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# Kerala Agricultural University

A PERSPECTIVE



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DIRECTORATE OF EXTENSION EDUCATION

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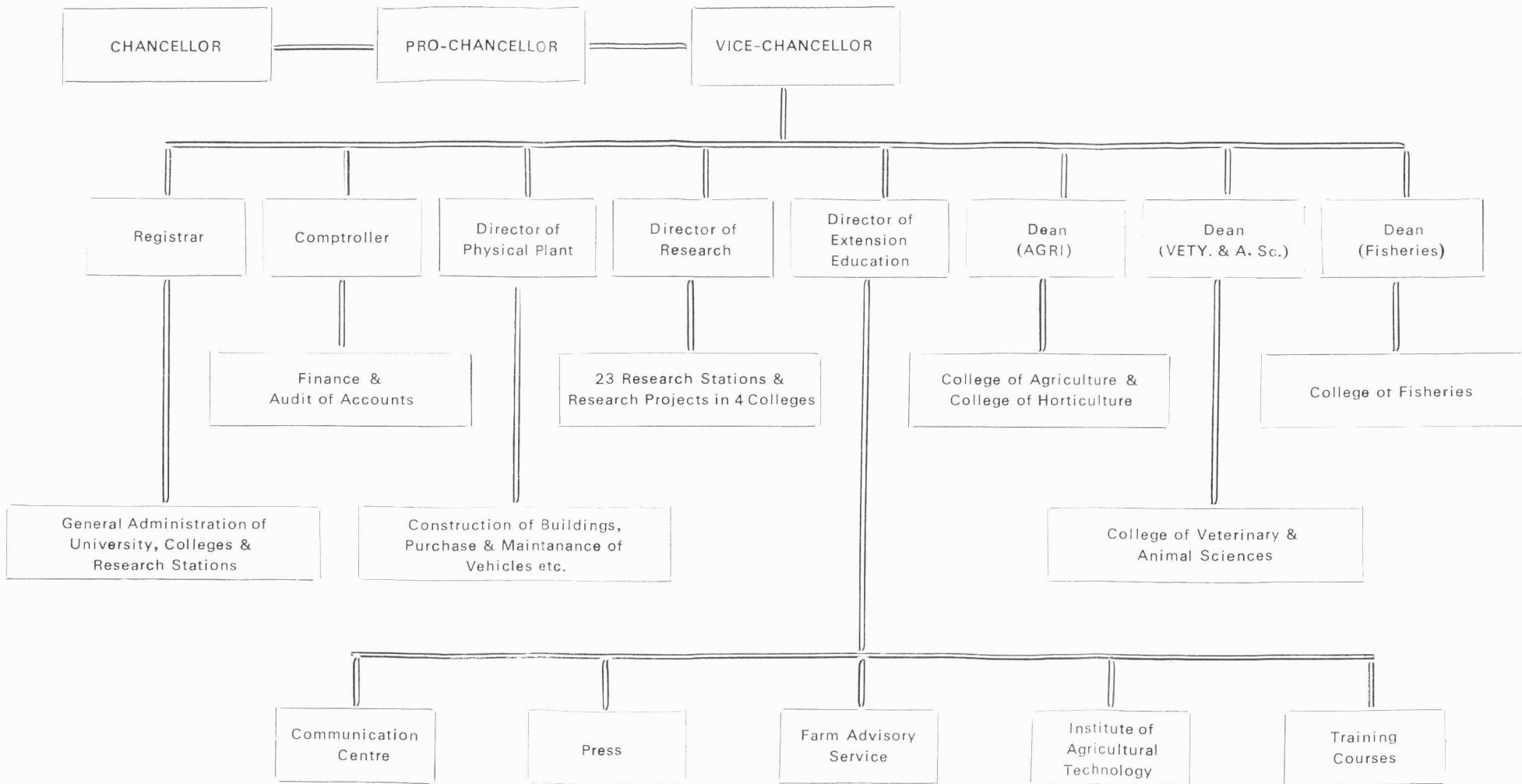
*Mannuthy,*

# Kerala Agricultural University

## A PERSPECTIVE

### Introduction

The Kerala Agricultural University was founded in 1971 in accordance with the provisions of the KAU Act with headquarters at Mannuthy in Trichur District and later on in 1977 moved into its new headquarters complex at Vellanikkara. The leading educational and research institutions run hitherto by the Agricultural and Animal Husbandry Departments were transferred to the University on 1st February, 1972 and they formed the nucleus of the Kerala Agricultural University. The primary objective of the University as outlined in the KAU Act is to promote programmes of Agricultural Education, Research and Extension Education in Kerala. In the nine years since its founding the University has witnessed remarkable growth in all the areas of education, research and extension. The programmes of the University have been designed with a view to face the new challenges posed by an age of fast progressing science and technology. The Kerala Agricultural University provides ideal conditions for the students to master all branches of Agriculture, Horticulture and Veterinary Sciences. Numerous steps have also been taken to strengthen the research and educational infrastructure in Agriculture and Animal Sciences. The University has

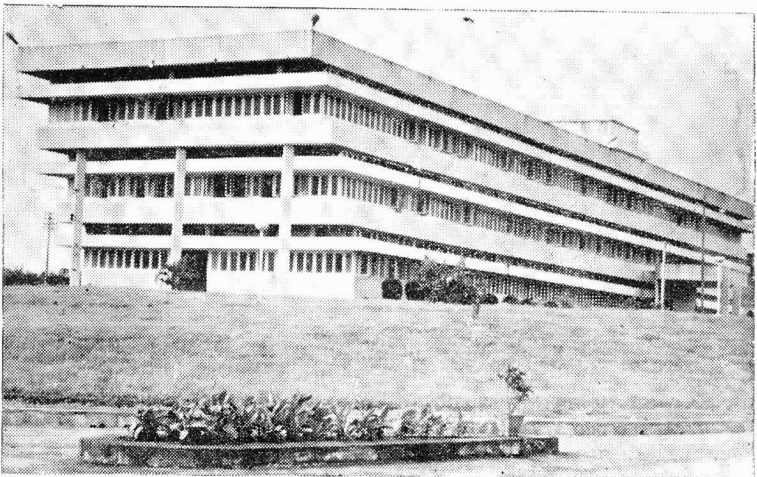


recently started a Faculty in Fisheries also. Now a wide network of well organised research institutions are functioning under the University. The research projects are designed to develop new technologies to increase productivity to a higher level taking into account the uniqueness and individuality of the different areas of cultivation and constraints in production of crops and animals. Research projects have also been initiated on factors inhibiting yields and efforts are underway to evolve improved varieties in crops and breeds of animals. A vital link that brings the academic world of the University closer to the farmer is its Extension Wing. It transmits effectively and quickly the farming techniques evolved by the scientists to the doors of the farmer through the various development departments,

### **Objectives of the University**

The objects of the University are:

- 1 To make provision for imparting education in different branches of study, particularly Agriculture, Horticulture,



*Main Campus, Vellanikkara*

Animal Husbandry including Veterinary and Animal Sciences, Co-operation, Fisheries, Forestry, Agricultural Engineering, Home Science and other allied branches of learning and scholarship.

- 2 To further the advancement of learning and prosecution of research particularly in agricultural and allied sciences.
- 3 To undertake an extension education programme and
- 4 Such other purposes as the University may from time to time determine.

With its research activities conducted in various crops in Research Stations and Livestock Farms, the University functions as the knowledge centre in the State for the dissemination of information in agriculture and allied sciences through its extension education programmes.

### **Administration**

The Governor of Kerala is the Chancellor of the University and the State Minister for Agriculture is the Pro-Chancellor.

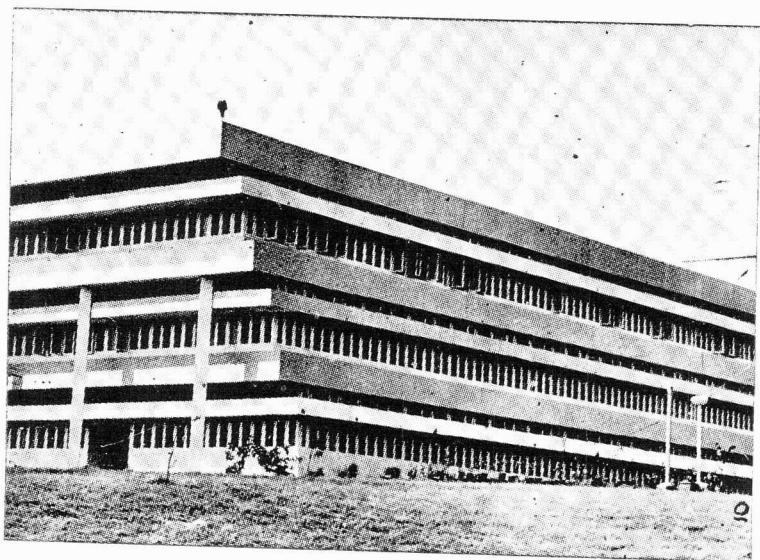
The General Council is the supreme authority of the University comprising of 19 Ex-officio members (Chancellor, Pro-Chancellor and representatives of the University administration, State government and State extension departments), 13 elected members (representing members of the State legislature, students and staff of Kerala Agricultural University, Panchayat Presidents and Municipal Chairmen, Corporation Mayors in the State), 17 nominated members, representing Agricultural Scientists, Farmers and Public Men and 4 members representing the three other Universities in the State and ICAR. The General Council meets once in four months.

The Executive Committee is the chief executive body of the University and consists of the Vice-Chancellor, 3 Government Secretaries, 6 elected members and the members representing ICAR in the General Council, Deans and teaching staff. The Executive Committee meets normally once a month.

The Vice-Chancellor is the Principal Executive and academic officer of the University. He is the ex-officio chairman of the Executive Committee and of the Academic council and presides over the General Council in the absence of the Chancellor and Pro-Chancellor. The Deans Director of Research, Director of Extension Education, Director of Physical Plant, Registrar and the Comptroller assist him in their respective spheres.

### **Organisation**

The teaching programmes are organised under three faculties, viz., Faculty of Agriculture, Faculty of Veterinary and Animal Sciences and Faculty of Fisheries. A Faculty of Basic Sciences and Humanities is proposed to be started. Board's of studies are instituted for each faculty. The Academic Council is the highest academic body for ensuring high academic standards. A Research Council with representatives of the Kerala Agricultural University and other sister Universities in the



*Horticultural College, Vellanikkara*

State and nominees of the Universities of Agricultural Sciences, Karnataka, Andhra Pradesh and Tamil Nadu has been constituted. There is a Research Advisory Committee for giving proper advice for Research and an Extension Advisory Committee to oversee the extension activities of the University.

### **Technical staff**

The technical staff engaged in teaching, research and extension education are integrated into a common cadre and are classified as Professors, Associate Professors, Assistant Professors and Junior Assistant Professors. The department is the primary unit of organisation in a Faculty.

### **Campuses**

The main campus of the University is now functioning at Vellanikkara. The University headquarters and the College of Horticulture are located here. The other campuses are at Mannuthy and Vellayani. The College of Veterinary and Animal Sciences is located at Mannuthy campus and the College of Agriculture at Vellayani Campus. The College of Fisheries located at Mannuthy will soon be shifted to the new campus at Panangad near Cochin. The Institute of Agricultural Technology is located at Tavanur. The Research programmes undertaken by the Kerala Agricultural University in the fields of Agriculture and Animal Husbandry are mainly conducted in the 23 Research Stations/Farms spread out in almost all the districts of the State.

### **Education**

The traditional system of education was followed till the academic year 1972-73. From 1972-73 onwards the trimester system of instruction has been introduced with a view to facilitate the students to acquire comprehensive and deeper knowledge of the disciplines.

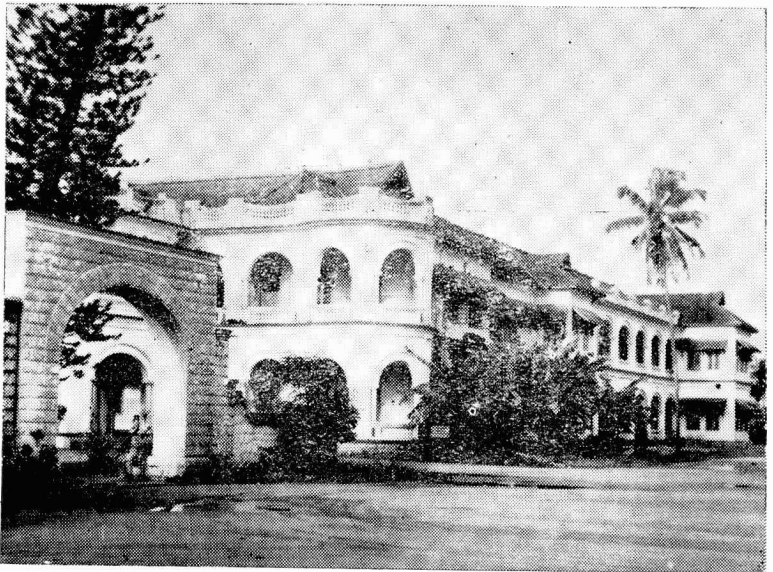


## Educational Institutions

The constituent educational institutions which function under the University are:

1. College of Agriculture, Vellayani, Trivandrum.
2. College of Horticulture, Vellanikkara, Trichur.
3. College of Vety. & Animal Sciences, Mannuthy, Trichur.
4. College of Fisheries, Mannuthy, Trichur.
5. Institute of Agricultural Technology, Tavanur, Malappuram District.

Courses are offered leading to the award of the following degrees viz., B. Sc. (Ag.), B. Sc. (Hort.), B. V. Sc. & A. H., M. Sc. (Ag.), M. Sc. (Hort.), M. V. Sc., Ph. D. and Diploma in Agricultural Science and Diploma in Natural Rubber Production. A Diploma course in Agricultural and Rural Engineering is proposed to be started during the current academic year.



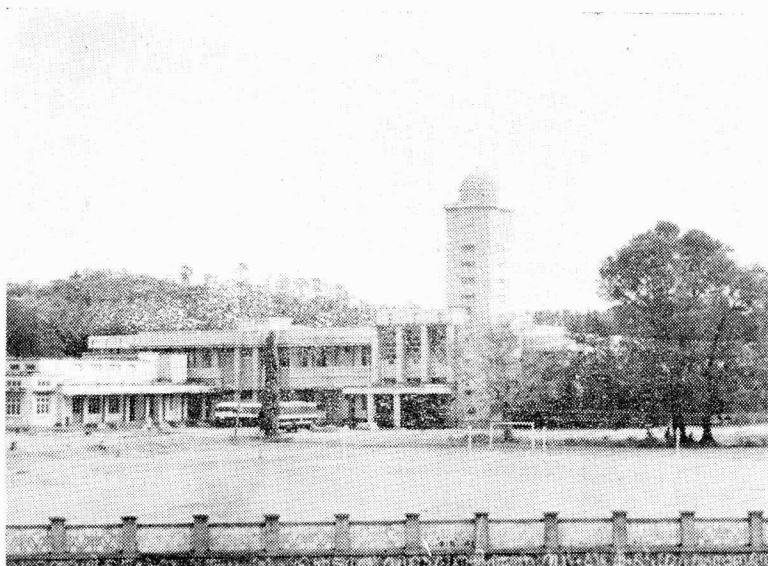
*Agricultural College, Vellayani*

## Departments

The College of Agriculture, Vellayani has 11 departments, Agronomy, Agricultural Botany, Plant Breeding, Agricultural Chemistry, Agricultural Entomology, Plant Pathology, Agricultural Extension, Horticulture, Agricultural Economics, Agricultural Statistics, and Agricultural Engineering. In addition to the B. Sc. (Ag.) course of 4 years duration, M. Sc. (Ag.) courses are also offered in eight departments and Ph. D. courses in six departments.

The College of Horticulture is offering a 4 year B. Sc. (Hort.) degree course. The College has 4 departments in Horticultural subjects and units of other departments of the Faculty of Agriculture. They are Pomology and Floriculture, Plantation Crops and Spices, Olericulture and Processing Technology.

The College of Veterinary and Animal Sciences has 18 Departments. Anatomy, Animal Management, Animal Re-



*Veterinary College, Mannuthy*

production, Animal Breeding and Genetics, Clinical Medicine, (Therapeutics), Dairy Science, Extension, Microbiology, Nutrition, Parasitology, Pathology, Pharmacology, Physiology, Poultry Science, Preventive Medicine, Surgery, Veterinary Public Health and Statistics. In addition to the 5 year B. V. Sc. and A. H. degree course, all departments are offering Master's degree programmes and 4 departments are offering Ph. D. course.

The two Veterinary Hospitals, one at Mannuthy, and the other at Trichur and the Livestock Farm, Poultry Farm, Pig Breeding Farm, Goat Farm and A. I. Centre in the College Campus serve as instructional units.

The College of Fisheries presently located at Mannuthy is offering a four year B. F. Sc. degree with a strength of 30 students of which 9 seats are reserved for the children of Fishermen.

### **Strength of Students**

The annual intake capacity of students for various courses at the Agricultural College, Vellayani:

B. Sc. (Ag.)	—100/year (Out of which 50 students will undergo the course for the first 2 years at Vellanikkara)
M.Sc. (Ag.)	—6—10/Department/Year
M.Sc. (Hort.)	—2—4
Ph. D.	—2/Department/Year.

The Horticultural College, Vellanikkara offers facilities for admitting 30 students each year for the award of the four year B. Sc. (Hort.) degree. Besides, a few candidates sponsored by other States and Institutes are also admitted. The College offers M. Sc.(Ag.) course in Horticulture too.

In the College of Veterinary and Animal Sciences at Mannuthy 40 students are admitted every year for the

B.V.Sc. & A. H. degree course excluding students from outside the State and nominees of ICAR. For the M. V. Sc. course there is a total number of 68 seats, 4 in each department. The College is essentially a residential institution providing hostel facilities for boys and girls.

The Institute of Agricultural Technology, Tavanur is offering a Diploma course in Agricultural Sciences of 7 trimester duration and the intake capacity is 50. The Livestock Assistant's Training Course and Inservice Training for Agricultural Demonstrators are also conducted at this Institute. The campus also includes an Instructional Farm extending over an area of 26 ha. which provides facilities for the practical classes of the Diploma students and trainees.

#### **Additional Programmes for enriching learning process**

In addition to the regular practical training in Laboratories and farms, work experience by cultivation of different



*Student's Practical training in the field*

crops form part of B.Sc (Ag) and B. Sc. (Hort) under-graduate course. Clinical training and farm training are part of the B. V. Sc. Course.

A system of extension lectures by distinguished scientists has been introduced in all the three Colleges so as to get the students acquainted with the latest developments in respective disciplines. The students and staff are actively involved in the village adoption programme and N. S. S. activities. This helps the students in getting practical experience of field extension work, in developing an attitude of service to the rural people and in getting an insight into the problems of farmers.

### **Faculty Improvement Programme**

Members of the staff were provided with facilities to acquire higher qualifications by granting deputation, study leave and study allowance. Staff were also sent for short term training courses in their respective areas of specialisation. Participation in international and national seminars and conferences was given all encouragement. Seminars on teaching methods are organised during trimester breaks with the co-operation of distinguished agricultural educationists.

There is a good Library attached to each of the College which give facilities for the improvement of the students. Increasingly higher provisions have been made to get more books and journals for the Libraries. Book Bank Scheme has also been implemented in the three Colleges.

The Agricultural Research Journal of Kerala and Kerala Journal of Veterinary Science are published from the Agricultural and Veterinary Faculties respectively. A system of publishing abstracts of important research articles in different journals has been introduced to bring to the notice of staff members latest information in all the fields of

agricultural sciences—"Agri-Abstracts", "Hort. Abstracts", and "Anivet Abstracts" are published with contributions of staff from all departments.

The establishment of a Faculty of Basic Science and Humanities has been considered by the University and required statutes has been prescribed for the appointment of Dean and other teaching staff.

### **RESEARCH—An Outline**

The Research programmes undertaken by the Kerala Agricultural University in the fields of Agriculture and Animal Husbandry are mainly conducted in the 23 research stations/farms spread out in almost all the agricultural zones in the State. The major Research Stations/Farms under the University are the following.

#### **Research Stations**

- 1 Coconut Research Station, Balaramapuram, Trivandrum District.
- 2 Model Agronomic Research Station, Karamana, Trivandrum District.
- 3 Rice Research Station, Kayamkulam, Alleppey District.
- 4 Rice Research Station, Moncompu, Alleppey District.
- 5 Sugarcane Research Station, Thiruvalla, Alleppey District.
- 6 Coconut Research Station, Kumarakom, Kottayam District.
- 7 Cardamom Research Station, Pampadumpara, Idukki District.
- 8 Rice Research Station, Vyttila, Ernakulam District.
- 9 Lemongrass Research Station, Odakkali, Ernakulam District.
- 10 Cattle Breeding Farm, Thumburmuzhi, Trichur District.
- 11 Agronomic Research Station, Chalakudy, Trichur District.
- 12 University Veterinary Hospital, Kokkalai, Trichur District.
- 13 University Pig Breeding Farm, Mannuthy, Trichur District.
- 14 University Poultry Farm, Mannuthy, Trichur District.
- 15 University Livestock Farm, Mannuthy, Trichur District.

- 16 Research Station & Instructional Farm, Mannuthy, Trichur District.
- 17 Banana Research Station, Kannara, Trichur District.
- 18 Rice Research Station, Pattambi, Palghat District.
- 19 Livestock Research Station, Thiruvazhamkunnu, Palghat District.
- 20 Cashew Research Station, Anakkayam, Malappuram District.
- 21 Horticultural Research Station, Ambalavayal, Kozhikode District.
- 22 Coconut Research Station, Pilicode, Nileswar, Cannanore District.
- 23 Pepper Research Station, Taliparamba, Cannanore District.

### **Research Policy**

The Kerala Agricultural University has re-oriented the research policy to achieve the maximum productivity per Unit area increasing the net income per unit area developing a farming system for effective utilization of all the available natural resources for Agricultural production and generation of additional employment, improving the quality of agriculture produce and solving the other biographical and socio-economic problems confronted by the farmers. A change over from the institutional, to the project based research was the first step introduced for implementing 'Problem Oriented Research'. The University has enunciated a research policy to emphasise the need for research oriented towards solving the problems of farmers, increasing total agricultural production in the State as well as net income of farmers thereby enabling them to substantially improve their standard of living. The ancillary considerations kept in view are maximisation of the use of farmers' own resources, increased labour use in farming and better labour productivity, better intensity of land use and better land productivity, water use efficiency, reduction of

drudgery in farm operations, better means to livestock and poultry production and reduction in costs of production.

### **Co-ordination groups to identify Research gaps**

An institutionalised setup was organised to assess the research gaps in different fields and to formulate projects. Accordingly fourteen Co-ordination groups in the Faculty of Agriculture and seven Co-ordination groups in the Faculty of Veterinary and Animal Sciences were formed. These Co-ordination groups assessed the present status of research work done in respective area, identified research gap and prepared 18 status papers under Faculty of Agriculture and seven pertaining to the Faculty of Veterinary and Animal Sciences. On the basis of the status papers and information on constraints to agricultural production, areas of research lacunae have been identified and individuals or groups made responsible to prepare research projects to find out solution for identified problems. Project proposals are scrutinized by the Project Coordinators and with the remarks of the Professor of the concerned disciplines are placed before the Faculty Research Committees for approval.

### **Implementation of Research Projects**

Research Projects are implemented in the research stations and College departments. The Post-graduate Research is also made as an integrated component of the University Research Programme. The Professor of the department is primarily responsible for the proper implementation of projects in each discipline. The schemes have to be approved by the Faculty Research Committee. This is to ensure that multi-disciplinary approach is adopted in tackling field problems. Research projects cleared by the Faculty Research Committee are scrutinised and approved by Research Council. After approval by the Research Council, the project leaders can implement the schemes subject to budget provision.



## **Participation of farmers in the formulation of Research Projects.**

In the formulation of research projects, progressive farmers and extension department personnel are intimately associated. Farm problems are identified in workshops of research scient-



*Rice Research Station, Pattambi*

ists and extension officers in farmer's conventions and in the Research Advisory Committee.

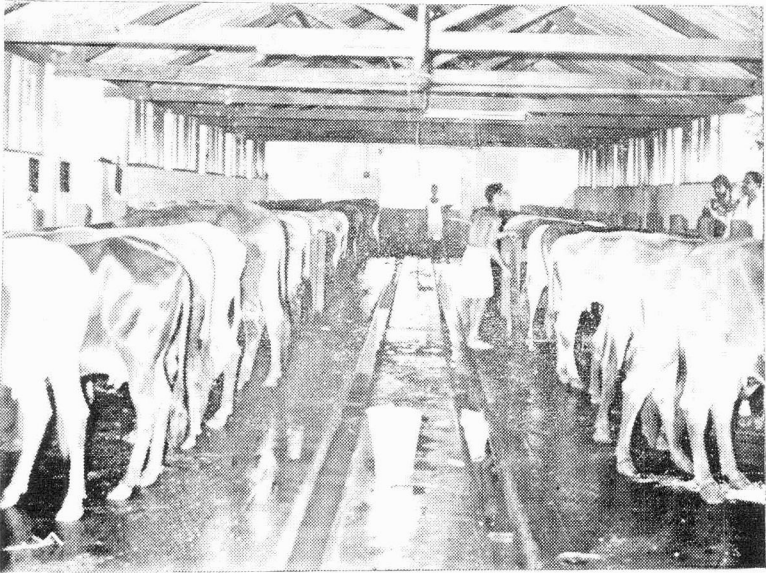
## **Research Projects Financed by outside agencies.**

The Kerala Agricultural University is also implementing 19 ICAR Co-ordinated projects under Faculty of Agriculture and 4 under Faculty of Veterinary and Animal Sciences including one project in Fish culture. In addition to this the Ford Foundation is financing a scheme for research and development of rice varieties resistant to BPH and GSV. The Kerala Agricultural Development Project (KADP) functioning in the College of

Horticulture is financed by the World Bank. Swedish International Development Agency is giving financial help to research on integrated use of groundwater, surface water and rainfall water for crop production.

### **Research on Crops, Animal Sciences and Fisheries.**

The research activities of the Kerala Agricultural University have been made more comprehensive to cover all economically important crops grown in the State and new crops that can be successfully introduced, Animal Sciences covering cattle, buffaloes, goats, pigs, poultry and ducks, inland fisheries and integrated homestead farming. During the period 1972-79, 457 Research Projects were completed and 960 projects were in operation, and a total number of 1345 research papers were published.



*Animals*

## RESEARCH HIGHLIGHTS

### CROP

#### 1. RICE

##### *Crop Improvement*

Three high yielding rice varieties Jyothy, Bharathy and Sabari suitable for different agroclimatic and ecological situations of Kerala and possessing high yield potential of 4-5 tons/ha were evolved. These varieties are now popular in Kerala. A tall improved rice variety, Suvarnarodan suitable for rainfed uplands was released. A high yielding variety of rice "Bhadra" with built in resistance to brown plant hopper suitable for pancha in Kuttanad was evolved from the Rice Research Station, Moncompu. Another culture M-15-36-2, has been proposed for release. Pure line selection of the saline resistant variety cheruvirippu has yielded a promising culture 174 suited for deep water salinity conditions as in Pokkali



*Rice*

area. Cul. 31-1 a semi-tall variety with higher yield suitable to the ill-drained soils of eastern lateritic region has also been proposed for release. The emphasis now given under crop improvement is to evolve season specific strains with semi-tall nature, high yield potential, good cooking quality and nutritive value and built in pest and disease tolerance.

### *Manurial and Cultural Practices*

The economic dose of nitrogen for short and mid and long duration rice varieties has been determined. It has been found that increased number of split application linked with critical growth phase of the crop contributes to better fertilizer use efficiency and economy. A combination of organic and inorganic manures was found to be superior to either of them alone for swamp rice. Mixing urea with wet soil or mixing with neem cake, are some of the recommendations to avoid fertilizer loss and increase fertilizer use efficiency. Weedicides like Fernoxone, Machette, Stam-F.34, Tok granules and Tok E.25 were found to be cheap and effective for weed control in rice fields.

### *Plant Protection*

The main theme of research is to prescribe a need based control with effective pesticides of minimum residual toxicity. Emphasis was also given for evaluation of indigenous materials and identifying biological control measures. Plants like calotropis, clerodendren, and laxtane and essential oils like Citronella, Palmarosa etc. were found to have insecticidal properties against rice pests like rice swarming caterpillar. Birlane-50, kerosene oil and diesel oil were found to be effective against brown plant hopper attack. Closer spacing and use of high dose of Nitrogen increased BPH incidence.

Intensive bio-efficiency studies on newer fungicides are undertaken and it has been possible to identify that Hinosan

and Bavistin can check the sheath blight and ear-head disease complex.



### *Spraying*

#### *Rice based cropping system*

Studies were conducted on rice based cropping systems at Chalakudy, Karamana, Kayamkulam and Pattambi research stations. Rice-Rice-Groundnut or Rice-Rice-Vegetables registered more income per unit area. Rice-Rice-Sesamum is the best for areas under limited moisture resources in the soil.

Rice-Rice-Pulses is remunerative with the complementary effect on fertility enrichment.

### *Water Management*

It was observed that 5 cm irrigation at hair cracking stage after the subsidence of ponded water, with protective submergence irrigation at tillering, panicle initiation and flowering significantly increases water use efficiency without any reduction in yield. A cheap drip irrigation technique with micro tubes was developed at the Agronomic Research Station, Chalakudy.

## 2 COCONUT

### *Crop Improvement*

Seven promising varieties were screened out and recommended for large scale cultivation. Better vigour and better rate of growth were exhibited by the progenies of WCT x LD, WCT x Neyur and WCT x AD. Sibmatic progenies were found to out yield the parents.

### *Cultural and manurial practices*

The effect of Potassium on the yield of nuts was more pronounced than that of the other two nutrients. Regular fertilizer application from the seedling stage is necessary for proper growth and yield of palms. Split application of fertilizers (1/3rd in May and 2/3rd in September) was found to be more effective than single application.

Supplementary irrigation during summer months at the rate of 300 lits of water once in 7 days was found to increase nut production on an average of 25–30 nuts per tree per annum.

A study on the integrated control of coconut caterpillar by using chemical and biological methods has indicated that spraying of sevin followed by a release of parasite after 16 days of spraying was best in the case of severe attack.

### *Cropping system*

Intercropping cocoa has been found to increase the net income. Groundnut was another rainfed intercrop found promising in coconut garden.



*Coconut*

### 3 SPICES

#### Pepper

A total of 197 germplasm collection from cultivated and wild types are maintained. The nitrogen requirement of Panniyur-1

pepper was found to be 60 gm. per plant. Application of Planofix and NAA were found to increase berry size and weight of pepper. Painting the lower portion of vines with Bordeaux paste and spraying 1% Bordeaux mixture; one as pre-monsoon, and one or two as post-monsoon application was found effective against quick-wilt disease. Application of 0.1% Ekalux or Rogar twice in a season will effectively control 'Polliu' disease. Nematode association in slow-wilt of pepper is



*Pepper*



identified and application of nematicides like Dasinit is found to reduce the incidence.

### **Ginger**

From the 32 types of ginger maintained in the germplasm, Rio-de-janeiro was observed to yield the highest on the basis of fresh rhizome yield, while Maran and Bajpai topped the list with regard to Oleo-resin content and dry ginger yield.

### **Cardamom**

Germplasm collection of 20 cardamom and related spices are maintained. The type No. 17 and 107 were found to be promising among the polycross seedlings. Plant protection schedules for controlling the thrips and nematode attack and 'Azhukal' disease has been worked out. Damping off disease in cardmom caused by *Rhizoctonia* can be effectively controlled by



*Cardamom*

drenching the primary nursery beds with 0.3% Dithane M-45. A multidisciplinary research programme has been taken up for controlling the 'Chenthal' disease.

### **COCOA**

Double row system of planting cocoa in the inter spaces

of two rows of coconut was found to be the most advantageous accounting for higher receipts both from Cocoa and Coconut.



*Cocoa*

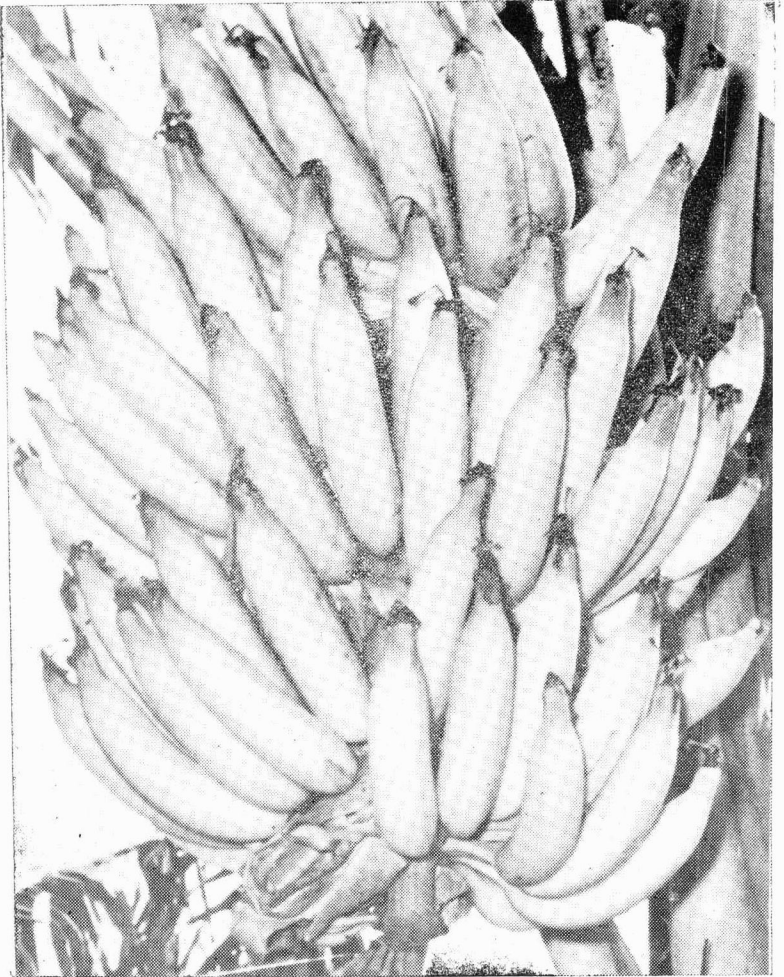
## CASHEW

Four hybrid progenies namely H3-19, H3-17, H3-12 and H3-7, and a type BLA 139-1 have been found to give good yields.

The month of March was found to be the most suitable season for layering cashew.

## 4 FRUIT CROPS

### BANANA



A germplasm of 158 varieties of Banana is being maintained. Marthen group in general was comparatively drought resistant and suitable for cultivation under rainfed conditions. Eight varieties showing tolerance to bunchy top disease have been identified. They are Boddliis Alta Fort, Pisang Ausat, Booditha-bontha bathtese, Karpooravalli, Kanchikela, Vadakkau Kadeli, Sonne Chenkadall and Vennethkannan. The vectors transmitting this disease can be controlled by soil or axil application of Thimet. The manurial requirement of Banana has been worked out as 225 gm, 225 gm. and 450 gm. NPK per plant.

The keeping quality of banana fruits can be increased by 40-50% by spraying Ethrel 200 ppm or CCC 500 ppm.

### **PINEAPPLE**

Higher population density help to increase the yield in Pineapple. Soil application of nitrogen was superior than



*Pineapple*

combination of soil and foilar application. A combination of 25 ppm ethrel+2% Urea+0.4% CaCo<sub>3</sub> was found effective both

for plant crop and ratoon crop in inducing uniform and maximum flowering.

### **MANGO**

Germplasm collections of 68 varieties including 41 hybrids are maintained in Trichur District. Twenty one promising types of mango suitable for pickle making were located.

### **5 VEGETABLE**

A collection of 56 different vegetables is maintained. These are 157 lines in Tomato, 93 in Chilli, 64 in Bhindi, 43 in Brinjal and 19 in Winged beans. Disease resistance studies are in progress. Hybrid variety of Bhindi-Pusa Savani X Kil-



*Snake gourd*

ichundan, recorded 10-15% increased yield over parental types.

### **6 TUBER CROPS**

Uniform regional trials on tapioca conducted at Coconut Research Station, Nilleshwar revealed that H-2304 was the top yielder. In the case of Tapioca planted in September the NPK requirement of the high yielding varieties were fixed at 100, 100, 100 kgm/ha NPK and for average

yielders at 75, 75, 75 kgm/per ha NPK. Irrigation at 5 cm once in 22 days was found optimum and the irrigated crop was ready for harvest 2 months earlier than unirrigated. Companion cropping of groundnut or cowpea with tapioca is found to be a feasible practice for maximising production per unit area.

## 7 PULSES

### SOYABEAN

The performance of soyabean varieties in rice fallows was tried and the variety EC. 29824 gave significantly higher yield.



*Soyabean*

## **COWPEA**

An early duration dual purpose cowpea variety Kanakamony capable of yielding 1300 kgm dry grain/ha. was evolved by pure line selection. The economic dose of N,  $P_2O_5$  and  $K_2O$  for cowpea was found to be 23 kgm, 23.5 kgm and 20 kgm respectively.

## **BLACKGRAM**

The blackgram varieties U-19 from Pant Nagar was found to be the best yielder. Variety Co-2 is found to be suitable for cultivation in rice fallows,

## **8 SUGARCANE**

The variety Co. 62175 yields 100% more than that of Co. 997 the popular variety grown in Thiruvalla area. The optimum nitrogen for maximum yield was estimated to be 164 kgm/ha for early and mid duration variety and 154 kgm/ha for variety Co. 997.

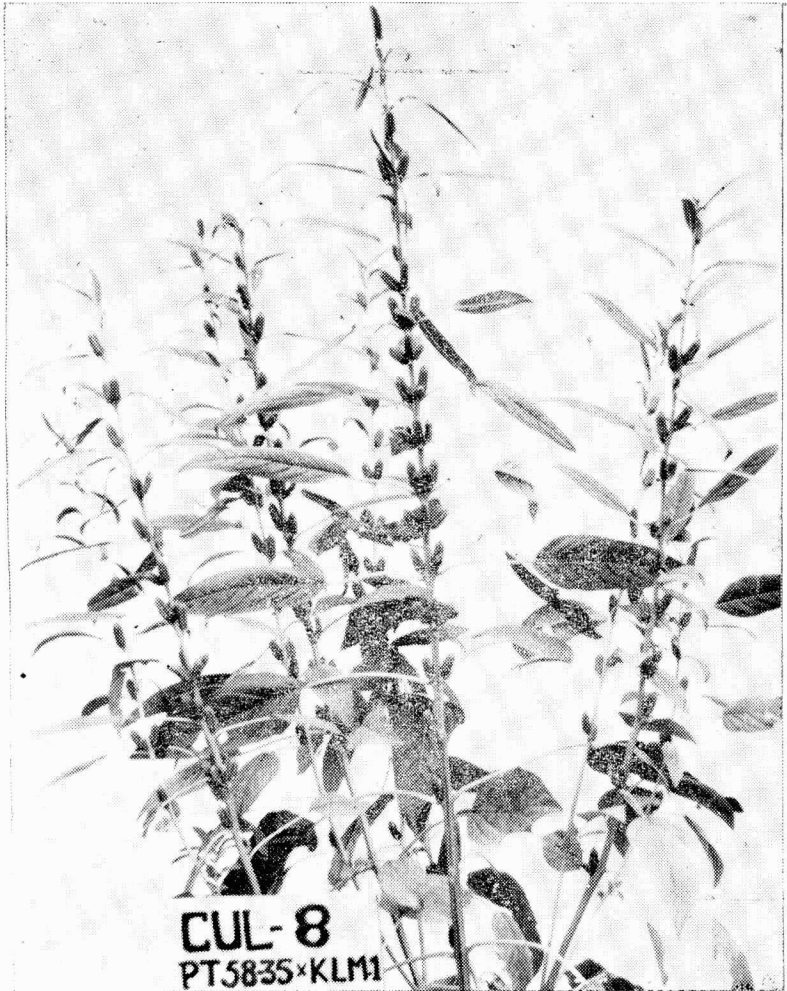


*Sugarcane*

## 9 OIL SEEDS

### SESAMUM

A high yielding variety Kayamkulam.—1 capable of yielding 350 kg/ha was evolved from Rice Research Station, Kayamkulam. A spontaneous multipoded mutant giving still higher yield under better manuring was also identified.



*Sesamum*



A multipoded hybrid cul-8, with profuse branching and higher yield is proposed for release as a better variety for cultivation. By giving two irrigation, one at vegetative phase and other at pod formation stage gave an increased yield of 30-40%.

### **GROUNDNUT**

Out of seven varieties tested TMV. 2 was found to be the best for rice fallows in Onattukara, In areas where the residual moisture status is better, it is more paying than Sesamum. Groundnut is evaluated as a good companion crop in Tapioca and intercrop in coconut garden.

## **10 ESSENTIAL OILS**

### **LEMONGRASS**

Seven improved types were identified from the OD. 19 variety. The manurial dose has been fixed as 100 kgm N to be applied in 4 splits after each cutting, Chopping the leaves



*Lemongrass*

before distilling was found to increase oil recovery by 33 percent. The optimum periodicity of harvest of leaves is 40 days as assessed by oil yield.

### **PALMAROSA**

The NPK recommendations for Palmarosa is 40:30:30 kgm/ha. Harvesting 5-7 days after flowering was found to give maximum yield.

## **11 FORAGE CROPS**

Under varietal improvement of perennial grasses 4 promising guinea grass varieties were identified. Guinea grass gave better yield when grown in coconut gardens, than hybrid napier.

## **12 FIBRE CROPS**

Jute and Mesta are introduced fibre crops under trial in Moncompu, Kayamkulam, and Punalur. For these fibre crops May is the best sowing season and for seed crop sowing is to be done during N. E Monsoon period.

## **13 AQUATIC WEED CONTROL**

Salvinia control is the major programme attended to. Biological control by insects could not make any headway as rate of multiplication is much faster. Preparing Salvinia Compost with superphosphate and cowdung starter is found to hasten the decomposition yielding a good organic manure.

## **BIO FIXATION OF NITROGEN**

Local samples of rhizobia have been collected and promising rhizobial strains suited for cowpea in acid soils are being isolated. Studies on culturing and inoculation of Azolla in second crop paddy are in progress.

## **FARMING SYSTEM**

Studies on Rice-cum-fish culture in Vyttila has revealed that P. Menoden gives an yield of 80 kg/ha in a period of 130 days. Studies on crop livestock fish integrated farming has been initiated at Coconut Research Station, Kuma-

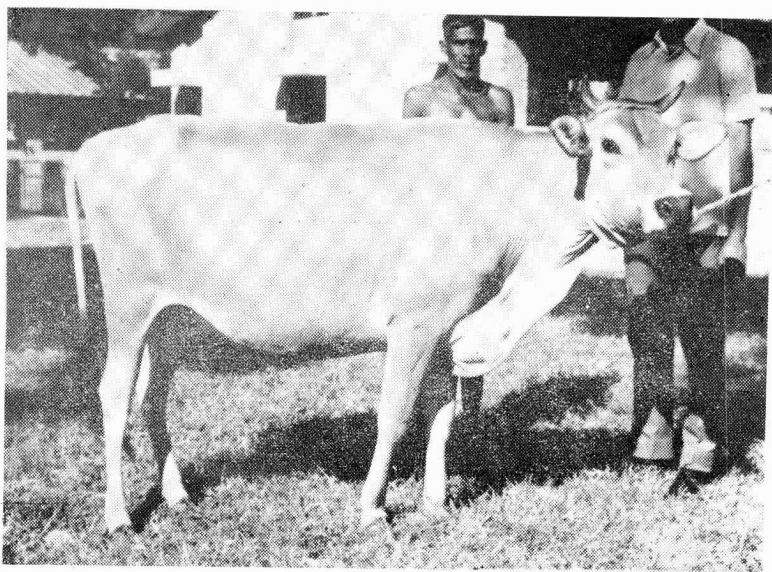
rakom. Common carp and Etropus are grown in the intervening channels recycling the manure from cattle unit and pig unit in the Station.

Research on Fisheries at Kumarakom and Vyttila Research Stations showed that rice-cum-fish farming is more profitable to farmers.

## VETERINARY AND ANIMAL SCIENCES

### CATTLE

Colostrum produced by high yielding cows in excess of the requirements of the calf can be stored at room temperature, for a period of 7 days and it can be fed to the calves to get better growth rate and physiological status. Lactation could be induced in fertile cattle by injecting hormones. Dairy calves can be economically raised with 38.5 kgm of milk only by introducing "calf starter ration" prepared from locally available feed ingredients. Tapioca leafmeal can be profitably incorporated



*Jersey Cow*

in the cattle ration and tapioca starch waste and rubber seed cake can profitably replace costly ingredients like maize, in the feed of cattle.

### **Buffaloe**

Buffaloes, as compared to Cross-bred cattle are better suited to our agroclimatic conditions as is indicated by lesser variations in rectal temperature and rate of respiration with changes in ambient temperature.

### **Goat**

Nutritive value of Raintree fruit meal for goats was studied and it shows that it can be profitably utilized for incorporation in the concentrate mixture for growing kids at a level of 20%.

### **Poultry**

The research work has been directed towards evolving methods and means for economic production. The incorporation of shrimp shell powder, feed additives, dried poultry



*Poultry*

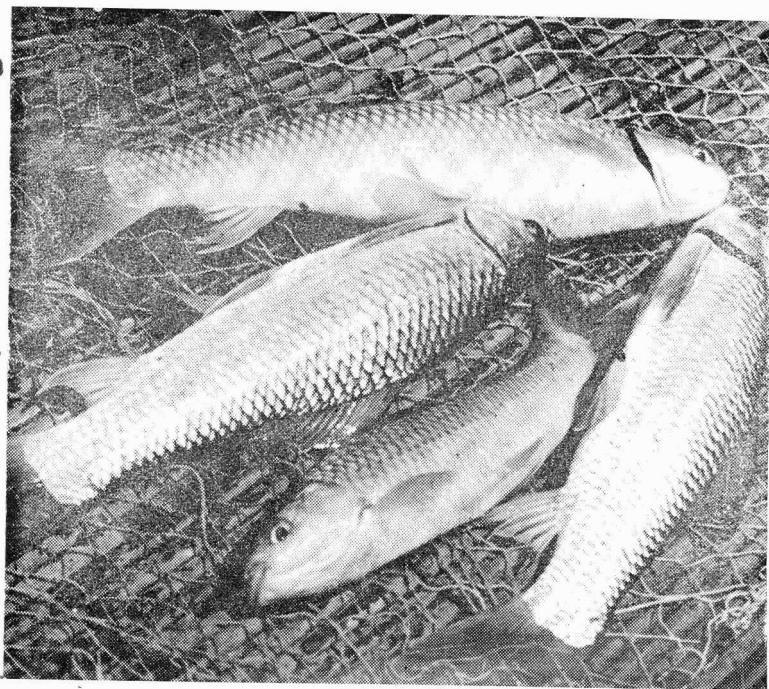
manure, rubber seed cake etc., was found to cut down cost of feeding without affecting egg production. Selection from among different strains of poultry was found to improve egg production.

### **Animal Reproduction and Artificial Insemination**

Intra-Uterine administration of antibiotics 12-24 hours after insemination enhanced conception rate. The farrowing interval could be substantially reduced by early weaning. Bull semen extended in CME can be preserved without substantial loss in fertility upto 72 hours of storage on the basis of actual measure of conception in inseminated cows.

### **Fisheries**

The prawn seed resources survey in the Cochin backwaters showed that the Tiger Prawn Seed (*Penaeus Monodon*) could



*Fish*

be collected in fairly large quantities from Puthuvypu area when the Midnapore shooting nets were used during the high tide. The experimental farming of tiger prawn seed brought from West Bengal has shown that the species has registered the best rate of growth.

## EXTENSION EDUCATION

The extension education activities of the Kerala Agricultural University are undertaken through the Directorate of Extension Education. The main strength of the Kerala Agricultural University extension education programme is the full co-operation and co-ordination established with the State extension departments.



*Practical Field Training*

## POLICY

The extension education policy of the Kerala Agricultural University recognises the following principles.

1) There is an adequate network of field extension officers for the State Extension Departments and hence the University need not duplicate their services. The function of the University is only to provide the technical back-stop to this field extension machinery.

2) The higher literacy and newspaper reading habit of farming public must be borne in mind while organising extension education programme and

3) It will be desirable to inculcate amongst our educated farmers' not only the technical skills of farming but to make them more as practising scientists by imparting scientific principles, on which farm practices are to be involved.

### **PROGRAMME-UTILISATION OF MASS MEDIA, PUBLICATION OF JOURNALS ETC,**

The Karala Agricultural University organises inservice training programmes for the staff of the State Departments of Agriculture, Animal Husbandry and Dairy Development, and also for School teachers, Farmers, Bank officers etc.

Apart from the Training programmes, the extension wing is undertaking extension activities like publication of periodicals, information communication through press and radio, advisory and consultative services and public relations programme. The Directorate publishes journals Kalpadhenu—the extension education bi-monthly, the Kerala Journal of Veterinary Science and the Agricultural Research Journal of Kerala Monthly Newsletter and Agres News supplement are being issued regularly as a part of public relations activity. Package of practices recommendations for Agricultural crops and for Livestock and poultry management are being formulated and published.

### **COMMUNICATION CENTRE-THE VITAL LINK OF LAB TO LAND**

The Communication Centre attached to the Extension

Directorate disseminates scientific technology to the farming community, through all available media like newspapers, exhibitions, radio, etc. The three sub-units viz. Publication unit, Information unit and Exhibition and Graphic services perform the duties of information communication. Publication of articles in Karshikarangam column of the leading Malayalam dailies of the State, publication of serialised lessons on Agriculture and Animal Husbandry, conduct of correspondence courses for farmers, publication of books and participation in the farm and home and farm school programmes of All India Radio, are the projects taken by the Communication Centre. Preparation of teaching aids for the use of the Constituent Colleges of the University is also undertaken by the Communication Centre. Collecting research results from other Research Stations in India and communicating to concerned departments of the University is also one of the duties of the Centre.

#### **VILLAGE ADOPTION PROGRAMME**

A village adoption programme to enable the University Scientists to get direct knowledge of farming situations and to serve as field laboratories for the University research programme has been implemented in 10 villages. Incidentally integrated development of these villages have also been covered. The research results will be tested in these adopted villages to identify any field constraints on the effectiveness of new research recommendations.

#### **UNIVERSITY PRESS**

A University Press has been established. The Press caters to all the printing needs of the University.

#### **FARM ADVISORY SERVICE**

A Farm Advisory Service is functioning. District-wise seminars are conducted throughout the State in collaboration with the Departments. Questions on scientific technical



points raised by farmers' engaged in Agriculture and Animal production are regularly answered.

### 'LAB TO LAND' PROGRAMME

In connection with the Silver Jubilee Celebrations of ICAR, the 'Lab to Land' programme was initiated in the adopted villages and the neighbouring villages of research stations. One



*Supply of Inputs*

hundred demonstration plots were organised in farmers' fields with the technical assistance of the University.

Where the extension staff are faced with new field problems, University specialists are sent, on request, to diagnose the causes and to recommend remedial measures.

### **T & V PROGRAMME**

The Kerala Agricultural University is giving a training for a period of 6 months to the newly recruited village level workers at three centres, under the training and visit system. The University would also organise Monthly Workshops at six centres for the training of subject matter specialists.

### **N.S.S. PROGRAMME**

The National Service Scheme (NSS) activities of KAU are also conducted through the Extension Directorate as the Director of Extension Education is the Programme Co-ordinator for NSS of the Kerala Agricultural University.

### **WORKS AND FINANCE**

The major works of the Kerala Agricultural University are undertaken through the Directorate of physical plant Vellanikkara. Execution of work, control and maintenance of buildings, procurement of equipments, vehicles, machinery etc are vested on this directorate.

### **MANAGEMENT OF FUNDS**

The Comptroller is responsible for the management of the funds and investments of the University. The main source of income of the University is the grant from the State Government under plan and non-plan, grant from ICAR and other outside agencies and income from University properties.

### **SIXTH PLAN POINTERS**

The sixth plan strategy of the Kerala Agricultural University has been formulated to fulfil the objectives of the University.

The existing faculties of the University viz., Agriculture, Veterinary and Animal Sciences and Fisheries are sought to be strengthened.

The plan proposals emphasise the development of the University Main Campus to a 'Centre of Excellence' for humid tropical horticulture with the collaboration of outside agencies

It is also proposed to establish a faculty of Basic Sciences and Humanities, and a faculty of Forestry and Department of Co-operation.

In order to boost up research activities University proposes to set up Regional Research Stations at Ambalavayal, Pilicode, Pattambi, Mannuthy, Kayamkulam, Moncompu, Vellayani and Thiruvazhamkunnu.

The Establishment of University Central Library is also envisaged. Proposals include acquisition of additional areas for the main campus and for Research Stations.

## CONCLUSION

The early years of the Kerala Agricultural University were spent for the co-ordination of the various educational institutions and research stations, its personnel and programmes.

Effective measures were adopted for improving building and laboratory facilities for the quick and steady expansion of teaching research and extension programmes. New building complexes were constructed, and new colleges and new departments opened. The integration of the teaching and research personnel has also been completed smoothly along with the organisation of the administrative wing. Now the University has not only surmounted its early problems with success but also has attained maturity and growth. The construction of Headquarters complex and Horticultural College at Vellanikkara, Extension Wing, Fisheries College and the proposed establishment of numerous regional research stations are outstanding events in the short period of the history of the University.

The University has been marching steadily on the way of fulfilling its objectives. No doubt the Kerala Agricultural University will continue to play its vital role in the Agricultural and scientific development of Kerala and will face the challenges successfully.

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