



ICAR-CTCRI Newsletter



भारत-केन्द्रीय कन्द फसल अनुसंधान संस्थान
ICAR-CENTRAL TUBER CROPS RESEARCH INSTITUTE

Volume 40

Issue 2

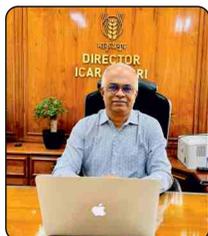
April-June 2023

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FORTHCOMING EVENTS

- 60th Foundation Day celebrations of ICAR-CTCRI on 22 July 2023
- National Symposium on 'Plant Health Management: Current Trends and Novel Mitigation Strategies' by Indian Phytopathological Society (Southern Zone chapter) and ICAR-CTCRI during 11-12 September 2023 at Thiruvananthapuram



Dr. G. Byju
Director

From the Director

I am happy to present the salient research and extension achievements of ICAR-CTCRI during the last three months. During the period, CTCRI has made significant achievements viz., central release of cassava mosaic disease resistant variety 'Sree Kaveri' for the states of Tamil Nadu, Andhra Pradesh and Kerala; development of production, protection, and value addition technologies; FLDs/OFTs on important varieties and technologies across the country; on campus and off campus training programmes for human resource development; and exhibitions and field diagnostic visits to major tuber growing states of India. The Institute successfully conducted RAC and IRC meetings and 23rd annual group meeting (AGM) of AICRP TC in a befitting manner and brought out proceedings on time for successful implementation by the scientists of the Institute and AICRP TC centres. Recommendation of fifteen lines for variety release and six technologies for inclusion in package of practices of different agro climatic zones are the major achievements of the 23rd AGM. The Brainstorming meeting on management of mealybugs in cassava at ICAR-CTCRI and rainbow diet campaign at Attapadi, Palakkad were the other two important events. As a part of IYoM celebrations, the Institute has established a Millet Museum for creating awareness among the farmers and common public for the production and consumption of millets. MoUs were signed for commercializing cassava based bioformulations and value added products of tuber crops which will help in building agribusiness and entrepreneurship development. The Institute is strengthening collaborations with research, extension and developmental organizations for addressing the challenges in tuber crops sector and also to fulfill the needs of farmers and other stakeholders.

निदेशक की कलम से

मुझे पिछले तीन महीनों के दौरान भा.कृ.अनु.प.-केन्द्रीय कंद फसल अनुसंधान संस्थान (आईसीएआर-सीटीसीआरआई) की प्रमुख अनुसंधान और विस्तार उपलब्धियों को प्रस्तुत करते हुए खुशी हो रही है। इस दौरान, सीटीसीआरआई ने महत्वपूर्ण उपलब्धियाँ हासिल की हैं। तमिलनाडु, आंध्रप्रदेश और केरल राज्यों के लिए कसावा मोजेक रोगप्रतिरोधी किस्म 'श्री कावेरी' की केन्द्रीय विमोचन; उत्पादन, संरक्षण और मूल्य संवर्धन प्रौद्योगिकियों का विकास; देश भर में महत्वपूर्ण किस्मों और प्रौद्योगिकियों पर अग्रिम पंक्ति प्रदर्शन / प्रक्षेत्र परीक्षण (FLDs/OFTs); मानव संसाधन विकास के लिए संस्थान परिसर और संस्थान के बाहर प्रशिक्षण कार्यक्रम; और भारत के प्रमुख कंद उत्पादक राज्यों का क्षेत्र निदान दौरे और प्रदर्शनियाँ आदि। संस्थान ने अनुसंधान सलाहकार समिति (RAC) और संस्थान अनुसंधान परिषद (IRC) की बैठकें और अखिल भारतीय समन्वित कंद फसल अनुसंधान परियोजना (AICRP TC) की 23^{वीं} वार्षिक समूह बैठक (AGM) का सफलतापूर्वक आयोजन किया और संस्थान एवं अखिल भारतीय समन्वित कंद फसल अनुसंधान परियोजना केंद्रों के वैज्ञानिकों द्वारा सफल कार्यान्वयन के लिए समय पर कार्यवाही प्रकाशित की। विभिन्न कृषि जलवायु क्षेत्रों की कृषि पद्धतियों में शामिल करने हेतु किस्मों को जारी करने के लिए पंद्रह वंशावलियों और छह प्रौद्योगिकियों की सिफारिश 23^{वीं} वार्षिक समूह बैठक की प्रमुख उपलब्धियाँ हैं। आईसीएआर-सीटीसीआरआई में कसावा में मिलीबग के प्रबंधन पर विचार-मंथन बैठक और अट्टापपाडी, पालक्काड में इंद्रधनुष आहार अभियान अन्य महत्वपूर्ण कार्यक्रम थे। अंतर्राष्ट्रीय मोटा अनाज वर्ष समारोह के एक भाग के रूप में, संस्थान ने मोटा अनाज के उत्पादन और उपभोग के लिए किसानों और आम जनता के बीच जागरूकता पैदा करने के लिए एक मोटा अनाज संग्रहालय की स्थापना की है। कसावा-आधारित जैविक मिश्रण और कंद फसलों के मूल्य वर्धित उत्पादों के व्यावसायीकरण के लिए समझौता ज्ञापनों पर हस्ताक्षर किया गए, जो कृषि व्यवसाय और उद्यमिता विकास के निर्माण में मदद करेंगे। संस्थान, कंद फसलों के क्षेत्र में चुनौतियों का समाधान करने के लिए, अनुसंधान, विस्तार और विकास संगठनों के साथ सहयोग को मजबूत कर रहा है और किसानों और अन्य हितधारकों को जरूरतों को पूरा करने के लिए काम कर रहा है।

G. Byju

भाकृअनुप - केन्द्रीय कन्द फसल अनुसंधान संस्थान
श्रीकार्यम, तिरुवनन्तपुरम 695 017, केरल, भारत

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

Research Highlights

Sree Kaveri: Multi-trait cassava variety

M.N. Sheela et al.,

Sree Kaveri is a multi-trait cassava variety released for the states of Tamil Nadu, Andhra Pradesh and Kerala for industrial use of starch extraction. It has resistance to cassava mosaic disease, drought tolerance and has high nutrient use efficiency. The variety is suitable for low-input farming. It has high yield (51 t ha^{-1}) and resembles the variety H-226 in its morphological traits.



Sree Kaveri tuber



Sree Kaveri plant

Genetic variation among hybrid progenies of cassava for dry matter and starch content

Mohan, C., Lavanya, S., Aneesa, N., Senthilkumar, K.M., Jyothi, A.N. and P.S. Shameer

Sree Vijaya (yellow fleshed) and breeding line 9S-127 (cream) were used as parents to develop 100 F_1 hybrid seedlings. Fifty randomly selected F_1 hybrids were evaluated for dry matter and starch content. The dry matter ranged from 27.76-52.05 % in the hybrids and parents (Sree Vijaya-37.0, 9S-127- 49.20). The starch content of the hybrids ranged from 13.88-33.46%, whereas that of the parents, Sree Vijaya and 9S-127 were 20.30 and 30.75%, respectively. Twelve hybrids with more than 29% starch content were identified and wide segregation for carotene content was also observed among the hybrids.



Genetic variation among hybrid progenies of cassava

Microfood for Chinese potato

G. Byju, D. Jaganathan and R. Muthuraj

A crop specific multimicronutrient liquid foliar formulation for Chinese potato was developed to increase the yield and quality of the tubers. The results of the OFTs conducted in Tenkasi and Tirunelveli districts of Tamil

Nadu showed that, on an average, the new technology (Microfood @ 5 ml per litre of water two times during 30 and 60 DAP) increased the Chinese potato yield (19.05 t ha^{-1}) by 12.79 % which corresponds to 2.13 t ha^{-1} more compared to farmers' practice (16.92 t ha^{-1}). The advantages of the microfood are, reduced fertilizer consumption, improved soil quality and improved soil fertility by judicious use of micronutrient formulations; management of micronutrient deficiencies in Chinese potato; cost effective as the B:C ratio worked out to be 2.91 in comparison to farmer's practice which was 2.70 and the product is readymade which is easy to use. The technology disclosure details of microfood have been submitted to AgrInnovate, New Delhi through ITMC for commercialization.



Adoption of Microfood technology in Chinese potato in Tenkasi and Tirunelveli districts

Technologies for organic farming of elephant foot yam + vegetable system

G. Suja

Organic package of practices for intercropping elephant foot yam with vegetables such as cucumber and Amaranthus, including FYM, poultry manure, vermicompost, neem cake, groundnut cake and PGPR were developed. The corm equivalent yield of elephant foot yam was highest when intercropped with cucumber under 75% organic + 25% inorganic (28.28 t ha^{-1}) in the first year and with Amaranthus under 100% organic (33.29 t ha^{-1}) in the second year. The soil chemical properties, pH, organic C, CEC, available N, P, K, Ca, Mg, Mn, Zn and Cu status were enhanced significantly in organic plots. The soil microbiome, especially the count of bacteria and fungi were also favoured in these plots.



Elephant foot yam + okra



Elephant foot yam + amaranthus



Elephant foot yam + cucumber
Organic farming of elephant foot yam + vegetables

Cassava starch-based hydrogel for dye adsorption

A.N. Jyothi

Reaction conditions were optimized for synthesizing biodegradable cassava starch phosphate carbamate with dye adsorption capacity and potential in water remediation applications. The phosphorus content and degree of substitution (DS_p) of the product were 0.0698% and 0.0037, respectively. The sample also exhibited good water absorption capacity of about 91.7-94.5 $g\ g^{-1}$. The percentage removal of the methylene blue dye by the hydrogel was 99.54% after 3 h of treatment. The adsorption capacity was 10.51 $mg\ g^{-1}$ for the dye solution of 10 ppm concentration.



Dye adsorption by cassava starch phosphate carbamate hydrogel

Sorghum incorporated sweet potato thin crackers

C. Pradeepika

Sweet potato-based bakery foods such as cookies, biscuits, and crackers are becoming increasingly popular among consumers worldwide due to the presence of nutritional attributes like fiber, minerals and starch content. Sweet potato and sorghum-based thin crackers were developed by completely replacing the maida. The nutritional characteristics of thin crackers viz., protein, fiber, starch, minerals, fat and sugar contents were determined. The protein content ranged between 3.06 to 1.75 $mg\ 100\ g^{-1}$ dry weight (dw), starch 36.59 to 24.58 $mg\ 100\ g^{-1}$ dw, fiber 1.45 to 2.78 $mg\ 100\ g^{-1}$ dw and ash 2.98 to 2.45 $mg\ 100\ g^{-1}$ dw. The micronutrient analysis revealed the presence of good amounts of calcium (0.771 to 3.478 $mg\ L^{-1}$), iron (0.587 to 1.956 $mg\ L^{-1}$), magnesium (0.189 to 0.314 $mg\ L^{-1}$), zinc (0.153 to 0.253 $mg\ L^{-1}$), and copper (0.039 to 0.099 $mg\ L^{-1}$). The treatment containing 40% of sweet potato flour, 40% of sorghum, and 20% of wheat flour showed

higher nutritional attributes compared to other formulations and it was also preferred in the sensory analysis.



Sorghum-sweet potato thin crackers

Extension

FLDs/OFTs

- Thirty-five FLDs on improved varieties of cassava viz., Sree Athulya (20) and Sree Reksha (15) were established in Salem, Namakkal and Kanyakumari districts of Tamil Nadu. Five FLDs on SSNM in elephant foot yam were established in Erode district of Tamil Nadu. Fifteen FLDs on improved variety of Chinese potato 'Sree Dhara' were established in Thrissur and Palakkad districts of Kerala. Five FLDs on improved variety of cassava 'Sree Reksha' and 5 FLDs improved varieties of sweet potato on 'Sree Arun' and 'Sree Varun' were established in Thiruvananthapuram district of Kerala.
- On-farm validation of site-specific nutrient management (SSNM) involving customized fertilizers & micronol and organic farming technologies were monitored in 10 coconut gardens of 50 cents each in cassava and elephant foot yam in Pollachi taluk, Coimbatore, Tamil Nadu. Ten on-farm demonstrations (3 SSNM in cassava, 3 organic farming in cassava, 2 SSNM in elephant foot yam and 2 organic farming in elephant foot yam) were monitored and farmers were supplied with critical inputs provided technical guidance.



Demonstrations on organic farming technologies in cassava and elephant foot yam at Pollachi, Coimbatore



Demonstrations on SSNM in cassava and elephant foot yam at Pollachi, Coimbatore

- Three OFTs on nematode management of elephant foot yam were conducted in Kayamkulam, Alappuzha district of Kerala
- Demonstrations on the application of nutrients in rice and banana using drones were conducted at Muttill, Kaniyambetta and Pulpally panchayats of Wayanad district during 25-27 May 2023. Nano urea was used for spraying in both the crops. About 30 ha of crop area was sprayed using drones.
- Thirty demonstrations on the application of micronutrients in cassava *Micronol Tapioca Special* developed by ICAR-CTCRI using drones were conducted at Olapadi near Attur, Salem District, Tamil Nadu during 13-17 June 2023.



Demonstration of Drone Application at Muttill, Wayanad



Demonstration of Drone Application at Olapadi, Salem

- Four FLDs were conducted in collaboration with RARS Pattambi covering 2 acres of land. FLDs on biofortified varieties conducted at Attapadi, Palakkad, Bhu Kanti has recorded highest tuber yield (20.27 t ha⁻¹) followed by Bhu Sona (19.03 t ha⁻¹) and Bhu Ja (6.67 t ha⁻¹). The benefit-cost ratio of biofortified varieties ranged from 4.25 to 4.53.
- Three Nutrigarden FLDs were laid out in Dhalai district of Tripura and one cassava variety for Eri Silk worm planted in Assam under the ICAR-CTCRI NEH programme.
- Five FLDs on SSNM in improved variety of cassava 'Sree Reksha' conducted by ICAR-CTCRI, Agricultural Information and Sales Centre, Kozhikode (Kerala Agricultural University) and ATMA Kozhikode. at Olavanna and Kadalundy Panchayaths

and Ramanattukara municipality in Kozhikode district during 2022-23, revealed that SSNM plot produced a yield of 43 t ha⁻¹ which is 12.5 per cent higher than the farmer's practice. Farmers opined that the variety is high yielding, cassava mosaic disease resistant, excellent cooking quality and taste. The planting materials were distributed to neighbouring farmers as part of seed village programme in Kozhikode district.



Demonstrations on SSNM in cassava var. Sree Reksha at Kozhikode

Training programmes

On campus programmes

- IP awareness programme on World Intellectual Property Day - 'Women and IP: Accelerating Innovation and Creativity' was organized on 26 April 2023 at ICAR-CTCRI, Thiruvananthapuram.
- Ten B.Sc. (Botany) students from National College, Manacaud, Thiruvananthapuram undergone training and project work on 'Morphological, tuber characterization of hybrid clonal generation of CMD resistant population & plant DNA isolation' from 08 - 26 May 2023 under the guidance of Dr. C. Mohan, Division of Crop Improvement, ICAR-CTCRI, Thiruvananthapuram.
- Training on 'Improved technologies of tropical tuber crops' was organized during 23-26 May 2023 for two SMSs of KVK, Chandrapur, Maharashtra.



Training for SMSs of KVK, Chandrapur

- Two B.Sc. Agriculture students from Govindraoji Nikam College of Agriculture, Ratanagri, Maharashtra undergone one month Training on ‘Molecular Biology laboratory techniques’ during May-June 2023 under the guidance of Dr. Senthilkumar K.M., Division of Crop Improvement, ICAR-CTCRI, Thiruvananthapuram.
- Training for the Kerala Administrative Service officer trainees was organized on 16 June 2023. They were briefed about the Institute activities and they visited the museum, labs and the Techno Incubation Centre at ICAR-CTCRI, Thiruvananthapuram.



Training for the KAS officer trainees

- Training programme on ‘Improved technologies of tropical tuber crops’ was organized during 21-23 June 2023 in collaboration with Department of Horticulture, Government of Tamil Nadu for 10 progressive farmers from Salem district.
- Training on ‘Improved technologies of sweet potato and Chinese potato’ was conducted for tribal women under ATMA Interstate exposure visit in collaboration with KVK, Chandrapur, Maharashtra during 26-27 June 2023 for 10 tribal women.



Training for farmers from Salem, Tamil Nadu



Training for tribal women from Chandrapur, Maharashtra

- In-plant training on ‘Tropical tuber crops technologies for livelihood improvement and commercial farming’ was organized during 01-30 June 2023 for 10 third year B.Tech. (Ag. Engg.) students from OUAT, Bhubaneswar at Regional Station, ICAR-CTCRI, Bhubaneswar.

Off campus programmes

- Training on ‘Improved technologies of tropical tuber crops’ was organized in collaboration with Department of Agriculture, Kilimanoor, Government of Kerala on 25 May 2023 for 30 farmers of Thiruvananthapuram.



Distribution of planting materials of tuber crops during the training programme at Kilimanoor

- District level training programme on ‘*Smart vilavinu Smart Krishi*’ was organized at Ambalavayal on 27 May 2023 under the auspices of ATMA, Wayanad and Krishibhavan, Ambalavayal. Dr. V.S. Santhosh Mithra handled the sessions during the training programme. About 100 farmers attended the training.
- Training on ‘Production and value addition in tuber crops’ was organized on 08 June 2023 at Kanchinda village, Sorisapal Gram Panchayat, Bangriposi block, Mayurbhanj district of Odisha under MIDH Project for 70 farmers.
- Training on ‘Production and value addition in tuber crops’ was organized on 09 June 2023 at Chalunia village, Saragchida Gram Panchayat, Kuliana block, Mayurbhanj district of Odisha under MIDH Project for 70 farmers.



Training at Chalunia, Mayurbhanj



Training at Khedapada, Rayagada

- Training on ‘Production and value addition in tuber crops’ was organized on 14 June 2023 at Khedapada village and G.P., Kolnara block, Rayagada district of Odisha under MIDH Project for 65 farmers.
- Training on ‘Production and value addition in tuber crops’ was organized on 15 June 2023 at Hatamuniguda village and G.P., Muniguda block, Rayagada district of Odisha under MIDH Project for 70 farmers.



Distribution of planting materials during training at Karanjiari, Jajpur

Seminars/Workshops/Interface Meetings/Field Diagnostic Visits Organized

- An awareness programme on the management of stem and root rot of cassava was organized at Palakuzha Panchayath, Moovattupuzha, Ernakulam district, Kerala on 02 June 2023 for the benefit of 31 farmers.



Awareness programme at Palakuzha, Ernakulam



Field Diagnostic visit to Thuckalay, Nagercoil, Kanniyakumari

- The Field Diagnostic team of ICAR-CTCRI visited Thuckalay, Nagercoil, Kanniyakumari district, Tamil Nadu on 15 June 2023 to address the witches broom symptoms in cassava.
- An awareness meeting was organized on 13 June 2023 at Olapadi to sensitize the farmers about the benefits of smart farming technology developed by ICAR-CTCRI as well as about the use of drones for spraying nutrients and pesticides. The meeting was organized by Dr. V.S. Santhosh Mithra and Dr. C. Mohan, Principal Scientists of ICAR-CTCRI, Thiruvananthapuram, Mr. Velmurugan, Assistant Director of Agriculture, Pethanaickenpalayam, Mr. Kubaran, President, Olipadi Panchayat, Mrs. Logaswari, President, Ottampatti Panchayath and Mr. Vijayakumar, Councilor. About 100 farmers attended the meeting.

Exhibitions

ICAR-CTCRI has participated in seven different exhibitions:

- Exhibition in connection with Farmers seminar and inauguration of Krishisree Centre on 01 May 2023 at Kadampanadu, Parakkode block, Adoor, Pathanamthitta, Kerala.
- Training programmes on 'Agro-techniques and production of quality planting materials of tuber crops' were organized during 14-15 March 2023 at Kandhamal, Odisha (Tikabali and Raikia) for 228 farmers and other stakeholders.
- Exhibition in connection with 'Chertala Fest-Karapuram Karshika Kazchakal' during 19-28 May 2023 at Chertala, Alappuzha, Kerala.



Exhibition at Adoor, Pathanamthitta



Exhibition at Chertala, Alappuzha

- Exhibition in connection with Technology Conclave and Expo organized by KSUM at KMEA Engineering College on 10 May 2023 at Aluva, Ernakulam, Kerala.
- Exhibition in connection with 36th Foundation Day celebrations of ICAR-IIWM, Bhubaneswar on 11 May 2023 at ICAR-IIWM, Bhubaneswar, Odisha.
- Exhibition in connection with PPV&FRA Workshop during 11-12 May 2023 at ICAR-NRRI, Cuttack, Odisha.



Dr. Trilochan Mohapatra, Chairperson, PPV&FRA visiting the CTCRI stall

- Exhibition in connection with Kalpavajra-Kisan mela cum farmers seminar celebration on 13 May 2023 at ICAR-CPCRI Regional Station, Kayamkulam, Alappuzha, Kerala.
- Exhibition in connection with 'Bio-Connect 2023' Kerala Industrial Conclave on Life Sciences during 25-26 May 2023 at Leela Raviz Hotel, Kovalam, Thiruvananthapuram, Kerala.

Mera Gaon Mera Gaurav Programme

- A programme on 'Tuber Crops Seed Village: Farmers Training and Distribution of Planting Materials' was organized under MGMG programme on 02 June 2023 at NSS Karayogam Hall, Muttakkadu, Thiruvananthapuram and planting materials of cassava, yams and elephant foot yam were distributed to 40 beneficiaries from Venganoor grama panchayath Thiruvananthapuram.



Distribution of quality planting materials to farmers under seed village programme



- Planting materials of cassava variety Sree Reksha and sweet potato varieties Sree Arun and Sree Varun were distributed on 30 May 2023 to 30 farmers at Karakulam village, Nedumangad block, Thiruvananthapuram.



Distribution of quality planting materials to farmers

IYoM programmes

Millets Museum at ICAR-CTCRI

- With an aim to create awareness and increase production & consumption of millets, Government of India had proposed to the United Nations General Assembly for declaring 2023 as the International Year of Millets (IYoM 2023). To commemorate this, ICAR-CTCRI has established a millet museum at the Institute comprising nine millets viz., sorghum, pearl millet, finger millet, foxtail millet, proso millet, kodo millet, barnyard millet, little millet and brown top millet was established at the Institute premises on 28 April 2023. It was inaugurated by Dr. G. Byju, Director, ICAR-CTCRI, in the presence of the staff of the Institute. Students, farmers and other stakeholders who are visiting the Institute are taken to the millet museum and explained about its nutritive value and its importance in daily life.
- Under the IYoM programme, awareness campaigns on Nutritive value of millets and value addition was conducted in three MGMG villages viz; Karakulam (30 May 2023), Muttakkadu (02 June 2023) and Thiruvallam (15 June 2023) and at ICAR-CTCRI, Thiruvananthapuram (20 June 2023). More than 150 farmers and farm women participated.



Inauguration of Millet Museum by Dr. G. Byju
Director ICAR-CTCRI



Awareness campaigns on Nutritive value of millets and value addition at MGMG villages and CTCRI

- Organised an awareness campaign on millets as part of MGMG programme on 08 June 2023 at Krishi Bhavan, Thiruvallam, Thiruvananthapuram, Kerala with the participation of 20 farmers. Dr. Asha K.I. delivered a lecture on millets and their health benefits in view of the International Year of Millets.

Exposure visits to ICAR-CTCRI

- One day exposure visit cum training on 'Improved technologies of tuber crops' was organized for the benefit of 142 farmers, 412 students and 194 officials across the nation at ICAR-CTCRI, Sreekariyam, Thiruvananthapuram.



Exposure visits to ICAR-CTCRI, Thiruvananthapuram

Agribusiness Incubator Activities

- Enrollment of new incubates: M/s Southern Hills Industries Pvt. Ltd., Payyanur, Kerala and M/s Micro Nutrich Pvt. Ltd., Chennai.
- Business pitching for technology development incubation: Participated in DPR Clinic organized at Chertala on 24 May 2023 and Four Farm Plan training was organised by KVK, Thrissur (23 May 2023), KVK, Kottayam (20 May 2023), KVK, Wayanad (15 May 2023) and KVK, Pathanamthitta (20 June 2023).
- A Nutrition awareness programme on biofortified tuber crops for school children and launching of SCHOOL CONNECT programme as a part of Rainbow Diet Campaign was organized at KILA Campus, Agali, Palakkad on 16 June 2023 for 56 beneficiaries.



School connect programme at Agali

- Stakeholders' meeting on Scaling up biofortified tuber crops for achieving nutritional security at Attapadi as a part of Rainbow Diet Campaign was organized at KILA Campus, Agali, Palakkad on 16 June 2023 in which 171 farmers and other stakeholders participated.



Stakeholders meeting at Agali

In techno incubation centre, a total of 5 trainings on 'Value addition and entrepreneurship development in tuber crops' was conducted at Techno incubation centre with the participation of 144 trainees consisting of 83 male and 61 females.

- Tuber crops based snack foods and pasta was organized on 11 May 2023 for 24 entrepreneurs from different districts of Kerala.
- Value addition and entrepreneurship development in tuber crops during 08-09 June 2023 for 27 aspiring entrepreneurs from Thrissur, Kerala.
- Value addition and entrepreneurship development in tuber crops on 13 June 2023 for 47 aspiring entrepreneurs from Kollam, Kerala.
- Tuber crops based snack foods and pasta on 22 May 2023 for 25 entrepreneurs from Kottayam, Kerala.
- Value addition and entrepreneurship development in tuber crops was organized on 27 June 2023 for 21

aspiring entrepreneurs from Kottayam, Kerala.

Technology Commercialization/Linkages/ Collaborations

- Technology on fried snack foods and fried chips from Tapioca was licenced to M/s., Madappally Block Vanitha Food Processing Industrial Co-Operative Society Ltd. No. S.IND (K) 342, Madappally Block, Changanacherry, Kottayam, Kerala-686546 on 12 April 2023.
- Technology on fried snack foods and fried chips from Tapioca was licenced to M/s., DNALIFE Pvt.Ltd., Plot No.74, Door No.1-80/1/L/74, PVR Arcade, Lumbini Avenue, Gachibowli, Hyderabad, Telangana-500032 on 15 May 2023.
- ICAR-CTCRI bio-formulations with pesticidal action was commercialized to Green Edge Agri Imports Pvt. Ltd., No.31, Ganapathy Nagar, Ariyamangalam, Tiruchirappalli, Tamil Nadu-620010 on 22 June 2023 for ₹ 5 lakhs.
- MoU was signed with M/s KCM Agri Clinic, No. 148, Sivanthi Patti Road, Thiagaraja Nagar, Maharaja Nagar, Tamil Nadu-627017 for contract research on 'Development of Cassava Custard' on 03 May 2023.



Signing of MOU with Green Edge Agri Imports Pvt. Ltd., Tiruchirappalli

Capacity building Trainings attended by staff

Sl.No.	Name	Particulars of the training	Period
1	Shri. T. M. Shinil	Training on Remote Pilot by Garuda Aerospace Private Limited, Chennai	17-27 April 2023
2	Dr. J. Suresh Kumar	Cocaponics/soil less culture- A new method of growing vegetables and medicinal herbs in terrace/ roof top at ICAR-IIHR, Bengaluru	27 April 2023
3	Dr. S.S. Veena	Training programme on Prevention, Prohibition and Redressal of Sexual Harassment of Women at Workplace by Institute of Secretariat Training and Management, Dept. of Personnel & Training, Govt. of India	01 May 2023
4	Dr. K. Sunilkumar	Management development Programme on Innovation and Design Thinking: Train the Trainer's programme for Mentors of K-DISC, Government of Kerala at IIM Kozhikode	04-06 May 2023
5	Dr. C. Pradeepika	International training (Online) on Technology Innovation in Agriculture, Horticulture, Animal Husbandry, Fisheries, Sericulture and Allied Sectors for Sustainable Entrepreneurship (21 days)	16 June-06 July 2023

Staff participation in scientific events/seminars/symposia/conference/workshop/meetings

Sl.No.	Name of the participant	Programme	Particulars of the programme
1	All Scientists	Online Meeting with DDG (Hort. Sci.), ICAR, New Delhi	ICAR-CTCRI, Sreekariyam, Thiruvananthapuram 05 April 2023
2	All Scientists	Second meeting of IX Research Advisory Committee	ICAR-CTCRI, Sreekariyam Thiruvananthapuram 12-13 April 2023
3	All Scientists	49 th Annual Institute Research Council meeting	ICAR-CTCRI, Sreekariyam Thiruvananthapuram 17-20 April 2023
4	Dr. K. Laxminarayana	Dhan Diwas and 78 th Foundation Day 'Technical transformation in rice ecosystem'	ICAR-NRRI, Cuttack 23 April 2023
5	All Staff	World Intellectual Property Day Celebrations	ICAR-CTCRI, Sreekariyam, Thiruvananthapuram 26 April 2023
6	Dr. G. Byju	Classical Biological Control of Cassava Mealybug (CMB) in India: Field Release of the Parasitoid, <i>Anagyrus lopezi</i> in Kerala	Jointly organized by ICAR-NBAIR, Bengaluru, ICAR-CTCRI, Thiruvananthapuram & AICRP-BC KAU, Vellanikkara at Madakkathara Grama Panchayat, Thrissur, Kerala 26 April 2023
7	Dr. G. Byju Dr. G. Suja Dr. S.S. Veena Dr. A. N. Jyothi Dr. P. Murugesan Dr. Asha K.I. Dr. M. Nedunchezhiyan Dr. K. Laxminarayana Dr. J. Sreekumar Dr. Asha Devi A. Dr. Shirly Raichal Anil Dr. Kalidas Pati Dr. J. Suresh Kumar Mr. M. Padmakumar	23 rd Annual Group Meeting of AICRP on Tuber Crops	BCKV, Kalyani, West Bengal 10-12 May 2023
8	Dr. G. Byju	Kalpa Vajra (2022-23): Kisan Melacum-Farmers' Seminar	ICAR-CPCRI Regional Station, Kayamkulam, Alappuzha 13 May 2023
9	Dr. M.S. Sajeev Dr. A.N. Jyothi Dr. J. Sreekumar Dr. T. Krishnakumar	Brainstorming session on SOP preparation of tapioca starch/sago with representatives from different starch/sago factories	SAGOSERVE Salem, Tamil Nadu 17-18 May 2023
10	All Scientists	Brainstorming meeting on Management of mealybugs in cassava: Present status and future strategies	ICAR-CTCRI, Thiruvananthapuram 23 May 2023

11	Dr. G. Byju Dr. V.S. Santhosh Mithra	Review Meeting of ICAR-CTCRI with Hon'ble Minister of Agriculture and Farmers' Welfare, Govt. of India	Krishi Bhavan, New Delhi 31 May 2023
12	All Staff	H.H. Sree Visakham Thirunal Endowment lecture on 'Affordable clean water using nanomaterials' by Padma Shri Prof. T. Pradeep, IIT Madras	Organized by Indian Society for Root Crops and ICAR-CTCRI, Sreekariyam, Thiruvananthapuram 05 June 2023
13	Dr. B.G. Sangeetha	Ph.D. Advisory committee meeting	Department of Entomology, College of Agriculture, Vellayani, Thiruvananthapuram 08 June 2023
14	Dr. S.S. Veena	7 th Dr. Y.R. Sarma Memorial lecture (Hybrid mode)	ICAR-Indian Institute of Spices Research, Kozhikode 09 June 2023
15	Dr. Sheela Immanuel	National Training Conclave 2023	Organized by Capacity building commission at Pragathi Maidan, New Delhi 11 June 2023
16	Dr. K. Laxminarayana	Multi-stakeholder Workshop on Shaping the Sustainable future of Odisha Millet Mission	Organized by the Directorate of Agriculture & Farmers' Empowerment, Govt. of Odisha at Krushi Bhawan, Bhubaneswar 12 June 2023
17	Dr. B.G. Sangeetha	Workshop on Phytochemical techniques on aromatic plants research	Central Instrumentation Facility, (KSCSTE-JNTBGRI), Palode, Thiruvananthapuram 15-16 June 2023
18	Dr. G. Byju Dr. P.S. Sivakumar Dr. R. Saravanan Mr. D.T. Rejin	Rainbow Diet Campaign - Stakeholders Meeting on Scaling up Biofortified Tuber Crops for Achieving Nutritional Security in Attapadi	Jointly organized by ICAR-CTCRI and RARS, KAU Pattambi at Agali, Palakkad District 16 June 2023
19	All Staff	9 th International Yoga Day celebrations	ICAR-CTCRI, Thiruvananthapuram 21 June 2023
20	All Scientists	Meeting on Technology license agreement signing ceremony: Bio formulations with M/s Green Edge Agri Imports Pvt. Ltd., Trichy and ICAR-CTCRI	ICAR-CTCRI, Thiruvananthapuram 23 June 2023

Publications

Research papers

- Anil, S.R., Devi, A.A., Asha, K.I, Beevy, S.S. and Siril, E.A. 2023. Intraspecific inflorescence and palynological variations in the morphotypes of *Amorphophallus paeoniifolius*. *Genet. Resour. Crop Evol.* (NAAS score: 8.0).
- Asha, S., Summaya Mohammad and Makesh Kumar, T. 2023. High throughput sRNA sequencing revealed

gene regulatory role mediated by pathogen-derived small RNAs during Sri Lankan Cassava Mosaic virus infection in cassava. *3Biotech*, 13: 95 (NAAS score: 8.89).

- Chintha, P., Sarkar, D., Ramakrishna, R., Dogramaci, M., Lulai, E.C. and Shetty, K., 2023. Biological elicitors to enhance wound healing responses in cut potato tubers. *Scientia Horticulturae*, 319, p.112152 (NAAS score: 10.34).

4. Govindasamy, P., Senthilkumar, K.M., Bagavathiannan, M., Mowrer, J., Jagannadham, P.T.K., Maity, A., Halli, H.M., Sujayanand, G.K., Vadivel, R., Das, T.K., Pooniya, V. Babhu, S., Rathore S.S., Muralikrishnan, L. and Tiwari, G. 2023. Nitrogen use efficiency-a key to enhance crop productivity under a changing climate. *Front. Plant Sci.*, 14: 1121073 (NAAS score: 12.63).
 5. Harish, E.R. and Krishnan, J.U. 2023. Cost-effective media for mass production of *Bacillus thuringiensis* Berliner for the management of taro caterpillar, *Spodoptera litura* Fabricius. *J. Entomol. Res.*, 47(1): 8-15 (NAAS score: 5.89).
 6. Jayanti M., Narendra G., Ashok Kumar B., Mehul Kumar S., Saravanan, R., Shrikant B., Lalji B., Bharatkumar, D. 2023. Exploration of HPTLC technology for rapid chemical finger printing and simultaneous determination of bioactive constituents from *Clitoriaternatea* LINN, *Chemistry Select*, 8(13): e202203217 (NAAS score: 8.31).
 7. Raji, P. and Byju, G. 2023. Modelling the growth, yield and future climate sustainability of underutilized tuber crops- 'aroids': a review. *Current Horticulture*, 2(11): 9-14
 8. Raji, P., Sunitha, S., Santhosh Mithra, V.S. and Byju, G. 2023. Future climate suitability of underutilized tropical tuber crops-Aroids in India. *J. Agrometeorol.*, 25(2): 255-261 (Impact factor: 0.27).
 9. Rethinam, P. and Murugesan, P. 2022. Seven decades of research on oil palm in India. *International Journal of Innovative Horticulture*, 11(2): 198-213 (NAAS score: 3.40).
 10. Sangeetha, B.G., Jayaprakas, C.A. and Harish, E.R. 2023. Metagenomic DNA analysis of bacterial communities associated with striped mealy bugs *Ferrisia virgata* (Cockerell) (Homoptera: Pseudococcidae) infesting cassava. *J. Entomol. Res.*, 47(1): 1-7 (NAAS score: 5.89).
 11. Prakash, P., Jaganathan, D., Sheela Immanuel, Muthuraj, R. and Sivakumar, P.S. 2023. Socio economic impact of improved variety of Chinese potato in Tamil Nadu. *Indian Journal of Horticulture*, 80(2): 177-183 (NAAS score: 6.00).
 12. Prakash P., Kumar, P. and Kishore, P. 2023. Economic feasibility of polyhouse establishment with and without government subsidy support: A case of bell pepper (*Capsicum annuum* L.) cultivation in Maharashtra, India. *European Journal of Horticultural Science*, 88(2): 01-07 (NAAS score: 7.07).
 13. Viswanatha Reddy, K., Damodar Reddy, D., Prakash, P., Hema, B. and Srinivas, A. 2023. Impact of WHO-FCTC on performance of Indian tobacco sector. *Current Science*, 124 (7): 840-844 (NAAS score: 7.17).
- Book chapters**
1. Chauhan, V.B.S., Mallick, S.N., Mohapatra, P., Pati, K., Arutselvan, R., Nedunchezhiyan, M. and Verma, A.K. 2023. Taro (*Colocasia esculenta* L.) Schoff.) for nutritional security and health benefits. Horticulture for nutritional and income security. NIPA Genx Electronic Resources & Solutions P. Ltd., New Delhi, pp 1-11.
 2. Chauhan, V.B.S., Mallick, S.N., Mohapatra, P., Pati, K., Arutselvan, R., Nedunchezhiyan, M. and Verma, A.K. 2023. Phytochemistry, Ethnobotany and Pharmacology of East Indian Arrowroot (*Curcuma angustifolia* Roxb). NIPA Genx Electronic Resources & Solutions P. Ltd., New Delhi, pp 423-433.1.
 3. Giri, N.A., Krishnakumar, T., Jeevarathinam, G. and Sajeev, M.S., 2023. Thermophysical and Physicochemical Technologies for Drying of Food Products. *Novel and Alternative Methods in Food Processing: Biotechnological, Physicochemical, and Mathematical Approaches*, p.69.
 4. Sajeev, M.S., Padmaja, G., Jyothi, A.N., Krishnakumar, T. and Pradeepika, C. 2023. Tropical Tuber Crops: Nutrition and Entrepreneurial Opportunities. In: Singh, B. and Kalia, P. (eds.) *Vegetables for Nutrition and Entrepreneurship*. Springer, Singapore. pp. pp 409–438. https://doi.org/10.1007/978-981-19-9016-8_19.
- Technical bulletins**
1. Augustine Jerard, B., Damodaran, V., Sunitha, S., Sheela, M.N. and Suresh Kumar, J. 2023. *A catalogue of conserved Greater Yam accessions at ICAR-CIARI, Port Blair*, AICRP on Tuber crops, ICAR-CIARI, Port Blair, Andaman and Nicobar Islands, 130 p.
 2. Augustine Jerard, B., Damodaran, V. and Sunitha, S. 2023. *A catalogue of conserved Colocasia accessions at ICAR-CIARI, Port Blair*, AICRP on Tuber crops, ICAR-CIARI, Port Blair, Andaman and Nicobar Islands, 60 p.
- Popular articles**
1. Sheela Immanuel, Jaganathan, D., Prakash, P. and Sivakumar, P.S. 2023. Women empowerment: For engendering agriculture and social development. *Agro*

India. April 2023: 31-34.

2. Sheela Immanuel, Jaganathan, D., Prakash, P. and Sivakumar, P.S. 2023. Strategies to enhance livelihood of tuber crops farmers. *Kerala Karshakan e journal* 10(10):09-15.
3. Veena, S.S., Harish, E.R., Suja, G. and Jeeva, M.L. 2023. *Ippol sradhyykkam kizhangvila vithsambharanathil*. (Pay attention now for storage of seed tubers - Malayalam), *Kerala Karshakan*, 68(5): 56-59.

Technical/Extension folders/Leaflets

1. Anita Kumari, D., Suresh Kumar, J. and Suresh, V. 2023. *Management of leaf blight in taro (Telugu)*. Technical Folder, Sri Konda Laxman Telangana State Horticultural University, Telangana, India.
2. Harish, E.R., Jayaprakas, C.A. and Rajeswari, L.S. 2023. Green technology for green environment: bioactive molecules from cassava crop residues. Technical Leaflet, ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.
3. Harish E.R., Jayaprakas, C.A., Jeeva, M.L., Veena, S.S., Makesh Kumar, T., Kesava Kumar, H., Sangeetha, B.G. and Jaganathan, D. 2023. Standard operating procedure for management of mealybugs in cassava. Technical folder. ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.
4. Jaganathan, D. and Suja, G. 2023. Profile of ICAR-CTCRI: When it turns 60. Technical folder. ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.
5. Senthilkumar K.M., Sujatha Kumari N. and Madhu, A. 2023. One Scientist One Product (OSOP) and One Technical One Skill (OTOS) of ICAR-CTCRI during 2023. ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.
6. Veena, S.S., Jeeva, M.L. and Byju, G. 2023. Collar rot of elephant foot yam. Technical Folder, ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala, 4p.
7. Veena, S.S., Jeeva, M.L. and Byju, G. 2023. Leaf blight of taro. Technical Folder, ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala, 4p.
8. Visalakshi Chandra C., Saravanan R., Pradeepika, C. and Senthil alias Sankar. 2023. Postharvest Physiological deterioration in cassava. ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.
9. Visalakshi Chandra C., Asha Devi, A. and Senthil alias Sankar. 2023. *Cassava meinkatayi ki baad ki*

physiological giravat (Hindi). ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.

10. Visalakshi Chandra C., Krishna Radhika N., Sangeetha B.G. and Senthil alias Sankar. 2023. *Vilavedupinu sheshamulla maracheeniyude physiological apachayam* (Malayalam). ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.
11. Visalakshi Chandra C., Saravanan R., Pradeepika C. and Senthil alias Sankar. 2023. *Maravallikizhangin aruvadaipinsaar udaliyal seerazhivu* (Tamil). ICAR-CTCRI, Sreekeriyam, Thiruvananthapuram, Kerala.

TV Programme

1. Santhosh Mithra, V.S. 2023. *Smart Vilavinu Smart Krishi* programme in Kisan Krishideepam, Asianet and telecasted on 14 April 2023.

Radio talk

1. Dr. S.S. Veena delivered a radio talk on 'Precautions to be taken while planting cassava to reduce pests and disease incidence' in All India Radio, Thiruvananthapuram on 13 June 2023.

Institute Publications

1. ICAR-CTCRI. 2023. *Annual Report 2022*. ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala, India, 179 p.
2. ICAR-CTCRI. 2023. *49th Annual IRC Meeting 2023: Proceedings and Project Milestones (2023-2024)*, ICAR-Central Tuber Crops Research Institute, Sreekeriyam, Thiruvananthapuram, Kerala, India. 130 p.
3. ICAR-CTCRI. 2023. *49th Annual IRC Meeting: Salient Achievements (2022-2023)*, ICAR-Central Tuber Crops Research Institute, Sreekeriyam, Thiruvananthapuram, Kerala, India. 167 p.
4. ICAR-CTCRI. 2023. Action Taken and Progress Report of Second Meeting of IX Research Advisory Committee, ICAR-CTCRI, Thiruvananthapuram. 71 p.
5. ICAR-CTCRI. 2023. Proceedings of Second Meeting of IX Research Advisory Committee, ICAR-CTCRI, Thiruvananthapuram. 22 p.

Major Institute Events

Second Meeting of IX RAC

The ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala organized the second meeting of IX Research Advisory Committee during 12 to 13 April 2023. Dr. Sudhakar Pandey, ADG (Fruits,

Vegetables, Spices & Medicinal Plants), ICAR provided various suggestions to improve different research activities of the Institute. Dr. N.K. Krishna Kumar, Former Deputy Director General (Horticultural Science) and Chairman, RAC and other members Dr. S.K. Pandey (Ex-Director, ICAR-CPRI, Shimla), Dr. K. Umamaheswaran (Ex-Professor, Kerala Agricultural University), Dr. Sanjaya Kumar Dash (Dean, College of Agrl. & Tech., OUAT, Bhubaneswar), Dr. H. Philip (Ex-Director (Extension), TNAU, Coimbatore), Dr. G. Byju (Director, ICAR-CTCRI, Thiruvananthapuram) and Dr. P. Murugesan (Member Secretary, RAC & Head (i/c), Division of Crop Improvement, ICAR-CTCRI) had participated in the meeting. Dr. P. Murugesan, Member Secretary, RAC presented the recommendations of the previous RAC and the Action Taken Report. The committee stressed upon the importance of commercialization of various tuber crop technologies. Also, it was suggested to prioritize tuber crops research for producing different animal feeds. Ten publications and products were released and a MoU was signed for transfer of technology on processing of tuber crop products with Madappally Block Vanitha Processing Industrial Co-Operative Society Ltd., Kottayam during the occasion.



Release of publication during IX RAC meeting

49th Annual Institute Research Council (IRC) Meeting

The 49th Annual Institute Research Council (IRC) meeting of ICAR-CTCRI was held during 17-20 April 2023. The meeting was inaugurated on 17 April 2023 by Dr. G. Byju, Director and Chairman, IRC. The Director made a presentation on Salient research achievements and targets of ICAR-CTCRI. During his inaugural speech, he congratulated all the scientists and other staff members for their dedication and commitment towards research programmes through which ICAR-CTCRI has bagged the 14th position in the ranking among 93 ICAR Institutes during 2022. The Chairman urged all the scientists to apply for external aided projects, publish research papers in high rated journals, generate revenue through technology commercialization, consultancy and sale of technological products besides undertaking research and extension programmes. The Director also informed that the scientists

are expected to deliver ‘One Scientist One Product’ (OSOP) for which the Institute has recently published a document on ‘One Scientist One Product for the year 2023’ as per the suggestion by the Secretary, DARE and Director General, ICAR, New Delhi.

Subsequently, under the Chairmanship of the Director, all the 42 projects under 8 Institute mega projects and 3 developmental projects viz., SCSP, TSP and NEH were presented by the project leaders in five sessions viz., Crop Improvement, Crop Production, Crop Protection, Crop Utilization and Extension Social Sciences during 17-20 April 2023. Significant achievements and outputs of all the projects were thoroughly discussed and finalized the technical programme and targets for the year 2023-2024. Six new project proposals and 3 new experiments under ongoing research projects were presented and approved during the meeting. Twenty four externally aided projects of the Institute were also discussed during the meeting. The meeting was Chaired by Dr. G. Byju, Director and Co-chaired by Dr. J. Sreekumar, SIC, Extension & Social Sciences; Dr. S.S. Veena, Head (A), Crop Protection; Dr. A.N. Jyothi, SIC, Crop Utilization; Dr. G. Suja, Head (A), Crop Production; Dr. P. Murugesan, Head (A), Crop Improvement; Dr. K. Laxminarayana, SIC, RS, Bhubaneswar. Dr. T. Makesh Kumar, SIC, PME Cell convened the meeting. Dr. D. Jaganathan, Senior Scientist and Member Secretary organized the 49th IRC meeting.



Address by Dr. G. Byju Director & Chairman

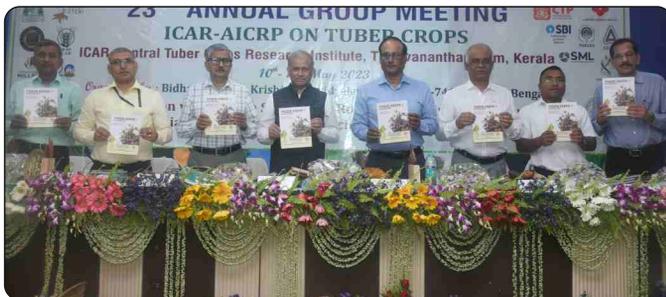


Director and Scientists during 49th Annual IRC Meeting

23rd Annual Group Meeting of AICRP TC

The 23rd annual group meeting (AGM) was held at Bidhan Chandra Krishi Viswavidyalaya (BCKV), Kalyani, West Bengal during 10-12 May 2023. Dr. Anand Kumar Singh, Deputy Director General (Hort. Sci.), ICAR; Dr. Sudhakar Pandey, Assistant Director General (FVS & MP), ICAR; Scientists from 21 centres, External Experts, Heads of

Divisions and selected scientists of ICAR-CTCRI participated in the deliberations. There were seven sessions including the session on action taken report (ATR) of recommendations of 22nd AGM. A critical and constructive evaluation of different programmes carried out by different centres was done and recommendations for future action are included in the proceedings. Fifteen entries (cassava: 3, greater yam: 4, eddoe taro: 4, dasheen taro: 3 and elephant foot yam: 1) were recommended for release. Six crop production and protection technologies have also been recommended for inclusion in package of practices (PoP) of different agro climatic zones (ACZ) in India. The best centre award for 2022-2023 is shared by Dr. YSRHU, Peddapuram and Dr. YSRHU, Kovvur, the two AICRPTC centres of Dr. YSRHU, Andhra Pradesh.



23rd AGM of AICRP TC at BCKV, Kalyani, West Bengal



Best Centre Award to Dr. YSRHU, Kovvur and Peddapuram

Brainstorming Meeting on Mealybugs in Cassava

Mealybugs are serious pests of a number of crops including cassava, the fifth most produced staple food crop of the world. The introduction of a parasitoid wasp, *Anagyrus lopezi* by ICAR-National Bureau of Agricultural Insect Resources (NBAIR) in 2021 and its subsequent release in Tamil Nadu in 2022 and in Thrissur in April 2023 for biological control of cassava mealybug assumes great importance. Considering the gravity of the problem, ICAR-CTCRI, Thiruvananthapuram organized a one-day brainstorming meeting on 23 May 2023 for bringing together scientists from ICAR-NBAIR, ICAR-CTCRI, Kerala Agricultural University and Tamil Nadu Agricultural University along with different stakeholders including officials from all Krishi Vigyan Kendras (KVKs) in Kerala, State Department of Agriculture & Farmers

Welfare, progressive farmers and students. Dr. S.C. Dubey, Assistant Director General (Plant Protection & Biosafety), ICAR, New Delhi and Dr. S.N. Sushil, Director, NBAIR, Bengaluru were present to prepare the roadmap. The parasitoid wasps were released in cassava fields and distributed to officials of agriculture department, progressive farmers, eight KVKs from Kerala and also from Tamil Nadu and Maharashtra. Five important topics were discussed by domain experts, which were (i) Hurdles in the management of mealybugs in agricultural crops (Dr. C.A. Jayaprakas, ICAR-CTCRI), (ii) Management of mealybugs using entomopathogenic fungi (Dr. O.P. Reji Rani, KAU), (iii) Mass culturing technique of cassava mealybug parasitoid, *Anagyrus lopezi* (Dr. Sampath Kumar, NBAIR), (iv) Management of *Paracoccus marginatus* in cassava (Dr. M.T. Ranjith (KAU) and (v) Status of cassava mealybugs in Salem district and other cassava growing areas of Tamil Nadu and their management strategies (Dr. P.A. Saravanan, TNAU). In the plenary session of panel discussion, experts in the field interacted and addressed all queries raised by different stakeholders. Dr. G. Byju, Director, ICAR-CTCRI, in his concluding remarks said that a policy document on Management of mealybugs infesting cassava will be prepared considering all the valuable suggestions and recommendations of the sessions and after consultation with ADG (PP&B) and Director, ICAR-NBAIR, will be published and submitted to council. Dr. E.R. Harish, Organizing Secretary and Dr. S.S. Veena, Head (A), Division of Crop Protection coordinated the event.



Brainstorming meeting on management of mealybugs in cassava



Release of mealybug parasitoid, *Anagyrus lopezi* in the field

H.H. Sree Visakham Thirunal Endowment Lecture

The Indian Society for Root Crops (ISRC) along with ICAR-CTCRI, Sreekariyam, Thiruvananthapuram, organized the ‘H.H. Sree Visakham Thirunal Endowment Lecture’ on 05 June 2023. This endowment lecture is annually delivered by eminent scientists and technocrats from the field of Agricultural/Biological Sciences on topics of contemporary significance. This year, the lecture was delivered by Padma Shri Prof. T. Pradeep, Institute Professor, IIT Madras, Chennai. The programme started at 10 am with a floral tribute to H.H. Sree Visakham Thirunal. Dr. T. Makesh Kumar, Principal Scientist & Secretary, ISRC welcomed the participants. Dr. G. Byju, Director, in his presidential address highlighted the importance of natural resources for the existence of life. The Guest of Honour, Prince Adithya Varma from Travancore palace talked about the introduction of tapioca from Brazil in 18th century and its establishment in Kerala. He emphasized the importance of protecting the environment and getting pollution free air and water for future and urged the students to develop such a culture. Padma Shri Prof. T. Pradeep delivered the endowment lecture on ‘Affordable clean water using nanomaterials’, in which he explained about the nanomaterial-based water purification system that works without expensive filtration membranes or electricity and their successful use in community water purification systems. He mentioned the mechanism to remove poisonous arsenic content from water utilizing nanotechnology and about the patent for ‘Amrith’ water filter, which purifies water at a low cost. He also talked about the importance of developing new materials as sensors and their opportunity in water quality measurement in future. The lecture was attended by the scientists and staff of ICAR-CTCRI and students from Bharatiya Vidya Bhavan school, Thiruvananthapuram.



Padma Shri Prof. T. Pradeep offering Floral tributes to His Highness Sree Visakham Thirunal



Inaugural Session of His Highness Sree Visakham Thirunal Endowment Lecture

Institutional Biosafety Committee (IBSC) Meeting

The Institutional Biosafety Committee Meeting (IBSC) was held at ICAR-CTCRI, Thiruvananthapuram on 22 June 2023 to review the rDNA based research projects.

Dr. G. Byju, Director, ICAR-CTCRI & Chairman, IBSC; Dr. R. Selvarajan, Director, ICAR-NRCB, Tiruchirapalli & DBT Nominee; Dr. T. Bindu, Medical Officer, Govt. of Kerala, Thiruvananthapuram & Biosafety Officer, IBSC; Dr. A. Ishwara Bhat, Principal Scientist, ICAR-IISR, Kozhikode & External expert, IBSC; and Internal experts, Dr. M.N. Sheela, Principal Scientist, Dr. M.L. Jeeva, Principal Scientist; Dr. T. Makesh Kumar, Principal Scientist & SIC, PME; Dr. J. Sreekumar, Principal Scientist and Dr. K.M. Senthilkumar, Member Secretary, IBSC attended the meeting and reviewed the progress of rDNA based research projects of ICAR-CTCRI. The committee members appreciated the scientists for strict adherence of the biosafety guidelines at the research laboratories of the Institute.



Address by Dr. G. Byju Director & Chairman

Swachh Bharat Abhiyan

Cleaning was carried out at Block I of ICAR-CTCRI farm to remove plastic waste on 11 April 2023. The remaining crop stubbles and paper waste were disposed about 150 kg from 500 sq. ft. Also, cleaning drive was conducted under the leadership of Dr. G. Byju, Director, ICAR-CTCRI on 19 May 2023 at 4 PM. The main road near office from the main gate to the gate near sales counter was cleared of trash. Plastic waste, paper and other trash materials of about 20 kg thrown on the 200 m stretch of road near the Institute were collected by the staff and students at ICAR-CTCRI, Thiruvananthapuram. Scrap items including non-functional discarded instruments and equipments and other junk material of about 5 tonnes, were disposed off from the Institute in June 2023, clearing nearly 2000 sq.ft. and earning a total revenue of ₹4,44,270.



Swachh Bharat Abhiyan at ICAR-CTCRI

Other Important Events

Hindi Corner

A meeting of the Official Language Implementation Committee (OLIC) of ICAR-CTCRI was held on 30 June 2023 under the Chairmanship of Dr. G. Byju, Director and Chairperson (OLIC) to review the progress of OL activities in the Institute. In the meeting it was decided to conduct a workshop and the Hindi Pakhwada celebrations during the next quarter in a befitting manner. Dr. A. Asha Devi, Principal Scientist and Liaison Officer and Shri. Padmakumar M., Private Secretary and Member Secretary (OLIC) organized the meeting.

Director's Visits

- The Director visited the AICRP TC Coimbatore Centre on 08 June 2023 and monitored ongoing experiments and other activities of the centre. A visit to different experimental plots were organized by Dr. C. Thangamani, Asst. Professor, TNAU, Coimbatore.



Visit to experimental plots at AICRP TC Coimbatore Centre

- The Director reviewed the research activities of Institute, External Aided & AICRP TC Projects at ICAR-CTCRI Regional Station during 26-27 June 2023.



Visit to field experiments and laboratories at ICAR-CTCRI Regional Station, Bhubaneswar

- Dr. G. Byju, Director, ICAR-CTCRI met Shri. Rohit Kumar Lenka, IFS, Director of Horticulture and Dr. Arabinda Kumar Padhee, IAS, Principal Secretary, Department of Agriculture & Farmers' Empowerment on 26 June 23 and discussed about different research and extension activities at RS, ICAR-CTCRI, Bhubaneswar, Odisha.
- Dr. G. Byju, Director, ICAR-CTCRI, Dr. K. Laxminarayana, Scientist in Charge, ICAR-CTCRI, RS, Dr. M. Nedunchezhiyan, Principal Scientist,

ICAR-CTCRI, RS met Prof. Pravat Kumar Roul, Vice Chancellor of OUAT, Bhubaneswar on 26 June 23 and discussed about Institutional collaboration.

- Dr. G. Byju, Director, ICAR-CTCRI, Dr. M. Nedunchezhiyan, Principal Scientist, ICAR-CTCRI met Dr. P.K. Nanda, Vice Chancellor, Siksha 'O' Anusandhan University, Bhubaneswar on 27 June 2023 and discussed about Institutional collaboration.



Meeting Mr. R.K. Lenka IFS, Director of Horticulture, Odisha



Meeting Mr. A.K. Pandhee IAS, Principal Secretary, Dept. of Agriculture & Farmer's Development, Odisha



Meeting Prof. Pravat Kumar Roul, Vice Chancellor, OUAT, Odisha



Discussion with Professor Dr. P.K. Nanda, Vice Chancellor, Siksha 'O' Anusandhan (SOA), Deemed University, Bhubaneswar

- Dr. G. Byju, Director, ICAR-CTCRI, Dr. M. Nedunchezhiyan, Principal Scientist, Dr. P.S. Sivakumar, Principal Scientist and Smt. Jayasree Dixit, YP-I, AICRP TC met Shri V.K. Pandian IAS, Private Secretary to C.M. & Secretary to CM-Transformational Initiatives (5T) of Odisha on 28 June 2023 and appraised about ICAR-CTCRI activities and discussed about a state level new project on nutritional development for children.



Meeting Shri. V.K. Pandian IAS, Private Secretary to C.M. & Secretary to CM-Transformational initiatives (5T), Odisha



Visit to KVK and IFS established under AICRPTC, SCSP in Kairabad, Jajpur

- Dr. G. Byju, Director, ICAR-CTCRI, Dr. M. Nedunchezhiyan, Principal Scientist, visited the KVK and IFS established under AICRPTC, SCSP at Kairabad, Jajpur, Odisha on 28 June 2023.

Distinguished Visitors

- Padma Shri Prof. T. Pradeep, Institute Professor, IIT Madras, Chennai.
- Dr. N.K. Krishna Kumar, Former Deputy Director General (Horticultural Science) & Chairman, RAC.
- Dr. S.C. Dubey, Assistant Director General (Plant Protection & Biosafety), ICAR, New Delhi.
- Dr. S.N. Sushil, Director, NBAIR, Bengaluru.
- Dr. S.K. Pandey, Former Director, ICAR-CPRI, Shimla & Member, RAC.
- Dr. K. Umamaheswaran, Former Professor, Kerala Agricultural University & Member, RAC.
- Dr. Sanjaya Kumar Dash, Dean, College of Agrl. & Tech., OUAT, Bhubaneswar & Member, RAC.
- Dr. H. Philip, Former Director Extension, TNAU, Coimbatore, Tamil Nadu & Member, RAC.

Honours, Awards and Recognitions

- Dr. D. Jaganathan participated as an External Expert in the Scientific Advisory Committee meeting of Krishi Vigyan Kendra, Ernakulam on 05 April 2023.
- Dr. D. Jaganathan acted as an External Expert for the formulation of KERA Mission project proposal funded by World Bank during 26-27 April 2023 at SAMETI, Anayara, Thiruvananthapuram.
- Dr. K. Sunilkumar performed duty as ASRB Observer during 26-30 April 2023 for Online National Eligibility Test-2023, Subject Matter Specialist (T6), Senior Technical Officer (T6) Examination-2023.
- Dr. P. Sethuraman Sivakumar delivered a talk on 'Advanced Research Methods in Behavioral Research- An orientation' in MANAGE-KAU online training programme on 'Advances in Agricultural Extension Research' held during 02-04 May 2023.
- Dr. G. Suja co-chaired the session on Agrotechniques;

Dr. S.S. Veena co-chaired the session on Pests and diseases management; Dr. A.N. Jyothi co-chaired the session on Planting material production, research-extension-farmer linkage and value addition; Dr. J. Sreekumar co-organiser and Dr. J. Suresh Kumar co-organiser and Rapporteur of 5 sessions in 23rd Annual group meeting of AICRP TC during 10-12 May 2023 held at BCKV, Kalyani, West Bengal.

- Dr. Kalidas Pati delivered invited lecture on Biodiversity of Tuber Crops on 12 May 2023 in Regional Workshop on PPV&FR Act, 2001 and Exhibition on Agro-Biodiversity at ICAR-NRRI, Cuttack, Odisha.
- Dr. K. Laxminarayana acted as an expert for verification of certified potato seed stock at Jalandhar and Kapurthala districts, Punjab during 14-15 May 2023 to distribute the seed materials to the farmers of Koraput, Odisha by Department of Horticulture, Odisha.
- Dr. D. Jaganathan acted as an External Examiner for the Qualifying viva-voce of 3 Ph.D. Scholars of College of Agriculture, Vellayani, Thiruvananthapuram on 18 May 2023.
- Dr. D. Jaganathan reviewed a research article for the Journal of Plantation Crops during May 2023.
- Dr. K. Laxminarayana acted as an expert for verification of certified potato seed stock at Nadia district, West Bengal, during 03-04 June 2023 to distribute the seed materials to the farmers of Koraput, Odisha by Department of Horticulture, Odisha.
- Dr. P. Sethuraman Sivakumar delivered a lecture on 'Tuber Crops based Value Chain and Entrepreneurship Development' at the FPPP Masters training Phase II at SAMETI, Thiruvananthapuram (2 June 2023), KVK, Wayanad (15 June 2023) and KVK, Pathanamthitta (20 June 2023).
- Dr. P. Sethuraman Sivakumar delivered a lecture on 'Advanced Research Methods in Social Sciences' on 13 June 2023 in the training programme on 'MANAGE TNAU Collaborative online Training on Faculty Development Programme for Extension Professionals' held during 13-16 June 2023.
- Dr. D. Jaganathan acted as an External Expert in the Interview Board on 15 June 2023 for selection of SRF for the Externally aided project at ICAR-Indian Institute of Oil Palm Research, Palode, Thiruvananthapuram

- Dr. P. Sethuraman Sivakumar delivered an expert talk on 'Agriculture and Plant Sciences' to college students and young researchers who have registered in the ongoing Young Innovators Programme 5.0 anchored by K-DISC through online on 25 June 2023.
- Dr. P. Murugesan acted as adjunct faculty of SKLTSU, Telangana state in the discipline of horticulture for delivering new/special lecture(s) related to tuber crops/vegetable/plantation crops for the benefit of PG students and also actively participate in the initiatives taken up by SKLTSU towards skill development among the students.
- Dr. N. Krishna Radhika acted as reviewer for Genetic Resources and Crop Evolution journal.
- Dr. N. Krishna Radhika acted as Member advisory board of one M.Sc. Biotechnology Student, College of Agriculture, Vellayani, Thiruvananthapuram.
- Dr. N. Krishna Radhika acted as an External examiner for evaluation of M.Sc.(Ag.) thesis, Kerala Agricultural University, College of Agriculture, Vellayani, Thiruvananthapuram.
- Dr. Shirly Raichal Anil acted as reviewer for Current Science journal.
- Dr. Sujatha T.P., received certificate of Peer Reviewer contribution from Springer journal 'Australian Plant Pathology'.
- Dr. P. Prakash reviewed research papers for the journals viz., Cogent Food and Agriculture, Tobacco Research and African Association of Agricultural Economics.

Media Coverage

Sl.No.	Date	News Title	Name of the Newspaper
1	27.04.2023	<i>Meelimoottaye thurathaan afrikkanvandu</i>	Malayala Manorama
2	28.04.2023	<i>Maracheeniyile meelimoottaye thurathaan afrikkan vandu</i>	Mathrubhumi
3	29.04.2023	<i>Meelimoottaye thurathaanethunnu afrikkayil ninnu vandu</i>	Kerala Kaumudi
4	29.04.2023	ICAR-CTCRI sets up millet museum on its city campus	The Hindu
5	29.04.2023	CTCRI yil cherudhaanya museum	Malayala Manorama Desabhimani Janmabhumi
6	06.05.2023	CTCRI developing food products using tuber-millet combo	The Hindu
7	22.05.2023	CTCRI session on pest management in cassava	The Hindu
8	22.05.2023	Brainstorming in cassava mealybug	The Hindu
9	23.05.2023	Brainstorming in cassava mealybug	Malayala Manorama
10	23.05.2023	<i>Meelimuttakalude shalyam: vidagdharude yogaminnu</i>	Malayala Manorama
11	25.05.2023	Brainstorming in cassava mealybug	The New Indian Express
12	25.05.2023	CTCRI to prepare policy document on management of mealybugs	The New Indian Express
13	01.06.2023	Fungal disease in cassava- visit by CTCRI scientists	Malayala Manorama
14	03.06.2023	<i>Kizhakkan mekhalayil kappai kku kumilrogam; aashanka</i>	Malayala Manorama
15	04.06.2023	<i>Maracheeniyudelokam</i>	Desabhimani e- paper
16	13.06.2023	CTCRI research team monitoring demonstration plots at Pollachi, Coimbatore	Dinamalar
17	14.06.2023	Drone demonstration in Salem district	Digital Media
18	15.06.2023	Awareness on modern agriculture	Dinakaran
19	15.06.2023	'Rainbow diet' drive in Attappady to tackle malnutrition	The Hindu
20	18.06.2023	<i>Malleeshvara vidyaanikethanil madurakkizhangu krishi</i>	Janmabhumi
21	19.06.2023	<i>Attappadiyil rainbowdiettu pracharanavumaayi CTCRI</i>	Malayala Manorama



Tuber Crops for Food, Health, Wealth and Prosperity

ICAR-CTCRI Newsletter : April-June 2023 (Quarterly)

July 2023

Volume 40 Issue 2

Chief Editors

A.N. Jyothi and D. Jaganathan

Editors

Kalidas Pati, H. Kesava Kumar, K.M. Senthilkumar

J. Suresh Kumar and C. Pradeepika

Published by

G. Byju
Director



ICAR-Central Tuber Crops Research Institute

Sreekariyam, Thiruvananthapuram 695 017, Kerala, India

Phone: (91) (471) 2598551 to 2598554

E-mail: director.ctcri@icar.gov.in

Website: <https://www.ctcri.org>

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