dr.	ICAR Co-ordinated	6.00	01/04/1995	60
224	AICRIP - Double Cropping, Main Centre	Assoc. Director, RARS, Pattambi	ICAR Co-ordinated	21.50	01/04/1990	120
225	AICRP on Arid Legumes (Guar)	Associate Director	ICAR Co-ordinated	15.60	01/04/1997	12
226	Evaluation of agricultural projects under people plan campaign in Malappuram district	Prcma A.	Kerala Res.Prg.on Local Level Development	2.00	28/05/2001	18
227	Induction of resistance in rice against blast and sheath blight through in vitro culture system	Beena C. Dr.	KSCSTE	3.04	01/04/2003	36
228	Mechanisation of experimental plots	Deepthi Susan P.E.	NATP	32.50	01/03/2004	10
229	Pilot study on sustainable rice production through organic farming	Balachandran P.V. Dr.	NATP	28.00	01/04/2001	24

1	2	3	4	5	6	7
230	Seed multiplication and integrated pest management programme	Assoc. Director RARS Pattambi	Other Depts. (GOK)	3.00	04/01/2000	12
343 RARS, Pilicode						
231	Starting of experimental agrometeorological advisory services at RARS Pilicode	Prasada Rao. GSLHV Dr.	Dept.of Science & Technology (GOI)	1.00	01/04/1995	60
232	Evaluation of acid tolerant strains of Cyanobacteria for growth and yield o paddy in Kerala	Govindan M. Dr.	KSCSTE	2.84	02/09/2003	36
233	Climate and Coconut (M/s Marico Industries Ltd., Bombay)	Prasada Rao. GSLHV Dr	Others	8.89	01/06/1994	94
344 Onattukara RARS, Kayamkulam						
234	Survey and identification of root wilt disease free palms and evolution resistant genotypes in coconut through selection and hybridization	Swarup John Dr.	Coconut Development Board	34.87	30/01/2004	60
235	Invitro cloning techniques in Garcinia campogia Des	Shyam S. Kurup. Dr.	ICAR Adhoc	16.40	12/12/2001	36
236	Breeding and invitro techniques for incorporating stress tolerance in sesame	Swarup John Dr.	ICAR Adhoc	10.28	01/08/2002	36
237	AICRP on sesame and niger	Sverup John Dr.	ICAR Co-ordinated	5.72	01/04/1997	12
345 RRS, Moncompu						
238	AICRIP - Double Cropping Main Centre	Head	ICAR Co-ordinated	9.80	01/04/1997	60
346 RRS, Vyttila						
239	Rice varietal improvement under abiotic stress	Shylaraj K.S. Dr.	KSCSTE	3.63	23/09/2003	36
347 SRS, Thiruvalla						
240	AICRP on Sugarcane	Station Head	ICAR Co-ordinated	11.24	01/04/1997	12

1	2	3	4	5	6	7
241	Conservation and utilization of biodiversity in Erianthus and Sacccharum Spontanum in Kerala for the gebetic improvement of sugarcane	Sreekumar K. Dr.	KSCSTE	6.11	15/01/2004	36
379 LRS, Thiruvazhamkunnu						
242	AICRP on Agroforestry (Functioning at LRS, Thiruvazhamkunnu)	Mohankumar. B. Dr.	ICAR Co-ordinated	26.00	01/04/1990	120
383 PPNMU, Vellanikkara						
243	Sustainable management of proven technology on control of insect pests and diseases in coconut and establishment of demonstration cum seed production technology	Babu Philip Dr.	Coconut Development Board	25.00	05/05/2003	36
385 Dept. of Olericulture, CoH, Vellanikkara						
244	Rainshelter cultivation of vegetables for off-season production and employment generation	Indira P.Dr.	NATP	13.59	01/04/2002	36
245	Sustainable management of plant biodiversity: vegetable cowpea and amaranthus	Salikutty Joseph Dr.	NATP	24.00	01/04/2001	33
403 Communication Centre, Mannuthy						
246	A study on the indigenous technical knowledge (ITK) in the farming systems of Kerala	Mulakeedhara Prasad R. Dr.	Indian Council of Medical Research	10.00	20/09/2003	6
247	Participatory extension system for technology generation, refinement and dissemination	Binoo P. Bonny, Dr.	NATP	9.25	01/04/2002	36

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Total Outlay Rs. 3,567.22

