AGRICULTURE DEPARTMENT

POLICY NOTE

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Minister for Agriculture

Policy Note 2014-2015
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The State Level Sanctioning Committee (SLSC) has been constituted with the Chief Secretary to Government as Chairman and the Agricultural Production Commissioner and Secretary to Government as Vice Chairman & Member Secretary with GOI officials, Secretaries and HoDs of various State Departments as members. SLSC is the apex body which sanctions the project proposals, monitors and reviews the implementation of NADP in the State. The project proposals received from agriculture and allied departments based on Government of India allocation are placed before the State Level Sanctioning Committee (SLSC), for discussion and approval. State Government issues Government order for the SLSC approved projects and the funds are released to the implementing departments accordingly.

Year wise Government of India release and expenditure details

(Rs. in Lakhs)

Sl. No.	Year	GOI Release	Expenditure
1	2007-08	15,360	18,312*
2	2008-09	14,038	14,475*
3	2009-10	12,790	12,790
4	2010-11	25,003	25,003
5	2011-12	33,306	33,174
6	2012-13	61,327	63,485*
7	2013-14	26,996	27,735*
	Total	**1,88,820**	**1,94,974**

* The excess expenditure incurred over and above the GOI release with respect to the fund sanctioned in State Level Sanctioning Committee (SLSC) has been met out from the State fund.

State Level Data Centre

For efficient management and scientific planning of watersheds, a State Level Data Centre (SLDC) with core GIS facilities with spatial and non-spatial data have been established at TAWDEVA and augmented with satellite imagery data and Global Positioning System.

In the last five years, 239 IWMP projects are implemented in 2,413 watersheds sanctioned by GOI. The watersheds are digitized and Cadastral Maps are incorporated in the watershed boundary by using GIS. The details like Latitude and Longitude, Survey number etc., of all developmental works carried out under IWMP are collected and verified with available satellite imagery of IRS and Google Earth at SLDC. Using GIS Applications the watershed works are checked with accuracy and overlapping of watersheds with other watershed schemes are avoided. The Thematic maps like Soil, Topography, Land Capability, Slope, Drainage, Land use etc., are prepared for every watershed. The SLDC conducted GIS and GPS training to field level functionaries at district level.

GIS functionality in nutshell at SLDC includes:

- Creation of Polygon to avoid overlapping through marking of watershed boundaries.
- For evaluation through satellite remote sensing images and Global Positioning System consistent monitoring the execution of developmental works in the watersheds are carried out.
- Various important thematic maps vital for watershed planning and archived systematically at SLDC are made available through Internet for the benefit of District Watershed Development Agencies, other line departments and common public.

XII Five Year Plan objective

The total geographical area of Tamil Nadu State has been delineated into 18,568 micro watersheds covering an area of 130.27 L.Ha. The treatable micro watersheds in the state is 11,116 Nos. covering an area of 60.85 L.Ha. Out of the treatable micro watersheds, so far during the XII FYP, 781 Nos. of watersheds were covered to treat an area of 3.674 L.Ha. under Rural Development Ministry of Government of India with the sharing of State Government. For the year 2014-15, an area of 1.596 L.Ha. will be sanctioned by Government of India under IWMP. It is proposed to include the remaining watersheds to be treated in the XII Five Year Plan period.

8. AGRICULTURAL EDUCATION, RESEARCH AND EXTENSION EDUCATION

Tamil Nadu is one of the water starved States, where the per capita availability of water resources is 900 cubic meters per year as compared to all India average of 2,200 cubic meters. The Gross Cropped Area (GCA) which was 62.26 L.Ha (including area under Horticulture crops) during 2001-02 has come down to 57.53 L.Ha during 2010-11. Of this, 33.48 L.Ha (58%) are under irrigated condition and 24.05 L.Ha (42%) are rainfed. Tamil Nadu contributes approximately, three per cent of the food grain production, 12 per cent of fruit production and 24 per cent of flower production in India. Tamil Nadu state, which is surging ahead in all fronts, has created a history in the annals of agriculture of the state by obtaining the highest food grain production of 101.52 L.MT during 2011-12. As per the fourth advance estimate for 2013-14, the food grain production is110.65 L.MT. It is now incumbent on all the institutions to sustain this peak and improve further to attain the goal of five per cent rate of growth envisaged under the Hon'ble Chief Minister's Tamil Nadu Vision 2023.

Tamil Nadu Agricultural University is focusing its activities in six major domains such as Agricultural Education, Agricultural Research, Agricultural Extension Education, Agri Business Development, Agricultural Policy Support and Open and Distance Learning to enable youth to develop their skills in farming, farming related activities and farm business ventures, to meet the global challenges of food production.

The major initiatives are production and supply of quality seeds, promoting System of Rice Intensification(SRI), Sustainable Sugarcane Initiative(SSI),

Improved pulses and oil seeds production technologies, production and supply of bio-control agents such as *Trichoderma viride*, *Pseudomonas fluorescence*, booster and coconut growth promoters such as maize maxim, pulse wonder, groundnut rich, cotton plus, sugar cane tonic, precision farming, integrated farming systems, mission mode approach to tackle papaya mealy bug, drought effect mitigation on rice through PPFM spray, farm mechanization, promotion of improved crop husbandry decisions in choice of crops, extent of area and farm operations including input usage through price forecasting, weather forecasting, e-Agriculture, market extension and to help in increasing the income through agri business promotion.

Besides the traditional tools to disseminate scientific technologies to farming community viz., village meetings, newspapers, radio, television, mass contact programmes, exhibitions and melas, the recent developments in information and communication technology like; internet, mobile phones and telephony are used for disseminating the knowledge to farmers. Apart from that, TNAU - Agri Tech Portal which is a virtual extension platform, Short Message Services and Kisan Call Centres were also employed for knowledge penetration to reach the farm gates of the needy farmers.

1. Notable Acievements in Agricultural Education

1.1. New Horticultural College and Research Institute exclusively for women for the first time in the country

For the first time in the country, for women empowerment, Hon'ble Chief Minister inaugurated the newly established Horticultural College and Research Institute for women on 25.07.2011 at Navalur Kuttappattu, Srirangam

taluk, Tiruchirappalli district exclusively for women. Hon'ble Chief Minister of Tamil Nadu inaugurated the new administrative building and ladies hostel which were constructed at a cost of Rs. 14.55 crore on 30.06.2014.

The number of girl students admitted to B.Sc. (Horticulture) during 2011-12, 2012-13 and 2013-14 were 37, 42 and 41, respectively**.**

1.2. Establishment of Institute of Agriculture to offer Diploma in Agriculture

At Kudumiyanmalai in Pudukkottai district, a new Diploma in Agriculture programme was started during 2012-13 and 47 students were enrolled. During 2013-14, 48 students were enrolled.

1.3. Newly established affiliated colleges

Three new private Agricultural colleges were established during 2013-14, at Thuraiyur, Namakkal and Boothalur (Thanjavur) with affiliation to Tamil Nadu Agricultural University.

1.4. New courses introduced

The following Postgraduate and Doctoral courses were introduced during the period from 2011-12 to 2013-14.

During the year 2011, M.Tech. (Ag. Engg.) in Environmental Engineering and M.Tech. (Ag.) in Agricultural Nanotechnology were introduced.

During the year 2012, the following seven new Forestry programs viz., i) MBA in Forest Business Management, ii) M.Sc. (Forestry) in Forest Resource

Management, iii) Tree Breeding and Biotechnology, iv) Silviculture and Agroforestry, v) Wood Science and Technology, vi) Forest Ecology and Environment and vii) Wildlife Management. Five new Home Science programs were introduced namely; M.Sc.(Home Science) i) in Food science and nutrition, ii) Family Resource Management and Ergonomics, iii)Human Development and Family Dynamics, iv) Textile and Apparel Merchandizing and v) Home Science Extension and Communication Management. Besides, M.Sc. (Ag.) Plant Genetic Resources and M.Tech. (Ag.) Geo-informatics were introduced.

During the year 2013, i) M.Sc.(Ag.) in Molecular Plant Breeding, ii) Integrated Ph.D. in 26 disciplines, iii) External Ph.D. in Agronomy, Agricultural Entomology, Genetics, Soil Science and Microbiology were started. B.Tech in Food Science and Technology was started at Indian Institute of Crop Processing Technology (IICPT), Thanjavur with affiliation to Tamil Nadu Agricultural University.

1.5. Under graduate and Postgraduate courses offered

Tamil Nadu Agricultural University is currently offering 13 Under Graduate programmes, 39 Masters degree and 26 Doctoral degree programmes.

1.6. Students admitted to various degree programmes in the 12 constituent colleges of TNAU.

The number of students admitted to Under graduate programme during 2011-12, 2012-13 and 2013-14 were gradually increased and stood at 1474, 1691 and 1921, respectively. The number of students admitted to Postgraduate programme during 2011-12, 2012-13 and 2013-14 was 397, 380 and 449, respectively. However, the number of students admitted to Doctoral programme

during 2011-12, 2012-13 and 2013-14 was gradually brought down to 194, 174 and 135, respectively to ensure quality of the critical mass in research and education spheres.

1.7. Dual degree programmes offered with foreign collaboration

M.Tech. in Food Processing and Marketing and M.Tech. in Biotechnology and Business Management are offered jointly with the Cornel University, USA. So far, 32 students have completed the dual degree programme successfully. The programmes include six months residential requirement in USA.

1.8. Directorate of Open and Distance Learning

Tamil Nadu Agricultural University is offering many correspondence courses through the Directorate of Open and Distance Learning. At present, one Diploma programme, five Postgraduate diploma programmes three Postgraduate degree programmes, 16 Certificate courses besides, one Bachelor degree in B. F. Tech. (Bachelor of Farm Technology), to benefit farmers and rural youth are offered. The number of candidates enrolled during 2013-14 in certificate courses is 392, 60 in Postgraduate degree programmes and 12 in Postgraduate diploma programmes besides 253 in B.F. Tech course.

1.9. Students' Welfare and placement

Directorate of Students' Welfare (DSW) of the Tamil Nadu Agricultural University (TNAU), Coimbatore, which is the hub providing career counseling and job placement for students, opened an 'Overseas Employment Unit' to

facilitate graduates to get placement in organisations abroad. A state-of-the-art 'Communication Laboratory' was also established to improve the soft skills and employability of the graduates.

The number of students placed in various industries during 2011-12, 2012-13 and 2013-14 was 737, 223 and 112, respectively. Students were placed in Agro Industry, Seed Industry, Food Industry, Fertilizer Industry, Non Governmental Organisations, Plantations and Banking sector.

This Directorate facilitated students by providing coaching on Graduate Record Examination (GRE), Test of English as Foreign Language (TOEFL) and International English Language Testing System (IELTS) and guidance to pursue higher studies in abroad.

1.10. Strengthening TNAU Library

The University Library caters to the benefit of users by subscribing to many online journals and databases. Also, provides a facility to access the CeRA consortium journals and Krishiprabha online thesis databases. At present the Library has more than 1,75,000 books and back volumes. e-Journals are received from Consortium for e-Resources in Agriculture (CeRA) journals (3051) and Proquest journals (6119). Online Databases include; www.indiastat.com, www.delnet.nic.in and www.commodityindia.com; www.sciencedirect.com, www.springer.com/ebooks, www.cabi.org, www.cabi.org/cpc and www.cabi.org/fc.

Totally, 69,792 persons have used the library resources with a membership base of 1087 during 2013-14. University library collections include; 1,17,496 books,

51,431 back volumes, 5,485 Theses / Dissertations and 588 book bank books for SC/ST students.

In March 2014, a total of 7.80 Lakh pages of valuable documents (rare books, theses, back volumes, annual reports, etc.) have been digitalized at TNAU Library for the use of students and scientists, through the NAIP–ICAR Project on Strengthening of Digital Library and Information Management (e-Granth). All these contents are made available in the Digital Repository of *Krishikosh* and could be referred by anybody at any time.

2. Notable Acievements in Agricultural Research

2.1. Newly formed Research Stations

The Grape Research Station was started in the year 2012-13 at Mallingapuram in Theni district to promote research in grapes.

The Centre of Excellence in Millets was established at Athiyandal, Thiruvannamalai district and it was inaugurated by the Hon'ble Minister for Agriculture on 10th October, 2013.

A Food Processing Research and Training Institute was established at Chettinad in Sivagangai district during January 2014.

2.2. Varieties and Hybrids, Farm machinery and Management technologies released

In the year 2011, TNAU released; (A) seven varieties / hybrids, viz., (1). TNAU rice ADT 49, (2).TNAU rice hybrid Co 4, (3). TNAU blackgram VBN 6, (4). TNAU sorghum hybrid Co 5, (5). TNAU cumbu hybrid Co 9, (6). TNAU vegetable cowpea PKM 1 and (7). TNAU casuarina MTP 2;

(B) Two farm implements, viz., (1). Self propelled flail mower for cutting grasses and bushes and (2). Automatic protray sowing machine for vegetable nursery production; and (C) Six management technologies viz., (1). High density planting system in cashew, (2). TNAU indigenous sex pheromone lure for Yellow Shoot Borer management in rice (3). Processing and value addition of sugarcane syrup, (4) Multigrain adai mix, (5) Integrated Pest and Disease Management (IPDM) package for silkworm, *Bombix mori* L. and (6) Designer micronutrient fertilizer mixtures.

In the year 2012, (A) thirteen varieties / hybrids, viz., (1) TNAU rice ADT 50, (2) TNAU maize hybrid Co 6, (3) TNAU sugarcane Si 8, (4) TNAU coconut ALR (CN) 3, (5) TNAU papaya Co 8, (6) TNAU coccinia Co 1, (7) TNAU bottle gourd hybrid Co 1, (8) TNAU ash gourd hybrid Co 1, (9) TNAU mushroom Co (TG) 3, (10) TNAU malai vembu MTP 1, (11) TNAU Niligris kufri potato 1 (Kufri neelima), (12) TNAU blackgram VBN 7 and (13) TNAU coconut VPM 4 (Kera keralam); (B) Five agricultural implements, viz., (1) Arecanut harvester, (2) Tractor operated multipurpose hoist, (3) Improved coconut tree climber, (4) Pulse line marker and (5) Aerial access hoist for coconut harvesting and (C) Three management technologies, viz., (1) Subsurface drip fertigation system in sugarcane, (2) Biocolour from beetroot and (3) Soil Test Crop Response (STCR) based Integrated Plant Nutrient System (IPNS) for agricultural and horticultural crops, were released.

In the year 2013, (A) Twelve varieties / hybrids viz., (1) Rice Co 51, (2) Ragi Co 15, (3) Greengram Co 8 (4) Groundnut Co 7, (5) Lucerne Co 2, (6) Davana PKM 1, (7) Tapioca YTP 1, (8) Turmeric Co 2, (9) Sweet potato Co 5 (10) Coleus Co 1, (11) Amaranthus PLR 1 (12) Eucalyptus MTP 1 and (B) Two agricultural implements, viz.,

(1) Tamarind huller, (2) Multi crop multi row weeder were released.

In the year 2014, (A) four varieties / hybrids viz., (1) Rice TPS 5, (2) Blackgram MDU 1, (3) Fodder sorghum Co 31, (4) Butter pear Ooty 1 and (B) one agricultural implement, viz., (1) Tractor operated single row / two row cassava harvestor were released for the benefit of farming community.

2.3. Seeds and seedlings multiplication and distribution

Tamil Nadu Agricultural University is involved in production and distribution of seeds in 175 varieties of principal crops in various classes. Breeder seeds are utilized for multiplication in seed supply chain as foundation and certified seeds by the Government and private agencies which takes two years and distributed to farmers. Similarly, within a year the foundation seeds are produced and multiplied as certified seeds and distributed.

During 2011-12, a total quantity of 1858 quintals of breeder seeds in 98 varieties, 3354.4 quintals of foundation seeds in 51 varieties of principal crops, 5018.88 quintals of certified/truthful labelled (TFL) seeds in 116 varieities of principal crops and 24.75 Lakhs planting material in 17 crops were produced and distributed.

During 2012-13, a total quantity of 1,463 quintals of breeder seeds in 110 varieties, 3,752.19 quintals of foundation seeds in 60 varieties, 3,067.70 quintals of certified/TFL seeds in 120 varieities of principal crops and 26.02 Lakhs planting material for various crops were produced and distributed.

During 2013-14, a total quantity of 1,598 quintals of breeder seeds in 108 varieties, 4,155.23 quintals of foundation seeds in 53 varieties, 3,189.08 quintals of certified/TFL seeds in 120 varieities of principal crops and 26.46 Lakhs planting material for various crops were produced and distributed.

In order to facilitate the consumers easy access of the fruits / vegetables seeds round the clock, an **'Automatic Seed Vending Machine' (ASVM)** was installed in January 2014 at Tamil Nadu Agricultural University, Coimbatore to commemorate with the celebration of State Level Farmer's Day 2014.

2.4. Research Findings / New technologies developed during 2013-2014

2.4.1. Seeds and seedlings fortification/treatment

- In groundnut, seed treatment with Sulphur Oxidizing Bacterial (SOB) inoculant @ 1 kg/ha with *Rhizobium* @ 1kg/ha was standardized. This along with basal application of gypsum @ 400 kg/ha and soil application of SOB @ 5 kg/ha on 45th day after sowing enhanced the yield upto 21.0%.
- Development and standardization of rooting mixture for raising sugarcane chip bud seedling under Sustainable Sugarcane Initiative (SSI) technique were made.
- Standardization of nursery techniques for quality seedling production in 'White Kadamba' tree was made.
- Mini clonal technology for mass multiplication of casuarina was developed.

2.4.2. Bio-inputs

- Mixed inoculants like Azophos and Azophosmet for supply of N, P and growth hormones were standardized for application to different crops.
- Formulation, dosage, method of application and feeding schedules of liquid biofertilizer were developed for precision farming system.

2.4.3. Plant nutrition

- Nutrient management for cotton under drip fertigation system was standardized.
- Long term experiment on STCR-IPNS technology revealed that yield increase over blanket recommendation was 25.0 per cent and 21.8 per cent during *Kharif* and *Rabi* respectively, in rice – rice cropping system.

2.4.4. Irrigation mangement

- Irrigated groundnut with micro-sprinkler registered the maximum yield of 2844 kg/ha followed by sub-surface drip irrigation method (2655 kg/ha). Application of NPK at 17:34:51 kg /ha with 50 per cent P and K as basal as straight fertilizer and the balance P, K and full N as water soluble fertilizer registered increased pod yield (2685 kg/ha).
- Sub-surface drip fertigation system in maize - cotton - maize sequence was standardized.

2.4.5. Crop mangement

- Pruning for high density planting in Alphonso mango, cashew, cocoa and defoliation in palmyra was standardized.
- Advanced rice breeding lines (ASD 16, ADT 43 and IR 64) expressing pro-vitamin A, are in the developmental stage.

- Precision production technology package for jasmine, marigold and carnation such as; spacing, enriched media consortia, fertigation schedules, spraying of bio-stimulants and micro nutrients, integrated and eco-friendly pest and disease management were standardised.

2.4.6. Pest and disease management

- Rice varieties Co 43 and ASD 16 were improved for bacterial leaf blight and drought resistance. These are under testing.
- Management of rust disease in pearlmillet with foliar application of Hexaconazole @ 0.1% immediately after the observation of rust symptoms and second spray at 15 days after the first spray was found to be effective in reducing the rust severity.
- Management of cocoa pod rot and bacterial leaf blight disease of mulberry was standardised.

2.4.7. Agricultural Engineering / Farm machinery

- Briquetting technology studies of forest plantation residues and wood based industrial residues have been taken up.
- 'High solid content fixed dome' type biogas plant for power generation in dairy units was developed.
- Pod breaker (capacity 230 kg/hr and at a cost of Rs.5,000/-), drier for cocoa, cassava harvester and paddy seeder were developed.
- Farm machinaries such as; weeder for maize and cotton, centrifugal dehuller for small millets, combine harvester for groundnut and tractor operated fertilizer dibbler for ratoon sugarcane were developed.

2.4.8. Post harvest technology

- Processing methods for broken rice, moringa, banana, curry leaf, tomato, sago, sorghum, amla and palmyra were developed.

2.4.9. Health and nutrition (Home Science)

- Community based approach for prevention of anaemia among young rural women was takenup.
- Drudgery reducing technologies for tribal families in Sirumalai hill areas of Dindigul district was propagated.

3. Agricultural Extension Education in Tamil Nadu Agricultural University

3.1. Krishi Vigyan Kendras' activities

Transfer of Technology programmes were takenup through the 14 Krishi Vigyan Kendras. Totally, 71 On Farm Testing (OFT), 174 Front Line Demonstrations (FLD) of newly released varieties and technologies were conducted, besides, 4,281 trainings to extension officers, rural youth and SHGs and 13,413 farm advisory services.

The National Initiative on Climate Resilient Agriculture (NICRA) project has been sanctioned to Villupuram, Nagapattinam and Ramanathapuram Krishi Vigyan Kendras.

3.2. Information and Communication Technology (ICT) based e- extension

3.2.1. Agritech Portal (http://agritech.tnau.ac.in)

This dynamic portal holds around six Lakh pages in Tamil and English with multi–media content. The Portal (http://agritechportal.tnau.ac.in) has been dedicated for the benefit of field extension officials, farmers and other stakeholders. During the past three years, the portal was used by 21.59 Lakh users. During the year 2013-14, the

daily users ranged from 2,783 to 5,126. New users numbered between 1,340 and 2,550 in a day. The e-mail queries received were 65,000.

The details of usage of the agri-tech portal are given below:

Sl. No	Particulars	2011-12	2012-13	2013-14
1.	Total viewers of portal	6,52,345	6,27,444	9,06,247
2.	Daily visitors	450-550	740-900	2,783-5,126
3.	Average time on site	12-18 minutes	24-32 minutes	45-54 minutes
4.	Repeated hits / day	35-60 times	240-290 times	390-490 times
5.	e-Mail queries	1,865	35,000	65,000
6.	New visitors / day	125-140	190-320	1,340-2,550

3.2.2. 'e-Velanmai'

'e-Velanmai' programme was implemented in 26 sub basins of Tamil Nadu as a special scheme under Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration and Management (TN-IAMWARM) Project. Field Co-ordinators facilitated the technology transfer between scientists and farmers using ICT tools. The project details can be accessed from www.evelanmai.com. During the year 2013-14, sustainability of the e-Velanmai model of agricultural extension was tested by involving the Block Technology Managers (BTM) and Subject Matter Specialists (SMS) of ATMA scheme jointly implemented by the Department of Agriculture and TNAU. During the year, 6,700 beneficiaries received 11,279 advisory on their crop problems. The number of farmers enrolled as members who

received scientific advices in agriculture from the expert team are:

Year	Number of beneficieries	Number of farm advisory services provided
2011-12	4,557	10,797
2012-13	4,770	7,997
2013-14	6,700	11,279

3.2.3. Educational Media Centre (EMC)

Educational Media Centre (EMC) is co-ordinating video documentation of important programmes and events of the University. Totally, 506 video lessons in 3 GP format were produced on various subjects for the benefit of farmers and extension functionaries.

The details of activities of Educational Media Centre are given below**:**

Particulars	2011-12	2012-13	2013-14	Total
Video programmes produced	180	142	377	699
3 GP Video lessons produced	-	-	506	506
Video telecast through DDK, Chennai.	-	-	396	396
Video coverages	32	64	209	305
Video CD lessons sold	68	203	320	591
Video shows conducted	10	15	34	59

3.3. Printed media and other mass attraction programmes

3.3.1. Uzhavarin Valarum Velanmai

'Uzhavarin Valarum Velanmai' a monthly Tamil farm magazine of Tamil Nadu Agricultural University, Coimbatore is published for the benefit of the farming community and other stake holders. In the year 2013, there were 5,438 Annual members and 5,947 Life members.

The details of reader base are given below :

Category	2011-12	2012-13	2013-14
Annual membership	4,528	4,535	5,438
Life membership	5,834	5,794	5,947
Total	**10,362**	**10,329**	**11,385**

3.3.2. Community Radio Station

Community Radio is an effective tool to disseminate the farm technologies to the farming community living around 18 km from the Radio Station. One such Community Radio Station was established in the University campus during 2010 and functioning as 'Velaan Palkalaikazhaga Vivasaayee FM' at 107.4 MHz frequency.

The instantaneous information on weather, market prices, forecast for sowing in relation to marketability, etc., are broadcast apart from the technical guidance by scientists and experiences of farmers. So far, 348 recorded programmes were broadcast. Totally, 285 farm programmes were uploaded in http://agritech.tnau.ac.in/comm-e-radio.html website for the benefit of the farmers.

3.3.3. Kisan Call Centre (KCC)

With a view to bridge the gap between farmers, farm scientists and development functionaries, the Government of India has formulated a scheme called 'Kisan Call Centre'. Under this scheme, any farmer in the country can access by dialling the toll free number 1551 or 1800-180-1551. He / She can also interact in his/ her local language with experts. This Centre functions on all working days between 7.00 a.m. and 10.00 p.m. On an average 850 calls are received every day. Total number of calls received during 2013-14 was around 3.23 Lakhs.

3.3.4. Agricultural Technology Information Centre (ATIC)

The Agricultural Technology Information Centre (ATIC) is a single window delivery system which provides information on technologies and sells products developed by the University to the farmers. It disseminates information through published literature, audio - visual aids and electronic media. It is also rendering services to the visiting farmers through advisory services.

3.3.5. Regional Agricultural Melas

For the first time, Regional Agricultural Melas were conducted at Agricultural College and Research Institute, Madurai on 07.12.2013, Agricultural College and Research Institute, Killikulam on 02.01.2014 and Tamil Nadu Rice Research Institute, Aduthurai on 10.01.2014. Totally, 10,500 farmers visited the exhibitions and participated in the intreractions and seminars organised in these Melas. For the first time, Farmer-Teacher awards were instituted in these Melas and 8 progressive farmers were honoured.

3.3.6. Varieties Release function and State Level Farmers Day

The Varieties Release function and State Level Farmers Day was conducted at Tamil Nadu Agricultural University, Coimbatore on 11.01.2014. More than 3,500 farmers participated. Exhibition and farmers-scientists interaction sessions were organized.

For the use of farmers visiting Tamil Nadu Agricultural University, battery operated two wheelers were introduced in January 2014 for the mobility inside the campus and to see various facilities and demonstrations laid.

3.4. Demonstrations takenup

3.4.1. System of Rice Intensification

System of Rice Intensification (SRI) was implemented in 1,030 Ha. The overall average yield recorded under SRI was 7,320 kg ha^{-1} while, under conventional practice it was only 5,515 kg ha^{-1}. The increase in yield was 32.7 % in SRI. Besides, 30 per cent water saving was also achieved.

3.4.2. Sustainable Sugarcane Initiative (SSI)

In Sustainable Sugarcane Initiative (SSI), for improving the productivity, the technology packages have been standardized. The area covered under SSI was 100 Ha during 2013-14. The yield increase was from 65 to 110 tons per Ha.

3.5. Weather forecasting

The Agro Climate Research Centre (ACRC) is making medium range forecast on the basis of weather

parameters obtained from the Automatic Weather Stations for the benefit of farmers of Tamil Nadu to take crop husbandry decisions under weather based farming. Yield increase in different crops ranged between 8 - 15 % and farm income by 10 – 18 % by practicing weather based farming. Prior to August 2013, the forecast messages were published in the dailies. From August 2013, Agromet Advisory Services bulletins are uploaded regularly in India Meteorological Department (IMD) website www.imdagrimet.gov and the forecast is sent fortnightly to farmers through the portal. Since, August 2013, totally 25 Lakh messages were sent to the registered farmers.

Weather parameters recorded at Automatic Weather Station are:

1. Air Temperature
2. Relative Humidity
3. Solar Radiation
4. Wind Speed
5. Wind Direction
6. Rainfall
7. Atmospheric Pressure
8. Soil moisture
9. Soil Temperature
10. Leaf wetness duration

3.6. TNAU - Information and Training Centre, Chennai

At TNAU Information and Training Centre, Chennai, during 2013-14, totally 91 trainings were imparted to 3,406 partipants on varied topics such as roof gardening, kitchen gardening, fruits and vegetables preservation, textile dyeing and printing, value addition in millets and spices, indoor plants care and maintenance, mushroom cultivation.

3.7. Agricultural Marketing promotion

3.7.1. Price forecasting and Market intelligence

Tamil Nadu Agricultural University operates the Domestic and Export Market Intelligence Cell (DEMIC) (www.tnagmark.tn.nic.in) and provides forecasts of prices of agricultural produces before sowing and prior to harvest which are published in Tamil and English daily news papers and broadcast through radio and television. About 2 Lakh farmers were benefitted. The programme covered maize, cumbu, groundnut, sunflower, gingelly, cotton, coconut, blackgram, bengalgram, turmeric, chillies, small onion and potato. The price forecast achieved 95 per cent reliability.

3.7.2. Daily Market Information

e-Extension Centre of Tamil Nadu Agricultural University in collaboration with Agro Marketing Intelligence and Business Promotion Centre (AMI & BPC), Trichy is providing daily market information of 160 commodities and details of wholesalers to the farmers in time through TNAU Agritech portal. A total of 3,125 registered farmers receive price information through Short Message Services (SMS) to their mobiles. Also, short message services on agricultural technologies are sent to 9,13,180 farmers through Kissan SMS portal.

3.7.3. Agri Market Intelligence and Business Promotion Centre

Tamil Nadu Agricultural University is associating in effective functioning of the Agro Marketing Intelligence and Business Promotion Centre, Tiruchirappalli, under the Department of Agricultural Marketing and Agri business for providing market information to farmers. For effective

extension, along with all the stakeholders, focused efforts are taken to have intensive contact with the farmers.

3.8. Agri – Business Promotion

Agri-business Incubator in Tamil Nadu Agricultural University has so far commercialized 15 technologies including Coconut tonic, Panchagavya, Egg removing device, SRI power weeder, *Pseudomonas* and *Trichoderma* since its inception in the year 2010-11. Prior to 2011, seven technologies were commercialized. During the year 2013-14, three technologies were commercialized; (i) Herbal insect repellent for rice, (ii) Phosphorus solubilising liquid biofertilizer and (iii) Device to remove insect eggs in pulses.

3.9. Trade and Intellectual Property Protection

Seven inventions were filed for patent rights during the year 2013-14. Out of seven inventions, six were filed under product patent right and one was filed under process patent right. Under Geographical Indication, Erode turmeric was filed for community protection.

Under the Integrated Watershed Development Programme (IWDP) funding, four trainings on Agro-export and Domestic Trade for Watershed Development Team were conducted. In the year 2013-14 in association with Federation of Indian Export Organization, workshop on export of agro-processed products was conducted to farmers and exporters.

3.10. Food Processing and Value addition

The Post Harvest Technology Centre in TNAU is offering trainings to progressive entrepreneurs, rural youth and women on value addition and post production

management of farm produce particularly vegetables and fruits. During 2013-14, totally, 39 trainings were offered. Thrust is given to millet based food products. In association with Entrepreneurship Development Institute, Chennai, agripreneurial trainings were imparted to educated women and the entrepreneurs' samples are tested in the food testing laboratory on cost basis to ensure food safety.

4. Plan Schemes/flagship schemes in operation

4.1. National Agricultural Development Programme (NADP)

Tamil Nadu Agricultural University is implementing various projects funded through the National Agricultural Development Programme since 2007. As on March 2014, 56 projects have been implemented with an outlay of Rs.7,775.62 Lakhs.

During 2013-14, the following five projects were implemented with an outlay of Rs.360.00 Lakhs.

- Demonstration of synchronized maturing pulses varieties with key technologies and mechanisation for higher productivity
- Promotion of quality seed production in green manures
- Enhancement of productivity and quality in grapes through Hi- tech management practices
- Demonstration of Direct Seeded Rice (DSR) in dry and puddled condition to enhance productivity in selected districts of Tamil Nadu.
- Establishment of back office at Tamil Nadu Agricultural University to interface with e-Resource division of Agro Marketing Intelligence and Business Promotion Centre, Trichy.

4.2. Part II Plan Schemes

- Under Part-II Plan schemes, six schemes including, enhancing the productivity and value addition of millets and establishment of an Insects Museum with a total outlay of Rs.153.27 Lakhs were taken up.

4.3. Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration and Management Project (TN-IAMWARM)

The World Bank funded TN-IAMWARM project is implemented in 63 river basins with an outlay of Rs.905.29 Lakhs. During 2013-14, System of Rice Intensification (1,030 Ha.), Semi dry rice (60 Ha.), Groundnut (110 Ha.) precision farming (86 Ha.) and Maize production technology (150 Ha.) were demonstrated. Rice fallow pulses demonstration was taken up in 1,020 Ha.

5. Opening and laying of foundation stones of new buildings of TNAU by Hon'ble Chief Minister of Tamil Nadu

Opening of new buildings (Rs.783.39 Lakhs) and laying of foundation stones (Rs.1,121.20 Lakhs) for new buildings at various research stations of Tamil Nadu Agricultural University was made through video conferencing by the Hon'ble Chief Minister of Tamil Nadu on 19.02.2014. Similarly, the Hon'ble Chief Minister declared open new buildings (Rs. 573.70 Lakhs) and laid foundation stones (Rs.1,203 Lakhs) at various research stations and colleges of Tamil Nadu Agricultural University through video conferencing on 27.06.2014. The new administrative building and ladies hostel at the Horticulture College and Research Institute for Women, Tiruchirapalli, constructed at a cost of Rs.1,455 Lakhs were declared open by the Hon'ble Chief Minister of Tamil Nadu on 30.06.2014.

6. Proposed research programme for 2014 – 2015

6.1. Varieties and Hybrids

6.1.1. Green Super Rice

- From International Rice Research Institute, Manila, Philippines, 32 Green Super Rice (GSR) genotypes were imported. The material was multiplied and evaluated for the duration and other morphological characters. The study indicated that all the GSR materials had duration in the range of 120-135 days and did not yield superior to our check variety, Co 47 which matured in 117 days. The GSR materials are reported to possess resistance against major biotic and abiotic stress factors. In order to test the same, the 32 GSR cultures are being evaluated at Ambasamudram, Paramakudi and Tirur.

6.1.2. Other crop Varieties and Hybrids

- High yielding superior hybrids in sorghum, pearl millet and maize will be evolved through intensive inbred development.
- High yielding varieties in blackgram, greengram and redgram will be developed.
- Evaluation of production packages will be made for rice yield maximization.
- Development of intra-specific and inter-specific hybrids in cotton with good fibre quality and yield will be takenup.
- Evaluation of adaptability of domestic collection and synthesized hybrids for copra and tender nut purpose will be takenup.
- Evaluation of high yielding elite flowers such as Heliconia and orchids in coconut and banana based cropping systems will be takenup.
- Standardization of agro techniques for Heliconia, carnation and cocoa will be takenup.

- *Dalbergia sissoo* (*Sisoo maram*) genetic resources for biomass based power generation, *Chuckrassia tabularis* (*Akila maram*) for agro forestry system and Agar (*Aquillaria malaccensis*) for oleo resin production will be evaluated.

6.2. Bio-inputs

- Evaluation of combined inoculation of bacterial cultures in green gram / black gram will be taken up.
- Enhancing maize productivity through drip fertigation, seed bio-priming and using bio-control agents will be taken up.

6.3. Irrigation management

- Evaluation of drip fertigation in castor and nutrient management in groundnut will be made.
- Standardization of fertigation Schedule and inter cropping in coconut will be taken up.
- Optimizing spacing, irrigation schedule under drip, nipping and foliar spray of Plant Growth Regulator Consortia (1.5%) to control flower drop in redgram will be made.

6.4. Weed management

- Evaluation of weed control practices for irrigated maize will be taken up
- Sustaining increase in sugarcane productivity will be evaluated through bio-inoculants such as, azophosmet and management of twining weeds.

6.5. Pests and disease management

The Programmes to be taken up are:

- Evaluation of new pesticide molecules against leaf folder, gall midge, plant hoppers, sheath blight and brown spot diseases in rice.
- Integrated Pest and Disease Management for blast and false smut in rice.
- Management of Sheath blight and charcoal rot in maize.
- Management of soil borne and foliar diseases of cotton.
- Control of powdery mildew in sunflower.
- Management of coconut eriophid mite.
- Development of wilt resistant grafted pepper.
- Management of pest and diseases in vegetables such as; brinjal, bhendi, snakegourd and plantation crops namely; coconut and oilpalm.

7. Seed Production Programme for 2014-15

- The Seed Centre in TNAU has programmed to produce and distribute 20,000 quintals of various classes of seeds in major principal crops in 175 improved varieties besides, 30 Lakh planting material.
- Automatic Seed Vending Machines are proposed to be installed at commercially important places of major cities to facilitate consumers to obtain their choice of seed material especially fruits / vegetable seed packets at any time.
- Production of high quality oil palm seedlings by establishment of mother palm gardens is also programmed.

9. SEED CERTIFICATION & ORGANIC CERTIFICATION.

1. **Introduction**

The Agriculture is the first and foremost sector which paves the way for the development of all other allied sectors. Food is the most essential and undeniable requirement for survival and development. To attain self sufficiency in food production and to meet the growing needs of the increasing population, agricultural sector needs utmost priority and focused attention.

In agriculture, seed is the most important factor which influences not only the yield potential but also the quality and uniformity of the produce which ultimately decides the market value. One of the most critical management decisions of the farmer is the selection of appropriate seed source and variety. The seed quality can affect the yield potential of a crop more than any other input factor. Thus the income of the farmer totally depends upon the use of quality certified seeds.

In order to increase the certified seed production and to ensure quality seed supply for the benefit of the farmers, the Department of Seed Certification and Organic Certification is implementing the following programmes namely,

1. Seed Certification,
2. Seed Quality Control,
3. Seed Testing,
4. Training,
5. Organic Certification.

The Department aims to achieve the following Goals by

- Ensuring the availability of good quality seeds to farmers of the State,

- Motivating the private seed producers to involve in certified seed production of various crops,
- Strict enforcement of seed legislations,
- Creating awareness among the stakeholders of the seed industry regarding seed certification and seed testing,
- Encouraging and involving farmers to register under organic certification programme.

2. Seed Certification

Seed Certification is a regulatory process to secure, maintain and make available seeds with standard qualities of germination, physical purity, genetic purity and seed health as prescribed under the Indian Minimum Seed Certification Standards (IMSCS).The functions of the seed certification agency are carried out in accordance with the provisions of The Seeds Act 1966 and The Seeds Rules 1968 by the Seed certification wing.

Out of the total quantity of seed certified, the quantity certified under paddy crop accounts for 92%. The share of the private sector in the total production of paddy seeds amounts to 84%. The private sector are being motivated and encouraged to take up certified seed production of Millets, Minor millets, Pulses and Oil seed crops.

To increase the working efficiency of the field level functionaries, it is proposed to provide seed certification kits under the NADP Scheme during the year 2014 -15 at a total cost of Rs.18.16 Lakhs. The proposal has already been sent to the Government and is approved for the year 2014-15 by the State Level Sanctioning Committee. Under the part II scheme, sanction has been issued for the purchase of 10 numbers of new jeeps as replacement for old, condemned and handed over jeeps. Financial allocation of

Rs.57.50 Lakhs has been sanctioned during the year 2014-15.

During the year 2013-2014, 84,776 MT of various crop seeds has been certified against the annual target of 1,10,000 MT of seeds. It is proposed to certify 1,10,000 MT of various crop seeds during the year 2014-15. Use of Information and Communication Technology (ICT) will be promoted for easy monitoring and effective reporting.

3. Seed Quality Control

The Government is keen in ensuring the timely availability of quality seeds for which seed distribution, system is properly monitored by the Quality Control wing through enforcement of various seed legislations viz.,. The Seeds Act 1966, The Seeds Rules 1968, The Seeds (Control) Order 1983 and The Environment (Protection) Act 1986 .

The Seed Inspection wing is issuing license for seed dealers under provisions of The Seeds (Control) Order, 1983. At present there are 9,148 licensed seed selling points in the state. The seed quality control activities involve inspection of the seed selling points at regular intervals and drawing of seed samples for quality check from seed lots kept for sale. The samples are analyzed in the notified seed testing laboratories. Based on the results of the analytical reports, actions are initiated against sub standard seed lots. Contraventions of seed legislations detected by the Seed Quality Control wing are dealt with legal actions.

During the year 2013-2014, 69,392 seed selling point inspections have been conducted as against the annual