KALPA

CPCRI Newsletter

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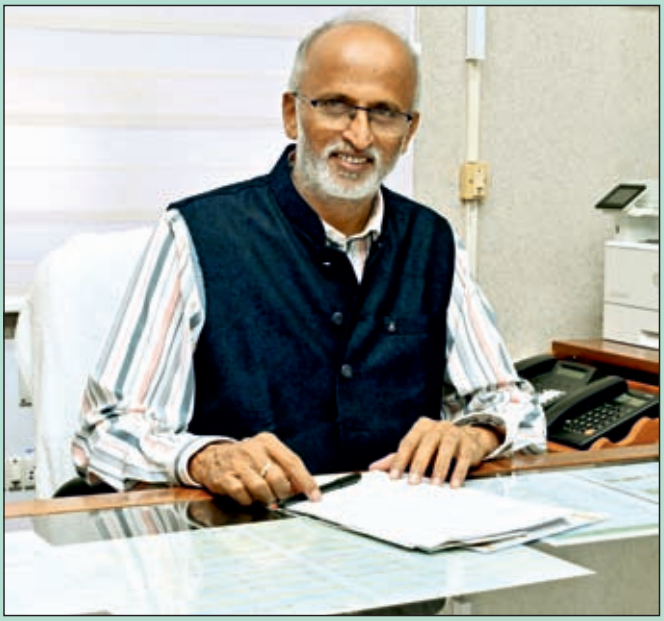
ICAR-CENTRAL PLANTATION CROPS RESEARCH INSTITUTE

Kasaragod, Kerala - 671 124

An ISO 9001:2015 Certified Institute



DIRECTOR'S DESK

Stronger lab to land linkage for higher productivity

One of the important barriers attributed against crop productivity are the climate related biotic and abiotic changes in the cropping system. These, most of the times deceive the farmers from achieving their expected outcome in terms of farm revenue. Farm revenue, of course, affects not only the farmers livelihood at the instance but also influence their cultivation practices including capital expenditure.

We, from the research institute regularly advice the farmers and developmental officials to adopt the latest scientific package of practices with precision farming methods. To a certain extent we can overcome the effect of abiotic conditions through irrigation and integrated soil test based nutrient management practices. Most of the time, farmers face low yields, button shedding in coconut and arecanut, fruit retention, splitting of nuts, lesser weight nuts and low quality commodity due to the above facts. Conducting more and more scientist-farmer interfaces, institution visits, field visits, demonstrations, etc. are the methods adopted by the system to directly do the outreach programme. Need based training programmes are also conducted in the institute as well as in the farmers fields. Recently, social media influence and the artificial intelligence powered tools such as Gemini, Chat GPT, Kisan GPT, DeepSeek, etc. are becoming more and more freely available to the stakeholders. However, we had to have more authentic data sets to provide accurate advice to farmers through AT.

At this point of time, there is no doubt that the PMKSY is helpful to buy seeds, planting materials and the most essential nutrient fertilizers. Therefore, it is urged to effectively utilize the resources for future agriculture. At the same time, the PM-WBIS also keeps the farmers guarded against sudden setbacks due to disease and pests due to natural calamities. Ultimately, it is important that all the stakeholders together have to see that the national GDP is not affected due to the lack of performance from the agricultural sector.

K. Balachandra Hebbar
Director

CONTENTS

INSIDE…

SPOTLIGHT

Kalpa Nakshatra Coconut Hybrid

Coconut variety, Kalpa Nakshatra, a hybrid between Chowghat Orange Dwarf and West African Tall has been approved by the Kerala State Variety Release Committee for cultivation in the state Kerala.

Kalpa Nakshatra – Coconut hybrid

TECHNOLOGY HIGHLIGHTS

Technology Connect by ICAR-CPCRI in the Bio-suppression of Coconut Black Headed Caterpillar

Localized outbreak of coconut black headed caterpillar, *Opisina arenosella* Walker (Oecophoridae: Lepidoptera) was reported from Kanniyakon in Kottayam district, Kerala during November 2024. ICAR-CPCRI released parastioids *viz., Goniozus nephantidis* and *Bracon brevicornis* in the pest inflicted gardens.

On 06 December 2024 ICAR-CPCRI, convened an awareness campaign empowering the role of bioagents in the bio-suppression of black headed caterpillar. A technical folder on the "Integrated management of coconut black headed caterpillar" was distributed to all the participating farmers. Later the scientific team in collaboration with the State Department of Agriculture and Parasite Breeding Station visited the affected coconut plantations and re-released more than 500 parastioids. Currently, about 50 ha area were badly affected with around 85% pest damage. The pupal parasitoid, *Brachymeria nosatoi,* was recovered from the affected gardens, indicating success of the biodiversity-driven approach in pest suppression.

Spicy coconut chips

A technology for spicy coconut chips was standardized using different spice and salt combinations. Further, adoptive trial on the spicy chips has been undertaken by M/s. GJ foods, Kerala during the month of October 2024 and found highly acceptable for commercialization and marketing.

Bio-nutri-priming of polybag coconut seedlings

Healthy mother palms in hot spots of root (wilt) disease affected areas are less than one percent as recorded in the field survey (2022-2024) in Devikulangara and Pathiyoor panchayaths under Farmer FIRST Programme (FFP). During the farmer participatory assessment of the seedlings, farmers rated the seedlings of all treatments as better than normal polybag seedlings based on collar girth, growth and observable vigour. The morphological traits coupled with observations recorded during first phase of evaluation for assessment by the farmers such as root volume, number and length of roots and chlorophyll pigment content (which was recorded by farmers and scientific data collected) showed significant variation between the treatments. Bio-nutri priming treatments of Kera Probio combined with *Trichoderma* and the combination treatment with Kalpa Poshak foliar spray, *Trichoderma* and Kera Probio recorded better attributes of polybag coconut seedlings in farmer participatory evaluation.

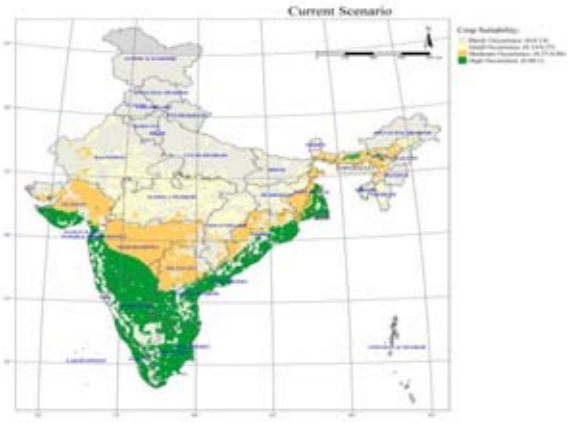
Impact of institute technology integration in farmers livelihood capital

FFP is being implemented in six modules (Crop, Horticulture, Entrepreneurship Development, Livestock, NRM and Integrated Farming Systems) among 1000 farm families. Analysis of the livelihood capital of participant. farmers, indicated that the highest livelihood capital improvement attained was in the human and social capitals. Financial capital improvement among landless farmers, women SHGs and land holders was comparatively low per farmer, but distributed among the communities equitably. Improvement in Physical capital, was the

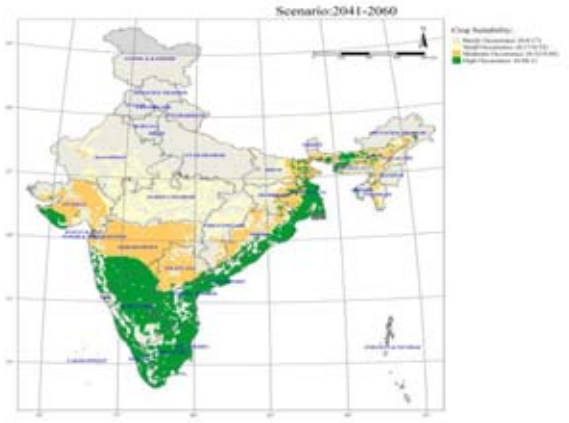
processing facilities and machineries and tools for common facility in the FPO in FFP for coconut, turmeric, livestock products, mushroom, etc. The overall livelihood index improvement was 62.57 (pre FFP) to 75.62 (post FFP) indicating the impact in improvement of livelihood status of FFP beneficiaries.

Optimizing climate suitability predictions for coconut cultivation across India

Several machine learning techniques were employed to improve the predictive accuracy and robustness of a coconut climate suitability prediction algorithm. The methods compared include Decision Tree (DT), Random Forest (RF), Artificial Neural Network (ANN), Support Vector Machine (SVM), and Gradient Boosting Machines (XGBoost). Using district-level location data from the Coconut Development Board, climate suitability models were built based on CMIP6 downscaled future climate projections from WorldClim v2.1 over four 20-year intervals (2021-2040, 2041-2060, 2061-2080, and 2081-2100). All models exhibited excellent performance, with accuracy exceeding 98%. However, the SVM-based model, achieving the highest accuracy of 99.65%, was chosen for final model development. The key climate factors influencing coconut cultivation suitability were identified as temperature seasonality (BIO-4), maximum temperature of the warmest month (BIO-5), and the minimum temperature in November and December. Under the low greenhouse gas concentration pathway (RCP2.6) scenario, by 2040-2080, states like Karnataka, Andhra Pradesh, Tamil Nadu, Maharashtra, and Odisha are expected to maintain a total coconut cultivation area of at least 6,907,159 hectares. These results highlight the value of machine learning in climate suitability assessments and emphasize its role in supporting adaptive strategies for sustainable agriculture.



Current status of coconut area across India



2041-2060 status of coconut area across India under CMIP6: SSP 1-2.6 climate scenario

Development of whole genome pipeline tool for plantation bacterial analysis

A set of Linux-based Python scripts was developed alongside well-established whole genome sequencing assembly tools, including SPAdes and Velvet, to analyze the genomes of two bacterial species: *Microbacterium enclense* and *Paenibacillus typhae*. These bacteria have attracted interest due to their potential in enhancing coconut cultivation by promoting plant health and improving soil fertility. Microbacterium enclense is typically found in the rhizosphere of coconut palms. Genome annotation was carried out using tools such as Prokka, BUSCO, and EggNOG-mapper. The genome of *Microbacterium enclense* consists of approximately 21,241 CDS, 21,589 genes, 30 rRNA, 6 tmRNA, and 312 tRNA, including vital nutrient recycling proteins such as Iron-sulfur cluster assembly protein, Fe-S metabolism-associated domains, and Phosphoserine phosphatase. In contrast, *Paenibacillus typhae* has 67,258 CDS, 68,414 genes, 24 repeat regions, 64 rRNA, 12 tmRNA, and 1,080 tRNA, with important proteins like Zinc uptake system ATP-binding protein, Zinc-binding protein, and Alkaline phosphatase-like protein.

SUCCESS STORY

A Farmer's experience with Kalpa EPN liquid suspension technology in organic pest management under plantation eco-system

In the coconut and arecanut plantations of Kasargod, where the commitment to organic farming is unwavering, Sreevidya Melath of Poonghavanam Agri Farm of Kanhangad village, a women progressive farmer facing a recurrent incidence of leaf folder and pumpkin beetle insect pest in her watermelon cultivation under coconut eco-system, casting a shadow over the Organic District of Kerala. In the midst of this crisis, Sreevidya turned to the ICAR - CPCRI and sought the expertise of Dr. Rajkumar, Senior Scientist (Nematology) on biological pest management using EPNs and provided her with liquid suspension of Kalpa EPN containing infective juveniles (IJs) of *Steinernema carpocapsae* and *Heterorhabditis indica* of 100 units each as field trial-cum-demonstration in their field in collaboration with ICAR-KVK, Kasaragod.

Handing over of 100 units of Kalpa EPN aqua suspension to Smt. Sreevidya

Soil application of Kalpa EPN liquid suspension @ 10 units/1000 square meter at fifteen days interval along with irrigation water and foliar application @1 unit (150ml) per 10 liters water spray during early morning or late evening hours at weekly interval, effective when used as a spray when pest incidence detected early acted as a natural shield against the leaf folder and pumpkin beetle attack and saved her crop from potential devastation. After 3 to 4 applications of *S. carpocapsae* and *Heterorhabditits indica* observed significant reduction of pest population to the tune of 66.2% and recorded an impressive seven tones yield of water melon from seventy five cents land, underlining the viability of sustainable pest management practices.

Visit of local farmers recognition to her field, organically harvesting watermelon by adopting organic based EPN technology for pest management

IMPORTANT EVENTS

National Conference on Plant Physiology – 2024

The National Conference of Plant Physiology – 2024 with the theme "Frontiers in Cell to Whole Plant Physiology: Bridging Science and Sustainability" was inaugurated on December 17, 2024 at ICAR-CPCRI, Kasaragod. This three day conference was jointly organised by the ICAR-CPCRI and the Indian Society for Plant Physiology (ISPP), New Delhi.

Dr. R. Chandra Babu, Vice Chancellor, Kerala Agricultural University and the President, ISPP inaugurated the conference and briefed about the salient activities and the history of the ISPP. He called the young researchers for exchanging ideas and to take up collaborative initiatives to have a futuristic plan in plant physiology of crop plants. Dr. P.V. Varaprasad, Professor, Kansas State University, USA was the Chief Guest for the programme. He highlighted ten major innovations in the fields of, speed genomic level breeding, gene editing, stress tolerant crop varieties, nutritious and climate resilient plants, biofortified varieties, above and below ground intercropping, agroforestry, perennial grains (Kernza, sorghum), cross cutting-edge disciplines, climate resilient agriculture. He spoke on global challenges of the relative yield gain decrease as an impediment for development. Dr. K.B. Hebbar, Director, ICAR-CPCRI, Kasaragod during his presidential address highlighted the achievements of CPCRI and the importance of plantation crops in the economy of India. He urged the younger plant physiologists to take up active interdisciplinary research in plantation crops. Dr. Brajesh Singh, Director, ICAR-CPRI, Shimla spoke about storage physiology and post-harvest handling of potatoes benefiting the world. Dr. Jagdish Rane, Director, ICAR-CIAH urged the younger scientist to work for goal oriented research aimed at bringing out disruptive technologies for the benefit of the society.

The conference had Technical Sessions: *viz*., Physiological responses to stresses, Cutting-edge technologies, Sustainable agriculture practices, Post-harvest physiology and processing, and Field physiology and adaptation strategies, besides Lead talks, young scientists presentation, flash talks and concurrent poster presentations.

Valedictory session of the Conference 2024 was held on 19 December 2024, presided over by Dr. K. Balachandra Hebbar, Director, CPCRI.

Dr. Sanjay Kumar, Chairman ASRB, newly elected President, ISPP was the Chief Guest. He told that plant physiology has important role in the prosperity of the nation with examples of Asafoetida seed germination enhancement in India, Saffron taken out of Kashmir to other states, tulips bulb production in Kashmir and tulips offered in Ayodhya Ram Mandir due to production of tulips in large quantity in the country, which was dominated by Australia earlier.

The pogramme was attended by more than 300 delegates from the national and international research organisations, agricultural and traditional universities as well as NGOs. A panel discussion featuring plantation scientists and eminent plant physiologists explored the challenges and opportunities in integrating science with sustainability.

The organization of this seminar at CPCRI was considered timely, given the growing focus on the plantation sector. The government's proposal to implement the National Mission on Edible Oils highlights the potential of oil palm and coconut in contributing to this initiative. However, there is a critical need to identify physiologically elite breeding lines with superior productivity and quality. Additionally, plant height remains a concern, making research on dwarfism in palms a priority.

Further, characterizing and identifying functional molecules can aid in developing alternative value-added products for crops like arecanut. Establishing a robust temporal and spatial biomass quantification methodology is essential for accurately estimating carbon content, enabling the initiation of carbon credit programs for farmers.

Climate resilience research is also imperative to enhance preparedness and response to climate-related disturbances, trends, and extreme events. A deeper understanding of these factors will help farmers adapt to changing weather conditions, ultimately leading to improved crop yields, reduced losses, and greater food security.

Dr. P.V. Varaprasad, inaugurating NCPP programme

World Soil Day

Kasaragod

ICAR-CPCRI, Kasaragod, celebrated World Soil Day 2024 with the theme "Caring for Soils: Measure, Monitor, and Manage". Dr. K. B. Hebbar, Director, ICAR-CPCRI, presided over the program and highlighted the importance of soil health and its sustainable management in his opening remarks. The chief guest of the function, Dr. Anil Kumar K. S., former principal scientist, ICAR-NBSS&LUP, Bangalore, gave a thoughtful presentation on the geographical landscape of India, the area under cultivation, and water availability for agriculture. His words provided valuable insights to both farmers and students. Dr. Anil Kumar handed over soil health cards to 12 farmers.

About 30 persons, including officials, farmers from Kerala, Karnataka, and Tamil Nadu participated in the program.

A drawing competition on the theme of Soil Day was conducted for the students of KV 1 and the staff of CPCRI, and prizes were distributed to the winners of the competition.

World Soil day Celebrated in Kasaragod

KVK, Kasaragod celebrated World Soil Day with an awareness program on natural farming at Aravath in Panayal village in Kasaragod district on 5 December 2024. The programme was attended by 30 farmers.

KVK Alappuzha

World Soil Day was also celebrated KVK, Alappuzha with farmers on 5 December 2024 in collaboration with the Department of Agriculture at the Kanjikuzhy Panchayat Community Hall. Soil health cards were distributed to 25 farmers. Around 90 farmers participated.

Mohitnagar

World Soil Day was also celebrated at ICAR-CPCRI, RC, Mohitnagar at Harisobha Ground, Chak Moulani, Lataguri, Jalpaiguri. A total of 90 farmers attended the programme. 10 soil health cards were distributed to 10 farmers during the programme.

Rural India Business Conclave (RIBC 3.0)

Rural India Business Conclave (RIBC) was organized in collaboration with the Kerala start-ups Mission and Central University of Kerala (CUK) during 14-15 December 2024 in which 300 delegates participated. Two days exhibition in connection with RIBC3.0 was held at CPCRI, Kasaragod from December 14-15 2024.

Hon'ble District Collector, Kasaragod inaugurating RIBC at Kasaragod

PUBLICATION

Research articles

Anithakumari, P. and Selvamani, V. 2024. Spatial and social dimensions of community extension approach in management of coconut red palm weevil. *Journal of Plantation Crops*. **52** (1): 48-57.

Pandian, R.T.P., Sidharthan, V.K., Rajesh, M.K., Babu, M., Sharma, S.K., Kumar, B.N., Chaithra, M. and Hegde, V. 2024. From the discovery of a novel arepavirus in diseased arecanut palms (*Areca catechu* L.) in India to the identification of known and novel arepaviruses in bee and plant transcriptomes through data-mining. *Virology*, **600**: p.110256. NASS Rating: 9.70.

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state. *Indian Journal of dairy Science*. **77**(6): 578-582. NASS Rating: 5.24.

Pandey S, Ponnusamy, K. and Keesam Manasa 2024. Adoption level of improved dairy farming practices by resource poor dairy farm households. *Gujarat Journal of Extension Education* **38** (2): 59-65. DOI: https://doi.org/10.56572/gjoee.2024.38.2.0010. NASS Rating: 5.30.

Ponnusamy, K. and Keesam Manasa 2024. Challenges and Pathways in Dissemination and Adoption of Better Practices for Dairy Cattle Welfare in India. *Indian Journal of Animal Production Management*. 40:155-162. NASS Rating: 2.51.

Prathibha, V.H., Nagaraja, N.R., Rajesh, M.K., Thejasri, K.P., Hegde, V. and Anok, U. 2024. Development of rapid, efficient, and cost-effective screening techniques for testing arecanut against *Phytophthora media*, the incitant of fruit rot disease. *MethodsX*, **13**, p.103032.

Rachana, K.E., Gangaraj, K.P., Muralikrishna, K.S., Antony, G., Prathibha, V.H. and Rajesh, M.K. 2024. Resistance gene analogs (RGAs) of coconut respond differentially to *Phytophthora palmivora* and exogenous salicylic acid and methyl jasmonate. *Plant Physiology Reports* **29**: 421-437. NASS Rating: 7.50.

Rajesh, M.K., Budhwar, R., Shukla, R., Oraon, P.K., Goel, S., Paul, B., Thomas, R.J., Dinesh, A., Jayasekhar, S., Chandran, K.P. and Muralikrishna, K.S. 2024. Chromosome scale genome assembly and annotation of coconut cultivar Chowghat Green Dwarf. *Scientific Reports*, **14**(1): 28778. NASS Rating: 10.60.

Rajesh, M.K., Nagaraja, N.R., Sabana, A.A. and Muralikrishna, K.S. 2024. Inter-specific hybrids in *Areca* spp.: Verification using SCoT markers. *Indian Journal of Genetics and Plant Breeding*, **84**: 308-310. NASS Rating: 7.00.

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Sabana, A.A., Antony, G., Gangaraj, K.P., Grace, T. and Rajesh, M.K. 2024. Regulation of coconut somatic embryogenesis: decoding the role of long non-coding RNAs. *Plant Biotechnology Reports*, **18**: 33-44. NASS Rating: 8.40.

Thube, S.H., Pandian, R., Rajkumar, M., Babu, M., Josephrajkumar, A., Nirmal Kumar, B.J., Hegde, V., Patil, B., Rajashekara, H., Prabhulinga, T. F., B.B., Gawande, S., Nagrale, D., Devindrappa, M. and Rajesh, M.K. 2024. *Euwallacea per brevis* (Schedl, 1951) and associated novel fungal symbiont, *Fusarium* sp.: A potential cause of wilting in cocoa, *Theobroma cacao* in India. *Crop Protection* **184**: 106754. NASS Rating: 8.80.

Papers presented in seminar/ symposia conferences/ workshops/ webinars/ etc

Augustine Jerard, B. 2024. Insights from Multi-location trials for plantation crops. *In*: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024. pp 24.

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Chitra, R., Janaki, D. and Panjavarnam, G. 2024. Investigating the influence of organic manures and nutrient management strategies on yield, quality and physiological performance of betelvine (Piper betel L.) *In*: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024 # pp 184.

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Jaisankar, Ramesh, S.V., Augustine Jerard, B., Lakshmana Prabu, S., Hari Nivas, Asokan, Blesy, G.M, Arthi, N., Umamaheswari A., Sanjeev, B. 2024. Phytochemical analysis, GC–MS profiling, and in vitro evaluation of methanolic extracts of P. lerum fruit pulp. *In*:

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Murali Gopal 2024. Fermentation chemistry and preservation of plantation-based food products: Focus on coconut, palmyrah and cocoa. *In*: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024. # pp 22.

Niral, V., Elain Apshara, S., Nagaraja, N.R., Ramesh, S.V. 2024. Invaluable germplasm resources of palms and cocoa for crop improvement research. *In*: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024 #pp 186.

Niral, V., Sudha R., Samsudeen, K., Neema, M. and Aparna, V.2024. Characterizing drought tolerance in coconut hybrids using physiological traits. *In*: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024.pp 183.

Ponnusamy, K. 2024. Adoption of climatic resilient technologies in plantation crops. *In*: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024 #pp 23.

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Sumitha, S, Augustine Jerard, B., Rajendra Prasad, K., Manivananan, M.I., and Raja Goud, 2024. Variability for seed germination and seedling growth morphological traits in Palmyrah (*Borassus flabellifer* L.) *In*: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024 # pp 155.

Vinayaka Hegde, Daliyamol, Prathibha, V.H., Prathibha, P.S., Rajkumar, Sujithra, M. and Josephrajkumar, A. 2024. Applications of Artificial Intelligence (AI) in Palms. In: Alka Gupta, Josephrajkumar A., Jayasekhar S., Ramesh S.V., Daliyamol, and Bhavishya. Book of Abstracts, National Conference of Plant Physiology-2024, ICAR-CPCRI, Kasaragod 17-19 December 2024 # pp 21.

Popular articles

Anithakumari, P., Jithin Shaju, and Mahima Mohan. 2024. Participatory extension model of inter crops area wide adoption in coconut gardens. (In Malayalam) *Indian Nalikera Journal*. **16** (11): 5-11.

Anithakumari, P. and Hanumanthe Gowda, B. (2024). Coconut Farmer Field Schools (CFFS). *Indian Coconut Journal*. **67** (3): 18-24

Sivakumar, T. and Anju Sathyan, S. 2024. Plant protection measures for coconut in Monsoon. *Karshakan.* **32**(8): 9-12 2.

Sivakumar, T. 2024. Warrior for plant protection measures in coconut. (In Malayalam) *Indian Nalikera Journal.* **16**(9): 32-33.

Extension folders

Anithakumari, P., Shareefa, M., Induja, S., Anes, K.M. Entrepreneurship development and empowering farming communities in technology adoption- Project profile. (In Malayalam).

Shareefa, M., Induja, S., Anes, K.M., Anithakumari, P. Polybag coconut seedling and biopriming. (In Malayalam.).

Shareefa, M., Anithakumari, P., Induja, S., Anes, K.M. Quality coconut seedling production and scientific management practices. (In Malayalam).

HUMAN RESOURCES DEVELPOMENT

Training attended

Name & designation	Programme Title	Place & date
Dr. (Mrs.) Merin Babu, Dr. (Mrs.) M. Shareefa, Dr (Mrs.) K. Nihad, Dr. (Mrs.) Jeena Mathew, Dr. R. Sudha, Dr. (Mrs.) S. Neenu, Dr. S. Paulraj, Dr. S.V. Ramesh, Dr. Rajkumar, Dr. (Mrs.) M. Sujithra, Dr. (Mrs.) P. S. Pratibha, Sr. Scientists, Dr. N.R. Nagaraja, Dr. Bhavishya, Dr. R. Thava Prakash Pandian, Dr. T.N. Madhu, Dr. M. Chaithra, Dr. (Mrs.) M. Suchithra, Dr. (Mrs.) E.K. Saneera, Dr. L. S. Singh, Dr. (Mrs.) Surekha, Dr. (Mrs.) P.P. Shameena Begum, Dr. (Mrs.) Daliya Mol, Mrs. T.N. Ranjini Dr. (Mrs.). S. Sumitha, Dr. (Mrs.) G. Panjavarnam, Dr. K.M. Anes, Dr. S. Indhuja, Dr. (Mrs.) Jilu V. Sajan Dr. (Ms.) M. Chaithra, Shri Y. Diwakar, Scientists	Online training on "Statistical Applications in Plantation Crops"	ICAR-CPCRI, Kasaragod 11-15, November, 2024.
Dr. S. Elain Apshara, Principal Scientist	Online training on 'Women in Agri Business Navigating Challenges, Seizing Opportunities'	MANAGE, Hyderabad from December 3-6, 2024
Shri. Arunji G, Technical Assistant (Library)	Regional awareness programme on J-Gate@CeRA for South Region	Kerala Agricultural University, Thrissur on 16th October, 2024
Dr. Maya Lekshmi, Technical Officer, Dr. Kamalkumar, Technical Assistant (Field/Farm)	Hands on training on 'Cryopreservation'	Malabar Botanical Garden & Institute for Plant Sciences, Kozhikode on 25-12-2024

Awards

Dr. Jeena Mathew, Sr. Scientist, ICAR-CPCRI, RS, Kayamkulam, and received the best oral paper award in the Agricultural Session during the 31st Swadeshi Science Congress at ICAR-CIFT, Kochi on 9 November 2024.

CPCRI bagged the best stall award during the Cocofest 2024, held in organized by the Krishi Vigyan Kendra (KVK) and ICAR-CMFRI, Kochi, from 20–22 November 2024, at Kavaratti Island, Lakshadweep.

CPCRI bagged the best stall award during the Cocofest 2024

TRANSFER OF TECHNOLOGY

On campus training

Kasaragod

A total number of 8 trainings conducted within state and interstate exposure visit cum trainings under ATMA scheme at ICAR-CPCRI, Kasaragod during October 2024 benefitting 160 farmers and 18 officials from the state of Tamil Nadu, Kerala and Karnataka. Kalpa Start-up Master Class Series 2024 which was started from 17 September 2024 has continued in the month of October 2024 also.

Kisan Diwas was celebrated at KVK, Kasaragod on 23 December 2024 with participation of 50 farmers. Shri Sharonvaas, DDM, NABARD was the chief guest.

Kayamkulam

Stakeholders meet and training program for technological input production to augment adoption- organized on 7 October 2025 in which 43 farmers attended.

Empowered biotechnology students from MSM College, Kayamkulam, on 21 November 2024, on instrumentation principles and the science of farming.

KVK, Alappuzha

Organised training program on 'Coconut and groundnut' for 68 farmers at Muthukulam on 4 October, 2024.

Organised training on 'Upland paddy in coconut gardens as intercrop' on 7 October 2024.

Organised training on 'Fodder cultivation' and stakeholders meet for elucidating coconut cultivation challenges on 7 October 2024. 42 farmers and people's representatives attended the programme.

Organised training for coconut farmers and launching of 'Satha Keram Kera Samridham' interventions on 20 November 2024. A total of 46 farmers, representatives of Krishnapuram panchayat, and officials of the Department of Agriculture participated.

Organised farmers training under the LODP program at Vadakarai, Kanakkappilllai Valasari, and Kadayanlloore in Tenkasi district on 19 December 2024, and distributed 1312.5 kg of 'Kera Probio.'

Vittal

Training Cum Exposure Visit was organized at ICAR-CPCRI, Regional Station, Vittal on 05 November 2024 for 14 Farmers from Navachetana Totagarik Company, Kallori, Belthangady, Karnataka.

Organised one-day training for seventh standard students under the BRC program on 20 November 2024 and inspired them on understanding science, scientific farming, and pest management principles.

Mohitnagar

One training programme was conducted at ICAR-CPCRI, Research Centre, Mohitnagar on 01 October 2024 on "How to grow plantation crop in sub Himalayan terai region" for the farmers of Madhubani District of Bihar.

A training on "Plantation Crops—its importance" was organised among the 25 BSc (Hons)-Botany students of P D Women's College, Jalpaiguri, on 24 December 2024.

Training on Scientific cultivation of plantation crops and crop diversification for doubling Income was organized among 38 trainees under DAESI of KVK, Chopra on 31 December 2024.

Training on Scientific cultivation of plantation crops and crop diversification for doubling Income was organized among 38 trainees under DAESI of KVK, Chopra on 31 December 2024.

Training on arecanut cultivation and its processing was organised for 9 executive members of FPC of Kalchini on 09 December 2024.

Kisan Diwas (Farmers Day) was organized on 23 December 2024 in which women farmers participated at ICAR-CPCRI, RC, Mohitnagar. A total of 60 farmers' of different blocks of Jalpaiguri attended the programme. Sri Ranadip Majhi, DDM, NABARD, Jalpaiguri graced the occasion.

Kahikuchi

Input and planting material distribution at ICAR-CPCRI, RC, Kahikuchi, Guwahati on 25 October 2024. A total of 100 farmers from different parts of Assam participated where 1000 coconut seedlings were distributed.

Comprehensive training cum demonstration on Bordeaux Mixture for fungal disease control in arecanut, coconut, and cocoa, was conducted at ICAR-CPCRI, RC, Kahikuchi, on 30 December 2024 where 30 farmers from various parts of Assam participated

Off-campus trainings

Training on arecanut cultivation and its processing was organised for 9 executive members of on 09 December 2024.

Organised the farmers training under the LoDP program at Puliyara in Tenkasi district on 13th December and distributed 437.5 kg of 'Kera Probio.

Total of 4 Training programs on "groundnut as potential intercrop in coconut gardens" for 58 farmers of eight panchayaths in Muthukulam block (October 4, 2025), Upland paddy cultivation in coconut gardens (October 8). HYV Fodder cultivation for livestock farmers (December 4) and coconut based IFS for coastal areas (December 10). Total of 219 farmers attended the training programs.

One day training programme was conducted on 4 November' 2024 at ICAR-KVK, Dudhnoi, Goalpara, Assam on scientific cultivation and management practices of cocoa. Thirty one numbers of farmers from various villages such as Ghagra, Rangpathar, Kaliasastra, Majpara, and Rambukpara, of Dhudhnoi, Goalpara district of Assam participated the programme.

Interface meetings

A focused group discussion on 30 October 2024 was organized by ICAR-CPCRI in hybrid mode (Zoom platform) inviting diverse stakeholders from major producing states *viz*., Kerala, Karnataka and Tamil Nadu, including oil/copra merchants, industry representatives, coconut producer companies, entrepreneurs, developmental agencies and researchers to share their perspectives and arrive at a definition for non-edible/nonstandard copra.

Outreach Seminars

One day Seminar on the subject "Coir and its Diversified Applications for Sustainable Development of Coir Industry" – was jointly organized by Coir Board Regional office, Kannur, Kerala and ICAR-CPCRI, Kasaragod on 28 October 2024 at ICAR-CPCRI, Kasaragod.

A workshop on "Coconut based enterprises in Lakshadweep: status and strategies for sustainable development" was organized on 19 November 2024 at 10. 30 am as part of the project on coconut enterprises: assessment the status and strategies. Dr. P.N. Ananth, Head, KVK, Kavaratti welcomed the gathering and gave an introductory remarks. Dr. U.S Gautam, DDG, Extension, ICAR, New Delhi inaugurated the programme. Dr. K.B. Hebbar, Director ICAR-CPCRI, Kasaragod, Dr. V. Venkattasubramanian, Director, ATARI and Mrs. Sona John, Publicity Officer Coconut Development Board, Kochi gave their remarks in the inaugural session. Dr. C. Thamban, Principal Scientist, ICAR-CPCRI gave vote of thanks. There were 70 participants in the workshop. The inaugural function was followed by the technical session in which a presentation on "salient findings of the research project on coconut enterprises in Lakshadweep islands" delivered by Dr. C. Thamban, Principal Investigator of the project. Representatives from selected Self Help Groups across the 10 islands.

Dr. Shameena Beegum, P.P presented a paper on "Women-oriented coconut processing technologies for Lakshadweep islands" as part of the Cocofest 2024 organized by the Krishi Vigyan Kendra (KVK) and ICAR-CMFRI, Kochi, from 20–22, November 2024, at Kavaratti Island, Lakshadweep.

Integrated Management of Root (wilt) in Coconut

A flagship programme on integrated management of root (wilt) in coconut, as laying out of demonstration plots, supported by the Coconut Development Board, Kochi, with the patronage of the Tamil Nadu State Department of Horticulture, was launched on 15 November 2024 by Dr. K.B. Hebbar, Director, ICAR-CPCRI, in the presence of Sri. Elango, Deputy Director (Hort.), Sri. E. Aravazhi, Director, CDB, and Dr. Regi J. Thomas, Head, ICAR-CPCRI, Kayamkulam. The program is implemented in 100 ha in four cluster villages of Vadakarai, Kanakkapillai Valasu, Kadayanallur, and Puliyarai in Tenkasi district. A technical pamphlet on root (wilt) disease and a technical session on palm health management were also conducted. More than 100 farmer beneficiaries participated in the programme.

Natural Farming

A workshop on 'Natural Farming in Coconut Based Farming System' was organised at Tiptur Karnataka on 29 October 2024 as part of the CDB supported research project on 'Natural farming in coconut based farming system –An analysis of farmers' experiences and impact'. Scientists from ICAR-CPCRI, coconut growers and extension personnel from State Department of Horticulture participated in the workshop.

Launching Seminar

Organised launching of sweet potato (ICAR-CTCRI varieties) and upland rice (KAU varieties) as intercrops of coconut at Arattupuzha on 11 November 2024. A total of 68 farmers' representatives of the Muthukulam block and Arattupuzha panchayat and agricultural officials attended

Distribution of Coconut Seedlings to the NEH Region

Coconut planting material distribution programme was conducted at ICAR-CPCRI, Research Centre, Kahikuchi on the 25, October 2024. A total of 1000 numbers of coconut seedlings of WCT variety were distributed to 100 farmers from Kamrup district, Assam.

Exhibition

One day exhibition was organized at IIHR, Bangalore in connection with 2nd ICAR-IIHR Industry meet 2024 on 24 October 2024 organized by IIHR, Bangalore in collaboration with Society for Promotion of Horticulture and BESST-HORT, Bengaluru.

Global Soils Conference 2024 on Caring Soils beyond Food Security: Climate Change Mitigation & Ecosystem Services from 19 October 2024 to 22 November 2024 at NASC Complex, New Delhi- Dr Jeena Mathew and Mr. Pavan Kumar participated.

Cocofest-2024 (Coconut Festival) of Lakshadweep Islands from 20.11.2024 to 22 November 2024 organised by KVK-Lakshadweep in collaboration with Kavaratti FPO and Department of Agriculture, UT Administration of Lakshadweep.

An exhibition and poster presentation was also arranged.

10 days "Agro Carnival" exhibition at Bekal, Kanhangad organized by Kanhangad Block Panchayat from 22 December 2024 to 31 December 2024.

Field visits

Kasaragod

More than 35 farmer field visits and mobile based advisories were provided from ICAR-CPCRI, Kasaragod.

Kayamkulam

Orientated a group of farmers from Kaduthuruthy on 'Palm health management technologies in coconut' on 22 November 2024.
Empowered about 50 farmers of Vellavoor, Panchayat, Kottayam District on scientific health management in coconut on 23 November 2024.
More than 30 farmer field visits and mobile-based advisories.
Total two student visits benefitting 61 students and 7 faculty members was organised.

Vittal

Placement of final year RHWEP students to Research Institute under student READY programme of B.Sc. (Hons.) Horticulture students from College of Horticulture, Mudigere, Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences (KSNUAHS), Shivamogga, Karnataka, was organized from 11 November 2024 to 16 November 2024 at ICAR-CPCRI, Regional Station, and Vittal.
Total 8 Number of students' visits of 598 students + 21 staff was held during the period.
Conducted awareness campaign on Laying Out Demonstration Plot (LODP) scheme at Tenkasi, Tamil Nadu on 'Integrated management of root (wilt) disease' and distributed cowpea seeds to farmer beneficiaries on 09-29 October 2024. Visited demonstration plots at Tenkasi on 13 November 2024 and empowered the farmer beneficiaries on the use of cowpea seeds and biomass recycling (basin management).

SCSP Activities

Three numbers of training programme (27 December 2024, 28 December 2024 and 29 December 2024) on vegetable cultivation was organized among 110 numbers of vegetable growers belongs to Scheduled Caste community.
Participated in the scientific delegation to assess the agrarian issues in the tribal settlements of Kalvarayan Hills, Kallakurichi District, Tamil Nadu, on 27 December 2024, and suggested technological solutions for sustainable livelihood in the interactive meeting with Hon'ble Secretary, Tribal Welfare, and District Collector, Kallakurichi, on 28 December 2024.

Demonstration

On 23 October 2024, ICAR-CPCRI, RC, Kahikuchi, in collaboration with KVK Kokrajhar, conducted a one-day demonstration programme on the application of *Trichoderma*-enriched Farm Yard Manure (FYM) at a farmer's field in Kokrajhar, Assam, to showcase its effectiveness in controlling Ganoderma disease in arecanut. This eco-friendly, sustainable approach introduced farmers to *Trichoderma* spp., a beneficial fungus that combats Ganoderma pathogens, thereby reducing disease prevalence without reliance on chemical fungicides. The programme included a detailed session on preparing *Trichoderma*-enriched FYM, followed by a practical field demonstration, enabling farmers to observe the application process first-hand.

ICAR- KRISHI VIGYAN KENDRAS

Krishi Vigyan Kendra, Kasaragod

KVK Honey bee keeping training conducted at Kasaragod benefitting nearly 60 farmers.

Beneficiary meet under Tribal Sub Plan programme

ICAR – KVK, CPCRI, Kasaragod organised a beneficiary meet on 15 October 2024 for distribution of agricultural inputs under Tribal Sub Plan programme in association with the Green Chandragiri Agro Farmers Producer Company Limited at Holy Family Church, Rajapuram. Hon'ble M.P. of Kasaragod Shri. Rajmohan Unnithan inaugurated the programme by distributing the coconut and arecanut seedlings to the ST farmers. Dr. K.B. Hebbar, Director of ICAR-CPCRI, Kasaragod in his speech has emphasized on different activities being conducted at ICAR- CPCRI for the benefit of SC & ST farmers and youth. He has highlighted the ongoing eight months training programme at ICAR- CPCRI, Kasaragod. A total of 450 coconut and 2250 arecanut seedlings from CPCRI were distributed to the 103 participant

farmers. KVK, Kasaragod also organised an input distribution programme under TSP at Kadumeni village, where 100 coconut and 546 arecanut seedlings were distributed to 38 farmers.

Apiculture farmers conclave and Honey Festival 2024

In a joint effort to promote biodiversity conservation and pollination assistance through honey bees, ICAR-KVK, CPCRI, and the Federation of Indigenous Apiculturists (FIA) organized a two-day "Apiculture farmers conclave and Honey festival 2024" on 24-25 October 2024, at CPCRI, Kasaragod.

Flag-off Ceremony: Export of Honey from Tulunadu Ecogreen FPC, Kasaragod

The Tulunadu Eco Green Farmers Producer Company Ltd at Pallathinkal, Kasaragod, is an FPO mentored by ICAR-KVK, Kasaragod established during 2016 with the financial support of NABARD. The company is engaged in the agglomeration and value addition of the various agricultural commodities like honey, coconut, spices etc. The company has established facilities for value addition in its factory at Pallathinkal, Munnad. The first export consignment consisting of 360 kg honey was flagged off to Qatar by Shri. K. Inbasekar IAS on 19th November 2024. Special address was offered by Dr. K. Muralidharan, Principal Scientist, CPCRI, Kasaragod. The representatives from ATMA, Dept. of Agriculture, DIC, APEDA and KVK, Kasaragod also participated in the programme. The programme was attended by around 60 registered members of FPC and local farmers.

Other extension activities

The KVK, Kasaragod has initiated 2 OFTs, 12 frontline demonstrations, one EDP programme, one nutrigarden programme, SCSP and various extension activities during the period.
Assessment of two Ridge Gourd hybrids (*Luffa acutangula* L. Moench) KRH-1 and Arka Vikram were conducted in the 5 farmers fields of Kasaragod and Manjeshwar block of Kasaragod Dist. The crop during this season got affected with downy mildew.

Frontline Demonstrations

Application of Micronutrients in paddy using drone technology was demonstrated at Bellur Padasekhram in Manjeshwar during October 2024 with farmers' participation. The KAU Sampoorna micronutrient mixture was used for crop growth, pest and disease resistance and grain filling in paddy crop.
The vermiwash foliar application through drones in vegetables demonstrated in Kolavayal padashekaram of Ajanur panchayath for amaranth and brinjal.

Krishi Vigyan Kendra, Alappuzha

Office building cum procurement and processing centre of OSFPC inaugurated

Office building cum procurement and processing centre of Onattukara Spices Farmer Producer Company (OSFPC), was inaugurated on 4 November, 24, by Sri. Saji Cherian, Hon. Minister of the Government of Kerala. The program was attended by Adv. U. Prathibha, MLA; Adv. M. Arunkumar, MLA; Smt. K. G. Rajeswary, Alappuzha District Panchayat President; and Sri. Baiju N Kurup, CGM, NABARD, Kerala. Associated enterprises of the FPC, viz., a seedling production unit and a snack cum catering unit, were also inaugurated by the VIPs on the occasion.

Launching of Custom Hiring Centre

KVK-Alappuzha, in collaboration with Vallikunnam Agricultural Improvement Cooperative Society (VAICoS), launched a custom hiring centre of farm machinery for the benefit of farmers in the Bharanikka block. Farm equipment, *viz*., tractors with attachments like cultivators and rotavators, power tillers, mulching machines, shredders, zero-till cum fertiliser drills, and walk-behind paddy transplants owned by the KVK, were handed over to VAICoS on a MoA for making available to farmers. Sri M.S. Arunkumar, MLA,

Mavelikkara, launched the program on 26th November 2024.

Training programmes

During the period 29 training programmes were organized benefitting a total number of 735 farmers/rural youths. The details of the training programmes were as follows:

Thirteen B.Sc. (Ag) final year students from three Agricultural universities viz., Lovely Professional University, Jalandhar (Punjab), Guru Kashi University, Bhatinda (Punjab) and Theerthankar Mahaveer University, Moradabad (U.P) undertook RAWE programme of five weeks duration from 23 September to 25 October, 2024.

Farmers, officials and entrepreneurs from different parts of the state and other states visited the Agro Processing Training cum Incubation Centre (APTIC) of the KVK to acquaint, learn and build capacity on agro-processing and value addition aspects of different agricultural produces. Forty eight participants, mostly entrepreneur men and women, from 11 districts of Kerala (except Kozhikode, Palakkad and Wayanad) attended a two day paid training programme on "Processing and value addition of fruits and vegetables" organized on 25 and 26 November, 2024.

Eight farmer leaders of a FPO along with two SMSs from KVK-Uttar Kannada, Karnataka visited the KVK and attended orientation cum training programme on value addition of banana and other crops on 29 November, 2024.

Details of other training programmes organised are given below:

Training	No.of Programmes	Participants		
		Men	Women	Total
On campus	16	173	239	412
Off campus	13	131	192	323
Total	29	304	431	735

Extension activities: a) Help line service (calls attended and responded) – 412 b) Agro-clinic – 101 c) Soil & water testing – 80

Upland paddy cultivation was initiated on 50 acres of land in the FFP area with varieties namely, Bhagya (90 days duration), Amritha and Sagara (salt-tolerant) for coastal panchayats, and Dhanu (long-duration varieties) in other areas.

TECHNOLOGY COMMERCIALIZATION

Seven technologies were commercialized to with the revenue generation of Rs.2, 15,000/- during the period.

MoU exchange with an entrepreneur

OTHER INFORMATION

Swachhata Diwas Celebration

Kasaragod

As part of the Swachhata Hi Sewa-2024, the Swachhata Diwas was celebrated at the institute on 02 October 2024. Activities were undertaken at the institute from 17 September 2024 to 01 October 2024, which included, the swachhata launch by the Member of Parliament and Member of Legislative Assembly, Kasaragod District, Kerala, followed by awareness class on "Effective waste management at household level', Ek ped maa ke naam' plantation drives, swachhata run, swachhata samvad on "Role of agricultural input dealers in SHG

campaign", swachhata ki pathshaala, mega cleanliness drives at Bekal and CPCRI Beach, swachhata lakshit ekayi (cleanliness drives at offices & institutional buildings, religious places), time bound transformation of difficult & dirty spots (black spots) generally neglected garbage points, safai mitra suraksha shivirs (honouring, health check up and talk on social welfare linkages etc.

Dr. K. B. Hebbar, Director, felicitated sanitation workers of Haritha Karma Sena, Suchithwa Mission, Mogral Puthur Panchayat, Kasaragod. On the occasion, the 40 sanitation workers of the institute were distributed with umbrellas. The fund raised by the staff for the medical treatment of wife one of the sanitation workers, Mr Sivadasan was handed over.

A new bio-waste management (composting) unit at Hill Block was also inaugurated. At the end, as part of shramadan, the two black spots identified were cleaned by all the staff of the institute.

Suchitwa Mission has declared the Institute as a green institute with and awarded with an 'A grade Green Protocol Certificate'. Shri. Inbasekar K, IAS, District Collector handed over the certificate to the Dr. K.B. Hebbar, Director, ICAR-CPCRI on the occasion of Swachhata Diwas.

Vittal

Swachhatha Pakhwada was celebrated in the RS, Vittal from 16 to 31 December with various activities including *Kisan Diwas* celebrations, farmers training, cleaning drive, planting of tree saplings in the farm etc.

Director Administrating oath during Swachhatha Pakhwada Celebration at Kasaragod

'Swachhta Hi Seva' campaign was organised by the KVK, Alappuzha from 15th September to 2 October, 2024. Awareness programs on cleanliness and the relevance of hygienic circumstances for a healthy life were organised for farmers, farm women, rural youth, and students in the campus and off-campus mode in the NICRA village and other operational areas. 'Swachhta Pakhwada' was organised by the KVK from 16 to 31 December 2024.

NEW PROJECT INITIATED

A project entitled with 'Formation, Promotion and nurturing of Farmer Producer Organization (FPO)' was initiated with the Rs. 88.66 lakhs fund for duration 5 years. Dr. Regi Jacob Thomas, Principal Scientist, ICAR-CPCRI, RS, Kayamkulam.

A contract research project (CRP) titled *"Evaluation of Bio-efficacy and Phytotoxicity of Indaziflam 20 G/L + Glyphosate-Isopropylammonium 540 G/L SC (ALION PLUS) in Arecanut Plantation"* has been initiated. Funded by Bayer Crop Science Limited with a budget of ₹15, 21,728, the study is being conducted in the arecanut plantation at the institute farm of ICAR-CPCRI, RS, Vittal.

Another CRP project titled *"Evaluation of Bio-efficacy and Phytotoxicity of Tebuconazole 50% + Trifloxystrobin 25% WG (Nativo) Against Leaf Spot (Colletotrichum spp.) in Arecanut"* has been initiated at ICAR-CPCRI, RS, Vittal. Funded by Bayer Crop Science Limited with a budget of ₹18, 74,902, the study aims to evaluate the effectiveness and safety of Nativo, a fungicide, in managing leaf spot disease in arecanut.

WOMENS ACTIVITIES

Three Entrepreneurship Development programs and training on scientific cultivation of inter crops for women SHGs organized in Devikulangara, Pathiyoor and Arattupuzha panchaths during November and December 2025.

NATIONAL / INTERNATIONAL LEVEL SEMINARS/ SYMPOSIA ATTENDED

During the period 27 no.of scientists attended 9 programmes and presented research paper among the peer groups.

PERSONALIA

APPOINTMENT

Name	Designation	Place	Date
Shri Kiranmoy Patra	Subject Matter Specialist/ Senior Technical Officer (Agronomy)	KVK, Kasaragod	29.11.2024

TRANSFER

Name of the staff	From (Place)	To (Place)	w.e.f.
Dr. Saneera E.K., Scientist	ICAR- CPCRI, RS, Vittal	ICAR- SBI, Kannur	06.12.2024
Dr. Mahendran B., Scientist	ICAR- SBI, Kannur	ICAR- CPCRI, RS, Vittal	09.12.2024
Shri Vivek Singh, Stenographer Gr.III	ICAR- CPCRI, RS, Vittal	ICAR- HQs, New Delhi	08.11.2024

RETIREMENT

Name	Designation	Place	Date
Shri V.S. Pakkeera	Skilled Support Staff	ICAR-CPCRI, Kasaragod	31.10.2024
Shri S. Chennappa	Technician(T-1)	ICAR- CPCRI, RC, Kidu	31.12.2024

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