

STRIDES IN AGRICULTURE



50 YEARS



College of Agriculture, Vellayani, Thiruvananthapuram



809786



STRIDES IN AGRICULTURE

50 Years

Edited By

Dr. K. Harikrishnan Nair

Former, College of Agriculture, Vellore

Edited By

Dr. S.K. Nair

Dr. Geethakumari V.L.

Dr. Manorama Thampatti K.C.

Photographs

Collections from the respective departments

& Dr. V. Ganeshan

Coverpage Design

Sri. Chandanandan V

Layout, Design & Printing:

SB Press (P) Ltd., Thiruvananthapuram - 1

December 2007

Copies : 500

INDIAN COUNCIL OF AGRICULTURAL RESEARCH



ACCREDITATION BOARD

Letter of Accreditation

The College of Agriculture, Vellayani, a constituent college of Kerala Agricultural University, Thrissur submitted a Self-Study Report to the Indian Council of Agricultural Research, New Delhi, for accreditation, giving details indicating the fulfilment of accreditation criteria. The ICAR sent a Peer Review Team to the University, which visited the College and submitted its report to the Council.

Upon the recommendation of the ICAR Peer Review Team and the Education Division, and being satisfied that the College fulfills the minimum accreditation criteria, the Accreditation Board is pleased to accredit the College for three years from the date of issue of this letter. The University will keep the ICAR informed about any major changes with respect to Administration, Financial Resources and Academic Programs of the College. The University will also submit half yearly updates on progress for implementation of decisions of the Board for further enhancing the relevance and quality of institutional programs.

(J.C.Katyal)
Deputy Director General(Edn.), ICAR
& Vice Chairman, Accreditation Board

(Mangala Rai)
Director General, ICAR
& Chairman, Accreditation Board

Date : August 25, 2004
Place : New Delhi

Message

K.R. VISWAMBHARAN, IAS
Vice Chancellor
Kerala Agricultural University

Phone { Office : 0487-2371928
Res : 0487-2370439



I am happy to know that College of Agriculture, Vellayani is bringing out a publication entitled "Strides in Agriculture-50 years", a compendium on the history and mandate of the college and fabulous achievements of the pioneer Agricultural institute in the state of Kerala in connection with the "Karshikotsavam 2007".

I sincerely hope the publication will serve as a reference material for the scientists, extension personnels and the farming community involved in Agriculture and other allied enterprises.

I congratulate the efforts of the Dean and colleagues for bringing out this compendium and wish all success in their endeavor.

With best wishes

K.R. VISWAMBHARAN, IAS

Message

Dr. K.HARIKRISHNAN NAIR
Dean, Faculty of Agriculture

Phone { Office : 0471-2381829
Res : 0471-2222939



It is my privilege to present the publication "Strides in Agriculture-50 years" a compendium on the history, mandate and meritorious achievements and accomplishments of the pioneer Agricultural institute of Kerala. I am happy to acknowledge with gratitude the efforts put in by all faculty members in providing the technical inputs and other relevant informations and processing and presenting the publication in the present form.

I sincerely hope the publication will help the aluminees of the institution to cherish the nostalgic memories of the student life and the panoramic beauty of their alma matter. I am sure the document will serve as reference material for technology transfer and provide useful information about this prestigious institute.

Best wishes to all staff, students and labourers of the college.

K. HARIKRISHNAN NAIR

turn the pages

11

BACKGROUND

13

LOCATION, MISSION AND GOALS

14

**ORGANIZATION AND
GOVERNANCE**

46

LATERAL FACILITIES

17

PREFACE

COLLEGE OF AGRICULTURE

Vellayani, Thiruvananthapuram

Agricultural Education in Kerala dates back to the year 1896 when a demonstration farm was established at Karamana in the erstwhile Travancore State, for training young men in the field of scientific agriculture. Later, agriculture was introduced as an optional subject in the middle school classes in the State and a diploma course in agriculture was started in 1939 at Travancore University. In 1953 agriculture was introduced as an optional subject in the intermediate course. The idea of establishing an Agricultural college was originated and approved by the Government of the erstwhile State in 1955. The and Research into existence in May, Thiruvananthapuram and the research existing research Travancore Department of Agriculture. The Institute started functioning in the palace building at Vellayani which belonged to the royal family of erstwhile Travancore. This building and the adjoining area were generously handed over to the Government for this purpose by the Royal Family. It is a beautiful campus laid out on one of the hillocks surrounding the fresh water lake of Vellayani.



Travancore-Cochin Agricultural College Institute thus came 1955 at Vellayani, by transferring the staff programmes of the wing of the then University and the

During the initial period of inception, the Agricultural College and Research Institute was directly administered by the Government. Later it was attached to the Department of Agriculture. The College was affiliated to the then University of Travancore for all academic purposes. With the enactment of Kerala Agricultural University Act by the State Legislature in 1972, this institution was declared as the first constituent college of the Kerala Agricultural University with effect from 1-2-1972 and was renamed as the College of Agriculture. The affiliation of the college to the Kerala Agricultural University led to the integration of various ongoing teaching, research and extension activities. This college still continues to be a leading agro technology provider for the State and its graduates are recognized throughout the world.

The guiding spirits of the Institute

At the time of inception of the college, the Head of the Institution was designated as Principal. Late Prof.M.C,Cherian,the then Principal of Bapatla College of Agriculture, has the credit of being the first Principal of this prestigious institution. He was succeeded by late Prof.L.S.S.Kumar, former Principal of Puna Agricultural College. Late. Dr.C.K.N.Nair, former Scientist of ICAR and Late Prof.P.Kumara Pillai, renowned educationalist in Kerala Agricultural university. The institutional head was also serving as Additional Director of Agriculture.

Principals

Name	Field of Specialisation
Late Prof. M.C. Cherian	Agricultural Entomology
Late Prof. L.S.S. Kumar	Agricultural Botany
Late Dr. C.K.N. Nair	Soil Science and Agricultural Chemistry
Late Prof. Kumara Pillai	Botany

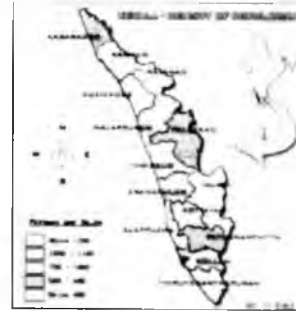
In 1972, with the enforcement of KAU Act, the Head of the Institution was redesignated as Dean, College of Agriculture, Vellayani. Late. Dr. J. Samraj, well known pathologist was posted as the first Dean of the college.

Deans

Name	Field of Specialisation	Period
Late. Dr. J. Samraj	Plant Pathology	18.07.1972 to 31.07.1974
Late. Dr. N.S. Mony	Soil Science and Agricultural Chemistry	01.08.1974 to 31.10.1976
Dr. N. Sadanandan	Soil Science and Agricultural Chemistry	01.11.1976 to 31.09.1985
Dr. M.M. Koshy	Agronomy	01.10.1985 to 05.11.1989
Dr. C. Sreedharan	Agronomy	06.11.1989 to 12.06.1997
Dr. P. Balakrishna Pillai	Agronomy	13.06.1997 to 17.04.1999
Dr. K.M. Rajan	Plant Pathology	18.04.1999 to 21.02.2000
Dr. P.A. Wahid	Soil Science and Agricultural Chemistry	22.02.2000 to 06.06.2001
Dr. R. Vikraman Nair	Agronomy	07.06.2001 to 12.05.2002
Late. Dr. G. Sreekandan Nair	Horticulture	13.05.2002 to 11.08.2003
Dr. C. Sundaresan Nair	Soil Science and Agricultural Chemistry	12.12.2003 to 13.09.2006
Dr. K. Harikrishnan Nair	Soil Science and Agricultural Chemistry	14.09.2006 to till date

2. Location

The College of Agriculture is located at Vellayani in the Kalliyoor village of Thiruvananthapuram district. It is located at 8.5° N latitude and 76.5° E longitude and 29 m above MSL. The college is about 12 km south of the capital city of Thiruvananthapuram and 4 km north-west of the famous beach resort of Kovalam. The College of Agriculture lies in the mid land physiographic region of Kerala. A humid tropical climate is prevalent in the area with an average rainfall of 1630 mm and a mean temperature of 27°C.



3. Mission and Goals

The primary mandate of the college is to provide leadership in teaching, research and extension activities related to agriculture and allied sciences. The Institute has been making efforts to keep pace with new frontiers of science and contemporary developments which are socially, economically and technically relevant to the farming community of the state. In keeping with the spirit of the mission and mandate of the Institute, the following goals have been projected.

- ♦ To impart quality education in the fields of agriculture, horticulture, veterinary and animal sciences, agricultural engineering, home science and other allied sciences in order to make it responsive to the growth of the society in general, and the aspirations of the farming community, in particular.
- ♦ To provide leadership in both basic and applied research for evolving need based and eco-friendly technologies for sustainable agriculture
- ♦ To develop suitable end use technologies to solve farmers' problems
- ♦ To serve as a leading centre for the collection and maintenance of agricultural database and their effective transfer through IT missions to students, researchers and farmers.
- ♦ To impart training for grass root workers and officers of the State Departments of Agriculture, Forestry, Dairy science, Central institutes, NGO's and Private organizations to update their knowledge base and practical skills.

4. Resources

The college has a total area of 222.27 ha of which 78.02 ha is garden land and the remaining 144.25 ha is occupied by fresh water Vellayani lake. The soils of the area are developed from lateritic formations, colluvium and alluvial deposits. The soils belong to the soil orders of Entisols, Alfisols and Ultisols. The tract is blessed with "Fresh water Vellayani Lake" which serves as the source of water for domestic as well as irrigation purposes.



This institution what is today is mainly due to the dedication and the collective efforts of all staff, students and farm labourers over a period of time since its inception in 1955. Many of the teachers have received a number of state and national awards for excellence in different fields. The different categories of administrative and supporting staff, farm labourers and the student community also constitute a significant component of the overall human resource scenario of the college.

5. Organisation and Governance

The College of Agriculture follows the administration pattern of Kerala Agricultural University. The service rules followed in the university are the Kerala Service Rules. As per the statutes of the university, the administrative head of the College, is the Dean, Faculty of Agriculture. The Dean reports directly to the Vice Chancellor.

In academic programmes, the Dean is assisted by various heads of departments and other scientific and technical staff.

In the general administration, the Dean is assisted by an Administrative Officer, and other staff members.

5.1 Departments

In order to encompass various teaching, research and extension activities, college has twenty departments. Each department is governed by a Head. The head of the department is responsible for the implementation of various programmes of the department either individually or in collaboration with other departments or agencies.

At the time of inception, the college had initially seven departments viz. Agronomy, Agricultural Botany, Agricultural Chemistry, Agricultural Entomology, Plant Pathology, Agricultural Engineering and Animal Husbandry.



N. K. Mohan Kumar
Administrative Officer

College Of Agriculture ,Vellayani, Thiruvananthapuram

The programmes in Agricultural Economics, Agricultural Extension, Agricultural Statistics and Physical Education were originally dealt by the Department of Agronomy.

A separate department of Agricultural Extension was started in 1962. Departments of Agricultural Economics, Physical Education and Agricultural Statistics came into existence in 1966.

Initially Horticulture was dealt as part of Agricultural Botany which was later converted into an independent department in 1968.

The Department of Plant Breeding and Genetics was formed in 1979 by replacing the Department of Agricultural Botany. Home Science department was started as an independent unit in 1983. Department of Plant Physiology was constituted in 1993. In 1998, Departments of Plant Biotechnology and Agricultural Meteorology came into existence.

Considering the growing importance of horticultural crops in the State, Horticulture was further divided into four major departments in 1999 viz Plantation Crops and Spices, Pomology and Floriculture, Processing Technology and Olericulture. Department of Agricultural Microbiology was constituted in 2006.

The growth and development of the college over years

1955	NEWLY FORMED DEPARTMENTS								
	1962	1966	1968	1979	1983	1993	1998	1999	2006
Agrl. Botany	Agrl. Extension	Agrl. Economics Physical Education Agrl. Statistics	Horticulture (Later divided in to four separate departments)	Plant Breeding and Genetics	Home Science	Plant Physiology	Olericulture	Plantation Crops and Spices Pomology and Floriculture Processing Technology Agr. Meteorology	Agrl. Microbiology
Soil Sci. & Agrl. Chemistry									
Agrl. Engineering									
Agrl. Entomology									
Agronomy									
Animal Husbandry									
Plant Pathology									

Thus at present 20 departments are functioning in the college. Besides the scientific faculty, the department also has supporting staff in the categories of technical assistant, typist, class IV etc.. depending on the requirement.

5.2 Academic Cell



Dr. D.S. Radha Devi

The Dean is assisted in the academic matters by an Academic cell. The activities of academic cell is supervised by senior faculty members. At present the academic matters related to under graduate programme are looked after by Dr. M. Komala Amma, Associate Professor and the post graduate programme by Dr. D.S. Radha Devi, Professor. The academic cell is provide with other supporting staff to carry out its function smoothly



Dr. M. Komala Amma

Former officers in charge of Academic Cell

Name	Area of Specialisation
Dr. James Mathew	Plant Pathology
Dr. George Koshy	Agricultural Entomology
Dr. Haveendran Nair K.K.	Agricultural Entomology
Dr. Santhakumari K.	Agricultural Entomology
Dr. M. Achuthan Nair	Agronomy
Dr. S. Chandini	Agronomy

5.3 Technical Cell



Dr. Manorama Thampatti

A technical cell has been functioning in the college to assist the Dean in technical matters. Presently Dr. Geetakumari, V.L Professor (Agronomy) and Dr. K.C. Manorama Thampatti, Associate Professor (Soil Science and Agricultural Chemistry) are working as members in the Technical cell.



Dr. Geetika Kumari V.L.

Former officers in charge of Technical Cell

Name	Area of Specilisation
Dr. M. Achuthan Nair	Agronomy
Dr. D. Dale	Agricultural Entomology

5.4 (a) Regional Agricultural Research Station (Southern Zone)

The Regional Agricultural Research Station (Southern Zone) was established at Vellayani, on 30th November, 1981 to cater to the research and development needs of the southern zone of Kerala, comprising the districts of Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha and Kottayam. The station is headed by the Associate Director of Research. The satellite stations viz. Cropping Systems Research Centre, Karamana, Thiruvananthapuram, Coconut Research Station, Balaramapuram,



Thiruvananthapuram, Farming Systems Research Station, Sadanandapuram, Kottarakkara, Kollam and the Soil Conservation Research Station, Konni, Pathanamthitta operate under this regional station. The station is responsible for the identification of location specific problems and conduct of basic and applied research for tackling these problems. Further the responsibility of assigning, co-ordinating and evaluating research programmes and transfer of technology are also vested with the station. Apart from continuing research activities under the Kerala Agricultural University, the RARS, Vellayani has been implementing several externally aided projects assisted by the ICAR, ICMR, DST, DAE, DBT, BARC, World Bank, NABARD, NHB, State Planning Board, State Horticulture Mission, KSCSTE, RRI of Kerala, Ministry of Earth Sciences, Ministry of Food Processing Industry, CDS, PPIC, etc. The Zonal Research and Extension Advisory Council (ZREAC) Meetings held annually, review the research and extension work done by the station. This regional station was instrumental in the release of twenty-nine improved varieties of crops ranging from rice to fodder, development, standardization and transfer of protocols for the in vitro propagation of crops and microbial inoculant technology.

ASSOCIATE DIRECTORS

Name	Area of specialization
Dr. A.G.G. Menon	Agricultural Extension
Dr. N. Mohanakumaran	Horticulture
Dr. P.D. Vijayagopal	Plant Breeding and Genetics
Dr. R. Vikraman Nair	Agronomy
Dr. P. Saraswathi	Agricultural Statistics
Dr. S. Nazeema Beevi	Agricultural Entomology
Dr. J. Arthur Jacob	Plant Nematology

PRESENT FACULTY ATTACHED TO THE OFFICE OF THE ADR, RARS (SZ)

Name	Area of specialization
Smt. Susan Thomas	Computer Science
Dr. P. Shalini Pillai	Agronomy

5.4 (b) Instructional Farm

The Agricultural college farm was established in 1955 along with the inception of the college and was elevated to the status of an Instructional Farm in 1972 with the formation of Kerala Agricultural University. Apart from the prime responsibility of providing instructional facilities to students and researchers, the farm also undertakes multifarious activities like production and distribution of good quality seeds,



seedlings and farm produce, participation in exhibitions and in advisory services. The mandate of the farm is accomplished by the scientists, technical and administrative staff and farm workers.



The farm has an arable garden land (upland) area of 70.9 ha and wetland area of 10.5 ha used for crop production. A variety of crops are grown here, the most important being coconut. Earlier, the kayal land (lake) was used for paddy cultivation (puncha crop) after dewatering the area. However, this practice has been discontinued since long. The farm is well

connected by roads. The main source of irrigation is from Vellayani fresh water lake. All the blocks are well connected by a net work of underground irrigation pipe lines. Modern irrigation techniques such as drip, sprinkler and micro-sprinkler are adopted in selected coconut gardens and green houses. A sales cum information centre is established as part of the farm at the main entrance of the college to provide information and technology guidance as well as quality planting materials and seeds through a single window for the benefit of farming community and the public.

FORMER HEADS OF INSTRUCTIONAL FARM		PRESENT FACULTY	
Name	Area of Specialisation	Name	Area of Specialisation
Dr. Karthikeyan	Plant Breeding & Genetics	Dr. M. Suharban	Plant Pathology
Dr. Sukumaran P.	Agronomy	Sri P.H. Latif	Agronomy
Dr. Sivasankara Pillai	Agronomy	Dr. G. Sobhana	Agri. Extension
Dr. Karunakaran	Plant Pathology	Dr. Kamala Nair	Plant Pathology
Dr. Pushpangathan K.	Agronomy	Dr. D. Geetha	Plant Pathology
Dr. M.R.C Pillai	Agronomy	Dr. M.S. Hajilal	Agri. Engineering
Dr. V.R. Sashidhar	Agronomy	Dr. A.S. Anilkumar	Agronomy
Dr. S. Janardhanan Pillai	Agronomy	Dr. T. Sajitharani	Agronomy
Dr. H. Oommen	Agronomy		
Dr. K. Hanukrishnan Nair	Soil Science & Agri. Chemistry		

5.5 Salient Activities of Departments

Department of Agricultural Economics

The department of Agricultural Economics came into existence in 1966 for giving more emphasis to the education and research in the discipline so as to train the students to deal with the rural problems of changing agricultural scenario. The department is offering 5 courses for B.Sc. (Ag.) students with credit hours of 10. The staff members serve as members of advisory committees of PG students, besides contributing service to RAWE. The staff also participate in meetings organized by the Department of Agriculture, State Agriculture Prices Board and State Planning Board.



Sri. K.S. Karayalar was the first Head of the Department. Present faculty includes Dr. Elsamma Job (Associate Professor & Head), Smt. Santha, A. M., Associate Professor and Sri.T.Paul Lazarus, Assistant Professor.

Former Heads of Department

Name	Period	Area of specialization
Prof. K.S. Karayalar	1966-1990	Farm management
Prof. E.R. Narayanan Nair	1990-1992	Agricultural marketing & Finance
Prof. S.Venugopalan	1992-1995	Economic Theory
Prof. E.R. Narayanan Nair	1995-1998	Agricultural marketing & Finance
Dr. Ravi Raman, K	1998-2001	Economic Theory

Department of Agricultural Engineering



The department of Agricultural Engineering was functioning in the college since its inception in 1955. The department was first headed by late Dr. Jose Samuel. The department offers four courses for B.Sc. (Ag.) students. This department possesses various modern agricultural implements/equipments and imparts the technical know-how on farm mechanisation to the farming community. Faculty of the department is undertaking various research programmes in farm mechanization, irrigation, soil and water conservation and post harvest

engineering etc This department is also undertaking projects on development of agricultural expert system softwares. The presents faculty includes Dr. V. Ganesar (Professor & Head) and Dr.Xavier K. Jacob. Associate Professor.

Former Heads of Department

Name	Period
Late. Dr. Jose Samuel	1955-1977
Dr. Jacob John	1977-1980
Dr. Rema Devi L.	1980-2003
Dr. Xavier K. Jacob	2003-2006

Department of Agricultural Entomology

The department of Entomology has been functioning in the college since its inception in 1955. Teaching and research programmes on general entomology, insect toxicology and pesticide residues, insect pathology and microbial control, productive insects, biological control, botanical pesticides and other methods of pest control, extension entomology and nematology form the main mandate of the department. The department offers B.Sc (Ag) courses for 11 credits, M.Sc (Ag) courses for 40 credits and Ph.D courses for 26 credits. At present the Department has projects funded by different external agencies. The scientists of the Department are actively involved in various extension activities. A Centre of AICRF on nematode pests financed by ICAR was established at Vellayani in 1977.



The Indian Council of Agricultural Research (ICAR) also initiated an All India Co-ordinated Research Project on Pesticide Residues during the year 1984-85 with the aim of developing protocols for the safe use of pesticides. A well equipped pesticide residue laboratory was set up under this project at the College of Agriculture, Vellayani in the year 1986. From July 2007 onwards the residue laboratory was functioning as an independent unit. The AICRP on Honey bee Research and Training was also started in the Department in 1994.

Former Heads of Department

Name	Period	Areas of specialization
Late. Sri. K.V. Joseph	1955-1963	Agricultural Entomology
Late Dr. M.R.G.K.Nair	1963-1977	Agricultural Entomology
Dr. N. Mohandas	1977-1990	Toxicology
Dr. K. John Kuriyan	1990-1992	Nematology
Dr. K.V. Mammen	1992-1993	Insect morphology, Nematology
Dr. K. John Kuriyan	1993-1995	Nematology
Dr.A. Visalakshi	1995-1999	Toxicology, Pesticide residues
Dr. G. Madhavan Nair	1999-2000	Host plant resistance
Dr. K. Saradamma	2000-2003	Insect physiology

Present Faculty

Name	Areas of specialization
Dr. T. Nalinakumari	Storage entomology, pest management
Dr. J.Arthur Jacob	Plant Nematology
Dr. M.S. Sheela	Nematology, Nematode biocontrol
Dr. Naseema Beevi S.	Pesticide residues, IPM
Dr. K. Sudharma	Biocontrol, IPM
Dr. Hebsy Bai	Botanical pesticides, IPM
Dr. C. Nanadakumar	IPM
Dr. Thomas Biju Mathew	Pesticide residues, IPM
Dr. Devanesan S.	Apiculture
Dr. Jiji T.	IPM, Vermiculture
Dr. Krishnakumar R.	Sericulture, Apiculture, IPM
Dr. K.S. Premila	Apiculture, Rice pest management
Dr. N. Anitha	IPM
Dr. M.H. Faizal	Insect Pathology, Microbial control
Dr. Thomas George	Pesticide residue, Agricultural chemicals
Dr. K.D. Prathapan	Systematics of Chrysomelidae

Department of Agricultural Extension

The Department of Agricultural Extension was started in 1962 which envisaged imparting theory and practice of extension science and transfer of agricultural technologies to the graduate and post graduate students in agriculture and transferring agricultural technology to the stake holders concerned. The department offers 28 credits for B.Sc (Ag.) 40 credits for M.Sc. (Ag.) and 26 credits for Ph.D programmes. Besides, the teachers of this department take up research in extension science which include action research, technology refinement, and validation of other developmental interventions. The department maintains close relation with local self government and other development agencies. The prestigious RAWE programme for the final year students is implemented by the department in collaboration with other departments.



About 90 students completed M.Sc programme and 14 students completed Ph.D programme. The present intake capacity for M.Sc and Ph.D programmes are six and two seats respectively.

Former Heads of Department

Name	Period
Sri. K. Madhavan Nair	1962-1966
Dr.A.G.G. Menon	1966-1982
Dr.A.M. Thampi	1982-1990
Dr. G.T. Nair	1990-1995
Dr. B. Babu	1995-1999
Dr. G. B. Pillai	1999-2000
Dr. M.M. Hussain	2000-2003
Dr. C. Bhaskaran	2003-2007

Present Faculty

Name	Period
Dr. S. Mochilal Nehru	Participatory approaches
Dr. C. Bhaskaran	Agricultural communication
Dr. R. Prakash	Journalism
Dr. N.P.K. Sushma	Participatory approaches
Dr.V.B. Padmanabhan	Terrace gardening
Dr. S. Shilaja	Gender empowerment
Dr.N. Kishorekumar	Communication management
Dr. B. Seema	Gender studies
Dr.A. Anilkumar	Participatory planning
Dr.A.K. Sherief	Training
Sri A. Sakeer Hussain	Training

Department of Agricultural Meteorology

The department was established in 1998 with Dr. Muraleedharan Nair, Professor (Agronomy) as the Head. He was succeeded by Dr. L. Girija Devi as head of the department in 2002. It also undertakes externally aided projects. The department offers B.Sc (Ag) course of 2 credits. The faculty is also rendering agrometeorological advisory services. Agro advisory bulletins are issued to contact farmers in Kalliyoor, Venganoor and Nemom Krishibhavans weekly. Agro advisory bulletins are also published in FIB News letter and the details are made available to public through AIR, Dooradarsan and Asianet.



Agricultural Microbiology



The Department of Agricultural Microbiology started functioning from 2006 onwards under the headship of Dr. P. Sivaprasad. The other faculty members are Dr.K.S.Meenakumari, Associate Professor and Dr.K.N.Anith, Associate Professor. The department offers course at UG level for three credits. The faculty are actively engaged in the exploitation of soil microorganisms for crop nutrition and health. The staff impart teaching at UG level, besides undertaking research and extension activities

Department of Agricultural Statistics

The Department of Agricultural Statistics was established in 1966. The department caters the teaching activity of under graduate and post graduate students. All the works relating to design, analysis and sample surveys of research projects of the college and research stations of the southern region are managed by the teachers of this department. The department offers facilities for computer aided statistical analysis. The present faculty includes Sri. R. Balakrishnan Asan and Dr. Brigit Joseph. Assoc. Prof.



Former Heads of Department

Name	Period
Late Prof. E.J. Thomas	1966-1981
Prof. K.C. George	1981-1985
Prof. P.V. Prabhakaran	1985-1989
Dr. P.Saraswathi	1989-2005

Department of Agronomy

This is one of the major departments of the College from the time of its inception. The major objectives of the department is to undertake teaching as well as research and extension programmes on crop production and management, irrigation, weed control, input management, natural resource conservation and management etc. The M.Sc.(Ag.) programme was started in 1961 and Ph.D programme in 1965. The research programmes are tailored to formulate management strategies for major crops of Kerala for boosting up the production and productivity. The department offers B.Sc (Ag) course for 18 credits, M.Sc (Ag) courses for 40 credits and Ph.D courses for 26 credits.



The department is running an All India Coordinated Project (AICRP) on Forage Crops. The project was successful in identifying various promising grass legume mixtures, cereal legume mixtures, and developed silvipastoral and hortipastoral systems suited to Kerala conditions. Apart from ICAR sponsored research projects, the Scientists of the Department also undertake research on various externally aided projects. The faculty is also offering extension services besides teaching and research.

Former Heads of Department

Name	Period	Areas of specialization
Late. Dr. C.K.N. Nair	1959-1964	Crop production
Late. Prof. C.M. George	1964-1973	Crop production
Dr. N. Sadanandan	1973-1976	Crop production
Dr. C. Sreedharan	1976-1982	Water management, Soil fertility
Dr. V.K. Sasidharan	1982-1988	Cropping systems
Prof. E.P. Koshy	1988-1989	Crop production
Late. Prof. K.P.M. Mahavan Nair	1989-1992	Weed control
Dr. G. Raghavan Pillai	Jan, 1992-April, 1992	Fodder crops
Prf. P. Chandrasekaran	1992-1996	Dry farming
Dr. M.R. Chidananda Pillai	1996-1997	Crop production
Dr. G. Raghavan Pillai	1997-2000	Fodder crops
Dr. V. Muraleedharan Nair	2000-2002	Soil fertility
Dr. S. Janardhanan Pillai	2002-2005	Meteorology
Dr. R. Pushpakumari	2005 -2007	Cropping systems, Tuber crop

Present Faculty

Name	Areas of specialization
Dr. M. Abdul Salam	Cashew production & management
Dr.R. Pushpakumari	Tuber crops, Seed Technology, Homestead Farming
Dr. Annamma George	Crop production, Cropping system, IFS
Dr. S.M. Shahul Hameed	Soil fertility
Dr. S. Chandini	Crop production
Dr. P. Sukumari	Integrated nutrient management
Dr.V. L. Geethakumari	Soil fertility
Dr. Lakshmi.S	Forage crops, Organic farming
Dr. Sansamma George	Weed management, Rainfed agriculture
Dr. M. Meera Bai	Crop production, organic farming
Dr.O.Kumari Swadija	Soil productivity management
Dr. Babu Mathew P.	Water management, Integrated nutrient management.
Sri.V. Jayakrishnakumar	Water management, Soil conservation
Dr. K.Prathapan	Weed management, Soil fertility management

Department of Animal Husbandry

The department was established during 1955 under the headship of Dr.K.C.Mathew.

The Department of Animal Husbandry is created with the task of imparting teaching to UG students on animal health care and management. The department offers B.Sc (Ag) course of 3 credits. The faculty is also undertaking research programmes in the field of animal husbandry. Rendering extension service forms another important mandate of the department.



At present this Department has a Dairy Unit, Poultry Unit, Piggery unit, Veterinary Hospital and Clinical Laboratory.

This department is offering courses in Animal management, Animal nutrition, Animal health care, Dairy Science and Poultry science to B.Sc. (Ag.) students. The PG Courses are offered to M.Sc. (Food Science and Nutrition) students. The present faculty includes Dr.R.Vijayan, Professor and Head and Dr.Jiji, Assistant Professor.

Former Heads of Department

Name	Period	Areas of specialization
Dr.K.C.Mathew	1955-1970	Dairy science
Late.Sri.J.B.Rose	1970-1980	Dairy science
Dr.Skariah Oommen	1980-1999	Dairy science
Dr.S.P.Suresan Nair	1999-2005	Gynaecology

Department of Home Science

The department of Home Science in KAU had its origin from an Applied Nutrition Unit established in the Department of Agricultural Extension, in 1965 to impart training in Human nutrition to the under graduates of the College and to conduct research projects to evaluate the various aspects of the nutrition programme.



Later this was transformed to the department of Home Science in 1983 with the objective to develop suitable resident instruction programmes leading to Bachelor's and Master's degrees in Home Science. From 1987 to 1989 a College of Rural Home Science was functioning in the institution. Now the department is functioning under the faculty of Agriculture. M.Sc. (Home Science) – Food science and Nutrition, is being offered since 1984 and Ph.D (Home Science) since 1988. The department is offering B.Sc (Ag) course for 2 credits, M.Sc courses for 40 credits and Ph.D courses for 26 credits. It has implemented several Externally Aided Projects, and vocational training programmes. The department also runs a processing unit and the unit has obtained FPO licence for the sale of products. The department plays a pivotal role in the transfer of technology and dissemination of scientific knowledge especially to women self help groups.

Former Heads of Department

Name	Period	Specialization
Dr. [Name]	1965-2002	Food and nutrition, Nutritional biochemistry
Smt. N.K.Vimalakumari	2005-2007	Food and nutrition

Present Faculty

Name	Specialization
Dr. Mary Ukkuru.P	Food and nutrition, food science
Dr. S.Syamakumari	Child development, Psychology
Dr. S. Chellammal	Food and nutrition, food science
Dr. P.V. Nandini	Food and nutrition, food science
Dr. M. Rajani	Home science extension
Dr. B. Prasannakumari	Home science extension
Dr. C. Nirmala	Food and nutrition, food science
Smt. Rari John	Textiles and clothing
Smt. Geetha, P.	Home science extension
Dr. Suma Divakar	Home science extension
Dr. Bela, G.K.	Human and Child development,

Department of Olericulture

The first step in the formation of the Department of Olericulture in the College of Agriculture, Vellayani was initiated by the Kerala Agricultural University in September 1996 by declaring Dr. L. Rajamony, Associate Professor as the Head of the Department of Olericulture in the Faculty of Agriculture and continued till 2005. Formerly this division was under the department of Horticulture, which was divided in to four sub divisions during the eighth five year plan period, viz. Pomology and Floriculture, Olericulture, Plantation crops and Spices, and Processing Technology. The department is offering B.Sc (Ag) course for 2 credits, M.Sc courses for 40 credits and Ph.D courses for 26 credits. The faculty regularly attends farmers field problems and take classes on various aspects of vegetable production. Apart from teaching they also undertake research projects in areas such as collection and characterization, quality analysis, heterosis breeding, pest and disease resistance breeding in vegetables. Dr. L. Rajamani was the Head of the Department at the time of its inception (1996 to 2005). He was succeeded by present head Dr. M. Abdul Vahab.



Present faculty

Name	Area of specialization
Dr. M. Abdul Vahab	Vegetable Breeding and management
Dr.V.A. Celine	Vegetable Breeding
Dr. J. Sreelathakumary	Vegetable Breeding and management

Department of Physical Education

The Physical Education department was created in 1966 with the objective of providing good physical training to student so as to keep them in good physique and health. The department was first headed by Dr. Marykutty and succeeded by Dr. Palania Pillai and Dr. T.I. Manoj. The department is also entrusted with the responsibility of hosting regional, state and national level events in athletics and sports. The department is also entrusted with the responsibility of maintaining a good play ground and indoor stadium. The college ground is having a well maintained eight line track, foot ball field and two turf wickets. The Indoor stadium has facilities for conducting games like basketball, volleyball, shuttle badminton, table tennis, judo, wrestling, weight lifting and weight training. accommodation facility for 125 players is also available in the indoor stadium. The department offers a single course of one credit to under graduate students.



Head of the Department
Dr. T.I. Manoj

Department of Plant Biotechnology

Biotechnology research has been initiated at the College of Agriculture, Vellayani in 1988 and the department came into existence in 1998. The department offers course at under graduate and post graduate level. The department offers B.Sc (Ag) course of 3 credits and M.Sc courses for 40 credits. The faculty also undertake research in areas like protocol development for raising tissue culture plantlets for both mass propagation and secondary metabolite production, crop improvement through tissue culture and inter-specific hybridization for imparting disease resistance. The department is headed by Dr.K.Rajmohan, Professor, from its inception. The other faculty members include Dr. Swapana A ex, Assitant Professor and Dr.K.B.Sony, Assistant Professor.



Head of the Department
Dr. K. Rajmohan

Department of Plant Breeding & Genetics

The Department of Plant Breeding and Genetics was one among the major departments since the inception of the Agricultural College and Research Institute in 1955 which was then designated as department of Agricultural Botany. The activity of the department is aimed at imparting education in plant breeding and genetics at undergraduate and post graduate level. Research on crop improvement form the major mandate of the department. The department offers B.Sc (Ag.) course for 12 credits, M.Sc courses for 40 credits and Ph.D courses for 26 credits. The faculty is also involved in various out reach programmes for the scientific dissemination of knowledge on crop improvement.



A botanical garden was established in 1959 under this department. For the first time the Indian Council of Agricultural Research Scheme was initiated in the department in 1960 and this marked the beginning of 'intensified research'. The first scheme sanctioned for the department was "The Co-ordinated Weed Control Scheme". The scheme worked for a decade. The more serious weed species were identified and the right measure of herbicidal control was imposed. The M.Sc. level teaching programme was initiated in 1961. The Ph.D. programme in cytogenetics and plant breeding (Agricultural Botany) was initiated in 1973. Considering the substantial increase in the overall workload, the Plant Breeding Department was separately established to concentrate on the crop improvement research activities, on 11th May 1979. Eventually the crop improvement activities were brought under the newly established Department of Plant Breeding. Since 18th April 1995 the department has been redesignated as the Department of Plant Breeding and Genetics by annexing Cytology, Genetics and related subjects which were hitherto deal with in the erstwhile department of Agricultural Botany.

Former Heads of Department Department of Agrl. Botany

Name	Period
Dr. T.C. Joseph	1959 - 1960
Prof. P. Kumara Pillai	1960 - 1969
Dr. (Mrs.) Mary K. George	1969 - 1982
Dr. N. Krishnan Nair	1982 to 1991
Prof. K. Gopakumar	1991 to 1992
Dr. K. Gopimony	1992 - 1995

Department of Plant Breeding (w.e.f 11.5.1979)

Dr. V. Gopinathan Nair	1979-1993
Dr. P.D. Vijayagopal	1993-1995

Department of Plant Breeding and Genetics (w.e.f 18.04.1995)

Dr. R. Gopimony	1995-1999
Dr. P. Manikantan Nair	1999-2002
Dr. D. Chandramony	2002-2005

Present Faculty

Name	Area of Specilization
Dr. P. Manju	Coconut, Vegetables
Dr. D.I. Suma Bai	Forage crops, Pulses
Dr. D. S. Radha Devi	Banana, Vegetables
Dr. K.M. Abdul Khader	Vegetables, Oil seeds
Dr. D. Wilson	Vegetables
Dr. Sunny K. Dommen	Vegetables
Dr. K. Arya	Medicinal plants, Pepper
Dr. P. Maya Devi	Anthurium
Dr. Mareen Abraham	Medecinal plants, Vegetables,
Dr. C. Lekha Rani	Orchids, Vegetables
Dr. V.G. J ayalekshmi	Molecular markers

Department of Plant Pathology

The Department of Plant Pathology was one among the major departments since the inception of the Agricultural College and Research Institute in 1955. The Department offers B.Sc (Ag.) courses for 10 credits, M.Sc courses for 40 credits and Ph.D courses for 26 credits. The faculty also undertake need based research and training programmes on both fundamental and applied aspects in plant disease management and crop protection of major crops of Kerala. The department also undertake plant quarantine certification activities. M.Sc programme was started in 1961 and Ph.D programme in 1972. An All India Co-ordinated Project on mushroom is undergoing in this department.



Former Heads of Department

Name	Period
Late Dr. J. Samraj	1955 - 1970
Late M.R. Menon	1970 - 1979
Late Dr. M.C. Nair	1979 - 1985
Dr. K.I. Wilsan	1985 - 1991
Late Dr. M.C. Nair	1992 - 1996
Dr. P. Karunakaran	1996 - 1997
Dr. S. Balakrishnan	1977 - 2001
Dr. C.K. Peethambaran	2001 - 2004
Dr. B. Rajagopalan	2004 - 2006
Dr. B. Balakrishnan	2006 - 2007

Present Faculty

Name	Area of Specialization
Dr. K.K. Sulochana	Mycology
Dr. Santhakumari P.	Mycology
Dr. Joseph P.J.	Virology
Dr. Mary C.A.	Mycology
Dr. Gokulapalan C.	Mycology
Dr. Naseema A.	Bacteriology
Dr. Lulu Das	Mushroom Culture
Dr. Girija V.K.	Bacteriology

Department of Plant Physiology

The Department of Plant Physiology is a newly created department which started functioning in 1993. The department offers B.Sc (Ag) course for three credits and M.Sc courses for 40 credits. The department is undertaking research programmes on physiological aspects of crop production.



Head of the Department
Dr. Roy Stephen

Former Heads of Department

	Name	Period
	Dr. S. Sheshadr Nath	1993 - 1996
	Dr. R. Gopimony	1996 - 1998
	Dr. S.T. Mercy	1998 - 2001
	Dr MM Viji	2001 - 2006

Present Faculty

	Name	Area of Specialization
	Dr.Roy Stephan	Stress physiology
	Dr.Manju,R.V	Eco physiology

Department of Plantation Crops & Spices

During the eighth five year plan period four divisions (v.z. Pomology & Floriculture, Olericulture, Plantation crops & Spices and Processing Technology) under the discipline of Horticulture were established at the College of Agriculture,Vellayani Plantation crops & Spices stated activities in 1998 unds the headship of Dr. G. Sreekandan Nair was the first head of the department. Later he was succeeded by Dr. B.K. Jayachandran who took over the charge on 01.09.1998 and continues in the chair till date.The department offers B.Sc (Ag) course for four credits. M.Sc courses for 40 credits and Ph.D courses for 26 credits The faculty also implement research programmes on plantation crops, spices and medicinal plants besides imparting up-to-date knowledge on management, processing and value addition of these crops.



Head of the Department
Dr.B.K. Jayachandran

Present Faculty

	Name	Area of Specialization
	Dr. B.K. Jayachandran	Plantation crops
	Dr. B.R. Reghunath	Plantation crops
	Dr. G.R. Sulekha	Spices
	Dr. Jessykutty P.C	Plantation crops

Department of Pomology and Floriculture

The department of Pomology and Floriculture was established at the College of Agriculture, Vellayani in June 1999. A division of Horticulture functioned under the department of Botany at the college until 1968 when an independent department of Horticulture was established. With the inception of the Kerala Agricultural University, this department was reorganized with a Professor as its Head. In 1976, M. Sc. programme in Horticulture was started in the department with an intake of 4 graduate students. Ph D programme in Horticulture was started in 1984 initially with an intake of one. In 1994 four constituent divisions viz., Pomology & Floriculture, Olericulture, Plantation crops & Spices and Processing Technology were established with specific budgetary provision for strengthening them and developing into four independent departments. Accordingly, in 1999, the department of Pomology and Floriculture was established.



The late professor S. Srinivasan, the pioneering horticultural scientist of the Kerala Agricultural University led the department from the time of its inception to 1980.

The department has the academic mandate for conducting under graduate courses for B.Sc. (Ag.) degree programme and post graduate courses and research for M.Sc. and Doctoral programmes in Horticulture along with research, training, transfer of technology and extension out reach activities in tropical fruit crops and flower crops. Training programmes in plant propagation, commercial floriculture, post harvest handling of cut flowers and ornamental gardening and landscaping were organized and conducted by the faculty.

The department offers B.Sc (Ag) course for five credits, M.Sc courses for 40 credits and Ph.D courses for 26 credits. The department handles research projects in pomology and floriculture.

Former Heads of Department

Name	Period
Dr. K. Rajmohan	1999-2004

Present Faculty

Name	Area of Specialization
Dr. C.S. Jayachandran Nair	Pomology
Dr.T. Sabeena George	Floriculture
Dr. Sheela.VL	Floriculture

Department of Processing Technology

As per the statutes of the Kerala Agricultural University, there are five departments in the discipline of horticulture viz. Pomology & Floriculture, Olericulture, Plantation crops & Spices, Processing Technology and Horticulture. The College of Agriculture, Vellayani continued to have only one department in the discipline of horticulture, i.e. The Dept. of Horticulture, despite the fact that at College of Horticulture, Vellanikkara the four departments of Pomology & Floriculture, Olericulture, Plantation crops & Spices and Processing Technology existed since the inception of the University and continued even after the B.Sc (Hort.) degree programme was discontinued. Realizing the long felt need and following a decision of the General Council, the four departments named above were established at the College of Agriculture, Vellayani with effect from 01.09 1998, in addition to the already existing Department of Horticulture. While doing so, the existing infrastructure facilities, faculty members and supporting staff were distributed among the four departments while the Department of Horticulture only existed for namesake and had subsequently become defunct by a university order. As per the statutes of KAU the mandate of the department is teaching, research and extension in the field of post harvest handling, processing and value addition of horticultural crops.



College Of Agriculture ,Vellayani, Thiruvananthapuram

At the time of establishment of the department of Processing Technology Dr. Philipose Joshua, Associate Professor (Horticulture) was posted as the Head of the Department and he remained the sole faculty member as there was no other faculty member who had specialized in post harvest technology. Subsequently, Dr. K.Vasanthakumar, Associate Professor (Horticulture) was posted in the department on working arrangement from NARP, w.e.f. 23.12.2005

The department offers B.Sc (Ag) course for three credits, M.Sc courses for 40 credits and PhD courses for 26 credits. The department undertakes research on processing and value addition of major crops of Kerala. Besides this, the department also conducts training programmes to agricultural officers and other personnel involved in agriculture.

Present Faculty

Name	Area of specialization
Dr. Philipose Joshua	Processing technology
Dr. K.Vasanthakumar	Processing technology

Department of Soil Science & Agricultural Chemistry

The department was formed as a part of the college of Agriculture Vellayani in 1955. In the beginning activities of the department were confined to undergraduate teaching programmes. The post graduate programmes viz. M.Sc (Ag) and Ph.D were started in 1961 and 1967 respectively. A post-graduate diploma course was also started during 1980 but subsequently discontinued in 1986. The department had organized its research programmes on a sound basis even from its inception. During 60's five ICAR schemes were operated in this department. The research efforts of the department had largely been responsible for the recognition of the problems of soil acidity, reclamation measures, management of saline soils, delineation of deficiency / toxicity problems of plant



nutrient elements. Fertility investigation of major soils of Kerala and fertilizer recommendations for the major soils and crops were also attempted. The soil testing lab attached to this department during this period had been responsible for the standardization of soil testing methods in the early years which subsequently was taken up by the department of Agriculture as a major extension activity. Soil test based agro-technology transfer was the main objective. The Professor & Head of the department was recognized as the State Agricultural Chemist right from the inception of the College. With the formation of KAU in 1972 the department expanded its activities with a multi pronged approach on teaching research & extension activities. Systematic studies were then initiated covering areas of Soil morphology, Mineralogy, Pedology, Soil chemistry and Plant nutrition besides teaching. Studies on laterites and associated soils, paddy soils and forest soils were intensified in the above areas and PG research was strengthened. Low cost agro techniques to improve the poor soil fertility of the soils were suggested and crop wise / soil wise research was strengthened through externally funded projects. Studies to improve the efficiency of added fertilizers with respect to major micronutrients were initiated during this period besides conducting trials on the use of indigenous y available lost cost materials to supplement chemical fertilizers.

A Central Instrumentation Laboratory was established during the first phase of NARP in this Department facilitating instrumental analysis to the requirements of the different disciplines of the college and other stations of the University. The Laboratory was strengthened by second phase of NARP and college funds to render sophisticated chemical analytical facility.

The department offers B.Sc (Ag) course for 15 credits, M.Sc courses for 40 credits and Ph.D courses for 26 credits. The Department also undertakes research on soil health, plant nutrition, natural resource conservation and management and basic aspects of Pedology and land use management. The staff also render their services for proper functioning of central instrumentation laboratory and soil museum, besides providing advisory services and extension activities.

Former Heads of Department

Name	Period	Specialization
Late Prof. A.P.A. Britomuthunayagam	1955-1961	Soil Chemistry
Late Prof. E.J.Varghese	1961-1964	Soil Chemistry
Late Dr. N.S. Money	1964-1971	Soil fertility and management
Dr. M.M. Koshy	1971-1977	Soil fertility and management
Dr. R.S. Aiyer	1977-1991	Soil Chemistry
Dr. P.Padmaja	1991-1997	Soil fertility, vermitechnology
Dr. Thomas Varghese	1997-2000	Pedology, Soil survey and classification
Dr.VK.Venugopal	2000-2006	Soil fertility and management
Dr. K. Harikrishnan Nair	May,2006-Sept, 2006	Soil fertility, vermitechnology
Dr. M. Subramonia Iyer	Sept, 2006 to June 2007	Pedology, Soil survey, classification, Watershed based land use management

Present Faculty

Name	Specialization
Dr. K. Harikrishana Nair	Soil fertility and management
Dr. N. Saifudeen	G I S, Land use planning
Dr. M. Subramonia Iyer	Pedology, Soil survey, classification, Watershed based land use management
Dr. R.S. Shehana	Crop nutrition
Dr.Sumam Susan Varghese	Soil fertility and management
Dr. Sumam George	Plant nutrition
Dr. Sam T. Kurumthottical	Pollution
Dr. P.B. Usha	Soil fertility and management
Dr. C.R. Sudharmaj Devi	Plant nutrition,
Dr. Ushakumari, K	Organic farming
Dr. K.C. Manorama Thampatti	Management of waterlogged soils, Soil pollution and Bioremediation
Dr. M. Komala Amma	Co-ordination Chemistry

6. Collaborative Educational and Research Programmes

The KAU has entered into an MOU with the Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, Kerala in 1998 for the conduct of research programmes on plant resistance to biotic stress. The main activities of the same are being carried out in the College of Agriculture, Vellayani.



In 2005 the Department of Home Science was recognized as the programme study centre for IGNOU for offering a course on M.Sc. "Dietetics and Food Service Management."

M/s Udiyannoor Industries, Vattiyoorkavu, Thiruvananthapuram, has also entered into an MOU with KAU in 2000 for manufacturing and marketing of dehydrated banana powder (VITA BAN). The Department of Home Science, College of Agriculture, Vellayani has provided the technical know-how and expertise for this purpose. Recently another MOU has been signed with M/s POABS Envirotech Pvt. Ltd., Kuttoor P.O., Thiruvalla, Kerala for enrichment of organic manures with beneficial microorganisms such as AM Fungi, Pseudomonas fluorescens, Trichoderma and Azospirillum with a royalty amount of Rs. 1 lakh to the University each year.



"Sree Ayyankali Memmorial Govt. Model Residential Sports School, a joint venture of Dept. of SC Development, Government of Kerala and KAU is also functioning in the campus.

7. Other Academic Bodies

Several sections are constituted in the college for assisting in teaching, research and extension activities.



7.1 College Council

The involvement and participation of all categories of staff in the management and implementation of the academic, research and extension programmes and other activities of the college are ensured through the

activities of the college council. The College Council has been formed with Dean as Chairman and Professor and Head, Department of Biotechnology as Convenor. Professor (RC), Associate Director, RARS (Southern Region), Professor and Head, Instructional Farm, all Heads of Departments, Professor in charge of Academic Cell, members of Technical Cell, Officer in charge of Training service Scheme, Assistant wardens, Assistant Executive Engineer of DPP Wing are all regular members of college council.

8. Academic Facilities

8.1 College Library

The college library started functioning in 1955 to support various research and academic activities. As a part of the P.G. academic programmes, the library is offering a course on library orientation. In addition, regular training programmes on the use of



internet and Information Technology (IT) in the field of agriculture are also organized for the benefit of teachers and research scholars. The library building is centrally located and can be easily accessed from the various departments. It has a seating capacity for 100 students at a time. The library has a total area of 1060 m² with 11 sections viz., Issue Section, Reference section, Circulation Section, SC/ST Book Bank Section, Research Wing, Theses Section, Info lab, ARIS Room, Lobby, Property Counter and Photocopy Section. Presently the library possesses text books, journals (national and international), theses on agriculture and related topics. Abstracted journals of international reputation are also available for reference. Library is also offering internet facility to students and staff.

Campus computer club

A campus computer club is also functioning under the librarian for imparting computer literacy to all categories of staff members and farm labourers.

Internet and other e-sources facility

Internet facility is available through VSNL connection from 1998 onwards. Recently, a KU Band Very Small Aperture Terminal (VSAT) connection was also established under the Agricultural Research Information Service (ARIS) project of the

ICAR. A campus network for the Internet is also established. The library offers a LAN facility for accessing in-house databases and CD-ROMs of major agricultural databases. Photocopying facility is also available in the library.



Book bank scheme

From 1980 onwards a book-bank scheme is operating in the library as per the norms fixed by ICAR and KAU. Text books recommended by course teachers are purchased and distributed to students at 50% subsidized rate. Another unique feature is the SC/ST book-bank scheme under the financial aid from SC/ST Directorate.

8.2 Soil museum & documentation Centre

Soil museum and documentation centre is established under the department of Soil Science and Agricultural Chemistry. Sixteen reference soils from different locations representing various agro ecological zones of the state have been collected and their macro-monomoliths are exhibited in the museum. Details of taxonomic classification, landforms and their characteristics, cultivable crops in the area, constraints and their management are also presented. Soil Museum possesses a good collection of rocks and minerals which can be utilised for education purposes.



8.3 Crop museum

Department of Agronomy maintains a crop museum where the crops are regularly raised for teaching and demonstration purpose for various departments of the campus and other universities. The crops raised in the crop museum include cereals and millets, pulses, oil seeds, banana, tuber crops, spices and condiments, narcotics & beverages, vegetables including cool season vegetable crops such as like cabbage, cauliflower, carrot and green peas. Different types of fruit crops, green manure crops and cover crops, fibre crops, sugar cane and medicinal plants are being maintained in the crop museum.



8.4 Fodder museum

A cafeteria of major fodder crops of Kerala is maintained by the department of Agronomy as a teaching and demonstration unit.



8.5 Medicinal Plants museum

Department of Pomology and Floriculture is maintaining a museum of medicinal plants named "Sreeflora" in memory of the late Dr. Sreekantan Nair, the former dean and a pioneering scientist in the field of mediculture. This museum serves as teaching cum demonstration unit for academic as well as extension purpose. The collection contains 60 plants like Neem, Neeramaruthu, Ponkorandi, Karuka, Vayana, Moovila, Adapathiyam, Vayambu, Koduveli etc.



8.6 Central Instrumentation laboratory

A Central Instrumentation Laboratory was established in 1982 in the department of Soil Science & Agricultural Chemistry to meet the requirements of different disciplines of the college and other stations of the University. The laboratory possesses sophisticated instruments like UV-VIS spectrophotometer, Atomic absorption spectrophotometer, refrigerated centrifuge, microcontrol based flame photometer, deep freezer, ion trace analyzer, petrological microscope, microwave digestion system etc.



8.7 Biocontrol laboratory

A laboratory is functioning under the Department of Agricultural Microbiology to deal with research on soil microorganisms. The laboratory is equipped with instruments like fermentor, lyophiliser, autoclave, laminar flow, refrigerated centrifuge, digital spectrophotometer etc.



8.8 Pesticide residue laboratory

The presence of pesticide residues in agricultural produces is a major challenge for chemical approach in pest control. The occurrence

of pesticide residues in various food commodities such as rice, oil, fish, honey, spices, fruits, vegetables, drinking water, total human diet, animal feed and environmental substrates are monitored here to fix guidelines on their levels and safety. On the basis of the data gathered on organochlorine residues in bovine milk and milk products, and breast milk from Kerala and other states, HCH (BHC), a major organochlorine insecticide was banned in India. The laboratory is equipped with instruments such as Gas chromatography (GC), high performance liquid chromatography (HPLC) and GCMS for detecting pesticide residues at nanolevels.

8.9 Plant Virus Indexing Laboratory

A Virus-indexing lab of the was established in the department of Plant and Pathology to develop disease free planting materials of banana, black pepper, vanilla, orchid and anthurium. Major research work of this laboratory is molecular and serological diagnosis of plant pathogens. Virus indexing of tissue cultured plants mass multiplied through nuclear centers and multiplying centers of KAU and other agencies is being carried out in this lab.



8.10 Mycoherbicide laboratory

The thrust area of this laboratory is the management of important weeds with mycoherbicides. Developed a strategy for eco-friendly management of water hyacinth in water bodies. This can be managed by spraying 5% Cashew Nut Shell Liquid (CNSL) emulsion followed by 40% Wettable Powder formulation (WP) of *Fusarium pallidoroseum* (5%). Spraying is to be repeated with WP 5% alone, after 2 weeks, if any new sprouts develop.

8.11 Nematology laboratory



Nematology laboratory is functioning at the college for diagnosing nematode problems so as to formulate effective nematode management strategy for the cultivation of rice, banana, vegetables, pulses, oil seeds, spices and aromatic and medicinal plants

8.12 Molecular Biology Laboratory

This laboratory is functioning under the department of Plant Biotechnology laboratory and is well equipped with sophisticated equipments like PCR machine, gel documentation units, refrigerated micro- centrifuge, High speed centrifuge, gel electrophoresis unit, hybridization incubator, electroblotter, ELISA reader, zoom stereomicroscope, gyratory shaker, deep freezer, ice flaking machine and laminar air flow chamber for facilitating successful conduct of research in the field of plant biotechnology.



8.13 Livestock, Poultry and Piggery Units

These units function under the Department of Animal Husbandry. The major purpose is to impart training to B.Sc. (Ag.) students. It is also used for giving practical training to the internees from College of Veterinary and Animal Sciences and to farmers undergoing training programmes organized by the College.



8.14 Biocontrol unit

This unit functions under the Department of Agricultural Microbiology. Cultures of *Trichoderma viridae* and *Pseudomonas fluorescens* and formulation of *Bacillus macerans* and *Paecilomyces lilacinus* are made available to the farmers.

8.15 Agromet unit

The Department of Agricultural Meteorology is in charge of the unit. As part of the national programme on Agrometeorological Advisory Services, Agrometeorological Advisory Bulletins are issued from College of Agriculture, Vellayani on the basis of the forecast sent by the National Centre for Medium Range Weather Forecasting (NCMRWF), New Delhi.



8.16 Meteorological Observatory

Department of Agricultural Meteorology runs a Meteorological Observatory where important weather parameters such as rainfall, temperature, relative humidity, sun shine hours etc. are recorded.

8.17 Automatic weather station

An automatic weather station is used for the collection of weather data and its dissemination on real time basis from one place to another without human interference. This automatic weather station field unit consists of sensors, signal conditioning sub system, data conversion, storage and transmission system, antenna, power supply system and hardware.



8.18 Sericulture unit



The agrotechniques for mulberry cultivation and rearing technology for silk worm were standardized. Rearing houses with mud brick walls thatched with coconut leaves were found to be suitable and cost-effective for rearing silkworms. This unit is run by Department of Entomology.

8.19 Apiculture Unit

An apiculture unit is functioning for undertaking need based apiculture research in southern part of the country and for imparting knowledge on apiculture to the students and beekeepers through training programmes.

8.20 Engineering workshop

A well equipped engineering workshop is functioning under the department of agricultural engineering



8.2.1 Integrated Farming System unit

The department of Agronomy is maintaining an IFS unit for demonstration as well research purpose. The major components are fish and duck with azolla as auxillary unit.



9. Other Establishments

9.1 Maintenance Wing & Vehicle Section

This section is responsible for the supply of water and electricity in the campus besides and undertaking petty construction and repair work. It is also responsible for the operation and maintenance of the college vehicles. There are three pump houses with nine pump sets of capacities in the range of 10-20 HP for round-the-clock supply of drinking water to the campus.

9.2 Directorate of Physical Plant Wing & Engineering Sub Division



This wing functions in the college with the mandate of executing and supervising civil and electrical works. The major construction activities are undertaken by the Director of Physical Plant through the Engineering Sub-Division established in this campus.

10. Lateral Facilities

Student Hostels
Student Amenity Centre
Staff Quarters
Co-operative store
Students and Staff Canteens
Hospital
Co-operative Society
Post Office
Conveyance facility
Indoor Stadium



II. Education

The Kerala Agricultural University, established under the KAU act 33 of 1972, started functioning on 1st February 1972 as the 15th SAU in India. The main objectives of the University are:

- To make provision for imparting education in different branches of study particularly in Agriculture, Horticulture, Animal Husbandry including Veterinary and Dairy science, Cooperation, Fisheries, Forestry, Agricultural Engineering, Home science and other allied branches of learning and scholarship.
- To further the advancement of learning and research, particularly in Agriculture and other allied sciences besides under taking extension education programme and any other purpose as the University decides from time to time. The territorial jurisdiction and responsibility of the University extend to the entire state.



II.1. Mode of Selection for Admission

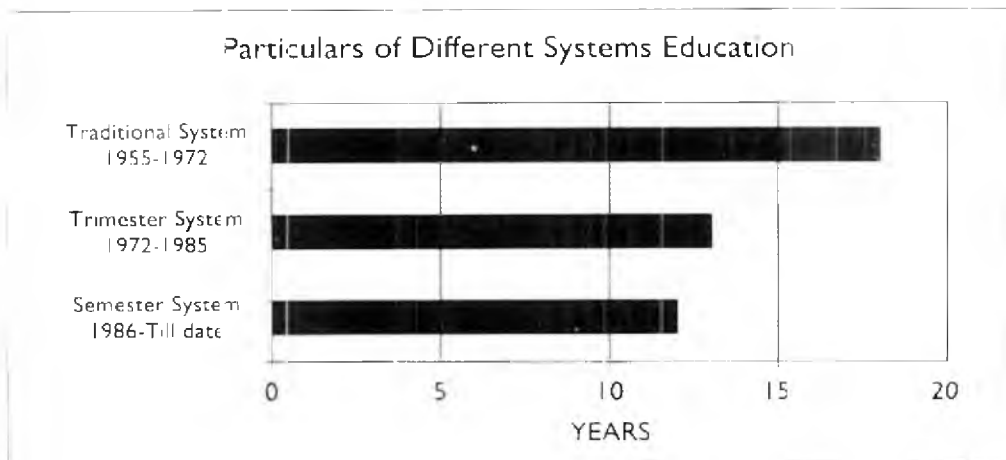
The College of Agriculture, Vellayani, plays a crucial role in imparting technical education in the field of agriculture and allied sciences. Education programme of the college includes B.Sc. (Ag.), M.Sc. and Ph.D. degree in Agriculture and allied subjects. Admission to B.Sc. (Ag.) course is based on common entrance test conducted by the Commissioner of Entrance Examinations, Government of Kerala. Pre-degree (or 10+2) of any university in Kerala with Physics, Chemistry and Biology as optional subjects or an examination recognized by the KAU as equivalent thereto, is the basic qualification required for securing admission to B.Sc (Ag.) Programme.

Admission to various M.Sc. courses is also through an entrance examination, separate for each discipline, conducted by the University. A basic degree from the concerned faculty or a qualification recognized by the KAU as equivalent thereto with an OGPA of 7.3/10 or 2.25/4 or an aggregate of 52.8% marks in the traditional system is required for various M.Sc. degree programmes. Selection of for Ph.D. programmes is based on overall assessment of the merits of the candidate by a selection committee constituted

for the purpose. A Master's degree in the discipline or related discipline from the concerned faculty of the KAU or a qualification recognized as equivalent thereto with an OGPA of 7.8/10 or 2.75/4 or an aggregate of 60% marks in the traditional system is the minimum requirement of admission. The college is offering under graduate programme from 1955 onwards. M.Sc (Ag.) programme was started in 1955 onwards and Ph.D from 1965 onwards in Agronomy, Agricultural Botany, Agricultural Chemistry, Agricultural Entomology, Horticulture and Plant Pathology. Later the PG programmes were strengthened by including more disciplines. At present the institute has 20 departments and is offering M.Sc in 13 disciplines and Ph.D in 12 disciplines.

11.2. System of Education

At the time of inception, the College of Agriculture was following traditional system of education with a course duration of three years. With the establishment of the University in 1972 the academic curricula were thoroughly revised and a trimester-course credit system of education with a course duration of four years was introduced and was continued till 1986. Since 1986, the semester-course credit system of education is in the Kerala Agricultural University.



The curricula for educational programme is mainly based on the syllabus prescribed by the ICAR. The students after the successful completion of the under graduate programme are awarded B.Sc. (Ag.) degree. From 2007 onwards the nomenclature was changed to B.Sc. (Hons) Agriculture. The Masters and Doctorate Degree programmes also include a successful completion of a research project in the major field of study and submission of a thesis there on.

11.3. Curricula for Agricultural Educational Programme

▶ Traditional System of Education

Traditional system for under graduate degree programme was in vogue from 1955 to 1972. The duration of the programme was three years with a total of 13 courses.

Subjects covered under traditional system

Sl. No.	Subjects	Sl. No.	Subjects
1	Agronomy	8	Agricultural Extension
2	Agricultural Botany	9	Animal Husbandry
3	Agricultural Bacteriology	10	Agricultural Statistics
4	Agricultural Chemistry	11	Horticulture
5	Agricultural Engineering	12	Mathematics
6	Agricultural Entomology	13	Mycology and Plant Pathology
7	Agricultural Economics		

▶ Trimester system of Education

The Trimester system of education was implemented in 1972 and this was continued till 1985. With the introduction of this system the duration of the UG programme was enhanced to four years to accommodate 12 trimesters. Major subjects were handled as different courses spread over in various trimesters. The details of courses for the commencement year (1972) and the terminating year (1985) are furnished below.



List of courses handled under trimester system

	1972	1985
	<p>AGRONOMY</p> <p>Farm operation and management Introduction to Agriculture Elementary Agronomy Agri.meteorology Soil fertility and management Soil and Water management Crop production Farm Planning, Farm management and Agricultural development</p>	<p>AGRONOMY</p> <p>Principles of Agronomy Principles of weed control Agri.meteorology Soil productivity and management Soil and Water conservation Water management Crop production I to IV Crop production- Practicals I & II</p>
	<p>AGRICULTURAL BOTANY</p> <p>Morphology and systematic botany Anatomy and embryology Economic Botany Plant physiology Cytogenetics</p>	<p>PLANT BREEDING & GENETICS</p> <p>Crop Botany I & II Cytology and embryology Plant physiology I & II Methods of Plant Breeding Genetics Breeding annual and perennial crops Seed Production and Certification</p>
	<p>SOIL SCIENCE & AGRICULTURAL CHEMISTRY</p> <p>Basic chemistry Agricultural biochemistry Fundamentals of soils including basic geology Soil microbiology Soil fertility and fertilizers Chemistry of pesticides Elective</p>	<p>SOIL SCIENCE & AGRICULTURAL CHEMISTRY</p> <p>Physical chemistry and biophysics Organic chemistry Agricultural biochemistry Introductory soils Soil biology Soil fertility and soil plant relationship Manures and fertilizers Soil Analysis Plant and water analysis Chemistry of pesticides and environmental pollution Chemistry of submerged and problem soils</p>
	<p>AGRICULTURAL ENGINEERING</p> <p>Surveying and farm structures workshop practice Farm power and machinery</p>	<p>AGRICULTURAL ENGINEERING</p> <p>Agricultural Surveying and structures Irrigation and drainage engineering Field operations Farm power and machinery</p>

<p>AGRICULTURAL ENTOMOLOGY</p> <p>Zoology Nematology Insect Control Economic Zoology Economic Entomology Elective</p>	<p>AGRICULTURAL ENTOMOLOGY</p> <p>General Entomology Economic Entomology I to III Insect taxonomy and development Insect control Beneficial insects and biocontrol of pests Non insect pest and their control</p>
<p>AGRICULTURAL ECONOMICS</p> <p>Basic economics Introduction to Agricultural Economics Agril.cooperation Economics and Farm Management and Agricultural Management</p>	<p>AGRICULTURAL ECONOMICS</p> <p>Basic economics Introduction to agricultural Economics and Planning Indian Agriculture Farm management and Economics Agricultural Finance Agricultural marketing</p>
<p>AGRICULTURAL EXTENSION</p> <p>Sociology Psychology Fundamentals of Extension education and community development Communication extension methods and aids Programme Planning and evaluation</p>	<p>AGRICULTURAL EXTENSION</p> <p>Introductory Sociology and Psychology Introduction to Extension education Communication, Extension methods and aids Programme Planning and Evaluation Project work Introduction to Agricultural and Horticultural Sciences Field Training</p>
<p>ANIMAL HUSBANDRY</p> <p>Livestock husbandry Animal nutrition and dairy science Animal breeding Veterinary Science</p>	<p>ANIMAL HUSBANDRY</p> <p>Animal Management Animal nutrition and health care Poultry and dairying</p>
<p>AGRICULTURAL STATISTICS</p> <p>Mathematics Introduction to theory of statistics</p>	<p>AGRICULTURAL STATISTICS</p> <p>Mathematics Principles of statistical methods Experimental techniques in Agricultural research</p>



809786

<p>HORTICULTURE</p> <p>Introductory Horticulture Pomology I Plantation crops I Plantation crops II Olericulture and Ornamental gardening</p>		<p>HORTICULTURE</p> <p>Fundamentals of Horticulture Plant propagation and nursery management Fruit crops I & II Plantation Crops I & II Vegetable Crops I & II Fruit growing - practical Vegetable Growing - Practical Spices Essential Oils and Medicinal Plants Plantation crops - Practical Landscaping and Ornamental Gardening Post Harvest Processing of Fruits and Vegetables Post Harvest Technology of Plantation Crops and Spices</p>
<p>PLANT PATHOLOGY</p> <p>General microbiology Plant pathology I Plant Pathology II Plant Disease control</p>		<p>PLANT PATHOLOGY</p> <p>Microbiology I & II Principles of Plant pathology Plant Disease control Diseases of field crops Diseases of fruit crops and post harvest pathology Diseases of vegetable and ornamental crops Diseases of plantation crops, spices and essential oil crops</p>
<p>HOME SCIENCE</p> <p>Basic Human nutrition</p>		<p>HOME SCIENCE</p> <p>Food Science and Nutrition</p>
<p>Work Experience</p>		<p>Work Experience</p>
<p>Elective*</p>		<p>** Physical Education I to III</p>

* - Elective courses were discontinued from 1977 onwards

** - Physical education courses were included in the curricula from 1977 onwards

▶ Semester System of Education

Semester system of education was implemented from 1986 and is still continuing. In this system the courses are spread over in eight semesters.

List of courses handled under the semester system

1986	2006
<p>AGRONOMY</p> <p>Principles of Agronomy Soil productivity and management Soil and water conservation Principles of weed management Water management Crop production I Crop production II Crop production III Crop production IV Cropping pattern and farming systems</p>	<p>AGRONOMY</p> <p>Principles of Agronomy Weed management Irrigation and water management Field crops I Field crops II Rainfed agriculture Farming system and sustainable agriculture Practical crop production I -rice optional courses</p>
<p>HORTICULTURE</p> <p>Fundamentals of Horticulture Plantation crops Fruit crops Vegetable crops Spices Medicinal & Aromatic plants Post harvest handling & processing of horticulture crops Land scaping and ornamental gardening</p>	<p>HORTICULTURE</p> <p>Fundamentals of horticulture Landscaping and ornamental horticulture Vegetable production Plantation crops Fruit crops Spices and medicinal plants Post harvest management and processing of horticultural crops Practical crop production-vegetables Optional courses</p>
<p>SOIL SCIENCE AND AGRICULTURAL CHEMISTRY</p> <p>Physical chemistry and bio physics Analytical chemistry Agrl. Biochemistry Basic soil science Soil fertility soil plant relationship and soil biology Manures and fertilizers Agrl. Chemicals and environmental pollution management Chemistry of submerged and problem soil</p>	<p>SOIL SCIENCE AND AGRICULTURAL CHEMISTRY</p> <p>Fundamentals of soil science Elementary biochemistry Soil fertility and nutrient management Conservation and management of soil and water resources Agro ecology and environmental pollution (multidisciplinary course) optional courses</p>
<p>AGRICULTURAL ENTOMOLOGY</p> <p>Fundamentals of Entomology Insect taxonomy & beneficial organisms Ecology & pest management Economic Entomology I Economic Entomology II Non insect pest and their management</p>	<p>AGRICULTURAL ENTOMOLOGY</p> <p>Crop pests and their management Fundamentals of entomology Economic entomology Agro clinic Optional courses</p>

<p>PLANT PATHOLOGY</p> <p>Microbiology I Microbiology II Principles of plant pathology Diseases of field crops, vegetables and ornamentals Diseases of plantation crops Diseases of fruit plants and post harvest pathology</p>	<p>PLANT PATHOLOGY</p> <p>Introductory plant pathology Microbiology Principles of crop disease management Disease of field crops Disease of horticultural crops Mushroom cultivation</p>
<p>PLANT BREEDING AND GENETICS</p> <p>Morphology & systematics of crop plants Anatomy, Embryology & cytology Principles of Genetics Methods of Plant Breeding Breeding of crops and seed certification</p>	<p>PLANT BREEDING AND GENETICS</p> <p>Breeding of crops Principles of Plant Breeding Seed production and certification</p>
<p>AGRICULTURAL EXTENSION</p> <p>Rural sociology Psychology and extension education Extension education & rural development Communication in agriculture Extension methods & aids Programme planning Agricultural extension management.</p>	<p>AGRICULTURAL EXTENSION</p> <p>Sociology and psychology as applied to extension education Fundamentals of extension education and rural development Communication and diffusion of agricultural innovations Rural agricultural work experience programme (RAWEP)</p>
<p>AGRICULTURAL ENGINEERING</p> <p>Irrigation & drainage engineering Agrl. Survey and structure Farm power and machinery and field operation</p>	<p>AGRICULTURAL ENGINEERING</p> <p>Farm machinery and power Post harvest engineering</p>
<p>AGRICULTURAL STATISTICS</p> <p>Mathematics Statistics methods Design and analysis of experiments *Introduction to Computer Applications</p>	<p>AGRICULTURAL STATISTICS</p> <p>Mathematics Elementary statistics Computer applications Design and analysis of experiments</p>
<p>ANIMAL HUSBANDRY</p> <p>Animal management and nutrition Poultry, dairying and fisheries</p>	<p>ANIMAL HUSBANDRY</p> <p>Livestock and poultry management</p>
<p>PLANT PHYSIOLOGY</p> <p>Principles of crop physiology Growth and morphogenesis</p>	<p>PLANT PHYSIOLOGY</p> <p>Elementary crop physiology</p>
<p>AGRICULTURAL METEOROLOGY</p> <p>Agrl. meteorology</p>	<p>AGRICULTURAL METEOROLOGY</p> <p>Agricultural meteorology</p>

HOME SCIENCE Foods and nutrition	HOME SCIENCE Human food and nutrition
AGRICULTURAL BIOTECHNOLOGY Principles of Biotechnology Molecular Biology	AGRICULTURAL BIOTECHNOLOGY Introduction to plant biotechnology
PHYSICAL EDUCATION Physical education I Physical education II	PHYSICAL EDUCATION Physical education
* WORK EXPERIENCE	OPTIONAL COURSES
**STUDY TOUR Study tour I Study tour II FIELD TRAINING	STUDY TOUR Study tour II Study tour II RAWE

* Work Experience : The objective of including this course is to impart practical knowledge in crop production and live stock management.



Study Tour

The under graduate students of the college are exposed to different systems of agriculture, various institutions related to agriculture at national and international levels, and different state Agricultural Universities etc. through the study tour programme for South India and North India during their periods of study.



Physical Education: The course curricula is oriented to enlighten the intellectual capacity of students besides improving the physical welfare of the students.



► B.Sc Hons. (Agriculture) Education Programme

In order to keep in pace with the changing scenario of Agriculture the course curricula was revised in 2007 and the course profile to suit the latest syllabus is furnished below.

Course Profile for B.Sc. Hons (Ag.)

Sl. No.	Course No.	Proposed courses	Credit hrs
I. Agronomy			
1.	Agro.1101	Introductory Agriculture	1 (1+0)
2.	Agro.1102	Principles of Agronomy	2 (1+1)
3.	Agro.1203	Irrigation and Water Management	3 (2+1)
4.	Agro.1204	Weed management	2 (1+1)
5.	Agro.2105	Field crops-I	3 (2+1)
6.	Agro.2206	Practical crop production (Rice)	1 (0+1)
7.	Agro.2207	Field crops II	2 (1+1)
8.	Agro.3108	Cropping pattern and Farming systems	2 (1+1)
9.	Agro.3209	Sustainable agriculture and organic farming	2 (1+1)
Total			18 (10+8)
II Plant breeding & Genetics			
1	Pbgn.1101	Morphology and Systematics of crop plants	1 (0+1)
2	Pbgn.1102	Principles of Genetics & Cytogenetics	3 (2+1)
3	Pbgn.2103	Principles of Plant Breeding	3 (2+1)
4	Pbgn.2104	Seed production of Crops	3 (2+1)
5	Pbgn.3205	Principles of seed Technology	2(1+1)
Total			12 (7+5)
III Soil Science & Agricultural Chemistry			
1	Scac.1101	Introduction to Soil Science	3 (2+1)
2	Ssac.1202	Agricultural biochemistry	3 (2+1)
3	Ssac.2103	Organic farming and Soil Health	2 (1+1)
4	Ssac.2204	Fertilizers and Agro-chemicals	2 (1+1)
5	Ssac.3105	Soil Chemistry, Soil fertility and Nutrient Management	3 (2+1)
6	Ssac.3206	Environmental Science	2 (1+1)
Total			15 (9+6)
IV Agricultural Entomology			
1	Ento.1101	Insect Morphology, Physiology and Systematics	3 (2+1)
2	Ento.1202	Insect Ecology and Integrated Pest Management	3 (2+1)
3	Ento.2203	Pest of crops and stored Grains and their Management	3 (2+1)
4	Ento.3204	Plant Parasitic Nematodes, other non insect pests and their management	2 (1+1)
Total			11 (7+4)
V Agricultural Economics			
1	Econ.1201	Principles of Agricultural Economics	2(2+0)
2	Econ.2102	Agricultural Finance and Co- operation	2 (1+1)
3	Econ.2203	Production Economics and Farm Management	2 (1+1)
4	Econ.3104	Agricultural Marketing , Trade and Prices	2 (1+1)
5	Econ.3205	Fundamentals of Agri-Business Management	2 (1+1)
Total			10(6+4)

VI		Agricultural Engineering	
1	Engg.1101	Fundamentals of Soil, Water and Conservation Engineering	2 (1+1)
2	Engg.1202	Farm Power and Machinery	2 (1+1)
3	Engg.3103	Protected Cultivation and Post -Harvest Technology	2 (1+1)
4	Engg.3204	Renewable Energy	1 (1+0)
Total			7 (4+3)
VII		Plant Pathology	
1	Path.1101	Introductory plant pathology	2 (1+1)
2	Path.2102	Principles of crop disease management	2 (1+1)
3	Path.3103	Disease of field crops and their management	3 (2+1)
4	Path.3204	Diseases of horticultural crops and their management	3 (2+1)
Total			10(6+4)
VIII		Horticulture	
1	Hort.1101	Fundamentals of Horticulture	1 (1+0)
2	Hort.1202	Plantation crops	2 (1+1)
VIII		Horticulture	
1	Hort.1101	Fundamentals of Horticulture	1 (1+0)
2	Hort.1202	Plantation crops	2 (1+1)
3	Hort.2103	Landscaping and ornamental horticulture	2 (1+1)
4	Hort.2204	Vegetable Crops	3 (2+1)
5	Hort.3105	Fruit Crops	3 (2+1)
6	Hort.3206	Spices and Medicinal plants	2 (1+1)
7	Hort.3207	Post-Harvest Management and Processing of horticultural crops	3 (2+1)
Total			16(10+6)
IX		Agricultural Extension	
1	Extn.1201	Sociology and Psychology as applied to Agricultural Extension	2(2+0)
2	Extn.2102	Agricultural Extension and Rural Development	2(1+1)
3	Extn.3103	Communication and Extension Methodologies for Transfer of Agricultural Technology	2(1+1)
4	Extn.3204	Entrepreneurship Development and Extension Management	2(1+1)
5	Extn.4105	*Rural Agricultural Work Experience Programme (RAWEP)	20(0+20)
Total			28(5+23)
X		Plant Physiology	
1	Crps.2201	Crop Physiology	3(2+1)
Total			3(2+1)
XI		Microbiology	
1	Micr.1101	Agricultural Microbiology	3 (2+1)
Total			3 (2+1)
XII		Statistics and Computer Application	
1	Stat.120	Basic Statistics	2 (1+1)
2	Stat.2101	Introduction to Computer Applications	2 (1+1)
3	Stat.3203	Design and Analysis of Experiments	2 (1+1)
Total			6 (3+3)

XIII	Animal Husbandry		
I	Anhs.2101	Fundamentals of Livestock Poultry Production	3 (2+1)
Total			3 (2+1)
XIV	Agricultural Meteorology		
I	Agmt.1101	Agricultural Meteorology	2 (1+1)
Total			2 (1+1)
XV	Plant Biotechnology		
I	Biot.2201	Principles of Plant Biotechnology, Bio-safety Rules and Intellectual Property Rights	3 (2+1)
Total			3 (2+1)
XVI	Home Science		
I	Hmsc.2201	Food and Nutrition	2 (1+1)
Total			2 (1+1)
XVII	Non Credit Courses		
1	Phed.1101	Physical Education	1 (0+1)
2	Stur.2201	**Study tour -I	1 (0+1)
3	Stur.3202	Study tour -II	1 (0+1)
Total			3 (0+3)
XVII		Experiential learning	20
Grand Total			172

*Rural Agricultural Work Experience (RAWE):

As part of RAWE programme, the students organize training programmes, agro clinics, one day seminar, exhibitions etc, at various pockets of nearby villages like Venganoor, Kalliyoor, and Palappur. Under the Village Stay module of RAWE programme the student's camp in the selected Village and conduct PRA to assess the resources and problems of that area. Based on the information gathered resource map of the area is prepared. Development projects on agriculture and related areas are prepared and submitted to the panchayath officials so that they can implement the same. The students also organize many field programmes such as training programmes and clinics at Ward level, Quiz programme for school children, laying out, kitchen garden/ medicinal plants garden at school premises agricultural exhibitions, animal show, crop competition, mobile soil testing for the farmers of that panchayath.



11.4. Student Profile

At the time of inception 51 students were admitted for B.Sc (Ag.) programme and during the next five years the student strength was about 80. The strength exceeded 100 in the years 1966, 1976, 1977 and 1981. Though a low profile is observed in student strength recently it is gaining momentum. The student strength from 1955 to 2007 is furnished below.

Student strength from 1955 to 2007

Year	Student strength		
	B.Sc. (Ag.)	M.Sc	Ph.D
1955	51	-	-
1956	80	-	-
1957	78	-	-
1958	81	-	-
1959	80	-	-
1960	66	-	-
1961	59	22	-
1962	59	25	-
1963	59	22	-
1964	63	30	-
1965	63	28	4
1966	114	30	2
1967	91	50	Nil
1968	52	22	Nil
1969	54	20	Nil
1970	53	20	Nil
1971	54	21	Nil
1972	50	-	Nil
1973	83	24	10
1974	83	10	18
1975	89	17	11
1976	112	38	7
1977	110	33	7
1978	62	53	8
1979	70	48	10
1980	82	48	11
1981	126	35	6
1982	77	34	5
1983	67	51	7
1984	74	37	8
1985	71	43	4
1986	66	38	6
1987	60	-	-
1988	70	25	5
1989	57	32	14
1990	58	44	16
1991	55	45	11
1992	52	42	13
1993	47	-	14
1994	56	-	11
1995	57	32	12
1996	58	43	16
1997	48	43	9
1998	68	40	7
1999	71	41	12
2000	44	35	13
2001	33	42	18
2002	41	37	8
2003	47	40	9
2004	42	33	6
2005	61	22	16
2006	37	14	4
2007	57	13	7

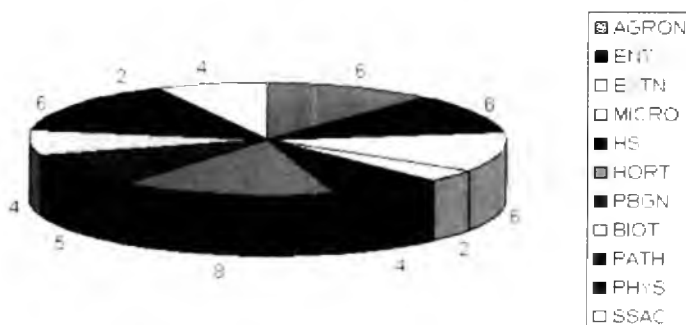
College Of Agriculture ,Vellayani, Thiruvananthapuram

The latest syllabus revision was effected in the year 2007 in accordance with the changing scenario of the National Agricultural Education Programme and the details regarding the student intake capacity and course curricula are depicted below.

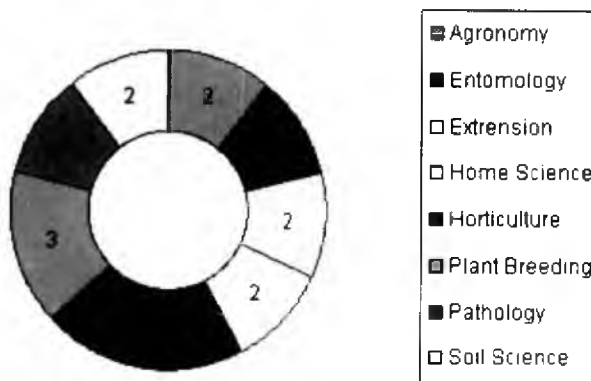
Student Intake Capacity For Educational Programme

B.Sc.Hons. (Agriculture)	M.Sc	Ph.D
59	51	19

Discipline wise distribution of seats (M.Sc)



Discipline wise distribution of seats (Ph.D)



College Of Agriculture ,Vellayani, Thiruvananthapuram

A total of 172 credit hours is handled by various disciplines over a time span of eight semesters for the B.Sc. Hons (Ag.) programme. For M.Sc (Ag.) programme each discipline offers courses for 40 credit hours and for Ph. D 26 credit hours. All departments are handling UG courses and 13 department are offering M.Sc (Ag.) programme. Doctoral programme is offered by 11 departments.

Educational Programme Profile of various departments

Department	Credit hours		
	B.Sc	M.Sc	Ph.D
Agricultural Economics	10	-	-
Agricultural Engineering	7	-	-
Agricultural Entomology	11	40	26
Agricultural Extension	28	40	26
Agricultural Meteorology	2	-	-
Agricultural Microbiology	3	-	-
Agricultural Statistics	6	-	-
Agronomy	18	40	26
Animal Husbandry	3	-	-
Home Science	2	40	26
Olericulture	4	40	26
Physical Education	1	-	-
Plant Biotechnology	3	40	-
Plant Breeding & Genetics	12	40	26
Plant Pathology	10	40	26
Plant Physiology	3	40	-
Plantation Crops & Spices	4	40	26
Pomology & Floriculture	5	40	26
Processing Technology	3	40	26
Soil Science and Agricultural Chemistry	15	40	26

11.5. Students Welfare Programmes And Benefit Schemes

Scholarships and Fellowships

The main objective of providing scholarships and fellowships is to give financial assistance and incentive to all the eligible post graduate students who are taking their thesis problem as part of the university research programmes irrespective of their nativity. Post graduate students are being awarded KAU merit scholarship and KAU fellowships. The Junior fellowship is awarded to study and research leading to Masters degree and the senior fellowship is awarded to study and research leading to Ph.D degree.

Endowment Awards Instituted at the College

Sl. no	Name of endowment	Purpose
1.	Smt. Chinnamma Thomas	Awarded to the B.Sc. (Ag.) student who gets the highest OGPA at the end of third year
2.	Sri. C.P. Madhavan Nair Memorial Endowment	Awarded to the 1st rank holder in the B.Sc. (Ag.)
3.	Dr. Abraham Thomas Memorial Endowment	Awarded to the out-going student who secures highest OGPA in the B.Sc.(Ag.) programme
4.	Smt. N. Kunhan Pillai Memorial Endowment	Awarded to the out-going student who secures highest OGPA in the B.Sc. (Ag.) programme
5.	Sri. Pandalam, P.R. Madhavan Pillai Memorial Endowment	Winner of the elocution / essay competition
6.	Dr. P.R. Mehta Award	Given to the best M.Sc. (Ag.) student

11.6. Extra-curricular Programmes

Students Union Activities

Students union co-ordinates all the co-curricular and extra curricular activities. Extra-curricular activities are mainly organized by various clubs under the Student's Union. They are Arts Club, Sports Club, Speakers Club, Planning Forum, Social Service Club, Camera Club, Forestry Club and National Service Scheme.

Students representatives are elected as office bearers of Students Union. The Dean is the patron and a senior faculty member act as associative patron. One of the faculty members serve as the staff advisor. Students union is mainly responsible for conducting inter class arts festival, quiz programmes, seminars, discussion, debates, social service and community contact programme and publishing college magazine



National Service Scheme

NSS is an important programme functioning in the college. One faculty member is nominated as Programme officer for imparting necessary guidance to the students. The National Service Scheme at College of Agriculture Vellayani is functioning to inculcate the spirit of voluntary work among the students and teachers through sustained community interactions and to bring academic institution closer to the society for community development. It also gives a social responsibility and an opportunity to acquire leadership qualities and personality development to the volunteers. The NSS unit has organized several auspicious programmes in college and near by panchayathus.



11.7. Parent Teachers Association

The Parent Teachers Association of the College of Agriculture, Vellayani came into existence in the year 2000 with the following objectives

- ◆ To foster and promote good relationship among teachers, students and parents/guardians.
- ◆ To create keen interest among members for the smooth functioning and progress of the college
- ◆ To promote better participation of the parents/guardians in the various programmes of the college
- ◆ To liaison with the Government and potential employers to enhance the employment opportunities for the students.
- ◆ To institute scholarship, prizes, medals etc to benefit students showing proficiency in their academic pursuit, and provide support to improve the amenities to the students of the college.

Parent Teachers Association has actively coordinated many welfare activities to cater the needs of the students. Some of the note worthy activities of Parent Teachers Association are campus recruitment for the students by various banks, and IIITK and providing financial assistance to the need worthy students. Honouring the teachers and students of academic excellence is an important activity of PTA.

11.8. Achievements of the Students

The students of this college have excelled in competitive examinations held at national and inter national levels. They have secured JRF's/Placements for PG studies in India as well as abroad.. A few alumni of the college has secured civil service positions.

12. Research Focus

Agriculture is fast changing and so also the challenges before the research system. In the fifties and sixties, the years immediately after independence, the main forcing paradigm for agricultural development was the need and urgency of achieving self-sufficiency in the production of foodgrains in the shortest possible time, in the context of the growing population. To achieve these development objectives the key strategies adopted are to focus on the evolvement and spread of area under high-yielding varieties of food grain crops and to enhance crop productivity through improved management and use of inputs, including spread of irrigation, fertilizers, crop protection measures, etc. Over the successive five-year plans, the research has expanded to widen the research focus to include an array of field and horticultural crops, livestock species and fisheries. The concept has also been evolving to emphasize greater focus on livestock health and production, horticultural crops, etc. and for enhancing the quality of resource base. The key challenge before the agricultural scientists is to conceive and promote strategies that integrate the concerns of enhancing productivity and resource conservation for sustainable agriculture.

The research activities of The College of Agriculture dates back to 1962 with the commencement of post graduate programme. Subsequently the scientists started research projects for solving local, regional as well as national problems in the field of agriculture and allied sectors. The research is mainly coordinated by the Director of Research assisted by Professor (RC), Associate Directors and Project Coordinators of various thrust area areas identified for research.



Major Thrust Areas of Research

- ◆ Rice and Rice based cropping systems
- ◆ Coconut and Other Palms
- ◆ Vegetables
- ◆ Sugar and Tuber crops
- ◆ Fruits
- ◆ Floriculture
- ◆ Spices and Plantation crops

- ◆ Pulses and Oil seeds
- ◆ Forage and Green Manure crops
- ◆ Aromatic and Medicinal Plants
- ◆ Soils and Agronomy
- ◆ Plant Protection
- ◆ Biotechnology
- ◆ Post-harvest Technology
- ◆ Agricultural Extension and Development Studies
- ◆ Beneficial Organisms
- ◆ Agroforestry and Silviculture
- ◆ Food Science & Nutrition
- ◆ Seed Technology
- ◆ Organic Farming
- ◆ Gender Studies
- ◆ Agribusiness Management
- ◆ Agro-economics

The research programmes of the college includes post graduate projects, plan projects, AICRP's, and external aided projects. The main funding agencies of the research programme are KAU, ICAR, ICMR, DBT, DST, BARC, KSCSTE, WGDP, Government of Kerala, Biotech Kerala, Oil Palm India, PPIC, Hindustan Latex, Excel Industries, NHB, World Bank etc. The RARS (SZ) is mainly responsible for the implementation of various research programmes.

Salient research findings

Rice (*Oryza sativa*)

Varietal studies

Aarathy and Remya were identified as high yielding, medium duration red rice varieties suitable for transplanting during kharif season. Aarathy was suited to late sowing situations also. Harsha and Matta Triveni were found ideal for shaded upland situations.

Scented rice variety Kasturi was found high yielding and resistant to sheath blight disease. Pusa basmati-I recorded good cooking quality but was highly susceptible to sheath blight disease.

Nutritional studies

Major portion of K existed in lattice form and it maintains positive inter-correlation with total K in lateritic alluvium of Pattambi, Onattukara sandy and red soils of Trivandrum.

The peak absorption of phosphorus by rice occurred at maximum tillering stage and phosphate application at or after panicle initiation was not likely to be helpful in bringing about the desired yield increase in rice.

Optimum nutrient schedule for medium duration rice variety in acid sulphate soils of Kuttanad was 90:45:15 kg NPK ha⁻¹ as revealed by Systematic Approach of fertilizer use.

A fertilizer dose of 90:45:67.5 kg NPK ha⁻¹ with 50 per cent N as FYM and 50 per cent N as chemical fertilizer was found best in increasing the yield and net returns in basmati rice in wetlands.

Biofertilizer / Growth promoter studies

Soaking rice seeds in *Penshibao*+*Azospirillum* along with foliar spray of *penshibao* at 20 and 30 DAT recorded the highest grain yield in rice.

This institute was successful in developing AMF technology for low land paddy. Developed acid and salinity tolerant *Azospirillum* for paddy and confirmed the plasmid borne characters. Inoculation with the culture helped to save 25 per cent of fertilizer N.



Upland rice

Identified the varieties suitable for upland situation and standardised the integrated nutrient schedule for profitable upland rice cultivation.

Basmathi rice

Standardised the agrotechniques like suitable varieties, optimum nutrient levels, suitable spacing and optimum time of planting for profitable basmathi rice cultivation. Earlier planting (10th October) increased the grain yield and yield attributing characters and quality aspects of basmathi rice and 20 x 10 cm was found as ideal spacing.

System Rice Intensification

Standardised the agrotechniques for adopting SRI techniques in rice production in low land rice soils of southern Kerala.



Wet land rice soil studies

Submergence for two weeks after addition of organic manures was recommended for creating a conducive chemical and biological environment for better growth and yield of rice.



Wetland rice soils of Vellayani, Karamana, Karapadam, Kole, Kaipad, Pattambi, Kattampally and Wayanad did not require lime to raise pH for rice cultivation because all these soils attained a pH of 5.5 within two weeks of submergence.

Wetland rice soils were grouped under soil orders, Entisols, Inceptisols, Alfisols, Ultisols and Vertisols. The Kari lands were classified as true acid sulphate soils and Pokkali lands were grouped as potential acid sulphate soils.

Kaolinite was the predominant clay mineral in wetland soils except in Chittoor where smectite was found to be the major one. Other minerals and clay minerals identified were quartz, goethite, gibbsite, feldspars, illite and chlorite.

Wet land rice soils of Kerala were medium to high in available N and P. Available K status was low and in Kaipad and Wayanad soils it was deficient. The soils were generally deficient in secondary and micronutrients. Iron toxicity was observed in acid sulphates soils of Kuttanad.

The wetland rice soils based on the extent of soil acidity were rated as Kari > Pokkali > Kayal > Karapadom > Kole > Pattambi > Kattampally > Vellayani > Kaipad > Karamana. Major portion of potential acidity was constituted by non exchangeable acidity. Exchangeable aluminum was the best parameter for measurement of acidity in the wetland rice soils of Kerala. Available Sulphur was also found to be a better parameter for evaluation of acidity in acid sulphate soils.

The water soluble, exchangeable, active, free oxide, total amorphous and amorphous organic forms of iron were highest in kari soil.

The Onattukara soil recorded the highest leaching loss ie 56% of applied nitrogen and Kayal soil showed the lowest leaching percentage of 24.

Plant Protection

Pest Management



The potential of parasitoids and predators in regulating the population of pests in rice eco system was established. A comprehensive package including cultivation of tolerant varieties, monitoring the field at weekly intervals for the occurrence of pests and their natural enemies, avoidance of insecticidal sprays during the vegetative phase, spot application of insecticides in heavily infested pockets was found to be the ecological and economical viable option for the sustainable management of pests of rice. The potential of spiders in regulating the population of pests in rice

eco system was also established.



Natural Products, an important component in IPM

Rhizome bits of *Acorus calamus* and chopped leaves of *Azadirachta indica*, *Vitex negundo*, *Adathoda vasica* and *Clerodendron infortunatum* when shade dried and

mixed with paddy grains could reduce the pest infestation in paddy grains up to three months of storage.

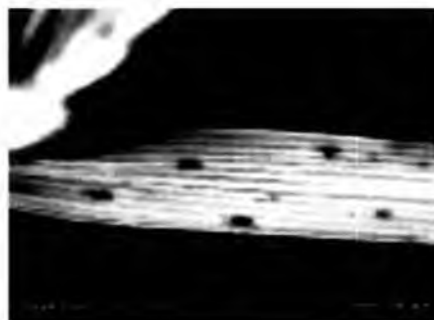
Biocontrol

Rice root nematode (*Hirschmaniella oryzae*), cyst nematode (*Heterodera oryzaicola*) and root knot nematode (*Meloidogyne graminicola*) were identified as the major nematode pests of paddy.

Disease Management

Sheath blight

Combined application of carboxin (0.1%) and carbofuran (3kg ai/ha) significantly reduced the incidence and intensity of sheath blight. *Trichoderma* spp. also proved to be effective for the management of sheath blight. A combination of zinc, nematicide and a fungicide was found to reduce markedly the incidence of



sheath blight disease in rice. A13 and Gr23, hypovirulent *R. solani* isolates offered protection to rice plants against the sheath blight disease. The rice variety, Karchika was found to be tolerant to sheath blight.

Benlate, hinosan and vitavax were effective in reducing the intensity of blast, brown spot and other diseases in rice and in increasing the yield.

Sheath rot of rice caused by *Sarocladium oryzae* was reported for the first time in Kerala and it caused severe damage to the crop. Systemic fungicides of the benzimidazole group were effective in controlling the disease. Carboxin was found to be the best for reducing the incidence and intensity of sheath rot of rice.

The biocontrol agent *Fluorescent pseudomonas*, isolate Pf16 was efficient for the management of sheath rot of rice. Seed treatment, seedling root dip and foliar application of *Fluorescent pseudomonads* isolate Pf16 was best for the management of sheath rot of rice caused by *S. oryzae*.

Penicillin (250 ppm) and Agrimycin-100 (250 ppm) were effective in controlling bacteria blight. Weeds *Oryza sativa* var. *fatua* and *Paspalum conjugatum* served as alternate host for rice bacterial blight pathogen. Curative spraying of cowdung extract 20g/l and streptomycin and oxytetracycline (1:9) reduced bacterial blight disease incidence and increased the grain yield.

Weed management

Basmath rice at a spacing of 20x10 cm and pre-emergent application of the combination herbicide anilofos+2,4-DEE @ 0.4+0.53kg a.i ha- at 6 days after transplanting followed by 2,4-D sodium salt @ 1 kg ha- at 20 days after transplanting recorded higher grain yield and lower weed population.

Pyrazosulfuron ethyl at higher levels in 20 g a.i ha- applied at 10 DAT controlled weeds and produced better grain yields

Weeds of rice fields as bio accumulators

Plants like *Eichornia crassipes*, *Cyperous pangorei*, and *Hydrilla verticillata* possess hyper accumulation capacity for Fe, Mn, Zn, Cu and Al. All these plants can be utilized for environmental clean up to purify the metal loaded effluents discharged from factories.



Eichornia crassipes



Cyperous pangorei

Cropping System Studies

Sesamum and black gram in 1:1 proportion and cowpea and rice in 1:2 proportion can be recommended as economically viable and biologically sustainable practices for the rice fallows of Onattukara.

Rice-rice-sweet potato, rice-rice-groundnut and rice- rice- bhindi systems are found economical. Rice-rice-rice system generated maximum employment opportunity.

The soil phosphorus level was almost maintained when P was applied only to the third crop of cowpea or sesamum. N can be economized in rice through in situ growing and incorporation of *Sesbania rostrata* during third crop season.

Maximum grain yield for first and second crop rice in Onattukara was obtained where one fourth recommended N was substituted with farm yard manure or vermicompost along with Azospirillum.

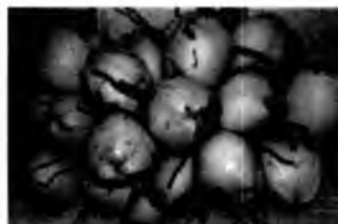
Compaction of coarse textured soils (4 passes of a 400 kg roller) with 2.5 t ha-

FYM and 5 t ha⁻¹ coir pith significantly improved the soil physical properties, nutrient uptake and yield of crops under rice based cropping systems of Onattukara.

Coconut (*Cocos nucifera*)

Varietal studies

The variety "Komadan" was evolved and found ideal for Southern Kerala. The nuts are bronze colored and a husked nut weighs about 551 g. The copra content is about 177 g and the average oil content is 65.2%.



Pest management



Red Palm Wwvil

Red palm weevil, coreid bug and coconut eriophid mite are the major pests of coconut in Kerala. For the control of red palm weevil, release of sterile males in 10:1 ratio was found to be effective. The pheromone, Tripheron efficiently attracted the pest to destruction. A combination of pineapple waste, palayankodan banana, yeast and carbofuran granules proved to be the best bait in traps for capturing the weevil. The extract of the apples of *Anacardium occidentale* 10% caused high mortality of the pest. Leaf extracts of *Thevattia nerrifolia*, seed oils of neem and *Samadera indica* showed repellent action against the pest.

Rejuvenation of palms with optimum nutrient and water management, intercropping/mixed cropping with compatible remunerative crops and adoption of the recommended plant protection measure, and spraying with azadirachtin 0.004% (Neemazal T/S 1%) or neem oil-garlic emulsion 2% were evolved for the management of the mite.



Coreidbug infestation

The coreid bug *Paradasynus rostratus* occurs in coconut gardens throughout the state in varying intensities. Several crops like guava, cashew, cocoa, neem, tamarind, mango,



Mite infestation

pepper etc. seen in the vicinity of coconut palms serve as breeding sites for the bug. Destruction of the pest on the alternate hosts through regular monitoring was found to be a practical and economic solution for its management.

The mealy bugs *Pseudococcus longispinus* and *Dysmicoccus brevipes* were reported to infest buttons of coconut. Removal and destruction of all the dried up inflorescences and application of neem oil-garlic emulsion 2% could check the pest effectively.



Cropping System Studies

Combined application of 10t FYM, 120kg N and 80 kg K₂O ha⁻¹ along with 50 kg P₂O₅ ha⁻¹ was found most advantageous for arrowroot intercropped in coconut garden

Coconut + banana+ ginger +vegetable cowpea and coconut + cassava + banana + elephant foot yam + vegetable cowpea system were found as economical coconut based cropping systems.

Vellayani Hraswa, a short duration variety of casava was found ideal for intercropping in coconut gardens.

Cassava hybrid Sree Visakhom was superior to the popular cultivar M-4 under partial shaded situation of coconut

Elephant foot yam gave the maximum net profit while Tania cultivation was found uneconomic.

The net return from coconut could be enhanced substantially by intercropping with tuber crops like elephant foot yam, colocasia and vegetables like chilli.

Cultivars of betel vine viz: Cheelanthi karpooram (Red), Thulasikodi, Mulam kodi, Cheelanthivella, Chettan Kodi and Nadan kodi were superior in coconut based cropping system.

Forage grasses like Guinea, Congo signal, Gamba grass, Signal grass and Hybrid Napier could be profitably grown with no deleterious effect to coconut.

Mulberry could be grown as inter crop in coconut at a spacing of 60 x 60 cm, a nutrient level of 300:120:120kg NPK ha⁻¹ with Azospirillum @ 20kg ha⁻¹

Fruit crops

Varietal studies

Elavazha, Palayankodan and Njalipoovan were banana varieties suitable for leaf production. The practice of pruning all the leaves seven days after unfurling was economically viable under Kerala conditions.



Characterization of 50 traditional mango varieties of southern Kerala was carried out in Trivandrum (17), Kollam (10), Pathanamthitta (6) and Alappuzha (17) district and were assessed for variability. High variability with respect to tree height, tree habit, leaf shape, leaf length, leaf width, petiole length and floral characters like position of inflorescence, shape, length, colour and density of flowers and season and regularity of flowering and fruit characters like fruit length, breadth, thickness, weight and volume was observed. Fruit characters like shape, presence of basal cavity, beak type, sinus type, presence of groove, type and slope of shoulders and apex exhibited remarkable variation.

Crop Nutrition

In Nendran banana poultry manure @ 5 kg plant⁻¹ and 2,4-D @ 10 ppm spray was beneficial for growth, yield and quality of fruits. Farm yard manure at 10 kg plant⁻¹ and 2,4-D@10 ppm spray recorded highest benefit cost ratio. Partial substitution of inorganic fertilizers with vermicompost recorded high yields and improved quality in banana

Application of NPK @ 380:115:600 g plant⁻¹ in three splits was beneficial for better growth, yield and quality of banana. Cowpea (green manure) or vermicompost with 85% recommended dose of fertilizers N(190 g plant⁻¹) and 30 ppm of 2,4-D gave high economic returns

Application of farm yard manure (10 kg /pit) or banana pseudostem (10 kg/pit) along with 133 % of recommended N,,P and K dose for single sucker is sufficient for double sucker planting . When vermicompost used as the organic source the recommended dose for single sucker planting is sufficient for double sucker planting.

Combined application of rock phosphate along with P solubilising organisms, FYM and mulch in an acidic laterite soil resulted in 7.5 % yield increase in banana cv. Nendran .

Considering both yield and quality,K application level @ 225 g K,O plant⁻¹ is to

be recommended for banana var. Nendran in the sandy clay loam soil of Vellayani. Petiole of the third leaf was the best reflect for K status of the crop.

N, P₂O₅, K₂O applied @200:200:400 g plant⁻¹ gave highest B:C ratio for Njalipoovan.

The substitution of 50 % of K requirement by Na of common salt (MOP – 335 g and Common salt – 500 g) was found to enhance yield and quality in banana.

The application of 250 g N, 250 g P and 500 g K per plant per year for papaya gave the highest yield, highest benefit cost ratio, maximum fruit volume, maximum pulp % and shortened the time taken for harvesting the first fruit. Application in six equal splits per year was found to be economically viable and improved the growth, yield and quality of Papaya

Non monetary inputs / practices

Studies showed that trimming of one or two apical hands and application of GA 50 ppm one month after bunch emergence improved bunch characters such as weight and length of bunches, weight of hands and fingers, finger girth and bunch shape index. Qualitative attributes of fruits such as pulp weight, sugar content, TSS and shelf life increased and fruit acidity decreased as a result of the treatment.

Planting banana at 3 x 2 m spacing with two suckers/pit and raising cucumber/amaranthus as intercrop was found beneficial for getting higher yield per unit area and maximum economic returns.

Double sucker planting of banana with cucumber followed by amaranthus was more remunerative than single sucker planting.

The spacing of 1.75 m x 1.75 m resulted in greater plant girth, fruit length and girth and higher yield per unit area and greater net profit in papaya. The spacing of 2 m x 2 m resulted in earliness, greater fruit weight, per plant yield and fruit quality.

Plant protection

The fungal pathogens *Metarhizium anisopliae* & *Beauveria hassiana* were found promising against the banana pseudostem weevil *Odoiporus longicollis*.



The root knot nematode (*Meloidogyne incognita*) and burrowing nematode were identified as the major pests of banana in the state. Parring suckers and dipping in hot water at 55 °C for 20 minutes and application of neemcake 1 kg per plant or carbofuran 0.5 gram ai/ha were effective for the control of the nematodes.

The banana varieties Robusta and chakkara kolli were the most susceptible while

Venattumonthan and Mass were the least susceptible to leaf spot disease. Power oil was observed to be the best fungicide for the control of leaf spot diseases. The fungi associated with fruit damage were *Glocosporium musarum*, *Fusarium sp.*, *Botrydiplodia theobromae* and *Rhizopus sp.* Maximum preservation of banana fruits was noticed when covered in polythene bags of 200 gauge thickness.



Application of 25g phorate or 20g carbofuran 20days after planting around the rhizomes in the soil and application of 12.5g phorate or 10 g carbofuran per plant in the leaf axils or 25 g phorate or 20g carbofuran per plant in soil 75 days and 165 days after planting was recommended for the control of *Pentalonia nigronervosa*, the vector of the dreadful bunchy top disease.

The fungal pathogens *Metarrhizium anisopliae* and *Beauveria bassiana* were found promising against the banana pseudostem weevil, *Odoiporus longicollis*



Ziride was effective in controlling the dry fruit rot disease of guava.

Adoption studies

For banana, the selection of variety was based on the preference for the variety and majority grows table and Nendran varieties.

Vegetable crops

Varieties

Jwalamukhi, Jwalasakhi and Vellayani Athulya are some of the chilly varieties developed by the institution. Jwalamukhi is tolerant to partial shade, both are suited to all seasons.



Malika, Sharika and Vellayani Jyothika are the popular vegetable cowpea varieties developed at the College.

Three bhindi varieties viz., Kiran, Anjitha and Manjima (F1 hybrid) were developed from the college. Kiran possess long straight yellowish green fruits and could be cultivated under both kharif and summer seasons. Anjitha is resistant to YVM disease. Manjima is also resistant to YVM disease and come up well in homestead situations also.



Arun, the most popular amaranthus variety of southern Kerala has been developed from the college. This is purple in colour, photo insensitive and suitable for multi-cut. It can be cultivated in uplands rice fallows and homesteads throughout the year.

Vellayani Vijay is a tomato variety released from the institution.

Nutritional studies

Yield and keeping quality were highest in brinjal when poultry manure & inorganic fertilizers were applied in 1:1 ratio.

Chemical fertilizers and poultry manure in 3:1 ratio was found best in chilli. The incidence of bacterial wilt was least in dual application of chemical fertilizers and neem cake in the ratio 3:1. In vegetable chilli grown in pots with modified drip irrigation system, the N level of 12.8g plant⁻¹ when used along with poultry manure and Azospirillum inoculation enhanced the yield of chilli.

In chilli, 75% of the recommended dose of NPK (56.3:30:18.8kg/ha-

1)+fluorescent Pseudomonads(dual culture P1 and P22) +Azospirillum produced significant higher fruit yield and ensured a saving of 25% of recommended dose of NPK.

A basal dose of 25 t/ha of FYM and poultry manure to supply the recommended dose of 70 kg N/ha with Azospirillum @ 1 kg/ha gave comparable yield with POP in bitter melon

Dual inoculation of Azospirillum and AMF with 75 per cent dose of POP gave maximum marketable yield in amaranthus variety Arun and Karnataka local. Arun variety was better than Karnataka local.

A basal dose of 50 t/ha of FYM and application of poultry manure/ glyricidia/ neem cake to supply the recommended dose of 50 kg N/ha with Azospirillum @ 1 kg/ha was the best economic organic nutrient schedule for increasing the productivity and quality of amaranthus. Vitamin C content and keeping quality was improved by vermicompost

A basal dose of 12 t/ha of FYM and application of poultry manure / glyricidia/ neem cake to supply the recommended dose of 50 kg N/ha (on N equivalent basis) in combination with Azospirillum @ 1 kg/ha was the best economic organic nutrient schedule for increasing the productivity and keeping quality of bhindi.



Application of NPK @ 110:35:70 kg ha⁻¹ is most ideal for getting maximum yield and profit for Bhindi.

Application of 120 kg nitrogen 8 t of well decomposed poultry manure or 25 t of farm yard manure to supply 120 kg N/ha along with rhizobium and AMF was found best for bush type vegetable cowpea.

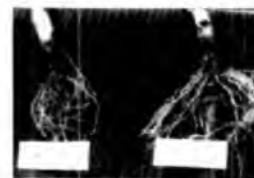
A basal dose of 25 t/ha of FYM and poultry manure /green manure / vermicompost/ neem cake to supply 75 kg N/ha in combination with Azospirillum @ 1 kg/ha gave comparable yield with POP in chilli

Productivity of snake gourd was the highest when farmyard manure and poultry manure were used as organic source to substitute NPK

Enriched vermicompost (banana waste + 1% rock phosphate + Azospirillum + Phosphobacteria) can be successfully used as an alternative to chemical fertilizers in slicing cucumber.

Plants grown on pandals at a density of 13333 plants/ha with 112.5 kg N, 37.5 kg P and 37.5 kg K/ha gave the maximum yield of 34.6 t/ha in slicing cucumber

Substitution of 50 % of the K requirement by Na of common salt was found to enhance yield and quality of vegetable cow pea, amaranthus and tomato.



Boron and Zn fertilization has an important role in improving the yield and quality of tomato in red, laterite and onattukara sandy soils. The highest yield, quality and B:C ratio were obtained at boron application @ 1.5 kg ha

Vermiwash application in conjunction with inorganic fertilizers could increase the yield and quality parameters of tomato.

Composted dairy solid waste has been found as a good organic source in improving soil properties and increasing yield in amaranthus.

Effective bio management of dairy solid waste can be carried out using *Eudrillus eugeniae*. Use of vermicomposted dairy soil waste ensures better N availability and can reduce the use of FYM partially or fully in amaranthus.

The latex sludge can be used as an alternate and cheap source of P in chilli. The combination treatment viz., half P as latex sludge + half as rock phosphate (of recommended dose P) was found to be the superior one with respect to yield and quality of chilli and of soil health attributes.

Seed Production

In bhindi, frequent picking of green fruits improved the bearing capacity of plants, but mature fruit yield, seed yield and quality were significantly reduced. Highest seed yield was obtained with two vegetable harvests. FYM @ 12 or 6 t/ha coupled with chemical fertilizers gave higher seed yield, quality and net returns.

Seed bearing capacity of the bitter gourd plant was improved by the frequent picking of green fruits but the ripe fruit yield and seed yield was increased only with two to four vegetable harvests.

Growth regulator at 200 ppm caused significant increase in fruit yield, seed yield and net return. Seed quality was not affected by the application of growth regulator except for 1000 seed weight.

Weight of seeds per fruit and the quality were highest for seeds when fruits were harvested at 30-45 days after flowering. Seed quality was highest when the seeds were extracted after storing the fruits for 9 days.

Transplanting the plants 20 days after sowing gave maximum seed yield. Maximum seed yield was obtained by harvesting the crop 50 days after flowering in amaranthus.

Irrigation Studies

In vegetable chilli cv. Jwalasakhi, yield was the maximum for drip irrigation @ 2 litre/plant/day and with 100:40:33.3 Kg NPK/ha.

Irrigation at 5 mm CPE was the economic irrigation schedule for snake gourd

The yield of cucumber was the highest at the drip irrigation level of 3 litre/plant/day, 70 kg N/ha and 50 kg K₂O/ha

Yield of green pods was highest when bindi was irrigated through micro sprinklers at 20mm CPE with a depth of 10 mm water.

Weed Management

In Brinjal the yield loss was minimum under black polythene mulching followed by fluchloralin and one hand weeding.

Stale seed bed based with polythene mulching or pre-and post emergent glyphosate applications were identified as the best nut sedge control measure in cropped area.

For long term nut sedge control, glyphosate with sub lethal dose of 2,4-D was suggested.

Plant protection

A single application of the formulated product of the fungal pathogen *Fusarium pallidoroseum* @ 3kg/10 cents gave adequate protection to vegetable cowpea against aphids through out the season.

An IPM strategy composed of spot application of a spray solution (40 ml per spot) containing 0.1% malathion + 10% jaggery or 10% pulped ripe banana in water @ 200 spots ha⁻¹ to the under side of the leaves (Bait Application Technique – BAT) and hanging of 5x5 cm square plywood blocks of 1.2 cm thickness soaked in 6:4:1 solution of ethanol, cue lure and malathion for 48 hr. in pandals @ 10/ha (Make Annihilation Technique-MAT) was evolved for the control of the



fruit fly, *Bactrocera cucubita* of cucurbits.

A new strain of *B. bassiana* found pathogenic to several pests of vegetables and *P. tilacinus* to fruit flies of cucurbits and mango were formulated for field application.

Extracts of *A. indica*, *Eupatorium odoratum*, *C. infortunatum*, *Thevetia nerifolia* and *Nerium oleander* reduced the population of several pests of brinjal, amaranthus and bhindi. Application of neem oil, marotti oil and illupai oil at 2.5% were effective for controlling the leaf miner *Liriomyza trifolii*. Three sprays of azadirachtin 0.002% of cow's urine 10% + NSKE 5% at fortnightly intervals starting from two weeks after transplanting controlled the leaf webbers of amaranthus.

The bacteria, *Bacillus macerans* and the fungus *Paecilomyces lilacinus* were identified as potential biocontrol agents of *M. incognita*.

The chilli variety 'Kandhari' was highly resistant to wilting while 'Chinese giant' was highly susceptible. Cheshnut compound was found to be superior to other chemicals for the control of the disease.

Solarisation of nursery beds was also demonstrated to be a highly effective technique for controlling nematodes in transplanted crops like brinjal, chilli and tomato.



Fluorescent *Pseudomonas* Isolates P28 and P51 exerted maximum inhibition against *R. solani* and P20 and P28 against *Fusarium* sp.) The efficient *Trichoderma* isolates were TR17 and TR20 against *R. solani* and TR19 and TR22 against *Fusarium* sp. The combination treatment (TR20 + P28) was the most effective in chilly.



Application of rice husk ash (1000qm^{-2}) caused maximum Rhizotonia leaf blight disease suppression and plant growth enhancement in amaranthus. The fungal antagonist *Trichoderma harzianum*, *Pseudomonas fluorescens* (B3) and the application of turmeric powder and baking soda (10:1) was found to enhance the plant growth and reduce disease intensity in amaranthus.

Pulses and Oil Seeds

Varietal Studies



Three cowpea varieties viz., V.26, Charodi-1 (G.C.2) and Shubhra were developed. V.26 is an erect type suited for uplands, Chharodi is compact type suited for kharif uplands and Shubhra is suited for summer rice fallows. Cow pea variety S-488 was found tolerant to Al and Mn toxicity.

Developed a blackgram variety T.A.U.2, tolerant to partial shade and moisture stress. It can be raised as a floor crop in coconut gardens. Black gram variety Velloor was found tolerant to Al and Mn toxicity.

Crop nutrition

S nutrition @30kg ha⁻¹ as gypsum increased grain yield of cowpea var. Kanakamoni by 42% and protein content by 25% as compared to NPK alone.

Priming vermicompost with rock phosphate reduced the P requirement of cow pea to half the recommended dose.

Coating of cowpea seeds with vermicompost and application of full dose of chemical fertilizers and FYM gave highest grain yield and nutrient uptake, compared to the existing POP recommendation.

Pelleting cowpea seeds with calcium carbonate after rhizobial inoculation increased the total number of nodules and total dry weight.

Phosphogypsum was found to be highly beneficial in increasing the grain yield of cowpea, by mitigating the adverse of soil acidity, such as aluminium toxicity. Application of phosphogypsum @ full Lime requirement gave highest grain yield in cowpea grown in laterite soil.

Soma, Surya and Thilak are the three varieties of sesame suited for summer rice fallows. Soma and Surya are shy branching type and multi loculed, while Thilak is branching type.

T.G.3, T.G.14, Spanish Improved, Sneha and Snigdha are the varieties of groundnut, evolved from the institution. T.G.3 and T.G.14 are cultivated both under uplands and summer rice fallows. Sneha and Snigdha are suited for upland cultivation.

Plant Protection

Major fungal pathogens, viz., *Alternaria sesame*, *Colletotrichum gloeosporioides*, *Curcularia lunata*, *Botryodiplodia theobromae* and *Fusarium oysporum* f. sp. *sesami* reduce the yield of sesame considerably. Application of Bavistin 0.1% effectively controlled the above pathogens but caused alterations in the acid value, iodine value and saponification value of sesamum oil.

Application of gingelly cake helped in disease management and growth enhancement of collar rot and web blight affected cowpea. Of the indigenous material used 10:1 combination of turmeric powder + baking soda and 100 gm⁻¹ concentration of RHA were found to be excellent in enhancing growth and disease suppression. Biocontrol agents *T. harzianum* and P-22 culture of *P. fluorescens* were found to be superior in disease suppression and growth enhancement.

Floriculture

Varietal Studies

Released six varieties of orchids viz., Sonia 16, Deep Blush, Monster Delight, Pink cascade, Lemon green and Velvet Soft.



Nutrition

The growth medium and organic nutrient dosage were standardized for young plants of *Anthurium andreanum* 'Tropical'. The growth medium containing sand and coir pith compost and the nutrient dosage of 4 g l⁻¹ of fresh cow dung extract at weekly intervals and 25g of organic manure mix at bimonthly intervals were found to be suitable.

Weekly liquid application of 2.0 mg each of N, P and K from the third to the sixth months after de-flasking and 6.0, 2.0 and 2.0 mg each from the sixth to the ninth months and thereafter, 6.0, 6.0 and 2.0 mg each of the nutrients up to the 12th month is recommended for *Dendrobium*.

Propagation

Standardised the protocol for multiplication of protocorm-like bodies in *Dendrobium* and the medium for in vitro rooting of gladiolus.

In three cultivars of *Heliconia psittachorum* namely Lady Di, Andromeda and Parakeet in vitro pollination was successful on the day of anthesis and the medium ME3 was identified as the best medium for germination of pollen



Lotens Sun Bird (*Nectarina lotentia*) and stingless bees (*Melipona iridipensis*) and ants were identified as pollinators of *Heliconia*

Post harvest treatments and handling techniques

Post harvest treatments and handling techniques were streamlined for 5 important cultivars of monopodial and sympodial orchids belonging to the genera *Arachnis*, *Aranda*, *Aranthera*, *Dendrobium* and *Oncidium* and for *Anthurium andreanum* 'Tropical'.

Plant Protection

A prophylactic root dip and foliar spray of *Bacillus* sp. (B16) or turmeric powder + sodium bicarbonate (10:1) @ 0.15 per cent were effective for the management of bacterial blight of anthurium. Pre and post inoculation sprayings with crude extract of neem cake and that of *Tagetes erecta* and antibiotic Streptocycline 100 ppm effectively managed the disease.

Spraying indofil M45 twice at 15 days interval on the affected parts was effective in the management of anthracnose of a

Leaf spot disease of hydrangea was caused by *Asporioides* and Captan was found to be the best fungicide in reducing the damage to hydrangea.

The best fungicides for the control of all important diseases of rose and jasmine were Dithane Z-78 and Fytolan. Sulfur dusting was found to be effective against root diseases.

Plantation crops and spices

Standardized tissue culture protocols for medicinal plants viz., *Clitoria ternatea*, *Indigofera tinctoria* and *Mucuna pruriens*.

Best explant for shoot multiplication is nodal explant in *Clitoria ternatea* and *Indigofera tinctoria* and *Mucuna pruriens*

Package of Practices recommendations were developed for mango-ginger (*Curcuma amada jacq.*). Ideal seed rate is 1500 kg ha⁻¹, spacing - 25 x 30 cm and the manurial recommendation is cattle manure/compost @ 30-40 t ha⁻¹ and @ 30:30:60 kg NPK ha⁻¹.

In ginger, mini-seed rhizome weighing 10g is sufficient instead of normal seed rhizome weighing 15 g and above. Use of mini- seed rhizome saves a minimum of 500 kg seed rhizome ha⁻¹

Developed a simple, low cost technology for small scale storage of the seed rhizome of ginger, turmeric and mango-ginger. The technology is to store them in ventilated polythene covers of size 35 X 25 cm with 125 punch holes (each hole with 4 mm diameter). If one kilogram seed rhizome is stored, after 3-4 months, the recovery of the quality seed rhizome will be about 500-680 grams.



Characterized the true kashhuri turmeric (*Curcuma aromatica*) and confirmed its cosmetic values.

Turmeric can be grown organically in coconut garden with organic manures viz., coir pith compost, FYM, vermicompost and poultry manure. In addition to the basal 40 tonnes of FYM any one of the following can be used to satisfy the nutrient requirement: coirpith compost: 3t ha⁻¹; FYM: 3t ha⁻¹, vermicompost : 2t ha⁻¹; and poultry manure: 2 t ha⁻¹.

The balance of P and S is additionally supplied as rock phosphate and wood ash based on the

Ginger is grown organically in coconut garden using one of the following three combinations (1) FYM @ 38t ha⁻¹ + AMF @ 180 kg ha⁻¹ (2) FYM @ 30t ha⁻¹ + neem cake 1t ha⁻¹ + AMF @ 180 kg ha⁻¹ + rock phosphate+ 100kg ha⁻¹ + Ash.1000 kg and (3) FYM @ 30t ha⁻¹ + green leaves 1t ha⁻¹ + Trichoderma @180 kg ha⁻¹ + Ash 1000 kg ha⁻¹.

Plant Protection

Leaf blight disease of clove caused by *Cylindrocladium quinqueseptatum* could be controlled by using clove oil and Dithane M-45.

A method for rapid isolation of *Phytophthora* sp. from the soil causing 'Azhukal' disease in cardamom was developed. It was found that soil moisture, relative humidity and rainfall influenced the incidence and spread of *Phytophthora* disease.

Out of the sixteen native isolates of *Azospirillum* from pepper rhizosphere, isolate 34 and TW culture was selected for root induction studies in panniyur-I and Karimunda varieties of bush pepper. The per cent of rooted cuttings obtained varied from 23.3 -26.8 per cent in Panniyur-I and 17.5-17.9 in carrier based inoculum of *Azospirillum*.

M-1 and M-4 isolates of *Glomus* sp. were identified as most efficient for rhizome rot suppression, growth enhancement and yield increase of ginger.

Antagonistic fungi isolate Ai-12 (which was identified as *Trichoderma viride*) was most efficient for rhizome rot suppression, growth enhancement and yield increase, while isolate Ai-13 (identified as *Aspergillus fumigatus*) was highly effective for rhizome rot suppression

Combining appropriate native AMP (Mi-1 and Mi-2) and antagonistic fungi (Ai-12) for inoculation of seed rhizome at planting time was an effective management strategy for rhizome rot of ginger.

Spices

Three sprays of either neem seed oil 2% +soap emulsion 2% + garlic 2% or neem seed oil 2%+ soap emulsion 2% + garlic 2% + karanj oil 1% , one each at spike emergence, berry formation and berry maturation stage could be recommended as an ecofriendly pest management strategy in black pepper

Application of *B. macerans* @10g formulated product having 10.6 c. f. u. per g just before monsoon period was recommend for controlling root knot nematode.

Safe waiting periods were fixed for mancozeb, dimethoate, quinalphos and endosulfan in cardamom and pepper. Three sprays of neem oil + garlic 2% one each at spike emergence, berry formation and at berry maturation stage was found to afford protection against pollu beetle of black pepper.

Rubber (*Hevea brasiliensis*)

Mucuna bracteata was found to be the best cover crop for rubber plantation and an optimum level of nutrition was 10:30:30 kg NPK per ha.

Self sustainability of phosphorus cycle was noticed in a well managed mature rubber plantation which was fertilized during the active growing phase of the plant, suggesting the possibility of skipping P application in trees of that age group.

Rubber plantations sprayed with Cu fungicides contained significantly higher quantity of Cu compared to unsprayed plantations / virgin lands, but Cu was not present in water. Macro and microorganisms were seriously affected by spraying

Adoption Studies

The adoption of high yielding varieties of pepper was only 11 per cent and the major constraint was non availability of the planting material

Fodder crops

Varietal studies

Haritha, Marathakam and Harithasree are the Guinea grass varieties released from the institution. All these varieties were suited for upland situation and can be cultivated throughout the year. Haritha is suitable for partial shade conditions. Marathakam has higher fodder yielding capacity and the fodder quality is also very good. Harithasree possesses high tillering ability, and is suited for partial shade conditions. Suguna and Supriya varieties are hybrid Napier types released from the institution



Crop Nutrition

Inoculation of *Azospirillum* and *Azotobacter* along with chemical fertilizers in guinea grass (*Panicum maximum*) produced significantly higher

yields and 25 per cent of the recommended nitrogen could be saved through the use of either of the biofertilizers. Inoculation with VAM enables the reduction in P requirement by 25 per cent.

In the case of congo signal grass (*Brachiaria ruziviensis*) when inoculated with either *Azospirillum* or *Azotobacter*, 50 per cent of the recommended fertilizer nitrogen was adequate for good yield. Combined doses of VAM with chemical fertilizers at all levels of applied phosphorus responded more or less similar to the recommended fertilizer levels

Application of potassium @ 150 kg ha significantly increased the seed yield of signal grass (*Brachiaria decumbens*).

VAM-maize+*Rhizobium*-Cowpea+50 per cent of the recommended fertilized dose registered the highest net profit which can be recommended fodder maize-cowpea intercropping system.

Dual inoculation of *Rhizobium* and AMF produced significantly higher green fodder yield and dry fodder yield in hedge Lucerne (*Desmanthus virgatus*(L.) willd) under rainfed conditions .

Application of KNO_3 @ 4 kg ha in signal grass (*Brachiaria decumbens*) produced the highest seed yield.

Guinea grass and gamba grass (*Andropogon gayanus*) recorded highest green (91.17 and 121.14 t ha⁻¹) and dry (10.26 and 50.73 t ha⁻¹) fodder yields when irrigated at 30mm CPE. The fodder yield, quality and net returns were highest for congosignal grass receiving irrigation at 45 mm CPE.

Irrigating congosignal grass (*Brachiaria ruziviensis*) at 45 mm CPE produced highest fodder yield and B:C ratio.

Non conventional fodder sources

Highest green fodder yield was recorded by *Panicum javanicum*, dry fodder yield by *Rhynchelytrum repens* and crude protein content by *Dactyloctenium aegyptium*. The quality index developed on the basis of nutritional and antinutritional factors, *Brachiaria distachya* & *Eleusine indica* were observed to be the best.

Grasses

Glyricidia sp. and *Flemingia congesta* recorded the highest fodder yield.

Hot water treatment significantly enhanced the germination percentage

(86.25) and vigour index (1104.6) of *Flemingia congesta*. The same treatment also recorded significantly higher germination percentage (82.00) and vigour index (1138.63) of *Desmanthes virgatus*.

Stylosanthes hamata was found to be the best perennial legume for intercropping in hybrid napier. Among the annual intercrops cowpea was found to be the best one with green fodder yield of 140.13 t ha

Tuber crops

Cropping System

Vellayani Hraswa, released from Instructional farm, vellayani is an ideal cassava variety suited for inter cropping in coconut gardens. Cassava hybrid Sree Visakhom was superior to the popular cultivar M-4 under partial shaded situation of coconut.

Elephant foot yam give the maximum net profit while Tania cultivation is uneconomic.

The net return from coconut could be enhanced substantially by intercropping with tuber crops like elephant foot yam, colocasia and vegetables like chilli

In a cassava based fodder production system consisting of three methods of planting of cassava viz, normal row, paired row and skipped row and four levels of fertilizers for the intercrop maximum fodder yield of fodder cowpea was recorded when it was intercropped in the skipped row system of planting cassava. Full recommended dose (25:60:30 kg ha NPK) of fertilizer to fodder cowpea recorded better tuber yield of tapioca as well as higher forage yield.

Intercropping in tapioca was found to be profitable when black gram, cowpea and groundnut were raised as intercrops with additional fertilizers to them.

Ground nut is the most profitable intercrop in which gave the maximum net return as found to be the best intercrop. In tapioca based inter cropping system *Stylosanthes* is an efficient intercrop for reducing soil loss in slopy areas. Coconut + cassava + banana + elephant foot yam + vegetable cowpea is the most profitable cropping system for the partial shaded coconut garden. Cassava variety Sree Visakhom can be successfully cultivated under the partial shade of coconut.

Nutritional Studies

A fertilizer prescription equation for specific yield targets of cassava variety M4 in the laterite soils of Kerala is derived. In this approach, the fertilizer dose could be adjusted in accordance with the specific objective and available resources of the farmers.

In soils having low to medium status of potassium, 50 % potassium (MOP) can be substituted with sodium (common salt) without affecting the tuber yield or quality (Devi, 1995). For Kannikappa grown in southern Kerala fertilizer response varied with soil nutrient status and response upto 50 kg each of N, P and K ha⁻¹ was observed. The investigation to realize the maximum yield potential in cassava through Hunter's 'systematic approach' in fertilizer use by taking into account the nutritional constraints of the soil, manipulating these limiting factors and optimizing the nutrient status could achieve a potential yield of 43.41 t ha⁻¹ over the normal average yield of 20-25 t ha⁻¹ under prevailing package of practices recommendations.

Partial substitution of potassium with sodium to the extent of 50 % increased the growth attributes, yield attributes, marketable tuber yield and quality attributes like starch, protein, total sugar and cooking quality of sweet potato. Pest incidence was also reduced when both cations were applied in 50:50 ratio. Fifty percent substitution of potassium by sodium was found to be economic.

Under intercropping situations in coconut garden, a medium spacing of 75 x 75 cm and a fertilizer dose of 40:50:100 kg NPK ha⁻¹ were found optimum for *Xanthosoma* a fertilizer dose of 80:80:120 kg NPK ha⁻¹ was found suitable for *Dioscorea esculenta*.

For economic production of coleus, a nutrient dose of 60 kg N, 30 kg P₂O₅ and 120 kg K₂O/ha may be applied in two split doses, half nitrogen, half potash and full phosphorus as basal and the balance 30 days after planting.

Plant propagation and spacing studies

In colocasia, cormal yield, cormal – corm ratio and total tuber yield were maximum when medium sized cormels were used as planting material. Maximum marketable cormel yield was recorded at a spacing of 60 x 45 cm.

The optimum size of planting material in amorphophallus has been found to be 1 kg sized corm when planted at a spacing of 90 x 90 cm. However, the highest productivity of 77.2 t ha⁻¹ was recorded by 750 g corm size with 50 x 50 cm spacing. Seed size of 130 g + 10 g was found suitable for *Dioscorea esculenta*.

Allied Enterprises

Apiculture

Colonies of Italian bee, *Apis mellifera*, resistant to the Thai Sac Brood Virus (TSBV) disease were introduced in the State consequent to the outbreak of the disease in the colonies of the Indian bee *Apis cerana indica*. As the bee was observed to thrive well in Kerala, suitable management practices for bee keeping with the species were developed. Though four ecotypes of Indian honey bee were identified, all of them were susceptible to TSBV. The sting less bee prevalent in the state, was identified to be *Trigona iridipennis* Smith. Management practices for the bee were also standardized. More than 75 plants were identified as sources of nectar and pollen for different species.



An Apiculture unit functions as apart of "AICRP on Honey Bee". This section conducts training programmes on apiculture and also serve as a sale outlet of good quality honey.

Sericulture

The agrotechniques for mulberry cultivation and rearing technology for silk worm were standardized. Rearing houses with mud brick walls thatched with coconut leaves were observed to be suitable and cost effective for rearing silkworm.

Mushroom Production

Anantha n' an interstock hybrid of *Pleurotus petaloides* was developed in the AICRP on mushrooms at the Vellayani. A tropical milky mushroom, *Calocybe indica* was also identified to be well suited to Kerala. *Schizophyllum commune* was identified to be efficient decomposer of coirpith.

Instructional Farm and Department of Plant Pathology are running mushroom units for imparting technical guidance in mushroom production for the farming community, unemployed youth, women and landless farmers.



Microbial inoculant production

Efficient strains of *Fusarium pallidoroseum* were identified for ecofriendly management of insect pests and this fungus is being mass multiplied and sold to the

general public. Mass multiplication and field level application of bio control agents for plant disease management including *Trichoderma* sp. and *Pseudomonas fluorescens* has been standardized and the product is being introduced to the farmers in collaboration with the State Department of Agriculture. Different microbial bio fertilizers including AM Fungi, Azetobacter, Rhizobium etc. are also being supplied for the enhancement of plant health and growth.

Animal Husbandry

The clinical efficacy of the field kit developed by Sree Chithra Thirunal Institute of Medical Science and Technology (SCT) for testing Antibiotic sensitivity of mastitic milk samples were assessed and recommended for field use through Veterinary institutions in the state. Oil bordeaux mixture, a therapeutic agent for the treatment of fungal mastitis was formulated and successfully applied in dairy cattle. Documented and validated four ethnoveterinary formulations effectively used for the treatment of mastitis in dairy cattle. Validated the efficacy of *Cassia alata* formulation used by the tribes of Western Ghats for the treatment of Udder impetigo, Dermatomycosis and Pustular dermatitis in dairy cattle and tobacco-oil combination for the treatment of wart.

Dairy and poultry units are run by the Department of Animal Husbandry. Milk from dairy unit is sold to the students hostels, staff quarters and to other staff members of the college and the remaining quantity will be sold to the Poonkulam Milk Cooperative Society. Eggs are mainly sold to the student's hostels and also to campus dwellers.

Piggery unit run by the department of Animal Husbandry provides practical training to the farmers on pig rearing and also supply good quality piglets.

Department of Animal husbandry runs a unit for providing Artificial Insemination service to the livestock. Semen collection is done twice in a week from the breeding bull kept in the dairy farm and is preserved under refrigeration after dilution. Chilled semen is utilized for inseminating cows in the farm. It is also used for imparting training to the interneees coming from College of Veterinary and Animal Sciences, Mannuthy and will be used for inseminating cows brought by the farmers. Artificial Insemination using frozen semen has commenced since July 2007. This unit intends to impart training to the interneees coming from College of Veterinary and Animal Sciences, Mannuthy and will be used for inseminating cows brought by the farmers.

Veterinary services including diagnosis and treatment of livestock diseases were done in the Veterinary hospital. About 6 to 8 sick animals per day will be treated in the Veterinary Hospital.

A full equipped clinical laboratory is functioning to examine blood, urine, dung, milk samples and skin scrapings. Samples received from farmers and surrounding veterinary hospitals are examined and the results are communicated to them.

Value addition and product development

High quality weaning and supplementary foods based on rice, banana, ragi, cassava, sweet potato and soya bean were developed & tested for acceptability

Standardised the technologies for value addition of rice products viz quick cooking rice, instant fried rice, instant rice noodles, rice starch, rice flakes, cocoa powder coated rice bread and germinated brown rice.

Novel products based on rice, coconut, cassava, sweet potato, selected spices & cocoa mass were standardised

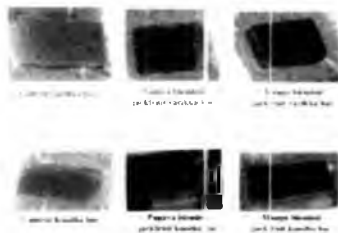
Techniques for preparing processed products from commonly available as well as under-exploited fruits like jack, cashew apple, bael, passion fruit, karonda, jamun, pineapple, mango, amla, lovilovi, rose apple, bilimbi, banana bi-products and blended fruit products were standardized.

Overall assessment of nutrition cognition of rural youth was found to be unsatisfactory.

Biscuits made from minor tubers were acceptable.

Age, quantity of oil used, life style pattern and stress had positive correlation with total cholesterol values of the subjects under study. With flax seed and spirulina supplementation, the total cholesterol and LDL level of the subjects reduced significantly.

Acceptable extruded, baked and confectionary products could be developed utilizing minor tubers, such as taro and minor yam. Two supplements and several recipes suitable for hyperlipidemic patients have been standardized. Processed products from jackfruit namely, jackfruit bar, fruit nectar, preserve and clarified juice have been standardised and popularized.



Department of Home science runs a processing unit for profitable utilization of farm produce and farm waste. The processing unit managed by the revolving fund has procured FPO license from the Ministry of Food

Processing Industries. The unit could produce processed products more than 2000 bottles each of squash, jam and pickle, 1000 bottles of fruit syrup and also jelly, sauce, chutney, RTS etc. using vegetables and fruits. It functions as an extension laboratory for conducting training programmes in vegetable and fruit processing and preservation for the unemployed VHSE students, and also for farm women. The excess farm produce of the instructional farm of the college is still being profitably utilized.

Nutritional studies

Nutritive value of all rice varieties developed by KAU and that of different varieties of pulses, mango, papaya, thamara venda, winged bean, cashew kernel, green leafy vegetables, hyacinth bean and banana were analyzed and promising varieties were identified.

Bioavailability of iron in foods during different cooking and processing methods were evaluated

Food habits, nutritional status, food security and quality of life of different segments of population such as agricultural labourers, tribals, farm women stone breakers, fish vendors, coir workers, industrial workers, sewage workers and vegetarians were evaluated. Traditional food habits of different communities were all evaluated.

Nutritional problems of infants, pre school and school children, adolescents, pregnant and lactating women and elderly belonging to rural, tribal and agricultural families were assessed. Educational models, IEC materials for nutrition and health education were developed and tested.

Biotechnology

Protocols were developed for rapid *in vitro* cloning of elite plants like jack, banana, vanilla, orchids, anthurium, rose, gladiolus, foliage plants and medicinal plants (*Plumbago rosea*, *Aristolochia indica*, *Smilax* sp., *Bacopa monnieri*, *Centella asiatica*, *Aegle marmelose*, *Ipomoea* sp. and *Boerhaavia diffusa*). The tissue culture plants were evaluated for their field performance in different agro-climatic conditions. Progress could be made in the *in vitro* propagation of mono and polyembryonic mango varieties via somatic embryogenesis from nucellar tissue.

Okra hybrids resistant to yellow vein mosaic disease were developed through embryo rescue. Hybrid Dendrobium plants could be established via embryo culture and new varieties have been released. Mutants of Dendrobium variety Sonia 17 developed via *in vitro* mutagenesis are being evaluated. *In vitro* conservation methods for several medicinal plants have been standardized.

Molecular characterization of banana, papaya, mango, cashew, Dendrobium, turmeric, ashgourd, ivy gourd, moringa, Pandanus spp, several medicinal plants has been done.

Agrobacterium mediated genetic transformation protocol has been standardised in orchid Dendrobium Sonia 17 and *Centella asiatica*. Transgenic Dendrobium Sonia 17 plants having antisense ACC synthase gene incorporated to increase the vase life of the flowers have been developed and are under evaluation.



Eleven banana clones (Musa AAB Plantain sub group) were characterized by RAPD technique. The similarity index was high for the Koonoor Ethan, Quintal Banana pair followed by the Manjeri - Myndoli pair. Attu Nendran, Changanasseri Nendran, Kaliethan, Koonoor Ethan and Quintal banana formed the largest cluster Manjeri Nendran and Myndoli formed the second cluster and Padalamurian, Mysore Ethan and Zanzibar formed three separate clusters.



Morphological evaluation and molecular characterization by RAPD of 12 Dendrobium cultivars revealed that morphological characterization was found to be in line with molecular characterization. A selection index was formulated for ranking varieties based on morphological characters.

A study on Agrobacterium mediated genetic transformation was carried out in Dendrobium Sonia-17. PLBs gave the highest transformation efficiency by the pelleting method. The maximum transformation efficiency obtained was 2.0%.

Evaluation of Heliconia species and varieties, and their molecular characterization by RAPD revealed that genotypic and phenotypic variation was high for the vegetative and floral characters. By RAPD analysis the Heliconia genotypes were grouped into 5 clusters consisting of similar morphotypes. For in-vitro propagation, shoot apices were found to be better than rhizome bits, root segments and leaf segments.

Standardized tissue culture protocols for medicinal plants viz., *Clitoria ternatea*, *Indigofera tinctoria* and *Plumbago rosea*.

Standardized the various stages of somatic embryogenesis in cashew (*Anacardium occidentale*), namely induction, initiation, maturation and germination using nucellus and embryo mass as explants. Out of the two explants tried, nucellus responded better than embryo mass in initiating embryogenic callus/somatic embryoids. Ex vitro establishment was not successful.

Among the explants used for enhanced release of axillary buds, cotyledons responded better than nodal segments in bael (*Aegle marmelos*). Sand was the ideal potting media for ex vitro establishment. Embryogenic callus induction of bael (*Aegle marmelos*) was noted in MS basal medium supplemented with 2, 4- D 0.2 mg l^{-1} , BA 0.1

Coconut water 200 ml l^{-1} , sucrose 40.00 g l^{-1} and agar 6.00 g l^{-1} . The highest ting of the micro shoots (50 per cent)l bael (*Aegle marmelos*) occurred in two treatments namely, MS basal medium supplemented with IBA 2.50 mg l^{-1} , sucrose 30 g l^{-1} and agar 6 g l^{-1} and on the same basal medium supplemented with NAA 1.00 mg l^{-1} , sucrose 30.00 g l^{-1} and agar 6.00 g l^{-1} .

Basic studies

Soil classification and properties

The soils of Kerala come under the taxonomic orders Alfisol, Ultisol, Mollisol, Entisol, Inceptisol and Vertisol. The main soil types of Kerala are laterite, red, forest, coastal alluvium, riverine alluvium, Onattukara sandy, brown hydromorphic, hydromorphic saline (pokkali & kaipad), acid saline (kari, kayal, karappadom) and black soil. The major soil type is laterite in which N, K, Ca, Mg, S, Zn, Cu and B are deficient and P, medium to high. Laterites in Kerala come under two main soil orders Ultisols and Alfisols. The predominant clay mineral identified is kaolinite and these soils are acidic in reaction. Laterite Number is identified as a suitable index for assessing the extent of laterization and the values were >50 , in locations viz., Varkala, Thripunithura, Calicut, Angadipuram and Vythiri indicating severe laterisation

Black soils are found in Chittoor thaluk of Palakkad district only. Smectite is the predominant clay mineral and the soil reaction is alkaline.

Village level maps were prepared by utilizing informations from soil survey. In these maps, a classification of land use based on their productivity and utility have been attempted successfully with regard to the major crops of Kerala. In Kuttanad ecosystem, one rice one fish was found to be the most profitable land use model.

Delineated the acid sulphate soils of Kuttanad spreading over an area of 14277.51 ha comprising six soil series viz. Ambalapuzha, Thakazhi, Purakkad, Thottappally, Thuravur and Kallara.

Major land resource areas of Kerala viz., southern dissected terriplain, southern low land laterites, southern coastal plain, southern dissected midland laterites, southern foot hills, Kuttanad coastal plain, central backwater basin, central dissected laterite, Palakkad gap, northern dissected midland laterites and Wyanad plateau were classified with isohyperthermic temperature regime but with aquic, udic and ustic moisture regime.



Fractionation of soil organic matter in red loam soils revealed that Humic acid accounted for 28.23 %. Humic acid and Fulvic acid maintained a constant proportion irrespective of the variation in content of organic matter. Of the three fractions, humin fraction was the dominant one.

P fixation studies in different soils showed that acid soils with high sesquioxide showed high fixation capacities, values ranging from 55 to 95 %.

A data base on the physical properties of major soil series of Trivandrum district was prepared. The major physical constraints identified were low WHC, low moisture retention, high porosity and hydraulic conductivity. Aggregate stability was low leading to clogging of surface pores by impact of rain drops causing excess run off, erosion and low infiltration rate.

Mulching was found to be effective in increasing the water stable aggregates in soil. The Onattukara soil recorded the highest leaching loss ie 56% of applied nitrogen and Kayal soil showed the lowest leaching percentage of 24.

Studies on acid soils and their management

Indigenous liming materials like, Dolomite, Bhusakthi, Steatite, etc have been recognized as, ameliorants for acid soils of Kerala. Mussoorie rock phosphate, Rajasthan phosphate, Basic slag, Super lime mixture etc. have been identified as excellent materials for use in acid soils.

The main acidity contributing factors in Kerala soils are exchangeable aluminum, exchangable hydrogen & active iron. But in acid sulphate soils like Kari and Pokkali, sulphur is the main factor.

Application of lime @ 1/10 of LR as per SMP method (250 kg/ha) significantly improved grain yield of cow pea, black gram and green gram.

Fifty percent of the recommended dose K can be substituted by Na as common

salt for better nut yield and quality

Heavy metal toxicity and pollution

Soils continuously fertilized with rock P and other P fertilizers resulted in accumulation of heavy metals such as Cd, Pb and Ni in soils and crops.

Rice grains harvested from the PMT of Pattambi revealed that the Cd content of rice grain exceeded the food safety standard of 1 mg kg⁻¹.

Bioremediation

Studies on bio remediation of inorganic contaminants in rice based ecosystem of Kuttanad revealed that plants like *Eichornia crassipes*, *Cyperous pangorei*, *Hydrilla verticillata* possess hyper accumulation capacity for Fe, Mn, Zn, Cu and Al. All these plants can be utilized for environmental clean up to purify the metal loaded effluents discharged from factories.

Vermitechnology

This department is the pioneer in the field of vermitechnology in Kerala Agricultural University. Comparative study was conducted to identify the best earthworm species. *Eudrillus eugineae* was identified as the most efficient earth worm species suitable for vermicomposting in Kerala. Different technologies using the above species had been standardized for vermicomposting of farm, market and kitchen wastes.



A special vermicomposting kit suitable for house hold waste management was designed and popularized among the members of different residential associations.



A farmer friendly technology to collect vermiwash has been standardized. Vermicompost applied in combination with inorganic fertilizers has recorded high yield in vegetables and banana. Enriching bio waste with natural organic and inorganic materials namely bone meal, neem cake, rock phosphate etc improved the vermicompost production technology and reduced the time taken for composting.

The enzyme activities (urease, phosphatase,) were found to be higher in plots receiving treatments involving combination of

organic manures and fertilisers. Considering the paramount importance of organic farming in the present agricultural scenario a vermicomposting unit is functioning in the college to cater the organic manure requirement of the farming community.

Use of industrial wastes in agriculture

Composted dairy solid waste has been found as a good organic source in improving soil properties.

Phosphogypsum was found to be highly beneficial in mitigating the adverse effects of soil acidity in laterite soil by reducing the extractable Al content and increasing exchangeable Ca content of the soil.

Effective bio management of dairy solid waste can be carried out using *Eudrillus eugeniae*. Use of vermicomposted dairy soil waste ensures better N availability and can reduce the use of FYM partially.

The latex sludge can be used as an alternate and cheap source of phosphorus.

Pesticide residual studies

Safe waiting periods were fixed for carbaryl, fenitrothion, quinalphos, malathion, fenthion and dimethoate in the vegetables snake gourd, chillies, tomato, cowpea, bhindi, bittergourd and brinjal and for mancozeb, dimethoate, quinalphos and endosulfan in cardamom and pepper. Washing vegetables in 2% table salt solution or 2% vinegar or thorough washing in water using scrubber were recommended for reducing surface contaminants. The occurrence of pesticide residues in various food commodities (rice, oil, fish, honey, species, fruits, vegetables, drinking water, total human diet, animal feed) and environmental substrates were monitored to fix guidelines regarding their levels and safety. On the basis of the data gathered on organochlorine residues in bovine milk and milk products, and breast milk from Kerala and other states, HCH (BHC), a major organochlorine insecticide was banned in India. Though the monitoring studies also revealed wide spread contamination of methyl parathion, monocrotophos, quinalphos, phosphamidon and phorae at varying levels in bittergourd, cowpea, snakegourd, brinjal, bhindi and cucumber in most cases the residues were below the Maximum Residue Limit.



Biocontrol of water hyacinth

A survey was conducted to obtain the fungal pathogens of water hyacinth for its biocontrol. *Colletotrichum gloeosporioides* (Penzig) and *sacc Curvularia lunata* (wakker) boedjin, *Fusarium equiseti* (corda) sacc., *Fusarium semitectum* Berk and Rav, *Fusarium solani*(Mart) sacc., *R. solani* kuhn and sterile fungus were found infecting the plants. 1011 spores per ml concentration of *C. gloeosporioides*, and *F. pallidoroseum* each were required for the effective destruction of the weed. Wettable powder of *F. pallidoroseum* was formulated using mycelium, talc, tween-80, glycerol and sucrose. This WP @ 5 g and 10 g/100 ml on 2.0 per cent CNSL sprayed plants recorded 82.22 and 97.78 per cent disease intensity on water hyacinth plants. Field application using CNSL (5%) and *F. pallidoroseum* as WWP formulation (@ 5 g/100 ml) recorded a mean per cent damage of 91.43 on water hyacinth plants. Safety test of formulated product and metabolites of *F. pallidoroseum* revealed that they are safe on commonly seen aquatic flora and fauna

Farm mechanization

A simple and easy to use mower was designed and developed. The rotary mower cut like a scythe or knife. The outstanding advantages of the mower are its ability to cut high weeds, stalks and grass and its ability to trim close to trees, walls and other obstructions.

Developed a simple coconut climbing device.



13. Extension Interventions

College of Agriculture plays a very important role in taking up extension interventions for social development unlike many other professional colleges. Extension education has been always an important mandate of an agriculture college. Extension education needs to be scientifically appraised and analysed and appropriate extension strategies are to be formulated to suit the changed agricultural and socio economic scenario of Kerala state for increasing agricultural production , productivity and net income of the farmer. Extension programmes are designed to attract youngsters to farming, enhancing the capabilities of human resources in the agriculture and the allied sectors. Therefore the history of the hitherto extension interventions need to be recorded which will enable future planners and policy makers to make use of the experiences and knowledge.

The Department of Agricultural extension is responsible for the extension interventions like functioning of Information Centre, conduct of Village Adoption Programme, Self Help Groups, Agroclinic, Training Service Scheme and activities of Agri-Diagnostic and Information Centre.

Information Center

The Information Center serves as a window to the public on farm information. Farm clinics, exhibitions, field days, workshops, seminars, etc., are being organized both within and outside the campus with the interdisciplinary participation and collective efforts of specialists available in the college.

Village adoption programme

Kerala Agricultural University introduced this programme in 1976 in Muttacaud village located some 4 km away from the college. This village served as a virtual field laboratory for testing and demonstrating innovative and improved technology in agriculture and allied fields in areas like vegetable production, banana cultivation, balanced diet, health and hygiene, environmental sanitation, home management, budgeting, food preservation, poultry keeping, rabbit rearing, calf management etc. During 1989-90, the programme was shifted to Palappur village adjacent to the college. A co-operative society for the marketing of vegetables was started with the co-operation of the Department of Co-operation and the Department of Agriculture, Kerala State. Another ward (Vennyoor) in Kalliyoor Panchayat was also brought under this programme. During 1994-95 one more ward (Kakkamoola) was also included.

Self help groups

As part of the community interaction programme, the Department of Agricultural Extension with its village adoption activity, initiated the formation of three women's self help groups in and around the college. The self help groups were empowered by imparting training in the income generation activities, in collaboration with the Home Science Department of the college. The Department of Industries, Women's Development Corporation and the local panchayat samithi provided the financial assistance to self help groups by granting eligible subsidies to the SC/ST group.

Agroclinics

Agro clinics are being organised by the scientists and students of the college in selected centers. Agricultural exhibitions are arranged in district headquarters and panchayat headquarters to cater to the needs of the farming community. The specialists of the college are visiting the problem areas as and when required and suggesting necessary solutions. In addition, many farmers and entrepreneurs are contacting the specialists for solving many of their agronomic and plant protection aspects. Many of the specialists are acting as consultants to some of the farms and institutions based on request basis.

Training Service Scheme

Training Service Scheme, College of Agriculture, Vellayani is a sub-centre of the Central Training Institute, Directorate of Extension, Kerala Agricultural University. It was established in 1986 with the financial assistance of World Bank. Trainings are organized at this centre in various branches of agriculture and allied subjects like crop husbandry, horticulture, animal husbandry and veterinary, dairy science, forestry, agricultural engineering, home science and various management branches.



Each year as many as 100 on and off campus training programmes are conducted by the Training service centre for the farmers, extension functionaries of state departments, officers of Commodity boards, Banks, NGOs etc. As part of the extension activities of the Department of Animal husbandry, Poultry vaccination campaigns, anti rabies vaccination campaigns, calf exhibitions, Animal health check up camps and cattle infertility camps were conducted. Animal husbandry seminars and group discussions for farmers and unemployed rural women were held in selected villages in southern Kerala. The Department has organized several on campus and off campus training programmes to the farmers on broiler farming, goat farming, rabbit

rearing, First aid in veterinary practice and infertility in cattle.

Mass media programmes

The major departments of the college are taking part in the various exhibitions like annual agricultural fair, science fair, media exhibitions, flower show, school exhibitions, etc., being sponsored by governmental and non-governmental agencies. The scientists of the college are regularly participating in the agricultural programmes organised by the All India Radio, Dooradarsan and other mass communication media.

Agri-Diagnostic and Information Centre

This project cater the needs of farming community in diagnosing agricultural problems and providing suitable recommendations to the farmers.

Diagnostic Team

The Diagnostic team comprising experts from various disciplines is functioning in the college to cater the needs of farming community. The team used to visit the problem area and render technological solutions for field oriented agricultural problems.

Agricultural Extension and Developmental Studies

The study conducted in Kunathukul Panchayath of Thiruvananthapuram district and Thamarakulam panchayath of Alppuzha district to analysis the structure, function and role of Thozhil Sena and to study the employment and income generation revealed that education, achievement motivation and attitude towards peoples plan had positive and significant relationship with the role of Thozhil Sena. Influence of farming culture 'Folk arts and rituals on North Malabar Region of Kerala State revealed that most folk arts like 'Theyyam' and Chimmamkali have widely been originated from an ancient asprasian society which had a deep rosted stand in farming culture

Analysis of farmers participation in the participatory development (PTD) with regard to plant protection in vegetable farmers had high level of cosmopolitness, self concept, risk bearing capacity and motivation. Farmers had good knowledge regarding PTD and plant protection.

Development of special group suitable for rural extension and integrated land evaluation for sustainable agriculture. Agricultural officers were in the medium category and awareness and knowledge on land evaluation for sustainable agriculture development.

20-786