the essentials never change

100 Glorious Years

Rendezvous with Reminiscenses

2005

1906-2005

Agricultural College and Research Institute, Coimbatore

THIS BUILDING

WAS

COMMENCED IN JANUARY 1907

AND

COMPLETED IN JULY 1909.

THIS COLLEGE AND RESEARCH INSTITUTE

WAS OPENED

BY HIS EXCELLENCY

THE HONOURABLE SIR ARTHUR LAWLEY

C.C.I.E., K.C.M.G.

GOVERNOR OF FORT ST. GEORGE

ON THE 14TH JULY 1909

THIS FOUNDATION STONE

OF THE

ACRICULTURAL COLLEGE AND RESEARCH INSTITUTE

WAS LAID ON 24TH SEPT 1906

BY

HIS EXCELLENCY THE HONBLE SIR ARTHUR LAWLEY

G.C.I.E. K.C.M.G.

Rendezvous with Reminiscenses

Contents

Agricultural College and Research Institute
Coimbatore

2005

राष्ट्रपति
भारत गणतंत्र
PRESIDENT
REPUBLIC OF INDIA

MESSAGE

I am happy to know that the Agricultural College and Research Institute, Coimbatore is celebrating its centenary commencing from January 2005 and bringing out a souvenir to mark the occasion.

The Institute has a major role in nation building through enriching science, engineering and technology and by providing value-based education to students to make them leaders in specific fields. The Institute should continue to make efforts to provide instruction to its students which are relevant to the changing nature of agriculture while focusing on research that can provide solutions peculiar to agricultural problems of the State.

I extend my warm greetings and felicitations to all those associated with the Institute and wish the Celebration all success.

(A.P.J. Abdul Kalam)

New Delhi
December 17, 2004

Geared to go Global

SURJIT SINGH BARNALA
GOVERNOR

MESSAGE

I am happy to learn that the Centenary Celebrations of the Agricultural College and Research Institute, Coimbatore of Tamil Nadu Agricultural University is to commence from January 2005 and a souvenir is being released in commemoration of the centenary celebrations.

It is heartening to note that the Agricultural College and Research Institute has made rapid strides in the field of education in Agriculture & Research by developing innovative techniques and augmenting increased agricultural production and productivity.

I convey my warm greetings to the faculty, staff and students and wish the centenary celebrations all success.

Raj Bhavan, Chennai
November 29, 2004

Surjit Singh Barnala

(Surjit Singh Barnala)

Geared to go Global

J JAYALALITHAA
Chief Minister

SECRETARIAT
Chennai - 600 009

Date : 30.6.2005

MESSAGE

I am very happy to learn that the Agricultural College and Research Institute, Coimbatore, is celebrating its Centenary Year, commencing from January, 2005. This College is one of the oldest Agricultural Colleges in our country and has played a pioneering role in introducing scientific agriculture to our farmers and taking research from the laboratory to the land.

By adopting a three-pronged strategy of research, education and extension in bringing about agricultural development, the College and the Tamil Nadu Agricultural University have established a vibrant two-way relationship with the Farm Community. I wish to place on record my appreciation for the untiring efforts of the College in popularising crop production technology and in introducing high yielding crop varieties.

In the context of extreme water stress and frequent droughts in the State, the Government of Tamil Nadu has taken up promotion of less water-intensive crops like Jatropha, Sweet Sorghum and Sugar Beet. My Government's initiatives in undertaking programmes such as Comprehensive Wasteland Development,

Precision Farming, Rain Water Harvesting and Food Processing have now started yielding good results. We are on the threshold of a bio-technology revolution, which we must use to bring about a breakthrough in agricultural productivity. Policy makers, administrators, scientists, NGOs and private agencies must work together to preserve soil health, conserve water and practice sustainable agriculture to achieve nutritional security. I am very happy to note that the Tamil Nadu Agricultural University has taken the nodal responsibility in providing full technical and research support for all these programmes.

On this occasion of the Centenary Year of the Agricultural College and Research Institute, Coimbatore, I extend my felicitations to the faculty and students for the grand success of the Centenary Celebrations and wish this great institution many more years of invaluable service to the farming community and the Nation.

J JAYALALITHAA
Chief Minister of Tamil Nadu

K. PANDURANGAN
MINISTER FOR AGRICULTURE
SECRETARIAT
CHENNAI - 600 009

MESSAGE

As rightly said by the Saint Tiruvalluvar, Agriculture is the mainstay of our country. Tamil Nadu Agricultural College and Research Institute at Coimbatore is undoubtedly playing a vital role in every sphere of agriculture for the past 100 years.

The University educates, develops and trains the students in all modern techniques of agriculture including Horticulture and Agriculture Engineering with a sole motive of making our country self-sufficient in agriculture.

I really feel very happy that the Tamil Nadu Agricultural College and Research Institute, Coimbatore is celebrating the Centenary Celebrations and I take pleasure and honour of WISHING the CENTENARY CELEBRATIONS A GRAND SUCCESS.

Chennai
November 19, 2004

19/11/04
(K. Pandurangan)

Geared to go Global

M S SWAMINATHAN RESEARCH FOUNDATION

Prof. M. S. SWAMINATHAN
Chairman, National Commission on Farmers, Govt. of India
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MESSAGE

1905 was a landmark year in the history of institutional infrastructure development for agricultural education and research in India. The Indian Agricultural Research Institute was established in Pusa, Bihar in 1905. Plans were also finalized for starting Agricultural Colleges in Coimbatore, Nagpur, Pune, Kanpur and Lyalpur (now Faizalabad in Pakistan). Lord Curzon, who was then the Viceroy of India said, while inaugurating IARI at Pusa, "I hope the setting up of this Institute will be the starting point of a policy of agricultural development henceforward to be systematically pursued in good years and bad ones by the Government of India so that a time may one day arrive when people will say that India is looking after her **greatest living industry** as well as she is now looking after her ancient monuments. "Further, Lord Curzon emphasized the need for "rural schools that will give children preliminary training which will make them intelligent cultivators, will train them to be observers, thinkers and experimenters and will protect them in their business transactions with the landlords to whom they pay rent, ad the grain dealers to whom they dispose of their crops."

Another significant milestone in pre-independent India was the organization of the Indian Council of Agricultural Research in 1929 on the basis of a recommendation of the Royal Commission on Agriculture headed by Lord Linlithgow. Emphasizing the critical importance of agricultural research and education the Royal Commission emphasized "however efficient the organization which is built up for demonstrations and propaganda be, unless that organization is based on the solid foundations provided by research, it is merely a house built on sand".

The Agricultural College and Research Institute at Coimbatore which was elevated to the position of Tamil Nadu Agricultural University in 1971, has lived up to the early expectation that it will be an outstanding center for research, education and extension training. It is now one of the foremost Agricultural Universities in the world. Coimbatore has become the epicenter of genetic improvement of the quality and productivity of a wide range of crop plants, including rice, sugarcane, cotton and horticultural crops. I had the privilege of studying at the Coimbatore Agricultural College from 1944-47. Those were some of the best years of my life, since the College maintained the highest standards of academic excellence and social relevance in its educational and research programmes.

TNAU can look back with pride and satisfaction on its contributions to enhancing the productivity, profitability and sustainability of the major cropping systems of not only of Tamil Nadu but also of other parts of India as well as internationally. During the second century of its existence, TNAU will experience both great challenges and uncommon opportunities. Tamil Nadu and India will have to produce more and more food and other farm commodities from diminishing per capita arable land and irrigation water resources. There has to be increasing emphasis on the economic and quality aspects of agricultural production, in order to enable our farmers to become globally competitive. There is also need for greater emphasis on non-farm employment and for a paradigm shift from unskilled to skilled work. Agriculture should not only help to increase food production but should also generate more income and jobs. Then only we can erase the present unenviable and unnecessary reputation of India being the home of the largest number of the poor and undernourished in the world. I am confident that the faculty and scholars of TNAU will take the University to new heights of achievement during the second century in the life of this great center of learning.

This will be possible if TNAU becomes the flagship of the eco-agriculture movement involving appropriate blends of frontier science and traditional wisdom and trains its students to become the torch-bearers of the Hunger-free India Movement.

Chennai

June 13, 2005

M. S. Swaminathan

வாழ்த்து

நமது தேசத்தில் விவசாயம் காலூன்ற முக்கியப் பங்காற்றி வரும் கோயமுத்தூர் வேளாண் கல்லூரி தனது 100 வது வயதிலும் இளமை குறையாமல் தனித்தன்மையோடு இயங்கிவருவது பெருமகிழ்ச்சி அளிக்கிறது. இனிவரும் காலங்களில், மாறிவரும் சூழலுக்கேற்ப விவசாயத்தை வலுப்படுத்தி மேன்மையடையச் செய்யும் யுக்திகள் பல உருவாக்கும் நிறுவனமாக வளர எனது மனமார்ந்த வாழ்த்துக்களைத் தெரிவித்துக் கொள்கிறேன்.

மதுரை - 10
ஜூன் 23, 2005

(பெ. சின்னப்பிள்ளை)

POLLACHI V. JAYARAMAN, M.A.,
Minister For Food and Co-operation
Secretariat
Chennai - 600 009

MESSAGE

I am glad to know that the Agricultural College and Research Institute of Tamil Nadu Agricultural University, Coimbatore is holding the Centenary celebrations and that Special Souvenir is also proposed to be released to mark the occasion in a fitting manner.

I have great pleasure in sending my good wishes to the organisers and greeting to the participants for the success of the Centenary celebrations.

Chennai
November 22, 2004

26/11/04

(Pollachi V. Jayaraman)

Geared to go Global

பா. வளர்மதி
ஊரகத் தொழில் துறை அமைச்சர்

தலைமைச் செயலகம்
சென்னை - 600 009

வாழ்த்துச் செய்தி

தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழகத்தின் ஒரு அங்கமாகத் திகழும் கோயம்புத்தூர் வேளாண் கல்லூரி மற்றும் ஆராய்ச்சி நிலையத்தின் நூற்றாண்டு விழா கொண்டாடப்படுவதை அறிந்து மிகவும் மட்டற்ற மகிழ்வுகொண்டேன்.

"உழவுக்கும் தொழிலுக்கும் வந்தனை செய்வோம்"
-வீணில்
உண்டுகளித் திருப்போரை நிந்தனை செய்வோம்".

என்றார் புரட்சிக் கவிஞர் சுப்பிரமணிய பாரதியார் அவர்கள்

அவ்வழியில் ஒரு நூறாண்களுக்கு முன்னர் 1905-ஆம் ஆண்டு ஜனவரியில் துவக்கப்பட்ட, இக்கல்லூரியும் அதன் ஆராய்ச்சி நிலையமும், வேளாண்மை இயலில், பற்பல அறிவியல் புதுமைகளைப் புகுத்தி, இந்த பஞ்சசீல பாரதத்தை, பஞ்சமில்லா பசிப்பிணியில்லா, பட்டொளி பறக்கும், பாரதமாக மாற்றிடவும் மற்றும் குறிப்பாகத் தமிழக மக்களின் துயர்துடைப்பதில் பசுமைப் புரட்சிமூலம் அரும்பாடுபடும், இக்கல்லூரியும் ஆராய்ச்சி நிலையமும் பல்லாண்டு, பல்லாண்டு மற்றும் பல நூறாண்டுகள் சீரும் சிறப்புமாக விளங்கித் தடையில்லாமல் தொடர எனது பசுமை நிறைந்த வாழ்த்துக்களை உளமாரத் தெரிவித்துக்கொள்கிறோம்.

17.11.2004

சென்னை - 600 009
நாள் : 17.11.2004

(பா.வளர்மதி)

LEENA NAIR, I.A.S.
Agricultural Production Commissioner
& Secretary to Govt.
Agricultural Department

Secretariat
Forte St. George
Chennai - 600 009
Phone : off. 25674482

MESSAGE

I am glad to learn that the Agricultural College and Research Institute, Coimbatore is celebrating its hundredth year. The College which has grown into the Tamil Nadu Agricultural University is a leading agro technology provider for the country and has spearheaded the Agriculture Education and Research in the Country. It has set superior standards of education not only for South India but for the country as a whole, It's Alumni have contributed immensely to Agricultural Development across India and in several countries

This institution has not only strengthened the technical knowledge altitude and ability of the students it has produced, but has also cultivated in Item the moral, social and ethical values. Due to this the College produces students who are top notch marketable graduates.

The varieties and technologies developed by this Institute have been widely adopted by farmers in the State. The plant resources have also been used for developing varieties and hybrids by other Indian and International institutions.

I am confident that the institute is fully geared to develop human resources to encounter the challenges and opportunities of the dynamic agricultural environment in India and the World. It will also provide the State the technical guidance to meet the WTO challenges.

I extend my best wishes for the grand success of the Centenary Celebration of the historic Institution.

(LEENA NAIR)
APC & Secretary to Government

Geared to go Global

Thiru. J.C. KALA, I.F.S.,
Principal Chief Conservator of Forests
Chennai - 15

MESSAGE

It gives me much pleasure to learn that Tamil Nadu Agricultural College and Research Institute is celebrating their centenary year. Agriculture and Forestry development have contributed significantly to the progress of the State. Tamil Nadu Agricultural University has undoubtedly contributed to the diversity and increase in agricultural crops and products, due to the scientific and technological innovations, which in turn has placed the State in a comfortable position in food and agricultural products. With globalization and free trade, agricultural products and services has to meet the growing domestic demands besides the international market demands, The field of agricultural science therefore requires continuous research and hi-tech solutions, to meet the emerging challenges. I am sure Tamil Nadu Agricultural University with their excellent and dedicated team of scientists and the vast experience gained, will contribute further for the economic development of the State and the Country.

Tamil Nadu Agricultural University has over the years, established new departments including Forest College and Research Institute to meet the growing challenge. The achievement of Agricultural College and Research Institute Coimbatore, is laudable, particularly in area of agricultural education and research. Students and scientists from Agricultural College and University, working in many parts of the country, have contributed to the progress and development of agricultural sector in the country. The vast list of crop varieties and farm implements released from time to time have contributed to the socio-economic development of the State in the country.

Agro forestry and relative fields, are areas in which the Forest Department and the Tamil Nadu Agricultural University can work in close coordination, to converge modern technologies and to provide enlightened management to the farming community in the State. I wish Tamil Nadu Agricultural College and Research Institute all success.

(J.C. Kala)

Dr. **G. RANGASWAMI, Ph.D.** (RUTGERS, U.S.A.)
D.Sc., (U.S.A), D.Sc., (TNAU), D.Sc., (P.U.)
Prof. Emeritus, University of Madras
International Agricultural Consultant
Formerly : Vice-Chancellor, TNAU, Coimbatore
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MESSAGE

As an alumnus of the century-old and internationally reputed Agricultural College & Research Institute (AC & R I), Coimbatore, I am privileged to send my greetings and best wishes. When I was admitted to the College in 1943 by the then Principal Mr. P.V. Ramiah, I was one among the last batch of 48 students and one amoung a dozen of them who belonged to the present Tamil Nadu State. Being at that time the only Agricultural College in South India, students from different districts of the erstwhile Madras Presidency and the princely States of Travancore, Cochin, Coorg, Mysore and Hyderabad were also accommodated. The need for more professional agricultural graduates for extension work was increasingly felt and the very next year, in 1944, the admission strength in the college was doubled to 96 and subsequently the second Agricultural College in the Presidency came up at Bapatla. Today there are more than 20 Agricultural Colleges to serve the area earlier covered by the one at Coimbatore.

During 1943-46, the Second World War period, things were difficult in the College and its surroundings, but its surroundings, but we were fortunate in being taught by eminent Professors, including C. Ramasamy (famous Test Cricket Player of the time) and V.T. Subbiah Mudaliar in Agronomy, S.N. Chandrasekara Iyer and S.V. Parthasarathy in Botany, H. Shiva Rao and Kasiviswanatha Iyer in Agricultural Chemistry, P.N. Krishna Iyer in Entomology, T.S. Ramakrishna Iyer in Mycology, Variola Suryanarana in Economics and B.M. Lakshmipathy Mudaliar in Agricultural Engineering, setting high academic standards. The Agricultural graduates who passed out of the College were readily pressed into Government service in the districts. I was one among the three who were assigned for research and teaching work in the Agricultural College, in 1946, soon after I passed out. Thus I was privileged to work in the same College where I studied, which helped me to build up my academic career.

Again, when the Tamil Nadu Agricultural University (TNAU) was established in 1971 with the AC & RI as the center of activity it was my privilege as the Founder Vice-Chancellor to prepare a Master Plan for development of the University and with the College as its main campus and implement various new programmes. Thus the new Departments of Agricultural Microbiology, Environmental Biology, Seed Technology and Forage Crops came up and the pioneering institutions of Colleges of Horticulture, Agricultural Engineering and Forestry branched off with the AC&RI as the base.

While the erstwhile Faculty of the College consisted mostly of basic non-professionals, over a period of years, culminating with the establishment of the Agricultural University, almost the entire Faculty has been upgraded with highly competent professionals in various branches of specialization, with emphasis on front-line research in every branch of Agricultural Science. The contributions of AC & R I in teaching, research and extension education have helped the farmers of the State in being identified as among the most progressive in this part of the world. Today it is very well recognized that Agricultural Profession is no less important than Medicine or Engineering. I feel proud of my associations with such a great Institution from 1943 onwards, for nearly six decades.

I wish the Institution ever increasing progress and developmental activities through the past and present students and the staff of the College and Research Departments.

(G. Rangaswami)

Center for Development and Policy Studies

Dr. V. RAJAGOPALAN
Chairman CDPS &
Former Vice Chancellor
Tamil Nadu Agricultural University
Coimbatore, India

GREETINGS

I am happy the CENTENARY CELEBRATIONS OF THE AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, COIMBATORE are planned to run through 2005. It is a memorable occasion for the alumni of the Institution who are spread wide over the world carrying its mission successfully, and for the farmers of Tamil Nadu, Kerala and Andhra Pradesh states who were benefited by the research and training offered. It is also gratifying to note that AC&RI, Coimbatore, under the TNAU, leads the agricultural colleges in India and elsewhere through its dynamic, relevant academic programmes in excellence, besides decentralized and problem solving research to meet the challenges of emerging issues covering agricultural growth, development and trade, and changes for rural transformation which opens opportunities for better living in rural sector. While appreciating the great contributions of the Institute, we feel privileged to salute our alma mater for its service to Tamil Nadu and Indian Agriculture.

We remember at this august moment the devoted, selfless services of our scientists - past and present, to the cause of agriculture and record our gratitude for their significant contributions towards growth of agricultural sciences and ushering in scientific agriculture for the benefit of our farmers. We dedicate ourselves for the growth of this mighty institution for designing visionary programmes for agricultural and rural development. I wish to congratulate the members of the faculty and organizers for excellent arrangements for the Centenary Celebrations.

Thanjavur
November 15, 2004

V Rajagopalan
(V. Rajagopalan)

Geared to go Global

Sustainable Farm and Rural Development
S.JAYARAJ RESEARCH FOUNDATION

Dr. S. JAYARAJ

M.Sc.(Ag,), Ph. D., F.E.S.I., F.I.S.S., F.P.P.A.I., F.N.A.A.S., F.N.A.S.S
Chariman, SJRF
Former Vice Chancellor, Tamil Nadu Agricultural University &
Former National Professor, Indian Council of Agricultural Research

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prof_sjayaraj@hotmail.com

MESSAGE

I am very proud that I am a product of the famous Agricultural College and Research Institute, Coimbatore. The College has produced many stalwarts who have contributed quite substantially to the growth and development of agriculture at the state, country and global levels. With the thorough grinding in all aspects of theory and practice of' agriculture, the graduates from the College could excel in every field. The hard work of the most dedicated teachers and the excellent field and laboratory facilities at the undergraduate and post-graduate levels had resulted in producing a large number of well-trained graduates, which the country needed.

The unique presence of all major types of soils of South India and various systems of farming, and with the intensified and long-lasting interaction with the hard-working farmers of the region, who are second to none in the country, the scientists at the Institution were enabled to develop large number of improved varieties and hybrids of crops suited to varied situations and with better yield potential and quality. Pioneering research was carried out at the Institute and all its Research Stations across the state in crop and soil management, pest and disease management, agricultural engineering, horticulture, social sciences, etc. The College formed the nucleus to establish the Tamil Nadu Agricultural University, which became internationally renowned.

On this solemn occasion of Centenary of the great Institution, A. C. & R. I., Coimbatore, it is my proud privilege to salute my *Alma Mater* and wish and pray for many more contributions in the service of our farmers in the years to come. I also wish the present day torchbearers all success in their endeavours.

Chennai
June 4, 2005

(S. Jayaraj)

Dr. S. Sankaran
Former Vice Chancellor, TNAU
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MESSAGE

I am happy to learn that Tamil Nadu Agricultural University is organizing the Centenary Celebrations of the Agricultural College and Research Institute, Coimbatore during the year 2005.

I entered as a student of Agriculture College in the year 1955 when the student admission strength was 108 only. The candidates from other parts of South India (Kerala and Andhra Pradesh) were also admitted in the B.S., (Ag) degree programme making the class a really cosmopolitan and multilingual nature. Because of dedicated teachers, we could imbibe the value of hard work and dignity of labour from our practical classes. Interaction with students of different cultural background molded us in developing accommodative spirit and carrying out the assigned task in a team spirit.

My association with the Agricultural College and Research Institute spans over four decades (1955-1996), first as a student and later as a teacher, Head of the Department and Dean of the college. My service in the institution was a highly rewarding experience in my life. During this period, the college faculties have grown, students strength increased with concomitant achievements in academic and research fields. The college has become one of the best institutions in the country.

I feel elated and happy that I had and opportunity to serve in this great institution for over four decades and contribute for its development. I wish the Centenary Celebrations all success and pray for the continued growth of the College to achieve greater heights in the service of farming community.

(S. Sankaran)

Haji Prof Dr. A. ABDUL KAREEM,

B.Sc., (Ag.) M.Sc., (Ag)., Ph.D.,
Former Vice - Chancellor
Tamil Nadu Agricultural University

Kareem - Noor Cottage
No. 59, Khader Meera Street, Vandavasi - 604 408. Tamilnadu, India
Phone : 04183-227787, 225659 Cell : 9443294940

MESSAGE

Each and every one of the Alumni will be extremely happy on this occasion of the centenary celebration of the Agricultural College and Research Institute, Coimbatore of Tamil Nadu Agricultural University, during the year 2005. I am especially privileged to have associated with the college in one way or the other for 44 years from 1956 to 1999. I was most fortunate to participate / witness the celebrations of golden, diamond and platinum jubillees and the formation of the Agricultural University for Tamil Nadu and sooner the centenary celebrations too, with His grace.

As a second year B.Sc. (Agri.) student, I lived for one year in one of the ten blocks of six rooms (Room No.13) built in 1910 and I am also one of the first batch to occupy the first and the newly built 'Tamilzhagam' hostel (named by us only) in 1959 when I joined the first batch of M.Sc. (Agri.) course in Agricultural Entomology. Most of the Principals and Deans, since 1956, have handled classes and they were the born and dedicated teachers who guided and shaped us as the first generation devoted and dedicated teachers to serve after them.

Apart from the curriculum, the bondage between the learned and learning communities then, was the same as the relationship between the gurus and sishyas as in the ancient gurukulam system. The faith and fear of reverence to our teachers, brought laurels to everyone of us and to the Alma Mater alike. Our teachers' guidance during each and every hour we spent in the classrooms, laboratories, fields, educational tours, farm-training, hostel and student clubs were exemplary and then only provided the 'Light of Life' in our career, subsequently.

On behalf of our and every batch of colleges in A.C.&R.I., I as a former Student, Teacher, Researcher, Extension Specialist, Director and Vice-Chancellor of A.C.&R.I. and T.N.A.U., take this opportunity to place on record all our praise to our Alma Mater 'A.C. & R.I.' for several centuries to come and forever.

May the Almighty shower His Blessings on the Institution to be the torch bearer to those who seek wisdom and the light and way of life. Wishing everyone who toiled for the existence and growth of the A.C.&.R.I., all 'glorries' here and in Eternity.

Vandavasi - 604 408
January 1, 2005

A. Abdul Kareem

Indian Council of
Argicultural Research

Dr. MANGALA RAI
SECRETARY & DIRECTOR - GENERAL
Government of India
Department of Agricultural Research
& Education
Indian Council of Agricultural Research

MESSAGE

It gives me immense pleasure to know that the Agriculture College and Research Institute (AC&RI), Coimbatore of Tamil Nadu Agricultural University is celebrating its Centenary. The AC&RI has a glorious history, starting as an experimental farm in May, 1891, the College was established in January, 1905 at Coimbatore. The College shares a rich heritage for making contribution in scientific development of agriculture in India.

The AC&RI has significant achievements to its credit in research technology, transfer and human resource development. The College has released over 400 varieties of field crops, trees, horticulture crops and mushrooms and also has an impressive list of alumni. The country is proud of achievements and contributions made by National Agricultural Research System of which TNAU and its institute the AC&RI is a part, in transforming the country from food deficit to food secure State.

I congratulate Tamil Nadu Agricultural University and specially its Agriculture College and Research Institute, Coimbatore on its century long achievements and wish them success in their future endeavours.

New Delhi.
December 19, 2004

(Mangala rai)

Geared to go Global

जे.सी. कत्याल
उप महानिदेशक (शिक्षा)

J.C. KATYAL
Deputy Director General (Education)

भारतीय कृषि अनुसंधान परिषद
कृषि अनुसंधान भवन - II
पूसा, नई दिल्ली 110 012

INDIAN COUNCIL OF AGRICULTURAL RESEARCH
KRISHI ANUSANDHAN BHAVAN - II
PUSA, NEW DELHI - 110 012

MESSAGE

I am pleased to know that the Agriculture College and Research Institute (ACRI), Coimbatore of Tamil Nadu Agricultural University is celebrating its Centenary during 2005. The ACRI is one of the oldest pillars of our educational training efforts as it started building capabilities of young people in the filed of agriculture as early as 1868, then at Saidapat and as a college at Coimbatore since 1906.

The ACRI has significant achievements to its credit in both agriculture human resource development and technology generation. The college has an impressive list of alumini which includes nearly 4200 graduates and 4100 post graduates from within and outside India. On technology generation front it has released over 400 improved varieties of field crops, trees and fruits which have transformed the production and productivity scenario in the country, in general, and Tamil Nadu, in particular.

I congratulate the present and former faculty members, staff and students of Agriculture College and Research Institute, Coimbatore on this occasion and wish the ACRI a great future.

New Delhi
June 1, 2005

J. C. Katyal
(J.C. Katyal)

Indian Council of
Argicultural Research

Anupam Varma
National Professor
Advanced Centre for Plant Virology
Division of Plant Pathology
Indian Agricultural Research Institute
New Delhi - 110 012. India.

MESSAGE

I am extremely happy to learn that Tamil Nadu Agricultural University is celebrating the Centenary of the Agricultural College and Research Institute, Coimbatore.

Tamil Nadu has a long history of agricultural research and education Establishment of cotton farms of 400 acres each at Tinnevelly and Coimbatore in 1819, establishment of Experimental Farm at Saidapet 1865, which in 1876 became the College of Agriculture of offer 3 years' duration Certificate Course in Agriculture, and establishment of the Agriculture College and Research Institute at Coimbatore in 1907, which became the Tamil Nadu Agricultural University (TNAU) in 1971, are major land mark developments. Tamil Nadu Agricultural University has played a key role in developing trained human resource in the country and it has become a leading Centre for active agricultural research, education and extension for meeting the challenges of improving agricultural production in the country. It is a matter of pride, that since 1930, when post-graduate courses were started, over 4000 students have obtained postgraduate degrees in various disciplines of agriculture from the University.

The research efforts of the TNAU are directed to find practical solutions to the problems faced by farmers and to develop new technologies to modernize Indian Agriculture. The University has made remarkable progress in the development of science-based agriculture in the State leading to improvement in productivity and increase in agricultural production.

As a Member of the Board of Management of the University, it has been a great pleasure for me to be closely associated with the efforts of the University in improving agriculture in the country.

I congratulate the functionaries of the University for the Centenary of the Agricultural College and I wish the University greater successes in the years to come.

(Anupam Varma)

डा. एस. अय्यप्पन
उप महानिदेशक (मत्स्य)
Dr. S. AYYAPPAN
Deputy Director General (Fisheries)

भारतीय कृषि अनुसंधान परिषद
कृषि अनुसंधान भवन - II
पूसा, नई दिल्ली 110 012
Indian Council Agricultural Research
Krishi Anusandhan Bhavan-II
Pusa, New Delhi 110 012.

MESSAGE

I am happy to learn that the Agricultural College and Research Institute, Tamil Nadu Agricultural University is celebrating its centenary during January, 2005. The College over the century has immensely contributed to the agriculture in the country, with high level of human resources developed in different aspects. The Institution has also made its impact on the research spectrum of the country.

I compliment the Vice Chancellor and all the staff members of the University for the contributions and wish the celebrations all success.

(S. Ayyappan)

S. RAJAGOPAL, IAS
SPECIAL SECRETARY TO GOVERNMENT
AGRICULTURE DEPARTMENT
SECRETARIAT
CHENNAI - 600 009

MESSAGE

It is a matter of pride and happiness that the Centenary Celebrations of the Agricultural College and Research Institute, Coimbatore will be held in 2005. The institution has a long and glorious past and is now a part of the Tamil Nadu Agricultural University. The contributions made by this institution in the fields of agricultural education and agricultural research have been recognized and applauded by farmers and scientists all over the world. By releasing a large number of crop varieties that enabled a higher yield and displayed strong resistance to pests, the institute has been a friend of the farmer facilitating the complete capture of the benefits of the green revolution in Tamil Nadu. The laurels of the past are a source of inspiration for the future.

The challenges in the fields of agriculture are enormous. I am sure that the dedicated team of professionals currently serving the institution will pave the way for its continued growth and success and help the Government and the people to serve the farming community better.

(S. Rajagopal)

Geared to go Global

Dr. **S. MOHAMED GHOUSE**
Chief Engineer i/c.,
Agricultural Engineering Department
487, Anna Salai
Nandanam, Chennai - 600 035

MESSAGE

I as a member of Board of Management of Tamilnadu University, extremely happy about the great event of Centenary celebrations of the Agricultural College and Research Institute, is being organized by Tamilnadu Agricultural University, Coimbatore.

The Agricultural College and Research Institute, Coimbatore, is one of the oldest public schools to train young people Agriculture started in 1868. Students from all over India and abroad seek admission in this University.

AGRICULTURAL RESEARCH in Tamil Nadu has a very early start and made a visible mark on the development of scientific Agriculture, leading to increased Agricultural Production and Productivity. Due to the efforts of Research Scientists of Tamilnadu Agricultural University, we are using new implements in our Programmes.

Reclamation of Sand dune area in Nagapattinam District is being implemented by Agricultural Engineering Department in co-ordination with Tamilnadu Agricultural University. Similarly this department is co-ordinating with Tamilnadu Agricultural University in Remote Sensing, GIS, Farm Mechanisation, Watershed and Soil Survey under RSGY program in Sivaganga, Nagapattinam and Cuddalore Districts.

In plant training is being given to the Agricultural Enginerring Under Graduate students of Tamilnadu Agricultural University in Remote Sensing and GIS Research Center of Agricultural Engineering Department at Chennai and the Department is walking with TNAU with its endevour.

I am sure that the Scientists, delegates and officers who will gather at Coimbatore for the Centenary Celebrations will bring out valuable suggestions.

I congratulate the organizers of the centenary celebrations and wish them all success.

Chennai - 600 035
December 22, 2004

(S. Mohamed Ghouse)

மது. இராமகிருஷ்ணன்

வாழ்த்து

உணவின் பிறப்பிடம் மண் - அதை
உலகுக்களிப்பவன் விவசாயி
விந்தைகளின் பிறப்பிடம் மண் - அதை
விளைச்சலாய் மாற்றுபவன் விவசாயி
சக்தியின் பிறப்பிடம் மண் - அதை
தரணிக்கு அளிப்பவன் விவசாயி
தனக்கென வாழாதது மண் - அதில்
வாழ்ந்து காட்டுபவன் விவசாயி
உழைப்பின் பிறப்பிடம் மண் - அதை
உயர்வாய் கொண்டவன் விவசாயி
அதிசயத்தின் பிறப்பிடம் மண் - அதில்
ஆனந்தத்தை விதைப்பவன் விவசாயி
சாகசத்தின் பிறப்பிடம் மண் - அதை
சக்தியாய் மாற்றுபவன் விவசாயி
சாதனையின் பிறப்பிடம் மண் - அதில்
சாதித்துக் காட்டுபவன் விவசாயி
ஈகையின் பிறப்பிடம் மண் - அதை
இன்னுயிர்களுக் களிப்பவன் விவசாயி
சாந்தியின் விளை நிலம் மண் - அதை
சரியாய் உணர்ந்தவன் விவசாயி
கழிவுகளின் மறைவிடம் மண் - அதை
கருத்தோடு கையாள்பவன் விவசாயி

தாய்மையின் பிறப்பிடம் மண் - முதல்
சேயாய் மலர்ந்தவன் விவசாயி
மண்ணும் விவசாயியும் உலகின்
இரு கண்கள்
இந்தக் கண்களைக் காக்கும் இமைகளே
வேளாண்பல்கலைக் கழகங்கள்
தமிழ் மக்கள் பெற்ற தவப் பயனே
தமிழ்நாடு வேளாண்மைப் பல்கலைக்
கழகம்
இது உருவாவதற்கு
விளை நிலம் தேர்ந்தெடுத்த,
விதைவிதைத்த,
முளையிட வைத்த,
நீர் பாய்ச்சிய,
உரமிட்ட,
பாதுகாத்த,
வளர்த்து வருகிற
அனைத்து நல்ல நெஞ்சங்களையும் இந்த
இனிய வேளையில் நினைவுகூர்ந்து
பாராட்டுகிறேன். இது ஆல் போல் தழைத்து,
அருகுபோல் வேரூன்றி
வளர வாழ்த்தி, வணங்கி மகிழ்கின்றேன்.

மது. இராமகிருஷ்ணன்

Mrs. MINOTI ARAM
President &
Member Board of Management

SHANTI ASHRAM
Shanti Ashram Road,
Kovaipudur, COIMBATORE - 641 042.
Tamil Nadu, India.
Tel / Fax : (91) 0422 - 2607271, 2605550
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MESSAGE

I am extremely happy that the Agriculture College and Research Institute, Coimbatore, of the Tamilnadu Agricultural University is celebrating its centenary. It is one of the Agricultural Colleges in the country and has contributed much for the development of Agriculture in Tamilnadu.

The population of Tamilnadu has doubled during the last 50 years; the food grains production in our state has also doubled during the same period. This has not only resulted in self-sufficiency in food but also has created enough buffer stock for the people of our state. With the new sown remaining at 45% of the geographical area, the increase in food production could be made possible predominantly because of improved productivity of crops and high yielding planting material. The productivity of food grains. Which was 914 Kg/ha in 1950s increased to 2043 Kg/ha in 1990s. The research solutions provided by the Agricultural College and Research Institute stands out singularly in this significant achievement of food production in Tamilnadu.

The College has in the past undertaken the triple function of teaching, research and extension, which in itself is unique. The linkage between the college and the State Department of Agriculture has also resulted in valuable transfer of technology - from lab to land. It is worth mentioning that the college has produced eminent agricultural scientists including Dr. M.S. Swaminathan and continues to produce young scholars of good quality.

I congratulate the Agricultural College and Research Institute on completing 100 years of dedicated service again and hope that it will continue to play a vital role in societal development.

Minoti Aram
(Minoti Aram)

D. CHANDRAMOULISWARAN
Member, Board of Management
Tamil Nadu Agricultural University
Coimbatore

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வாழ்த்து

கோவை வேளாண் கல்லூரி கடந்த 100 ஆண்டுகளாக இந்தியப் பொருளாதாரத்தின் முதுகெலும்பான விவசாயத் தொழிலின் வளர்ச்சிக்கு சீரிய பணியாற்றி வருகின்றது. தொடர்ந்து மாறிவரும் சூழ்நிலைகேற்ப விவசாயத் தொழிலில் புதுப்புது தொழில் நுட்பங்களைக் கண்டறிந்து புகுத்தி வருகிறது. விவசாயம் மற்ற தொழில்களுடன் போட்டி போட்டு அவற்றிற்கு ஈடாக லாபகரமாக இயங்குவதற்குத் தேவையான தரமான தொழில்நுட்பக் கல்வியை வழங்குவதுடன் தலைசிறந்த விவசாய விஞ்ஞானிகளையும் நாட்டிற்கு அர்ப்பணித்து வரும் சீரிய பணியினைத் தொடர்ந்து ஆற்றிவருகிறது. கல்லூரி அதன் நூற்றாண்டு விழாவினைக் கொண்டாடி வரும் வேளையில் துணைவேந்தர் அவர்களுக்கும், கல்லூரித் தலைவர் அவர்களுக்கும், பேராசிரியர்கள், மாணவர்கள் மற்றும் சம்பந்தப்பட்ட அனைவருக்கும் எனது அன்பான நல்வாழ்த்துக்களைத் தெரிவித்துக்கொள்கிறேன்.

(தே. சந்திரமௌலீஸ்வரன்)

Geared to go Global

Dr. G. SAROJINI
Member Board of Management
Tamil Nadu Agricultural University
Coimbatore

MESSAGE

I convey my heart felt wishes on the occasion of Tamil Nadu Agricultural University, Coimbatore successfully completing 100 years of service in terms of teaching, research & successfully 100 years of service in terms of teaching, Research & Extension and celebrating Centenary. I understand that the beginning of this prestigious institution had historical and chronological strides before it attained the University status. The seed sown during British Regime has fully grown and developed into a Giant Tree with a big canopy. The university has educated and trained several thousands of young people in Agriculture, Horticulture, Agricultural Engineering and allied subjects by offering Under Graduate and Post Graduate programs leading to M.Sc and Ph.D., now engaged in assignments all over the world.

It is nice know the concerted Agricultural Research efforts in the University have remarkably contributed to Agricultural Growth by way of increased production and productivity by releasing several varieties of gereal grains, Pulses, Oil Seeds, Sugarcane, Fruits, Vegetables, Spices, Flowers, Plantation Crops, Cotton etc.,

I hope Tamil Nadu Agricultural University will strive to achieve the National Agricultural Goal and save people from Hunger and Malnutrition in the Country.

Hyderabad
November 17, 2004

G. Sarojini

(G. Sarojini)

A.D. JEYEM PANDIAN
Member Board of Management
Tamil Nadu Agricultural University
Coimbatore

MESSAGE

I am extremely privileged and happy that Centenary Celebrations of the Tamil Nadu Agricultural University will be held during the year 2005

Tamil Nadu Agricultural University has contributed by leaps and bounds to alleviate poverty and bringing about self sufficiency in food. India is at present embarked on the Second Green Revolution which will enable it to further increase its productivity in the productivity in the agricultural sector. By 2020 India would require to produce over 300 million tonne in view of population growth. The increase in the production would have to surmount many impeding factors has been well mentioned by our Honorable President of India Dr. A.P.J. Abdul Kalam, "Bridging the rural-urban divide, changes in Employment, Agricultural Produce to Marketing, Soil Upgradation, Quality of Seeds, Water Management, Agro-processing and Waste Management, Role of Information Technology, Tele-Consultancy, (Providing Urban amenities in Rural Areas) PURA concept, Ecconomic Connectivity for PURA Enterprise, and Business Plan for PURA are some of the areas in which we need to focus to realize the second green revolution.

Infact, I am happy to pronounce, Tamil nadu Agricultural University for more than two decades is involved in the above objectives by doing Research to reinforce the efforts of farmers for enabling enchancement of per hectare productivity and graduating to food processing near large farms and also marketing their products.

Finally we observe the 2005 as year of Centenary Celebrations of Tamil Nadu Agricultural College and Research Institute, symbolizing an end as well as a beginning signifying renewal as well as change. This is not merly a celebration of achievement but is a continuous process for enchancing agricultural productivity of our nation.

I salute those who have contributed to the growth of our University particularly erudite and eminent Vice Chancellors and their team during 100 years and also the Present Vice Chancellor Dr. C. Ramasamy a programmatic and unstinted scholar and his team.

Wishing the existing team bountiful success in all their endeavor.

"Nothing Succeeds like Success"

(A.d. Jeyem Pandian)

Dr. R. SARAVANAMUTHU,
M.Sc., M. Phil, Ph.D., P.G-DCA., Cert. MT(Intel), F.B.S.,
Reader in Botany
Member, Board of Management
Tamilnadu Agricultural University
Coimbatore

A.V.C. College (Autonomous)
Mannampandal - 609 305
Mayiladuthurai. (T.N.)
✆ : 04364 - 222264

MESSAGE

It gives me immense pleasure to learn that the Tamilnadu Agricultural University is going to celebrate its centenary celebrations from January 2005 onwards. Since the consummation of the prophetic idea of starting an agricultural school in the minds of Dr. Wright, with a scope for education in the science and art of agriculture and with the purpose of making the Indians to become useful occupants and well qualified cultivators, the first seed was sown with the formation of Experimental Farm in 1865, which has assumed the shape of the prestigious Tamilnadu Agricultural University with a global acclaim.

The institution has played a vital role in transforming the country from the pre-green revolution period of food dependency to the present status as one of the countries, which are self sufficient and exporters in food grains. Thanks to the untiring efforts and selfless services of the agricultural scientists, which made the country boastful and self reliant in food production. It is a noteworthy point that food security has always been the top most priority in the agenda of the University. The University can be proud of having produced more than 400 post graduates and scientists who are serving the cause of agriculture throughout the world and having released more than 400 new varieties in diverse crops.

We can not ignore the challenges before the farmers in the context of WTO. Knowing all the dimensions of the challenges, the University has worked out a future strategic plan and targeted it through education, research, training and extension. The farmers are being fortified and motivated towards precision farming, alternative crops and cropping, value addition, wasteland development and post harvest technology. I am sure that this University, as ever, will succeed in its endeavour in making the farmers and community as global competitors. The success is not far off because the goals and objectives are very high and the meticulous planning, involvement and dedication of the faculty, scientists, staff and students are incomparable.

With all humility I take this opportunity to salute all the farming scientists and teachers on behalf of the farming community and on my own behalf.

With regards, and good wishes.

(R. Saravanamuthu)

Dr. S.P. SUGIRTHAVATHI
Member of the Board of Management of
Tamil Nadu Agricultural University
79/264, Lakshmanaswamy Salai
K.K. Nagar, Chennai - 600 078

MESSAGE

With profound happiness I congratulate the Authorities of TNAU for celebrating the centenary of the University.

It is highly commmendable when we look back to the one hundred years of sincere hardwork with inspiration and motivation for the development and growth of the University.

I wish and pray that the TNAU continues to be one of the pioneering Universities in the World arena in research and Scientific developments in the field of Agriculture and Horticulture, the good results which ultimately reach the Agriculturists to solve their local problems with confidence.

Chennai
June 6, 2005

S.P. Sugirthavathi

P. சிதம்பரம், B.A. B.L., M.L.A.,
பவானிசாகர் தொகுதி
தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழக
நிர்வாகக்குழு உறுப்பினர்

21, எக்ஸ்டென்சன் வீதி
ரங்கசமுத்திரம், சத்தியமங்கலம் - 2
ஈரோடு மாவட்டம்
போன் : (வீடு) 04295 - 225299, 220646
(அலு.) 222985 செல் : 94430-20646

சென்னை:
C4C, புதிய எம்.எல்.ஏ. விடுதி
ஓமந்தூரார் அரசினர் தோட்டம்
சென்னை - 2 போன் : 044-25368302

வாழ்த்துச் செய்தி

தரணி போற்றும் தங்கத்தாரகை
இதய தெய்வம் மாண்புமிகு அம்மா! அவர்களின்
பொற்கால வரலாற்றில் நூற்றாண்டு விழா
காணும் வேளாண்மைப் பல்கலைக்கழகம்
ஆல் என தழைத்து
வாழையடி வாழையாக
திகழ்ந்திடவும் அகிலம்
போற்றும் வகையில் பல புதிய - புதிய
விவசாய - விஞ்ஞான கண்டுபிடிப்புகளை
கண்டறிந்து தமிழகத்திற்கு பெருமை
சேர்க்க வேண்டுமென மாண்புமிகு அம்மா அவர்களின்
ஆசியோடு வாழ்த்துகிறேன்.

19.5.05

(பி. சிதம்பரம்)

Prof. K.V. PETER
Vice-Chancellor
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MESSAGE

Greetings !

I received the folder elaborating the contributions of the Tamil Nadu Agricultural University during its 100 Glorious Years. Farming community of Tamil Nadu as well as nearby states including Kerala have been much benefited by the scientific technologies developed at your University. The University released several varieties, which are readily available to the farmers. During the 100th glorious years of TNAU, Kerala Agricultural University joins other Universities to wish further progress, success and contributions for the cause of farmers. Kindly convey my regards and respects to all the staff in the University.

K.V. Peter

Dr. M.S. PATIL
Director of Instructions (Agri)
College of Agriculture
Bijapur (Karnataka)

MESSAGE

I am very happy to know that TNAU has completed 100 years (1906-2005). On this occassion I convey my best wishes for Centenary Celebrations of TNAU.

M.S. Patil

SINCE 1906

Agricultural College, Coimbotore

Transforming lives of farmers

Agricultural College and Research Institute, earlier known as the Madras Agricultural College (MAC), had its genesis in Agricultural College, Saidapet in 1876, which was shifted to Coimbatore in the year 1905. Started with the laurels of improvement of Indian Agriculture by giving young men and women the knowledge of scientific agriculture, it continues to strive through the labyrinths of last century of second millennia and establishes itself as a keystone of Indian Agriculture.

The Research Institute building which housed the Agricultural College till 1922 was laid out with a handsome Hindu-Saracenic style building made of red table moulded brick in mortar and finely dressed cut stones with an impressive 75' clock tower atop in a sprawling campus of 500 acres in 1906

Agricultural College since 1922

Arial view of Agricultural College & Research Institute

by Sir Arthur Lawley, the then Governor of Fort St. George. The college was later in 1922 housed in a separate Freeman Building, with galleried class rooms and well equipped laboratories.

The first educational programme offered in 1908 by Agricultural College, Coimbatore was a two-year certificate course, "Licentiate in Agriculture". B.Sc(Ag) degree programme was introduced in 1920 with 8 students. The student strength increased from 8 to 48 in 1926, 96 in 1944, 108 in 1953 and 162 in 1956. During 2004-2005, a total of 400 students were admitted to B.Sc.(Ag.) program.

The Institute has emerged as a nodal centre for Agricultural Education and Research through development of high

Geared to go Global

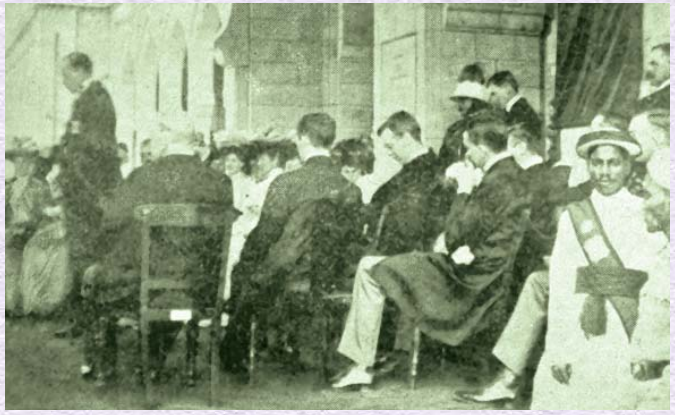
yielding varieties in various crops and management technologies keeping pace with the Green Revolution of 1960's.

The ever growing demand for agricultural graduates due to intensification of research activities, in diverse research fields like Agriculture, Horticulture, Animal Husbandry, Post Harvest Technology and Farm Machinery culminated in the formation of Tamil Nadu Agricultural University during 1971 with AC & RI as a germinal nucleus.

Continuing its path of progress in tune with the development of technologies and needs of the nation, focus was laid on specialization in agriculture and allied subjects. New degree programmes in Agricultural Engineering and Horticulture in 1972, Forestry and Home Science in 1980 and Biotechnology in 2002 were started to cater to the ever expanding manpower needs.

Milestones

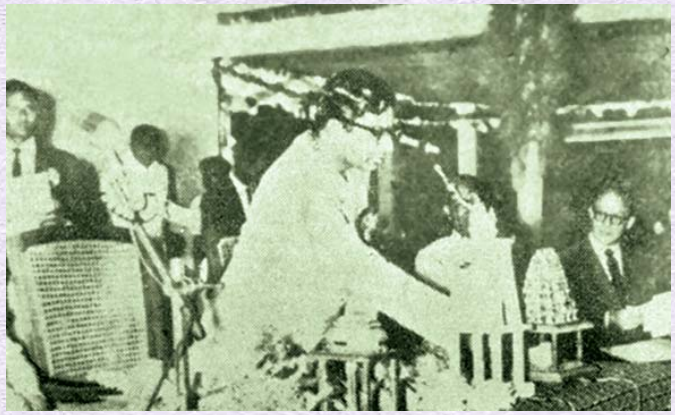
- 1876 Dawn of Madras Agricultural College, Saidapet with three year certificate course
- 1906 Founding of Agricultural College and Research Institute, Coimbatore and construction started



Dedication of AC & RI (1909)

President of India Dr. Rajendra Prasad - PG Block Foundation (1958)

- 1908 First Batch of students admitted to Licentiate in Agriculture
- 1920 Starting of B.Sc. (Ag.) three year course
- 1948 Certificate course in Horticulture commenced
- 1950 Fruit Specialist was shifted to Agricultural College and Research Institute, Coimbatore along with Diploma in Indian Horticulture (DIH)
- 1953 Introduction of six months intensive practical farm training in the third year of the course
- 1958 Separate postgraduate block constructed and PG courses started
- 1960 Launching of B.Sc(Ag) four year course
- 1965 Agricultural College and Research Institute guides India to green revolution
- 1971 Establishment of Tamil Nadu Agricultural University
- 1972 Degree programmes in Horticulture and Agricultural Engineering



Hon'ble Minister C. Subramaniam - Opening of Library Building (1961)

- 1980 Degree programmes in Forestry and Home Science
- 1998 Degree programme in Food Process Engineering
- 2002 B.Tech. programmes in Agricultural Biotechnology and Horticulture
- 2004 B.Tech. programme in Energy and Environmental Engineering

Hon'ble Prime Minister Pandit Jawaharlal Nehru and Smt. Indra Gandhi - Golden Jublee (1959)

RENDEZVOUS WITH INDIAN AGRICULTURE

Heralding A New Horizon In Agricultural Education And Research

The centenary Institute has been responding to the challenges of the nation stricken with a long history of famines and ever growing problem of feeding the millions through its constant endeavour in pursuit of food security. Dynamic efforts in frontiers of Education, Research and Extension throughout these

Hon'ble Chief Minister Thiru K. Kamaraj - Opening College Stadium (1963)

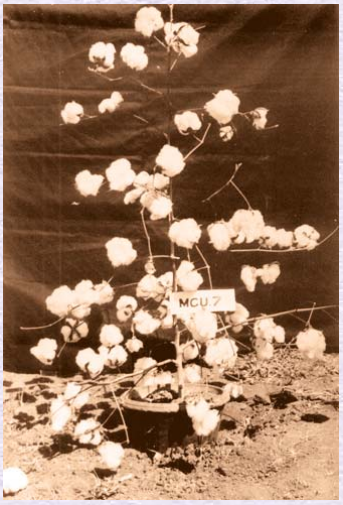
hundred long momentous years have revolutionized the Indian Agriculture. Here are the glimpses of its achievements.

Education

- The Institute has grown leaps and bounds in the last one hundred years to become top-notch center in agricultural education. The centenary Institute has produced 14,500 B.Sc(Ag) graduates
- The Institute, now has ten constituent institutions and two affiliated colleges and offers 9 Under Graduate programmes and 28 Post Graduate programmes.

- The distinguished alumni of the Institute have been manning the prestigious national and International Institutes and have been the mainstay of state Agricultural and Horticultural Departments.
- The Institute has championed the cause of women by enrolling more than 50% of women candidates every year in all degree programmes and carefully nurtured training programmes for farm women to make them torch-bearers of agricultural education.
- The Institute organizes a series of crop scientists' meet, scientific workers' conference, regional research and extension councils by involving researchers, government extension officials and stakeholders viz., farmers, agro industrialists and entrepreneurs.
- The Institute has drawn students from all over India and abroad for its degree programmes. Students of this Institute have been securing top notch positions in Junior and Senior Research Fellowship examinations of ICAR, CSIR, ASRB and UPSC.

Landmark Rice variety GEB 24



MCU 7 Cotton

CO 1 Chilli

- The basic and applied training given at this Institute have moulded the agricultural graduates competent and efficient and it is no wonder that the alumni of this institute are occupying distinguished careers in internationally reputed research institutes, world bank and a host of foreign universities and MNCs.

RESEARCH

Crop Improvement Technology

- Agricultural College and Research Institute has been in the frontline of agricultural research in the country. Development of 516 agricultural, 170 horticultural and 2 tree crop varieties stands testimony to its commitment to farming community at large.
- Strenuous research efforts coupled with effective dissemination of technologies propelled the productivity level in rice from 1800 kg per hectare during first quarter of last century to 5000 kg /ha during the turn of the century. Landmark varieties such as CO 2, GEB 24 and TKM 6 stood the test of the time and cultivated widely by farmers. This

CO TH 1 Hybrid Tomato

institute also played a crucial role in the successful introduction of IRRI varieties like IR 8 and IR 20 and by developing 150 rice varieties, which augured well for reaching self sufficiency in rice production in the country.

- 129 millet varieties in sorghum, bajra, maize and other minor millets, have transformed the dryland agriculture in the state.
- The Institute has embraced the Mission Gold for enhanced oilseed production with the release of notable varieties like Ground nut VRI 2, VRI 3, Gingelly VRI 1 and Castor CO 1.
- The Institute has developed 170 varieties in vegetables, fruits, flowers, spices and aromatics. Splendid varieties viz., Tomato CO 3, Chillies CO 1, Papaya CO 2 are a few notable among them.
- Release of varieties in Sugarcane Co.C. 6304, Co.C.671 has given new impetus to the Sugar industry.
- The Institute played a pivotal role in the introduction and development of Hirsutum Cotton. Madras Combodia Uganda varieties like MCU 5 and MCU 7 have given a fresh lease of life to the textile industry.
- The Institute has been the chief source of seed material of improved varieties and hybrids of crops to the farming community. Seed production unit is well equipped to undertake breeder seed programme in 150 varieties/ hybrids of 20 crops at present.

Crop Production And Management

- Over the past 100 years the centenary institute has completely overhauled management technologies for field and horticultural crops by introducing innovative concepts like soil reclamation, foliar nutrition, decision support system for integrated fertilizer recommendation, biodynamic organic farming for hill crops and vermi-composting.
- This Institute has made headway in establishing state model precision farming unit in Tamil Nadu with the assistance of government, which changes the economic scenario of backward districts.
- The centenary Institute has been making lasting impression in the field of integrated pest management and host

Co C 6304 Sugarcane

Noble Laureate Dr. Norman Borlaug, Dr. G. Rangaswami and Dr. R.K. Sivanappan (1973)

plant resistance with innovative internationally acclaimed research findings and new ground in the field of nematology through its findings on golden nematode of potato in the country.

- This Institute also pioneered in the field of microbiology and bioregulators. Remarkable contributions include standardization of protocol for mass multiplication techniques for biofertilizers like Azospirillum, Mycorrhizae etc., PGPR and antagonistic agents such as Trichoderma viride and Pseudomonas fluoresens and edible mushrooms.

Madras Agricultural Students Club - Illuminates (1960)

Leveraging Farm Mechanization

- The Institute has developed excellent farm machinery tools and equipments to remove drudgery and facilitate farm mechanization. To date, it has developed 124 farm machinery tools and processing equipments to shape the farm mechanization in the country.
- Tremendous progress has been made in bio-energy sector with the devising of bio-generators using farm wastes, biodiesel extraction plants, solar energy devices and low cost cooling chambers for vegetables and fruits.

Students' celebration ...

- Custom made low cost irrigation gadgets, development of micro-irrigation and fertigation devices, in-depth studies in water use efficiency and water requirement of different crops, has contributed a big way in alleviating the water scarcity problem in agriculture.

Human Resource Development

- This Institute has been selected as the Centre of Excellence with institution of Center of Advance Studies in disciplines like Agronomy, Entomology, Plant Breeding and Genetics and Microbiology to train the Nation's Agri Science Teachers and Scientists.

Racing to be Global

- The Institute has been making forays in the fields of biotechnology, bioinformatics, food processing and post harvest technology by building up strategic tie-up with international institutions like Ford Foundation, Rockefeller Foundation, Mc Gill University, Guelph University, MSU, Cornell, etc.
- Human Resource Development par excellence through overseas linkages and the teachers keep themselves abreast of the latest trends and technologies.

Taking Technology To Farmers

- A complete integration of agricultural research and extension brought out effective transfer of technology from lab to land and vice versa. Effective utilization of mass media and publication of need based extension literature have made agricultural extension a success story in this part of the country.
- Tamil Nadu enjoys excellent listenership in farm broadcasting, thanks to the perfect co-ordination of AC&RI and network of research stations with the AIR stations.
- Conducting training programmes and demonstrations has been the lifeline of its extension programme through a network of Krishi Vigyan Kendras and Plant Clinic Centres. Emphasis is given for entrepreneurship training in beekeeping, mushroom production, vermicomposting and sericulture as a means of rural reconstruction.

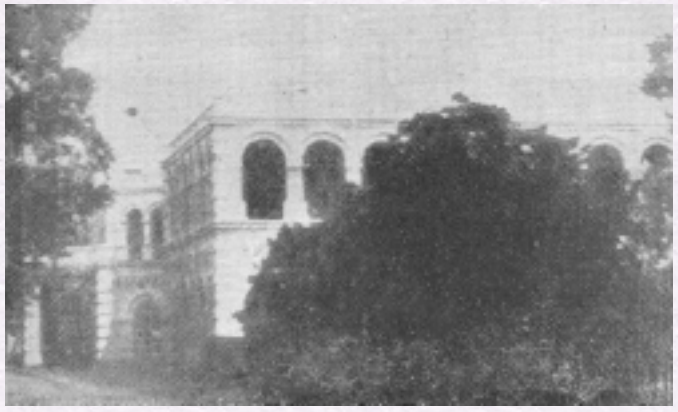
Catching up with Gene Revolution

- The Institute is equipped with infrastructure and know-how for creating a gene revolution in the country. It is making steady progress in the rice transformation technology and is on the way to produce the first transgenic rice of the nation. Besides, the excellent infrastructure of biotechnology tools are used to train students, teachers and scientists.

Working Towards Globalization

- The Institute has undertaken in-depth studies relating to production economics, agricultural finance, marketing and rural development.
- Since pre-independence era, governments have, for several years, appointed honorary visitors to agricultural college to get non-official opinion to bear upon the agricultural policy of the government.
- Tamil Nadu is considered one among the developed States in the country in terms of agricultural production and productivity. The unique position enjoyed by the state is understandably to a very large measure due to the concerted research efforts of this institute over hundred years.
- The institute continues to strive hard in shaping the agricultural policy of the governments and enactment of laws and rules for the betterment of the global farming community.


THE ROOTS



Madras Agricultural College, Saidapet - 1876

Staff of Agriculture College and Research Institute (1909) with J.W. Shepperson, the First Principal, Dr. C.A. Barber and Dr. W. H. Harrison

Staff of Agriculture College Saidapet (1903) with Walter Keess and S.L. D'Silva

Staff of Agriculture College and Research Institute (1909) with J.W. Shepperson, the First Principal, Dr. C.A. Barber and Dr. W. H. Harrison

Laying the foundation stone in 1906 by Sir Arthur Lawly, Governor, Fort St. George

Agricultural College (Freeman Building) - 1922

The Glass House funded by the Rockfeller Foundation

Millet Breeding Station since 1922

Agricultural College (Freeman Building) in 1935

Thiru Nehru, being taken round 'Follow his steps'!

Thiru Nehru, inaugurating the Golden Jubilee building by pressing the button

Panditji writing in the Visitors' Book of the Agricultural College and Research Institute

Thiru P. Kakkan, Minister for Home and Agriculture delivering his Presidential Address

Dr. R.W Cummings, Field Director, Rockfeller Foundation, New Delhi addressing the gathering and declaring open the glass house

The Emblem of the Tamil Nadu Agricultural University is being unveiled by Hon. Minister Thiru K. Rajaram (1971)

Thiru M. Karunanithi inaugurating the Tamil Nadu Agricultural University (1971)

First Convocation of TNAU (1972)

Thiru S. Subramanian, Secretary of the Madras Agricultural Students' Union garlanding the chief guest Hon. Minister Thiru S.J. Sadiq Pasha

Thiru M.G. Ramachandran, Hon' Chief Minister of Tamil Nadu at TNAU (1978)


UNIVERSITY LIBRARY

2003 ம் ஆண்டு நடைபெற்ற 24-வது பட்டமளிப்பு விழாவில் தமிழக முதல்வர் மாண்புமிகு டாக்டர் ஜெ ஜெயலலிதா அவர்களுக்கு "பெருமை சேர் அறிவியலார்" என்ற பட்டம் அளிக்கப்பட்டது

THE SEEDS

Geared to go Global

C. Ramasamy

The past is the foundation for the future. Thereby, the glorious past of Tamil Nadu Agricultural University (TNAU) commenced with the establishment of the **Agricultural College and Research Institute** (AC & RI) and the Centenary Celebrations are observed during the current year. The history of AC & RI can be divided broadly into three phases –as a School, College and University. From an agricultural school that trained young people on agriculture at Chennai, the institute became a College subsequently at Coimbatore, and finally it was elevated as a University. At present, TNAU is rated as the number one Agricultural University in the country for its excellence in Education, Research and Extension.

Keeping up its tradition, the vision and mission of TNAU at all times are fuelled by the government policies, emerging societal needs and the global agricultural scenario. Lyndon B. Johnson once told, "We can draw lessons from the past, but we cannot live in it". Likewise, dynamism is seen in every activity and function of the University with the education, research and extension activities undergoing profound changes over the 100-year period. In fact, we are at present living in a time line that separates the past from the present. Earlier, the focus of the University activities was in line with increasing agricultural production, more than anything else, whereas, the face of Indian agriculture has undergone drastic changes since then. With the achievement of food security, the focus has now shifted to organized production, processing, marketing and export. Therefore, in recent times, the University places much emphasis on agri-business, commercial farming, market oriented agriculture, export agriculture, agri-preneurship, biotechnology, environmental science, contract farming, collective action, gender issues, computer applications and related areas. In order to gain a global advantage, TNAU has become a borderless institute; open for collaborative or joint ventures in different fields.

The 21st century is designated as the century of the mind. Accordingly, the educational system of TNAU places much emphasis on building the practical knowledge and skills of the students on science and technology of agriculture. So much so, the B.Sc. programmes focus largely on the science dimension, while the B.Tech programmes centers chiefly on the technology and application aspects. Quite recently the B.Tech. (Agrl. Biotechnology) and B.Tech (Energy & Environmental Engineering) programmes were introduced, which are seen to be in much demand among the students community. Besides technical knowledge, familiarity on Management and Information Technology is also considered essential, and therefore such

courses have been included in the curriculum. At postgraduate level, courses such as Bioinformatics, Biochemical Technology and Microbial Technology have been newly added at Masters level mainly to expose the students to the emerging areas.

The value of an educational institute is basically the career prospects and how well its graduates are employed. Therefore, TNAU meticulously prepares its students for jobs in different sectors such as public, private, NGO, banks, Information Technology, Civil Services, Entrepreneurship and Consultancy.

TNAU takes the credit of launching a dual and convergent mode of education termed as "Open and Distance Learning" (ODL) systel of education for the first time in the country. The ODL aims to provide educational opportunitites to scores of rural people who lack access to regular education in agricultural colleges, mainly to develop their entrepreneurial skills for self-employment.

As far as research is concerned, precision farming, transgenic crops, hybrids, bio fuel crops, medicinal crops, computer assisted soil fertility management, micro irrigation, watershed development, greenhouse technology, post harvest, food processing, alternate cropping systems, waste recycling etc., are the main thrust areas of research pursued at the University.

Research is also underway to develop new varieties of *Jatropha curcas* (bio fuel crop) with high yielding potential and oil content. Evaluation studies are also being undertaken on sweet sorghum and sugar beet varieties, which have potential for yielding ethanol. The University is involved presently in an action research for the Neyveli Lignite Corporation (NLC), to carry out studies for establishment of agricultural crops on mine spoil and for stabilization of mine spoil slopes by means of silvipasture techniques.

Extension is one of the strong points of TNAU with its network of Krishi Vigyan Kendras, Plant Clinic Centres, Communication Centres etc. A project funded by Tamil Nadu Government is presently being implemented at Dharmapuri district in order to demonstrate the value of precision farming horticultural technologies on selected vegetables in farmers' holdings. Projects on video conferencing to network TNAU with the villages for transfer of technology, establishing community radio sets, and an Agricultural Leadership Programme to train food processors and traders are on the anvil. The University has also tied up with TICEL (TIDCO Centre for Life Sciences) Park, Chennai for conducting research on biotechnology, offering trainings on plant molecular biology and biotechnology besides providing biotechnology services.

Bertrand Russell once told, "Science may set limits to knowledge, but should not set limits to imagination". Therefore, much importance is given to Human Resource Development (HRD) activities in TNAU whereby, there is continuous upgradation of knowledge among the Faculty. So much so, a conducive atmosphere prevails in the University that encourages creative thoughts and activities without any restriction. In short, the clear vision, sound leadership at different levels, higher organizational commitment and greater degree of scientific temper are the main factors that govern the superior performance of this University and helps to propel it to greater heights of success. The future looks promising for agricultural growth and development wherefore the University is fully prepared to face the future challenges and to play a significant role especially at the global level. And thus, in this 21st century, TNAU is truly ***Geared to go Global***.

Vice-Chancellor
Tamil Nadu Agricultural University
Coimbatore

100 Years of Agricultural Education in Agricultural College and Research Institute, Coimbatore

R. Krishnasamy and S. Kombairaju

Genesis

Sir William Denisan, the then Governor of Madras Presidency wins the credit of having awakened a practical interest in agriculture in Tamil Nadu as early as 1863. He presented a note to the Council drawing attention to farming factors like continuous cropping, deficiency of manure and the use of cowdung as fuel, defective implements, lack of trees, poor cattle and hence the urgent need for want of accurate knowledge and statistics in agriculture. After careful assessments, an order was placed in England for an elaborate consignment of agricultural implements as means of stimulating interest in agriculture. To find a use for these implements, 350 acres of land in Saidapet, a place about five miles from Madras, were set apart in 1864 and a committee of amateur enthusiasts organized a full scale trial and exhibition of the agricultural implements received from England and undertook to run a trial of artificial manures and an exhibition of the improved system of agriculture for the benefit of the people. As the committee had little knowledge of the local conditions, its first efforts did not succeed. So, in 1868, a full-fledged public agricultural school was started for the purpose of training young people in different branches of agriculture. The school was transferred to the control of the Director of Public Instructions in 1884, so that academic programmes could be suitably developed and controlled. At the close of the year 1905-1906 the control of the school was transferred to the reorganized Department of Agriculture.

The Government then decided to shift the Saidapet Agricultural School to Coimbatore since this tract represented all soil types and was more amenable for educational purposes than Saidapet. The foundation stone for the Madras Agricultural College and Research Institute was laid in Coimbatore on 24th September, 1906 by the then Governor of Fort St. George, Sir Arthur Lawley. The first Director of Agriculture was put in charge of Agricultural Research and Education for the whole of Madras Province, which included the present State of Tamil Nadu and parts of the present States of Andhra, Kerala and Karnataka.

Academic Programme

Students were first admitted into the Agricultural College at Coimbatore in 1908 for an educational programme leading to

Licentiate in Agriculture (L.Ag.). The Agricultural College and Research Institute was opened by Sir Arthur Lawley on July 14, 1909. In 1920, the college was affiliated to the Madras University and a new course of study leading to a degree in Agriculture, B.Sc. (Ag.) was introduced. To start with, only eight students were admitted for the three year degree course, the qualification for admission being a pass in the Intermediate examination with 11 years of study in school and two years of Intermediate before entering the Agricultural College, thus bringing the total duration of study for an Agricultural graduate to 16 years. The number of students admitted to the college gradually increased from eight (in 1920) to forty eight (in 1926). The strength increased further to 96 (in 1944) 108 in 1953, 162 in 1956, 293 (in 1975 - 76), 570 (in 1985 - 86), 434 (in 1995 - 96), 471 (in 2002 - 03) and 487 (in 2003 - 04). A second Agricultural College was started in 1945 at Bapatla (now in Andhra Pradesh) and a third college in 1965 at Madurai to cope with the vast expansion and intensification of agricultural activities in Tamil Nadu. A four year integrated B.Sc. (Ag.) course was started when the one year Pre-University course came into existence in 1960 thus maintaining the total duration at 16 years for first graduation in Agriculture. In 1971, the Agricultural College and Research Institute at Coimbatore and Madurai became part of the newly established Tamil Nadu Agricultural University.

Post - graduate education in Agriculture was started in 1930 when the University of Madras recognized the Agricultural College, Coimbatore as a centre for M.Sc and Ph.D degrees. When the Government of India set up a team of Indian and American experts to offer recommendations for strengthening agricultural research and education in India, this Institute was an obvious choice as one of the five 'Regional' Centres for recognition as first- rate post-graduate centre. The Government of Madras readily agreed to establish in 1958 a Regional Post-graduate Training Centre at the Agricultural College and Research Institute, Coimbatore. This centre, started initially with four branches of specialization, grew steadily offering Post graduate programmes in eight subjects viz., Agronomy, Soil Science, Plant Breeding and Genetics, Horticulture, Entomology, Plant Pathology, Agricultural Economics and Agricultural Extension. Then, another centre was started in 1969 at the Agricultural College, Maduari, which was affiliated to the Madurai Kamaraj University. Doctoral program was introduced in 1973 in Horticultural College and Research Institute, Coimbatore.

Further Developments

The Agricultural College at Coimbatore was separated from the Research Institute in 1922. The foundation stone for the Freeman building was laid on June 30, 1922 by the Governor of Madras, Lord Wellington of Ratton and was opened in July 1926 by Viscount Goschen of Hawkhurst, the then Governor of Madras. In 1942, research and teaching sections were integrated. A post – graduate diploma course in Horticulture of one year duration was started under the auspices of the Madras Government (Agriculture Department) in 1984 which was affiliated to the Madras University in 1953. The course was intended primarily to train the agricultural graduates employed already in Government sections of Horticulture. The course was discontinued from 1957. The oldest Agricultural College in the Country, which is none other than the Agricultural College and Research Institute, Coimbatore became the germinal nucleus for the growth of the Tamil Nadu Agricultural University.

Agricultural College and Research Institute, Coimbatore is on its path of progress in tune with the development of technologies in the nation and felt the need of specialization in agriculture and allied subjects. New degree programmes in Engineering, Horticulture in 1972, Forestry in 1980 were offered. Degree Programmes in Horticulture and Agricultural Engineering were started with an intake of 20 and 40 students respectively. Subsequently the intake for Horticulture was increased to 40 and for Agricultural Engineering to 50. Thus, with the starting of the College of Agricultural Engineering, the Faculty of Agricultural Engineering began functioning in 1972 with four departments viz., Soil and Water Conservation, Farm Machinery, Agricultural Processing and Agricultural Structures.

New Masters Programs

Realizing the importance of environmental research, masters program was initiated in Environmental Biology in 1975. Recognizing the importance of Agri-business in agricultural development, a post- graduate diploma course in Agricultural Business Management was started in 1976.

Masters and Doctoral program in Agricultural Engineering was introduced in 1977 at the College of Agricultural Engineering, Coimbatore. Masters and Doctoral programs were started in Environmental Sciences and Biotechnology in 1978.

Masters program in Agricultural Marketing Management (AMM) was started in the year 1982. Masters program in Business Management (MBM) was started in the year 1988 and the course was renamed as Master of Business Administration (MBA) in 2002.

Masters Programme in Sugarcane Production Technology was commenced in 1989 which attracted candidates working in the sugar factories not only in Tamil Nadu but also in neighbouring states like Andhra Pradesh and Karnataka. To strengthen the administration of PG programme conducted in different campuses, a separate post of Dean, Post Graduate Studies was created in 1979.

The name of ' Post Graduate Studies ' was changed as " School of Post Graduate Studies " from 2001. Taking into account the changing needs new three courses in master's program viz., Agricultural Meteorology, Bioinformatics and Biochemcial Technology were started in 2004 as self supporting courses. As on date, Agricultural College and Research Institute offers masters programme in 28 disciplines and doctoral program in 23 disciplines.

Students from all over India and abroad seek admission in college. Students from Kerala, Andhra Pradesh, Karnataka, Kashmir, Assam, Manipur, Sikkim, Meghalaya and Nagaland in India; Nepal, Thailand, united Arab Republic, lraq, Iran, Mauritius, Sri Lanka, Kenya and Malaysia seek admission.

The number of students admitted in each discipline varies from time to time as decided by the University. In 10 years from the inception of TNAU, the number of master's degree holders has more than doubled while it has increased five fold in the case of Ph.D. In order to upgrade the competencies of the staff of the University, the Tamil Nadu Agricultural University has permitted its staff members to carryout masters and doctoral programmes on part time basis since 1972. To enable the staff members to bestow adequate attention to their studies especially in doctoral program, the university has developed as 'internal deputation' scheme since 1980. Apart from part time and internal deputation, staff members were deputed for doctoral / post doctoral programmes in other Universities under Faculty improvement programme by granting study leave.

After 1990, the admission of the International students both to masters and doctoral programmes was done through ICAR and ICCR. Till 2004, totally 10 International students from Ethiopia, Syria, Vietnam, Sudan, Nepal and Sri Lanka have completed masters and doctoral programmes. Presently 15 foreign students from Ethiopia, Syria, Vietnam, Sudan and Sri Lanka are pursuing their masters and doctoral programme in various disciplines.

System of education

Trimester system of education was followed from the inception of University with 70 working days.

A judicious combination of course work with theory and practicals, seminars and term papers was the pattern of instruction for the master's program. The seminars were particularly designed to stimulate initiative and creative thinking and above all to improve the ability of coherent presentation of data in support of hypotheses developed out of the study. The 'term paper ' was meant to train the student in the selection, preparation and presentation of scientific topics. The important requirement of the master's program was the preparation of dissertation, embodying the results of original research carried out by the student. This provided the student with a valu-

able professional background for his career as a research worker. At the end of two academic years, the masters students appeared for their final examination consisting of both written and practical tests. The examiners were specialists drawn from different parts of India. The Ph.D program continued to be a whole time research study for three years supervised by a guide.

When the Tamil Nadu Agricultural University assumed control of the agricultural education and research in Tamil Nadu, it took steps to introduce the trimester system of teaching both for masters and doctoral program in 1972. This system combines the best of the early systems like direct teaching, seminars, term papers and practical exercises and the best of the trimester system like minimum course work and minimum overall credit performance and personal responsibility. Internal evaluation is done based on course – credit system. As in the old system, dissertation of original research work submitted by the student at the end of the academic programme is evaluated by experts from other Institutions in the concerned field of specialization in India for the award of the degree.

Based on the experience gained, feed back information and common system of Agricultural Education motivated by the ICAR, semester system of teaching both for masters and doctoral courses were introduced from 1992 onwards.

Courses and Syllabi

In formulating the new courses for the Undergraduate degree programme, a thorough revision of the syllabi has been made so as to bring the students closer to the latest developments in Agriculture in India and also to provide more practical basis in learning – teaching. Education in agriculture includes intensive theoretical and practical training in Agronomy, Agricultural Botany, Soil Science and Agricultural Chemistry, Plant Pathology, Agricultural Economics, Agricultural Entomology, Horticulture, Animal Husbandry, Agricultural Extension, Agricultural Engineering, basic Sciences like Physics, Chemistry and Mathematics, Statistics, Rural Sociology and Language communication. Students are also required to engage them-

selves in production programmes like cultivation of a series of crops in wet lands and garden lands; in addition they have educational tours to research stations in the State and elsewhere as well. The courses in Horticulture lay emphasis on principles of cultivation of fruits, vegetables, spices, plantation crops, floriculture, ornamental gardening, fruits and vegetable preservation.

Falling in line with the policies of the University and ICAR, the curricula and syllabi are revised periodically by the Board of Studies for Agriculture. The syllabi for all the courses are revised once in four years. The total number of applied courses was increased from 21 in 1980 to 50 in 2003 and the number of basic courses was reduced from 50 in 1980 to 18 in 2003.

From 2003 - 04, cafetaria style courses were introduced and of the total 150 credit hours, core courses and cafetaria style courses share 130 and 20 credit hours respectively. The core courses include 27 % fundamental courses, 20 % technical courses, 20 % management and social courses and 33% applied courses. The cafetaria courses included management courses, technical courses, entrepreneurship and skill oriented courses.

The course curricula for undergraduate programme is revised in such a way to accommodate new areas of agribusiness, export, diversification of agriculture, IPM, IPNS, biodiversity, environmental sciences, biotechnology, bioinformatics, GIS, Computer applications, biostatistics etc., Introduction of specialized courses in agri export business, quality control, value addition and product development, market trends and intelligence , World Trade Agreement, TRIPS etc with a major focus on generation of a competent breed of 'Technology Agents' as job creators.

Agricultural education to the social need

The practical component has received particular emphasis in the overall curriculum. In line with this, the commercial agricultural courses are included in the curriculum on a wide range of broad – based potential areas, namely, seed production, mushroom culture, hybrid seednut production technology, broiler poultry production technology, nursery techniques, commercial production of tissue culture plants, production of biocontrol agents, cut flower production and trade, etc.,. In addition to these, a number of "earn while you learn" projects are also available for students. The "Village Stay Programme" is also included in the curriculum. Besides a number of in-service and refresher training courses are organized by the Directorate of Extension Education in collaboration with various public and private organizations related with development.

Commercial agriculture

In order to infuse self - confidence to start agri - business, a course on Commercial Agriculture is offered. A total of seven courses viz., Mushroom Production, seed production, Biopesticide Production, Horticultural Nursery Technology, Broiler Production and Food Processing Technology were offered. These courses come under team teaching. In each course, the teachers of the concerned discipline will cover the technological part in detail. The terminal five classes are utilized for

preparing the feasibility report, business plan. The experience gained in this course, as it is observed, provides a precise and thorough knowledge of understanding on the economic feasibility of the various avocations.

Village Stay Programme

In 1960s intensive farm training for a period of six months after completion of the degree programme was offered in B.Sc. (Ag.) curriculum with the assistance of the development departments. However the programme was dispensed, as there was a very heavy demand for graduates to serve in the government organizations. The training period was also felt long. After the lapse of two decades, the programme was re - introduced in the name of village stay programme for one month period. Similar programme is being followed in Andhra Pradesh Agricultural University.

To gain rural bias, the final year students of B.Sc.(Ag.), B.Sc.(Horticulture), B.Sc.(Forestry) are placed in different villages for a period of one month throughout Tamil Nadu. The students are divided into groups of six and each group is attached to a progressive farm family selected in the districts of Coimbatore, Salem, Erode and Dharmapuri. The students during their stay are involved in studying the rural social structure, rural resources, infrastructure available for the supply of inputs and marketing, etc. The students understand and learn the indigenous farm practices. They learn the use of various extension teaching methods in communicating technologies to the farming community. The students study in depth, the aspects of farm planning with respect to small, medium and large farms.

Agro - industrial tie up programme

Agro - industrial tie up programme is also included in the new syllabus. The credit load is 0+1. The students will be attached to nearby Agro - industries where they are expected to learn the technology involved, management aspects, procurement of new materials and sale of end products.

Economic survey

The students acquire direct experience on the economic survey through three different courses viz., i) Farm Management ii) Agricultural Marketing and iii) Agricultural Finance. In this survey, the students are given opportunities to enquire and collect data on farm business activities including cost of culti-

vation inventory, Credit requirements and the Levels of indebtedness, and individual commodity marketing survey in respect of all agricultural crops. These courses offer an understanding to the students as to how the cultivation and marketing of agricultural produce are remunerative and profitable.

Experiential Learning

The undergraduate students learn theory and practicals in various departments and at different periods of time. To give a comprehensive knowledge and understanding of the application of various technologies at farm level, the students are given plot cultivation experience in the third year. Each student is assigned with five cents plot in which the students practice various technologies from seed to harvest, apply them in his own plot and finally he works out the cost of cultivation. The profit he/she gets from his/her plot cultivation goes to the students as incentive. This plot cultivation exercise is given both in wetland and upland farming through three seasons. The students also get a direct experience on the various problems and constraints in farming from farmers' point of view.

Educational tour

The students are taken on educational tour to various agriculturally related institutes in Tamil Nadu during their second and third year B.Sc. (Agri.). During their final year of study, the students are taken to important agricultural institutes at National level. In this study tour, the students learn various cropping pattern under varied agro-climatic and agro ecological conditions followed in different parts of Tamil Nadu and India. They are fully exposed to soil types and socio-economic status of farm families.

The Institute has made tremendous progress for the past 100 years in diverse arena of agriculture. The concerted efforts of the Agricultural Scientists and the students take the fame of the Institute to greater heights. The Institute produces farm graduates with a potential to challenge the world.

Dean, Agriculture College and Research Institute
Dean, School of Post Graduate Studies
Tamil Nadu Agricultural University
Coimbatore-641 003

Education, Research and Extension Policies of Tnau

Dr. N. Raveendran

Education

Education modules of Tamil Nadu Agricultural University have been consistently modified to prepare graduates to meet the emerging global challenges. University offers undergraduate programme in agriculture, horticulture, forestry, home science and agricultural engineering apart from self-supporting courses like B.Tech. in Food Process Engineering, Horticulture, Agricultural Biotechnology and Energy and Environmental Engineering. The course curricula of the programmes have been accordingly modified to infuse practical skills to the students. Periodical revision of syllabus is undertaken by the university inviting the experts from the other universities to keep abreast of knowledge. To impart training while learning and develop entrepreneurial skill each courses are designed with practical component and multi-disciplinary approach. The university also offers commercial course like mushroom cultivation, nursery preparation, poultry production, production of bio-pesticides, bio-fertilizers, bee keeping etc. and these courses are periodically reviewed and updated based on the changing demand scenario in the job market.

The undergraduate programme is designed in such a way that the undergraduate students are learning from the farmers' field for which the university has implemented a three month village stay programme namely Rural Agricultural Work Experience programme (RAWE) for which a strong monitoring mechanism is developed to expose the students to the practical problems. With an interface with private firms the students are exposed to various specialized subjects and trainings are being provided to students on management and computer skills. The university has also designed a policy for interfacing with field functionaries like progressive farmers, the government development departments, NGOs. They are invited to the university to interact with students about opportunities available in agricultural front and students take up assignments with firms of present importance. University has started a Directorate of Students Welfare to look into the students' job career. The directorate periodically invites private, public and non-governmental organizations to the university and they conduct on - campus interview for appointment of the students.

Masters degree programmes in 22 disciplines and Doctoral degree programmes in 20 disciplines (Agriculture and allied) are being offered by university. Apart from major and minor courses, optional courses are introduced to provide flexibility to the students in choosing their courses based on their field of research and interests. This helps the postgraduates become specialists in their respective field and for seeking specialist jobs. To educate the student community both by theory and practice and to keep them abreast of the global technology, the syllabi of the courses are periodically reviewed and updated and new postgraduate programmes are being introduced based on the demand. TNAU, in a collaborative mode, encourages the post graduate students to take up their thesis research at National and International research institutes on frontier areas namely biotechnology and molecular biology, agricultural meteorology, environment agriculture, integrated nutrient management, integrated pest management and socio-economic research. University has formulated a student exchange

programme with the Western Universities in which TNAU students visit western universities and students from western university also visit TNAU for collaborative research and teaching.

Research

In Tamil Nadu, the yield levels of major crops have already reached a plateau in certain cases, water resources have become more scarce, the gross cropped and gross irrigated area are marginally decelerating with stable cropping intensity (hovering around 120 per cent) and the era of scarcity has given rise to the era of market-surplus which has to be marketed successfully internally and externally. To meet these challenges TNAU is reorienting its research programmes towards the goal of maintaining tempo of self sufficiency in food production and exploring the agricultural potentials of the state for export of agricultural produce and thus improve the rural economy of Tamil Nadu. The University encourages multidisciplinary research for addressing the problems of farming community. More emphasis is given to development, production and dissemination of hybrids of various crops to break the yield barriers. Research in precision farming is given due weightage in research resources allocation. To meet the demand and supply gap the university is focusing on improving production and productivity of pulses in the rice fallows of Cauvery Delta regions of Tamil Nadu. With a view to have balanced application of fertilizer and manures and to optimize the field of individual crops, the University allocates sizeable resources for popularizing the Integrated Nutrients Management (INM) methods. Researches on dry land agriculture, wasteland development and agro-forestry have been intensified.

Research on transgenics (Bio-Technology) QTL mapping of genes for insect resistance are also intensified. Research focus is also on integrated pest management to develop more cost-effective methods and devices. To provide marketing intelligence and information to the farmers, a marketing intelligence cell was created in the university and the cell periodically supplies price information through electronic media to the farmers. Similarly, weather forecasting is also undertaken by the University for the benefit of the farmers. In cognizance with the changing environment, research has been reoriented to suit the taste and preferences of the international markets particularly in vegetables, fruits, flowers and medicinal plants. Research programmes have also been focused on value added products and post harvest technology. To discuss and evaluate the on going research programmes for their social relevance and identify new emerging research areas, University conducts Scientific Workers Conference and Crop Scientists Meet periodically. Experts cutting across the different disciplines of the University, development departments, policy makers and farmers participate in the above said forums. The monitoring mechanisms of the research programmes were completely decentralized for effective implementation of the research projects.

Agricultural Research, Education and Extension attracts meager public resources presently and less than one per cent of AGGDP is invested in agricultural research, education and extension, which is far below as compared to developed coun-

tries. Of the total expenditure, the cost towards salaries contributes around 65 per cent. So the major challenges for the university will be to find adequate resources to sustain and expand their activities. University is making serious efforts to strengthen its resource mobilization and keeps improving the infrastructure and to upgrade the human resources on a continuous basis.

The university is generating resources from the private/ international and national funding agencies through interface and MoUs. The scientists are motivated to propose research projects on frontier areas for resources mobilization. The university also brought in the consultancy project mode for encouraging the scientists to provide consultancy services on cost basis. The University has introduced a novel plan of venture capital to support the research stations for their own fund generation and bring competitive environment in the university. In the university Planning, Monitoring and Evaluation Cell (PME) was set up to train the Research Managers for judicious use of resources and prioritizing their research activities under the resource crunch situations. The administrative set up of the university was completely computerized to reduce cost and improve the delivery system. University undertakes large scale production of seeds and vermicompost for generation funds. Mass production of bio-pesticides and bio-fertilizers are also being undertaken by the university to promote environmentally sustainable agricultural technologies. University is interfacing with the State Government in agricultural policy formulations. Agricultural Policies in Tamil Nadu are being prepared based on the emerging challenges and presented to the Government for implementation.

Extension

The Directorate of Extension Education of TNAU is primarily responsible for expeditious transfer of the latest technologies emanating from various research programmes of TNAU to the farming community and extension personnel of the State Agricultural Department, through its Krishi Vigyan Kendras, Plant Clinic Centres, Communication Centre, Training Division, Institution – village Linkage Programme and Integrated Village Development Programme. Details on agro-climatology, weather forecast, market intelligence are provided through TNAU website. For periodical dissemination of technologies and developing a strong partnership, TNAU participate in the monthly zonal workshops conducted by the Department of Agriculture and the outcome of the workshops are being hosted in the TNAU website for the benefits of the farmers, technocrats and extension personnel. With the collaborative partnership, trainings, demonstrations and dissemination of technologies through mass media are being undertaken. The University has implemented certificate courses to non-formal groups like input dealers and open distance learning programmes for the school drop outs and farmers.

Director
Center for Rural Development Sudies
Tamil Nadu Agricultural University
Coimbatore - 641003

Tamil Nadu Agricultural University Administration - Organizational Setup

Dr. S.D. Sundar Singh and Dr. P. Subbian

The Tamil Nadu Agricultural University (TNAU) came into being on June 1, 1971. However, it had its genesis from establish-ment of an Agricultural School at Saidapet, Chennai, Tamil Nadu, as early as 1868 and it was later relocated at Coimbatore in 1906. TNAU assumed full responsibilities of Agricultural Education and Research and supported the State Agricultural Department by delivering research products. Till 1946, the Agricultural College and Research Institute, Coimbatore, was the only Institute for Agricultural Education for the whole of South India. In 1958, it was recognized as a Post-graduate Centre leading to Masters and Doctoral degrees. The Agricultural College and Research Institute, Madurai was established in 1965. These two colleges formed the nucleus of the Tamil Nadu Agricultural University when it was established in 1971. The Tamil Nadu Agricultural University came into existence on 1-6-1971 through a State Act with the following objectives:

a) to impart education in different branches of agriculture and applied sciences as the University may determine.

b) to further the advancement of learning and prosecution of research in agriculture and allied sciences, and

c) to undertake the extension of such sciences to the rural people in co-operation with the concerned Government Departments.

As defined in the Act, the term AGRICULTURE is taking to encompass basis and applied sciences of the Soil and Water Management, Crop Production including Production of all garden crops, control of plant pests and diseases, Horticulture including Veterinary and Dairy Science, Fisheries, Forestry including Farm Forestry, Home Science, Agricultural Engineering and Technology, Marketing and Processing of Agricultural Animal Husbandry Products, Co-operation, land use and Management and Economic and Social uplift of the rural people. The University's common seal is designed to bring out the salient aspects of agricultural education, research and extension in Tamil Nadu. Under the aegis of the State symbol 'Temple' is presented by the lotus which symbolizes prosperity. The plough stands for cultivation, the fish and fisheries, the tree for forestry, the bullock for animal sciences, the tractor for agricultural engineering and the lamp for home science. The green background to the lotus symbolizes agricultural prosperity and

the sun, true to its radiating influence on all these components of agriculture, is at the center. The two earheads of paddy surrounding the crest signify the importance of rice crop in Tamil Nadu. The motto of the University is expressed in three words *Uzhuvom* (till), *Uzhaippom* (toil) and *Uyarvom* (triumpth).

Currently the research work are carried out at Coimbatore Campus by the Faculty of Agriculture comprising the departments of Agronomy, Agricultural Meteorology, Soil Science and Agricultural Chemistry, Agricultural Entomology, Plant Pathology, Crop Physiology, Seed Technology, Plant Nematology and Animal Husbandry. Under Plant Breeding and Genetics the departments of Rice, Cotton, Pulses, Oilseeds, Millets, Forage Crops and Seed Science and Technology are functioning. The Centre for Agricultural and Rural Development Studies consists the departments of. Agricultural Economics, Agricultural Extension Education and Agricultural Rural Management. There are five Advance Centres of Excellence in the faculties of Agricultural Microbiology, Agronomy, Plant Breeding and Genetics and Entomology.

The Faculty of Horticulture has the departments of Olericulture, Pomology, Floriculture, Spices and Plantation Crops and Food Science Technology.

Faculty of Agriculture Engineering is having the departments of Soil and Water Conservation, Farm Power and Machinery, Agricultural Processing and Bio-Energy.

The Directorate of Plant Molecular Biology has the departments of Plant Molecular Biology and Bio-Technology, Bio-Chemistry and Agricultural Microbiology and Environmental Sciences.

The Directorate of Plant Protection Studies consists of departments of Agricultural Entomology, Plant Pathology, Plant Nematology and Sericulture.

MANAGEMENT

Authorities of the University

The authorities of the University shall be the Board of Management, the Academic Council. the Board of Studies of each faculty and such other bodies of the University as may be declared by the statutes to be authorities of the University.

Board of Management

The Board of Management is the top most and policy making body of the University. The Board of Management has 16 members, where the Vice-Chancellor is the Chairman and the Registrar is the Member Secretary.

The Powers and Duties of the Board shall be to consider and review the financial requirements and approve the annual financial estimates of the University and provide for the administration of any funds places at the disposal of the University for the purpose intended. It also arranges for the investment and withdrawal of funds of the University; and powers to borrow money for capital improvements and to make suitable arrangements for its repayment. It helps to acquire, hold and dispose of property on behalf of the University, to determine the form and provide for the custody, and regulate the use, of the common seal of the University, and to appoint such committees, either standing or temporary, as it may consider necessary and specify the terms of reference thereof subject to the provisions of this Act and the Statues. It will determine and regulate all questions of policy relating to the University in accordance with the provisions of this Act and the Statutes. The Board of Management gives financial provision of the instruction, teaching, research, advancement and dissemination of knowledge in such branches of learning and courses of study as may be determined by the Academic Council. It provides for the establishment and maintenance of college, hostels, labo-

ratories, experimental farms and other facilities necessary for carrying out the purposes of the Act, and also provide for the institution and conferment of degrees, diplomas and other academic distinctions. It also provides for the institution, maintenance and award of scholarships, fellowships, studentships, medals, prizes and; to accept trust, bequest, donation and transfer of any movable or immovable property on behalf of the University. It helps to enter into contract on behalf of the University; and to exercise such other powers and performs such other duties not inconsistent with the provisions of the Act or the Statues as may be necessary for carrying out the purposes of Act.

Academic Council

The Academic Council shall be the academic authority of the University and shall, subject to the provisions of this Act and the Statues, have the control and general regulation of teaching and examination in the University and be responsible for the maintenance of the standards thereof.

Powers and Duties of Academic Council

The powers and duties of the Academic Council shall be to exercise general control on teaching and other educational programmes and maintain and promote the standards thereof and to make regulations and amend or repeal the same. It also gives decisions on the admission of students to the University and the number of students to admit and courses of study leading to degrees, diplomas and other academic distinctions and the conduct of examinations and maintenance and promotion of standards of education. It also advices the Board on all academic matters including control and management of libraries and make recommendations to the Board for the institution of Professorship, Associate Professorship, Assistant Professorship and other teaching posts including posts in research and extension education and in regard to the duties thereof. It has a say on formulation, modification or revised of schemes for the constitution or reconstitution of department of teaching, research and extension education. Recommends to the Board regarding Post-graduate teaching, research and extension education. To make recommendation to the Board for the conferment of honorary degrees or other distinctions.

All the authorities of the University shall have power to continue or reconstitute committees and to delegate to them such of their powers as they deem fit, such committees shall, save as otherwise provided, consist of members of the authority concerned and of such other persons, if any, as the authority, in each case, may think fit.

Research And Extension

Research Council

The Research Council shall be the policy making body on Research in the University. The Constitution of the Research Council shall be as follows :

The Vice-Chancellor shall be the Chairman and the Director of Research shall be the Secretary to the Research Council. The Director of Research shall also be the Co-ordinator for the research activities of the University and the Controlling Officer of the Research Stations located outside the College Campuses in the regions concerned and the Deans of the Colleges / Directors of the University shall be responsible for conduct of research in the various departments and research stations located in the college campuses / regions concerned. The term of office of the nominated members shall be three years and maybe extended by another term by the Vice-Chancellor in respect of item (xv) and with the approval of the Pro-Chancellor in respect of item (xv). The Research Council shall meet at least once in six months to identify priorities, approve the programmes of the activities and to review the research activities of the University.

Extension Education Council

The Extension Education Council shall formulate the policies and broad outlines of Extension Education activities to be carried out by the University in co-operation with the concerned Government Departments.

The Vice-Chancellor shall be the Chairman and the Director of Extension Education shall be the Secretary to the Extension Education Council. Term of office of the nominated members shall be three years and may be extended by anther term by the Vice-Chancellor with the approval of the Pro-Chancellor. Extension Education Council shall meet at least twice a year to approve the programme of activity and to review the Extension activities of the University.

The University has been functioning under the able administrative set up and has set laurels in the administration. The useful services rendered by the administration have created healthy, glorious traditions left behind us to emulate. The University will march with zeal and vision to bring a one more sustainable green revolution in agriculture sector to feed each and every individual born in this country. The University has been placed as one of the Institute among the Indian Agricultural Universities by the International Bodies.

Registrar
Joint Registrar
Tamil Nadu Agricultural University, Coimbatore - 641 003

Research Activities of TNAU

Dr. S. Ramanathan

The Tamil Nadu Agricultural University has a long tradition of notable contribution for agricultural research in the country. The research programmes of the University are field oriented, location specific, time bound and demand driven to develop continuously appropriate technical know-how to meet the requirements of the farming community in all seven agro-climatic regions of Tamil Nadu state. The research programmes are spread over the seven teaching campuses and 32 research stations indicating its substantially expanded and organized education, research and extension infrastructures.

The Directorate of Research was established in June 1971 to co-ordinate all research activities in TNAU and to administer / monitor the activities of Research Stations situated in different parts of Tamil Nadu. Consequent to the formation of the Directorate at Tamil Nadu Rice Research Institute, Aduthurai, areas in Tamil Nadu has been divided into Region I and Region II. The 13 Research Stations coming under Region I are under the technical & administrative control of Director of Research, TNAU, Coimbatore and 12 Research Stations under Region II are under the technical and administrative control of the Director, TRRI Aduthurai. Horticultural Research Stations numbering seven are under the technical & administrative control of Dean, HC & RI, Coimbatore.

The research activities primarily relate to crop improvement, crop management and crop protection of Agricultural and Horticultural crops. Research is also carried out in Agricultural Engineering, Water Technology, Social Sciences, Sericulture, Bio-technology, Forestry and Food Science and Nutrition, Bassed on the research accomplishments and realizing the need for further improvement, Centres of Excellence have been established by bringing allied departments under one roof for effective co-ordination and inter disciplinary approaches. The projects are formulated with a time framc to develop / generate varieties / technologies that will help the farming community. Due to decentralization, the schemes, research sub-projects etc. other than Region I are monitored by the concerried University Officer / Directorate

The research programmes are implemented through schemes funded by various agencies as detailed below:

Funded by	No. of Schemes	Rs. In Lakhs
ICAR Partly Finariced	64	973.78
ICAR Fully Financed	88	53.03
Govt. of India	74	743.55
Private Agency	107	393.65
Foreign Agency	45	254.91
Plan	124	1509.34
Non-Plan	126	5393.86
Total	628	9322.12

Identification of Research problems

The research Council is the policy making body on research in the Faculties and Research Stations of the University. The Vice-Chancellor is the Chairman of the council and Director of Research acts as a Member-Secretary. The problems for research are identified during the discussion in, monthly zonal work-

shops of each districts, TOT centres, Statewide Farmers Interactive meeting, Farmers' Days in various campuses and Research Stations, State Research and Extension Councils and State Scientific Workers' Conference in Agriculture, Horticulture, Agricultural Engineering, Forestry and Sericulture where extension functionaries of the state development departments and scientists of the TNAU and in instances farmers industrialists. NGOs also participate and deliberate on various issues concerning agriculture.

After identification of the various problems, the problems are prioritized and based on the prioritization and availability of scientific manpower, project proposals are formulated for initiating research by obtaining funding through various funding agencies.

Monitoring and evaluation

The progress of the on-going research projects is monitored by the Professor and Head of the Station / Department in the monthly technical meetings. The Half Yearly Progress Reports of the research projects prepared by the Project Leader and sent to the concerned Director or Dcan are referred to the Technical Directors / Load Scientists for comments. Suggestions / comments offered by them are communicated to the Project Leaders for their follow up.

The Director of Research and Technical Directors during their visits to the Research Stations / College campuses monitor the progress of the research projects and provide guideline to the project leaders in their research pursuit.

TNAU is conducting Crop Scientists' Meets every year for various crops viz., Rice, Millets & Forage crops, Pulses, Oilseeds, Cotton, Sugarcane and palms. These meetings are organized by the Directorate of Research. In these meets, scientists of different disciplines working in the particular crop are participating. The main aim of htis meet is to review the progress of research work done and to fine tune the future programmes to meet the requirments of chancellor, the Director of Research and the Technical Directors / Deans monitor and evaluate the progress of the research projects during discussion with the project leader and identify technologies for adoption / OFT. Thrust areas are also identified during these meets.

Dissemination of outcome of Research

The Project Leaders publish the findings from their research projects in various National and International journals which are valued greatly by the scientific community. They also publish popular articles in Journals, Agri Magazines and Newspapers for the benefit of the farming community.

The Directorate of Research and Directorate of Planning & Monitoring publishes the TNAU Research Highlights and Annual Report respectively and provide copies to National and International Institutes / organizations for dissemination of research information.

The Scientific Workers' conference is being held every year. Different Scientific Workers' Conferences conducted in TNAU (upto 2002) have been combined and a combined Scientific Worker's Conference is being held at TNAU, Coimbatore from 2003 onwards. This is an unique gathering of scientists of all

faculties of TNAU, Officials from Departments of Agriculture, Horticulture, Agricultural Engineering, Forestry and Marketing to discuss on various issues relating to Agriculture. Horticulture, Agrl. Engineering, Forestry and Marketing. The research findings identified during different Crop Scientists' Meets from research projects which have been categorized as (a) for adoption and (b) for on-farm testing are presented in the Annual Scientific Workers' Conference for transfer of technology. Besides, the new crop varieties, implements and management technologies released every year are also being displayed in the exhibition for the benefit of department officials and visiting dignitaries. This conference is being organized by the Directorate of Research.

The research findings are incorporated in Crop Production Guide every year to update the technologies in this basic and reference document which is used at all levels in the state for improving the agricultural production and productivity. During the monthly Zonal meetings, Field days and Farmers' days conducted in different districts / centers, the research findings are passed on for adoption. It is also put in the TNAU website www.tnau.ac.in for the benefit of the stakeholders.

Research Achievements

The Britishers deserve to be complimented for having laid the foundation of Agrl. College & Research Institute, Coimbatore in a place endowed with different soil types exceedingly suited for working on various crops grown in the tropics. From 1906 to 1971, the Coimbatore Agricultural College and Research Institute served as the nerve center to promote scientific research activities organized throughtout the State with the assistance of outlying research stations and provided sound education in agriculture.

Since 1971 with the setting up of the TNAU with its headquarters at Coimbatore Agricultural College, the organizational structure and various activities of this institution have been greatly modified to suit the present day demands and future needs of the society. Research capabilities have been greatly strengthened by providing required laboratory equipments and otherfacilities. Research efforts have been reorganized with a sharp focus on field problems and interdisciplinary approaches. Regional research capabilities have also been upgraded and suitably linked with the Coimbatore institute. Along with intensification of biological research activities, efforts have been taken to strengthen research programmes on Post-harvest technology, Socio-economic environs, agrobased industries etc. As a result we are now better poised to serve the cause of agriculture in an efficient manner.

1. Adoption of different breeding techniques have resulted in the development of 686 crop varieties in Tamil Nadu.

a. Agriculture		**b. Horticulture**	
Rice	150	Fruits	28
Maize	08	Vegetable Crops	84
Millets	129	Flowers	19
Pulses	89	Spices	16
Oilseeds	61	Plantation crops	10
Cotton	33	Medicinal Plants	01
Sugarcane	29	Aromatic plants	01
Forage crops	15	**C. Tree species**	02
Green manure	02	**d. mushroom**	09

In crop production in recent times, there is a shift in plant breeding with more emphasis on the development of hybrids. The Government Policy emphasizes the need for popularization of hybrid rice cultivation in Tamil Nadu. Coimbatore and Erode districts are identified as most suitable places for producing hybrid seeds of CORH 2 and ADTRH 1 rice hybrids. Exploitation of hybrid vigour has also been attempted in crops like, cholam, cumbu, maize,

redgram, sunflower, castor, coconut, cotton, forage crops, vegetable and fruit crops. Many hybrid cultures are under evaluation. Through transgenics in biotechnology, mapping of genes for insect resistance were done. Sugarcane clones resistant to red rot disease have been identified and evaluated under field conditions. More than 400 species of very high value medicinal plants are maintained in the herbal garden established in HC & RI, Periyakulam, Yercaud and Pechiparai.

2. Apart from new crop varieties, 124 improved farm implements / equipments (for operations like ploughing, puddling, sowing, harvesting, cleaning, spraying, extraction of seed / oil, chaff cutting, biogas / biodiesel production etc.) have also been released for the benefit of the farming community.

3. Research on crop management and crop protection and location specific research on management practices was undertaken in the TNAU centers situated in different agroclimatic zones of the state. This resulted in the development of several new crop management and crop protection technologies for the benefit of the farming community. Most important technologies are :

- INM packages for various crops
- JPM technologies for major crops
- Rice - direct seeding
- Seedling throwing in rice
- Biofertilizers for vatious crops
- Micro nutrient application
- Neem cake blended urea
- Enriched farm yard manure
- Gypsum application to groundnut / castor
- Integrated farming system
- Bioremediation of polluted sites
- Bio-composting of solid wastes of industries and coir waste
- Foliar application of urea / DAP in pulses
- Fertigation for yield maximization in sugarcane
- TNAU coconut tonic
- Decision support system for integrated fertilizer recommendation (DSSIFER)
- Site specific Nutrient Management (SSNM) for intensively rrigated rice
- Polyethylene film mulch for irrigated groundnut
- TNAU Vermi Bio-compost
- Bio dynamic organic farming system for hill crops in Nilgiris
- High density planting in banana
- Fertigation in banana
- Affordable micro irrigation system
- Rice hybrid seed production technologies
- Modified drum seeder for rice
- Biocontrol agents for pest / discase management
- Mass production technology of the biocontrol agents Trichoderma viride & Psudomonas fluorescens.
- Two in one model trap for pulse beetle monitoring in storage.
- Biodynamic organic farming system for hill crops under the Nilgiris ecosystem
- Developed technologies for value addition
- Established norms and procedure for rain water harvesting
- Developed methodologies and procedure for recharging gound water through abandoned wells

Taking into account the failure of monsoon resulting in measgre flow in the rivers and main canals of Tamil Nadu, new alternative cropping pattern have been developed. Importance is given

to research programmes on waste land development by undertaking research on fruit trees and bio-fuel sources suitable for waste land. TNAU has demonstrated under farmers field condition that yield of rice fallow crops can be increased by adopting recommend technologies and it is encouraged by giving prizes to three farmers who produced higher yield in blackgram.

The agricultural scenario in Tamil Nadu has changed fast with new problems and challenges. Taking into account the shrinking land and water base for agriculture in Tamil Nadu coupled with increased demand for agricultural commodities due to increased population, increased agrobased industrics and the emerging scenario of vast export potential necessitating attention on post-harvesting etc., the Government of Tamil Nadu announced many developmental policies for bringing Tamil Nadu to number one position in India in all spheres. Some of these well thought out measures are :-

- Use of abandoned wells for rainwater harvesting
- System of rice intensification for increased productivity and improved input use efficiency.
- Maximization of rice yield in rainfed areas
- Development of agro techniques for bio-fuel crops such as *Jatropha curcus*, Sweet Sorghum, Sugar-beet etc.
- Non-chemical methods of pest control
- Eco-friendly management of waste water
- Documentation of "Low cost" and "No cost" agro technologies for dry tracts.
- Promotion of export oriented agriculture
- Subsidiary farming activities such as mushroom, apiary etc.
- In Dharmapuri, vegetables under the Tamil Nadu Precision Farming Project.

Breeder Seed Production

TNAU is involved in production and distribution of breeder seeds of high yielding crop varieties to the State. Dept. of Agriculture and private Seed Producers, so as to multiply further and supply to the ultimate user groups for getting high yields, in major crops in the state. The seed production activities have been strengthened so that quality seed supply could be ensured to the extent possible.

Venture Capital Scheme

Venture Capital Scheme is being implemented to encourage scientists to take up production oriented projects to generate income to the University and provide employment to graduates and post graduates of the University and also to provide quality seeds, placing materials and other inputs to the farmers.

Thrust Areas of Research

The vision for agricultural research is be demand driven. The University consciously realizes the need to derive maximum benefit out of each unit of investment made. Research activities are more focused on society's needs and will continue to

address basic issues of human life such as poverty, food security and better livelihood.

Crop Improvement

- Evolving varieties for improvement in quality and productivity with inbuilt resistance for biotic and abiotic stresses
- Evolving location–specific and economically viable improved varieties of crops.
- Evolving hybrids with consumer preferred qualities.
- Collection and conservation of land races and enriching the germplasm of different crop varieties besides utilizing in breeding program
- Genetic improvement in forages and fodder crops to increase the biomass and quality.
- Identification and exploitation of available bio-fuel yielding species (sweet sorghum, jatropha, surgarbeet etc) and evolving improved varieties.

Bio-technology

- Production of transgenic crops
- Marker aided selection of genetic Traits
- Characterization of antiviral proteins
- Isolation of genes for pest and disease resistance and other abiotic stresses.

Crop Management

- Organic matter build up of soil-vermi-composting and waste recycling
- Identifying effective biofertilizers and bio-inoculants
- Integrated farming system approach to suit various agro-climatic zones with emphasis on optimization of resource use for farm development
- Developing integrated crop management practices to improve productivity and profitability
- Reorientation of research on water saving technologies and developing related devices.
- Wasteland development
- Standardization of agrotechniques for growing biofuel yielding, tree species / crops
- Evolving appropriate technologies for promoting agro-forestry and social forestry
- Research on post harvest technologies like product development, processing, storage, increasing shelf life and keeping quality and value addition
- Research on dryland agriculture and identifying appropriate technologies for improving productivity of dryland crops.
- Organic farming and precision farming

- Developing machinery, implements and tools suitable to Indian farming situations.
- Research on use of agro-energy and recycling of farm wastes
- Developing suitable strategies for doubling crop yields in the state
- Developing alternative cropping strategies for extreme conditions of severe drought, moderate drought and normal monsoon in all the seven agro climatic zones of Tamil Nadu State.
- Research on agri-inputs and exports emphasizing quality standards
- Agri-business management research and agricultural policy research
- Participatory research and extension approaches with farmers and agri-businesses to facilitate the development of appropriate technologies and to reduce the time lag involved in the diffusion of innovations, so as to improve the impact on agricultural production. The operations research may have its own renaissance.

Crop Protection

- Identification of bio-control agents, bio-pesticides, bio-fungicides to combat pests and diseases
- Developing IPM packages for various crops

Conclusion

In the past, research system in TNAU has risen upto the expectations of the Nation. Now with a clear vision, the tasks will be within the realm of realization. Major areas such as crop improvement, management, protection, natural resource management, environment science, socioeconomics, horticulture, dryland agriculture, mechanization and food science will be closely examined periodically before new research programmes are initiated. Time and resource limitations dictate prioritizing research activities. Accordingly, the research activities have been prioritized in a such a way to achieve the growth rate of 4 per cent in Agriculture and 8 per cent in Horticulture.

Director of Research
Tamil Nadu Agricultural University
Coimbatore

Extension activities of Tamil Nadu Agricultural University

Dr. G. Doraisamy

Introduction

Indian agriculture has come a long way from subsistence farming to commercial agriculture and in transferring itself to exploit opportunities opened up in world markets. In the new millennium, the most remarkable transition in agriculture is resource and science based technology transfer system. The extension orientation until mid 60's was mainly attributed to the overall importance given in the Community Development, National Extension Services and Intensive Agricultural District Programme. Until 1960's Agricultural Extension was purely a function performed under the guidance of the State Departments of Agriculture, the main extension agencies of the country. The Indian Council of Agricultural Research (ICAR) became involved in extension activities in 1966 with National Demonstration Programme.

The State Agricultural Universities (SAUs) had initiated training programme for the Officials and Farmers with demonstrations and exhibitions which were strengthened with the establishment of Directorate of Extension Education in each of them. The ICAR's involvement increased considerably with the initiation and spread of Krishi Vigyan Kendras. (Farm Science Centres) and the programmes then in operation, namely Lab to Land and Operational Research were merged with them. The Directorate of Extension Education was started in 1972 immediately after the establishment of TNAU during 1971 and play a vital role in transfer of technologies. The establishment of the Pondicherry KVK (1974) was the first in the country. The Training and Visit system (T&V) was introduced and the Directorate of Extension Education played key role in providing systematic training to the T&V functionaries of the state.

The Directorate of Extension Education of the Tamil Nadu Agricultural University is primarily responsible for expeditious transfer of the latest technologies emanating from various research programmes of the Tamil Nadu Agricultural University to the farming community and extension personnel through the Transfer of Technology Centres (TOT) such as Krishi Vigyan Kendras (13), Plant Clinic Centres (5), Agricultural Information Technology Centre (ATIC), Communication Centre, Training Division and Video Production Centre.

Krishi Vigyan Kendras

The thirteen Krishi Vigyan Kendras located at Coimbatore (Coimbatore District), Sirugamani (Trichy District), Sandhiyur (Salem District), Ramanathapuram (Ramanathapuram Dis-

trict), Vamban (Pudukottai), Madurai (Madurai District), Pechiparai (Kanyakumari District(, Vridhachalam (Cuddalore District), Tindivanam Villupuram District), Virinjipuram (Vellore District), Tirur (Thiruvallur District), Sikkal (Nagapattinam District) and Needamangalam (Thiruvarur District) facilitate the process of dissemination of technology through Monthly Zonal Workshops, training programmes, skill demonstrations, kisan meals, village meetings, seminars, campaigns, front line demonstrations and model village adoption etc.

The major activities of these centers are (1) Conducting on-campus and off-campus training programmes on agriculture and allied subjects for the benefit of farmers, farm women and unemployed youth, (2) Conducting Front Line Demonstrations (FLDs) and On Farm Trials (OFTs) on cereals, pulses, oilseeds and horticultural crops, (3) Conducting training for the extension functionaries of the development departments, (4) Formation of Farmers Discussion Groups (FDGs) and transfer of technologies through them, (5) Organizing farmers day, field days, seminars, exhibitions and campaigns, (6) Village adoption and developing model village, (7) Conducting Monthly Zonal Workshop with officials and extension functionaries and developing monthly plan for agricultural development in the district concern, (8) Rendering farm advisory services and (9) Dissemination of technologies through mass media.

Plant Clinic Centres

The five Plant Clinic Centres located at Bhavanisagar (Erode District), Killikulam (Thoothukudi District), Srivilliputhur (Virudhunagar District), Paiyur (Krishnagiri District), Ambasamudram (Tirunelveli District) are engaged in TOT activities in solving field problems, identification of pests and diseases and suggesting remedial measures, on-farm testing of pre-release cultures, management practices and plant protection methods, surveillance work for forecasting pests and disease outbreak etc., and emphasis has been is given for IPM in the control of pests and diseases with the use of bio-control agents and bio-pesticides. The PCCs look after surveillance work for forecasting the pests and diseases outbreak and working out prediction formulate for pests and diseases outbreak, periodical field visits to farmers' holdings to diagnosis the pest and disease problems and suggest suitable remedial measures on the spot itself, pests and diseases calender preparation, training of extension workers and farmer on IPM and Dissemination of IPM technologies through Mass media.

Agricultural Technology Information Centre (ATIC)

The Agricultural Technology Information Centre located in the main campus is catering the needs of the farmers by 'single wondow' delivery system and function as 'sales outlet' in supplying necessary seeds and other inputs. The other activities are : adopting 'single window' system for supply of inputs, farm implements and university publications for the benefit farming community, rendering farm advisory services and diagnosing of pest, diseases and other field problems and suggesting remedial measures.

Communication Centre

The Communication Centre at Coimbatore disseminates the innovations through mass media like radio, dailies, farm magazines, publications. It also Correspondence Courses on various subject matter areas for the benefit of farming community.

a. Farm School on All India Radio

The Farm School on All India Radio programme is requlary conducted for a duration of 3 months on agriculture and allied topics in collaboration with All India Radio Stations in Tamil Nadu and Pondicherry. The syllabus provides adequate emphasis on Integrated Pest Management (IPM), Integrated Nu-

trient Management (INM), Intergrated Water Management (IWM) etc., to inculcate knowledge among the farmers.

b. Correspondence Courses

In the Correspondence courses, topics for a duration of 3 months on various aspects of agriculture and related sciences are regularly offered for the benefit of the farmers. More courses per year on various topics are conducted as per the felt needs of the farmers.

c. Publications

The TNAU Newsletter published during the first week of every month, highlights the research and extension activities carried out in various research stations and TOT centers of the University. Valarum Velanmai, a Tamil monthly magazine is also published every month with the inclusion of articles of location specific and seasonal importance for the benefit of farmers. The other activities of the Communication Centre include are : Dissemination of messages relevant to the farming community through various mass media, Issue of daily press note highlighting the ongoing research findings of completed research projects and TOT activities and Taking action-photographs of various events in Teaching, Research & Extension for necessary publication through press & other media.

Training Division

The Training Division is actively engaged in the capacity building of the extension functionaries of the development departments, input agencies, NGOs, nationalized banks on various topics of state and national importance. State level and national level training programmes on biocontrol agents, IPM, organic farming etc., are offered periodically.

Major activities of the Training Division are (1) To impart training on highly innovative production technologies of various crops to the extension personnel of the State Department of Agriculture, Horticulture, Seed Centification and Agricultural Marketing, (2) To conduct training sponsored by Government of India and quasi governments, (3) To train Pre-released Defence Personnel, Scientists, Bank officials and Fertilizer and Pesticide Firms, Special Officers of Co-operative, Central banks, Probationary Deputy Registrars of Co-operatives, Deputy Collectors and IAS Probationers.

Video Production Unit

Video cassettes explaining recent technologies evolved in agriculture and allied sciences are recorded and distributed to needy farmers since 1987. Many important topics on pest and idseas control in different crops. IPM, bio-control agents, biopesticides, farm implements, crop varieties, horticulture etc., were produced and sold to the farmers. Considering the changing needs of the people, VCDs on various subjects are produced and distributed to farmers. Audio cassette lessons in agriculture and allied topics are regularly sold at a nominal cost for the benefit of farmers.

Innovative Initiatives

The State Level Interactive Meet of scientists and farmers provides an opportunity for assessment, refinement and streamlining the research activities besides strengthening the existing extension activities. The State Level Farmers Day organized with the involvement of Departments once a year provides a wonderful opportunity for betterment of extension approaches and activities of the scientists, extension functionaries and farmers for effective transfer of technologies in the state.

The TANU – Agri Portal in collaboration with Private sector, provides Scientific production technologies and marketing information through internet for the benefit of farmers. The Narrowcast in collaboration with Doordharsan Kendra has also started for the benefit of farmers in Coimbatore region. The Gyan Vani radio programme are being broadcast on various subjects like agriculture, rural development, environmental protection, health and home management for the benefit of rural people in collaboration with IGNOU and All India Radio. The Kisan Call Centre with a toll free Telephone No. 1551 has been created in the Agricultural Technology Information Centre to facilitate farmers to have direct contact with the scientists of TNAU.

Future thrust

The stakeholders of agriculture based systems need capacity building on a continuous scale and technologies recommended, require skill. The extension personnel need to be sensitized of the recent developments and modify their approaches accordingly to meet the present day needs and based on resources available. Globalisation has resulted in new challenges and opportunities in agriculture. It has opened new avenues for farm exports. The extension system is geared to meet the present requirement. In order to strengthen the activities of the Directorate, the following programmes have been planned:

- Strengthening the Information and Communication system so as to make transfer of technologies effective and fast.
- To document indigenous technology including that of traditional ones.
- To Intensify training programmes on commercial agriculture, organic farming, integrated farming system, biocontrol agents, farm implements, water management, waste recycling, agro industries etc.
- To set-up video libraries and user-friendly computer system in KVKs and RRSs for effective transfer of technology.
- To Establish Communication Centres in Regional Research Stations and College Campuses.
- To Establish Training Unit and Video Production Units in all the College Campuses.
- To establish strong linkage with development departments, private sectors and Non-Government Organizations.
- To Intensify training programmes for farm women on need based topics like kitchen gardening, fruits and vegetables preservation, ornamental gardening.
- To Intensify TOT activities through the Model village concept in all KVKs, PCCs and Regional Research Stations.
- To Organise region-wise need based Farm School on AIR programmes through all the RRSs on commercial agriculture & export oriented topics.
- To introduce Cyber Extension in Agriculture for quick dissemination and education of Tamil Nadu farmers in latest technologies.

Director of Extension Education
Tamil Nadu Agricultural University
Coimbatore

Paradigm shift in Horticultural Domain

Dr. E. Vadivel

Faculty of Horticulture was established during 1972 by upgrading the erstwhile Department of Horticulture in Tamil Nadu Agricultural University. There are three domains of activities viz., Education, Research and Extension. The Faculty has two academic campuses, six Horticultural Research Stations and schemes at fourteen Regional Research Stations and Agricultural Research Stations apart from Urban Horticultural Development Centre at Chennai.

Vision

1. Tamil Nadu as horticultural state by 2020

Mission

1. Promotion of market led horticulture
2. Interfacing with horticultural industry
3. Generation of human resource for horticultural industry
4. Participatory research and extension

Goals

1. Generation of technology for patenting
2. Operational research with farmers
3. Strengthen supply chain management
4. Development of GAP, GMP, SPS and traceability standards and packages for horticultural crops
5. MoU with industry

Education

A. Science Stream : B.Sc (Hort), M.Sc (Hort), Ph.D (Hort). B.Sc (Hort) degree is offered at Horticultural College and Research Institute, Periyakulam while M.Sc (Hort) degree programme are offered at Coimbatore, Periyakulam and Madurai. Ph.D programme is offered at Coimbatore campus only. During 2004-05, M.Sc (Hort) and Ph.D degree programme were further revised as M.Sc (Hort) / Ph.D in fruit science, M.Sc (Hort) / Ph.D in vegetable science, M.Sc (Hort) / Ph.D in spices and plantations, M.Sc (Hort) / Ph.D in floriculture and medicinal plants as separate degree programmes with a view to generate human resource with higher specialization.

B. Technology stream B.Tech (Hort), (Regular 4 year degree programme) PG Diploma in medicinal plant production and quality control (under Open Distance Learning in collaboration with J.S.S. College, Ooty). B.Tech (Horticulture) is a four year degree programme, under self support mode offered from 2002-03 onwards. This course is primarily an entrepreneur oriented course. The science part of the curricula has been compressed to 20%, technology exploitation 40% and management of finance, men, materials, produces products 40%. Fifty per cent of the Faculty are from Horticultural Industry to share their practical expertise with the students. The students are placed in an industry for 60 days for a project. In a way, it is a degree work experience in an industry and has to work programme to generate a new breed of entrepreneurs. There is a quota

for all India sponsorship and NRIs to infuse all India and International character to the degree programme.

Open Distance Learning Programme

i. Certificate courses

Under Open Distance Learning, there are two certificate courses viz., Medicinal Plants Production and Trade, Landscape Gardening and Plant Propagation which are offered for a duration of six months. Such programmes help to develop human resource for implementation of schemes/ projects at grass root level.

ii. PG diploma in Medicinal Plant Production and Quality Control

It is a joint venture with J.S.S. College of Pharmacy, Ooty which has expertise in drug designing, evaluation and patenting. The missing link in the medicinal plant production and trade is the lack of manpower for processing and commercialization and the PG diploma fulfills the requirements.

Research

Research on tropical, subtropical and temperate horticultural crops are undertaken in all the centres representing the above regions. The efforts of the scientists has resulted in development of 28 varieties in fruits, 86 varieties in vegetables, 19 varieties in flowers, 15 varieties in spices, 10 varieties in plantation crops and 3 varieties in medicinal plants. Chronologically, the research out put of the Faculty is summarized as below:

1. Systematic research on fruits was started in 1935 with the establishment of Fruit Research Station at Kodur (now in Andhra Pradesh) and in 1950 at Coimbatore. The reorganisation of the states in 1953 led to the establishment of Fruit Research Sta-tion at Periyakulam. Research on temperate fruits was initiated at Pomological Sta-tion, Coonoor as early as 1920 and at Kodaikanal during 1961.
2. The ICAR scheme on grapes was sanctioned in 1961 and the co-ordinated scheme on banana and papaya in 1971. As a result of work in these research stations and schemes, several varieties of fruits were developed and popularised.
3. Research on potato was started in 1917 at Agricultural Research Station, Nanjanad, Ooty. Research on vegetables at Coimbatore has been in progress since 1950 and later through the Co-ordinated Vegetable Improvement Project was started in 1955.
4. As a result of research, several improved varieties of potato, gourds, tomato, onion, brinjal, bhindi, (okra), cassava, chillies, sweet potato etc. were released for cultiva-tion by the vegetable growers.
5. Research on cashew was started in 1967 at Cashew Research Station, Vridhachalam and subsequently All India Co-ordinated Research Programme (AICRP) on cashew came into being in 1971. Four promising varieties were released and improved production technologies were standardized.
6. Research on commercial flower crops came into existence in 1963 which resulted in the development of improved varieties and technologies suitable for the country. In addition, perfume extraction technology for jasmine and tuberose was developed.

Paradigm shift in Horticulture

Market led horticulture

The focus was much on maximizing the productivity of horticultural crops for over four decades and cultivate what is possible in the given circumstances. Now WTO regime has made

us to go beyond the farm and look at production system from the market end. In the globalized market system, it is not ideal to produce **what is possible** but produce **what is demanded** in the market with the prescribed standards and specifications.

For a country like India which is both a developed country and developing country as well and this is the biggest challenge of the day. Tamil Nadu horticulture is to be tuned to match the developments at national and international level and there is absolute need for promotion of the following kinds of production system instead of one we have now.

1. Production system for local market which requires too many crops and varieties to be grown intensively in small areas.
2. Production system for internal export (with in India) which requires select crops and specific cultivars to be grown extensively in horticultural estates of 100 acres and multiples.
3. Production system for **export** of raw horticultural produces to overseas which requires special status of cultivation viz., GAP, Organic Certification, Sanitary and Phyto sanitary issues.
4. Production system for export of products to developed countries which requires corporate support and supply chain management. In years to come the horticultural scientists need to generate technologies for all the above mentioned systems of production.

Extension

Farmers corporate

There are two major clientele groups, one is the farmers and the second is the industry. The peasant farming practiced so far is independent in all respects unminding the market forces. Since market forces have been growing stronger, the peasant farming is giving way for corporate farming. The corporate has four cardinal virtues. 1. Quantity any volume, 2.Assured quality, 3. Dependable **uniformity** and commitment to **deliver in time** are the capability of corporates and the same virtues needs to be infused into production system. Tamil Nadu Precision Farming Project's organized production through commodity clubs or Forums shall empower the farmers to acquire such virtues on lines with Maha grapes in Maharastra. One such successful experience is Tamil Nadu Precision Farming being implemented at Dharmapuri district.

The project is implemented in 400 ha and 100 ha had been completed during 2004-05. The latest state of art technologies like remote sensing, chisel ploughing, hi-tech nursery, water soluble fertilizers, drip and fertigation, market based selection of crops and varieties for cultivation and above all the establishment of Farmers' Forum ensured 100 per cent field stand of crops and 100 per cent productive plants which has resulted in 50-60% enhanced yield in the crops grown during the first season. It is a kind of direct extension where scientists themselves raised the first crop incorporating all the technologies. The farmers, farm woman and farm workers have been imparted skills on various field operations. It is a demo project

for the state. The farmers of neighbouring villages, districts and state are frequently visiting the production site, discussing with farmers on the benefits accrued out of this system. Water economy, less requirement of labour, weed free cultivation, 95% marketable produce etc are the systematized crop production areas in which farmers are practically satisfied themselves.

Market support

The farmers of the project have been taken to various markets (Cochin, Coimbatore, Koyampedu, Bangalore-Safal) to sensitize them on market demands and equally the buyers were taken to the fields to impress them on the quality infused during seed to pod process. The scientists provide them market intelligence based on which cropping pattern is decided.

The **insurance cover** also was extended to the crops and the system and bank support is followed to sustain the production. The success was primarily due to the empowerment of the Farmers' Association (Adhiyaman Precision Farmers Association, Rajaji Precision Farmers' Association) and their capability to buy all the inputs directly from the manufacturer and capability to do the minimal processing and bargain for the rates.

Commercial trainings to public, students and farmers

Regular commercial trainings are organized on a corporate basis as a horticultural industrial promotional activity. Commercial trainings on Tissue Culture System, Medical Plant Production and Trade, Landscape and Ornamental Gardening, Floricultural Therapy, Ikebana, Nutrition Garden, Processing of Fruits and Vegetables, Bakery and Mushroom Production are popular among the public.

Commercial clientele

The entrepreneurs demand service in frontier areas of horticultural science. The infrastructure like Micro Analytical Laboratory, Tissue Culture Unit, Green houses, Glass houses, Net houses, etc. have been developed for Research and Development as well as training purposes. The commercial clientele require regular programmes on supply chain management, Good Agricultural Practices, Sanitary and Phyto sanitary and Traceability issues.

Linkages

The Faculty is collaborating with Michigan State Universiy to build capacity for supply chain management of fruits and vegetables. Linkages has been established with world bank on sanitary and phyto-sanitary issues of mango and banana. With AVRDC, the Faculty is collaborating on vegetable soya project and with Yunnan Academy of Science and Technology, the Faculty is collaborating in the field of medicinal plants production and patenting.

Dean (Horticulture)
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Green Technology: Is it new to agriculture?

K.Ramasamy

Many scientists view the use of genetic engineering and biotechnology as the next step in the process of domestication of plants and animals that we've been following for years. Why do they think that way? According to archeological evidence, people certainly were cultivating plants 5000 to 6000 years ago.

Early plant breeders had to work with their ability to pick and replant only the best seeds from crop. Later, people learned how to cross-pollinate plants and they got better food plants more quickly.

At some point, people found and took advantage of crosses between two related, but separate species, or learnt to make such crosses. Some plants that we've eaten for years are the product of crosses that happened long ago between two or more closely related species. Coimbatore is known for its first attempt to cross maize and cholam.

Something New

Now, with the advent of biotechnology, it's easier to move DNA from one species to another, even species that are not closely related. Scientists now can move a small number of genes from any plant or animal and move them to crop plant to produce a new variety. Others see our ability to easily cross unrelated species and wonder: Is it ethical to manipulate genes in living matter?Time is running out. 61-75 million hectare is currently cultivated with transgenic crops.

Green gene technology has been a subject of controversy for many years. Although it is a rather young scientific discipline, it has already become an integral part of many applications. To date, genetic engineering has mainly been used in medicine ('red gene technology'). However, genetic engineering is becoming more and more important in agriculture and in the production of food. It opens up new dimensions in plant breeding and is promoted with phrases such as herbicide-resistant plants, larger harvests of better quality and an improvement in the global nutritional situation. More and more countries rely on the miracle weapon "green gene technology". However, the consumer is rather anxious. How dangerous are the genetically-modified tomatoes in the local supermarket? Critics warn of potential risks to human health and also of economic risks, based on the harizontal gene transfer observed in gut microflora by the Scotland scientists.

Essentially, green gene technology is applied in three fields:

- Agronomic characteristics of plants such as the increased resistance of the plants against pests, herbicides, aridity, or coldness. In addition,
- Qualitative characteristics of the plants or food, e.g. the protein or vitamin content and
- 'Molecular farming' which means the use of genetically-modified plants as 'bio-production plants' for the inexpensive production of enzymes and therapeutically-active substances.

The Benefits Must be Noticeable Green technology is unequalled when it comes to highly controversial discussions. But the topic can also be discussed differently as pure research, as a "Fascination Biology"

Genetically modified plants and in particular, GM food encounter massive acceptance problems. The public opinion could, swiftly change if transgenic plants had a clear and obvious use for the majority of people. So far, this use has been restricted to purely agricultural aspects such as resistance against insects and pesticides (known as roundups). The 'fructane' turnip, on which research is carried out in Dutch laboratories, would be such an obvious crop: This plant produces a calorie-free sweetener. Immunity against diseases with plants . Transgenic plants producing antigens of the cholera, jaundice or hepatitis pathogens that can be used for vaccinations. This provides hope for three to five million children who, according to the World Health Organisation, die from diarrhoea each year. However, the search for suitable plants continues – the banana is almost ideal but is a noticeably delicate plant, although the first successful results have been obtained after feeding transgenic potatoes to mice.

Measurement Capabilities Affect Outlook for Systems Biology

The idea of treating biological entities as systems has been around for more than 50 years. For example, as early as 1948, Norbert Wiener, a mathematician at the Massachusetts Institute of Technology, Cambridge, was encouraging others to apply cybernetics, or control theory, to biological processes. Soon thereafter, the Viennese philosopher Ludwig Von Bertalanffy, who left Europe to teach in Canada and the United States, developed a general system theory that he and others considered applying to biology.

Progress in biology thus is likely to accelerate if biologists interact more fully with other scientists and engineers. These interactions will help in developing not only new means to build large data sets required for understanding complex biological systems, but also new tools for analyzing those data.

Developments emanating from our expanded capacity to sequence genomes illustrate this point . The accelerating pace of DNA sequencing, especially in terms of analyzing bacterial genomes, broadens the scope of genome-enabled science, encouraging biologists to interact with specialists in other disciplines. Although many of these activities can be characterized as belonging to computational biology, let us think of them as being "computationally intensive biology." For one thing, this term retains the idea that understanding the fundamental biology of the system is still paramount. For another, it implies a significant change in how we need to educate biologists about math, while also educating physical scientists and engineers about biology.

Identifying a Special Role for Microbiology

Does the discipline of microbiology have a special importance in the development of systems biology research? I believe that it does. Just as *Escherichia coli* was essential to the development of molecular biology in the 1960s, the wealth of genome sequences available from *Bacteria* and *Archaea* - 136 on the Comprehensive Microbial Resource website as of December 2003 - and the relative ease of manipulating microbial systems make them excellent subjects for the current phase of systems biology.

Using available physiological, genetic, and genomic information about *E. coli* for complex systems analysis and modeling of cellular processes. And, in a separate development, genomic sequences were surveyed for many bacteria and concluded that probably more than 15% of genes arose as a result of horizontal gene transfers between species. Subsequent analysis of the genomes of photosynthetic prokaryotes indicates that horizontal gene transfer has been significant in their evolution.

Plant root and Microbial Interactions For augmented plant productivity

Nutrient availability in predominantly organic soils is determined by the activity of soil microbes that cycle nitrogen (N) and phosphorus (P), through decomposition of SOM. Growth of soil microbes is usually C-limited and depends upon plant litter, dead roots and rhizo-deposition of C. Leaf and root litter are important for the organic matter they supply to the soil and its turnover, while the loss of readily available forms of C from living roots, as exudates or through rhizo-deposition, has the effect of stimulating the activity of soil microbes in the rhizosphere. The presence of herbivores can affect plant soil interactions directly, through the impact of urine (and dung) deposition on soil solution chemistry, and indirectly through changes in the C and nutrient supply to the soil microbial community. In order to understand these interactions it is necessary to develop and apply robust methods of characterizing soil microbial diversity and activity, and to determine their impact on soil organic matter turnover.

Implications for biotechnology in developing countries

Species represent libraries of genetically encoded information (dealt with by genomics) and the translation of this information into function (dealt with by functional genomics and proteomics). Loosing species due to extinction deprives us from obtaining benefits from these species. This is also true for microorganisms, however, we know only little about extinction of microorganisms.

That our knowledge on the diversity of microorganisms is just the 'tip of the iceberg' is now a commonplace. More refined isolation techniques are required, since this is necessary for many biotechnological applications. Cyanobacteria, i.e. photosynthesizing prokaryotes, have never been isolated, until they have been seen by their autofluorescence in epifluorescence microscopes. Once they were detected, it did not take long to isolate them and isolation is indeed easy. This example fuels the hope that we can isolate more prokaryotes once we know what we have to look for. Knowledge from in situ approaches may thus help here to develop new isolation techniques. Understanding the link between diversity and function not only provides information on the resilience of ecosystems to (man-made) disturbance, but will also help in developing isolation strategies of indigenous prokaryotes useful for biotechnological applications such as waste management.

Research on genomics of microbial communities has started already and it is just a matter of time until functional genomics and proteomics enter the field. Strategies have been proposed to assess the information of the whole genome of a habitat, the so called 'metagenome', without the need of cultivation.

Some of these applications, such as genomics and proteomics, require rather expensive technologies (including database handling) and thus likely increase the gap between countries, which can afford that and countries, which cannot. Other applications, such as a rough assessment of ecodiversity of microbes and ecosystem functions, isolation of microorganisms, or phage therapy should be affordable by developing countries.

Carbon sequestering and fixation soil as soil humus

The contributions of plant roots and soil microorganisms to Soil CO2 emission along a hydrologic gradient from elevated to submerged are to be worked out to protect India from the oft repeated complaint that rice cultivation contribute more methane that burning fossil fuel by the developed western countries. In concert with CO2 flux measurements, root production and turnover as well as soil microbial properties (biomass,

bacterial/fungal ratio, respiratory potential) needs concerted study. Paired trenched and reference plots will be used to distinguish root + rhizosphere respiration from microbial respiration along the gradient. Fine root production and turnover will be measured with parallel carbon budget, compartment flow and minirhizotron approaches.

Soil microbial genome and ecosystem functioning

Microorganisms account for the main portion of the global metabolism (and biomass). Thus, also for functioning, the micoorganisms might be the unseen majority. A combination of fluorescent in situ hybridization (FISH) with microautoradiography (MICRO-FISH, STAR-FISH) is a means to link diversity and function for in situ studies.

Links between diversity and ecosystem functioning

That our knowledge on the diversity of microorganisms is just the 'tip of the iceberg' is now a commonplace. More refined isolation techniques are required, since this is necessary for many biotechnological applications. Research on genomics of microbial communities has started already and it is just a matter of time before functional genomics and proteomics enter the field. Strategies have been proposed to assess the information of the whole genome of a habitat, the so called 'metagenome', without the need of cultivation.

Thus it is time that the native microbial genomes be mined and documented for the nations prosperity. With agriculture as a main subsistence for the 60% of our population and the largest employer, we cannot sit idle, a time has come to unravel, document and use the genomes from soil biological entities. In a changed situation like sickened soil, expanded alkalinity, excessive use of nutrients and man made chemicals, soil microbes-the biocalysts of scavengers on this earth needs to be assessed and capitalized.

Environmental Biotechnology

Environmental microbiology represents a growing focus of microbiology, contributing to agriculture (e.g., traditional agriculture, plant growth promotion, plant protection, bio-pesticides, etc.), environmental protection (e.g., communal waste treatment and bio-remediation of pollutants) and environmental monitoring (e.g., applications of biosensors). Advanced tools and techniques that are available today, will be useful in accelerating the technology development and transfer in specified time frame so as to correct the problems in soil-plant ecosystem of the specified locations.

Carefull selection and metabolite induced population change will transform the root ecology, which in turn will increase the productivity of the plant besides enriching the soil biological productivity.

Additional Scientific and Administrative Challenges Need To Be Faced

Developments in computationally intensive biology could help to address several major challenges in biology. For one, mining data describing different genomes will provide insights into evolution and help to resolve the question of what distinguishes biological species.

However, genome sequence analysis alone cannot define the fundamental characteristics of life. It is argued that other layers of biological order, including the timing, location, and direction of physiological processes in cells, are emergent properties that arise because of complex interactions among gene-specified cellular components. Simulations, when extended to the whole-cell level, are one means for gaining insights into the dynamic behavior of cells. However, such efforts will re-

quire significant improvements in both global quantitative analysis of cellular functions and the mathematics to describe those dynamics in space and time.

We know that mining genomic data will produce insights, and those efforts can also serve as an important basis for designing experiments to analyze cellular functions. However, genomic technologies have not markedly changed "wet-bench" traditional approaches to uncovering functions of molecules in cells. For example, genome sequencing quickly identified that *G. metallireducens* has several hundred open reading frames for cytochrome *c* proteins.

This new capacity to examine organisms as complex, integrated systems along with the growing interest of colleagues from other disciplines is stirring tremendous excitement in biology and microbiology. But this excitement can also lead to frustrations because biological research is an increasingly complex undertaking. For just such reasons, microbial systems provide excellent opportunities to develop effective approaches in bioinformatics and systems biology. Meanwhile, maximizing what we can learn about complex cellular systems will depend not only on new technologies and collaborations but also on new approaches to educating life scientists, information scientists, and engineers.

Bioprospecting

The relevant technologies in the bioresources and bioactives areas can be grouped in four categories related to progressive stages of the value-adding chain.

- Identification of the bioactives;
- Production in bioresource; Value Adding Process
- Processing bioresources; and
- Utilisation of bioactives.

Another category of technologies, of importance to this roadmap report, are those involved with operationalising or further developing the sustainable development framework, described above.

Bioactives Identification

Expertise in the discovery arena is vital for organisations aiming to find or produce bioactives or their precursors that can be used in pharmaceutical or nutraceuticals. While a certain level of inhouse expertise is generally deemed essential, discovery service companies have also emerged and are able to provide solutions to bioactive suppliers in often expensive and highly specialized services such as high throughput assays. In addition, service providers are also targeting the newly emerging bio-chip and bio-informatics approaches. Synthesising appropriate compounds for pharmaceutical companies is a critical component for drug discovery service organisations.

Bioactives Production

Commercial bioactives need to be produced in sufficient quantities to serve market demands. Technologies are required to enhance sustainable development and economic growth as well as the harvest of animals or plants. The bulk of the technology advancement is oriented to sustaining and enhancing traditional food crops and fish, not necessarily focused on bioactives that may be contained in them.

Bioactives Processing

Separation and purification technologies for isolating often dilute components from natural feedstocks represents a critical technology barrier for developing a bioresource-based bioactives industry. The major and ongoing technology challenge is to extract, isolate and concentrate the bioactive ingredients economically. The innovation process in these technology fields is therefore often focused on reducing capital and operating costs, minimising raw materials requirements, increasing purity and minimising wastes. The scale-up of labora-

tory techniques to economical continuous processes remains a critical challenge.

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Potential and prospects of plant based modern medicines and health care products: Can India target the international market?

It is estimated that nearly three fourths of the plant-derived prescription drugs used worldwide were discovered following leads from local medicine. About 25% of modern medicines are descended from plants first used traditionally according to WHO. Many others are synthetic analogues built on prototype compounds isolated from plants. Almost, 70% modern medicines in India are derived from natural products.

The basic uses of plants in medicine will continue in the future, as a source of therapeutic agents, and as raw material base for the extraction of semi-synthetic chemical compounds such as cosmetics, perfumes and food industries. Popularity of healthcare plant-derived products has been traced to their increasing acceptance and use in the cosmetic industry as well as to increasing public costs in the daily maintenance of personal health and well being.

Recently even developed countries, are using medicinal systems that involve the use of herbal drugs and remedies. Undoubtedly the demand for plant-derived products has increased worldwide. The demand is estimated to grow in the years to come fuelled by the growth of sales of herbal supplements and remedies according to several surveys.

Genomics and Bioinformatics

The terms genomics and bioinformatics are not often heard in the high school biology classroom. When students do hear the terms, some will be given a definition to memorize for a test. An example would be "the definition of genomics is the study of the genome", or all the genes in an organism. In addition, the most common definition of bioinformatics is the convergence of biology and computer science to store, retrieve, and analyze data. These definitions do not explain what genomics and bioinformatics are or how they are changing modern science.

Genomics

Genomics can be broken down into three categories: structural, functional, and comparative. Structural genomics is defined as "the assignment of three dimensional structures to proteomes (which define the protein compliment to the genome) and the investigation of their biological implications". As the term implies, structural genomics is used to determine the structure of a protein. The structure of a protein is valuable for determining how the protein works and where it can bind to cause reactions.

Functional genomics is the "the development and application of global experimental approaches to assess gene function by making use of the information and reagents provided by structural genomics". In simple terms, functional genomics deals with the function of the genes and proteins.

Bioinformatics

As defined earlier, bioinformatics is the convergence of biology and computer science to store, retrieve and analyze data.

However, the field of bioinformatics encompasses much more than this simple definition. Data, in bioinformatics, pertains to nucleotide sequences and protein sequences. Bioinformatics does involve biology and computer science, but it also involves mathematics and statistics. Most of the mathematics and statistics are hidden in the computer science aspect of bioinformatics.

In addition all bioinformatics methods are accomplished using computers. The main goal of bioinformatics is to figure out what biological data means. Therefore, the housing or storage of data is important. The data is stored in many databases, such as GenBank, which is currently housing over twenty-two billion sequence records. The information in these databases is submitted by public and private scientists for comparison and is available to the public. It is possible for anyone to submit data to certain databases. Not only does bioinformatics offer ways to compare data sets, but it also performs many other tasks as well. One such task is to predict sequence structure and function as well as assemble proteins into families. After assembling families, bioinformatics can also help in establishing evolutionary relationships among organisms. In addition, bioinformatics allows scientists to discover single nucleotide polymorphism or SNPs. SNPs are differences in genomes that define individuals as unique. Another technique that bioinformatics has made practical is microarrays. Microarrays produce massive amounts of data, too much to compute by hand. Another role of bioinformatics, is to locate protein-coding regions in DNA sequences. Bioinformatics performs many tasks, and will continue to gain new assignments. The jobs of bioinformatics have applications in research and in everyday life.

The most widespread application of bioinformatics is in the medical field. In particular, the drug design process has become much faster. By using bioinformatics and not the trial and error method, the cost of drug design has decreased as well. A new method for prescription drugs also comes from bioinformatics. Known as pharmacogenomics, this field allows scientists to use bioinformatics to design and prescribe personal medications to individuals.

Plant Biotechnology

Domestication of plants and animals found in the wild, combined with gradual long-term changes in their qualitative and quantitative traits, were the first attributes of agriculture. Domestication, followed by food storage, coincided with the growth of microorganisms. Thus was born classical food fermentation, the earliest known application of biotechnology for the generation of food products.

Plant biotechnology encompasses a wide array of emerging fields of study and applications that include:

- Plant tissue culture;
- Plant molecular biology - includes techniques for locating, isolating, excising, cloning, silencing, expressing, amplifying and rearranging genes and other DNA entities; and
- Transformation or genetic engineering.

It has been speculated that our future on this planet may very well be defined by how these additions to man's technological arsenal provide a means of circumventing current plant breeding limitations. The possibilities are already apparent and in a few instances plant biotechnology has already enabled the development of crops with truly novel characteristics.

At the level of individual research institutes, the main challenges to accessing technology are priority setting, establishment of international alliances, management of IP, and capacity development.

The need to protect: Abiotic and biotic stress tolerance

The application of molecular genetics and plant transformation to the *diagnosis and control of plant pests* has become one of the major practical success stories of plant biotechnology in the past decade. The availability of dozens of transgenic crop plants which are resistant to a range of insects, viruses and herbicides, as well as to several phytopathogenic fungi and nematodes has been validated under both field and laboratory conditions, and is of great economic importance. Moreover, applying the principles of engineering plants for resistance to these pests to other plants of agricultural importance is now considered routine, although in practice still laborious, especially for new genotypes. Apart from a wider application to additional plants, the real *challenges lying ahead* include:

1. Improved expression of the target genes in the plants, especially their spatial and temporal control,
2. The use of wide-spectrum and alternative target genes to circumvent the problem of pest resistance,
3. Intensified integration of biological control via the use of selected and engineered microorganisms with a biocontrol potential.

While plant biotechnology has been applied successfully to fighting a large number of pests, this is not yet the case for abiotic stress conditions such as drought, salinity, extreme temperatures, chemical toxicity and oxidative stress. *Drought and salinization are the most common natural causes of lack of food and famine* in arid and semiarid regions, and the most serious environmental threats to agriculture in many parts of the world.

Desertification, resulting from overexploitation by the local inhabitants, is often aggravated by regional climatic changes, and results in increased soil erosion and a decrease in land and agricultural productivity. It is estimated that increased salinization of arable land will have devastating global effects, resulting in 30 % land loss within the next 25 years, and up to 50 % in the year 2050. Although more difficult to control and engineer than the usually monogenic traits of resistance to biotic pests and herbicides, the genetically complex response to abiotic stress is globally and regionally far more important. Therefore, *breeding for plant tolerance to drought and salinity stress* should be given a high research priority in all future agbiotech programs.

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Mechanization to improve the Agricultural Productivity

Dr. R. Manian and Dr. K. Kathirvel

Introduction

The Royal Commission on Agriculture that visited India in 1928 recommended that Agricultural Engineering research should be undertaken as one of the means of improving agricultural efficiency. The productivity of farms depends, mainly, on the availability and judicious utilization of power by the farmers. The agricultural implements and machines enable the farmers to employ the power available to them judiciously for production purposes. Agricultural machines increase productivity of land and labour by improving timeliness of operations and increasing work output per unit of time by way of reducing effort, reduction in removal deficiency of power in conventional means of farming and improvement / precision in the quality of farm operations for better response to the inputs. Farm mechanization along with increased application of other agricultural inputs such as seeds, pesticides, insecticides etc., have enhanced the productivity and production on the farms. But on the other hand it has also led to increased causalities and injurious due to accidents while carrying out different farming operations. At present agricultural machinery population in the country is estimated at about 150 million which includes about 2 million tractors and other self propelled equipment.

Small and marginal farms together account for 78% of holding, but cover only 32.3% of the area. Semi-medium farm, 2-4 ha, (number 13.91 M averaging at 2.76 ha/holding) account for 23.16% area, medium farm 4-10 ha (averaging 5.90 ha) account for 27.20% and large farms, above 10 ha numbering only 1.67 M cover 17.45% of area. Predominance of small and marginal farms makes farm mechanization in India difficult. Contrary to this, India has emerged as the world's largest manufacturer of four-wheel farm tractors with its annual sale crossing 2,25,280 during 2001-02. The production and sale of tractor and power tiller in India is furnished in Table 1. It has now a population of over 2.0 million tractors operating in the farms and the farmers invest more than Rs.20,000 crores in a year in agricultural engineering inputs. These farm tractors are

Table 1. Production and sale of tractors and power tillers in India during last ten years

Year	Production (Nos.)		Sale	
	Tractors	Power tillers	Tractors	Power tillers
1988- 89	109987	4798	110323	6678
1989- 90	121624	5334	122098	5442
1990- 91	139233	6228	139831	6316
1991- 92	151759	7580	150582	7520
1992- 93	147016	8648	144330	8642
1993- 94	136971	9034	138879	9449
1994- 95	164029	8334	164841	8376
1995- 96	191311	10500	191329	10045
1996- 97	221689	11210	220937	11000
1997- 98	257449	13450	251198	13100
1998- 99	261609	14488	262251	14480
2000-2001	255690	17315	254825	16018
2001-2002	219620	14837	225280	14563

fast replacing the pair of bullocks for the tillage and other farming operations. Today, the sale of tractors in the country is increasing steadily and the use of tractors increases at a compound growth rate of more than 13 per cent annually which may stabilize around 10 per cent by next decade. It is obvious that tractors are more popular and it has become the major source of farm power.

As a global power in the international tractor industry, India must ensure efficient utilization of such a heavy recurring investment in the agricultural engineering inputs. The agricultural engineering programme in India should not merely aim at the supply of tractors, but should put in place the systems needed to ensure their sustainability. The systems should cover areas such as a complete range of matching implements, cost and energy efficient utilization of resources. Following implements suitable for 35 to 45 hp tractors developed during the recent past at College of Agricultural Engineering, Tamil Nadu Agricultural University, Coimbatore.

1. Chisel Plough

Deep tillage using chisel plough is essential for improving the yield of crop especially under dry farming. Chisel ploughs are used to break through and shatter compacted or otherwise impermeable soil layers. Deep tillage shatters compacted sub soil layers and aids in better infiltration and storage of rainwater in the crop root zone. The improved soil structure also results in better development of root system and the yield of crops and their drought tolerance is also improved. Chisel plough consists of heavy chisel type tyne which is pulled through the soil normally at a depth greater than that at which conventional ploughing would be done and bursting up the underlying layers of soil without bringing the sub-soil to the surface. The tynes of the implement are sturdy and strong enough to withstand the stresses applied when they are working at depth where the soil conditions are hardened. The chisel plough developed has a sturdy but light structure made of 3 mm thick hollow rectangular tubular mild steel sections. The share has a lift angle of 20 degree, width of 25 mm and a length of 150 mm. The implement is protected by a shear pin, which prevents damage from over loading. The implement could be used for deep tillage upto a depth of 40 cm. The cost of the implement is Rs. 7,000. The coverage is 0.42 ha/hr when operated at a spacing of 1.5 m between rows. The salient features are two fold increase in hydraulic conductivity of sub-soil, conserves around 30 to 40% more soil moisture, roots proliferation is improved by 40 to 45%, nutrient mobility especially N and K increased by 20 to 30% and 30 to 40% respectively, enhances the crop yield by 15 to 20% and residual effect can be realized for three seasons.

2. Coir Pith Applicator

Deep loosening of soil and placement of coir pith in the subsoil layers improves the root zone which will not recompact during subsequent years. The unique property of coir pith to hold 7 to 8 times its weight of moisture helps to improve upon the moisture status of the root zone. The coir pith also acts as an amendment which helps to build up a biologically active root zone comprising the subsurface layers. Hence, a coir pith mulching applicator was developed as an attachment to the tractor drawn chisel plough to place the coir pith at a depth of

15-25 cm below the ground level which ensures that the coir pith filled trenches are not disturbed by subsequent ploughing thereby preventing the dispersion and disintegration of coirpith. The unit was built around the chisel plough, which acts as the tool for loosening the soil, and also provided the frame for mounting the coir pith attachment. Coir pith is fed from a hopper through a vane type rotary feeding device and is funneled into the furrow bottom. A pair of furrow opener wings opens the furrow behind the chisel plough for placement of subsoil mulch. A manually operated vane type rotary metering device feeds the coir pith. The cost of the unit is Rs.9,000/- The salient features are higher moisture storage (41%) is observed in subsoil mulched plots as compared to the control and yield of crop grown under subsoil mulched plots are significantly higher.

3. Irrigation Channel Former

In garden lands irrigation channels are formed at regular intervals and then beds are formed to the required size for irrigating the crop. This is done by human labour which consumes more time and cost. To over come this problem a tractor drawn channel former to form irrigation channels was developed. The main frame of size 22 x 65 cm is made of 5.0 x 2.5 cm M.S. channels. The channel forming portion consists of two inner blades of size 100 x 25 cm and two outer blades of size 130 x 25 cm. The front portion of the two inner blades is joined together such that they forms an angle of 30° in between them. At the junction of these two inner blades a cultivator shovel is fixed to penetrate into the soil. The inner blades can be mounted 5 to 10 cm lower than the outer blades so that they forms a furrow at a lower depth than the surface of the bed for the flow of irrigation water. The two outer blades are placed one on each side of the inner blades and at an angle of 60° to the direction of the travel. The soil collected in 105 cm width is formed as bund of size 35 cm on both the sides of the irrigation furrow formed by the inner blades. When the tractor is operated at 3 to 4 km forward speed and at 5 m intervals, the area covered varies from 1.2 to 1.5 ha/hr. The field efficiency varies from 70% to 80% depending on the condition of the soil and field size. The cost of the unit is Rs. 7000. The coverage at 5 m intervals is 9.0 ha/day of 8 hrs.

4. Trencher

Drainage is one of the most important aspects for successful crop production. In order to maintain sustained production in irrigated agriculture, removal of excess water from agricultural land is essential. The ill drained condition of the soil causes poor aeration and water stagnation in the field. This affects on the root respiration and root development of the crops. In order to over come such a serious problem, at present trenches are being formed manually for creating open drainage trenches as well as drain laying . A trencher which is helpful in making irrigation channels/trenches, drainage trenches and for application of chemical, organic and soil amendments, suitable for attaching with 35 to 45 hp tractors was developed for opening a rectangular trench of 300 x 300 mm.

The function performed by the share is that of cutting off trench slices from the trench bottom and raising them to the mould board portion which lifts and throws the soil. The tren-

cher mould board system should perform a complete lifting and throwing of soil slice away from the trench with least resistance. Hence a cylindrical type of mould board was adopted. Side plates were provided as an intermediate component, which connects the bottom of the trencher to the frame through standard. The share, bar share and mould boards were fitted to Y-base. This assembly is fitted to standard which in turn connected to the frame by means of side plates. A safety pin is provided between the standard and side plates to protect the unit from over load. The two bottoms are placed in line such that one operates behind the other. The front bottom throws the soil towards right side and forms a vertical wall at the left side of the trench and opens the trench upto 15 cm. The rear bottom opens the trench to a further depth of 15 cm, throws the soil towards left side and forms a vertical wall on the right side of the trench. The unit can also be used for laying drip irrigation pipes by opening trenches, for application of manure in coconut fields, for making drainage around the water logged fields. The cost, time and energy saved by machine

trenching in comparison to manual trenching were 95, 99 and 53 per cent respectively.

5. Cultivator Mounted Seedplanter

It is a tractor drawn equipment used for line sowing of crops like groundnut, sorghum, maize and pulses. Tractor industry in India has grown and now about two lakh sixty thousand tractors are being produced per annum. Even small and medium farmers are hiring the tractor for different agricultural operations. Any farmer who owns a tractor is invariably having the tractor drawn cultivator. Seed boxes along with cup feed type seed metering mechanism are mounted on the cultivator frame and the seeds are dropped in furrows opened by the cultivator shovels. Detachable side wings are fixed to the existing shovel type furrow openers of the cultivator which helps in placing the seed at the required depth. Power to operate the seed metering discs is taken from the ground wheel drive though a clutch. A square bar is provided at the back of the unit to close the furrows. The cost of the implement is Rs. 10,000 without cultivator. The unit is suitable for sowing groundnut, sorghum, Bengal gram, maize, soybean and pulses. It results in 48 and 91% saving in cost and time respectively. The spacing can be adjusted according to the crop. An area of 4 ha can be covered per day.

7. Improved Broadbed Former Cum Seeder

The implement forms broad beds separated by furrows and simultaneously undertake sowing in eight rows in the bed formed. The unit can be hitched to the 3 point linkage of tractor. This unit consists of a sheet metal float, which forms the broad beds separated by furrows at intervals of 160 cm. Over the sheet metal frame, seed hoppers and cup feed seed metering mechanism are provided. The drive for the seed metering device is taken from a projecting spoke type ground wheel, which trails behind the furrow openers on the bed. The furrow openers are made of cultivator shovels provided with wings. The depth of furrow opener can be adjusted with respect to bed surface. The cost of the implement is Rs.13,600/-. The unit is suitable for sowing groundnut, Bengal gram, maize, sorghum and pulses in raised beds. The coverage is 3.2 ha/day.

8. Basinlister / Broadbed Former Cum Seeder

Listing is the process of formation of alternate furrows and ridges on land to conserve soil and moisture. The basin lister consists of three trenchers of width 30 cm, cams, cam shaft, cam followers, ground wheels and frame. The penetrating portion of the trencher bottoms is provided with a replaceable share point.

The cams lift each trencher fitted with a cam follower up, at equal intervals. The cams are mounted on a common axle at

120 degree difference and supported by ground wheels. The power to rotate the cam is transmitted from one of the ground wheels. To reduce wheel slippage, spring tension has been provided. The basin lister unit is attached to the standard nine tyned cultivator. The seed box along with cup feed type seed metering mechanism is mounted on the cultivator frame and the seeds are dropped in between the basins. Seeds are sown in 4 rows at 45 cm apart. Power to operate the seed metering discs is taken from the ground wheel through a clutch. Changing the sprockets provided in the metering shaft can change the seed to seed distance. The operator can stop the dropping of the seeds by disengaging the clutch provided. The same implement can be used to form broad beds separated by furrows by removing the basin lister attachment from the cultivator. The unit consists of two sheet metal floats fixed on both sides of the cultivator tynes to form the broad beds separated by furrows at intervals of 180 cm.

The cost of the unit is Rs. 15000 (without cultivator). The basins/ broad beds and furrows formed prior to the sowing of crop in dry farming at regular intervals conserve adequate soil moisture for the utilization of crop at its critical stages. Increased moisture retention of 10 per cent is achieved. Significant increase in yield is observed in both main and inter crop. An area of 3.5 ha can be covered per day.

9. Ridger Seeder

The ridger seeder is a rear mounted attachment to four wheel tractor of 35 to 45 hp range. In the commonly available cultivators, nine cultivator tynes are staggered in two rows. n ridger seeder six tynes are provided in the front row of a cultivator for tilling. Ridges and furrows can be effectively and economically formed using tractor drawn ridger and planting can be done simultaneously by incorporating planting mechanism with the ridger. Three ridger bottoms are mounted, so that each one is placed in between two cultivator tynes. The planting mechanism consists of a seed hopper having two compartments one for seed storage and other for seed metering. The seed metering mechanism is of cup feed type as it was found effective for various types of seeds. The cup feed mechanism also has the advantage of minimum seed damage compared to other common types of seed metering devices. A ground wheel with spikes is provided for driving the seed-metering device. A funnel like structure was provided in the seed metering compartment for guiding the metered seeds to the other part of seed placement device. On the lower side of the seed funnel transparent flexible PVC hose is connected to the final placement device.

The soil thrown by the wings of the ridgers form the ridge and provisions are made to place the seeds while formation of

ridges itself and hence the need for separate furrow openers and furrow closers are eliminated. A mild steel tube fixed on one side of the ridger bottom is used for placement of seeds. No separate device is provided for covering the dropped seed, as the soil thrown by the wings of the ridgers itself covered the dropped seed.

A dog clutch is provided to engage or disengage the power to seed metering shaft. Markers are fitted on either side of the unit, so as to mark the next row over which the next pass of the implement has to start. In order to suit different crops, provisions are made for altering the row spacing, plant spacing and depth of seed placement. The cost of the unit is Rs.20,000. Row to row and plant to plant spacing is adjustable. It is suitable for sowing cotton, soybean, black gram, green gram, maize and cow pea in single row or paired rows. An area of 3.5 ha can be covered per day.

10. Sprayer for Coconut Trees

Coconut production in India has been increasing over the years. As a result, the country has emerged as the largest producer of coconuts in the world, though only third in area under the crop. Coconut is one of the major commercial oilseed crop cultivated in Tamil Nadu and grown in a total area of 2,20,909 ha. Recently the coconut trees are severely affected in a large scale by the attack of Slug Caterpillar and Leaf Blight. To save the perennial crop like coconut from the above mentioned insect and pest attack, spraying of Dichlorvos / Fytalon chemical is recommended. But the farmers are not in a position to apply the chemical on the coconut tree leaves, which are grown more than 8 m, and above. Hence a tall tree sprayer suitable for spraying chemicals in coconut trees has been developed.

The tractor operated tall tree sprayer a telescopic (62 and 37 mm) G.I. pipes which can extend from 9 m to 14 m height by winding a cable. The telescopic G.I. pipes are mounted on a 'L' angle frame work hitched to the tractor through the three point linkage connection. At the base of the frame, a 200 lit capacity chemical tank is mounted. The commercially available ASPEE triplex reciprocating pump is mounted on a base plate near the PTO shaft of the tractor. At the top of the 37 mm GI pipe, two spray guns with nozzles for cone or jet spray are hinged at different inclination so that they can be moved up and down by ropes from the ground level. In addition the spray guns can be rotated about the vertical axis of the telescopic pipe arrangement. These features of the sprayer ensure that the entire canopy area of the tree is easily sprayed. The cost of

the unit is Rs.35,000/. The total height of spray is 16 m. For easy transport, the unit can be kept in a horizontal position by folding the frame with telescopic pipes and the same can be erected vertically by winding a cable .The sprayer can be used in orchard trees and for spraying in field crops, by bifurcating the delivery section into spray lines with spray lances and spray guns. About 30 - 35 trees can be sprayed per hour.

11. Turmeric Harvester

The general practice in conventional method of harvesting is to wet the crop after removal of the cut foliage and the turmeric rhizomes are dugout after a week by skilled labour with a special fork type of spade / pick axe. Normally turmeric digging is done by contract labour who demand very high wages during peak season. The damage caused to rhizome by the fork type spade is more because the labour has to dig out the clump all around and in doing so, the fork bruises the rhizome every time it hits the rhizome. A tractor operated turmeric harvester has been developed to over come these problems.

The unit consists of a blade with five bar points for easy penetration into the soil. The blade is fixed at an inclination of 20° to a cultivator frame with straight tynes at both ends. The rake angle of the blade can be adjusted by moving the blade through a clevis provided at the bottom of the two tynes.

At the rear end of the clevis two converging slats are fixed to convey the harvested turmeric with the soil on to the lift rods without spilling to the side ways. To the rear end of the blade seven lift rods of 250 mm length are provided. For digging, the bar points with the blade penetrate into the soil, lift the turmeric rhizomes along with the soil and convey to the lift rods which aids in separation of the rhizomes from the soil. The soil slip back to the ground and the dug out rhizomes deposited at the centre of the unit. The cost of the unit is Rs.10,000. The unit results in 70 per cent saving in cost and 90 per cent in time when compared to manual digging. The extent of damage caused to the rhizomes is very much less (2.83 per cent). The undug rhizomes left in the field is minimum (2.42 percent). The field capacity of the unit is 1.6 ha per day.

12. Groundnut Harvester

This machine is used for harvesting groundnut crop from the field. The groundnut harvester consists of a soil loosening tool, a pick up conveying mechanism and gatherer windrower. The soil engaging tool is made of 15 mm thick x 100 mm wide x

1800 length straight mild steel blade. The tool at 15 deg rake angle is fixed to a main frame through shanks at both the ends. The pick up conveying mechanism of length 1700 mm is made of two 6mm endless ship chains spaced at 1800 mm apart. Both the chains are inter connected by conduct pipes spaced at 90 mm. Straight pegs of 100 mm long with end projection are fastened to these pipes at 75 mm spacing in a staggered manner. At the rear a gatherer windrow the conveyed crop. It is operated by a 35 hp tractor. The cost of the machine is Rs. 20,000/-. The unit is suitable for harvesting and windrowing groundnut crop (specifically for bunch / semi spreading varieties). The coverage is 2 ha per day. Harvesting and soil separation efficiency is 99 and 95 per cent. Saving in labour cost and time is 32 and 96 per cent respectively.

Agricultural labour input is becoming increasingly costlier on one side and the labour efficiency, the turnover of work and duration of working hours are deplorably deteriorating, resulting in poor crop management, increasing cost of cultivation and poor income to the farmers. Farm size and individual field dimensions have profound effect on mechanization. Size of the farm decides the farm power to be used and the crops grown govern the matching equipment that can go with it. In so far as the purchase of tractor and tractor-drawn machines are concerned, a very organized system of offering loans to farmers exists. A similar approach is needed for providing loans to the small farmers for purchase of animal and power tiller drawn implements of proven designs. Creativity will have to be displayed in great measures meeting the needs of mechanization such that farmers are not constrained to buy farm machinery which they can not utilize to full capacity. Equipment that is rarely used should be available through custom hire or custom service. Farm equipment have to be made versatile durable, giving trouble free service and designed for safety and easy replacibility of fast wearing parts. A concerted effort towards human resource development for efficient use, operation, repair and maintenance are also needed. Our commercial crops are facing new challenges with their traditional markets eroding. There is demand for appropriate mechanization for economic competitiveness. There is specific demand for cotton pickers, sugarcane harvesters and need for developing cotton stalk pullers/shredders to incorporate the cotton stalk in the field itself. Use of agricultural implements/machines will have to be promoted for faster growth of farm mechanization in order to increase the productivity and production at desired level. In the present scenario the following improved equipment require specific attention for their development and popularization. Area specific strategies have to be planned and executed to meet requirements of the farmers. For supply of quality implements and their proper selection and operation, training and testing facilities for agricultural machinery available in the country will have to be fully exploited and such facilities will have to be increased. Extension services for introduction, demonstration and popularization of agricultural equipment, will have to be strengthened upto grass root level through development on man power and coverage under Radio and TV programmes.

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Contribution of Forest College and Research Institute in Wasteland Development

Prof. K.S.Neelakantan, I.F.S. and Dr. K.T.Parthiban

Background

The forests in India were degraded at an alarming rate of 1.5 million ha till the recent past owing to industrialization, urbanization, population explosion and over exploitation of forest resources. These forces have taken heavy toll of Indian forests leaving an actual forest cover of 20.55% as against the mandated requirement of 33%. The low forest cover coupled with low productivity of our forest in comparison to global statistics ushered in a total mismatch between the demand and supply of timber and other non-timber resources. To meet the growing timber demands and also to protect and conserve natural forest, a massive afforestation programme is needed to utilize the available wastelands. Of India's 328 million hectare of geographical area, nearly 158 million hectare is degraded and poses serious environmental problems. These areas are to be rehabilitated not only for greening but also to meet the demands from all levels of stakeholders.

In recent times, afforestation of wastelands for energy plantation both for fuel energy and diesel energy is gaining attention across the country. This is because of growing energy needs. The country's demand for crude petroleum oil has accelerated and Government of India invests more than 1, 20,000 crores for the import of crude oil during the year 2004. Similarly the demand for firewood both for household and industrial consumption is also mounting. The record levels of crude prices in recent times once again emphasize the need to tap non-conventional and renewal energy sources. In developing countries like India, the village energy security can be addressed by harnessing these non-conventional energy forms. Under these circumstances, the vast stretches of wastelands available in the country could be profitably converted into energy plantation as well as biodiesel plantation.

Under these circumstances, Forest College and Research Institute has mandated its research objectives for rehabilitation of wastelands through various forestry and agroforestry activities. The wasteland afforestation programme formed the mainstay of the research agenda, especially in the last two decades.

Wastelands in India

The extent of wastelands in India is approximately 158 million hectare, which are potential rangelands where the domestic animals graze. These are mostly man made and can be ascribed through factors like excessive grazing, sheet erosion, water logging, salinity and alkalinity, wind erosion, shifting cultivation and shifting sand dunes. Extremes of climate, physical and chemical soil attributes and biotic factors are the characteristics of these sites. Over grazing induces secondary succession, which in turn causes desertification.

Strategy

The nation is faced with the problems of large blocks of degraded forest and non-forest lands, scarcity of financial and managerial resources and the increasing demand and supply of timber and industrial woods. At the same time, these are good prospects for complementarity between the forestry sector

and wood based industries. Wood based industries and other industries interested in cogeneration must be encouraged to rehabilitate barren wastelands for multifold benefits.

Policy initiatives

The forest policy 1988 has mandated for increasing the area under forest through massive afforestation programme in degraded wastelands of the country. Simultaneously, the same forest policy indicated that the national goal should be to have a minimum of one third of the total land area of the country under the forest tree cover.

The policy also indicated that a massive need based and time bound programme of afforestation under tree planting with particular emphasis on fuel wood on all degraded and denuded lands in the country is necessary. The policy emphasizes that the forest based industries should raise their raw material needs by establishing direct relation between factory and the individuals. No forest based industries except village and cottage level should be permitted in future unless it has been first cleared after careful scrutiny with regard to assured availability of raw material.

Similarly, the National Agricultural Policy 2000 seeks to actualize the vast untapped growth potential of Indian Agriculture through sustainable farming. The Government accords abiding importance to improve the quality of land and soil resources. Reclamation of degraded and fallow lands as well as problem soils will be given high priority to optimize their productive use. Special emphasis will have to be laid on conserving soils and enriching soil fertility. The policy also lays emphasis on integrated and holistic development of rainfed areas by conservation of rainwater by establishing vegetative measure on watershed basis and augmentation of biomass production through agro and farm forestry with the involvement of local people.

Contribution of Forest College for Wasteland Afforestation

The various facets of wasteland afforestation programmes initiated and developed at this institute have been furnished.

a) Production of quality planting materials for wasteland afforestation programme

The Institute has been involved for mass multiplication of quality planting material for various afforestation programmes in the wastelands of the state. Accordingly, every year a minimum of one lakh quality seedlings has been produced through soil based medium combined with microbial consortia using *Pseudomonas*, *Trichoderma* and VAM.

b) Wasteland reclamation through multi purpose tree species

Wastelands in the states were successfully rehabilitated and reclaimed through afforestation of site specific and problems centered tree species suitable for various agroclimatic zones. Accordingly two species viz., *Acacia planifrons* and *A. suma* have shown high survival in the adverse conditions of wastelands. For wastelands available in medium rainfall situations, the species viz., *A. auriculiformis, A. crassicarpa, Brachilletia molli* and *Eucalyptus tereticornis* have shown greater success. In the same way, the dry arid and semiarid tracts of southern parts of Tamil Nadu in poor rainfall area successfully afforested with *Prosopis juliflora* and *Prosopis cineraria*. Some phyllodinous acacias like *A. crassicarpa, A. holosericea* and Central American species like *Senna atomeria* and *Glyricidia sepium* had high adoption in semi arid conditions.

c) Afforestation of wastelands through biodiesel plantation

Vast stretches of wastelands, both community and private lands, are available across the state of Tamil Nadu. These uncultivable

and underutilized lands are exposed to uncertain monsoon rains leading to intensive soil erosion thus deteriorating and depleting the condition of land further. Before it becomes totally impossible, these lands can be tackled and rehabilitated with green belts. Under the circumstances, Forest College and Research Institute has fully involved in promotion of wide range of biodiesel plants for use us energy sources to produce diesel.

S.No.	Botanical name	Common Name	Oil Percentage
1.	*Jatropha curcas*	Kattamanakku (or) Ratanjyot	30% to 40%
2.	*Pongamia pinnata*	Karanja	27% to 40%
3.	*Azadirachta indica*	Neem	35% to 40%
4.	*Madhuca longifolia*	Mahua	35%
5.	*Calophyllum inophyllum*	Undi	50% to 73%
6.	*Aleurites fordii*	Tung oil	50% to 60%

Out of all these species, the State of Tamil Nadu is highly suitable for Jatropha for large scale afforestation of wastelands. This species is drought tolerant and is not browsed by animals. The drought tolerant capacity of this tree can withstand severe drought and regenerate quickly which will suit the present conditions prevailing in the States besides, providing better income realization to the stakeholders.

d) Afforestation of wasteland for edible oil production

The Institute has of introduced an evergreen tree called paradise tree viz., *Simaruba glauca* from El Salvador for large scale afforestation programme in the State. The species has potential of yielding more than 50% oil, which is edible. Establishment of commercial plantations of *Simaruba glauca* could overcome the current edible oil shortage in the country and presently unutilized wastelands can be made productive.

e) Afforestation of wastelands through high density short rotation energy plantation

The high density short rotation (HDSR) practice of growing in more trees per unit area and harvesting them at even younger ages will help to augment the overall productivity besides reducing the rotation period. Two and three years stem volume under high planting density of 40,000 per hectare was about ten times more than under the traditional population density of 2,500 per hectare. Using this HDSR concept, the following tree species were raised under various wastelands to generate firewood and also to generate electricity through gasification technologies.

Species	Specific gravity	Calorific value (Kcals/Kg)
Acacia nilotica	0.67-0.68	4870-4950
Acacia leucophloea	0.78	4886-4899
Prosopis juliflora	0.80-0.92	5000-5500
Casuarina equisetifolia	0.8-1.2	4950

f) Afforestation of wastelands for generating industrial raw material

Plantations to meet demand of industrial raw materials play an important role in Indian forestry especially after the enunciation of 1988 forest policy banning working of natural forest areas. It has been estimated that the demand for industrial wood during 1985 was 32 - 35 million m^3, which is expected to reach 60 million m^3 recent times.

i. Pulp and paper plantations

Eucalyptus is the most promising raw material for pulpwood industry, because of its astonishing growth and its adaptability to wide range of climate and soil conditions. Eucalyptus can thrive in any type of soil including saline and alkaline condi-

tions. Incase of problem soils, higher plant density is preferred to harvest the economic yield. The yield varies from 25-56 m^3/ha/year.

Similarly another fast growing tree species recommended for saline and alkaline wastelands of coastal districts and also for coastal afforestation is Casuarina. Casuarina besides its wide range of adaptability will be able to fix atmospheric nitrogen and can augment the soil fertility status. In the coastal afforestation, Casuarina is recommended as a high density plantation with the stocking density of 4000 to 5000 trees per acre. This industrial wood within a short span of 3 - 4 years could profitably yield 40 – 50 tonnes of industrial raw material and can generate enough employment potential to the rural mass.

Besides these two species, some more trees viz., *A. nilotica, A. auriculiformis, Gmelina arborea, Anthocephalous cadamba, Cassia siamea* and *Bamboos* are also good sources of raw materials for pulp and paper plantations. Forest College and Research Institute (FC&RI) has collaborated with M/s. Tamil Nadu News Prints and Papers Limited (TNPL) and M/s. Seshasayee Paper Boards Ltd. for establishment of captive pulp wood plantations under the wastelands of the State. Accordingly, M/s. TNPL has established 1000 acres of captive eucalyptus plantations through guidance of FC&RI and also established FC&RI clones for higher productivity. These plantation activities converted the unutilizable wastelands into utilizable biomass for pulpwood industries. These activities also created employment opportunities to the rural communities and augmented the socio economic status of the villages.

Similarly, from this year onwards, M/s. Seshasayee Paper Boards collaborated with FC&RI and a target of afforesting 1000 acres/year has been fixed and the programme was successfully initiated with an establishment of 100 acres under Casuarina and Eucalyptus plantations. This also created a strong buy back arrangement and credit facilities, which promoted many farmers to enter into tree husbandry activities.

ii) Match wood plantations

Match wood industry is one of the pioneering wood based industries in the country and predominant in the state of Tamil Nadu. These match industries are now facing problems of getting raw material on sustainable basis. Under these circumstances the match wood plantations with *Ailanthus excelsa* can generate excellent raw material to these industries. *A. excelsa* is highly adaptable to wide range of soil and climatic conditions and also tolerate drought. Similarly, species like *Ailanthus malabarica, Simarouba glauca, Bombax Ceiba* are excellent choices for match wood plantations.

iii) Tannin industries

Vegetable tannins play an important role in leather industries, utilizing more than 2.5 lakh tons of raw materials. The vegetable tannins are found in wood, bark, fruit, leaves of many forest plants, which are distributed through out the country. Tannins from bark are one of the important sources for raw material and can be generated in wide range of species. The species *Acacia nilotica* is one of the trees highly suitable for waterlogged areas. The bark can be used as an excellent source for tannin and wood can be used in pulp and paper industries

and as fuel wood also. The *Acacia auriculata* is another source of tannin materials, which could be recommended for large scale plantation establishment in the wastelands of the state. These two species can thrive in wide range of climate and soil. *Emblica officinalis* is also recommended for arid and semiarid lands and could profitably yield fruit tans.

Conclusion

There is excellent scope for greening the wastelands, produce industrial raw materials; biodiesel etc. and at the same time help in environmental benefits through carbon sequestration. The farmers and industries can earn carbon credits through such afforestation activities and at the same time meeting the demands for these products. Rural sector can get profitable employment in all activities of afforestation, and utilization of the resources generated.

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Value Added Products of Agricultural Produce

Dr. K. Sheela, Ph.D.

Home Science College and Research Institute has its origin as the Department of Home Science, Agricultural College and Research Institute, Madurai in 1980. Its evolution into a full-fledged individual institute became necessary and mandatory, when ICAR began to give special attention to the strengthening of Home Science faculties in all the Agricultural Universities. The institute became full-fledged in 2002 with five departments namely Food science and Nutrition, Human Development, Home Science Extension, Apparel Designing and Fashion Technology and Family Resource Management are actively involved in teaching, research and extension.

The College offers a four year professionalized UG programme, directed to both placement and entrepreneurship. Recognized as a professional degree programme, it draws students through the Tamil Nadu Professional Courses Entrance Examination. M.Sc.and Ph.D. programmes have been well founded in the Department of Food Science and Nutrition from 1982 onwards. Home Science College contributes significantly to the economic development of our nation. In order to fully utilize agricultural production, timely processing is necessary because of the seasonally and perishability of agricultural and horticultural produce.

India has a large raw material base suitable for producing wide range of processed foods. The current production level of food grains (including rice, jowar, bajra, maize, ragi, wheat, barley, gram and pulses) in the country is estimated to be about 25 million tonnes per annum. We produce nearly 41 million tones of fruits and 71 million tones of vegetables and our share in world production is about 12% fruits and 15% in vegetables.

About 65 out of 425 million tones of food materials of plant and animal origin worth Rs. 76,000 cores per annum get lost during post-harvest phase and this can be reduced if appropriate agro processing centers are established with proper linkage to ensure continuous supply of quality raw food materials to process value added agricultural products.

In the liberalized economic era and the new WTO regime, there is vast potential for out products in the international markets. Further, in the open economic scenario that exists today, we must maximize our value addition of Agricultural produce. Food processing appears to be one such promising area.

Advantages of value added products

Value added products fetch higher price, be made available throughout the year. It prevents wastage / spoilage of surplus

seasonal produce and increases employment opportunity. Demands for value added products are created to suit the change in life style and urbanization besides adding variety to the diet and increasing the foreign exchange value. In this context, the stall and post graduate students of Home Science College and Research Institute has focused research priority on value added products by using foods of both animal and plant origin.

Through research the post harvest technology generated over the years includes processing and utilization i.e., development of novel food products with value addition, packaging and storage of fruits and vegetables with a view to increase the shelf life0suitable for export purpose. Nutrition of the vulnerable groups giving much stress for the introduction of nutritious foods in the regular diets with a view to introduce highly nutritious but low cost foods using under utilized grains, legumes, greens, tubers and papaya products to combat malnutrition particularly micronutrient deficiencies. The department is also involved in the processing of ready mixes and low cost nutritious foods suitable for farm families.

Home Science College and Research Institute has taken up transfer of technology efforts through providing skill training

to the farmers, Self Help Group's (SHF) members to promote entrepreneurship. The trainings are organized with the financial support from the various national and international agencies viz., Canadian International Development Agency (CIDA), Indian Council of Agricultural Research (ICAR), Department of Science and Technology, Tamil Nadu, Centre for Entrepreneurial Development for women of Canara bank in collaboration with public, private sectors and Non Government Organizations.

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Agricultural University - Our Next Generation : Insight

M.Maheswaran and K.Ramasamy

In Agriculture, Tamil Nadu has reached a plateau in food production a common statement from everybody. We also hear another statement that our area under cultivation remain to be the same. Both statements are true in terms of overall statistics. But the fact remains to be analysed in a different perspective.

- We have given more importance to commercial crops leading to reduction in prime land for food grain production (from four sugar factories to thirty six sugar factories).
- Think of the construction and industrialization to which land is diverted?, ththat too from prime agricultural rice cultivation area.
- Myriad of teak or agroforestry projects have brought in arid soils to planting and this is also calculated for cultivable area.
- On one side we have lost much of our productive lands for developmental activities, while on the other side we have brought in unproductive lands.
- Cropping pattern has changed, from two to three crops of rice in Thanjavur District and we get only one crop of rice now.

If we have stagnated in the food grain production it is a misnomer. We have increased our production from the net unit of land under food grain production and we have expanded our production capability from waste lands through horticultural and forestry plantings. Expansion in sugarcane, turmeric, cotton, medicinal plants etc have contributed for our overall production. Our agricultural income has increased by 19 per cent in real monetary terms over a period of five years.

The Focused Approach

We work to improve yield of almost all crops known to mankind-let us restrict to four crops say, food grain, commercial, vegetable, fruit or flowers. With available man-power, let us target crop specific and location specific specialization and yield improvements.

Our goal should be to produce more from less land. We have brought in corporate sector in to Agriculture. We have no experience on this type of capital-intensive agriculture; let us train manpower for it.

Value addition and quality maintenance are requisites for market acceptability. We have no major programme on value addition. Let us place and train manpower for it.

We are not having any programme on packaging and market study. Let us redefine curriculum and get teachers for it. We are not having pilot plants to demonstrate the technologies. Let us establish pilot plants (biofertiliser, biobleachers, bioremediators, biopesticides, growth regulators etc.)

Our approach to provide high end trained Masters degree and Ph.D holders may be restricted to quality education. More trainees should be made available at middle level so that the one-to-one knowledge transfer is possible for the farmers.

Let us equip ourselves in terms of tools, equipments and infrastructure so that new technologies are developed to train

the future generation of agricultural graduates to face the research, teaching and service oriented enterprises. Such graduates will be employement generators rather than the present employment seekers.

Whether the organisation capitalise upon the potential of the individual scientists?

One could not ignore that a team of scientists could accomplish much more than the sum of its individual members working alone. Over the past few years we have seen many approaches aimed at increasing organisational effectiveness and many organisations today pay more attention to the trainings and development of their personnel, particularly those, who hold managerial positions. The success of an organisation depends on good teamwork and there is no two opinion on this.

Why, then there is a symptom of frustration among the scientists losing inspiration, lacking commitment and motivation, which are essential ingredients of effective teamwork. How is it, the scientists are not in a position to express themselves freely through the system while the organisation seem to spend a lot of time on retaliations. We had All India coordinated projects, we think of Net-work projects. CSIR has come out with Millennium projects, New-idea fund etc. Europe has come out specialized F-6 programme with identified leaders networking interested partners. Both long term and short-term goals are defined with a possibility to add or delete few more interested groups that opt to contribute. Goal orinted and technology specific programmes of this type can be planned and executed (eg, rumen grafting, hydrogen fuel, GMO detection, Food safety , Rhizosphere engineering etc)

Preparing Agricultural Graduates

Our approaches were largely in the overall production of food grains to feed the ever increasing population. So far we trained graduates who can fit well for the Government Agricultural Departments/ Blue Collar jobs. Our trainings and instructional techniques were different. From the production oriented curriculum we are forced to think for a service oriented curriculum. From the recall of information and teachings correct answers to questions or memorising facts with restricted information it is time to organise our curricula and syllabi to suit the requirements and future needs. No institute of academic standing can be silent for long without transforming itself to the ever-changing needs. Let us realize that we need people who can not only produce for the people but also preserve and store, process to value addition, interact with informed world, market his products and compete in the world market. To achieve these requirements there is a necessity of assess the quality of the system so that the produce of the system suits the society. From the discipline oriented courses we need multidisciplinary courses with team teaching so that the individual acquire knowledge to work alone part of the time and decides his courses (choice based credits), learn to work with others who may have different values, ideas, expertise or capabilities. Speaking, listening, writing and reading skills should be taught in every course. A person who knows but fail to deliver will not suit the 21st century.

Students must be taught how to access information, deal with ambiguity, think critically and holistically, collaborate with others and develop life long learning skills. Tomorrow 90 per cent of the information will be stored in computers. Without computer literacy he or she will suffer to unlock the doors of information. Faculty must de-emphasize content and replace it with class room activities that teach problem solving and inter-personal skills, prepare graduates for the changing global work force. New entrants to the future will be of more women and under privileged for whom the jobs will become rapidly obsolete, where life time employment in a single career field will not be possible, will be forced to change occupations. This will force Colleges to develop industry-partnership,

not for internship and career placement, but for collaboration in the development of software, equipment, text books and industry-faculty exchange programmes.

Employers look for New Generation Agri graduates:

- with problem solving and logical reasoning skills
- Communication, interpersonal skills and global awareness
- Technical skills
- Work experience
- Financial management skills
- with course work in business economics, finance, sales, marketing and budgeting

What we provide today is the technical skill alone. The jobs left for graduates will require more brainwork and more skill in inter personal relationship. They will communicate with their employers, colleagues and the world electronically.

In a world whose information is doubling in every four years the teachers job will be shared more for teaching, counseling, recruiting, research, extension, banking, sales and consulting. Two third of the available work will be information based. Are we prepared to face this?

Man power requirement in agriculture

The programme of action of agricultural universities should cover both long and short term needs of the state. The required manpower for various developmental activities in the state will have to be produced by the university, besides meeting the requirement of the industrial and service sector.

Annually 700 students are admitted in the undergraduate programms in the four campuses. The state agricultural department employs about 65 per cent of the total stock and the educational and research institution provides job nearly 10 per cent of the graduates. The nationalised banks, fertilizer firms, sugar factories and others provide job for the remaining graduates. In the coming years, the service sector will attract a number of agricultural graduates, in the context of liberalization and globalisation, the consultancy services in agriculture is also expected to emerge in the coming years.

It is presumed that during this period between 2000 and 2010, due to present policy, there will be substantial increase in requirement of agricultural graduates by different sectors to the extent of 10% and 20% increase in 2005 and 2010 A.D., respectively.

Additional Man Power Requirement

	Discipline	VIII plan	2000 AD	2005 AD	2010 AD
i)	Agriculture	1175	1479	1629	1810
ii)	Horticulture	225	424	465	525
iii)	Agrl. Engineering	250	285	315	360
iv)	Forestry	160	175	190	205
v)	Home Science	125	140	155	170
vi)	Animal Science*	580	725	800	920

* assumed as 50 percent of agricultural sector needs

Research thrust

Research inputs are basic necessity for targeting our capabilities in order to improve the overall economic welfare and quality of life in farming society and to determine how we can most effectively use the resources to achieve the greatest benefits. When part of our prime land under cultivation is lost by environmental pollution, expansion of urban house hold and industrialization, when the available water resources are depleting; commercial crops are replacing food crops; waste lands are brought in for cultivation, then alternate cropping system, input technologies and crop selection are necessary. We have to get more from rainfed agriculture.

What are the needs

Issue based approach to research: To address the need for a coherent research contribution the research priorities are to be restructures and issue based planning should be followed. Multimedia approach to ascertain the agricultural production problems should be focused. Many of the agricultural problems are location specific. An issue based approach will make it location specific and accountable to the society. Immediate solutions to the problem will help the researchers a sense of accomplishment and an involvement for further service.

Creation of information networking

To avoid duplication of research effort, documentation and information networking may be considered. Electronic networking will improve the information accessibility to the known problem.

Restriction of crops and targeting of goals

For the present we work on all crops that are cultivated. It is a basic necessity to use the available technical manpower for targeting of our goals with restricted crops for a committed duration and then can switch over to other crops.

Creation of centers of excellence with interdisciplinary approach

In a globalised environment we have to be internationally competitive. Conservation of natural resource, effective utilisation and opportunities to greatest risk reduction will force us to formulate policies, monitor progress and develop business acumen to compete in world market. We need to create infrastructure and trained manpower to interact and contribute to these new requirements in the following areas:

- Centre for Agro information
- Centre for Natural Resources
- Centre for Biodiversity and Ecosystems
- Centre for Precision Farming
- Centre for Biofuel
- Centre for Fermentation
- Central facility for Instrumental Analyses and Product Certification
- Centre for Bioprospecting and dDwnstream processing
- Institute for Agricultural Policy Planning and Monitoring

Improved recruitment, training and promotion

Any institute will thrive on good policies to support the existing teachers by promotion and recruit need based talents. Continuous learning and additional training at desired time interval will immensely benefit the institute so that its employees contribute the requirement.

Greater involvement of Academics in policy planning

Participatory management and policy planning will improve the present system to be target oriented and need based or issue based contribution.

Awards and rewards

Appropriate awards and rewards for excellence and contribution will force the teachers to contribute. Care it to be taken for identifying the deserving individual/group for awards. An award to a wrong candidate often brings negative effect on others. Channeled funding to select programmes through rewards will bring prosperity to farming community.

Identification and nurturing of local talents

In any population there will be creative individuals who need support to contribute. Suitable techniques to identify and nurture these individuals will help the institution.

Allowing the creativity to blossom and permitting select individual to test verify their hypothesis: Nature provides unlimited possibility for creative individuals. Most of the time their thinking and theories will be suspected by the larger population. Unique situations are to be created to test verify and succeed.

Let us pave way for greater involvement of scientific community in improving the crop production in a unit area and establish better link with the public to solve their problems in their door-step through issue based approach and make the quality of education relevant to the social needs.

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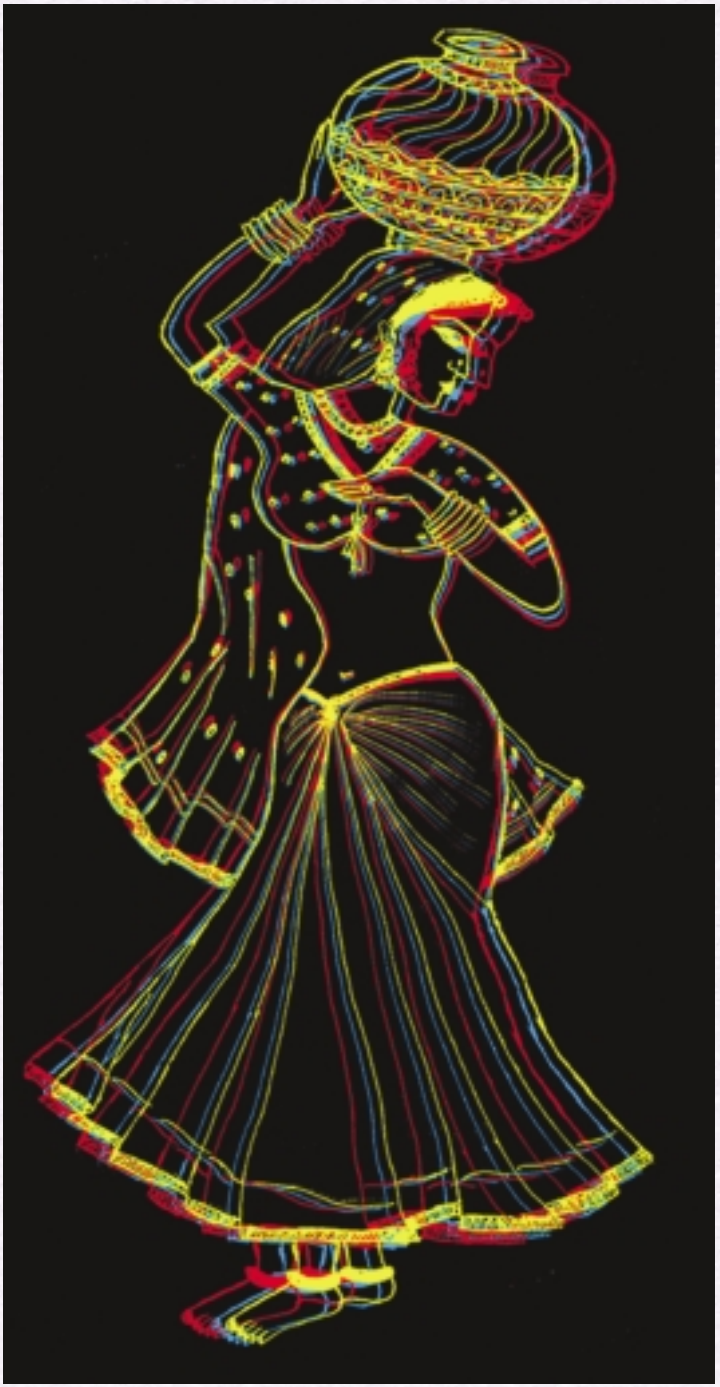
சவாலுக்கு பதிலாய்

சா. தங்கவேலு

தித்திக்கும் செந்தமிழும்,
சுந்தரத் தெலுங்கும்,
மயக்கும் மலையாளமும்,
கவிமிகு கன்னடமும்,
பிறவும் பேசி
வானுயர்ந்து வனப்புற
விளங்கும்,
உண்ண உணவும்
உடுக்க உடையும்
இருக்க இடமும் அளித்து
பயிற்றிப் பல கல்வி தந்து.
பூமிப் பந்து முழுவதும் மலர்ந்து
மணம் வீசும்,
எங்கள் வேளாண்மைக் கல்லூரிக்கு
நூற்றாண்டு விழா !
மனித நாகரீகத்தின் முதல்படி
வேளாண்மை !
இன்றும். பிரச்சனைகளுக்கும்
பிரளயங்களுக்கும்
எதிர்வரும் சவால்களுக்கும்
பதிலாய் !
வேளாண்மை,
உணவுக்கும். உடைக்கும்
மாத்திரமல்ல,
எரிபொருள் என்னாகும் என
உலகம் கலங்கினால்
மரவகை, செடி வகையென
பதிலாய் !
சுனாமியால்
சுருண்ட போதும்
ஆர்பரிக்கும் அலைகடலை
அவிசீனியாக் காடுகளில்
அடக்கம் செய்வோம் !
சுற்றுச் சூழல் மாசுக்கும்
சாயப்பட்டறைக் கழிவுக்கும்
மரங்களும்,
வண்ணப் பருத்தியும் பதிலாய்
நோய் தடுக்க
மூலிகைகள்
மரபணு மாற்றம் கொண்ட
நல்லதோர் ஆற்றல் கொண்ட
காய் கனிகள் பதிலாய்
மட்காத பொருட்கள் எல்லாம்
சாக்கடைகள் அடைத்து
பெருந்துன்பம் பெருக்கிய போதும்
மட்குகின்ற பிளாஸ்டிக்கும்
இன்னபிறவும்
சவாலுக்கு பதிலாய் !
பிராண வாயு இல்லையென
எதிர்காலம் கூறும்
சுகமாய்ச் சுவாசிக்க
சுற்றும் புறமும் பைகஸ்
மரவகைகள். பதிலாய்.
தங்கத்திற்கும். பிற உலோகத்திற்கும்

தோண்டித் துருவி
சூழல் கெடுக்காது.
செடி பிழிந்து தருவோம்
சுத்தமாய் !
விதைச் சாறெடுத்து
விஞ்ஞான விளக்கெரிப்போம்.
விளக்கொளியில்
விதவிதமாய்ச் செடி வளர்த்து
கொள்ளை அழகு
கொட்டி வைப்போம் !
கொசுக்களை
விட்டிலாய் வீழ்த்தி
முடிப்போம் !
ஏற்றம் தரும்
எண்ணற்ற படைப்புகளால்
எதிர்வரும்.
பிணிகளுக்கு மருந்தாய் !
சவாலுக்கு. பதிலாய்
ஆயுதமாய்ச் சுழற்றிடுவோம்
வள்ளுவரின் வாக்காய் !
உழவே தலையாய் !
சவாலுக்கு பதிலாய் !
வேளாண்மை !

உதவி வேளாண்மை அலுவலர்
தமிழ்நாடு வேளாண்மைப் பல்கலைக் கழகம்
கோவை-3



வேளாண்மைக் கல்லூரியுடன் எனது தொடர்பும் - அனுபவங்களும்

திருமதி. சு. சாரதாமணி

நான் ஒரு சிறு விவசாயி, எனக்கு மூன்று ஏக்கர் நிலம் இருக்கிறது. நான் கடந்த 25 வருடங்களாக வேளாண்மைத் தொழிலை செய்து வருகிறேன். பயிர் சாகுபடியில் சூரியகாந்தி, மக்காச்சோளம், சோளம், ஊடுபயிராக பாசிப்பயறு, வெண்டை, மரவள்ளி, தென்னை, மல்லிகை இத்துடன் ஆடு மற்றும் மாடு வளர்த்தலையும் செய்து வருகிறேன்.

நான் கடந்த பல வருடங்களாக தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழகத்துடன் தொடர்பு கொண்டு அரியபல தகவல்களை பெற்றுவருகிறேன். கோவை வேளாண்மைக் கல்லூரி எங்களைப்போன்ற விவசாயிகளுக்கு புதிய இரகங்களையும், நவீன தொழில் நுட்பங்களையும் மற்றும் புதிய பயிர்த்திட்டங்களையும் எடுத்துக்கூறி திறம்பட பணியாற்றிக் கொண்டு வருகிறது. **"நூற்றாண்டு விழா"** கொண்டாடும் தருணத்தில், பல்கலைக்கழகத்திற்கும் பல உழவர்களுக்கும் கிடைக்கப்பெற்ற இனிமையான அனுபங்களை பகிர்ந்து கொள்ள வாய்ப்பளித்தற்கு நன்றி. நான் **உழவர்தின விழா, வயல் விழா, பயிற்சிகள், மற்றும் கருத்தரங்குகளில்** கலந்து கொண்டு வருவதன் பயனாக, தமிழ்நாடு பண்ணை மகளிர் பயிற்சி திட்டம் 27.1.1997 அன்று எங்கள் கிராமத்தில் நடத்தபட்டது.. அதில் பலரும் கலந்து கொண்டு மண் மாதிரி எடுத்தல், விதை நேர்த்தி செய்தல், டி.ஏ.பி தெளித்தல் போன்ற பல தொழில்நுட்பங்களை ஆர்வத்துடன் கேட்டு தெரிந்து கொண்டனர்.

இதே ஆர்வத்துடன் 1998-ம் ஆண்டு எங்கள் கிராமம் பயன்பெறும் வகையில் உழவர் விவாதக்குழு அமைத்து, அதில் குழு அமைப்பாளராக சேர்ந்தேன். கிரிப்கோ உரக்கம்பெனியுடன் இணைந்து பேராசிரியர்கள் முன்னிலையில் மானாவாரி சாகுபடி தொழில்நுட்பங்கள் நிகழ்ச்சி 29.4.99 அன்று நடைபெற்றது. இதில் 100 விவசாயிகள் கலந்து கொண்டு பயன்பெற்றனர்.

வேளாண்மை அறிவியல் மையத்தில் ஒவ்வொரு மாதமும் நடைபெறும் பயிற்சிகளில் கலந்துகொண்டு நானும் பயனடைந்து எங்கள் பகுதி மக்கள் நன்மை பெறும் வகையில் மாதம் இருமுறை கூட்டம் நடத்தி தொழில் நுடபங்களையும் மற்றும் புதிய ரகங்களையும் எடுத்துக்கூறி அவரவர் கேட்கும் சந்தேகங்களை நிவர்த்தி செய்து வருகிறேன்.

தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழகமும் அதனைச் சார்ந்த பிற துறைகளும் எனக்கு பல சான்றிதழ்களையும் பரிசுகளையும் அளித்து என்னுடைய ஆர்வத்தை அதிகப்படுத்தியற்கு நன்றி.

- முதன் முதலாக 2000-ம் ஆண்டு முன்னோடி செயல் விளக்கத்திடல் அமைக்க என்னை தேர்வு செய்தீர்கள்.
- 2000-ம் ஆண்டில் கோவையில் நடந்த உழவர் தினவிழாவில் சிறந்த பெண் உழவர் விவாதக்குழு அமைப்பாளருக்கான சான்றிதழும் பரிசும் வழங்கிக் கௌரவித்தனர். இது எனக்கு மிகப்பெரிய உத்வேகத்தையும், ஆர்வத்தையும் அளித்தது.

- மேற்கு மண்டல ஆராய்ச்சி மற்றும் விரிவாக்க ஆலோசனைக்குழு உறுப்பினராக (2000 முதல் 2003 வரை) பணிபுரிந்தேன்.

- ஆண்டுக்கு ஒரு முறை கூட்டப்படும் இக்கூட்டத்தில், பல்கலைக்கழக துணைவேந்தர், விரிவாக்கக்கல்வி இயக்குநர் ஆராய்ச்சி, இயக்குநர், பிறதுறை இயக்குநர்கள் விஞ்ஞானிகள், மாவட்ட வேளாண்மை இணை இயக்குநர்கள், வேளாண்மைத் துறை மற்றும் தோட்டக்கலைத் துறை அலுவலர்கள் கலந்து கொள்வதால் எங்களுடைய கருத்துக்களை கூறி உடனடி நிவாரணம் பெறமுடிகிறது.

- 2002-ம் ஆண்டிற்கான "சிறந்த பெண் விவசாயி" என்ற பட்டத்தை அளித்தீர்கள்

- ஓங்கிய வருமானத்திற்கு ஒருங்கிணைந்த பண்ணைய திட்டம் தொடர்பான வயல்வெளித்திடல் அமைக்க என்னை தேர்வு செய்தமைக்கு நன்றி.

கோவை வேளாண்மைப் பல்கலைக்கழகத்தில் செயல்பட்டு வரும் வானிலைத்துறை மூலம் வானிலைக் குழுமத்தில் 1999-ல் உறுப்பினராகச் சேர்ந்தேன். இதனால் 2001-மார்ச் மாதம் எங்கள் கிராமத்திற்கு மழை மானி பொருத்தினார்கள். இது எங்களுக்கு மிகவும் பயனுள்ளதாக இருந்தது. எவ்வாறெனில் இந்த துறையின் மூலம் வடகிழக்கு பருவமழை முன்னறிவிப்பு, தென்மேற்கு பருவமழை முன்னறிவிப்பின்படி அதற்கேற்ப விவசாயம் செய்தல், நீர்பாய்ச்சுதல், நோய்களின் அறிகுறிகளை அறிதல், மருந்தடித்தல், உரமிடல் மற்றும் அறுவடைசெய்தல் என பலவற்றிற்கு பயனுள்ளதாக இருக்கிறது. மேலும் மழை அளவைக்கொண்டு கிணற்று நீர்ப்பாசனம் எத்தனை நாட்களுக்கு வரும், இதைக்கொண்டு என்ன பயிர்செய்யலாம் என அறியமுடிந்தது.

மழை முன்னறிவிப்பு பற்றி அறியாத சமயம் 1½ ஏக்கரில் கரும்பு சாகுபடி செய்திருந்தேன். போதிய தண்ணீர் இல்லாமையால் வருமான இழப்பு ஏற்பட்டது. மழை முன் அறிவிப்பை பயன்படுத்தியதன் மூலம் 1 ஏக்கர் மட்டும் கரும்பு நடவு செய்துவிட்டு ½ ஏக்கரில் உளுந்து சாகுபடி செய்து இழப்பு இல்லாமல் வருமானம் அதிகரிக்க வழி கிடைத்தது.

"மக்காச்சோளம் பயிர்சாகுபடி கருத்தரங்கு" சின்னமத்தம்பாளையத்தில் நடைபெற்றது. இதில் ஆர்வமுள்ள பல விவசாயிகள் கலந்து கொண்டு மக்காச்சோள பயிர்சாகுபடி மற்றும் ஒருங்கிணைந்த பயிர்பாதுகாப்பு பற்றி கேட்டறிந்தனர்.

எங்கள் இல்லத்தில் 15.2.2004 ஞாயிறு மலை 3.00 மணியளவில் இலை வண்ண அட்டையின் பயன்பாடு மற்றும் நெற்பயிருக்கு ஊட்டச்சத்துக்களின் மேலாண்மை பற்றிய கருத்தரங்கு நடந்தது. நெற்பயிரில் ஊட்டச்சத்துக்களின் தேவை, உரப் பரிந்துரை மற்றும் தழைச்சத்து மேலாண்மையில் இலைவண்ண அட்டையை பயன்படுத்துவது பற்றி விரிவாக எடுத்துக்கூறி, உழவர்களின் சந்தேகங்களுக்கு விளக்கம் கூறினர்.

கோவை தமிழ்நாடு வேளாண்மைப் பல்கலைக் கழகமும், வேளாண் பூச்சியியல் துறை, பயிர் பாதுகாப்பு மையம் மற்றும் இந்திய வேளாண்மை ஆராய்ச்சிக்கழகம், புதுடில்லி இணைந்து நடத்திய டிரைக்கோகிரம்மா ஒட்டுண்ணி மற்றும் கிரைசோபா இரை விழுங்கி உற்பத்திப் பயிற்சி பத்து நாட்கள் நடைபெற்றது. இதில் பல விவசாயிகள் கலந்து கொண்டு பயன்பெற்றனர்.

கோவை தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழக நுண்ணுயிரியல் துறையிலிருந்து எங்களுக்கு உயிர் உரத்தின் நன்மை, அதன் செயல்பாடுகள் மற்றும் உற்பத்தி செய்தல் பற்றி விரிவாக எடுத்துக்கூறினர்.

நமது பல்கலைக்கழகம் பெருமைக்குரியது, படித்தவர்களை மட்டும் அனைத்து இடத்திலும் முன் நிறுத்தி செயல்பட்டு வரும் பிற பல்கலைக்கழகங்களைப் போல் அல்லாமல் நமது பல்கலைக்கழகம் எங்களைப்போன்ற உழவர்களுக்கு முன்னுரிமை கொடுத்து செயல்பட்டு வருகிறது.

பற்பல தகவல்களை

பண்புடன் கூறும்

பாசமிக்க பல்கலைக்கழகத்திற்கு

பணிவான வணக்கங்கள் !!!

பருவத்தே பயிர்செய்

பாங்குடன் பாடுபடு என

எங்களை ஊக்கப்படுத்தி

எங்களுக்கு தூண்டுகோலாக இருக்கும்

பார் புகழும் எனது வணக்கத்திற்குரிய

பல்கலைக்கழகமே ! உனது செயல்

மென்மேலும் சிறக்க வாழ்த்துக்கள் !!!

உழவர் விவாதக்குழு அமைப்பாளர்
சின்னமத்தம்பாளையம்
கோவை மாவட்டம்

Geared to go Global

வேளாண்மைக் கல்லூரியுடன் எனது தொடர்பும் - அனுபவங்களும்

அம்பிகா பழனிச்சாமி

நூற்றாண்டு விழா காணும் வேளாண்மை பல்கலைக்கழகத்தில். நான் ஒரு அமைப்பாளராக உள்ளதில் மிகுந்த மகிழ்ச்சியும். பெருமையும் அடைகிறேன்.

பருவத்தே பள்ளி. கல்லூரி வாழ்க்கை முடிந்து விட்ட நிலையிலும். தமிழ்நாடு வேளாண்மைக் கல்லூரி பாடத் திட்டங்களின் மூலம் வாழ்நாள் கல்வியாளராக இருப்பதை நினைத்து மிகுந்த உவகை அடைகிறேன், 15 வருடங்களுக்கு மேலாக உழவர் விவாதக் குழு அமைப்பாளராகப் பணியாற்றி வரும் இன்னாளில் தமிழ்நாடு வேளாண்மை பல்கலைக்கழகத்தின் செயல்பாடுகளை எண்ணிப் பார்க்கும்பொழுது மிகுந்த பிரமிப்பு அடைகிறேன்.

15 வருடங்களாக பல்கலைகழகத்தின் தொடர்பின் மூலம் என் வாழ்க்கையில் ஏற்பட்டுள்ள வளர்ச்சியையும். சிறு, குறு விவசாயிகளின் விவசாய சாகுபடி முறையில் ஏற்பட்டுள்ள மாற்றத்தையும் வளர்ச்சியையும் அனுபவ பூர்வமாக உணர முடிகிறது, தனி ஒரு பெண்ணாக இருந்து எவ்வாறு விவசாயம் செய்வது என்று கலக்கம் அடைந்து இருந்த நிலையில். தமிழ்நாடு வேளாண்மைக் கல்லூரி கோவை வானொலி மூலம் வரும் அறிவிப்புகளால் கவரப்பட்டு, வேளாண் அறிவியல் மையத்தை அணுகிய போது. உழவர் விவாதக்குழு அமைப்பாளராக சேருவதற்கு ஆக்கமும். ஊக்கமும் கொடுத்தது குறித்து பெருமை அடைகிறேன்.

தமிழ்நாடு வேளாண்மை பல்கலைக்கழக ஒவ்வொரு துறையையும் பற்றி விரிவாக விளக்கி கூறினார்கள், இதன் மூலம். கோவை மாவட்டத்தில் உள்ள விவசாயிகளுக்கு உதவி புரிவதே பல்கலைக்கழகத்தின் முக்கிய குறிக்கோள் என்பதை புரிந்து கொண்டேன். சுமார் 15 வருடங்களுக்கு மேலாக அமைப்பாளராக உள்ளேன், அமைப்பாளராக இருப்பதற்கு உரிய கையேடு. புத்தகம் தமிழ்நாடு வேளாண்டைக் கல்லூரி விரிவாக்க மையம் கொடுக்கிறது.

உழவர் விவாதக்குழு உறுப்பினராக விதிமுறைகள். தகுதிகள் தெளிவாக விளக்கப்பட்டு (1) பத்தாம் வகுப்பு வரை படித்து இருக்க வேண்டும் (2) சொந்த நிலம் இருக்க வேண்டும் (3) வேளாண்மையில் ஆர்வம் உள்ளவராக பொதுச் சேவை செய்து தாங்கள் வசிக்கும் கிராமத்தை முன்னேற செய்ய வேண்டும், இதில் எங்கள் பள்ளபாளையம் கிராம விவசாயிகளுக்கு நீர் பாசன வசதி அரசை அணுகி செய்து கொடுத்துள்ளேன், மண்சாலை அமைத்துக் கொடுத்துள்ளேன், தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழக விரிவாக்க மையத்தின் மூலம் எங்கள் கிராமத்தில் அனைத்து விவசாயிகளும் பயனடைந்துள்ளனர்.

மண் நிலைய மேலாண்மை கூட்டுறவு ஆய்வு மையம் ஆஸ்ட்ரோலியா. குல்ப் பல்கலைக்கழகம் கனடா உணவு பதப்படுத்தும் முறைகள். உலக மணிச்சத்து நிறுவனம் மொராக்கோ. இஸ்ரேலில் உள்ள சொட்டு நீர்ப்பாசனம் ஆகியவற்றுடன் கோவை தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழகம் இணைந்து வெளியிட்டுள்ள பயிற்சி மற்றும் கையேடுகள் அறிவியல் அடிப்படையில் வேளாண்மையை கடைப்பிடிப்பதை உறுதிப்படுத்துவதோடு. தொழில் நுட்பங்கள் பற்றிய ஆற்றலை மேம்படுத்திக் கொள்ள உதவியது.

வானொலி விரிவாக்க கல்வி மையத்தில் மத்திய அரசின் இலவச தொலை பேசியை விரிவாக்கக் கல்வி மைய விவசாயிகளுக்கு அறிமுகப்படுத்தியது அவ்வப்பொழுது ஏற்படும் சந்தேகங்களை தொலைபேசி மூலம் எந்த நேரத்திலும் வேளாண் விரிவாக்கக் கல்வி ஆராய்ச்சியாளர்களிடம் தீர்த்துக் கொள்கிறோம்.

பயிரிடும் நடைமுறைகளை பின்பற்றுவதற்கு உரிய நேரத்தில் ஆலோசனைகளை வானொலி வேளாண்மை பாடத்தின் மூலமும். வளரும் வேளாண்மை மாத இதழ் மூலமும் மாதத்தில் முதல் செவ்வாய் நடைபெறும் பயிற்சி வகுப்புகள் வாயிலாக அறிந்து கொண்டு மற்ற விவசாயிகளுக்கு எடுத்துரைப்பேன், பயிற்சி வகுப்புகளில் கலந்து கொள்வதன் மூலம் கீழ்கண்ட பயன்களை அனுபவபூர்வமாக உணர்ந்துள்ளேன்.

1. விவசாயிகளுக்கு நல்ல வருமானம் கிடைக்கும் பயிர் இரகங்கள்.
2. நிலத்தின் தன்மைக்கு உகந்த உரங்களை பயன்படுத்துதல்.

3. உயிர் உரம். நுண்ணூட்ட உரம். தமிழ்நாடு வேளாண்மை கல்லூரி விஞ்ஞானிகளால் கண்டுபிடித்ததை பயன்படுத்த கற்றுக் கொண்டேன்.

4. இரசாயன பூச்சிக் கொல்லிகளை தவிர்த்து சரியான ஒருங்கிணைந்த மேலாண்மை நடைமுறைகள் (உதாரணம் வாழைக்கு கூன் வண்டு மருந்து போடுவதற்கு தகுந்த ஊசி ஆராய்ச்சி மூலம் கண்டுபிடித்ததை அறிந்து கொண்டேன்.

5. நீர்ப்பாசன திறனை மேம்படுத்துவதற்காக. சொட்டு நீர்ப்பாசனம். அலை பாசனம், மண் வளம், நிலத்தின் ஈரப்பதத்தை பாதுகாக்க அறிந்து கொண்டது.

6. தரமான விதைகள், கலப்பின விதைகள், நாற்றுகள் மற்றும் பயிரிட தேவையான பிற பொருட்கள் விவசாயிகளுக்கு எளிதில் கிடைக்க அறிந்து கொண்டது.

7. வேளாண்மை பொறியியல் துறை பற்பல வேளாண் யுத்திகளுக்கு ஏற்ப புதிய கருவிகளை கண்டுபிடித்து வேளாண் உற்பத்தியாளர்களுக்கு வேலை பளுவையும். நேரத்தையும் மிச்சப்படுத்தி உபரி வருமானத்திற்கு உதவியது.

8. குறைந்த காலத்தில் உயர் விளைச்சல். நோய் தாக்காத வறட்சியை தாங்கி வளரும் பயறு இரகம். தானிய பயிர் இரகம் எண்ணெய் வித்து இரகங்களை ஒவ்வொரு ஆண்டும் கண்டுபிடித்து விவசாயிகளுக்கு அறிமுகப்படுத்தி உற்சாகப் படுத்தியது.

9. ஒவ்வொரு ஆண்டும் சிறந்த விசசாயிகள். உழவர் விவாதக் குழு உறுப்பினர்களை தேர்வு செய்து பற்பல பரிசுகள் வழங்கி ஊக்கம் கொடுக்கிறது, கோவை வேளாண்மை பல்கலைக் கழகம் இதனால் பிற மாவட்ட விவசாயிகளின் இனிய அனுபவங்கள் அறிந்து கொள்ளுதல்.

10. வருடந்தோறும் உழவர் விவாதக்குழு அமைப்பாளர்களை கல்வி சுற்றுலா. வேளாண் விரிவாக்க மைய விஞ்ஞானிகளுடன் செல்கிறோம், இதனால் அனுபவ அறிவு பெறுவதுடன். அந்தந்த மாவட்டத்தின் தட்பவெப்பம். மண்ணின் தரம் அறிந்து நீரின் அளவு தெரிந்து கொண்டு விவசாயிகள் மேம்படுவதை அறிகிறோம்.

11, தமிழ்நாடு வேளாண்மைப் பல்கலைகழகத்தின் வானிலை மையம். ஒவ்வொரு மாதமும் அறிக்கையை விவசாயிகளுக்கு அளிக்கிறது, இதனால் தரிசு நிலங்கள் விதைப்பிற்கும். அறுவடை சமயம் தானியம் பாதுகாத்துக் கொள்ள உதவுகிறது, காட்டாமணக்கு முன்பு விவசாயிகள் வேலிக்காகவும். அருகம்பில் வரப்பில் உள்ளது உள்ளே பரவாதலும் இருக்கவும் பயன்படுத்தினோம், ஆனால் தற்காலத்தில். மதிப்பூட்டப் பெற்ற பொருளாக பயோடீசல் தயாரிக்கும் முறையை கண்டு-பிடித்துள்ளார்கள், தானியங்களில் பயறுகளில் வண்டு பூச்சிகள் தாக்காத தானிய கலங்களை ஆராய்ச்சி மூலம் கண்டுபிடித்தது, விதைகளை பாதுகாக்க மிகுந்த பயன் உள்ளதாக உள்ளது.

வனக்கல்லூரி ஆராய்ச்சி நிலையத்தால் விவசாயிகள் மரம் வளர்ப்பதில் தேர்ச்சியடைந்துள்ளோம், மழையை பூமிக்கு ஈர்த்து மழை பொழிய வைக்கும் சொர்க்க மரம் பற்றி தெரிந்து கொண்டோம்.

உலக வர்த்தகத்தில் ஈடுபட விவசாயிகளுக்கு பல்கலைக் கழகம் உதவ வேண்டும்.

தமிழ்நாடு வேளாண்மைப் பல்கலைக்கழகம் பல நுற்றாண்டுகள் சிறப்புடன் செயல்பட்டு. பின் வரும் சந்ததியின-ருக்கும் பயன்படும் வகையில் செயல் ஆற்ற, வேளாண்மைப் பல்கலைக்கழகத்தால் பயன்பெற்ற விவசாயிகளின் சார்பாக வாழ்த்துக்கள்.

உழவர் விவாதக்குழு அமைப்பாளர்
பள்ளபாளையம்

Geared to go Global

விவசாயத்தில் இடர்பாடான நிலையும் அதன் மேலாண்மையும்

- வேளாண்மை பல்கலைக் கழகத்தின் பங்களிப்பு

உ. கிருஷ்ணன்

விவசாயத்தின் அடிப்படை ஆதாரங்களான நிலம். நீர். சூரிய ஒளி. சுற்றுச்சூழல் இவைகளில் ஏற்படும் மாற்றங்கள் சில சமயங்களில் விவசாயத்திற்கு சாதகமாகவும் சில சமயங்களில் விவசாயத்திற்கு பாதகமாகவும் அமைந்து விடுகின்றன, சாதகமான சூழ்நிலையில் விவசாயிகள் தங்களுடைய சொந்த அனுபவம் மற்றும் சகவிவசாயிகளின் அனுபவம் ஆகியவைகளை கொண்டு நல்ல விளைச்சலை பெற்று விடுகிறார்கள், ஆனால் பாதகமான அதாவது இடர்பாடான சூழ்நிலைகளில் தங்களுடைய அனுபவத்திற்கு அப்பாற்பட்ட அறிவியல் ரீதியான அணுகுமுறை தேவைப்பட்ட சூழ்நிலையில் வேளாண்மைப் பல்கலைகழகம் அறிவியல் ரீதியான புதிய தொழில் நுணுக்கங்களை கண்டுபிடித்து குறிப்பாக தமிழக விவசாயிகளுக்கு உதவி வந்திருக்கிறார்கள், இப்பொழுதும் தொடர்ந்து உதவி வருகிறார்கள். அவ்வகையில் தமிழ்நாடு வேளாண்மைப் பல்கலைக் கழகம், அங்கு பணி செய்யும் ஆராய்ச்சியாளர்கள் மற்றும் விரிவாக்கத் துறையினர் அனைவரும் விவசாயிகளின் மரியாதைக்குரியவர்களா கிறார்கள்.

தொடர்ந்து விவசாயம் செய்து வரும் நிலையில் நிலம் தன்னுடைய இயல்பினை, இயற்கைத் தன்மையினை இழந்து வருவதால் மேற்கொண்டும் நிலத்தின் தன்மை சிதைந்து விடாமல் இருக்க மண்ணின் தரத்தை மேம்படுத்த பசுந்தாள் உரத்தை கொடுக்கும் சத்தான உரப்பயிர்கள். தொழு உரத்தின் முக்கியத்துவம். முழுவதும் தொழு உரத்தையே நம்பி இருக்காமல் ரசாயண உரம் கலந்த ஊட்ட மேற்றிய தொழு உரம் போன்ற உரப்பயன்பாடுகளும் மேலும் நிலத்தின் தன்மைகேற்ற மனற்பாங்கான மண். கரிசல் மண். உவர் மண். செம்மண் போன்ற மண் வாகிற்கேற்ற பயிர் வகைகளை விசவாயிகள் பயிர்செய்ய அறிவுரை கூறி அறிமுகப்படுத்துவதிலும் வேளாண்மை பல்கலைகழக விஞ்ஞானிகள் பெரும் பணியாற்றி வருகிறார்கள்.

நல்ல நிலம் இருந்தாலும் நீர் இல்லாவிட்டால் அந்த நிலத்தை விவசாயிகள் முழுமையாகப் பயன்படுத்த முடியாத நிலையில் இருப்பார்கள், நிலத்தடி நீரின் மிகையான பயன்பாட்டினால் குறைந்து வரும் நிலத்தடி நீரின் ஆதாரத்தைபெருக்குவதற்கான யுக்திகளை - பெய்த மழை நீரை வீணாகாமல் குளம். குட்டைகளில் நிரப்புதல். தடுப்பாணைகளை கட்டுதல். வற்றிப்போன கிணறுகளில் மழை நீரை தேக்குதல் போன்ற பணிகளை செய்வதோடு. கிடைக்கும் நீரை சிறப்பாக மேலாண்மை செவது பற்றிய தொழில் நுணுக்கம் இன்றைய அவசர தேவையாக இருக்கிறது, சொட்டு நீர் பாசனம். சூழல் நீர் பாசனம். ஆழச்சால் - அகலப்பாத்தி முறை. ஒரு மடை மாற்றி ஒரு மடை நீர் கட்டும் முறை என நீர் மேலாண்மை யுத்திகளை விவசாயிகள் மத்தியில் புகுத்துவதோடு குறைந்த நீரை கொண்டு அதிக விளைச்சலை கொடுக்கும் பயிர்களை (அதிக நீர் தேவையான பயிர் என கருதப்படும் நெல் பயிர்

முதற்கொண்டு) ஆராய்ச்சியின் முடிவாக விவசாயி-களுக்கு கொடுக்கப்பட்டு வருவது விவசாயிகள் மத்தியில் பெரும் வரவேற்பை பெற்றிருக்கிறது.

பூச்சி. பூஞ்சான தாக்குதலில் இருந்து பயிர்களை காக்க எந்த ரசாயண எந்த வகையான பூச்சிகளை கட்டுப்படுத்தும். பயிர்களில் நச்சுத்தன்மை அதிகமாகாத வகையில் எந்த அளவு பயன்படுத்த வேண்டும் போன்ற அறிவியல் பூர்வமான கருத்துக்களை தெரிவித்து வருகிறார்கள், சமீப நாட்களில் பூச்சி. பூஞ்சானங்களை கட்டுப்படுத்துவதில் ஒரு புதிய அணுகுமுறையை விவசாயிகள் மத்தியில் புகுத்தி வருகிறார்கள், நன்மை செய்யும் பூச்சிகளை கொண்டு தீமை செய்யும் பூச்சிகளின் முட்டைகளையும் இளம் புழுக்களையும் அளித்தல். வேம்பு. நொச்சி. புங்கம். மாட்டு கோமயம் போன்ற இயற்கை பொருள்களை கொண்டு பூச்சி கட்டுப்பாட்டு கலவைகளை தயாரித்தல் போன்ற முறைகளினால் மனித இனத்திற்கும். கால் நடைகளுக்கும் தீங்கு விளைவிக்காத கட்டுப்பாட்டு முறைகள் நடைமுறை படுத்தப்பட்டு வருகின்றன.

வேளாண்மையில் ஒரே பயிரிலிருந்து மனித இனத்திற்கு தானியமும் கால்நடைகளுக்கு தட்டும் கொடுக்கும் பயிர்களில் இருந்து மாறுபட்டு தீவனத்திற்கென்றே புதுவகை பயிர்கள் உருவாக்கப்-பட்டு வருகின்றன, கிளரிசிடிய, அகத்தி போன்ற அதிக சத்துள்ள மரத்தீன பயிர்களோடு கோ-1. 2 புல்வகைகளும் குறிப்பாக தீவனத்துறையினரால் சமீபத்தில் வெளியிட்ட கோயமுத்தூர் தீவன சோளம் - 29 (ஊகுளு-29) கம்பு நேப்பியர் புல் போன்ற சன்ன ரகத் தட்டும் அதிக தூர் கட்டுதலும், நிறைந்த இலைகளையும் கொண்ட மாடுகள் வீணாக்காது விரும்பித் திண்ணும் ரகங்கள் விவசாயிகள் மத்தியில் பெரும் வரவேற்பை பெற்றிருக்கின்றன்.

விவசாயிகள் தாங்கள் உற்பத்தி செய்த பொருட்களை நல்ல விலைக்கு விற்கவேண்டுமானால் அவர்கள் மேற்கொள்ள வேண்டிய முக்கிய நிலைகளில் முதன்மையானது அறுவடைக்குப் பின் தானியங்கள். காய் கறிகள். பழங்கள். பூச்சி பூஞ்சானங்களால் பாதிக்கப் படாமல் பாதுகாத்தல் முடியமாயின் பதப்படுத்தி மதிப்புக்கூட்டிய பொருட்களாக மாற்றி சந்தை படுத்துதல் மிக முக்கியமானதாகும், மாறி வரும் சூழ்நிலையில் விவசாயிகளும் தங்கள் தொழில் முறையில் மாற்றங்களை கொண்டு வரவேண்டியதன் அவசியத்தை பல்கலைகழக பொருளாதார நிபுணர்கள் விவசாயிகளுக்கு உணர்த்தி வருகிறார்கள், விவசாயிகள் தனித்தனியாகவோ. சிறு சிறு குழுக்களாகவோ அல்லது கூட்டுறவு துறை மூலமோ-சிறு. நடுத்தர தொழில் நிறுவனங்களை தொடங்கி தங்கள் உற்பத்தி பொருட்களை மதிப்புக் கூட்டிய பொருட்களாக மாற்றி சந்தை படுத்தவில்லை என்றால் விவசாயிகள் ந.'.டத்தையே சந்திக்க வேண்டிய சூழ்நிலையும் தொடரவே செய்யும்.

விவசாயிகள் எல்லோரும் தங்கள் விளைபொருட்களை ஒரே சமயத்தில் விற்பனைக்கு கொண்டு வருவதால் குறைந்த விலைக்கு விற்று எல்லோரும் ந.'.டத்தை சந்திக்க வேண்டியிருக்கிறது, இதை தவிர்க்க எந்த பொருளுக்கு எந்த சமயத்தில் நல்ல விலை கிடைக்கும். உள்நாட்டு - வெளிநாட்டு சந்தையின் தேவைகேற்ப உரிய பொருட்களை உற்பத்தி செய்து அதிக லாபம் பெற உள்ள வாய்ப்பு. போன்ற செய்திகளை ஒவ்வொரு நாளும் விவசாயிகள் தெரிந்து கொள்ளும் முகத்தான் சமீபத்தில் தமிழ்நாடு வேளாண்மை பல்கலைகழகம் "ஏற்றுமதி மற்றும் உள்ளூர் சந்தை மையம்" என்ற ஒரு முன் மாதிரி அமைப்பினைத் தொடங்கி இருப்பது விவசாயிகளுக்கு பெரிதும் உதவியாக இருக்கும் என்பதில் ஐயமில்லை.

மாற்றுப்பயிர் சாகுபடி என்ற முறையில் வேளாண்மை பல்கலைகழகம் கடந்த இரண்டு மூன்று ஆண்டுகளாக விவசாயிகள் மத்தியில் "காட்டாமணக்கு"

என்ற பெயரினை அறிமுகப் படுத்தி வருகிறது, காட்டாமணக்கு குறைந்த நீரிலும் நல்ல மகசூலை கொடுக்கக்கூடியது. பூச்சி, பூஞ்சான நோய் தாக்காதது, கால் நடைகளாலும் சேதம் ஏற்படாதது, விற்பனையிலும் சிரமம் இல்லாமல் இருக்க விவசாயிகளும் - வியாபாரிகளும் ஏற்றுக்கொண்ட ஒரு விலை நிர்ணயம் செய்து விற்க முடிகிறது, மொத்தத்தில் காட்டா மணக்கு எல்லா இடர்பாடுகளையும் தாங்கி விவசாயிகளுக்கு நல்ல வருமானத்தை தரும் பயிராக இருக்கப்போவது உறுதியாக தெரிகிறது.

நீர் பற்றாக்குறையினால் கரும்பு சாகுபடி குறைந்து வரும் நிலையில், கரும்புக்கு மாற்று பயிராக குறுகிய காலத்தில் குறைந்த நீரை கொண்டு சாகுபடி செய்ய கூடிய "சர்க்கரை சோளம்" என்னும் ஒரு புது வகை பயிரையும் வேளாண்மை பல்கலை கழகம் விவசாயிகள் மத்தியில் அறிமுகம் செய்து வருகிறது.

விவசாயத்தில் மனித உழைப்பையும் வேலை நேரத்தையும் குறைக்கும் நோக்கத்தை வெவ்வேறு பண்ணை கருவிகளை உருவாக்கி வேளாண் பொறியியல் கல்லூரி விவசாயிகளுக்கு உதவி வருகிறது, கதிர் அறுக்கும் அரிவாள், மஞ்சள் தோண்டும் கருவி. மஞ்சள் வேக வைக்கும் அண்டா. நெல் வேகவைக்கும் அண்டா. நிலக்கடலை. தோல் உரிக்கும் கருவி. விதை விதைக்கும் கருவி போன்ற பண்ணை கருவிகள் விவசாயிகள் மத்தியில் நடைமுறைக்கு வந்திருக்கின்றன, எதிர்கால தேவைகேற்ப முன் ஷாக்கிறதையாக சில பண்ணை கருவிகள் உருவாக்கும் முயற்சியும் மேற்கொள்ளப் பட்டிருக்கின்றன, அவற்றில் முக்கியமாக குறிப்பிட வேண்டியது தென்னை மரத்திலிருந்து தேங்காய் பறிக்கும் எந்திரத்தை உருவாக்க வேளாண் பொறியியல் கல்லூரி எடுத்து வரும் முயற்சி அதை வெற்றி கரமாக உருவாக்கி செயல்பாட்டிற்கு கொண்டு வரப் படுமானால் தென்னை விவசாயிகள் தேங்காய் பறிக்க உள்ள பெரும் இடர்பாட்டிலிருந்து விடுதலை பெற்றவர்கள் ஆவார்கள்.

உழவர் விவாதக்குழு அமைப்பாளர்
நாயக்கன்பாளையம்

இவ்வேளாண் பல்கலைக்கழகமும் உழவர் தொடர்பும் . . .

எஸ். நந்தகுமார்

புகுமுக வகுப்பு முடித்தவுடன் மேல்படிப்பில் சேரும் முயற்சியில் 1965ம் ஆண்டு கோவை வேளாண் கல்லூரிக்கு விண்ணப்பித்தேன், ஆனால் இடம் கிடைக்கவில்லை, பிரதான மணிக்கண்டு கட்டித்தையும். உழவியல் துறை இயங்கிவரும் கட்டிடத் தொகுதியையும் ஏக்கத்துடன் பார்த்து திரும்பி கலைக் கல்லூரியில் பட்டப்படிபை முடித்தேன். என்னுடன் பயின்றவர்களெல்லாம் பல்வேறு பணிகளில் சேர்ந்தனர், ஆனால் நான் வேளாண்மையை மேற்கொண்டேன், கோவை உழவர் பயிற்சி நிலையத்தின் வட்டாரப் பயிற்சி மூலம் உழவர் விதாக்குழு அமைப்பாளரானேன்,

கோவை உழவர் பயிற்சி நிலையம். வேளாண் அறிவியல் நிலையமாக மலர்ந்து. பல்வேறு பயிற்சிகள் வழங்கப்பட்டு வருகின்றன, பயிற்சிகளில் ஆர்வத்துடன் கலந்து கொண்டு. வேளாண் பட்டப்படிப்பு பயிலும் எனது ஆர்வத்தைத் தணித்துக் கொண்டேன்.

சிறு தானியங்களில் வீரிய ஒட்டு ரகங்கள் அறிமுகப்படுத்தப்பட்டபோது முதலில் அமைப்பாளர்கள் நிலங்களில் அனுசரணை திடல்கள் அமைத்து. புதிய பயிர்ரகங்களின் பல்வேறு அம்சங்களும் கண்டறியப் பட்டு அவை எந்தெந்தப்பகுதிக்கு ஏற்றவை என்று அறிந்து பரவலான சாகுபடிக்கு பரிந்துரை செய்யப்-பட்டன, டெக்கான் மக்காச்சோள ரகங்கள். சி,எஸ்,எச், வீரிய ஒட்டு சோளரகங்கள் மற்றும் எம்,சி,யு வகை பருத்திரகங்கள் இவ்வாறு பிரபலமாயின, ஐ,ஆர்,நெல் ரகங்களும் பரவலான சாகுபடிக்கு வந்தன, 80களில் சிறப்புக் குணங்களுள்ள பயிர்கள் அறிமுகப் படுத்தப்பட்டன, அதிக மாவுச்சத்துள்ள மக்காச்சோளம் அதிக அளவு மற்றும் இனிப்புள்ள தட்டு கொடுக்கும் சோள ரகங்கள், நீண்ட இழை கொடுக்கும் பருத்தி ரகங்கள் மற்றும் சன்ன அரிசியுள்ள வாசனை அரிசி நெல் ரகங்கள் அறிமுகமாயின, தக்காளியில் புரட்சி செய்த பி,கே,எம் மற்றும் செடி முருங்கை ரகங்களும் பிறந்தன, வடநாட்டு குட்டை கோதுமை ரகங்கள் அறிமுகமான போது. நான் துணிந்து ஸ்ன்று ரகங்களை ஒவ்வொன்றும் 10 சென்ட் பரப்பில் சாகுபடி செய்து வெற்றி கண்டேன்,

குறைந்த மழையினால், பெரும்பாலான விவசாயிகளுக்கு உள்ள தேவைகளைப் பூர்த்தி செய்வதே பால்பண்ணையும். கோழிப் பண்ணைகளும் என்றால் மிகையில்லை, பல்வேறு சிறப்புப் பயிற்சிகளான மின்சார மோட்டார் பராமரிப்ப, விசைத் தெளிப்பான் பழுது நீக்குதல். வேளாண்மையில் பிளாஸ்டிக் உபயோகம், சொட்டு நீர்-தெளிப்பு நீர் பாசனம். தேனீ வளர்ப்பு. காளான் வளர்ப்பு. காய்கள்-பழங்கள் பதப்படுத்துதல், சாண எரிவாயு அமைத்தல், சூரிய ஒளியிலிருந்து மின்சாரம் தயாரிப்பது, வெந்நீர் பெறுவது.,காற்றாலை உபயோகம், டிராக்டர் இயக்கம் போன்ற பயிற்சிகள் கொடுக்கப்பட்டன,

பரந்த அளவில் சாகுபடி மேற்கொள்ளும் போது ஏற்படும் ஆட்கள் பற்றாக்குறையை ஈடு செய்ய வேளாண்கருவிகள் புகுத்தப்பட்டன, தற்போது பரவலாக உழுவது. சேறு கலக்குவது இயந்திரங்கள் ஞலமே நடைபெறுகிறது, குறுகிய கால அவகாசத்தில் விதைப்பதற்கு டிராக்டர் பயன்பாடு பெரும் வரப்பிரசாதம், வேளாண் அறிவியல் நிலைய கல்விச் சுற்றுலாக்களில் பங்கு பெற்று. பல்வேறு ஆராய்ச்சி நிலையங்களையும். அங்கு நடைபெறும் ஆராய்ச்சிகள் புதிய பயிர் ரகங்கள் மற்றும் தொழில் நுணுக்கங்கள் தெரிந்து கொள்ள முடிந்தது, வெளி மாநிலங்களுக்கும் செல்லும் வாய்ப்பினால் அங்குள்ள புதிய பயிர்கள் சூழ்நிலைகள், கலாச்சாரம், உணவு முறைகள் பற்றிய தெளிவு ஏற்பட்டது,

வேளாண் விஞ்ஞானிகள் எனது கிராமத்திற்கு வந்து வேளாண் கருவிகள் உபயோகம். தென்னை நார்க் கழிவினை மக்கவைத்தல். தென்னையில் தோன்றும் நோய் பூச்சிகளைக் கட்டுப்படுத்துவது ஆகிய செயல் விளக்கங்களை நடத்தினர், காய்கறிகள். பழங்கள் பதப்படுத்துவது பற்றி கிராமமகளிர் தெரிந்து கொண்டனர், பல்கலைக்கழகத்திற்கு செல்ல முடியாத விவசாயிகளுக்கும் இப்பயிற்சினைப் பெற முடிந்தது,

வேளாண் பல்கலைக்கழகத்தில் எனக்கு கிடைத்த கௌரவம், மேற்கு மண்டல ஆராச்சிக் குழுவில் 1982 முதல் 1992 வரை உறுப்பினராக நியமனம்.

வேளாண் அறிவியல் நிலையத்தின் மேலாண்மைக குழு உறுப்பினராக 1987ல் ஆலோசனை வழங்கினேன், இந்திய அளவிலான அறுவடை மட்டும் அறுவடைக்கு பிந்திய தொழில் நுட்ப பயிலரங்கில் கலந்து கொள்ளும் வாய்ப்பு !!

நிலத்திலிருந்து ஆராய்ச்சிக் கூடத்திற்கு விஞ்ஞானிகளுடன் கலந்துரையாடும் வாய்ப்பு.

1992ல் ஆண்டின் சிறந்த உழவர் விவாதக்குழு அமைப்பாளருக்கான தொலைக்காட்சிப் பெட்டி பரிசு உழவர் தினவிழா சிறந்த அரங்கு பரிசளிப்பு குழு உறுப்பினராக பங்கு பெறுதல், 4.1.94 அகில உலக அளவிலான மாற்றுவழி மற்றும் செலவிற்கு ஏற்ற விரிவாக்க தொழில் நுணுக்கங்கள் பற்றிய பயிலரங்கில் பங்கு பெறும் வாய்ப்பு, 14-17.12.94. புதிய உத்திகளை புகுத்தும் உழவர் பரிசு. இந்திய கல்விக்குழு ஹைதராபாத், 16.02.95 தமிழக வேளாண் அறிவியல் பேரவை கருத்தரங்கில் பங்குபெறும் வாய்ப்பு டிசம்பர் 2001,

இக்காலத்திய கட்டாயமான மழைநீர் சேகரிப்பு பண்ணைக்காடுகள் அமைப்பது பற்றி அதிகமாக வலியுறுத்தப்படுகிறது, பல ஆண்டுகளுக்கு முன்பே அறிவுறுத்தப்பட்ட இக்கருத்துக்களுக்கு ஏற்ப எனது நிலத்தில் 25ஈ பண்ணைக்காட்டினை அமைத்துள்ளேன், மழைநீர் சேகரிப்பிற்காக. வெட்டிவேர் நட்டும். காற்று தடுப்பரணாக பனை. அயிலை மரங்கள் நட்டும். பண்ணைக்குட்டை அமைத்தும் உள்ளேன், உலக அளவில் விவசாயத்தில் ஏற்படும் தாக்கத்தினை பல்கலைக்கழகம் தன்னிடமுள்ள வசதியைக் கொண்டு உழவர்களுக்கு தக்க சமயத்தில் தேவையான ஆலோசனைகளை வழங்கி. உழவர்கள் மேம்பாட்டில் வேளாண்பல்கலைக்கழகத்தின் பணி மேன்மேலும் சிறப்படைய வாழத்துகிறேன்.

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The Indian Seed Industry

Dr. A.S. Ponnuswamy

Seed is the first link of food chain and ultimate symbol of security; seed sector is important sub system of agricultural system that maintains the ecology and genetic diversity. Exchange of seed, based on co-operation and reciprocity, among the local farmers has been the basis of maintaining bio-diversity as well as food security. In the later years, improved high yielding varieties were developed and they had to be multiplied and supplied to farmers only as seeds, for wide adoption. In any improved variety or hybrid usage of quality guaranteed certified seed will bestow at least 15% additional yield advantage. Indian Agriculture has made enormous strides in the past 50 years, raising food grain production from 50 million tones to over 200 million tones. The seed sector has made impressive progress over the last 3 decades. The area under certified seeds has increased from less than 500 ha in 1962-63 to over 5 lakh ha in 1999-2000. The quantum of quality seeds has crossed 100 lakh quintal. Today the Indian seed programme boasts as one of the biggest seed markets in the world, with annual sales at around US $920 million. Of this, domestic take of accounts for US $ 900 million and sales in the global market account for the remaining US$ 20 million.

The growth of the Indian seed sector has been accomplished in four spheres viz., i) Seed Industry ii) Seed Legislation iii) Seed Certification, Testing and Law enforcement and iv) Seed Research.

I. The Seed Industry

In the early years at agricultural collages and research station a few improved strains of cotton, wheat, groundnut and sugarcane came into existence. Seeds of these improved varieties were multiplied at one location and distributed over a large area so that the area under low yielding local varieties could be replaced by improved high yielding varieties.

After independence, "National Seeds Corporation Limited" was established in 1963. The High Yielding Varieties Programme was implemented successfully in 1966. The establishment of "Tarai Development Corporation Limited" (TDC) in 1969 was another important landmark in the development of seed industry. The association of "Indian Society of Seed Technology" in 1971 was another significant development. A further review of the seed industry was carried out by the National Commission on Agriculture and 1971 it stressed the necessity of maintaining the purity of high yielding varieties of seeds.

The New Policy on Seed Development (NPSD) was established in 1988 ushered in a liberal business climate with the objective of augmenting productivity and output quality. This stimulated major growth in industry as it attracted a lot of investment in seed business from major domestic seed companies. For reaching changes however, have taken place in national and economic and agricultural scenario and in the international environment since the enhancement of the existing seed legislation and the announcement of the 1988 policy. The National Seed Policy (2002), recently approved by the GOI has paved the way for planned development of the seed sector. The move is aimed at raising India's share in global seed trade to atleast 10% from the current 1%.

The role of public sector seed companies is now mostly confined to certified seeds of high volume, low value segment of high yielding varieties of cereals, pulses and groundnut with limited presence of the high value hybrid sectors of cotton and vegetables. At present the certified seed meets only 10 percent of the requirements. The gap is met by farmer saved seeds. The private seed sector, concentrate on hybrids, mainly corn, cotton, sunflower, vegetables and flowers and more recently rice. The basic reason for the private sectors focus on these crops is that it involves low production volume and higher margins. Currently there are over 200 private seed companies, together with a few multinational companies. The private sector accounts for 70% of the market in terms of market turn over whereas the public sector has greater share (60%) in terms of volume sales.

II. Seed Legislation

Considering the large seed requirements of India's farming community the seed industry could not be handed by the NSC (1963) and there was need to establish a large number of seed producing and supplying organizations in the public as well as private sector. Foresting this and to regulate the grown seed industry, the GOI enacted "The Seeds Act" in 1966. The Seed Rules formed under the Seeds Act was notified in 1968. This took care of the existing structure of the seed industry. Apart from the Act and Rules and amendments there to, the GOI declared seeds as an essential commodity under Essential commodities Act 1955 (10of 1955) and seed (control) order was issued in December 1883.

In 2001, a draft Seeds Act was finalized on the basis of the recommendations of Seed Policy Review group. It would replace the existing Seeds Act (1966) and Seeds (Control) Order (1983). The draft act aims at encouraging development of new plant varieties by ensuring appropriate returns on all such investment by domestic players. The proposed legislation features establishment of National Seeds Board (NSB) and compulsory registration by the board, of any seed for the purpose of sowing or planting. To address concerns about the lack of effective intellectual property rights in the seed industry, the GOI enacted legislation in August 2001 named, "Plant Variety Protection and Farmers Rights Act, 2001".

III. Seed certification, Testing and Law enforcement

Systematic arrangements for seed certification, testing and law enforcement on large scale began to take shape with the launching of seed production programmes for hybrids of maize, sorghum and pearl millet in the early 1960s. The National Seeds Corporation (NSC) (1963) became the first official seed certification agency even before enactment of the Seeds Act. The Seeds Act was passed in 1966 and for the first time in the country's history, statuary support for quality control of seeds was provided. Subsequently the Seed Review Team (1967) critically examined the situation and recommended the formation of the seed certification agency as an autonomous body. An amendment of the Seed Act in 1972 provided for the establishment of a Central Seed Certification Board to advice the Government on matters relating to certification and to co-ordinate the functioning of the State Seed certification Agencies. In Tamil Nadu, the Seed Certification agency is part of the State Department of Agriculture and was established in the year 1979. The function of the Seed Certification Agency can be broadly classified into the following categories i. Seed Certification, ii. Seed law enforcement, iii. Issuing of certification for transport of seeds and iv. Training and Liaison. The quality control of seed is achieved through the Seed Act (1966) by two means i. Labelling and 2. Certification. Although seed certification under the Seeds Act (1966) is voluntary, farmers have shown faith in certified seed and the bulk of the high volume low price agricultural seeds are offered for sale as certified. This is evi-

dent from the fact that though the production of the certified seed has been increasing progressively (Table 1) only 10 percent of the farmers requirement is met.

The evaluation of seed quality for seed certification and quality control purposes are performed in the seed testing laboratories. In Tamil Nadu, there are 8 seed testing laboratories located at Coimbatore (2 nos.), Madurai, Trichy, Tanjore, Kanjeepuram, Dharmapuri and Tirunelveli, apart from one grow-out test field in Coimbatore. In 2001-2002 the quantity of certified seeds in India was 1096600 tones.

The Seed Testing Lab in Coimbatore was established in 1964 and was notified in 1969. The Seed Testing Laboratories are conducting tests on physical purity, moisture, germination and ODV. Private seed companies have also set up seed testing laboratories for their own quality control programmes. These laboratories are not entitled to test seeds for seed certification purposes.

The enforcement of seed law is the responsibility of the State Governments. The State Governments have approved seed inspectors, who visit the premises of the distribution agencies, check the quality of the seed and in case of doubt, draw samples for verification. If found necessary, they can issue orders to stop the sale of seeds, seize stocks and initiate persecution.

IV. Seed Research

Since the inception of organized agriculture, seed the living embryo is considered as the basic, critical and vital input for enhancing and stabilizing productivity and harvesting higher net monitoring returns, per unit area, input and time. The World Bank has helped us in strengthening the seed programme in the country with the launching of NSP in 1977 - 1978 with an estimate of US $ 52.7 million and NSP II in the following year with an assistance of US $ 34.9. The ICAR launched an All India Co-ordinated Project on seed called "National Seed Project" (NSP) in 1979-1980 with 14 centres on Seed Technology Research and an equal number of Breeder Seed Production Centres. Another related Co-ordinated Project called "Seed Borne Diseases" was launched in 1980. This was later merged with NSP in June 1991 for better resource utilization and also to avid the overlapping of the programme. The seed programme of the country was further strengthened with NSP III (World Bank), project which started in 1989-90 which not only supported the ICAR and SAU's but also Department of Agriculture, Seeds Corporation, Seed Certification Agencies and Private Seed Industry. Under the "National Seed Project", the Breeder Seed Production Programme is running at 35 centres and Seed Technology Research at 22 Centres of various SAU's and ICAR institutes in the country. ICAR in guiding, co-ordinating and promoting seed technological research as well as Breeder Seed Production.

Under the Plant Variety Protection and Farmers' Rights Act, 2001, the GOI has sanctioned a Scheme to identify Distinctness, Uniformity and Stability (DUS) characteristics for various crops entitled "Implementation of Protection of Plant Varieties and Farmers Rights Legislation through DUS testing" for a period of 4 years (2003-2007) during the 10th plan period. Department of Seed Science and Technology, TNAU is one of the centres, where in sunflower, groundnut, pigeonpea and blackgram are characterized.

Department of Seed Science and Technology, TNAU, Coimbatore

The Department of Seed Technology, the first of its kind in India was established in the year 1972 in Tamil Nadu Agricultural University. Owing to its active involvement in applied and basic aspects of seed science it has been renamed as Seed Science and Technology in the year 1998. Totally, 46 seed scientists have been involving in seed research throughout Tamil

Nadu and eight of our scientists have been trained in International Institutes at USA, China, Sweden, Denmark, Canada, Britain, Philippines and Israel. Since, its inception this Department has been actively involved in seed research, education and transfer of technology activities.

India, today has a critical mass and level of growth that it could use not only to cater to the growing domestic requirement but also to make a concerned effort for global trade under provisions of GATT and WTO. Further more since India is endowed with second largest area of farmland, and the largest area of irrigated land in the world , the Indian seed industry is well positioned to serve both domestic as well as international markets, proficiently supported by its huge germplasm diversity, strong seed production system and audacious seed quality regulating system .Thus , given the growth of the seed sector in recent years, India has the potential to become the foremost player in the seed export business in the developing world with prospective markets in Asia, Africa and South America.

Professor and Head
Dept. of Seed Science and Technology
Tamil Nadu Agricultural University, Coimbatore - 3

அற்புதத்தின் அற்புதம் !

ஏ.இல. விசயலட்சுமி, மா.மீனாட்சிசுந்தரம்

படைப்புகளுக்கும்
படைப்பாளிகளுக்கும்
சரித்திரம் உண்டு
இங்கே ஒரு சரித்திரம்
இன்னும் ஓர்
சரித்திரம் படைக்கிறது
அந்த சரித்திரம்தான்
தமிழகம் பெற்றெடுத்த
வேளாண் கல்லூரி

நூற்றாண்டு காணும்
வேளாண் கல்லூரியே ! நீ
ஓர் அற்புதத்தின் அற்புதம் !

அன்று - நீ கன்னி முயற்சியில்
காலடி வைத்தாய் கல்லூரியாய்
இன்று - நீ பார்போற்றும்
பல்கலைக் கழகமானாய் !
இன்று உனக்கு அகவை நூறு
ஆனாலும் என்றும் இருக்கின்றாய்
இளமையுடன் மார்க்கண்டேனாய்

உழைக்கும் கரங்களுக்கு - நீ
ஓர் உற்ற தோழன்
உழுவோம் ! உழைப்போம் !! உயர்வோம் !!!
என்பதே உனது உயிர் மூச்சு
நீ கண்ட அறிவியல் நுட்பங்கள்
ஆயிரம் ஆயிரம்
அஞ்ஞானம் அகற்றி
விஞ்ஞானம் நீ வளர்த்தாய்

கல்வியில் கலங்கரை
ஆராய்ச்சியில் அட்சயபாத்திரம்
விரிவாக்கத்தில் விருட்சம் - என
மூன்றிலும் நீ வகித்தாய்
முதலிடத்தை

பட்டினிக்குக் குரல் கொடுக்கும்
பாட்டாளி நீ
விவசாயத் தோழர்களின்
வியர்வைத்துளி துடைக்கும்
விருந்தாளி நீ

வேளாண்மை உனக்கு
தாய்ப்பாலாய் இருந்தாலும்
உன் தாகம் தீர்ந்தது என்னவோ
தமிழ்ப் பாலில்தான்

நாளைகள் இன்றாகி
இன்றுகள் நேற்றாகும்
உன் பணிகள் மட்டும்
என்றும் நிலைத்திருக்கும்

உன் ஆயுளுக்கு
இன்று நூற்றாண்டு விழா
நூறு என்பது
உனக்கு
அனுபவத்தின் மைல்கற்கள்

ஆண்டுகளில் மட்டுமல்ல
அனுபவத்திலும்
பழுத்த பழம் நீ

உன் சேவை
நாட்டுக்கு எப்போதும் தேவை

உன் கண்டுபிடிப்புகளின்
வெளிச்சத்தில்தான்
நாங்கள்
தேசத்தின்
வளர்ச்சியை நோக்கி
சென்று கொண்டிருக்கிறோம்

நூற்றாண்டு காணும் நீ
இன்னும்
ஆயிரமாயிரம் ஆண்டுகள்
காணவேண்டும்

விரிவாக்கக் கல்வி இயக்ககம்
தமிழ்நாடு வேளாண்மைப் பல்கலைக் கழகம்
கோயமுத்தூர் - 641 003

Geared to go Global

Tamil Nadu Agricultural University Library

Dr. K. Perumalsamy, M.A, M.L.I.SC., Ph.D.

The University library is one of the oldest library. The present library initially started as a mini library in the Farm house at Saidapet in 1863, developed as an Agricultural College Library in 1884. It was later shifted to Agricultural College and Research Institute, Coimbatore which blossomed as a full fledged University Library in 1971 and now it is spreading its fragrance as a fully automated digital library in the Information Technology arena.

The University Library is the repository of knowledge for all research and extension activities and academic excellence. The richness and variety of collection available in the Library on Agriculture and allied subjects stands as a testimony for the greatness of the TNAU LIBRARY. The library caters the information needs of all segments of the University's academic structure.

The library, being the heart of the institution is situated at the center of the University for easy access by everyone. The library has a very good esthetic view surrounded by trees and ornamental plants which provides a cool and conducive atmosphere for learning. A long pathway with lawn on both sides leads to the library. The documents are housed in two buildings with two stories. The elevation of the library bears the attractive emblem of the University.

Mission

The chief goal of the library is to extend all support for outstanding performance in Education, Research and other academic and scientific activities carried out in the University. The mission of TNAU library is to acquire information, process, organize, disseminate and preserve the information to the posterity.

Objectives

The specific aims and objectives of the library are as follows.

- To collect and organize the resources of recorded information in accordance with the requisites of the University.
- To promote use of these recorded information.
- To provide guidance, reference and referral services to scientists and students in pursuit of their aims.
- Integrated library services throughout the university based on single management structure with centralization of library services in each campus.

- To co-operate with other libraries and information agencies to make a positive contribution to inter library co-operation, locally, nationally and internationally.

The vision of the library is reflected through the achievements of the scientists and students of the University. The services rendered by the Library has boosted the institution to a level of internationally renowned University.

Collections

The library has a total collection of 1,61,150 books and back volumes of periodicals and subscribe 250 Indian and Foreign periodicals. Nearly 1500 books are added every year. The library receives institutional reports, research reports, annual reports, Newsletters, bulletins and pamphlets from various institutions and universities. Besides this the library possesses very good collection of very rare publications which are well appreciated by dignitaries visiting the library. Even today, many inquisitive retired scientists world over visit the library to refer these rare collections.

Services

The library functions on all days throughout the year except Government holidays. The library services are available from 7.00 A.M. - 11 P.M on all week days and 7.00 A.M to 2.30 P.M on Saturdays and Sundays.

- The compilation of the list of Back volumes for easy retrieval.
- The monthly complication of Agricultural press News Index consists of nascent information useful for scientists.
- READ (Recent Additions) for books added to the Library.
- Conducting of user orientation programme to familiarize the students with the library facilities.
- The reprographic facility.
- Translation Services
- Inter Library Loan Services
- Internet browsing facility for online access

In search of excellence . . .

- in Service
- in Information Collection
- in Processing & Dissemination
- in Preservation of information for posterity
- in producing Excellent & Outstanding Students

Deputy Librarian and Head
Tamil Nadu Agricultural University
Coimbatore

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