

PROCEEDINGS

80th SCIENTIFIC WORKERS CONFERENCE (Agriculture, Horticulture, Agricultural Marketing, Agricultural Engineering, Seed Certification, Sericulture and Forestry) 29-30 May 2014

The 80th Scientific Workers' Conference was organized at Anna Auditorium of TNAU for two days between 29th and 30th, May 2014. The main agenda of the conference is to discuss the various issues of farming community, identifying specific problems faced by the extension officials and resolving them based on theme research at the university. The scientists of TNAU, the government officials, extension functionaries from the Department of Agriculture, Horticulture, Agricultural Engineering, Agricultural Marketing and progressive farmers participated in the deliberations.

The Director of Research i/c, Dr.M.Maheswaran welcomed the gathering and explained the importance of SWC for having transfer of various technologies developed from the university to the farmers of Tamil Nadu with the help of Department of Agriculture. Dr.K.Ramasamy, Vice-Chancellor, TNAU narrated the present agricultural scenario and challenges ahead and strategies to be adopted to have the effective agriculture growth and sustained food security in Tamil Nadu. He elaborated the success story of winning the Krishikarman award 2011 by the Tamil Nadu government and requested the scientists of TNAU and Extension Officials of the Department of Agriculture to work together to reach targeted 145 lakh tonnes of food grain production during 2014-15. He stressed the promotion of banana and millets cultivation, integrated pest/disease and nutrient management practices and growing trees with good carbon capturing capacity besides maintaining soil health in Tamil Nadu. The following are the strategies suggested by the Vice-chancellor for attaining agricultural prosperity.

- Scientific approach in solving agricultural problems
- Reorienting research for addressing the changes in the ground water level
- Focused research on ecologically important crops
- Survey on soil health status in relation with soil organic components, photo oxidation in rainfed and irrigated areas
- Climate change and its effect on agricultural productivity
- Farm mechanization suitable to all ecosystems
- Drought management strategies such as PPFM spray
- Replacement of chemical agents with bio-agents
- Economic utilization of agricultural byproducts and
- Market oriented survey for export.

He stressed the need of having newer crop varieties and technologies for the empowerment of Tamil Nadu farmers by establishing research programmes based on collaborations at various levels using the available resources. The conference continued with the presentations on the following areas by the Department officials to expose the field problems faced by them highlighting the technological interventions required from TNAU.

Issues based presentation and discussion

a. Soil health and FCMS

Additional Director of Agriculture (Research) made the presentation on the identified topic and the following issues were put-forth.

- Fixation of cropwise, nutrientwise, districtwise critical levels for all micronutrients
- Soil test based micronutrient recommendations including foliar spray and fertigation
- Evolving newer specialized forms of micronutrients
- Micronutrient recommendations for rainfed crops and organic farming
- Plan on improving soil organic content

- *In situ* composting methods for coir wastes
- Evaluating the benefits of humic acid in improving soil health
- Finetuning enriched Farm Yard Manure preparation
- Gypsum recommendation for millets and pulses based on soil types
- Improving the NUE for N, P, K, Ca, S, Mg and micro nutrients in each crop
- Performance of pulse wonder, groundnut rich, maize maxim, sugarcane booster in comparison with MN Mixture
- Reclamation strategies for sodic soil in rainfed areas
- Use of pulse wonder instead of 2% DAP spray for increasing the pulse productivity
- Notified varieties in green manure crops for seed production
- Feasibility of using biofertilizers consortium for boosting crop yield
- Recommendation of biofertilizers for medicinal crops and
- Technology for K and Zn mobilising/ solubilising micro organisms

Special Officer, Natural Resource Management will coordinate the activities to solve the above issues.

b. Horticultural productivity

Joint Director of Horticulture, Directorate of Horticulture and Plantation Crops, Chennai presented the success stories pertinent to the improvement and management of horticultural crops. The area, production and productivity under various fruits, vegetables, spices, condiments, plantation crops, medicinal, aromatic plants and flower crops were presented along with opportunities available through State and Central Government schemes for making a lead in the cultivation of horticultural crops.

c. Backup on Agricultural Marketing

Director, Agricultural Marketing presented the following as the problems faced by agricultural marketing system of Tamil Nadu.

- Heavy post harvest losses
- Lack of consistency in supply of quality agricultural produce

- Inefficient handling and transportation of farm produce
- Lack of pack houses and collection centres from farm to market
- Low utilization in processing sector
- Lack of direct linkages with buyers or consumers
- Predominance of middle man
- Inadequate market information and
- Insufficient market research and analysis

He suggested the following as possible strategies to overcome the above mentioned problems.

- Strengthening the post harvest infrastructure facilities to handle marketable surplus
- Promotion of commodity groups, farmer producers, marketing organization and market linkage through SFAC and AMI&BPC
- Encouraging private players in marketing, value addition, infrastructure facilities and food processing under Public Private Partnership mode
- Increasing food processing and value addition facilities through National Mission on Food Processing and through incubation cum training centre and
- Sensitizing the farmers for market-led agriculture by rendering crop advisory and market information through AMI&BPC

Director, CARDS will extend the technical support to the Department of Agricultural Marketing for circumventing the problems and for working out further strategies to overcome the same.

d. Technological requirements in Agricultural Engineering

The Chief Engineer, Department of Agricultural Engineering presented on the technological requirements in Agricultural Engineering. He stressed for the development of turmeric harvester and stripper, establishment of custom hiring centre on public private partnership mode at block level, seed to seed mechanization for sugarcane and development of appropriate sugarcane harvester for harvesting the bend canes.

Dean, AEC&RI, TNAU will coordinate the activities pertaining to the development of turmeric harvester and stripper.

**e. Seed Certification and issues related to seed production:
Strengthening seed production activities in SSFs**

The Director, Seed certification and Organic certification presented the status of certified seed production and the target fixed towards reaching the 145 lakh tonnes of food grain production in Tamil Nadu during 2014-15. He narrated the initiatives taken for improving the existing seed replacement rate in all the crops and seed production in vegetable crops by the public and private sectors.

The Commissioner of Agriculture, Dr.M.Rajendran, IAS delivered the special address in which he focused on the shrinking cultivable area due to urbanization, industrialization, reduced rain fall and labour, lack of mechanization at farm level and reduced seed replacement rate. He appreciated the introduction of new varieties suitable for stress situations, organic manures for land development and micro-irrigation techniques for water management and stressed the need on the improvement, maintenance and management of state seed farms for the production of quality seeds to the farmers of Tamil Nadu.

Research Support needed for executing time oriented research project for the benefit of Tamil Nadu farmers

The Director of Research i/c, Dr.M.Maheswaran in his speech stressed the importance of getting financial support from the Government of Tamil Nadu as "**Seed Money**" for executing goal oriented research projects for the benefit of Tamil Nadu farmers and explained the steps taken towards this change. He elaborated the identification of "**themes and teams approach**" to be implemented in the coming years and setting "**Research Priorities for TNAU**" and evolving "**TNAU Research Agenda 2014-2018**". He also narrated the role of different Technical Directorates in monitoring and coordinating the research activities across the departments/research stations

of TNAU in materializing the “themes and teams approach”. He emphasized on the cooperation of Extension Officials of the Department of Agriculture in conducting Adoptive Research Trials of pre-released cultures, popularizing the varieties released from TNAU and maintaining the seed security system.

In the afternoon session, the Technical Directors presented the scientific achievements of their Directorates and provided solutions for the problems raised by the extension officials.

i. Agricultural crops: Variety release and breeder seed production

Dr.C.R.Ananda Kumar, Director i/c, Centre for Plant Breeding and Genetics presented the research highlights in the area of crop improvement. He narrated the development and release of new crop varieties during 2014. He projected the importance of Anna (R) 4 in tolerating the drought under rainfed condition and the early duration rice hybrids *viz.* CORH3 and CORH4 with increased yield. In his presentation, he mentioned the potential of CO(R)50 suited for thaladi season (released in 2010) and CO51 for kuruvai season (released in 2013). The other noteworthy rice varieties include CO(R)49 and ADT(R)49 (alternate to BPT5204) and ADT(R)50 (alternate to CR1009). He mentioned the availability of extra early rice varieties *viz.* MDU5, ADT48 and CO41 to overcome the drought stress. The rice variety TPS5 has been released during 2014 for its cultivation during kar and late pishanam seasons.

In millets, the following are prominent varieties/hybrids *viz.* TNAU maize hybrid CO6, TNAU sorghum CO30 (a dual purpose variety suited for both grain and fodder) TNAU sorghum hybrid CO5 (suited for dry fodder), cumbu CO(Cu)9, TNAU cumbu hybrid CO9 and ragi CO(Ra)14 and CO15 released from TNAU. The varieties of small millets like samai CO(Sa)4, varagu CO3, kudiraivali CO(Kv)2, Tenai CO(Te)7 and panivaragu CO(Pv)5 were also released.

In pulses, two redgram varieties *viz.* CO(Rg)7 and VBN2 were released to replace SA2, CO6 and LRG41. In blackgram, TNAU blackgram CO6, a

determinant type with non-shattering pods and TNAU blackgram VBN6 having resistance to YMD were released. Three greengram varieties *viz.* TNAU greengram CO(Gg)7 with good cooking quality, TNAU greengram CO(Gg)8, resistant to MYMV and stem necrosis and VBN(Gg)3 having durable resistance to MYMV with high protein content and tolerance to pod borer were also released besides a short duration cowpea CO(Cp)7 tolerant to pod borer.

In his presentation, he mentioned about the release of the improved varieties in groundnut (CO6 and CO7), sesame (TMV(Sv)7), sunflower (hybrid CO2) and castor (hybrid YRCH1) for the rainfed and irrigated areas of Tamil Nadu. In cotton, SVPR 4, a medium staple cotton with good fibre strength was released.

He elaborated the role of CPBG in the production and distribution of breeder seeds of varieties released from TNAU. The Breeder Seed Unit of CPBG monitored the production and distribution of 1027.33 quintals in breeder seeds in rice, 530 kg of breeder seeds and 11.38 tonnes of TFL seeds in millets. The breeder seeds distribution in pulses was 15623 kg, 40022 kg in oilseed crops and 300 kg in cotton.

ii. Improvement and management of horticultural crops

Dr.S.Mariappan, Dean (Horticulture) *i/c* elaborated the points on crop improvement and management technologies in Horticultural crops. He highlighted the benefit of new varieties of horticultural crops, effects of pruning in fruit crops, foliar spray in cashew variety VRI3, grafting technique in brinjal and rapid multiplication of turmeric in pro trays for improving the productivity of horticultural crops.

iii. Crop management strategies

Dr.K.Velayutham, Director (Crop Management) *i/c* highlighted the following components in his presentation.

- Assessing the feasibility of transplanting redgram with and without micro-irrigation and comparing it with direct dibbling with and without micro-irrigation under varied soil conditions
- Utilization of rice cum green manure seeder
- Introducing mechanization for direct seeded and transplanted rice
- Impact of demonstration of dry seeded rice in puddled as well as in dry condition through NADP funding
- Evolving micro-irrigation methods for major crops
- Evolving fertilization schedule for TNAU CO6 maize hybrid with normal and water soluble fertilizers
- Introducing seed drill sowing in groundnut
- Evaluating the use of mepiquat chloride, a chemical which reduces vegetative growth and advances maturation of the bolls for introducing mechanical harvesting in cotton
- Different models available under Integrated Farming Systems (IFS)
- Availability of different crop boosters from the Department of Crop Physiology *viz.*, TNAU coconut tonic, pulse wonder, groundnut rich, maize maxim, cotton plus and sugarcane boosters and
- Introduction of weather based agro-advisory services and the management technologies for varied agroclimatic conditions

iv. Water management strategies

Director i/c, Water Technology Centre, Dr.B.J.Pandian presented the challenges faced by the farmers due to the inadequate availability of water for irrigation under wetland, gardenland and dryland ecosystems and explained the management strategies to overcome drought stress. The following are the major components in his presentation.

- Improved water use efficiency due to adoption of SRI method of cultivation in rice
- Advantages of Alternate Wetting and Drying (AWD) on better nutrient use efficiency which results in increased productivity and production

- Benefits of using drum seeder and direct seeding in semi dry and dry conditions for water saving
- Possibility of introducing drip fertigation system in rice
- Introduction of micro-irrigation systems for various horticultural crops (Improved from 3550 ha in 2007-08 to 25,000 ha during 2011-12)
- Introduction of Sustainable Sugarcane Initiative (SSI) and improved performance of sugarcane under SSI and impact of drip fertigation in sugarcane
- Introduction of sprinkler irrigation/rain gun and improved water use efficiency
- Importance of recharging the percolation ponds and recharge technologies for bore-well and
- Importance of localized rain-water harvesting and recharging ground water besides utilizing the capital investments.

v. Soil Health Management

Dr.V.P.Duraisamy, Director i/c, Natural Resource Management outlined the causes for soil health deterioration due to intensive cropping, excess removal of nutrients by the crops, scarcity and scanty use of organic manures, imbalanced fertilization, salinity and sodicity, polluted soils etc. He also added that in Tamil Nadu, the NPK use ratio had decreased over time from 2.5:0.9:1 to 1.8:0.7:1. The following are the important research achievements made to maintain the soil health.

- Finalization of STCR-IPNS based fertilizer recommendations for 12 agricultural crops, 13 horticultural crops, 15 soil series covering six agro climatic zones
- Finalization of STCR-IPNS based fertilizer recommendation for rice under SRI and cotton under drip fertigation
- Detection of micronutrient deficiency in Tamil Nadu soils: Soils of 12 districts were found to be deficit in two nutrients and soils belonging to eight districts were deficit in three nutrients.

- Popularization of multi-micro-nutrient fertilization through training and FLD programme and the need for the establishment of centres for micronutrient mixture production in each agro climatic zone
- Detection of low organic carbon status in soils of Tamil Nadu (gone down from 1.20 per cent to 0.68 per cent over years) and the strategies to improve organic matter build-up through procurement and distribution of sufficient green manure seeds to farmers, its multiplication through farmers participatory approach and utilization of organic wastes
- Importance of assessing nutrient potentials of crop residues and animal manures
- Strategies for biodegradability of industrial wastes, managing physical constraints like soil crusting in problem soils, managing excessively permeable soils, soil and water pollution due to heavy chromium, dye and textile effluents, developing of viable technologies like liquid biofertilizers and PPFM spray for inducing drought tolerance in other crops and
- Need for organizing training programmes to the personnel involved in 1) quality control system of biofertilizers 2) geographical information system, mapping for macro and micro nutrients to create digital village maps for Tamil Nadu.

vi. Bridging the gaps in seed chain management

Dr.M.Bhaskaran, Special Officer (Seeds) i/c explained about the seed supply chain management and the ways for bridging the gaps. The following are major points made in his presentation.

- Present scenario of Indian seed systems, their impact, regulatory frame works and the necessity for seed supply chain management to identify and rectify the missing links
- Futuristic seed plans and strategies, bridging the gaps through database, improving the seed delivery system, monitoring and effective

implementation to achieve the goal of self sufficiency in seed production

- Development of effective seed plan in the seed supply chain management, he drew a detailed plan both for TNAU and Department of Agriculture for timely supply of quality seeds in adequate quantity
- Adoption of innovative seed technologies *viz.*, upgrading, priming, disinfecting, encrusting, pelleting and film coating polymers for improved productivity and
- Adoption of innovative seed delivery system *viz.*, TNAU – Automated Seed Vending machine for facilitating vegetable seed availability to common people for kitchen/terrace gardening.

vii. Crop protection strategies

Dr.K.Ramaraju, Director (CPPS) i/c discussed various crop protection strategies and highlighted the main concepts of pest management in crop cultivation *viz.*, regular monitoring, correct identification, diagnosis, forecasting and developing integrated pest management methods. The following are major points expressed in his presentation.

- Introduction of IPM module for pigeon pea with C:B ratio of 1:3.7 and the usage of newer insecticides and botanicals for the management of insect pests of pigeonpea
- Assessing the effectiveness of the newer molecules (acephate and triazophos) against spiralling white flies in tapioca and on key pests of tomato
- Using microbial consortia for the management of leaf blight of coconut caused by *Hasiodiplodia theobromae* and nematode management in carrot and ashgourd
- Cautioned about the emerging pest and disease problems in various crop *viz.*, *Spodoptera exempta* in sorghum, blast in pearl millet, tobacco streak virus in cotton, downy mildew in cucumber, fungal nematode complex in gourds, head rot in lettuce, cabbage, crown gall

and white rust in chrysanthemum, *Fusarium* wilt and rust in carnation, rotting in *Lillium etc.* and

- Importance of pest forecasting system developed by TNAU and the need for registration with data which would be helpful in making viable forecasting of pest problems

viii. Invigorating extension system in Tamil Nadu – Mechanisms and modalities

Dr.K.A.Ponnusamy, Director i/c of Extension Education explained about invigorating extension system in Tamil Nadu including the mechanisms and modalities. In his presentation, he expressed that though there is knowledgeable, skilled and experienced manpower in Departments, KVK system, mass media, Government programmes, schemes, research and extension, there is no satisfactory synergy among various stakeholders. To overcome these drawbacks, effective planning with strategic research and extension programme for all districts are to be implemented for which all developmental activities are to be organized as joint field visits, integrated utilization of resources and schemes. He also emphasized on establishment of IFS model in each block through collective action of all development departments, wide publicity about the success stories and transforming the input supply to other institution for accomplishment of Vision 2023 in a scientific manner.

On second day (30.05.2014), the conference started with demonstration of rice + greenmanure seeder (Paddy cum daincha seeder) and pulse seeder. Dr.B.Sridhar, Professor and Head, AMRC explained the need of farm mechanization. Later, paddy transplanters developed by seven different companies *viz.*, M/s. Escorts, M/s. Kubato, M/s. Mahindra & Mahindra, M/s.Sharp Garuda, M/s.Varushapriya Agrotech Pvt. Ltd., M/s. Redlands and M/s.UST Tillers Tractor Ltd., were demonstrated to department officials. Dr. K. Velayutham, Director i/c (Crop Management) elucidated about the operational procedure of paddy and Daincha direct seeder followed with

detailing by Dr.C.Jayanthi, Professor and Head, Department of Farm Management on the wet land activities. Dr. Karthikeyan, Professor, Farm machinery also explained about the tractor drawn pulse seeder at Eastern Block followed by demonstration of blackgram sowing using tractor drawn pulse seeder and queries raised by the department officials were clarified. Following field visit, the presentation on the selected topics by university officials continued.

ix. Farm Mechanisation

Dr.B.Shridar, Professor and Head, AMRC narrated about farm mechanization in agriculture. The following agricultural equipments developed for reducing farm drudgery by TNAU was explained: Tractor operated pulse seeder, tractor operated small seeder, hill drop planter for bold seeds like maize and groundnut, automated protray seeder developed especially for vegetables with a capacity of 6000 trays per day, tractor drawn turmeric rhizome planter, engine operated rotary weeder, two row precision organic manure applicator which applies organic manures or chemicals below the root zone level, groundnut harvester attached to the tractor for harvesting and removing the pod, tractor operated sugarcane harvester with a capacity of 80 tonnes per day and hydraulic break system in tractor.

x. Post harvest management and value addition to crop products

Dr.R.Viswanathan, Professor and Head, Post harvest Technology Centre, TNAU, Coimbatore explained about food pipe line model and highlighted the importance of food processing industry which is one of the largest industries in India which deals with Rs.3,50,000 crores including Rs.99,000 crores worth of value added products. He also added the importance of value addition for reducing the wastage, addition of profit and increase of farm income, quality upgradation, increase in the shelf life, source of employment and creation of wealth. He also explained about the functioning and advantages of the post harvest equipments/technologies *viz.*, farm level improved turmeric boiling unit, large scale steamer, chilli, tomato

and brinjal seed extractors, hand operated and mechanical threshers for pepper, pepper peeler cum washer, fluidised bed dryer for mushroom, thresher for glory lily, cocoa pod breaker, onion umbel thresher and improved TNAU dhal mill.

He also expressed about the technologies on value addition *viz.*, pectin extraction from mango peel, quick cooking of sorghum, preparation of sorghum composite biscuits, millets dhokla mix and RRE millet dhokla, value added products from palmyrah, finger millet, barnyard millet, kodo millet, millet based extruded products, preparation of curry leaf powder, processing of sugarcane syrup and alcohol preparation from small millets. He also explained about the utility of the incubation facilities available at the Post Harvest Technology Centre, Coimbatore, Home Science College and Research Institute, Madurai, KVK, Madurai and food processing incubator at Srirangam and Kinathukkadavu which are available for sharing with private entrepreneurs.

xi. Socio -economic issues in agricultural development in Tamil Nadu

Dr.M.Chinnadurai, Director i/c, Centre of Agricultural and Rural Development Studies (CARDS), TNAU in his presentation highlighted the risk management strategies. He discussed on cost-price relationship for major crops in Tamil Nadu, adoption of technological intervention for improving the productivity of paddy, sugarcane, groundnut, large scale adoption on SRI technique and yield gap analysis for rainfed crops like millets, pulses, oilseeds and cotton and price forecast valuation for major crops. Leveraging price forecasting, value chain analysis of pearl millet, major challenges faced by farmers in marketing pepper in kolli hills, functioning of regulated markets in Tamil Nadu, export potential for Tamil Nadu agriculture and credit gap analysis, policy to counter credit gap, adoption of technologies and the impact of farm schools operated under ATMA extension reforms programme were other topics highlighted by him. The presentation was concluded with the vision on achieving second green revolution in Tamil Nadu by focusing on

crop and location specific technologies, optimum utilization of resources, linking farmers in production, marketing and value addition to increase the income of the farm families.

xii. Technologies from Sugarcane Breeding Institute, Coimbatore

Dr.N.Vijayan Nair, Director of Sugarcane Breeding Institute, ICAR, Coimbatore in his speech explained about the new sugarcane varieties and technologies for Tamil Nadu. He informed that sugarcane is grown in an area of 50.64 lakh ha in Tamil Nadu with a cane production of 338.96 million tonnes and productivity of 66.94 t/ha. He pointed out the major concern affecting sugarcane cultivation in the state are static productivity/variety degeneration, water resources, declining soil fertility, status of Yellow Leaf Disease (YLD), farm mechanization and high cost of production. He presented the variety scenario of sugarcane in Tamil Nadu and stated that eight sugarcane varieties were identified for Tamil Nadu through AICRP on sugarcane suited for peninsular zone and East coast zone (CO 06030) which are resistant to red rot and smut. Co-ordinated Agronomic evaluation (CAE) trials were also conducted to identify location specific varieties. He highlighted on the early maturing variety (CO 99006) which has high sucrose content and moderate resistance to red rot and smut. He said a total of 14,250 quintals of breeder seeds and 108,827 nos. of tissue culture plants were sold from 2008 to 2013. He also added that the impact of yellow leaf disease (YLD) in sugarcane could be eliminated through tissue culture methods.

xiii. Technologies from Central Institute of Agricultural Engineering (CIAE), Coimbatore

Dr.S.J.K.Annamalai, Principal Scientist and Head, Central Institute of Agricultural Engineering (CIAE), Coimbatore discussed the functions of the CAE and the role of Industrial Extension Project (IEP). He also elaborated the achievements made by CIAE during last four years in development of machineries and packages such as Mechanization package for sugarcane bud chips in collaboration with SBI, Coimbatore (Pedal operated, motorized and

pneumatic operated machine, power operated sugarcane bud chipping machine, bud chip protray filling machine, mechanized unit for sugarcane sett treatment, tractor drawn sugarcane bud chip settling planter). *Aloe Vera* gel extraction equipment, modified manual rice transplanter, oil palm harvesting equipments, potting machine for nursery planting, power weeder for cassava planted in mounds and banana pseudo stem chipper cum shredder are the other equipments explained by him. He also explained about post harvest mechanization package for banana central core, moringa leaf stripper and CAE millet mill. Finally, he detailed about the XII plan activities of IEP in relation to transfer of technology, research and development (precision farming, horticultural mechanization and agro produce processing) and about the infrastructure development.

xiv. Technologies of National Research Centre for Banana, Trichy

Dr.V.Kumar, Principal Scientist of NRCB, Trichy highlighted that Tamil Nadu has 1,30,000 ha of land with 6.7 million tonnes of production and explained the technologies for achieving improved productivity in banana through utilization / adoption of tissue culture banana plants, high density planting system, integrated nutrient management practices, bunchy top management and reduction of post harvest losses. He also added that the NRCB, Trichy released the variety Uthayam in 2005 having higher yield potential weighing 80 kg per bunch with 8 feet height and 28 hands which is still popular among the farmers. He also added that elite cultivars are produced through micropropagation technique in a rapid manner i.e. 50 to 60 plants per sucker within 4 to 5 months and the centre has also developed standards for certification to distribute disease free planting materials to farmers. Protocols developed for increasing the yield of banana through high density planting system which reduces the cost of production and increased the yield with reduced water requirement and nutrients were explained. In addition, drip irrigation schedule during different growth stages of banana to increase the yield from 50 to 70 per cent was also highlighted. White polythene bag with ventilation was also said to improve the yield and quality

of banana fruits. He also stressed on the use of clean planting materials for propagation with local quarantine measures for managing the diseases. He explained that nematodes infection could be effectively managed by using biocontrol agents like *Trichoderma viride* and *Bacillus* and by intercropping with marigold.

Dr.Sandeep Saxena, IAS, Agriculture Production Commissioner and Principal Secretary to Government in his remarks on the presentation of Directors and Deans informed that TN Government through the Policy Statement on Vision 2023 expects the following from the scientists and extension officials.

- Supply of quality planting materials to the farmers at affordable price
- Extension officials to provide technical guidance to the farmers to grow the best from the planting materials in the land available with them
- Linkage between production, market, producer and consumer
- The barren and fallow land to be brought under the cultivation to avoid shrinking land area under cultivation
- Utilization of the financial support from Government earmarked under different schemes
- Judicious utilization of water resources for agriculture
- Taking up assessment of impact of area under micro irrigation
- Creation of demo plots at the state seed farm to demonstrate the technologies
- Efforts to harvest rain water for agriculture
- Construction of proper storage godowns to avoid wastage of perishable horticulture produce
- Development of agro processing industry in each district
- Strengthening of agricultural mechanization through financial assistance from NADP
- Strengthening of time bound applied research and
- Development of package of practices for integrated farming system.

Plenary session

The plenary session of 80th SWC meeting was organized in the afternoon of 30.05.2014. The Director of Research i/c welcomed the gathering. The Vice - Chancellor in his presidential address thanked the Agricultural Production Commissioner and the Principal Secretary to Government for coordinating the activities of the university as well as the department and for motivating the officials in obtaining the Krishikarman award for Tamil Nadu, by channelizing the distribution of certified and truthfully labeled seeds for doubling the food production of Tamil Nadu. He requested for the concerted, coordinated efforts and involvement of field staff, scientists and students for achieving the highest food production of 145 lakhs MT for the year 2014 - 2015.

Th.P.Mahendran and Th.P.Nagaraj, Members of Parliament in their addresses stated that newer technologies and innovations should be introduced for the benefit of the farmers and farming community which is possible by foreseeing advanced technologies quoting that State / Central Government will support the agricultural research for obtaining food security.

Th.O.K.Chinnaraj, Th.R.Duraisamy and Th.V.C.Arukutty, Members of Legislative Assembly lauded the initiatives of Govt. of Tamil Nadu and TNAU on moving to the Second Green Revolution in Tamil Nadu and requested the scientists to deliver cost effective technologies to the farmers with the focus on higher productivity.

Mr.M.Radhakrishnan, Director, Seed Certification and Organic Certification, Coimbatore in his special address said that with the combined efforts of TNAU and Department of Agriculture, newer technologies have been introduced with quality seed supply to increase food grain production for achieving second green revolution.

Mr.M.Senthil, Chief Engineer in his address stated that introducing farm mechanization is the need of the hour due to labour cost and shortage. He also added that newer inventions in agricultural implements and its publicity could rectify the problems on shortage of farmers.

Thiru. Sathyapratha Sahoo, Commissioner of Horticulture and Plantation Crops suggested that the export of horticultural and plantation crops has to be elevated. The discussion was continued by Dr.M.Rajendran, IAS, Director of Agriculture and he insisted that landing of research outcome in the farmer's field for effective utilization is imperative in view of diminishing agriculture area due to urbanization, lesser labour force and rainfall pattern.

In his special address at the plenary session, Agricultural Production Commissioner outlined the need for development of good variety, availability of adequate quantity of quality planting materials, the linkage of entire supply chain from the produces to consumer to achieve the Vision 2023 of Tamil Nadu. He emphasized that the important operations to be taken up by the Department of Agriculture includes increasing the land area and bringing fallows to cultivation, judicious utilization of available water resources, adopting micro-irrigation suitable planting materials by farmers, converting each state farm in to a unit which can supply all the varieties of plants and planting materials of crops grown in that region. He insisted on avoiding agricultural wastage by creating proper storage facilities.

Th. Pollachi V. Jayaraman, Hon'ble Deputy Speaker has insisted on the development of area around Aliyar dam by adopting the model of Israel agriculture with an aim for higher productivity with minimum use of water.

The Hon'ble Minister for Agriculture in his speech explained how TNAU brought the transformation within oneself and thanked the teachers and scientists of the TNAU for the same. He insisted the need for feeding the burgeoning population of the state for which the Hon'ble Chief Minister is creating the ways for food security and one such is through Amma Unavagam especially for feeding the poor. The scientists are responsible for finding new technologies and new varieties whereas the Department Officials are responsible for taking the same to the field level. He added and highlighted that Hon'ble Chief Minister plays a major role in coordinating them to feed the farmers who depends both on the scientists and the officials of all the seven departments viz., Agriculture, Horticulture, Agricultural Marketing, Agricultural Engineering, Seed Certification, Sericulture and Forestry.

Hon'ble Minister expressed that 70 per cent of the village workers depend on agriculture and allied sectors and hence it is the duty of the scientists to develop technologies to improve the productivity. He said that the eyes and mind of the scientists should work together to evolve many technologies and varieties to achieve the major task of providing food, cloth and shelter to all. Hon'ble Minister said that efficiency of doing the right thing can be observed by completing job in an appropriate manner and avoiding wastage of time. He also requested to strengthen the research against Elnino effect in the field, developing super green rice, drought tolerant lines and high yielding varieties / hybrids in millets. Another area of agriculture research to be focused includes evolving varieties and technologies against water deficit situations in such a way to double the production and to triple the income of the farmers.

Hon'ble Minister also explained about the Hon'ble Chief Minister's plan towards achieving the goals under Vision 2023 and highlighted the various plan and aids for Department of Agriculture viz. Rs.10.5 crore for touch screen computers of Agricultural Extension workers, subsidy for 12,500 acre land under green cover for protecting the environment and a millet research station at Athianthal. He congratulated the efforts taken by APC, scientists of TNAU and agricultural extension workers in achieving the target and for getting Krishikarman award. He pointed out that under ATMA scheme, so far, 1322 workers have been appointed and 213 vehicles have been provided to agricultural staff costing Rs.13.87 crore. A storage godown has been constructed for onion storage and a model district (Villupuram) has been created for integrated farming system. He appreciated the work done by the scientists of TNAU who have evolved 615 new varieties and 170 farm implements and also requested co-operation and co-ordination between the scientists and department officials to realize the dream of Vision 2023 in the days to come.

The conference ended with vote of thanks proposed by Dr.R.Rajendran, Director i/c, TRRI, Aduthurai who put in record the contribution made by one and all for the successful conduct of 80th Scientific Workers' Conference.