



# ICAR-CTCRI Newsletter



Volume 41

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April-June 2024

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## FORTHCOMING EVENTS

- ICAR-CTCRI Foundation Day, 09 July 2024
- Brainstorming workshop on 'Harnessing Crop Wild Relatives for Tuber Crops Improvement', 29 July 2024
- Stakeholders Interface Meeting on Natural Farming, 31 July 2024



**Dr. G. Byju**  
Director

## निदेशक की कलम से

मुझे अपने सम्मानित पाठकों के समक्ष अप्रैल 2024 से जून 2024 तिमाही के लिए आईसीएआर-सीटीसीआरआई का समाचार पत्र प्रस्तुत करते हुए अत्यंत प्रसन्नता हो रही है। यह संस्करण इस संस्थान की उपलब्धियों, घटनाओं और घटनाक्रमों का एक संक्षिप्त विवरण प्रस्तुत करता है। हमारे संस्थान ने इस वर्ष संस्थान अनुसंधान परिषद की स्वर्ण जयंती मनाई, जिसके परिणामस्वरूप किसान अनुकूल प्रौद्योगिकियां, प्रक्रियाएं और उत्पाद सामने आए। देश के अंतिम छोर पर रहने वाले किसानों के ज्ञान रूपांतरण और सशक्तिकरण की प्रक्रिया का मार्गदर्शन करने के लिए हमने कंद फसलों की प्रौद्योगिकियों पर प्रदर्शन, प्रशिक्षण, जागरूकता अभियान और इंटरफेस बैठकें आयोजित की हैं। कंद फसलों पर अखिल भारतीय समन्वित अनुसंधान परियोजना की 24वीं वार्षिक समूह बैठक 25-27 जून 2024 के दौरान नवसारी कृषि विश्वविद्यालय, नवसारी, गुजरात में आयोजित की गई और इसमें दो उच्च उपज देने वाली अरारोट और एक शकरकंद किस्मों को जारी करने की सिफारिश की गई। संक्षेप में उपलब्धियों में बीज गांवों की स्थापना; एबीआई में दो इनक्यूबेटर्स का नामांकन; 17.70 लाख रुपये में मेसर्स टेक विजिट आईटी लिमिटेड, मुंबई को ई-फसल प्रौद्योगिकी का हस्तांतरण और तिरुवनन्तपुरम की कुडुम्बश्री इकाई की महिलाओं के लिए ड्रोन प्रशिक्षण शामिल हैं। इन उपलब्धियों का श्रेय संस्थान के कर्मचारियों को जाता है, जो निर्धारित लक्ष्यों को पूरा करने के लिए लगातार एक टीम के रूप में मिलकर काम करते हैं। मैं हमारे देश में कृषि खाद्य प्रणाली के विकास के लिए उनके समर्पण और सेवा के स्तर की सराहना करता हूं, जो राष्ट्र की खाद्य सुरक्षा को बनाए रखने वाले एक स्तंभ के रूप में खड़ा है।

## From the Director

I am very much delighted to present the newsletter of ICAR-CTCRI for the quarter April 2024 to June 2024 to our esteemed readers. This edition gives a bird's eye view of the achievements, events and happenings of this Institute. Our Institute conducted the Golden Jubilee of the Institute Research Council, this year which resulted in farmer friendly technologies, processes and products. To guide the process of knowledge transformation and empowerment of the farmers' living in the last miles of our country we have conducted demonstrations, trainings, awareness campaigns and interface meetings on tuber crops technologies. The 24<sup>th</sup> Annual Group Meeting of the All India Coordinated Research Project on Tuber Crops was held at Navsari Agricultural University, Navsari, Gujarat during 25-27 June 2024 and it recommended the release of two high yielding arrowroot and one sweet potato varieties. The achievements in brief include establishment of seed villages; enrolment of two incubates in ABI; transfer of e-crop technology to M/s Tech Visit IT Ltd., Mumbai for Rs. 17.70 lakhs and drone training for women from Kudumbashree unit, Thiruvananthapuram. The credit for these accomplishments goes to the Institute's staff, who consistently work together as a team to meet the set goals. I do appreciate their level of dedication and service to the development of the agri food system in our country which stands as a pillar that upholds the food security of the nation.

G. Byju

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

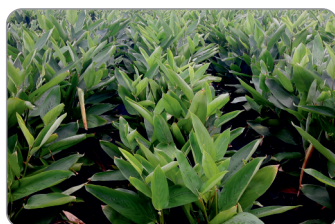
**ICAR-Central Tuber Crops Research Institute**  
Sreekariyam, Thiruvananthapuram 695 017, Kerala, India

## Research Highlights

### First arrowroot varieties recommended for central release

Arrowroot is a high value starchy crop for processing for industrial/medicinal/culinary purposes. Two high yielding arrowroot entries were recommended for central release by the 24<sup>th</sup> AGM of AICRP on Tuber Crops, held at Navsari, Gujarat during 25-27 June 2024. The entry, TAR 18-12 (Sree Nakshathra) has an average tuber yield of 32.25 t ha<sup>-1</sup>, potential yield of 39.55 t ha<sup>-1</sup> and starch content of 26.63% and is recommended for the states of Chhattisgarh and Jharkhand.

TAR 18-14 (Sree Karti) has an average yield of 23.57 t ha<sup>-1</sup>, potential yield of 41.46 t ha<sup>-1</sup> and starch content of 21.52% and is for Tamil Nadu, Manipur and Kerala states.



Arrowroot field view



Tubers of Acc. TAR 18-12



Tubers of TAR 18-14

### Standardisation of hydroponic nutrient solution for soil less production of sweet potato

J. Suresh Kumar, K. Sunilkumar and K. Susan John

Nutrient solution specific to sweet potato was customized and tested for three years under different methods of hydroponics and grow conditions namely NFT and drip systems under naturally ventilated polyhouse conditions and climate control facility with an aim to produce high quality tubers and disease-free planting materials. Different varieties of sweet potato viz., Sree Arun, Sree Kanaka, Bhu Krishna and Kanjanghai local were successfully cultivated. The crop grown by drip method of hydroponics recorded 3-4 folds higher yield than the soil based crop grown in open field, with no physical damage to the tubers and no weevil incidence on vines/tubers. Under hydroponic conditions, the maximum mean tuber yield of 2290 g plant<sup>-1</sup> was recorded by var. Sree Arun. Sree Kanaka and Kanjanghai local recorded 993.75 g plant<sup>-1</sup> and 947.5 g plant<sup>-1</sup> respectively at the harvest stage, i.e., 3 months after planting (MAP). The higher yield of 340 g plant<sup>-1</sup> in the open field soil grown crop was recorded in Kanjanghai

local, followed by Sree Arun (310 g plant<sup>-1</sup>), Sree Kanaka (265 g plant<sup>-1</sup>), and the lowest of 285 g plant<sup>-1</sup> was recorded in Bhu Krishna at 3 MAP and 308 g at 4 MAP. The vine multiplication ratio was also significantly higher in hydroponic crop, and it was 3-5 folds of soil based open field crop. The soil based open field crop recorded lower vegetative growth and the weevil incidence was 55-90% on vines and tubers.



Hydroponic sweet potato crop in climate control facility in trench method



Hydroponic crop in climate control facility in grow bags



Open field, soil grown crop with competition from weeds and sweet potato weevil



Hydroponic crop var. Sree Arun

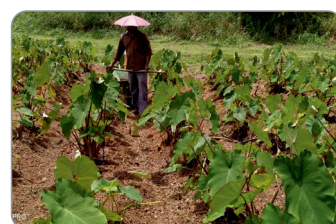


Soil grown crop var. Sree Arun

### Introducing IC-652061: The elite purple flesh taro from ICAR-CTCRI

Sarvanan Raju, P.S. Sivakumar, K.M. Senthilkumar and A. Asha Devi

ICAR-CTCRI identified a novel, elite purple flesh taro (*Colocasia esculenta* var. *esculenta*, IC-652061). This taro accession features a distinctive purple flesh, rich in anthocyanins, offering significant health benefits such as antioxidant properties. With dark brown skin and patterned purple flesh, it provides a visual and nutritional contrast to conventional taro. The robust plants yield approximately 1.5 to 2 kg of corms per plant, with a crop duration of 7-8 months. Biochemical analysis revealed that the flour, dried chips, and fried chips of this taro contain approximately 30, 10, and 3 µg g<sup>-1</sup> of 3-cyanidin glycoside, respectively. The elite purple taro holds substantial market potential due to its unique taste and appealing texture, especially in the production of visually appealing and tasty chips. With no direct



Crop in the field



competitors in the market for purple taro chips, this accession is poised to capture the interest of health-conscious consumers and the food industry.



Harvested corms

Chips

### A mutant with pigmented leaf colour was identified in country potato

P. Murugesan and L.K. Barathi

Mutant progenies of country potato with pigmented leaves were identified from the gamma irradiated (15Gy & 20Gy) progenies of local land race, Kallaparachal (IC 1641830). These progenies exhibited pigmentation in the emerging leaves after 15 Gy and 20Gy doses of gamma irradiation treatments. The 20Gy treated sprouts had one white albino emerging leaf. These were planted in the field and phenological growth has been monitored. The mutant plants showed stunted growth with intense variegation in leaf pigmentation one month after planting when compared to normal leaf colour variation and growth in control plants.



(a) Mutant obtained by Gy irradiation and (b) control

### Mining of nitrogen transporter genes in cassava

S. Swathy, K.M. Senthilkumar and M.N. Sheela

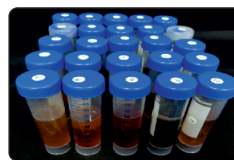
Two genes viz., MeAMT-1, an ammonium transporter gene and MeNRT-3, a nitrate transporter gene were mined in two genotypes with contrasting nitrogen efficiency, 15S409 and Export Kappa. Allele mining analysis showed the presence of allelic variations in NRT3, whereas no sequence differences at the allelic level were observed for the AMT1 gene among the genotypes 15S409 and Export Kappa. The sequence datasets were submitted under NCBI genbank Accession PP475475.1 to PP475478.1.

### Liquid formulation of *Bacillus subtilis*, an endophytic growth promoting and disease suppressing bacteria

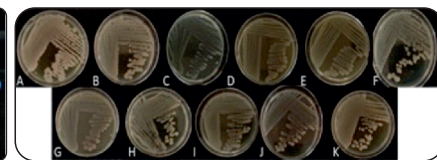
M. L. Jeeva and P. R. Amrutha

*Bacillus subtilis*, an endophytic bacterium, can reduce the severity of anthracnose disease in greater yam. It enhances the growth and yield of tropical tuber crops and vegetables through treatments of planting materials/seeds and soil

applications. Among the various cost-effective materials tested for liquid formulation, vegetable waste broth was proved to be the most effective for bacterial multiplication and maintaining the population for up to one year, making it a viable option for product development.



360 days old ICAR-CTCRI EB 12 culture in vegetable waste broth

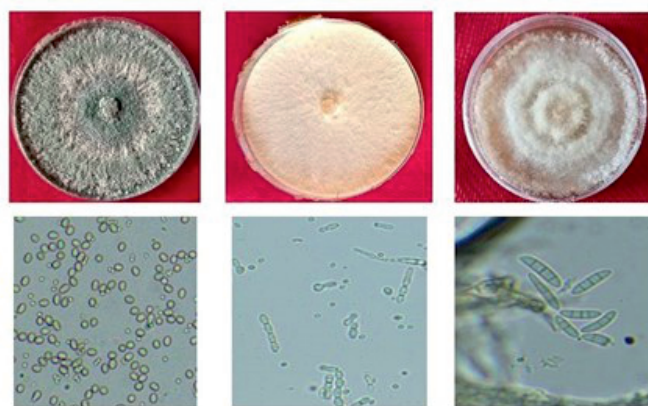


Viability at different interval till 360 days

### Isolation and characterization of endophytic bacteria and fungi from greater yam and sweet potato cropping systems

R. Arutselvan, M.L. Jeeva, S.S. Veena, T. Makeshkumar, Kalidas Pati, V.B.S. Chauhan, K. Hanume Gowda, M. Nedunchezhiyan and K. Laxminarayana

Endophytic organisms were isolated from greater yam and sweet potato cropping system from various locations in the ICAR-CTCRI Regional Station, Bhubaneswar. These organisms were collected from different plant parts and rhizosphere soil. A total of 18 endophytic organisms, including six bacterial and twelve fungal strains were successfully isolated. The highest abundance of endophytes was found in the soil rhizosphere, followed by floral tissues. Microscopic studies were conducted to identify and characterize the isolated endophytes.



*Trichoderma*

*Cephalosporium*

*Fusarium*

Endophytic fungi from sweet potato and greater yam

### Portable self-propelled cassava sett cutter

T. Krishnakumar, M.S. Sajeev and C. Pradeepika

A portable self-propelled cassava sett cutter was designed and developed, comprising of components such as petrol engine (2HP), rotary cutting blade (12 diameter), frame, pulleys, platform, inlet and outlet assembly and stopper.



This unit can be operated by hand or pedal. The adjustable feature on the stopper is used to produce the required length of cassava setts. Rotary cutting blades attached to the prime mover that rotate at 1000 RPM will produce uniform and round cutting of cassava setts for high quality cassava setts production. The performance of cassava sett cutter was tested and cutting efficiency, percentage of damaged setts and output capacity were 98%, 0.45% and 7500 setts per hour, respectively. The fuel consumption was 1 litre per h.



Cassava stem cutter

### New germplasm collection

Seven accessions comprising of cassava (4 nos.), sweet potato (2 nos.) and lesser yam (1 no.) were collected from the custodian farmers.

### Extension

#### FLDs/OFTs

Field day cum harvest festival on Sree Reksha was organized on 08 May 2024 at Udayarvilai, Kurunthancode block, Kanyakumari district. Officials from Department of Horticulture and progressive farmers participated in the field day along with scientists from ICAR-CTCRI. An average yield of 12-15 kg plant<sup>-1</sup> was recorded and market price of ₹ 30 kg<sup>-1</sup> could be realized. Action plan was finalized for scaling up of seed village programme in Kanyakumari district in collaboration with KVK, Kanyakumari and Department of Horticulture.



Glimpses of the event

- Chinese potato seed tubers of variety, Sree Dhara were distributed to the farmers of Kottaneller village, Velloorkara panchayat and Erumaipatti village, Tamil Nadu as well as the farmers of Thrissur district, Kerala for establishing seed villages demonstration plots for quality planting material production of Chinese potato.
- The biofortified sweet potato hybrids under on-farm trials at Vlathankkara and Karakulam, Thiruvananthapuram district, Kerala were harvested. OFT at Vlathankkara showed highest tuber yield of 34.3 t ha<sup>-1</sup> in H-38/15 followed by H-110/28 with 18.8 t ha<sup>-1</sup>.



Harvest of OFTs of biofortified sweet potato

- Conducted field visits in 10 farmers' fields and collected soil samples for establishing validation experiments on SSNM and organic farming in cassava and elephant foot yam in Tirupur district, Tamil Nadu.



Glimpses of the field visit and soil sample collection

- Under the Tribal Subplan, paddy straw mushroom cultivation was demonstrated at Pahadima village, Mohana Block, Gajapati district, Bhubaneswar on 28 April 2024 and planting/sowing operation of intercropping of greater yam + maize was demonstrated at Khajuripada village, Mohana Block, Gajapati district, Bhubaneswar on 22 June 2024.





Paddy straw mushroom demonstration at Pahadima village under TSP



Greater yam+maize intercropping demonstration at Khajuripada village

## Training programmes

### On campus programmes

Hands-on training on value added products for entrepreneurship development in tuber crops organized by the Techno incubation centre at HQ as per the following details:

Sl. No.	Date(s)	Participants from	No. of beneficiaries
1	12 April 2024	Krishi Bhavan, Vaikom, Kottayam	20
2	12 April 2024	Krishi Bhavan, Parassala, Thiruvananthapuram	45
3	18 April 2024	General training	25
4	02 May 2024	Krishi Bhavan, Vettikavala, Kollam	30
5	06-07 May 2024	Krishibhavan, Kuruva, Malappuram, Kerala	13
6	09 May 2024	Farmers from Trichy, Tamil Nadu	27
7	14 May 2024	Krishibhavan, Chadayamangalam, Kollam	26
8	29 May 2024	General training	22

- Farmers training on 'Improved technologies of tropical tuber crops' was organized in collaboration with Department of Horticulture, Govt. of Tamil Nadu for 26 farmers during 07-09 May 2024 and for 25 teachers from different government schools of Thiruvananthapuram district on 29 May 2024 at the Institute.



Trainings on improved technologies of tropical tuber crops

- The Institute organized a four-day drone training during 13-16 May 2024 with an aim to empower Kudumbashree women as drone pilots for agricultural purposes, which was a collaborative effort between ICAR-CTCRI, the State Kudumbashree Mission and Fertilizers and Chemicals Travancore Limited (FACT). The training was inaugurated by Dr. G. Byju,

Director, ICAR-CTCRI. Ms. K.S. Bindhu, Director, State Kudumbashree Mission, Dr. S. Shanavas, Programme Officer, State Kudumbashree Mission and Mr. S. Sivachandran (FACT Zonal Manager) graced the occasion. The training provided comprehensive knowledge on agricultural drone hardware, including maintenance, servicing, mapping, automatic and manual operation, troubleshooting, risk analysis, problem-solving, weather analysis, calibration, and terrain fencing. Practical sessions aided the participants to gain hands-on experience in operating drones for various agricultural applications across different terrains.



Training on drone for women from Kudumashree

- An internship training programme on 'Improved Technologies of Tropical tuber Crops' was conducted for the B.Sc. (Agri.) students of Vellore Institute of Technology, Tamil Nadu during 19 to 29 June 2024.

### Off campus training programmes

- A training was organized on arrowroot starch extraction in Hatapeta village, Koraput district, Odisha which was inaugurated by Dr. G. Byju, Director on 17 April 2024 with the participation of 54 beneficiaries. Arrowroot starch extraction machines

were supplied to the farmers and field advisory visits were conducted in Queensland arrowroot growing farms. Dr. D. Ramajayam, Head, Research Centre, ICAR-IISWC, Koraput; Shri. Pradhan, AGM, NABARD, Koraput and SOVA NGO and Dumduma FPC representatives attended.



Inauguration of training on arrowroot starch extraction



Demonstration of arrowroot starch extraction machine

- A training on arrowroot starch extraction was conducted at Kadruguma tribal hamlet, Bissamcuttack, Odisha on 18 April 2024 for the benefit of 63 farmers. Dr. G. Byju, Director inaugurated the programme. Mr. Balakrishna Panda and S.N. Padhi from Centre for World Solidarity (CWS) NGO participated.



Glimpses of the training at Kadruguma tribal hamlet, Bissamcuttack, Odisha



- A training was organized on 'Tuber crops based farming system' at Kajuripada Village, Mohana, Gajapati, Odisha on 19 April 2024 to 600 tribal farmers from 30 villages. The programme was inaugurated by Dr. G. Byju, Director, ICAR-CTCRI. Agricultural inputs were supplied to the beneficiaries. Mr. Jacob Thundiyl, President, PREM NGO and Mr. Rajib, State Coordinator, Azim Premji Foundation (Philanthropic organization), Odisha also attended the programme.



Glimpses of the training programme at Kajuripada village, Gajapati, Odisha



- A hands-on training programme was organized on 'Budding and grafting' at Gandhi Jaivolsavam at Gandhi Smarak Nidhi on 26 May 2024.

- Tuber crops seed village program, an initiative to ensure availability of good quality planting materials of tuber crops, was inaugurated in Kalanjoor village panchayat of Pathanamthitta district, Kerala on 19 June 2024 under the Scheduled Caste Sub-Plan. The program was jointly organized by ICAR-CTCRI and State Department of Agriculture Development and Farmers' Welfare. Kalanjoor Panchayat President Smt. T.V. Pushapavalli inaugurated the programme and Dr. G. Byju, Director, ICAR-CTCRI delivered the presidential address. Planting materials of improved tuber crop varieties as well as inputs were distributed to the farmers. Classes were taken by ICAR-CTCRI scientists on improved varieties of tuber crops, integrated management of pests and diseases and value addition and entrepreneurial opportunities in tuber crops. The programme was attended by 103 farmers and among them 30 were selected for input



Inauguration of the training programme by chief guest



Distribution of protray nursery of cassava

- A training on 'Sweet potato cultivation and prospects' was organized at Madappally, Changanassery, Kottayam, Kerala under Janakeeyasoothranam scheme by Madappally block, Department of Agriculture and Farmers Welfare on 21 June 2024.



Glimpse of the training session



Field visit to vine multiplication plots

### Seminars/Workshops/Interface Meetings organized

- Kisan Mela 'Food Forest and Mukkani Show' was organised by the Isha Foundation in association with ICAR-IIHR, Bengaluru; ICAR-NRCB, Tiruchirapalli; ICAR-CTCRI, Thiruvananthapuram and NIFTEM, Thanjavur at Pushkaram Agriculture College, Pudukkottai on 23 June 2024. More than 6000 farmers and other stakeholders participated in the event.





Kisan Mela at Pushkaram Agriculture College, Pudukkottai

- A talk on ‘Intellectual Property Management and Commercialization: Experiences of TiMED Incubator’ by Er. S. Balram, Scientist G (Senior Grade) and CEO, SCTIMST-TiMED incubator, the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, was organized at ICAR-CTCRI on 30 April 2024.



Talk on IP management and commercialization by S. Balram

- Organised a workshop on ‘Technology commercialisation and licensing’ for the students of College of Agriculture, Vellayani, Thiruvananthapuram during 29-30 April 2024 at ICAR-CTCRI and KAU.

## Exhibition

- An exhibition was organized in connection with Kisan Mela ‘Food Forest and Mukkani Show’ organized by the Isha Foundation in association with ICAR-IIHR, ICAR-NRCB, ICAR-CTCRI and NIFTEM at Pushkaram Agriculture College, Pudukkottai on 23 June 2024.

## Exposure visits to ICAR-CTCRI

- One day exposure visit cum training on ‘Improved technologies of tuber crops’ was organized for the benefit of 56 farmers, 686 students and 59 officials during this period at ICAR-CTCRI, Sreekariyam, Thiruvananthapuram.

## Activities of Agribusiness Incubator

- **Incubatee enrolment: 2**

Sl. No.	Name of Incubatee	Name of organisation/business	Address of the company	Date of enrolment
1.	Mr. K. Raman	M/s Geobites	168, Singai Nagar, Singanallur, Coimbatore	13 May 2024
2.	Mr. Shantaram Damodhar Kamat	M/s Kali Farmer Producer Company Ltd.	115/A, Main Road, Kumbarwada, Joida, Uttara Kannada, Karnataka	20 May 2024

## Mera Gaon Mera Gaurav Programme

- Tuber crops seed village program was organized in Venganoor Panchayat in association with Venganoor Krishi Bhavan and Gram Panchayat, Venganoor on 15 May 2024. Training on ‘Tuber crops seed village and decentralized seed multipliers program’ was imparted. Sri. R.S. Sreekumar, President, Gram Panchayat inaugurated the programme.



Glimpses of the programme

## Swachh Bharat Abhiyan

- Cleaning drive was organized under Swachh Bharat Abhiyan in the Section of Crop Utilization on 17 May 2024, Division of Crop Protection on 18 April 2024 and Agri Business Incubator on 20 June 2024. All the trash materials found in different divisions, labs and open wash area covering a total of about 5100 sq. ft. were cleaned and 103 kg wastes were disposed. Four awareness lectures were also conducted.



Glimpses of Swachh Bharat programme

- ICAR-CTCRI ABI has funded and established model seed production plot for tubers at KVK, Kallakurichi.
- ICAR-CTCRI ABI has supplied *Trichoderma asperellum* biocapsules (50 Nos.) to KVK Kallakurichi for carrying out OFT on assessment of ICAR-CTCRI *Trichoderma* biocapsules for management of collar rot/corm rot in elephant foot yam. Thirty *Trichoderma asperellum* bio capsules and twenty entophytic *Bacillus* sp. bio capsules were supplied to KVK Kottayam for conducting FLD in farmers' field.
- **Tuber Tech Ex 1.0:** Sixteen aspiring startups have been undergoing a 6 months export-oriented incubation programme on tropical tuber crops. The program offers extensive business mentoring, trainings and comprehensive workshops which cover essential aspects of the export focused entrepreneurship.
- **In-plant training/Internship of Certified Agritech Professional programme:** ICAR-CTCRI ABI is collaborating with College of Agriculture, Vellayani to equip the agricultural students skill sets in agricultural entrepreneurship, startup creation, technology management and business incubation. This is a part of CAgTSP and phase 2: Incubator attachment programme. About 61 final year 2020 admission B.Sc. (Hons.) agriculture students of KAU are working with ICAR-CTCRIABI for a period of one month.



Internship training of Certified Agritech Professionals

### Technology Commercialization/ Linkages/ Collaborations

The Institute signed a technology license agreement (TLA) with M/s Tech Visit IT Ltd., Mumbai and transferred the e-Crop technology for Rs. 17.70 lakhs. The TLA was signed on the occasion of world environment day celebrations at the Institute by Dr. G. Byju, Director, CTCRI, Dr. Praveen Malik, CEO, Agrinnovate India Limited (AgIN), New Delhi and Shri. Bharat Patni, Director, M/s Tech Visit IT Pvt. Ltd., Mumbai in the presence of Dr. V.S. Santhosh Mithra, the inventor of the

technology. Electronic crop (e-Crop), the first IoT device of ICAR which has been recently granted patent by Government of India, simulates crop growth in real time and provides agro-advisory at a daily time scale for smart farming. Through its commercialization, the Institute plans to make the device available to more areas and crops in India with a view to reduce the water, nutrients and carbon footprints without compromising the yield and income.



Exchange of TLA for commercialization of e-Crop technology to M/S Tech Visit IT Private Limited, Mumbai

### Capacity building

#### Trainings attended by staff

#### International training and workshop

Dr. T. Makeshkumar, Principal Scientist & Head, Division of Crop Protection, visited DSMZ, Braunschweig, Germany during 03-18 May 2024 to attend EVAg workshop on 'Advanced virus diagnostics: from serology to high throughput sequencing' during 13-17 May 2024. During this visit he acquired knowledge on high throughput virus screening protocol for cassava mosaic disease and cassava brown streak virus resistance in cassava as well as RNAscoop for locating the virus in the infected cells and confirming the infection. During the training program on 'Advanced virus diagnostics', he acquired knowledge on high throughput sequencing on virus discovery and interacted with other participants from eleven countries (Peru, Colombia, Phillipines, Tanzania, Laos, Kenya, Jordan, Montenegro, Vietnam, Mexico and Germany) and explored the possibilities of future collaborations.



Participants of the training program



Glimpses of training



- Details of other trainings are as follows:

Sl. No.	Name	Particulars of the training	Period
1	Dr. T. Krishnakumar	Online NPTEL course on 'Modern Food Packaging Technologies: Regulatory aspects and global trends'	12 Weeks from 27 January 2024
2	Dr. P. Prakash	Massive open online course on 'Artificial Intelligence in Agriculture' by ICAR-NAARM, Hyderabad	01-31 March 2024
3	Dr. T. Makeshkumar	ARMS 2.0 training for Nodal officers	22 April 2024
4	Dr. T. Krishnakumar	FSSAI regulations & registrations, conducted by Kerala Startup Mission	19 June 2024
5	Dr. C. Mohan	Online Training on 'Bioinformatics Advances in Genomics Data Analysis' conducted by ICAR-IASRI, New Delhi	25-29 June 2024

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

Sl.No.	Name of the participant	Programme	Particulars of the programme
1	Dr. K. Laxminarayana	37 <sup>th</sup> Foundation day celebrations of ICAR-CIFA	01 April 2024
2	All Scientists	Virtual meeting for interaction on 'Comprehensive Guidelines for the Foreign Visits of the Scientists/Officials of ICAR'	ICAR 03 April 2024
3	All scientists	Fourth Quarterly Review meeting of scientists	ICAR-CTCRI, Thiruvananthapuram 04-05 April 2024
4	Dr. G. Suja	Attended the Executive Committee Meeting of Indian Society of Agronomy (Online mode)	10 April 2024
5	All Scientists	Online meeting on Ecoregional programme chaired by DG, ICAR	12 April 2024
6	Dr. T. Makeshkumar	Institute Biosafety Committee Meeting as DBT Nominee	ICAR-NRCB 12 April 2024
7	Dr. A. Asha Devi	Annual Meeting of Board of Studies in Botany (UG)	20 April 2024
8	All scientists	World IP day Lecture on IP management and commercialisation: Experience of TiMED Incubator (SCTIMST)	30 April 2024
9	Dr. G. Suja Dr. S. Sunitha Dr. S.S. Veena	Pre-Kharif Review Meeting of AINPOF (Online mode)	02 May 2024
10	Dr. J. Suresh Kumar	Workshop on IPR, Patent Filing & Drafting	CSIR-NIIST, Thiruvananthapuram 02 May 2024
11	Dr. G. Byju Dr. T. Makeshkumar Dr. A.N. Jyothi Dr. N. Krishana Radhika Dr.K.M. Senthilkumar Dr. T.P. Sujatha	Review meeting on genome editing by DDG (HS)	07 May 2024
12	Dr. K. Laxminarayana	37 <sup>th</sup> Foundation Day celebrations of ICAR-IIWM	12 May 2024
13	Dr. K. Laxminarayana Dr. Kalidas Pati	Screening committee meeting for release of horticultural crop varieties	Directorate of Horticulture, Krishi Bhawan, Bhubaneswar, Odisha 14 May 2024
14	Dr. K.I. Asha Dr. A. Asha Devi	Biodiversity Cadre meeting (virtual)	Kerala State Biodiversity Board 16 May 2024
15	All scientists	Pre IRC meeting	ICAR-CTCRI, Thiruvananthapuram 20-22 May 2024
16	Dr. K.I. Asha	Online meeting on 'Conservation of PPVFRA registered varieties of perennial horticultural crop in field gene bank'	Organized by PPV & FRA 21 May 2024

17	Dr. K.I. Asha Dr. A. Asha Devi	One day consultative workshop on 'Bioinvasion – presentation of the policy document'	Organized by Kerala State Biodiversity Board 22 May 2024
18	Dr. T. Krishnakumar	Meeting with FSSAI officials in FDA Bhawan, New Delhi along with SAGOSERVE officials for fixing the additional testing parameters for tapioca sago by FSSAI.	24 May 2024
19	Dr. K.I. Asha Dr. S.S. Veena Dr. A. Asha Devi Dr. E.R. Harish Dr. H. Kesava Kumar Dr. K.M. Senthilkumar Dr. B.G. Sangeetha	International Seminar on 'New Horizons in Plant Sciences NHPS-2024'	Department of Botany, University of Kerala, Thiruvananthapuram 28-29 May 2024
20	All Scientist	Presentation meeting on commodities of the Fisheries Science Division of ICAR chaired by DG, ICAR	30 May 2024
21	Dr. A. Asha Devi Dr. H. Kesava Kumar Dr. K.M. Senthilkumar	International workshop on Plant Reproductive Biology	Department of Botany, University of Kerala, Thiruvananthapuram 30 May 2024
22	All Scientist	Interaction meeting of Dr. Girish Chandel, Vice Chancellor, IGKV Raipur, Chhattisgarh with scientists at ICAR-CTCRI	31 May 2024
23	All Scientists	H.H. Sree Visakham Thirunal Endowment Lecture: 2024	ICAR-CTCRI, Thiruvananthapuram 03 June 2024
24	All Scientists	World Environment Day celebrations	ICAR-CTCRI, Thiruvananthapuram 05 June 2024
25	Dr. E.R. Harish	International Seminar on Spices, KAU- 2024 (ISSK2024)	College of Agriculture, Thiruvananthapuram 05-06 June 2024
26	Dr. T.P. Sujatha	Webinar on 'Introducing proteomics at the speed and throughput of genomics'	organized by Genotypic Technology & Standard Biotoools 06 June 2024
27	Dr. G. Suja Dr. S.S. Veena Dr. S. Sunitha	QRT meeting of AICRP on IFS and AINP-OF	ICAR-CTCRI, Thiruvananthapuram 07-08 June 2024
28	All scientists	50 <sup>th</sup> Institute Research Council meeting	ICAR-CTCRI, Thiruvananthapuram 10-13 June 2024
29	Dr. G. Byju Dr. V.S. Santhosh Mithra Dr. E.R. Harish Dr. H. Kesava Kumar Dr. L.S. Rajeswari	National seminar on 'Climate smart agriculture for sustainable soil and plant health in plantation crops'	ICAR-CPCRI Regional Station, Kayamkulam, Kerala 13-14 June 2024
30	Dr. H. Kesava Kumar	Online Webinar on Bio-control Agents (Tamil)	Farm Graduates Forum, Tirunelveli, Tamil Nadu 16 June 2024
31	Dr. S.S. Veena	8 <sup>th</sup> Dr. Y.R. Sarma Memorial Lecture (Online)	ICAR-IISR, Kozhikode 20 June 2024
32	Dr. Kalidas Pati	Screening committee meeting for release of horticultural crop varieties	Directorate of Horticulture, Krishi Bhawan, Bhubaneswar, Odisha 20 June 2024
33	Dr. G. Byju Dr. G. Suja Dr. T. Makesh Kumar Dr. M. R. Sahoo Dr. A.N. Jyothi Dr. J. Sreekumar Dr. K. Laxminarayana Dr. D. Jaganathan	Presentation of ATR and Progress report of ICAR-CTCRI in Review meeting of ICAR Institutes by Secretary, DARE and DG, ICAR	ICAR-CTCRI, Thiruvananthapuram 20 June 2024



34	All scientists	International Yoga Day celebration	21 June 2024
35	Dr. R. Muthuraj Dr. D. Jaganathan Mr. N. Shiju	Kisan Mela 'Food Forest and Mukkani Show' cum Exhibition	Pushkaram Agriculture College, Pudukottai, Tamil Nadu 23 June 2024
36	Dr. G. Byju Dr. G. Suja Dr. T. Makesh Kumar Dr. Manas R. Sahoo Dr. J. Sreekumar Dr. A. N. Jyothi Dr. K. Laxminarayana Dr. K. Susan Jonh Dr. K.I. Asha Dr. M. Nedunchezhiyan Dr. H. Kesava Kumar Dr. Kalidas Pati	24 <sup>th</sup> AGM of AICRP on Tuber Crops	NAU, Navsari, Gujarat 25-27 June 2024
37	Dr. J. Suresh Kumar	OWOT (EED) on 'Agrivoltaics: Technology Gap and Needs Assessment' as special invitee	CSIR-NIIST, Thiruvananthapuram 26 June 2024
38	Dr. S.S. Veena	World Microbiome Day (Online)	ICAR-CPCRI, Kasaragod 27 June 2024
39	Dr. S. Sunitha	State Level Unit Cost Meeting of NABARD	NABARD Regional Office, Thiruvananthapuram 28 June 2024

## Publications

### Research papers

- Amritha, M.S., Dhanya, O.G., Nair, A.G., Vidya, P., Senthilkumar, K.M. and Mohan, C., 2024. Genetic diversity studies between *Ipomoea* wild species and cultivated sweet potato (*Ipomoea batatas* (L.) Lam.) using SSR markers. *South African Journal of Botany*, 169: 452-463. (NAAS Score: 9.11).
- Arutselvan, R. and Makesh Kumar, T. 2024. Single-tube colorimetric loop-mediated isothermal amplification (LAMP) assay for high-sensitivity detection in cassava from southern India. *Microbial Pathogenesis* 192:106718. Published by Elsevier Ltd. (NAAS score: 9.8).
- Koundinya, A.V.V., Senthilkumar, K.M., Ajeesh, B.R., Mohan, C., Sreekumar, J., Pulapet, S., Markkandan, K. and Sheela, M.N., 2024. Elucidation of novel drought-responsive genes from tuber transcriptome of cassava under water deficit stress. *South African Journal of Botany*, 169: 255-267. (NAAS Score: 9.11).
- Mahanta, S.K., Priyadarshini, P.K., Kartik, M., Selvakumar, E., Sivakumar, P.S., Pradeep, K.M., Saumendra, K.M. and Sandeep, K.P. 2024. Optimisation of *Levilactobacillus brevis* – fermented finger millet (*Eleusine coracana*) and evaluation of its effects on cancer cells (HCT116 and MDA-MB-231). *Methods*, **229**: 30-40.
- Muthuraj, R., James George, Sunitha, S. and Sheela, M.N. 2022. Evaluation of improved varieties of cassava in the tribal belts of Attapadi in Kerala. *Root Crops*, **48**(1&2): 83-86.
- Neethukrishna, P., Veena, S.S. and S. Karthikeyan, S. 2023. Synergistic effect of oil cakes and *Trichoderma asperellum* in the suppression of *Sclerotium rolfsii*. *J. Root Crops*, **49**(1): 39-45.
- Raghu, N., Viji, M.M., Raju, S., Senthilkumar, K.M., Manju, R.V., Stephen, R. and Beena, R. 2024. Screening of sweet potato (*Ipomoea batatas* (L.) lam.) cultivars for drought tolerance using multi-index analysis. *International Journal of Advanced Biochemistry Research*, **8**(4): 533-538. (NAAS Score: 5.29).
- Raji P., Roshni, T., Byju G. and Govindan Kutty. 2024. Computer aided crop yield forecasting techniques-Systematic review highlighting the application of AI. *Environmental Modeling and Assessment*. <https://doi.org/10.1007/s10666-024-09978-6> (NAAS score: 9.0).
- Ravi, V., Saravanan Raju and Sanket J. More. 2024. Evaluation of potential increase in photosynthetic efficiency of cassava (*Manihot esculenta* Crantz)

plants exposed to elevated carbon dioxide. *Functional Plant Biology*, **51**: FP23254 (NAAS score: 9).

10. Sheela Immanuel, Jaganathan, D. and Prakash, P. 2024. Gender analysis and empowerment of women and men in cassava (*Manihot esculenta*) production in Kerala. *J. Horti. Sci.*, **19**(1). DOI: <https://doi.org/10.24154/jhs.v19i1.2646>
11. Sunitha, S. and Sreekumar, J. 2023. Water productivity and crop water production function of taro (*Colocasia esculenta* (L.) Schott) under different irrigation regimes. *J. Root Crops* **49**(1): 35-38.
12. Sunitha, S., Sheela, M.N., Suresh Kumar J. and Makesh Kumar, T. 2024. Morphological and physiological responses of CMD resistant cassava (*Manihot esculenta*) genotypes to nutrient regimes. *Curr. Hortic.*, **12**(1): 50-54 (NAAS score: 5.29).
13. Susan John, K. and Remya Raj, R.T. 2023. Diagnosis and confirmation of subsoil acidity induced multi nutrient disorders in Tannia (*Xanthosoma sagittifolium* L. Schott) grown in an Ultisol, Kerala, India, *J. Root crops*, **49**(1): 50-57.
14. Susan John, K. and Remya Raj, R.T. 2023. Integrated nutrient management in tannia (*Xanthosoma sagittifolium* L. Schott) yield, plant nutrient concentration, plant uptake and soil chemical properties in an ultisol, Kerala, *J. Root Crops*, **49**(1): 11-16.

#### Book

1. Mamatha, K., Jaganathan, D., Nedunchezhiyan, M., Kumar, H.K. and Sreekumar, J. 2024. Brainstorming on elephant foot yam for empowering stakeholders: Challenges and Strategies, Dr. YSRHU, Venkataramannagudem, West Godavari, Andhra Pradesh & ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala. pp.40.

#### Book chapters

1. Byju, G. and Jaganathan, D. 2024. Tuber crops based agri-food systems and landscape for health, nutrition and sustainability. In: *Book of Abstracts*, National Seminar on Climate Smart Agriculture for Sustainable Soil and Plant Health in Plantation Crops, ICAR-CPCRI, Regional Station, Kayamkulam, Alappuzha, Kerala, pp. 82-90.
2. Jaganathan, D., Byju, G., Koundinya, A.V.V.,

Mamatha, K. and Muthuraj, R. 2024. Farmer participatory demonstrations on improved varieties and technologies of elephant foot yam. In: *Proceedings of Brainstorming on elephant foot yam for empowering stakeholders: Challenges and strategies*, 13 February 2024 held at Dr. YSRHU, Venkataramannagudem, West Godavari, Andhra Pradesh. ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala, pp. 25-28.

3. Kalita, D.J. and Pradeepika, C. 2024. Zinc-Containing Vegetables, Fruits and Other Food Products. In: *Zinc*, CRC Press, pp. 39-48.
4. Lakshmi, B.K.M., Mamatha, K. and Kumar, H.K. 2024. Management of pests and diseases in elephant foot yam. In: *Brainstorming on elephant foot yam for empowering stakeholders: Challenges and Strategies*, Dr. YSRHU, Venkataramannagudem, West Godavari, Andhra Pradesh & ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala. Mamatha, K., Jaganathan, D., Nedunchezhiyan, M., Kumar, H.K. and Sreekumar, J. (Eds.). pp. 17-22.
5. Meraj Ahmad., Pankaj Jakhar., S. Sunitha. and Anand K. Plappally. 2024. G filter: A step towards achieving circular economy in India. In: *Towards Water Circular Economy* (Ed. Ankit Agarwal et al), Springer Nature, pp.165-175.
6. Moorthy, S.N, Sajeev, M.S. and Anish, R.J. 2024. Functionality of tuber starches. In: *Starch in Foods. Structure, Function, and Applications*, 3<sup>rd</sup> Edition, Lars Nilsson (Ed.), Elsevier Wood Head Publishing, 125 London Wall, London EC2Y 5AS, U.K.
7. Nedunchezhiyan, M., Sunilkumar, K., Jaganathan, D. and Mamatha, K. 2024. Quality planting material production in elephant foot yam. In: *Proceedings of Brainstorming on elephant foot yam for empowering stakeholders: Challenges and strategies*, 13 February 2024 held at Dr. YSRHU, Venkataramannagudem, West Godavari, Andhra Pradesh. ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala, pp. 8-12.
8. Prakash, P., Jaganathan, D., Sheela Immanuel and Sreekumar, J. 2024. Economics and marketing of elephant foot yam in India. In: *Proceedings of*



*Brainstorming on elephant foot yam for empowering stakeholders: Challenges and strategies*, 13 February 2024 held at Dr. YSRHU, Venkataramannagudem, West Godavari, Andhra Pradesh. ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala, pp. 23-24.

9. Susan John, K. 2024. Soil-plant nutrition with zinc in tropical tuber crops. In: *Zinc: Early development, applications and emerging trends*, E. Sukumar, K. Vinoth Kumar and A. Manickavasagan (Eds.), CRC Press, Taylor and Francis group, LLC, pp.195-208, DOI:10.1201/9781003412472.

### Popular articles

1. Asha, K.I., Suja, G., Sheela, M.N., Krishna Radhika, N. and Aswin S. Kumar. 2024. Arrowroot: a potential industrial crop. *Kerala Karshakan*, **11**(10): 10-15.
2. Disha Baishnabi, Hanume Gowda, R. Arutselvan and V.B.S. Chauhan. 2024. Sweet Potatoes: A Sustainable Solution for Food Security and Climate Change. *Biotica Research Today*, **6**(5): 246-248.
3. Parvathy, S.T. and Amma, S.S. 2024. Tropical root and tuber crops: Treasures from the soil. *Science Reporter*, **61**(6): 48-51.
4. Pavithra, S.A. and Veena, S.S. 2024. Diseases of elephant foot yam. *Agritech*, **1**(2): 8-10.
5. Rahana, S.N. 2024. Ennapanayilinnulamooleyavarditha Ulpanangal (Value added products from oil palm) (Malayalam), *Kerala Karshakan*, **69**(6): 59-61.
6. Rahana, S.N. 2024. Golden Plam; Potential of oil palm farming. *Kerala Karshakan e-journal*, **11**(10): 4-9.
7. Rahana, S.N. 2024. Sasya ennayudevattathasrothasu (A perennial source of vegetable oil) (Malayalam), *Krishi Jagran*, **8**(4): 40-43.
8. Sheela Immanuel, Jaganathan, D. and Prakash, P. 2024. Women friendly agriculture, *Agro India*, April 2024: 10-13.
9. Sulekha Pradhan, Disha Baishnabi, Lopamudra Sarangi, Sushree Sandhya Pradhan, R. Arutselvan, V. B. S. Chauhan, K. Hanume Gowda, Kalidas Pati, K. Laxminarayana and N. Nedunchezhiyan. 2024. Endophytes: The Future of Plant Disease Management. *The Agriculture Magazine*, **3**(10): 244-246.
10. Veena, S.S., Harish, E.R., Susan John, K.,

Jeeva, M.L. and Makeshkumar, T. 2024. Sambharanam muthal nateelvar: Kizhangvilakalile rogaakeeda niyanthranangal (Malayalam). *Kerala Karshakan*, May 2024, **69**(06): 50-54.

### Conference/Souvenir/Seminar proceedings

1. Anes, K.M., Babu, M., Josephraj Kumar, A., Kumar, H.K., Sajjan, J.V. and Anithakumari, P. 2024. In: *Book of Abstracts. National Seminar on Climate smart agriculture for sustainable soil and plant health in plantation crops (NSCSAPC)*, 13-14 June 2024, ICAR-Central Plantation Crops Research Institute, Regional Station, Kayamkulam, Kerala, p. 64.
2. Asha Devi, A. and Shirly Raichal Anil. 2024. Development of true seeds in elephant foot yam (*Amorphophallus paeonifolius* Dennst. Nicolson) and variability exhibited by F1 progeny. In: *International Seminar on 'New Horizons in Plant Sciences-NHPS 2024'* held during 28-30 May 2024, Department of Botany, University of Kerala, Thiruvananthapuram, Kerala.
3. Harish, E.R. and Makeshkumar, T. 2024. Specificity of genetic characteristics and endosymbionts of *Bemisiatabaci* in virus transmission of cassava. In: *Abstracts of International Seminar on New horizons in plant sciences (NHPS-2024)*, 28-30 May 2024, Department of Botany, University of Kerala, Thiruvananthapuram, Kerala, p. 77.
4. Harish, E.R., Kumar, H.K., Sangeetha B.G. and Rajeswari L.S. 2024. Emerging pests of tuber crops and their management strategies. In: *Book of Abstracts. National Seminar on Climate smart agriculture for sustainable soil and plant health in plantation crops (NSCSAPC)*, 13-14 June 2024, ICAR-Central Plantation Crops Research Institute, Regional Station, Kayamkulam, Kerala, p. 51.
5. Kumar H.K., Shajna, R.H., Vishnu, S.N. and Jeeva, M.L. 2024. Identification of endosymbiotic bacteria associated with entomopathogenic nematode, *Oscheius* sp. In: *Book of Abstracts. National Seminar on Climate smart agriculture for sustainable soil and plant health in plantation crops (NSCSAPC)*, 13-14 June 2024, ICAR-Central Plantation Crops Research Institute, Regional Station, Kayamkulam, Kerala, p. 53.
6. Kumar, H.K., Senthilkumar, and Anes, K.M. 2024. Identification of root-knot nematode associated with

- elephant foot yam in Alappuzha, Kerala. In: *Abstracts of International Seminar on New Horizons in Plant Sciences (NHPS-2024)*, 28-30 May 2024, Department of Botany, University of Kerala, Thiruvananthapuram, Kerala, p. 76.
7. Kumar, H.K., Senthilkumar, K.M., Asheefa, J., Shilpa, S.U., Jeeva, M.L. and Makeshkumar, T. 2024. Identification of entomopathogenic nematode and its endosymbiont from Thiruvananthapuram, Kerala. In: *Abstracts of International Seminar on New Horizons in Plant Sciences (NHPS-2024)*, 28-30 May 2024, Department of Botany, University of Kerala, Thiruvananthapuram, Kerala, p. 75.
  8. Nileena, P., Veena, S.S. and Karthikeyan, S. 2024. Study on variability in symptom expression by leaf and pseudostem rot disease of elephant foot yam. In: *International Seminar-New Horizons in Plant Sciences-NHPS 2024*, 28-29 May 2024, Department of Botany, University of Kerala, Karyavattom, Thiruvananthapuram, Kerala, pp. 102.
  9. Noel B. Longhinos, Senthilkumar, K.M., Saravanan Raju, Mohan, C., Sheela, M.N. and Sreekumar, J. 2024. Genome-wide mining and identification of novel microsatellite markers from Cassava (*Manihot esculenta* Crantz) genome assembly. In: *International Seminar on New Horizons in Plant Sciences-NHPS 2024*, 28-30 May 2024, Department of Botany, University of Kerala, Thiruvananthapuram, Kerala.
  10. Senthilkumar, K.M., Saravanan Raju, Makeshkumar, T. and Sheela, M.N. 2024. Genome-wide analysis and expression analysis of *MeOPT* family genes in Cassava (*Manihot esculenta* Crantz) In: *International Seminar on New Horizons in Plant Sciences-NHPS 2024* held during 28-30 May 2024, Department of Botany, University of Kerala, Thiruvananthapuram, Kerala.
  11. Veena, S.S., Jeeva, M.L. and Karthikeyan, S. 2024. Employing soil microbiome for mitigation of fungal diseases and growth promotion in tropical tuber crops. In: *International Seminar on New Horizons in Plant Sciences-NHPS 2024*, 28-29 May 2024, Department of Botany, University of Kerala, Thiruvananthapuram, Kerala, pp. 62.
- mites in cassava*. Technical leaflet No. TL-5/2024, ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala, India.
2. Jeeva, M.L., Susan John, K., Veena, S.S., Makeshkumar, T., Kesavakumar, H. And Ramesh, V. 2024. Management of cassava stem and root rot. Technical leaflet No. TL-6/2024, ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala, India.
  3. Sheela Immanuel, Prakash, P., Jaganathan, D. 2024. Training Calendar 2024-2025, ICAR-CTCRI, Thiruvananthapuram, Kerala, 18p.
  4. Sheela Immanuel, Prakash, P., Jaganathan, D. 2024. Training Calendar of Skill Training Programme 2024-2025, ICAR-CTCRI, Thiruvananthapuram, Kerala, 18p.
  5. Sreekumar, J., Kesava Kumar, H., Karthik, P.S., Anuresmy, R.N. and Rajalekshmy, A. 2024. Technical folder on Profile of ICAR-AICRP on Tuber Crops. ICAR-All India Coordinated Research Project on Tuber Crops, ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram 695 017, Kerala, India.

#### E-publication

1. Arutselvan, R., Jeeva, M.L., Veena, S.S., Makeshkumar, T., Sulekha, P., Sushree Sandhya, P., Lopamudra, S., Pati, K., Chauhan, V.B.S., Hanume Gowda, K., Nedunchezhiyan, M. and Laxminarayana, K. 2024. *Alternaria solani* isolate SPLB-1 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene and internal transcribed spacer 2, complete sequence; and large subunit ribosomal RNA gene, partial sequence. PP905039. <https://www.ncbi.nlm.nih.gov/nuccore/PP905039>.
2. Senthilkumar, K.M., Kumar, H.K. and Anes, K.M. 2024. *Meloidogyne javanica* isolate EMK1 small subunit ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and large subunit ribosomal RNA gene, partial sequence. PP756339.1. URL <https://www.ncbi.nlm.nih.gov/nucleotide/PP756339.1>, 08 May 2024.

#### TV Programme

1. Dr. G. Suja. Expert in the Live Phone in programme of Krishi Darshan, Doordarshan Kendra,

#### Technical/Extension folders/Leaflets

1. Harish, E.R., Makeshkumar, T., Sangeetha, B.G. and Kesava Kumar, H. 2024. *Integrated management of*



Thiruvananthapuram on the topic 'Planting time of tuber crops' on 12 April 2024.

### Radio talk

1. Dr. G. Suja. delivered a talk on 'Chinese potato & Arrowroot: Opportunities & production techniques' in the Farm & Home Section of All India Radio, Thiruvananthapuram broadcasted on 01 April 2024. Dr. M.S. Sajeev delivered a talk on the recently patented Chinese potato grader in Akasavani Nalla Vartha on 06 April 2024.
2. Dr. Shirly Raichal Anil delivered a talk on 'Biofortified Sweet potato varieties' (FIB) on 08 April 2024.
3. Dr. V.S. Santhosh Mithra was interviewed on the topic 'Applications of Drones in Agriculture' in the Farm & Home Programme of All India Radio on 10 June 2024.

### YouTube programme

1. Dr. V.S. Santhosh Mithra was interviewed on the topic: 'Smart Farming' by Tharaka Jayasinghe, Visiting lecturer (Development Extension), Faculty of Agriculture, University of Rajarata, Sri Lanka for the youTubechannel <https://www.youtube.com/channel/UCI3tPvMp654IP0vbuBnghKQ>.

### Institute Publications

1. ICAR-CTCRI. 2024. Annual Report 2023. ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala, India, 176p.
2. Harish, E. R., Sreekumar, J., Shameer, P. S., Deepa, B. S., Sreekumar V. S. and Rejin, D.T. 2024. ICAR-CTCRI in Media 2023. Coffee Table Book. ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala. 46p.
3. ICAR-AICRP TC. 2024. Annual Report 2023, ICAR-All India Coordinated Research Project on Tuber Crops, ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram 695 017, Kerala, India, 115p.
4. ICAR-AICRP TC. 2024. Technical Report. XIV Annual Group Meeting, 25-27 June 2024, ICAR-All India Coordinated Research Project on Tuber Crops, ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram 695017, Kerala, India, 201p.
5. ICAR-CTCRI. 2024. Quarterly review meeting of scientists: Progress Report (January- March 2024), ICAR-Central Tuber Crops Research Institute,

Sreekariyam, Thiruvananthapuram, Kerala, 206 p.

6. Jaganathan, D., Prakash, P., Suresh Kumar, J., Visalakshi Chandra, C., Krishnakumar, T. and Sangeetha, B.G. 2024. 50<sup>th</sup> Annual IRC Meeting: Action Taken Report & Salient Achievements (2023-2024), ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala, 229p.
7. Jaganathan, D., Visalakshi Chandra, C., Suresh Kumar, J., Sangeetha, B.G., Krishnakumar, T. and Prakash, P. 2024. 50<sup>th</sup> Annual IRC Meeting: Output Summary (2023-2024), ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala, 179 p.
8. Prakash, P., Makeshkumar, T., Senthilkumar, K.M., Sheela Immanuel and Jaganathan, D. 2024. Evaluation document on innovation excellence indicators of public funded R and D organization Round 2.0. 42p.

### Major Institute Events

#### Quarterly Review Meeting

The 4<sup>th</sup> quarterly review meetings of scientists were conducted during 04-05 April 2024 under the Chairmanship of Dr. G. Byju, Director, to review the progress achieved during the quarter (January-March 2024) and to prioritize the targets for scientists of Crop Improvement, Crop Production, Crop Protection, Crop Utilization and Extension & Social Sciences.

#### Interaction meeting with Dr. Saralakumari, GKVK

Dr. Saralakumari, Head, Soil Science from Gandhi Krishi Vigyana Kendra (GKVK), Karnataka visited ICAR-CTCRI on 09 May 2024 and an interaction meeting was held with the staff of Division of Crop Production.

#### Pre-IRC Meetings

The pre-IRC meeting of scientists were conducted during 20-22 May 2024 under the Chairmanship of Dr. G. Byju, Director to review the progress achieved during April 2023-March 2024 and to prioritize the targets for scientists of Crop Improvement, Crop Production, Crop Protection, Crop Utilization and Extension & Social Sciences.

#### 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 03 June 2024. Dr. G. Byju, Director, ICAR-CTCRI presided the function. Prince Adithya Varma, the

guest of honour, discussed the historical introduction of tapioca from Brazil in the 18<sup>th</sup> century and its successful establishment in Kerala. The chief guest, Dr. Shaji K.V., Chairman, NABARD, Mumbai delivered the endowment lecture on 'Harnessing Digital Technologies for Sustainable Agriculture and Rural Development.' In the lecture, he elaborated the concerted efforts for greater income realization in rural economy by increasing core-productivity, creating robust value chain, climate resilience and rural entrepreneurship drive. The lecture was attended by the scientists and staff of ICAR-CTCRI, invitees from selected institutions and students from invited schools.



Inaugural session of the  
H.H. Sree Visakhham Thirunal:  
Endowment Lecture



Felicitation of the Chief guest  
by Director, ICAR-CTCRI

### 50<sup>th</sup> Annual Institute Research Council Meeting

The Golden Jubilee Annual Institute Research Council meeting was held during 10-13 June 2024. Most notable achievements of the Institute during April 2023-March 2024 are release of CMD resistant variety of cassava 'Sree Kaveri', taro varieties 'Sree Hira' and 'Sree Telia'; technology certification by ICAR (8 nos.), patents for e-Crop device and Chinese potato grader, development of three bio capsules, technology commercialization of bioformulations, micronol for Chinese potato, waxy coating of cassava, snack foods etc. The Institute has signed three MoUs for contract research/consultancy projects worth ₹ 21.72 lakhs and another four MoUs were signed for technology transfer/licensing fee for ₹ 7.375 lakhs. Two external aided projects were sanctioned for an amount of ₹ 10.04 crores. Besides, research papers in peer reviewed journals, two special issues exclusively on tuber crops varieties and technologies in Kerala Karshakan and Krishi Jagran magazines, technical bulletins on Package of Practices of six major tuber crops and other Institute publications were the major accomplishments during the year. The research projects have been playing an important role for the development of tuber crops sector for meeting the demands of farmers and other stakeholders. The projects are being undertaken by the 42 scientists of Crop

Improvement, Crop Production, Crop Protection, Crop Utilization and Extension & Social Sciences divisions/sections.

The IRC meeting was inaugurated on 10 June 2024 by Dr. G. Byju, Director and Chairman, IRC. Eight Institute publications including 'Output Summary 2023-2024' were released by the Director. The Chairman made a presentation on 'Progress report of ICAR-CTCRI for the year 2023-2024'. During the inaugural speech, Director congratulated all the scientists and other staff members for their dedication and commitment towards research programmes through which ICAR-CTCRI addresses the challenges faced by farmers and other stakeholders. Subsequently, under the Chairmanship of the Director, all the 44 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 and Social Sciences during 10-13 June 2024. Significant achievements and outputs of all the projects were thoroughly discussed and finalized the technical programme and targets for the year 2024-2025. One new project proposal under ongoing Institute Mega project 2 was presented and approved during the meeting. Twenty five externally aided projects of the Institute were also discussed during the meeting.



Dr. G. Byju, Director & Chairman inaugurating 50<sup>th</sup> IRC



Release of publications by the Chairman, IRC





Director and Scientists during 50<sup>th</sup> Annual Institute Research Council Meeting

## World Environment Day 2024

The World Environment Day 2024 was celebrated at ICAR-CTCRI on 05 June by planting saplings of fruit plants in the campus by the Director and staff. Dr. Praveen Malik, CEO, Agrinnovate India limited, Department of Agricultural Research and Education (DARE) was the chief guest on the occasion, and he delivered a talk on the theme 'Land restoration, Desertification and Drought resilience'.



World Environment Day celebration



## Meeting with CEO, Life Science Park, Thiruvananthapuram

Shri. K.S. Praveen, Chief Executive Officer, BIO 360 Life Sciences Park, Thiruvananthapuram visited ICAR-CTCRI on 03 June 2024 and discussed with Director and Heads of Divisions/Section-in-charges about the possible areas of collaboration.

## Review meeting of ICAR-IIFSR, Modipuram held at ICAR-CTCRI

The fifth Quinquennial review of research on integrated farming systems, organic and natural farming undertaken through AICRP-IFS and AINP-OF of ICAR-IIFSR, Modipuram was held at ICAR-CTCRI during 07-08 June 2024. Dr. Aravind Kumar, Former VC, RLBCAU; Dr. A.K. Singh, Former VC, BAU and Dr. N.P. Singh, Member, CACP reviewed the activities. Dr. G. Byju, Director, ICAR-CTCRI inaugurated the meeting. Dr. Sunilkumar, Director, ICAR-IIFSR; Dr. N. Ravisankar, PC-IFS; Dr. Raghavendra Singh, Head; Dr. Jacob John,

Director (Extension Education) & Chief Agronomist KAU; Dr. G. Suja, PI, AINP-OF and other centres from Kerala and Gujarat attended the meeting.



Inauguration of QRT meeting of ICAR-IIFSR



QRT team visiting the exhibition



Field visit of QRT team

## Hindi Workshop

A one-day workshop on 'Annual Programme 2024-25 and Glossary & Notings' was organized on 19 June 2024 by the Official Language Implementation Committee, ICAR-CTCRI.

## International Yoga Day

The 10<sup>th</sup> International Yoga Day was celebrated at ICAR-CTCRI on 21 June 2024 on the theme 'Yoga for Self and Society'. Dr. G. Byju, Director inaugurated the programme. Mr. Baskaran Nair and Mr. Arunkumar, yoga instructors from Art of Living Thiruvananthapuram Centre were invited for conducting the yoga session. The participants were trained in yoga stretching, yoga positions, pranayama and meditation.

## XIV Annual Group Meeting of AICRP on Tuber Crops

The 24<sup>th</sup> Annual Group Meeting (AGM) of the All India Coordinated Research Project on Tuber Crops was held at Navsari Agricultural University, Navsari, Gujarat during 25-27 June 2024. Hon'ble Vice-Chancellor of Navsari Agricultural University, Navsari, Gujarat, Dr. Z.P. Patel inaugurated the meeting in the gracious presence of Dr. Sudhakar Pandey, Assistant Director General (FVS & MP), ICAR as Chief Guest. Dr. G. Byju, Project Coordinator and Director ICAR-CTCRI presided over the



meeting and Dr. T.R. Ahlawat, Director of Research was the Guest of Honour. Dr. James George, Former Acting Director, ICAR- CTCRI and Former Project Coordinator, AICRPTC; Dr. Archana Mukherjee, Former Director, ICAR-CTCRI and Dr. R.M. Naik, Principal & Dean, ASPEE College of Horticulture, Scientists from PC Cell and 21 centres, Heads of Divisions and ICAR-CTCRI scientists involved in the trials participated in the deliberations. Three entries (Arrowroot: 2 and Sweet potato: 1) were recommended for release. One crop production technology was recommended for inclusion in package of practices (PoP) of different agro climatic zones (ACZ) in India. A total of 29 publications including catalogues, booklets, technical bulletins and folders were also released. The best centre award for 2023-2024 was received by SKLTSHU, Rajendranagar, Telangana. The centres, Dr. YSRHU, Kovvur, Andhra Pradesh, UHS, Dharwad, Karnataka and TCRS-TNAU, Yethapur, Tamil Nadu bagged the first, second and third position respectively in the best revenue generation centre award category.



Presidential address by Dr. G. Byju, Director & PC, AICRP TC



Participants of AGM

## Other Important Events

### Director's Official Visits

- Dr. G. Byju, Director had a meeting with Dr. Sudhanshu K.K. Mishra, Chief General Manager, NABARD, Bhubaneswar, GM and DGMs on 15 April 2024 and discussed possible interventions by ICAR-CTCRI.



Interaction of Director with NABARD officials, Bhubaneswar

- Dr. G. Byju, Director visited ICAR-Central Institute of Women in Agriculture (CIWA) on 16 April 2024 and had discussions with Dr. Mridula Devi, Director and Heads of Divisions about possible areas of collaboration. He also visited ICAR-Indian Institute of Water Management (IIWM) and ICAR-Central Institute of Freshwater Aquaculture (CIFA) and had discussions with the respective Directors and Heads of Divisions.



Glimpses of Director's visit at ICAR-IIWM and ICAR-CIWA

- Dr. G. Byju, Director visited the Regional Station of ICAR-CTCRI, Bhubaneswar on 20 April 2024 and reviewed the R&D work.



Director visits RS, ICAR-CTCRI, Bhubaneswar

- Dr. G. Byju, Director visited AICRPTC, Vegetable Research Station, SKLTHU, Hyderabad, Telangana on 02 May 2024 and reviewed progress of the work.



Visit of Director to AICRPTC, Vegetable Research Station, SKLTHU



- Dr. G. Byju, Director attended the Institute Management Committee meeting of ICAR-NAARM, Hyderabad on 02 May 2024. Dr. Ch. Srinivasa Rao, Director, NAARM; Mrs. Alka Arora, Additional Secretary, DARE and Financial Advisor (FA), ICAR; Dr. Seema Jaggi, ADG (Education); Dr. O.P. Yadav, Director ICAR-CAZRI, Jodhpur; Dr. Sheik N. Meera, Director, ICAR-ATARI, Hyderabad were among others.



Director attending IMC meeting at ICAR-NAARM, Hyderabad

- Dr. G. Byju, Director visited and had discussions with Dr. Neeraja Prabhakar, Vice Chancellor, SKLTHU; Mr. Phalguna, M/s Xobu Foods, Hyderabad about improving sweet potato value chain in Telangana on 06 May 2024.
- Dr. G. Byju, Director attended the inauguration of distribution of Shares Certificates of Kudumbamithra women FPC by Shri. V. Muralidharan, Union Minister of State for External Affairs and Parliamentary Affairs on 25 May 2024 at Thiruvananthapuram and delivered a keynote speech.
- Dr. G. Byju, Director attended the plenary session of National Seminar on Climate Smart Agriculture for Sustainable Soil and Plant Health in Plantation Crops organized at ICAR-CPCRI, Regional Station, Kayamkulam on 14 June 2024 and delivered felicitation address.



Director attending the valedictory function of National Seminar at ICAR-CPCRI Regional Station, Kayamkulam

## Infrastructure/Facilities

- Created Incubation space in the ABI of the institute with four cabins, a hall with 25-seater facility with Interactive digital board and PTZ video conferencing camera for conducting capacity building programmes.
- ICAR-CTCRI ABI Sales counter has been made functional with desktop, Tally software and printer for billing purpose for the sale of ICAR Institutes/incubatee products.

## New Project Sanctioned

- Establishment of mass production unit of bioagents for ecofriendly disease management in vegetable crops of Odisha (PI: Dr. R. Arutselvan Co-PIs: Drs. Kalidas Pati, V.B.S. Chauhan., Hanume Gowda, M. Nedunchezhiyn and K. Laxminarayana; RKVY, Govt. of Odisha; ₹ 320.91 lakhs).

## Distinguished Visitors

- Padma Shri Prof. Arvind Kumar, Former VC, RLBCAU, Jhansi & Chairman, QRT, ICAR-IIFSR, Modipuram (including AICRP on IFS and AINP-OF)
- Dr. Raghavendra Singh, Head (CSRM) & Member Secretary, QRT, ICAR-IIFSR, Modipuram
- Dr. Sunil Kumar, Director, ICAR-IIFSR, Modipuram
- Dr. N. Ravisankar, PC(IFS) & NPI, AINP-OF, ICAR-IIFSR, Modipuram
- Dr. A.K. Singh, Former VC, BAU, Sabour & Member, QRT, ICAR-IIFSR, Modipuram
- Dr. N.P. Singh, Member, CACP, DA&FW, Government of India & Member, QRT, ICAR-IIFSR, Modipuram
- Dr. P. Rajasekharan, Chairman, State Agricultural Prices Board, Kerala
- Dr. Jacob John, Director of Extension, Kerala Agricultural University, Thiruvananthapuram
- Dr. R. Dinesh, Director, ICAR-IISR, Kozhikode
- Shri. Praveen K.S., Chief Executive Officer, Kerala Life Sciences Industries Park, Thiruvananthapuram
- Dr. Praveen Malik, Chief Executive Officer, Agrinnovate India Limited (AgIn), DARE, Ministry of Agriculture & Farmers Welfare, Govt. of India
- Dr. Saralakumari, Head, Soil Science, GKVK, Karnataka

### Honours, Awards and Recognitions

- Dr. G. Suja was nominated as Councillor, Kerala, Indian Society of Agronomy.
- Dr. T. Makesh Kumar acted as an external examiner for the open defense of a Ph.D. student at Bharathiar University, Tamil Nadu.
- Dr. M.S. Sajeev acted as Member, Core Committee, Agri Entrepreneurs, FPOs and Agri Starups under Comprehensive Development Mission Programme of Agriculture, Govt. of Kerala.
- Dr. M.S. Sajeev acted as Member, Sub Mission on Agrl. Mechanisation - Committee for Empanelling of Manufacturers, Department of Agriculture Development and Farmers Welfare, Govt. of Kerala.
- Dr. M.S. Sajeev acted as Member, Working Group on Post harvest Engineering and Technology for Horticulture, ICAR, New Delhi.
- Dr. M.S. Sajeev acted as Member, Assessment Committee of Technical Personal, ICAR-IISR, Calicut.
- Dr. M.S. Sajeev acted as external examiner for the Ph.D. viva voce of a student at KCAET, Kerala Agricultural University, Tavanur, Malappuram, Kerala.
- Dr. S.S. Veena acted as an external examiner for the evaluation of the thesis of a Ph.D. student and external examiner for the evaluation of B.Sc.- M.Sc. (Integrated) Biotechnology student at Kerala Agricultural University.
- Dr. P. Murugesan was awarded the Fellow of Confederation Horticulture Association of India (CHAI) 2024 on 28 May 2024.
- Dr. P. Murugesan was an External Expert (Horticulture) for the promotion of a teaching staff from Professor to Senior Professor under CAS at The Gandhigram Rural Institute, Gandhigram.
- Dr. C. Mohan was the external examiner for the viva voce of a B.Sc.-M.Sc. (Integrated) Biotechnology student, College of Agriculture, KAU, Vellayani, Thiruvananthapuram, Kerala.
- Dr. N. Krishna Radhika was recognised as research guide (Biotechnology) of University of Kerala.
- Dr. T. Krishnakumar acted as technical member for establishing FSSAI lab for SAGOSERVE, Salem, Tamil Nadu.
- Dr. H. Kesava Kumar received the best oral presentation award for the paper entitled 'Identification of entomopathogenic nematode and its endosymbiont from Thiruvananthapuram, Kerala' (Authors: Kesava Kumar, H., Senthilkumar, K.M., Asheefa, J., Shilpa., Jeeva, M.L. and Makesh Kumar, T.) in the International seminar on New Horizons in Plant Sciences (NHPS 2024) held during 28-30 May 2024 at Department of Botany, University of Kerala, Thiruvananthapuram, Kerala.
- Dr. Sangeetha, B.G. received the best oral presentation award for the paper entitled '*Ipomoea mauritiana* Jacq. - A source of resistant gene and insecticidal proteins against sweet potato weevil' (Authors: B.G. Sangeetha, Athira. J.K. Jayan, T. Makesh Kumar, T. Santhosh Kumar, G. Ajesh, E.R. Harish and L.S. Rajeshwari) in the International seminar on New Horizons in Plant Sciences (NHPS 2024) held during 28-30 May 2024 at Department of Botany, University of Kerala, Thiruvananthapuram, Kerala.
- Dr. V.S. Sathosh Mithra delivered lead lecture on the theme 'Use of ICT and sensor for enhancing water productivity in rainfed ecosystem' in the brainstorming workshop on 'Rainwater Management Options for Enhancing Agricultural Productivity' held in hybrid mode on 28 June 2024 at ICAR-IIWM, Bhubaneswar.
- Dr. D. Jaganathan acted as external examiner for the qualifying examination of one M.Sc. student and final viva voce of one Ph.D. student at College of Agriculture, Vellayani, Thiruvananthapuram.



## Media Coverage

Sl.No.	Date	News Title	Name of news paper/ Magazine/e-paper
1	03.04.2024	Nadil vasthukkalvitharanamcheythu	Janmabhumi News Paper
2	04.04.2024	Karshakarkkunanma, menma, shreya	Malayala Manorama News Paper
3	06.04.2024	Nadil vasthukkaludevitharanam	Kerala Kaumudi News Paper
4	10.04.2024	kizhangukrishipadanathinuAafrikkanshaasthranjarethi	Desabhimani News Paper
5	10.04.2024	Kizhangukrishipadikkanchenkalilafrikkanshaasthranjar	Mathrubhumi (e-paper)
6	14.04.2024	Kadal kadakkanmezhukupurattiya kappa	Mathrubhumi News Paper
7	07.05.2024	CTCRI releases drought – tolerant tapioca variety	The Hindu News Paper
8	08.05.2024	Jaiva ulpannangalvilpanakku	Malayala Manorama News Paper
9	08.05.2024	Farmers day cum harvest festival in Sree Reksha variety under seed village demonstration plots at Udayarvilai village, Kanyakumari district	Dinathanthi Tamil News paper Tamil murasu Tamil News paper Dhinakaran Tamil News paper
10	10.05.2024	KSUM sets the stage to tap commercial potential of food tech	The Hindu News Paper
11	10.05.2024	KSUM to tap commercial potential of food tech	New Indian Express
12	10.05.2024	Cassava mosaic resistant new tapioca variety introduced in Kanyakumari district	Dailythanthi News Paper
13	10.05.2024	Field day cum harvest festival on Sree Reksha at Udayarvilai village, Kanyakumari district	Dinathanthi
14	11.05.2024	CTCRI to use genome editing to make industry-friendly tapioca	The Hindu News Paper
15	12.05.2024	CTCRI gives minor tubers a big push to expand food basket, ensure food security	The Hindu News Paper
16	12.05.2024	Introduction of new cassava variety at Udayarvilai village, Kanyakumari district	Dinakaran
17	12.05.2024	Sree Reksha : A new cassava variety introduced at Udayarvilai village, Kanyakumari district	Tamil Murasu
18	12.05.2024	Kudumbashree women with farming drones	Kerala Kaumudi News Paper
19	12.05.2024	Agricultural drone training for 50 women	Desabhimani News Paper
20	13.05.2024	Kudumbashree to train women farmers in use of drones	The Hindu News Paper
21	13.05.2024	Kudumbashree's 4-day agricultural drone training from today	The New Indian Express News Paper
22	14.05.2024	Biopesticides For Sale	Desabhimani News Paper
23	14.05.2024	Kudumbashree drone training started	Desabhimani News Paper
24	14.05.2024	Kudumbashree has launched agricultural drone training for women farmers	Janayugam News Paper
25	14.05.2024	Kudumbashree started agricultural drone training for women farmers	Malayala Manorama News Paper
26	15.05.2024	My village my pride by ICAR-CTCRI	Keral Kaumudi Malayalam News Paper
27	15.05.2024	ICAR-CTCRI seed programme through my village my pride	Mangalam News Paper
28	16.05.2024	Dattu Village Seed Village Scheme	Kerala Kaumudi News Paper

Konnivartham.com (e-news)

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ICAR-CTCRI,  
re presidential



## Personalia

### Promotions

Sl.No.	Name	From	To	Date	O.O.No & Date
1	Smt. B.S. Deepa	Senior Technical Assistant	Technical Officer	20.06.2023	F.No. 16-1/2016-Estt.III dated 24.05.2024
2	Shri. B. Satheesan	Senior Technician	Technical Assistant	04.02.2021	F.No. 16-1/2016-Estt.III dated 24.05.2024
3	Shri. T. Manikantan Nair	Technician	Senior Technician	23.03.2023	F.No. 16-1/2016-Estt.III dated 24.05.2024
4	Shri. V. Ravindran	Junior Field Assistant (T-1-3)	Sr. Technical Assistant (T4)	03.02.2000	F.No. 16-1/2016-Estt.III dated 24.05.2024
		Sr. Technical Assistant (T4)	Technical Officer (T5)	03.02.2005	F.No.20-14/2011-Per dated 02.07.2024
5	Shri. S. Sreekumar	Assistant	Assistant Administrative Officer	28.06.2024	F.No.20-10/2011-Per dated 02.07.2024
6	Shri R.S. Adarsh	Upper Division Clerk	Assistant	28.06.2024	F.No.20-10/2011-Per dated 02.07.2024

### New appointments

Sl.No.	Name	Position held	Date of Appointment
1	Ms. Pooja Krishnan	Technician (Trainee)	24.04.2024
2	Ms. L. Sreelakshmi	Technician (Trainee)	14.06.2024

### Superannuation/Retirement

Sl.No.	Name	Position held
1	Shri O.C. Ayyappan	Assistant
2	Dr. M.N. Sheela	Principal Scientist
3	Shri. T. Vijayakumara Kurup	AAO
4	Shri. K. Saratchandrakumar	Skilled Supporting Staff



## *Tuber Crops for Food, Health, Wealth and Prosperity*

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