KALPA

CPCRI Newsletter

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ICAR-Central Plantation Crops Research Institute
Kasaragod - 671 124, Kerala, India

From the Director's Desk

Nutrients to Leverage Productivity

Optimum use of nutrients ensures plant health and results in higher yields on one hand and quality of the produce on the other. The health of the soil, which is the growing media for the crops, plays a major role in sustainable crop productivity. This assumes greater importance in perennial plantation crops.

Nutrient availability is one of the components of soil health which decides plant health too. Understanding the importance of soil nutrient status for better crop productivity and to prevent excess use of costly inputs, government has initiated a programme of issuing soil health cards to farmers. This will enable farmers to regularize the use of costly input and achieve higher crop productivity with higher net income. Under this programme, ICAR-CPCRI has issued 320 soil health cards to the farmers during December 2017 during the occassion of World Soil Day.

Importance of micronutrients in crop health and yield has been recognized long ago. When the soil conditions hinder the uptake of micronutrients, the immediate solution will be the foliar application of nutrients. However, soil application of nutrients with improved soil conditions is also needed in the long run. Realizing the need for nutrient formulations to overcome the problems of fruit set, dropping of immature nuts and nutrient deficiencies in coconut, which have increased in recent years, ICAR-CPCRI has released two micro nutrient formulations "Kalpa Vardhini" - for seedlings and "Kalpa Poshak" - for adult bearing palms. This is a small step towards achieving the goal of doubling the farmers' income.

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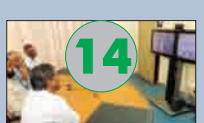


SPECTRUM

Varietal and seasonal influence on coconut inflorescence sap yield and quality

Coconut inflorescence sap or neera is the vascular sap collected by tapping the immature unopened coconut inflorescence in fresh form. It is a natural and non-alcoholic beverage, high in nutritional value and an instant thirst quencher. A study was carried out to find out the influence of genotypes and seasons on inflorescence sap production and quality. The coconut genotypes varied significantly with respect to yield of coconut inflorescence sap. Among the genotypes Jamaica Tall had the highest inflorescence sap yield of 3.6 L/day followed by Orissa Tall (3.05 L/day). Among the seasons, highest sap yield was recorded during post-monsoon (Oct-Nov) and monsoon (June-Sep) and lowest yield was recorded during winter season (Dec-Feb) in all the genotypes. The quality of inflorescence sap tapped from different accessions varied significantly with respect to total sugars, phenol and protein content. Total sugar content was higher in sap from Jamaica Tall (15.93 g/100 ml) followed by Orissa Tall (14.50 g/100ml). Total soluble solids content (TSS) and reducing sugar content of the sap did not vary significantly among the different genotypes studied and ranged between 15.0 to 16.9 °Brix and 0.4-0.8 g/100 ml, respectively. Higher protein content of 0.42 g/100 ml was associated with sap from Benaulim Tall which was on par with Jamaica Tall (0.36 g/100 ml). Higher phenol content was observed in sap from Niu Quewen Tall (4.14 mg/100 ml) which was on par with Jamaica Tall (4.02 mg/100 ml). The results obtained from the present investigation indicated that there was a significant influence of genotypes and seasons on inflorescence sap yield and quality parameters. The information will help to identify genotypes having superior sap characteristics suitable for tapping and develop strategies for tapping of palms for coconut inflorescence sap production on a commercial scale.

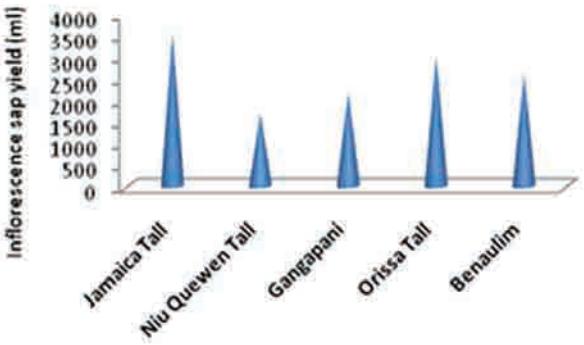


Fig. 1. Inflorescence sap yield from coconut palms

R. Sudha, V. Niral and K.B. Hebbar

In vitro flowering in coconut

A case of *in vitro* flowering was noticed in tissue culture propagated plantlets of West Coast Tall (WCT) cultivar. Rachillae bits (1mm) collected from immature inflorescence with outer spathe length of 5.5 cm size were used as explants. The explants were inoculated in Y3 media supplemented with 2,4-D (1mg/L). The cultures were incubated in dark for a period of six months and sub-cultured into the same media at monthly intervals. The regenerated white shoot like outgrowth was sub-cultured to ½ MS media supplemented with 1ppm each of NAA and BAP and transferred to light condition. After three months, the shoot like structure formed was transferred to Y3 media containing NAA and BAP. As and when the shoot like structure produced 2-3 well developed leaves, the cultures were transferred to rooting media containing Y3 with NAA (2mg/L) and BAP (2mg/L) and IAA (2 mg/L). Root initiation was observed after two months and

in order to develop secondary roots, the plantlet was kept for a period of six months in the same media. The transition of vegetative shoot to reproductive state was accompanied by some morphological changes in the in vitro raised plantlets which include rapid emergence of long and thin leaves before the appearance of ivory colored inflorescence. Unlike normal inflorescence, the emergence of inflorescence was terminal in such *in vitro* raised plantlets and the inflorescence was devoid of spathe. Prolonged sub culture in the same media might have resulted in changes in pH and reduction in organic and inorganic constituents of the media and the resultant chemical stress might have induced *in vitro* flowering.

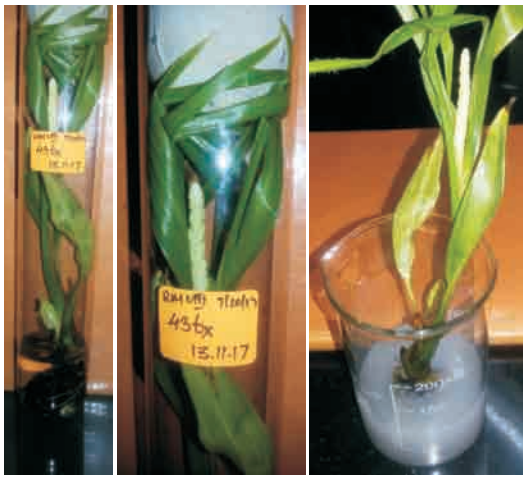


Fig. 2. In vitro flowering in tissue culture plantlets

M. Shareefa, J.S. Sreelekshmi, Regi J. Thomas and Anitha Karun

Characterization of variegated and normal arecanut trees of Mangala and Soth Kanara Local populations for physiological parameters

Physiological parameters of variegated and normal arecanut trees leaves of both Mangala and South Kanara Local populations were recorded. The photosynthetic rate of greener portion of variegated leaves did not differ significantly with normal leaves. Yellow regions of the variegated leaves showed very low chlorophyll index measurements compared to greener regions and normal leaves, hence yellow regions showed lower photosynthetic rate. Similarly stomatal conductance of green region and the normal leaves are higher than yellow regions of the variegated leaves, so is the transpiration rate. Hence expectedly, stomatal resistance was low in green region of variegated and normal leaves. Variegations in the leaves and consequently the yellow regions with less chlorophyll content reduced the transpiration rate because of its stomatal resistance but low chlorophyll content markedly influenced photosynthetic rate too.

N. R. Nagaraja, S. V. Ramesh and K. B. Hebbar

Characterization of arecanut germplasm using molecular markers

Twenty four arecanut accessions were characterized using SSR markers. SSR banding profiles are given in Figure. Spindle leaf samples were used to extract the DNA using DNeasy Plant Mini kit (Qiagen). The dendrogram was constructed using similarity coefficient values by following the Unweighted Pair Group Method with Arithmetic Mean (UPGMA) (Figure 3). The arecanut germplasm clustered at 41% similarity coefficient. Highest similarity was observed between Mettupalayam & Shrivardhana II, Chare 1 & Shrivardhana II, Chare 1 & Mettupalayam, Duduna & Madavpur and lowest similarity with similarity value of 0.42 was found between SCRDTC 18 & Kahikuchi II and SCRDTC 18 and Ganapathi pule.

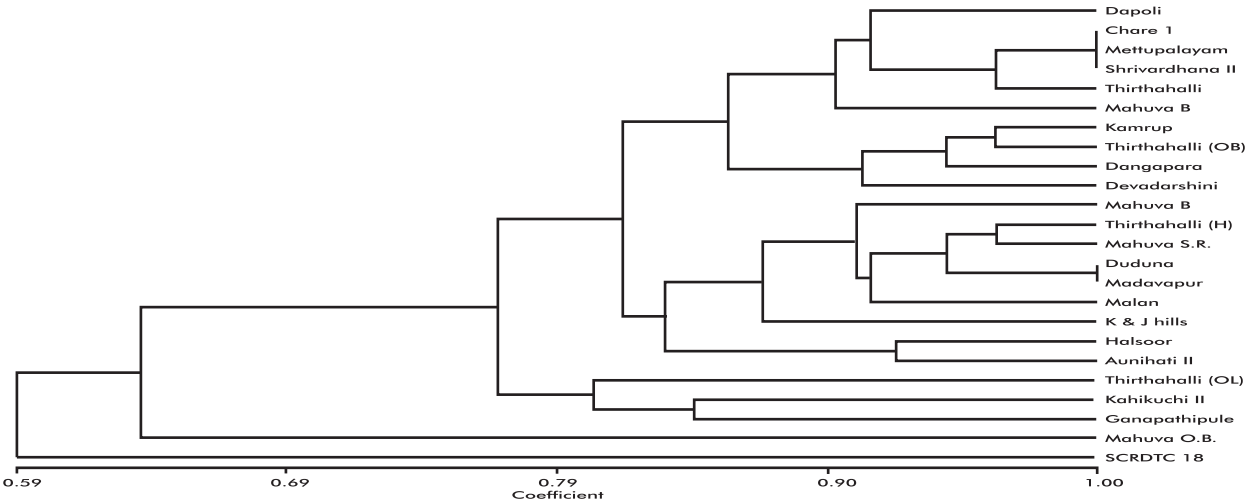


Fig. 3. UPGMA dendrogram based on SSR data

M-100 bp ladder, 1-Dapoli, 2-Chare 1, 3-Kamrup, 4-Thirthahalli (OL), 5-Thirthahalli (OB), 6-Mettupalayam, 7-Mahuva B, 8-Shrivardhana II, 9-Dangapara, 10-SCRDTC 18, 11-Kahikuchi II, 12-Ganapathipule, 13-Thirthahalli (H), 14-Devadarshini, 15-Mahuva O.B., 16-Duduna, 17-Mahuva S.R., 18-Halsoor, 19-Mahuva B., 20-Malan, 21-Thirthahalli, 22-Madavapur, 23-Aunihati II, 24-K & J hills.

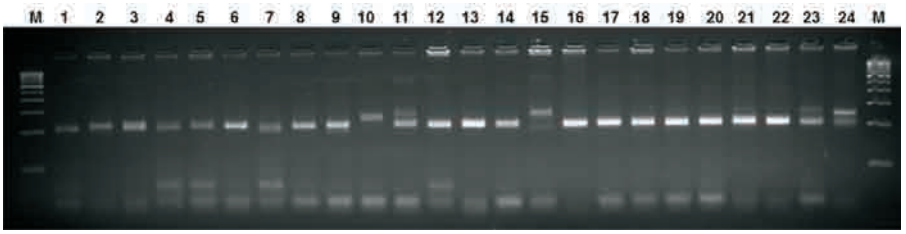


Fig. 4. SSR banding profiles generated using primer AC23 for twenty four arecanut accessions

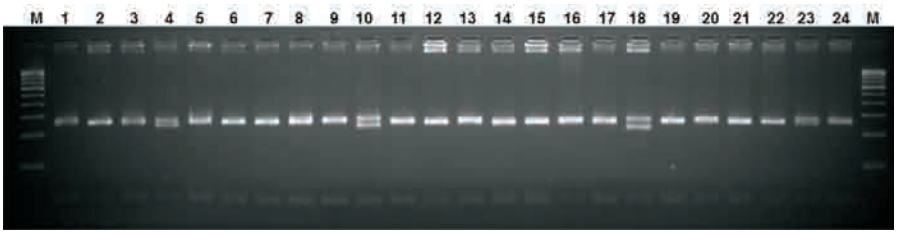


Fig. 5. SSR banding profiles generated using primer AC29 for twenty four arecanut accessions

M-100 bp ladder, 1-Dapoli, 2-Chare 1, 3-Kamrup, 4-Thirthahalli (OL), 5-Thirthahalli (OB), 6-Mettupalayam, 7-Mahuva B, 8-Shrivardhana II, 9-Dangapara, 10-SCRDTC 18, 11-Kahikuchi II, 12-Ganapathipule, 13-Thirthahalli (H), 14-Devadarshini, 15-Mahuva O.B., 16-Duduna, 17-Mahuva S.R., 18-Halsoor, 19-Mahuva B., 20-Malan, 21-Thirthahalli, 22-Madavapur, 23-Aunihati II, 24-K & J hills.

N. R. Nagaraja, K. S. Ananda and M. K. Rajesh

Compatibility reactions in cocoa

Compatibility reactions were studied in eleven cocoa accessions. Based on the frequency of flower retention after manual protected pollination, trees were classified as self-incompatible or self-compatible. Trees with flower retention (FR) of 10% or less 15 days after pollination were classified as self-incompatible, whereas trees with 30% or more flowers after same span of time were considered as self-compatible. Among the eleven accessions studied, flower retention varied from 0% to 10%. Maximum flower retention percentage of 10 was observed in the tree belongs to accession VTLC-186 and 0% flower retention was recorded in nine trees of nine different cocoa accessions viz., VTLC-162, VTLC-187, VTLC-159, VTLC-193, VTLC-179, VTLC-170, VTLC-174, VTLC-160 and VTLC-189. Cocoa tree belongs to the accession VTLC-167 exhibited flower retention percentage of 7.69.

Nagaraja N. R. and S. Elain Apshara

Nutrient mixtures for juvenile and adult coconut palms

Two nutrient mixtures *viz.*, 'Kalpa Poshak', comprising of potassium, sulphur, zinc, copper and boron, for juvenile coconut palms and 'Kalpa Vardhini', comprising of potassium, magnesium, sulphur, zinc and chlorine for adult bearing palms were released during the Kisan Conference on 8/1/2018 at ICAR-CPCRI, Kasargod by Shri. D. V. Sadananda Gowda, Hon'ble Union Minister for Statistics and Programme Implementation, Govt. of India.

Application of Kalpa Poshak @ 40 g per palm infour split dosse enhanced the growth parameters such as height and number of leaves of Kalpa Sankara hybrids at ICAR-CPCRI, Regional Station, Kayamkulam. The palms supplied with Kalpa Vardhini @ 125 g each in four split doses along with recommended dose of fertilisers recorded early flowering.

The recommended dosage of Kalpa Poshak is 40 g per year for the 1st year after planting and 100 g per palm per year from 2nd year onwards and that of Kalpa Vardhini is 500 g per palm per year.

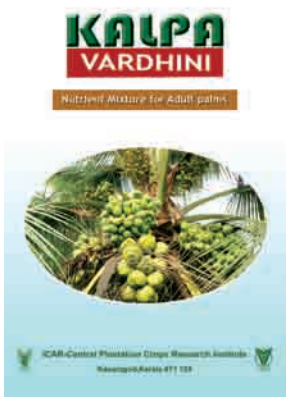


Fig. 6. Micronutrient formulations for coconut seedlings

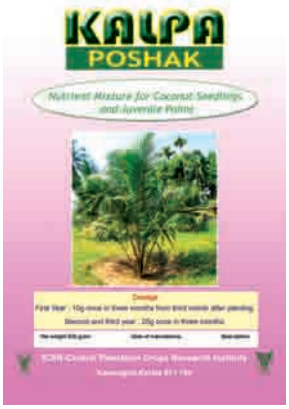


Fig. 7. Micronutrient formulations for coconut palms

Jeena Mathew, V. Krishnakumar, Abdul Haris, Ravi Bhat, P. Chowdappa

A promising plant growth promoting fluorescent rhizobacterium *Pseudomonas migulae*

A soil bacterium originally isolated as phosphate solubilising rhizobacteria (K3HPSB3) on Pikovskaya's agar isolation media collected from rhizosphere soil of healthy coconut palm in root (wilt) disease tract (Kumarakom, Kottayam) produced green fluorescent pigment in King's B agar media (Fig. 8). Apart from its ability to solubilize tricalcium phosphate, it also solubilized potassium, zinc and silicate from their fixed forms when supplemented through mineral media agar base (Fig. 9). It also secreted indole acetic acid in

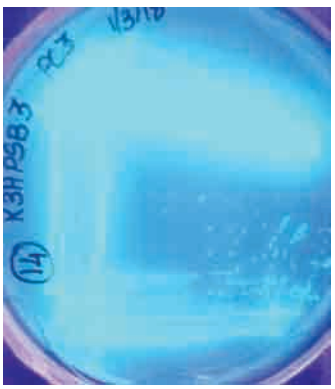


Fig. 7. Green fluorescence of K3HPSB3 on KB media under UV light

lower quantum (~2.5 μg mL^{-1}) in tryptophan supplemented media. Ribosomal 16S rRNA sequence analysis confirmed its identity as *Pseudomonas* sp. showing 99% sequence similarity with *Pseudomonas migulae*. It is being studied further for its plant growth promoting potential for developing PGPR bio-inoculants.

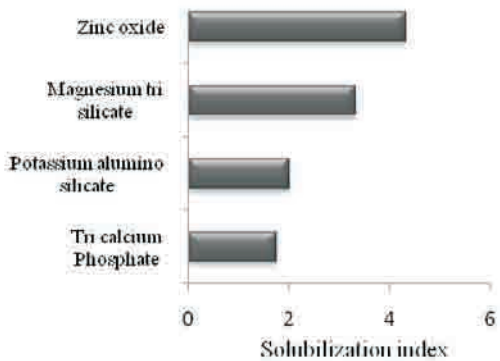


Fig. 9. Mineral nutrients Solubilization index of *Pseudomonas* sp.

Indhuja S, Merin Babu, Alka Gupta and Murali Gopal

Screening of cocoa accessions for Tea Mosquito Bug (TMB) resistance

Screening of 44 Upper Amazon Forastero/ Refractario cocoa accessions was carried out under field condition for TMB resistance based on the pod damage. Percent Damage and Severity Index were calculated to assess the accession wise TMB damage. Percent Damage was ranging from 0% to 20%. Zero percent damage was observed in 15 cocoa accessions and 20 percent damage was recorded in the cocoa accession VTLC-186. The two accessions, VTLC-173 and VTLC-176, which showed 0% pod damage during last year, exhibited 0% damage this year also. Cocoa accession, VTLC-186, which exhibited highest percent pod damage during last year (90.90%), this year also recorded highest percentage of pod damage (20%).

Nagaraja N. R. and S. Elain Apshara

A new entomopathogenic nematode from Kerala

A new species of entomopathogenic nematode belonging to Steinernematidae was isolated through *Galleria mellonella* soil baiting technique from Pathiyoor, Kerala, India. This steinernematid species was identified as *Steinernema hermaphroditum* (CPCRI-0905) based on the morphometric and molecular characterization by sequencing ITS region of the ribosomal DNA using 18S and 26S primers. Average length of the infective juveniles of this species is about 920μ, thus it belongs to glaseri group of steinernematids as confirmed through molecular phylogeny. Occurrence of *Steinernema hermaphroditum* is very sparse in our country and the presence of first generation hermaphroditic females is a unique feature of this species, which is rare among steinernematids.

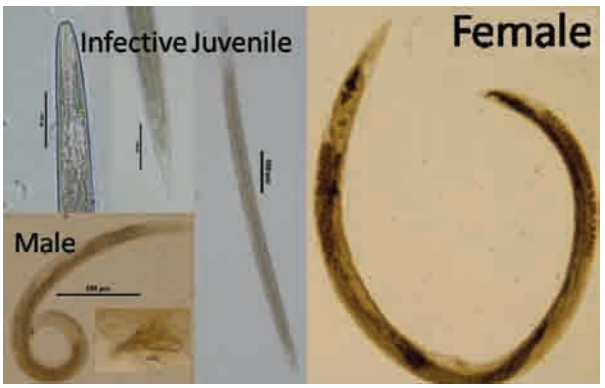


Fig. 6. Entomopathogenic nematode *Steinernema hermaphroditum*

Bio-control potential of this species is being investigated against coconut pests and the predominance of natural occurrence of entomopathogenic nematodes in this tract of Kerala could be one of the reasons for the natural

Anes, K.M., Merin Babu and Josephrajkumar, A.

Kalpa Sankara coconut hybrid for the root (wilt) disease prevalent tracts

Replanting root (wilt) disease affected gardens with seedlings of resistant / tolerant varieties is the strategy for increasing production and productivity of coconut. West Coast Tall (WCT) variety, which is the only extensively cultivated variety in the root

This hybrid by the name 'Kalpa Sankara' was released during 2012 for cultivation in the root (wilt) disease prevalent tracts.

Presently, The Department of Agriculture, Govt. of Kerala has listed 'Kalpa Sankara' in the list of

coconut varieties to be planted in demonstration plots in all the root (wilt) disease prevalent districts. The demand for seedlings of Kalpa Sankara (CGD x WCT) hybrid is very high.

To meet the seedling demand, a project entitled 'Large scale production of dwarf and hybrid seedlings of coconut for the root (wilt) disease prevalent tract' under 'Kera Samrudhi' scheme has been entrusted by the Govt. of Kerala to ICAR-CPCRI, Regional Station, Kayamkulam for a period of four years. The main focus of the project is decentralized hybrid seedling production in four districts (viz., Alappuzha, Kollam, Kottayam and Pathanmathitta) of Kerala State. Pollen for the decentralized hybrid seedling production is supplied from the centralized cryopreservatory established and maintained at ICAR-CPCRI, Regional Station, Kayamkulam. Photo: Kalpa Sankara coconut hybrid (on front cover).

Regi J. Thomas, Shareefa, M., Merin Babu and Kalavathi, S.

Registration for coconut seedlings at Kayamkulam

Registration for coconut seedlings was conducted at ICAR-CPCRI, Regional Station, Kayamkulam during 01-03rd March 2018. During the three day mustering programme, nearly 3650 farmers had registered for obtaining coconut seedlings. Farmers waited in long queues and got themselves enrolled and were acknowledged with a receipt. Distribution of coconut seedlings will be held during June 6-8, 2018. There was an overwhelming response from the farmers this year who were also technically empowered on scientific coconut cultivation and the experimental plots were showcased by our team. Farmers were also acquainted with the usage of e-Kalpa, a digital service in plantation sector.

Inauguration of booking for coconut seedling and farmers in queue for the booking of seedlings

Workshop on 'NGS Data analysis'

A workshop on 'Next Generation Sequencing (NGS) Data Analysis' was held under the chairmanship of Dr. P. Chowdappa, Director at ICAR-CPCRI, Kasaragod during 12th to 16th March, 2018. Experts in molecular biology and bioinformatics handled the sessions.

Workshop on "NGS data analysis" at Kasaragod

Awards

The Institute exhibition stall was awarded with First Prize for the Best Stall in the category of Government Organizations in the National Horticultural Fair organized at ICAR-India Institute of Horticultural Research (IIHR), Bengaluru during 15th to 17th March, 2018.

The poster "Arising pest threats on Banana in Kerala" by Sivakumar, T., Josephrajkumar, A., and Jiji, T. was adjudged as the best poster in the National Banana Festival-2018 held at Kalliyoor, Thiruvananthapuram, Kerala during 17th-21st February, 2018.

IMPORTANT EVENTS

A Mega Kisan Conference and an Agri-business Expo 2018

A mega Kisan Conference and Agri-business Expo-2018 was organized at ICAR-CPCRI, Kasaragod in connection with the foundation day celebrations of the Institute, which is in its 101st year of establishment, and the 25th year of establishment of ICAR-KVK, Kasaragod. The Agri-business Expo was inaugurated by Shri E. Chandrasekharan, Hon'ble Minister for Revenue, Govt. of Kerala on 5th January, 2018.

The mega Kisan Conference held on 8th January 2018 was inaugurated by the chief guest Shri D.V. Sadananda Gowda, Hon'ble Union Minister for Statistics and Programme Implementation, Govt. of India. On the occasion, the minister also inaugurated the new building of Kendriya Vidyalaya No. 1, Kasaragod.

Hon'ble Union Minister, in his inaugural address highlighted the importance of the agriculture in the national economy. He also emphasized that the government has implemented various schemes such as 'Krishi Sinchayi Yojana', 'Paramparagat Krishi Vikas Yojana', etc. to double the farmer's income by 2022. He mentioned that so far 9.91 crore soil health cards have been distributed by the government. He appreciated the efforts of ICAR-CPCRI in enhancing the productivity and income of the plantation growers in the country.

Shri D.V. Sadananda Gowda, Hon'ble Union Minister for Statistics and Programme Implementation, Govt. of India inaugurating the new building of Kendriya Vidyalaya No. 1, Kasaragod

The Hon'ble Minister released a commemorative postal stamp to mark 100 years of ICAR-CPCRI in the presence of Col. S.F.H. Rizvi, Post Master General, Northern Region,

Shri E. Chandrasekharan, Hon'ble Minister for Revenue, Govt. of Kerala inaugurating the Agri-business Expo

Shri D.V. Sadananda Gowda, Hon'ble Union Minister for Statistics and Programme Implementation, Govt. of India inaugurating the Kisan Mela

Kozhikode. The Hon'ble Minister felicitated three of the best farmers of the region: Shri Sibi Joseph of Balal, Kasaragod (coconut), Shri Rama Kishore of Bantwal, Karnataka (arecanut), and Shri Vishwanath Rao of Sullia (cocoa), during the function. MoUs on licensing of technologies developed by the Institute were also exchanged before the Hon'ble Minister: arecanut tissue culture, coir pith composting and coconut leaf composting with Southern Petrochemical Industries Corporation (SPIC), Coimbatore and virgin coconut oil (VCO), coconut chips, frozen coconut delicacies and Kalparasa with Madhura Agro, Coimbatore.

ICAR-CPCRI centenary commemorative postage stamps

Release of commemorative postal stamps

Micronutrient formulations for coconut viz., 'Kalpa Vardhini' and 'Kalpa Poshak' and selected publications viz., "25 years of ICAR-Krishi Vigyan Kendra Kasaragod", "Entrepreneur and Farmer Friendly Technologies" in Hindi and "Coconut" in Malayalam and Kannada were released by the Union Minister on the occasion.

Shri P. Karunakaran Hon'ble Member of

Dr. P. Chowdappa, Director, ICAR-CPCRI handing over MOU on arecanut tissue culture to Shri Narayanan of SPIC, Coimbatore in the presence of Shri D.V. Sadananda Gowda, Hon'ble Minister for Statistics and Programme Implementation, Govt. of India

Parliament, Kasaragod presided over the function. Shri N. A. Nellikunnu Hon'ble MLA, Kasaragod, Shri A.G.C. Basheer, President, Kasaragod District Panchayath, Shri A.A. Jaleel, President, Mogral Puthur Panchayath, offered felicitations. Smt. T.R. Ushadevi, Principal Agriculture Officer, Kasaragod was also present. Dr. A.K. Singh, DDG (Hort. Sci.) ICAR, mentioned the landmark achievement of ICAR-CPCRI in enhancing productivity of coconut from 5000 nuts per hectare to 13000 per hectare over the years. The Kisan Conference was attended by nearly 3000 farmers.

Concurrent with the six day Agri-business Expo, the following farmer interface programmes were also organized: i) Seminar on 'Soil and water conservation technologies and integrated soil health management' (5th January, 2018; 10:30 AM); ii) Seminar on 'High value under-utilized fruits' (5th January, 2018; 11:30 AM); iii) Training on 'Arecanut based multispecies cropping system and management of root grub using entomopathogenic nematodes' (6th January, 2018; 10:30 AM); iv) Seminar on 'Production and processing of cocoa' (6th January, 2018; 11:30 AM); v) Seminar on 'Dairying, goat farming, poultry rearing & fisheries for doubling farmers' income' (6th January, 2018; 2:30 PM); vi) Workshop on 'Bio-suppression of rugose spiraling whitefly of coconut' (6th January, 2018; 9:30 AM); vii) Seminar on 'Crop diversity' (6th January, 2018; 11:30 AM); viii) 'Start-up Green 2018 - Enabling Agripreneurship' (7th January, 2018; 10:30 AM); viii) 'KVK-ATMA: Farmer-Scientist Interface meeting' (8th January, 2018; 2:00 PM); ix) Interface meeting on 'Beekeeping' (9th January, 2018; 10:30 AM); x) Awareness programme on 'Energy conservation and LED bulb assembly' (9th January, 2018; 11:30 AM); xi) Seminar on 'Urban and peri-urban horticulture' (10th January, 2018; 11:00 AM) and xii) Interface on 'Value addition to coconut, mango and jackfruits' (10th January, 2018; 2:00 PM). A total of 3,000 farmers and other stakeholders actively participated in these interface programmes.

Glimpses of the Agri-business Expo 2018

There were about 150 exhibition stalls including representatives of ICAR Institutes, corporate sector agri-business houses and small and medium scale enterprises. On an average, around 10,000 visitors, comprising of farmers, entrepreneurs and school students, visited the exhibition daily.

The Valedictory Function of the Kisan Conference and Agri-Business Expo- 2018 was held on 10th January, 2018 under the chairmanship of Dr. P. Chowdappa, Director, ICAR-CPCRI.

Crop Diversity Fair

A seminar and exhibition on crop diversity was held on 6th January, 2018 under the chairmanship of Dr. P. Chowdappa, Director, ICAR-CPCRI at ICAR- CPCRI, Kasaragod, with funding support from Bioversity International and the Kerala Gramin Bank. The seminar was inaugurated by Dr. N Krishna Kumar, Bioversity International Regional Representative for South and Central Asia and former DDG, Horticultural Sciences, ICAR. In his inaugural address, Dr. N.K. Krishna Kumar emphasized that diversity drives evolution and called upon the participants to plant and nurture at

Dr. N.K. Krishna Kumar, Bioversity International Regional Representative for South and Central Asia, visiting the crop diversity fair along with Dr. P. Chowdappa, Director, ICAR-CPCRI

least one plant and to help prevent the loss of food diversity and extinction of native breeds/landraces. Dr. Sooryaprakash Shenoy, Principal Scientist and Head at Dr. Shivarama Karanatha Pilikula Nisargadhama, Pilikula, Mangalore talked about 'Plant diversity in Western Ghats'. Mr. Jayakumar from Thanal, Thiruvanathapuram, Kerala spoke about, "Role of NGO's in conservation". Mrs. Manorama Joshi, Secretary, Vanastree, Sirsi, Karnataka shared her experiences on "Conservation in homestead-community seed production and livelihood opportunities". Dr. Chandrashekar Chowta, progressive farmer from Miyapadavu, Kasaragod spoke on 'Food diversity- status and challenges'. Mr. Jayaprakash, Secretary, Pulari organization, Kasaragod, Mr. Parameshwara Bhat, traditional rice grower from Belthangadi, Karnataka and Mr. Suresh, a farmer from Wayanad, shared their experiences in the field of conservation. Farmers and farmer's organization from different parts of the Karnataka and Kerala, exhibited their collection of traditional varieties and landraces of different agricultural crops. About 300 participants attended the seminar.

Workshop on Bio-suppression of Rugose Spiraling Whitefly

The workshop on "Bio-suppression of rugose spiraling whitefly" of coconut, which was organized on 6th January 2018, was inaugurated by Dr. N.K. Krishna Kumar, Regional Representative, South and Central Asia, Bioversity International under the chairmanship of Dr. P. Chowdappa, Director. Dr. P. K. Chakrabarty, ADG (Plant Protection), ICAR was also present as guest of honour. Strategies for management of the invasive rugose spiraling whitefly, were worked out, along with release of technical bulletin and posters in English, Hindi, Malayalam, Kannada, Tamil and Telugu for distribution to different stakeholders in various coconut growing states.

Posters on "Invasive rugose spiraling whitefly of coconut" in six languages

World Soil Day celebrated at ICAR-CPCRI, Kasaragod

Various programmes were organized by ICAR-Central Plantation Crops Research Institute, Kasaragod as part of the World Soil Day celebration on 5th December 2017. World Soil Day celebrations and distribution of Soil Health Cards to farmers were inaugurated by

Permanent hoardings on Soil Health Card scheme have been installed at ICAR-CPCRI and KVK, Kasaragod

Shri. N.A.Nellikkunnu, Hon'ble M.L.A., Kasaragod at CPCRI, Kasaragod. Soil health cards were distributed to about 100 farmers from various villages of Kasaragod district in the function. In his inaugural address Shri Nellikkunnu stated that soil testing and distribution of soil health cards would be quite beneficial to the farming community for optimising nutrient management in crops cultivated, reducing cost of cultivation and enhancing productivity. It is an important intervention for ensuring sustainable crop production; he added.

Research Advisory Committee meeting

The XXth Research Advisory Committee Meeting of ICAR-Central Plantation Crops Research Institute, Kasaragod was held during 5th and 6thMarch, 2018. Following members of RAC have participated, Dr. H.P. Singh, Former DDG (Hort.), ICAR Chairman, Dr. P. Das, Dr. N. Kumar, Dr. P. Chowdappa, Director, ICAR-CPCRI, Dr. W.S. Dhillon, ADG (HS-II), ICAR, New Delhi, Shri. Suresh Kumar Shettty, Shri. Shivakrishna Bhat, Members and Dr. K.B. Hebbar, HD (PB&PHT) Member Secretary, along with the Scientists of ICAR- CPCRI, KVK-Kasaragod, KVK-Alleppey. Dr. P. Chowdappa, Director extended warm welcome to the Chairman and members of the committee. In his presentation, he provided the glimpses of ICAR-CPCRI's achievements and progress made during the year.

Following were the recommendations made by the RAC:

- Strengthen efforts to generate mapping populations in coconut using segregating populations already available within the Institute and AICRPP centres.
- Efforts may be made to sequence the whole genome of a tall variety of coconut to identify genes controlling plant habit by comparing with the genome of the dwarf cutlivar already available.
- Generate genome sequence of arecanut to decipher genes responsible for arecoline content to aid development of varieties with low arecoline content.

Dr. H.P. Singh, Former DDG (Hort.), ICAR Chairman, addressing the scientists at ICAR-CPCRI, Kasaragod

- Reinforce work on climate-smart management of palms and cocoa to combat the anticipated effects of climate change and develop suitable varieties to meet the future challenges.
- Strengthen the production of quality planting materials through Public-Private-Partnership (PPP) mode.
- Scale up initiatives in value addition in coconut and arecanut.
- Mass scale multiplication and release of parasitoids/ biocontrol agents to control the menace of rugose spiralling whitefly in collaboration with AICRPs. Assess impact of technologies developed by the Institute in effecting social and economic transformation.

Institute Research Committee meeting

The 46th Annual Institute Research Committee Meeting of the ICAR-Central Plantation Crops Research Institute, Kasaragod was held at ICAR-CPCRI Kasaragod during 20th - 24th March, 2018. The Plenary Session was held on 24th March, 2018 under the chairmanship of Dr. P. Chowdappa, Director. The session was co-chaired by Dr. Homey Cheriyan, Director, Directorate of Arecanut and Spices Development, Kozhikode, Kerala. The progress of research programmes and achievements under the ongoing projects under crop improvement, biotechnology, crop production, integrated disease management, integrated pest management, physiology & biochemistry, pre and post-harvest technology, value addition and social sciences including transfer of technologies were presented by the respective Principal Investigators.

During the meeting, all the ongoing research projects (including externally funded projects) grouped under seven research programmes were discussed in detail and the technical programme for the year 2018-19 was finalized.

Dr. Homey Cheriyan, Director, Directorate of Arecanut and Spices Development, Kozhikode addressing the members of IRC at ICAR-CPCRI, Kasaragod

Institute Management Committee meeting

Institue Joint Staff Council meeting of ICAR-CPCRI, Kasaragod was held on 3rd March, 2018 at CPCRI, Kasaragod under the chairmanship of Dr. P. Chowdappa, Director. Major activities of the institute were presented before the IMC members and the recommendations were recorded. The reconstituted Institute Grievance Committee was approved during the meeting.

Meeting of the IMC at ICAR-CPCRI, Kasaragod

Visit of Second Sub-committee of Committee of Parliament on Official Language

Dr. Prassanna Kumar Patsani, Hon'ble Member of Parliament (Rajya Sabha) and Dr. Sunil Baliram Gaikwad Hon'ble Member of Parliament (Lok Sabha), Second Sub-committee of Committee of

Hindi Parliamentarians releasing the technical bulletin and visiting the coconut exhibits

Parliament on Official Language visited Alappuzha, Kerala on 24th January, 2018 as part of inspection regarding use of Hindi in the Department. Hon'ble dignitaries were extremely pleased to see the coconut exhibits of ICAR-CPCRI displayed in Hindi and the review was rated as good on all aspects of implementation of official language by the Regional Station. Some of the Hindi publications on value added products of coconut, rugose spiraling whitefly as well as a poster were released by Hon'ble Parliamentarians. Dr. P. Chowdappa, Director, ICAR-CPCRI, Dr. V. Krishnakumar, Head, ICAR-CPCRI, Regional Station, Kayamkulam, Dr, Vikramaditya, Principal Scientist, ICAR, New Delhi, Shri. M.L. Gupta, Assistant Director (OL) and Mr. Manoj Kumar, ACTO, (OL) participated in the review programme.

Dream Big Kalpa 2018

An interface programme of scientists and entrepreneurs named "Dream Big Kalpa 2018" was held on 31st January, 2018 at ICAR-CPCRI, Kasaragod under the chairmanship of Dr. P. Chowdappa, Director. He mentioned the importance of value addition and invited the participants to take-up the technologies from ICAR-CPCRI. He also highlighted the technology worthiness and pointed out that so far 185 technology transfers have been made in just three years with 16 potential technologies. He also called for forming clusters of farmers called 'Kisan Sampadas' to take forward the entrepreneurial industries overcoming the major hindrances of land fragmentation, increasing input costs, climatic vagaries and market competitions.

Mr. Abdul Rasheed, General Manager, District Industries Center, Kasaragod was the Chief Guest. He spoke on the various programmes by the Kerala State Government to promote entrepreneurship, such as trainings, micro-credits, marketing, trade fairs, certifications, and various promotive strategies, by adopting which sky is the limit for a young entrepreneur. He invited the participants to break the comfort zones and emerge as leaders in the arena and opportunities available in Kasaragod. Mr. Sawad Nullippady, Coordinator, Start-up Mission, Kerala spoke on the various opportunities and the support programmes for starting business entreprise. He invited the participants to make use of the various Central and State Government subsidies and schemes.

During the programme, MoUs on ICAR-CPCRI technologies were exchanged with entrepreneurs followed by presentation of ICAR-CPCRI technologies and exhibition of products and services as well as publications. A special lecture on the various programmes of Coconut Development Board under Coconut Mission were highlighted by Shri K.S. Sebastian, Asst. Director (Mktg.), CDB, Kochi.

Mr. Pravas K. Naik, Krishna Plantations, Goa receiving a copy of the MoU from Dr. P. Chowdappa, Director, ICAR-CPCRI, Kasaragod

International Training Programmes

Two short duration training programmes and two one-day programmes were conducted with the participation of 75 foreign delegates from 14 countries. Twenty one executives from seven Asian and African countries (Cambodia, Ghana, Kenya, Liberia, Malawi, Sudan, and Uganda) have participated in the 'Feed The Future Indian International Training' (FTF ITT) programme on income generating enterprises in plantation sector conducted during 13th - 27th February 2018 in collaboration with National Institute of Agricultural Extension Management (MANAGE), Hyderabad.'

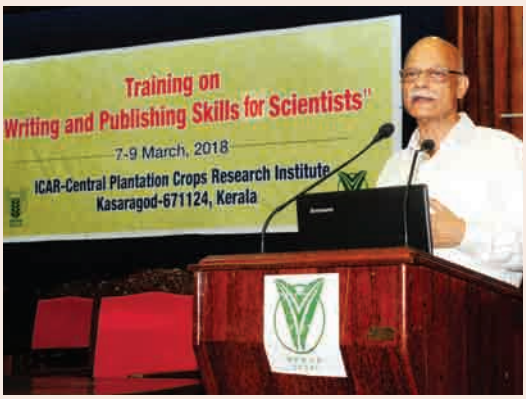
Under the India-Africa Forum Summit-III (IAFS-III), another training programme on Value Addition and Product Diversification of Coconut and Cocoa' was conducted during 1-15 March 2018 in which 14 foreign delegates from 10 African countries (Ghana, Kenya, Malawi, Sudan, Uganda, Tanzania, Nigeria, Ethiopia, Mali and Zambia) have participated.

Participants and faculty of International Training Programme (FTF ITT) on 'Income Generating Enterprises in Plantation Sector' along with Director, ICAR-CPCRI, Kasaragod

Participants and faculty of International Training Programme on 'Value Addition and Product Diversification of Coconut and Cocoa' along with dignitories at ICAR-CPCRI, Kasaragod

Training Workshop on 'Writing and Publishing Skills for Scientists'

A training workshop on "Writing and Publishing Skills for Scientists" was organized on 7-9th March 2018 at ICAR-CPCRI Kasaragod. A total of 34 scientists attended the programme. Among the participants three each were from ICAR-DCR, Puttur, ICAR-IISR, Kozhikode and ICAR-CIFT, Kochi and the 26 were from ICAR-CPCRI. The training comprised of different sessions, covering how to search the Internet more efficiently and writing literature reviews, writing effective emails, letters, and memos, make it easier for the readers to absorb quantitative information, tackle larger writing tasks (reports, position papers, articles for trade magazines, etc.), produce well-designed documents and posters that do justice to a particular research work etc. Dr. Yateendra Joshi, Associate Fellow, Communication Research Institute, Canberra handled the technical sessions in the training.



Dr. Yateendra Joshi, Associate Fellow, Communication Research Institute, Canberra handling technical session on "Writing and Publishing Skills" at ICAR-CPCRI, Kasaragod

Training Programme on 'Basics in computer Applications'

A training programme on 'Basics in computer Applications' for skilled supporting staff (SSS) of ICAR-CPCRI, RS Vittal and RC Kidu was conducted at ICAR-CPCRI Regional Station, Vittal during 13th to 15th March, 2018. Following SSS participated in the programme: Shri Chandu Naik, Shri Choma B., Shri Dharmapala, B., Shri M. Ananda and Shri Isubu D., Skilled Support Staff, ICAR-CPCRI RS Vittal and Shri Jathappa V., ICAR-CPCRI, RC, Kidu.

Another training programme on 'Basics in Computer Applications' targetting the technical staff of ICAR-CPCRI Kasaragod, was conducted during 27th to 28th March, 2018. Following technical personnel participated in the programme: Shri V. Balakrishna, TO (Field/Farm), Shri A. Divakaran, Sr. Technician, Shri K. Balakrishna, TO (Field/Farm), Shri P. K. Krishnankutty, Tech. Assistant, Shri Rajendran Nair M.P. TO (Mech. Engg.) and Shri Radhakrishnan Nambiar, Sr. Tech. Assistant. The course contents included familiarization of basics of computer hardware and software and also hands on practical sessions.

Certificate distribution of training programme on 'Basics in Computer Applications' at ICAR-CPCRI, RS, Vittal

Certificate distribution of training programme on 'Basics in Computer Applications' at ICAR-CPCRI, Kasaragod

Training programme on 'Nursery Techniques'

A training programme on 'Nursery Techniques and Farm Management Practices in Plantation crops' was organized at ICAR-CPCRI RC Kidu during 14th -16th March, 2018. Shri Padmayya Gowda, Shri S. Venkataramana, Shri S. Regappa Gowda, Shri S. Neelappa, Smt. N. Bhavani, Smt. S. Chandravathi, Shri Ananda M., Shri S. Janardhana, Shri M. Durgesha, Smt. S. Rukmini and Smt. S. Susheela, Skilled Supporting Staff, ICAR-CPCRI, RC, Kidu, attended the training.

Training prorgamme on 'Nursery Techniques and Farm Management Practices in Plantation Crops' at ICAR-CPCRI, RC, Kidu

Participants of the training prorgamme on 'Nursery Techniques and Farm Management Practices in Plantation Crops' at ICAR-CPCRI, RC, Kidu

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Kalavathi, S., Merin Babu, Jeena Mathew and Jacob Kurien 2018. Effective utilization of beneficial microbes. *Kerala Karshakan*, **63** (9): 60-61.

Lekha G and Muralidharan P. 2018. Eco friendly management of amaranthus leafspot disease, *Karshakasree* **24** (3):58 (in Malayalam).

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Anes, K.M., Josephrajkumar, A., Merin Babu, Nihad, K., Indhuja, S., Shareefa M., Jeena Mathew and Krishnakumar, V. 2018. Training manual on 'Advances in Pest Management and Harnessing Scientific Temperament', ICAR-CPCRI, Regional Station, Kayamkulam, p. 50.

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HUMAN RESOURCES DEVELOPMENT

Training attended

Name & designation	Title	Place and date
Dr. Vinayaka Hegde, Head, Dr. Alka Gupta, Dr. Joseph Rajkumar, Principal Scientists, Dr. M. Senthil Amudan, Mr. S. Jayasekhar, Dr. S. Paulraj, Dr. Neema M., Dr. Neenu S., Dr. Prathibha P.S., Dr. Sujithra M., Dr. Selvamani V., Dr. Rajkumar, Dr. Sudha R., Dr. Merin Babu, Dr. Jeena Mathew, Dr. Nihad, Dr. N.R. Nagaraja, Mr. Khadke Ganesh Navanath, Mr. R. Thava Prakasa Pandian, Mrs. Jilu V Sajan, Dr. Indhuja, Ms. Suchithra, Dr. Anes, Ms. T.N. Ranjini, Mr. Najeeb Naduthodi, Mr. Diwakar Y., Scientists	Writing and publishing skills of scientists	ICAR-CPCRI, Kasaragod 7-9, March 2018
Dr. Indhuja S, Scientist	Training cum workshop on 'Microbial Identification and Preservation'	NCMR-NCCS, Pune 8th to 13th January, 2018
	Training cum workshop on 'Microbial Genomics'	NCMR-NCCS, Pune 15th to 19th January, 2018
Dr. Sudha R., Scientist	21 days CAFT training programme on "Application of OMICS tools and techniques for agricultural germplasm improvement"	ICAR-IASRI, New Delhi 9th February to 1st March, 2018

TRANSFER OF TECHNOLOGY

On - campus Trainings

District level training programme on 'Pest and disease management in coconut' under the project 'Technology support for plant protection campaign against pests and diseases of coconut' was conducted at ICAR- CPCRI, Kasaragod for 83 farmers on 15th February 2017.

Shri A.G.C. Basheer, President, Kasaragod District Panchayath inaugurating the district level workshop at CPCRI Kasaragod

A training programme on ' Coconut cultivation practices' for 37 farmers from Nilambur, Malappuram district, Kerala was organized at ICAR-CPCRI, Kasaragod on 1st March 2018 in collaboration with ATMA, Malappuram.

Participants of Training programme on "Coconut cultivation practices" at Kasaragod

A training programme on ' Integrated crop management in coconut' for 20 farmers from Kalliassery block, Kannur district was organized at ICAR- CPCRI, Kasaragod on 26th March 2018 in collaboration with ATMA, Kannur.

Participants of training programme on "Integrated crop management in coconut" at Kasaragod

Training programme on 'Advances in pest management and harnessing scientific temperament' was organised for 10 B. Sc. (Zoology) students of Bishop Moore College, Mavelikkara during 14th-15th March, 2018. A holistic module covering all frontier technological updates were imparted to the students by faculties of ICAR-CPCRI, RS, Kayamkulam.

A training programme on 'Hybridisation techniques and plant health management in coconut was conducted' at ICAR-CPCRI, RS,

Visit of trainees to experimental field

Kayamkulam during 5th-9th February, 2018 for 18 participants including climbers, progressive farmers, members nominated by NGOs, Coconut Producer Societies (CPS) etc.

Organized a one-day training programme for the selected 50 farmers of Vyalar Krishi Bhavan on 16th February, 2018. Besides orientation of the Institute's activities on farmer's welfare, technical sessions on ecological engineering in coconut and organic farming were imparted. The farmers were also taken around the experimental farm and showcased the latest updates on scientific approaches in coconut farming.

A field oriented practical updates on Health management in coconut was imparted to 22 farmers of Kallooppara Farmers' club on 17th February, 2018.

Integrated Pest and Disease Management in coconut for 22 climbing technicians under the Changathikkoottam programme of Anugraha Social Service Society was conducted on 23rd February, 2018.

Around 150 school students from Pathiyoor Govt. LP School were exposed to all experimental plots, dairy farm, coconut museum for infusing interest in farming on the younger minds on 16th February, 2018 .

Ten days training programme on 'Cocoa Production Technology' sponsored by National Institute of Agricultural Extension Management (MANAGE), Hyderabad was organized at ICAR-CPCRI, Regional Station, Vittal during 15th to 24th February 2018. Nineteen participants from different states like Karnataka, Kerala, Tamil Nadu, Andhra Pradesh and Madhya Pradesh participated in the training programme.

Certificate distribution to participants at Vittal

Training programme on 'Multi Species Cropping System in Arecanut Garden for Higher Income' sponsored by Directorate of Arecanut and Spices Development (DASD), Calicut was organized at ICAR-CPCRI, Regional Station, Vittal on 16th March, 2018. Ninety participants attended the programme and got benefitted.

Off campus trainings

Field day on 'Arecanut Based Multi Species Cropping System for Higher Income' sponsored by Directorate of Arecanut and Spices Development (DASD), Calicut was organized at Shri Kashmeer D'Souza's garden, Kokkada, Belthangady Tk., Dakshina Kannada Dt., Karnataka on 17th March, 2018. Ninety five participants attended the field day and got benefitted.

Farmer First program

Different levels of stakeholders meeting among FFP farmers on sesamum cultivation, pond based farming system, processing of turmeric and coconut, cultivations of tuber crops and turmeric, desi cows and dairy were organized during the period in Pathiyoor. More than three-hundred and fifty farmers participated and were empowered on technical knowhow for refining the farming operations and processing approaches.

Participants of the field day at Kokkada, Belthangady, D.K., Karnataka

Off campus Training programmes and field level demonstrations on 'Pest and disease management

in coconut' under the project 'Technology support for plant protection campaign against pests and diseases of coconut' were conducted at various panchayath of Kasaragod, Kannur, Kozhikkode and Malappuram districts. The details are furnished below.

Sl. No.	Date	Place	No. of farmers participated
1	21.02.2018	Kanjirapoyil, Madikkai Panchayat, Kasaragod	143
2	26.02.2018	Friend's club premises,Pilicode, Kasaragod	220
3	28.02.2018	Panchayath hall, Muzhappilangad, Kannur	50
4	02.03.2018	Sahridhaya Hall, Kundamkuzhy, Kasaragod	73
5	03.03.2018	Chemnad Panchayath Hall, Koliyadukkam, Kasaragod	137
6	05.03.2018	Krishi bhavan hall, Kavilumpara, Kozhikkode	72
7	13.03.2018	Chaithravahini club, Konnakkad, Kasaragod	32
8	15.03.2018	Panchayat hall, Kankkol, Kannur	71
9	16.03.2018	Krishi Bhavan Hall, Thamarasserry, Kozhikode	42
10	17.03.2018	Vettom, Malappuram	143
11	18.03.2018	Marancherry, Malappuram	91

Off- campus training programme on "Integrated crop management in coconut" was organized at Vishwabharathi club, Veleshwaram, Kasaragod for 52 farmers in collaboration with Ajanoor Kerasree Federation of CPS on 17 March 2018.

Field day of EPN demonstration in arecanut for the management of root grubs

A field day cum training programme on 'Entomopathogenic nematodes for the management of root grubs and multispecies cropping system in arecanut was held on 27th January, 2018 at Renjala village, Markanja panchyath of Sulli, Karnataka wherein 120 farmers participated. Dr. Rajkumar, Dr. N. R. Nagaraj and Dr. Thavaprakash Pandian, Scientists from ICAR - CPCRI, Kasaragod organized the programme. Various topics on multispecies cropping system, improved hybrids/varieties, protection and post harvest aspects were discussed. Root grub damage was found as a major problem in the region and thereby root grub management through augmentive release of EPN was successfully demonstrated at two locations in Sullia taluk of Karnataka. A series of activities including diagnostic field visits and hands on training of EPN products were conducted for the benefit of the farmers.

Hands on training on EPN products at Markanja, Sullia, D.K., Karnataka

Farmers - Scientist interface on coconut pest and disease management

The officials of Vijaya Karnataka print media in collaboration with Horticulture department, Udupi, Karnataka, ICAR CPCRI, Kasaragod, Kerala, ICAR NBAIR, Bangalore and KVK, Brahmavar, Karnataka organized 'Farmers scientist interface programme on coconut pest and

disease management on 30.01.2018 at Pragathi Soudha, Udupi, Karnataka. A total of 200 farmers from Udupi district attended the function. Shri Pramod Madhwaraj, Hon'ble Minster of Fisheries, Government of Karnataka inaugurated the function and released the publications of ICAR-CPCRI on coconut rugose spiralling whitefly management in Kannada. He appreciated the timely efforts taken by Scientific community to contain the spread of pest menace in Karnataka. Dr. Rajkumar, Scientist and Shri P. Ravindran participated in the farmers scientist interaction session and gave information on pest and disease management, palms nutrition and availability of quality planting material in coconut. The function ended with vote of thanks by Smt. Bhuveshwari, Deputy Director of horticulture, Udupi.

Surveillance surveys and awareness campaign on rugose spiraling whitefly

Dr. A. Joseph Rajkumar, Pr. Scientist, ICAR-CPCRI, Regional Station, Kayamkulam conducted surveillance surveys and created awareness campaign on the invasive rugose spiraling whitefly (RSW), *Aleurodicus rugioperculatus* in East and West Godavari districts, Andhra Pradesh. Incursion of RSW was found expanded to West Godavari region on coconut and oil palm plantations in a period of one year. Sensitization campaign was organized with the assistance of Horticulture Department, AICRP on Palms and State Agricultural University in different Mandals of East Godavari district. Coconut farmers and media were apprised of the pesticide holiday strategy and conservatory biological control using the aphelinid parasitoid, *Encarsia guadeloupae* and in situ habitat conservation of sooty mould scavenger beetle, *Leiochrinus nilgirianus* which could rejuvenate the infested palms in Kerala. Release of *E. guadeloupae*-parasitized pupae of RSW in all pest infested gardens as well as improving palm health of RSW-infested palms through nutrient supplementation and adequate irrigation were suggested.

Field training on Coconut palm health management was imparted to seven farmers of Mayithara, Cherthala on 28th March, 2018.

A training session on "Coconut cultivation practices" was held under Champakulam Coconut Producers Society, Pacha-Chekkidikkad on 13th March., 2018.

Technology support for plant protection campaign in coconut

A new project funded by Department of Agriculture Development and Farmers Welfare, Govt. of Kerala was approved for a period of three years aiming at effective translation of technology delivery mechanisms involving various stakeholders in coconut sector through farmer participatory approaches for enhancing coconut productivity. The project is operation in 12 districts of Kerala except Idukki and Waynad. Capacity building initiatives for strengthening technical capabilities of coconut farming communities were conducted in all 12 districts during February-March 2018. A total of 2048 farmers were trained during the 24 programmes conducted across the State with active collaboration of Officials from Dept. of Agriculture Development and Farmers Welfare, ATMA, Coconut Development Board, Coconut Producers Society/Federation/Company, local panchayath and peoples representatives. Technical sessions and hands on method demonstrations were conducted on frontier farming strategies viz., mother palm selection, nursery techniques, enhancing nutrient uptake mechanism along with bio-resource utilization including moisture conservation, pest and disease suppression strategies and health management during the programmes. Method demonstrations on disease suppressive compost by bio-enrichment of organic materials with Trichoderma, bio-suppression of pest and diseases in coconut were showcased for effective integration of technologies towards inclusive development of coconut farming aiming at doubling their income.

Videoconferencing

A "Feedback videoconferencing session of the international training programme" was held from ICAR-CPCRI, Kasaragod on 26th February, 2018 with MANAGE, Hyderabad

Exhibitions

Sl. No.	Exhibition	Date
1	'30th Kerala Science Congress Expo' organized by KSCSTE at Muncipal stadium, Thalassery	26-30 January 2018
2	Exhibition organized by Perumkaliyataa Mahotsavam Committee at Sree Vengakot Bhagavathi Temple, Pilicode	10-18 January 2018
3	Mega Exhibition organized by Govt. Ayurveda college, Pariyaram at Ayurveda college campus, Pariyaram	13-19 January 2018
4	"2nd International Symposium on Societal Applications in Fisheries and Aquaculture using Remote Sensing Imagery (SAFARI-2) organized by CMFRI, Kochi at Kochi	15-17 January 2018
5	'Coconut Festival 2018' Organized by Confederation of Indian Industry (CII), Coimbatore at CODISSIA Trade Fair Complex, Coimbatore	27-28 January 2018
6	Technical School, Krishnapuram in connection with the State Level Youth Festival	27-29 January, 2018.
7	Haritham 2018 - ATMA Technology Meet of Alappuzha District at Haripad	14-15 February, 2018
8	Exhibition - cum - Interface programme organized at ICAR-CPCRI (RC), Kahikuchi, Assam	19 February 2018
9	Exhibition cum Trade fair organized at Padoor Commercial Complex, New Bus stand, Kasaragod	22-26 Feb 2018
10	'Krishi Unnati Mela 2018' organized by IARI, New Delhi at IARI main campus	9-11 March 2018
11	National Horticultural Fair organized at ICAR-India Institute of Horticultural Research, Bengaluru	15th to 17th March, 2018

Radio talks/TV programme broadcast

Radio programme by All India Radio, Thiruvananthapuram

Sl.No.	Name of official	Topic	Date of broadcast
1	Dr. V. Krishnakumar, Principal Scientist & Head	Doubling income through increasing coconut production in coconut based homestead farms	3rd January, 2018
2	Dr. K.M. Anes, Scientist (Pl. Nematology)	Thengineyum idavilakaleyum akramikkunna nima virakalude niyanthranam	3rd January, 2018
3	Smt. Jissy George	Uses and benefits of Virgin Coconut oil	5th February, 2018
4	Dr. K. Nihad, Scientist (Horticulture)	Scope of floriculture in coconut garden on Vayalum Veedum	28th February, 2018
5	Shri M.S. Rajeev	Interview on "Importance of farmer producer companies in agriculture production and marketing"	21st March, 2018.

Radio programme by All India Radio, Thiruvananthapuram

Sl.No.	Name of official	Topic	Date of broadcast
1	Dr. V. Krishnakumar, Principal Scientist & Head	Doubling income through increasing coconut production in coconut based homestead farms	3rd January, 2018
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4	Dr. K. Nihad, Scientist (Horticulture)	Scope of floriculture in coconut garden on	28th February, 2018

Krishi Vigyan Kendra, Kasaragod

KVK Silver Jubilee celebrations

The KVK Kasaragod celebrated the Silver Jubilee Year of its establishment and the Foundation Day of ICAR-CPCRI by organizing a Kisan mela, interface programmes, exhibitions and seminars during 5th to 10th January 2018. Details are in the succeeding chapters.

Paddy Harvest Festival

The Harvest Festival at Kottachery padasekharam in Kanhangad was inaugurated on 11th March 2018 by Shri. Pinarayi Vijayan, Hon'ble Chief Minister of Kerala and was presided over by Shri E. Chandrasekharan, Hon'ble Revenue Minister of Kerala and at Kolavayal padasekharam on 29th March, 2018 which was inaugurated by Shri. K. Kunhiraman, Hon'ble MLA of Udma constituency.

Frontline demonstration on mechanization in paddy cultivation was carried out in 22 acres of Kottachery and ten acres of Kolavayal padasekharams, employing various farm implements and machineries such as disc plough for tilling the uncultivated paddy fallows, helical blade puddler for churning the soil, and technical advances like mat nursery preparation for raising the paddy seedlings for mechanical transplanting and transplanting using walk behind and riding type transplanters and demonstration of combine harvester for paddy harvesting and straw baler for bundling of straw. Ecological engineering measures for pest management in rice through habitat manipulation by planting nectar providing plants and trap crops were successfully demonstrated. Biological control of paddy leaf

folder, Cnaphalocrocis medulanis using trichocards was also demonstrated in an area of 22 acres. The use of pink pigmented facultative methylotrophs for management of drought in paddy was also demonstrated in 22 acres in Kottachery padasekharam.

Monthly technology advisory meetings

KVK, Kasaragod along with the College of Agriculture, Padannakkad and ATMA provided the farm advisory services regarding various issues related to the pest, disease incidence, nutrient deficiency disorders and other problems faced by farmers during the monthly meetings held at College of Agriculture, Padannakkad.

On farm testing

Six on farm trials were taken up in 24 farmers fields during the year, as listed below.

1. Evaluation of paddy var. Shreyas in Kasaragod district
2. Assessment of Yard Long Bean varieties in Kasaragod district
3. Assessment of coconut water blending with seasonal fruit juices for beverages
4. Assessment of Powdery mildew disease management in cucurbitaceous vegetables
5. Eco-friendly management of Rhinoceros beetles in coconut
6. Varietal evaluation of dwarf coconut palm varieties

Frontline demonstrations

Eleven frontline demonstrations(FLDs) including one cluster demonstration under NFSM were undertaken in 88 farmers fields during the year.

1. Ecological engineering measures in rice pest management
2. Demonstration of HYV of Black Pepper variety Thevam
3. Mechanized cultivation of uncultivated fallow paddy lands with heavy machinery
4. Introduction of upland rice variety- Vaisakh
5. Demonstration of micronutrient mixture spray in banana
6. Management of pseudo-stem weevil of banana using cassava bioformulations
7. Introduction of grafted vegetable crops.
8. Demonstration of blast disease management in paddy
9. Ganoderma wilt disease management in coconut
10. Demonstration of scientifically designed cages for backyard poultry
11. Cluster FLD on pulses under NFSM programme

Promotion of Farmer Producer Organization

As part of the project, five sensitization programmes were organized at Kasaragod, Parappa, Kuttikol, Choyyamkode and Malakkallu with the participation of around 240 lead farmers. As a producer organization promoting institution (POPI), KVK Kasaragod organized farmers and promoted a farmers producer company " Tulunadu Ecogreen Farmers Producer Company". The company is presently having 70 shareholders with a share capital of 4.5 lakhs. The company has procured 2.5 tonnes of honey from member farmers, processed and marketed it under the brand name " Ecogold Honey" during the year.

Krishi Vigyan Kendra, Alappuzha

Live web cast of Prime Minister's addressto farmers

Honourable Prime Minister's address to the farmers of the nation on the occasion of Krishi Unnathi Mela and National Conference of KVKs at ICAR-IARI, New Delhi on 17.03.2018 was live web casted for the benefit of about 70 farmers and officials gathered in the KVK, Kayamkulam. An interface on "Cultivation and value addition of jackfruit" also was arranged on the day.

Live telecast of Krishi Unnati Mela at KVK, Alappuzha

Training cum exposure visit for OSFPC Director Board Members /farmers

Training cum exposure visit of director board members and selected farmers of 'Onattukara Spices Farmer Producer Company Limited' promoted by ICAR-KVK-Alappuzha was conducted to IISR, Calicut, SUBHIKSHA, Perambra, ICAR-KVK-Kozhikode and IISR experimental farm, Peruvannamoozhy during 8th-9th, January, 2018.

Members of Onattukara Spices Farmer Producer Company at ICAR-IISR, Kozhikode

District Agricultural technology meet at Haripad

An Agricultural Technology Meet was jointly organized by ICAR-Krishi Vigyan Kendra-Alappuzha, ATMA-Alappuzha and Department of Agricultural Development and Farmers' Welfare at Municipal Ground, Haripad for two days during 14th - 15th February, 2018 to scale up the successful agricultural technologies in the district. The agricultural exhibition highlighting various technologies arranged by the KVK as part of the meet attracted many farmers. More than 500 farmers attended the meet in the two days.

Paddy harvest festival organized at Thalavady

Harvest festival of the technology demonstration on 'Resource conserving and eco friendly technologies in paddy' under the 'National Innovation on Climate Resilient Agriculture' project being implemented by KVK Alappuzha at

Paddy harvest festival at Thalavady, Alappuzga

Thalavady panchayath of Kuttanad taluk was conducted on 27th March, 2018.

Training programmes

During the period organized 5 training programmes benefitting a total number of 151 farmers/rural youths. The details of the training programmes were as follows:

Training	No. of Programmes	Participants		
		Men	Women	Total
On campus	4	11	80	91
Off campus	4	28	26	54
Vocational	1	2	4	6
Total	5	41	110	151

New projects sanctioned

Department of Agriculture Development and Farmer's Welfare, Govt. of Kerala has sanctioned an"Agro processing Training cum Demonstration Centre" to ICAR KVK Alappuzha at a cost of Rs. 73.2 lakhs. The project sanctioned for two years will focus on capacity building and incubation support to entrepreneurs in value addition sector especially in jackfruit, fruits, vegetables, coconut etc.

COMMERCIALIZATION OF TECHNOLOGY

During the period from January to March, 2018, five technologies were commercialised by the Institute to entrepreneurs through MoA as per the details given below, an amount of Rs. 2.30 lakhs have been collected as technology transfer fees.

Sl. No.	Technology	Date of licensing	Transfer fees (Rs.)	Entepreneurs
1	Arecanut tissue culture protocol for mass production of Dwarf Arecanut Hybrid VTLAH2	08-01-2018	3,50,000	M/s SPIC Agro Biotech Centre Coimbatore
2	Technical know-how of production of virgin coconut oil (VCO)	16-01-2018	40,000	M/s Krishna Plantations Pvt. Ltd., Margao
3	Technical know-how of Kera Probio formulation	31-01-2018	50,000	Farmer First Programme, Pathiyoor Grama Panchayath, Alappuzha
4	Technical know-how of Kalpa Soil Care	26-02-2018	25,000	Shri Sebastian K Philip, Kalapurackal, Kannur
5	Technical know-how of production of coconut chips	01-03-2018	15,000	Shri D.A. Mohammed Arif, Mogral, Kumbla
	Total		**4,80,000**	

CELEBRATIONS

National Science Day celebrated at Kayamkulam

A one day workshop on 'Harnessing bio-agents for sustainable soil and palm health' was organized for undergraduate life science students at ICAR-CPCRI, Regional Station, Kayamkulam on 15-02-2018 as part of National Science Day celebration. The programme was sponsored by Kerala State Council for Science Technology and Education, Thiruvananthapuram. The programme included thematic sessions handled by Scientists and in addition elocution and quiz contest were convened for the participating students on the theme "Science and Technology for Sustainable Future". In the valedictory function presided by Dr. V. Krishnakumar, Head, Dr Thomas Biju Mathew, Head, Pesticide Residue Research and Analytical Laboratory, Vellayani functioned as chief guest and delivered a scintillation talk on "Pesticide Residues and Safe Use of Pesticides". E-manual on "Mastering Farming through Marvelous Microbes" and prizes were distributed on the occasion.

Participants of the workshop on 'Harnessing bio-agents for sustainable soil and palm health' at ICAR-CPCRI, RS, Kayamkulam

PERSONALIA

PROMOTIONS

Name of the staff	From (Designation)	To (Designation)	w.e.f.
Dr. M.R. Manikantan	Sr. Scientist (APE), ICAR-CPCRI, Kasaragod	Principal Scientist (APE), ICAR-CPCRI, Kasaragod	19-07-2016
Smt. V. Madhavikutty	UDC, ICAR-CPCRI, RS, Kayamkulam	Assistant, ICAR-CPCRI, RS, Kayamkulam	16-03-2018
Smt. Annamma N. Topino	UDC, ICAR-CPCRI, RS, Kayamkulam	Assistant, ICAR-CPCRI, RS, Kayamkulam	16-03-2018

TRANSFER

Name of the staff	From (Place)	To (Place)	w.e.f.
Mrs. Karthika K.S, Scientist	CPCRI RS, Vittal	ICAR-NBSS&LUP, Nagpur	01-03-2018

RETIREMENT

Name	Designation	Place	Date
Shri Bhaskara Velichappad	Skilled Support Staff	ICAR-CPCRI, Kasaragod	31-03-2018

OBITUARY

Sri K. Krishnankutty, Skilled Support Staff, ICAR-CPCRI, Kasaragod breathed his last on 9th February, 2018. The Director and staff of ICAR-CPCRI pray the Almighty for the peace and tranquility to the departed soul.

OTHER INFORMATION

Live programme of Prime Minister's address during Krishi Unnati Mela 2018

A live telecast of Shri Narendra Modi, Hon'ble Prime Minister's visit to the Krishi Unnati Mela at the IARI Mela Ground, Pusa Campus, New Delhi and his address to the gathering, were projected to the farmers and public in the Platinum Jubilee Hall, ICAR-CPCRI, Kasaragod on 16th March, 2017.

A view of the live programme arrangement for farmers at ICAR-CPCRI, Kasaragod

Participation in national seminars/symposia/conferences/workshops

Participation within India

Name and designation	Programme	Place & Date
Dr. P. Chowdappa, Director and Dr. Vinayaka Hegde, Head, Division of Crop Protection	CII Coconut Festival - 2018 - Farm to Fridge and Beyond	CODISSIA Complex, Coimbatore, Tamil Nadu 27-28 January, 2018
Dr. P. Chowdappa, Director	National Symposium on plant health management Eco-sustainable paradigm	AAU, Jorhat 16th February, 2018
	Kisan Mela on doubling farmers income from arecanut based cropping system	ICAR-CPCRI, Research Centre Kahikuchi 18th to 20th February, 2018
	ICAR-Directors Conference	NASC Complex, Pusa, New Delhi 8th to 9th March, 2018
	National Conference on Climate Change and its impact on livelihoods	IIPM, Bengaluru 19th March, 2018
Dr. Ramesh S.V., Scientist	National Conference on "Trends and Innovations in Biological Sciences"	Ethiraj College, Chennai 15th February, 2018

Women cell activities

The International Women's Day was celebrated at the institute on 12.3.2018 presided over by Dr. P. Chowdappa, Director, CPCRI, Kasaragod. Mrs. Jaya Adoor, Advocate, Kasaragod and an Accidental Mediator under Dispute Resolution (ADR) Forum was the chief guest. She delivered a talk on the general issues facing by the working women/girls in society. A pick and speak programme on the theme "Men's perspective on women" was organized. In addition, different staff members presented poetry and song on women's empowerment and status in society.

Members of Womens' Cell from ICAR-CPCRI, Regional Station, Vittal conducted a tour on International Womens' Day to ICAR-IIHR, CHES Chettali and ICAR-IISR, Appangala.

International Womens' Day celebration at ICAR-CPCRI, Kasaragod

Visit of Women's Cell members from ICAR-CPCRI, RS, Vittal to Chetalli and Appangala

Mera Gaon - Mera Gaurav

Three vibrant and functional MGMG groups at the Regional Station Kayamkulam could emphasize greatly on moisture conservation strategies to upkeep the health of coconut palm braving scorching summer radiation. Mulching was invariably advised to withstand moisture deficit stress. More than 450 coconut seedlings under Amma thengu programme is ready for distribution and the quality of those seedlings has been top class and healthy. Re-emergence of rugose spiraling whitefly has been reported from different villages and the infestation potential of the exotic pest is very low due to the natural build up of the aphelinid parasitoid, *Encarsia guadeloupae*. Since the price of coconut exceeded Rs 25/-nut, care extended by farmers to coconut palms increased several folds. Summer showers have come down drastically resulting in drop in humidity with reduction in nut setting as well.

Holistic farming system approach was advised to obtain regular income, continuous employment and pest regression to make farming prosper.

- Trichoderma was supplied to beneficiary farmers of Directorate of Arecanut and Spices Development (DASD), Calicut sponsored demonstration plots on arecanut based multi species cropping system.
- Monitored the demonstration plots on arecanut based multi species cropping system funded by DASD, Calicut.
- Gave guidance to beneficiary farmers for establishing demonstration plots on arecanut based multi species cropping system.
- Provided literatures and mobile based advisories to farmers.

Diagnostic field visit by scientists in MGMG programme

Trichoderma supplied to arecanut farmers at Palthady, Puttur taluk., Karnataka

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