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# CTCRI NEWS

Central Tuber Crops Research Institute  
Sreekariyam, Thiruvananthapuram 695 017  
Kerala, India

## Director General visited CTCRI

Dr. S.Ayyappan, Secretary, Department of Agriculture Research and Education (DARE), Ministry of Agriculture, Govt. of India and Director General (DG), Indian Council of Agricultural Research (ICAR) visited CTCRI on 6<sup>th</sup> November, 2010 and addressed the scientists. After a brief review of current research projects handled by the scientists, Director General appreciated the work done and suggested to concentrate mainly on the prioritized areas of research and to reduce the number of research projects. He stressed the need for enhancing awareness about CTCRI technologies. During the visit, he released a technical bulletin on "Diagnostic Techniques for diseases of tropical tuber crops." CASSNUM (Cassava Site Specific Nutrient Management) module was also launched in CTCRI website that enables farmers to estimate the fertilizer dose for applying to cassava based on site specificity as per the recommendation.



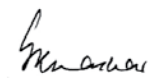
Director General addressing the Scientists

## *From the Director's Desk*

Dear Readers,

Tropical tuber crops are ideal as 'bridge crops' to overcome the occasional food deficits, because of their ability to accumulate maximum biomass giving economical yields even under unfavorable conditions. Over the years, area under tuber crops especially for sweet potato, aroids and yams is either remaining stagnant or declining. Lack of diversified uses for these crops except as vegetable appears to be one of the reasons for the declining trends. Appropriate market demand driven post harvest technologies are necessary to be developed and evaluated by the research system and demonstrated in the production centers for their faster adoption and diffusion. Transferring and showcasing of such technologies that are linked to the changing environment of marketing system is essential for sustaining their role in national economy and food security. To enhance the awareness about tuber crops and to showcase CTCRI technologies, the Institute has organized many programmes like Farmers' cum Tuber Crops Day, inauguration of Bio-pesticide laboratory, training cum awareness programme on PPV & FRA, IMPCC meeting and Farmers' cum workshop both at headquarters and at Regional Centre during this quarter. Institute also participated in various exhibitions organized in various states and displayed its activities to give wide publicity for technologies developed. Trainings were imparted on tuber crops production and processing technologies and various CTCRI activities to farmers and students from Kerala, Tamil Nadu, Haryana, Andhra Pradesh and Karnataka. Scientists actively participated in many seminars, symposiums, workshops both at National and International level. Scientists and technical officers gained knowledge by participating in refreshment trainings. I congratulate Dr. C.A.Jayaprakas who joined as Head, Division of Crop Protection of the institute.



  
S.K. Naskar

## Trends in tuber crops in India

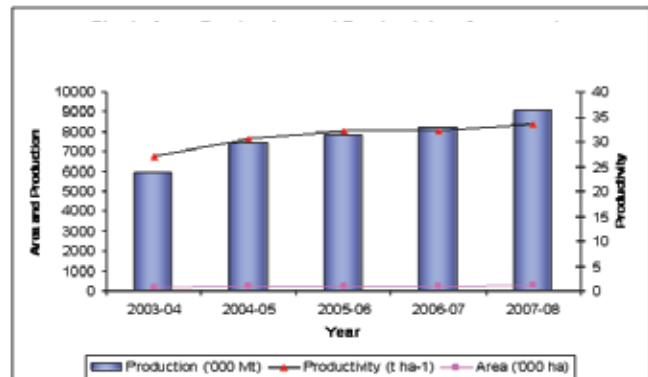
**Cassava:** Cassava area in India was increasing at 4.6% per annum from 2003-04 to 2007-08 while production and productivity were increasing at 9.8 and 4.9% per annum respectively (Fig. 1). Cassava area is increasing in Tamil Nadu and Andhra Pradesh but it is declining in Kerala. Market demand studies indicated that nearly 60 per cent of cassava is used industrially in the production of sago, starch and dry chips, 28 per cent of the total cassava production is estimated to be used for human consumption and 12 per cent of the tubers are used in animal feed sector.

The study further indicated that the future of cassava in India lies in its diversified uses in the industrial sector. Cassava demand in the human consumption sector has been declining drastically. In the animal feed sector, only thippi and peel are in demand. Projected demand in the industrial sector is more in adhesive industries especially in the corrugation gums and paper conversion industries. It finds good demand in the paper industry also. R & D efforts meeting the quality standards of these industries have to be strengthened. It was estimated that there will be a gap of 2.50 and 0.32 lakh tonnes between demand and supply of cassava starch and sago respectively in India by 2015-16. New and potential areas in the non-traditional states are to be considered for area expansion under the crop.

**Sweet Potato:** Area, production and productivity of sweet potato in India from 2003-04 to 2007-08 was depicted in the Fig. 2. Area and production were showing declining trend and were decreasing at 2% and 1.6% per annum respectively while productivity was increasing at 0.3% per annum. Sweet potato is used mostly as vegetable and snack food. Industrial utilization is very negligible causing negative growth in area and production. Vines are used as animal feed in some states like Uttar Pradesh, Bihar and North Eastern Region.

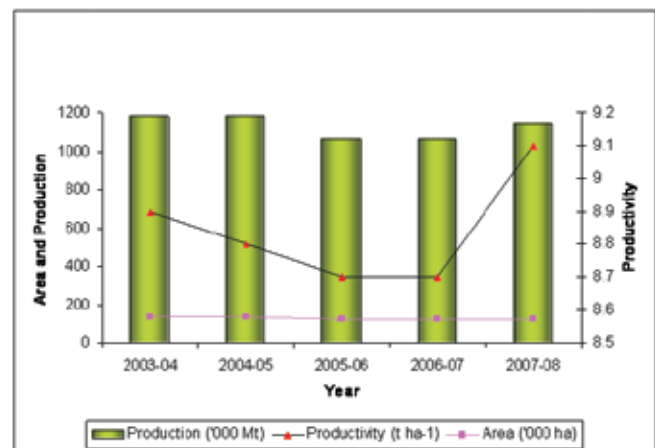
**Aroids and Yams:** There is no authentic published area, production and yield statistics for aroids and yams in India. However attempts to compile area under elephant foot yam in different parts of the country indicated that it is grown in an area of 32,000 ha producing 6.7 lakh tonnes with a productivity of 21 t ha<sup>-1</sup>. Major growing states are Andhra Pradesh, West Bengal, Gujarat, Kerala, Tamil Nadu, Bihar, etc.

Taro is used only as vegetable in the country and is grown commercially in Uttar Pradesh, Madhya Pradesh, Andhra Pradesh, Odisha and Kerala in localised areas such as Baruvassar in Jhansi district of Uttar Pradesh, Khandwa and Indore districts of Madhya Pradesh, Nayagarh district in Odisha, West and East Godavari, Krishna and Guntur districts of Andhra Pradesh, Alappuzha district in Kerala. Irrespective of fluctuations in prices over a period, taro is cultivated in these areas.



Source: National Horticulture Board

Fig. 1: Area, Production and Productivity of Cassava in India



Source: National Horticulture Board

Fig. 2: Area, Production and Productivity of Sweet Potato in India

## Techno-Economic Feasibility Reports as a tool for Commercialization of Technologies

India is now in a stage when it can take pride of having a strong network of S&T institutions, skilled manpower with innovative potential and a strong industrial base backed by equally efficient financial institutions. In a competitive world of scarce resources, new technologies fight for survival against developed technologies that promise immediate returns with comparatively little risk. Unfortunately, the lack of efficient technology commercialization models in India has led to poor transfer of technologies, thereby low production and productivity, high cost and poor quality. CTCRI developed many value added technologies from tropical tuber crops that can be used to establish agro-processing industries at cottage, small and medium scale in farm, home and industrial fronts. One of the ways CTCRI attempted to popularize these technologies is to develop

Techno-Economic Feasibility Reports for different technologies from tropical tuber crops. Sources/ places of raw material available, details of technology, market demand for the products, formalities to be followed before starting the industry, machineries required and their suppliers and plant economics for each product are provided in these reports and thus these act as ready reckoner to the interested entrepreneurs. Financing institutions also accept them as project reports before considering the project for financing. Cassava starch, sago, sago wafers, cassava flour, cassava fried food products, arrowroot starch, cold water miscible starch and liquid adhesives are the different value added products for which these reports were prepared. These reports are available for sale at nominal prices to create a sense of ownership among the interested entrepreneurs. The price details for these reports are given in the table below. Interested entrepreneurs can purchase by sending the Demand draft taken in favour of The Director, Central Tuber Crops Research Institute, Thiruvananthapuram payable at Thiruvananthapuram.

Techno-Economic Feasibility Report on	Cost (₹)	Service Tax+ Edu. Cess @ 12.5% (₹)	Total (₹)
Cassava starch	5,000.00	625.00	5,625.00
Sago	6,000.00	750.00	6,750.00
Sago wafers	3,000.00	375.00	3,375.00
Cassava flour	2,000.00	250.00	2,250.00
Cassava fried food products	2,000.00	250.00	2,250.00
Arrowroot starch	2,000.00	250.00	2,250.00
Cold water miscible starch	4,000.00	494.00	4,494.00
Liquid adhesives	2,000.00	250.00	2,250.00

### Market Prices for Tuber Crops & Value added products (October-December 2010)

Product	Average Wholesale price (₹ per 100 kg)
Cassava tubers	800
Sago	3808
Cassava Starch	2655
Sweet Potato	1000
Elephant Foot Yam	3500
Taro	1800
Yam	2800

Source : Sagoserve and other regional market sources (Koyembedu market)

## Farmer's cum Tuber Crops Day celebrated

Farmer's cum Tuber Crops Day was celebrated on 20<sup>th</sup> November 2010 coinciding with the Trikkarthika festival at a function organized jointly by Central Tuber Crops Research Institute (CTCRI) and Indian Society for Root Crops (ISRC). Shri G. Surendran, Director, Department of Agriculture in his key note address mentioned about the inclusion of tuber crops in the state food security programme along with paddy and vegetable cultivation and dairy, poultry and fish farming. He urged the farmers to exploit the new technologies and new varieties of crops developed at research institutes like CTCRI in order to make the state self-sufficient in food. Mayor K.Chandrika who inaugurated the function facilitated four winners of the Kerala Karshaka awards for 2008-09. Dr S.K.Naskar, Director, CTCRI and Dr M.Anantharaman, President of ISRC also spoke on the occasion. Exhibition stall displaying different varieties of tuber crops and value added products was arranged. An interactive session was organized for the farmers with the award winners and the scientists of CTCRI.



*Inauguration of Farmer's cum Tuber Crops Day*

## Inauguration of Bio-pesticide Laboratory

A research team led by Dr C.A.Jayaprakas, Head, Division of Crop Protection fabricated a pilot plant for extraction of bio-pesticide from cassava leaves. The plant was inaugurated by Shri. B. Veludham, Deputy Director (Propellants, Polymers, Chemicals & Materials Entity), Vikram Sarabhai Space Centre and switched on by Dr. C.T.S. Nair, Executive Vice President, Kerala

State Council for Science, Technology and Environment, and Ex-Officio Principal Secretary, in a colourful function held at the Institute on 3<sup>rd</sup> December 2010. Dr S.K.Naskar, Director, CTCRI presided over the function. This opened up a new avenue to the farmers for utilising cassava leaves as well as tuber rind as a source for bio-pesticide, which otherwise are often thrown as a waste. This bio-pesticide is effective against noxious borer pests like red palm weevil in coconut and pseudo stem weevil in banana.



*Inaugural function of Pilot Plant for Bio-Pesticide*

## Training cum Awareness programme on PPV & FRA organized

One day Training cum Awareness programme was organized at CTCRI on 15<sup>th</sup> December, 2010 in order to enlighten the various stake holders and create awareness on the provisions of Protection of Plant Varieties and Farmer's Rights Act (PPV & FRA). Shri Mullakkara Ratnakaran, Hon'ble Minister for Agriculture, Govt. of Kerala while inaugurating the programme said that India is one of the 12 countries designated as a biodiversity hot spot in the world and within our country entire Kerala is identified as biodiversity region. He further added that the Centre's role should be only as a monitoring agency and the responsibility of implementing the law should be decentralized to State governments and if possible further downwards for effective enforcement of the Act. Dr.S.K.Naskar, Director, CTCRI presided over the function. Dr.R.V.Varma, Chairman, Kerala Biodiversity

Board delivered the key note address. Dr.P.K.Singh, Registrar, Forestry, Medicinal and Aromatic Plants and Farmers Rights Authority, Govt. of India, New Delhi outlined the various provisions of the PPV & FRA Act including the system of reward to individual farmers as well as farming communities. In the technical session that followed the inaugural function, Dr. (Mrs) C.R.Elsy, Prof. & Coordinator, IPR Cell, Kerala Agricultural University and Dr.S.Rajasekharan, Head, Ethnopharmacological Division, TBGRI, Palode shared their experience on protecting farmers' right from the paddy sector and on the procedure of registration of varieties under PPV & FR Act respectively. About 150 participants including tribal farmers, field level functionaries of KVKs and NGOs took part in this programme.



*Shri Mullakkara Ratnakaran, Hon'ble Minister for Agriculture delivering inaugural address during Training cum Awareness programme on Protection of Plant Varieties and Farmers' Rights Act*

### Inter Media Publicity Co-ordination Committee meeting convened

The Inter Media Publicity Co-ordination Committee (IMPCC) meeting was convened at Central Tuber Crops Research Institute on 30<sup>th</sup> December 2010 under the Chairmanship of Shri P.K.Subash, Director, Doordarshan Kendra, Thiruvananthapuram. Dr. S.K.Naskar, Director, CTCRI presided. About 30 members representing various Central Govt. organizations, public undertakings etc. presented

their work during December 2010 and also informed about the forthcoming programmes. As a part of the meeting, the members were taken around the laboratories particularly bio-pesticide lab and the processing complex.



*IMPCC meeting in progress*

### Progressive Farmers' Seminar organized at Tirhut College, Dholi

The Regional Centre of CTCRI in collaboration with AICRPTC, Rajendra Agricultural University (RAU) organized a "Progressive farmers' seminar on commercialization of tropical tubers" at the Tirhut College of Agriculture, RAU, Dholi, Bihar on 1<sup>st</sup> October 2010. Dr. B.C. Chowdhry, Director of Research inaugurated the seminar and Dr. Jawahar Thakur, Principal, Tirhut College and Dr. James George, Project Coordinator, AICRPTC were chief guests of the seminar. Over 30 progressive farmers participated in the programme coordinated by Dr. P.P. Singh, Scientist (i/c), AICRPTC, RAU. Dr. R.S. Misra and Dr. P. Sethuraman Sivakumar gave talks during the seminar.



*Dr. R.S. Misra delivering talk during progressive farmers' seminar at Tirhut College, Dholi*

## Farmers' Seminar organized in Chattisgarh

The RCCTCRI organized a "Farmers' Seminar" in Anil Krishi Farm, Malpuri, Murmunda, Raipur, Chattisgarh on 28<sup>th</sup> October 2010 to popularize commercial cultivation of tuber crops with special focus on elephant foot yam. Dr. J. Singh, Scientist (i/c) AICRP-TC, IGKV, Raipur presided over the inaugural function and Dr. Dubey, Head, Department of Horticulture, Indira Gandhi Krishi Vidyalaya, Raipur was the chief guest. A scientist-farmers interface was also organized after technical sessions. Over 150 farmers and seed growers participated in the seminar. Dr. R.S. Misra coordinated the seminar.



*Technical session in progress at progressive farmers' seminar in Raipur, Chattisgarh*

## Regional Centre organized Farmers' Seminar-cum-workshop

Two days Farmers' Seminar-cum-workshop on "Livelihood Improvement through commercial cultivation and value addition of tuber crops for tribal farmers of Odisha" was organized by the Regional Centre of CTCRI (RCCTCRI), Bhubaneswar during 21-22, October, 2010. Dr. S.K. Naskar, Director, CTCRI presided the function. Shri Susanta Nanda, Programme Director, Odisha Tribal Empowerment and Livelihoods Programme (OTELP), Bhubaneswar during his inaugural address stressed the need for expanding better tuber crops technologies for improving tribal livelihoods in Odisha and invited the line departments to have meaningful collaboration

with RCCTCRI for tribal empowerment. Around 250 farmers along with Agriculture and Horticultural Officers representing 12 districts of Odisha attended the workshop. A group discussion was also held with various stakeholders in tuber crops as a part of the workshop.



*Technical sessions during Farmers' Seminar-cum-workshop*



*Group discussion with various stakeholders in tuber crops in progress*

## ICAR to Brand Agricultural Products

Planting material and products from agriculture and horticulture crops that are developed by the associate institutes of the Indian Council of Agricultural Research will be branded with a logo soon in order to protect nationally renowned varieties and products from being poached upon. Dr. H.P. Singh, DDG (Horti.) in a function organised in Bengaluru said that common branding had become a necessity as many products developed by the public sector research institutes were being marketed by the private sector under their own name.

## Feed back

“Greater thrust is required in Tuber Crops Research by spreading their cultivation to non-traditional areas, projecting their nutritional and food security role, augmenting their utilization prospects by developing value added functional foods, feeds and industrial products and developing demand assessment strategies.” - Dr. S.Ayyappan, Secretary, DARE and DG, ICAR.

“Highly impressed with the work on tuber crops especially cassava, sweet potato, yams etc. Industrial application of tuber crops initiated by the Institute is right intervention. There is great future for these crops in India.” –Dr V.M.Mayande, Vice-Chancellor, Dr PDKV, Akola and MAFSU, Nagpur.

“In the flood affected areas, soil moisture will be adequate to grow a short duration fodder crop or vitamin A rich sweet potato for faster biomass production.” - M.S. Swaminathan

## Happenings in brief

**New appointment:** Dr C.A.Jayaprakas joined as Head, Division of Crop Protection, CTCRI w.e.f 15-11-2010. CTCRI NEWS congratulates and wishes him success in this endeavor.

**Visits abroad:** Dr. S.K. Naskar, Director participated in the second strategic meeting of the Global Cassava partnerships for the 21<sup>st</sup> century held at Bellagio, Italy during 1-5 November 2010. Dr. T.Srinivas, Senior Scientist was deputed as consultant to ICARDA-Afghanistan program,

Kabul, Afghanistan for the period from 23-11-2010 to 24-12-2010.

**Visitors:** During October-December 2010, 18 batches of farmers were given training on tuber crops production and processing technologies and various activities of CTCRI wherein 616 farmers and 15 officials from Kerala, Tamil Nadu, Haryana and Andhra Pradesh participated. Seven batches of 220 students and 17 teachers from Kerala and Karnataka also attended awareness programmes on tropical tuber crops and training programmes conducted at CTCRI, Thiruvananthapuram.

**Hindi Workshop:** Shri A. Somadattan, Rtd. Assistant Director, OL distributed prizes to the winners of various Hindi competitions held during Hindi fortnight celebrations and Dr. S.K.Naskar presided over this function on 01-10-2010. Hindi workshop was organized at the Institute on 28th December 2010 during which Shri Somasekharan Nair, Hindi officer, LPSC (ISRO) Valiyamala took classes on Hindi noting and drafting.



*Participants in the second strategic meeting of the Global Cassava Partnerships for the 21<sup>st</sup> century at Bellagio, Italy*

**Exhibitions:** During this quarter, CTCRI participated in five exhibitions (Coconut Diversity Fair, Horticulture and Industrial Meet, Global conference on BANANA -2 010, International Horti- Expo -2010 and First Indian Biodiversity Congress (IBC 2010)) organized at CPCRI, Kasaragod, IIHR, Bengaluru, NRC Banana Thiruchirappalli, State Horticulture Mission Kerala, Thiruvananthapuram and CISSA, Thiruvananthapuram.



*Dr. H.P. Singh, DDG (Horticulture) visiting CTCRI stall at NRC Banana Thiruchirappalli during Global Conference BANANA-2010*

**Awards:** Dr. R.S. Misra, Head, Regional Centre of CTCRI, Bhubaneswar was awarded FIRST PRIZE for his paper entitled "Role of tuber crops in changing climate" in

the "National Seminar on Sustainable Agriculture & Food Security: Challenges & Opportunities" organised by Orissa University of Agriculture & Technology, Bhubaneswar during November 29-30, 2010.

Dr. P.S. Sivakumar was awarded first prize in the best paper category for the research paper entitled "Farmers' preferences and willingness-to-pay for greater yam seed attributes: A choice-based conjoint experiment in the Odisha state of India" at the "National Seminar on Extension Management Reforms – Initiatives and



*Dr. P. S. Sivakumar receiving the award for the best paper*

"Impact" organized by Society of Extension Education at Tamil Nadu Agricultural University, Coimbatore during 11-12, December 2010.

### Forthcoming events

1. National Seminar on Climate Change and Food Security: Challenges and Opportunities for tuber crops. (NSCFT 2011) during 20-22 January 2011.
2. Stakeholders meet on "Tuber Crops Research Industry Interface: Promotion and Commercialization" at Thiruvananthapuram on 23<sup>rd</sup> January 2011.
3. National Training on "Molecular Diagnostics for pathogens infecting crop plants" from 16<sup>th</sup> February to 3<sup>rd</sup> March 2011.

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**TUBERS FOR HUNGER ALLEVIATION**