भाकृअनुप
ICAR

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KALPA
CPCRI Newsletter

Companion of coconut community
Since 1916

Contents...

From the Director's Desk

Kalparasa and its value addition

Coconut jaggery and sugar have been known to common man for many years. In the beginning of the twentieth century there were findings on coconut juice yielding 9.5% of sugar. The technology of phloem sap collection was popular in coconut growing areas, the sap was well-known as 'Neera'.

Father of the Nation, Shri Mahatma Gandhi wanted utilization of Neera for nutrition. On the other hand the sap was widely used for production of toddy in rural areas, but its consumption was highly segmented. Recently, ICAR-CPCRI has ventured into collection of inflorescence sap with an aim to break across this segmentation and to evaluate varieties suitable for Neera production and production of good quality beverage for all. The crude method involved in tapping, contamination of the sap, use of inorganics such as lime in the sap deteriorating its quality, have haunted the researchers, thereby development of improved technology to extract farm fresh, hygienic, ready to serve inflorescence sap using a small device (patent pending) and named the sap as "Kalparasa". ICAR-CPCRI has also applied for registration of trademark for "Kalparasa". A simple farmer friendly technology of using "Coco-Sap Chiller" (patent pending) for collection of sap, process for preparation of coconut sugar, jaggary or honey and a collaborative technology with CAMPCO for making coconut sugar based bar chocolate and a chocolate drink.

The technology has paved the way for higher income generation from coconut farming. A farmer having 100 trees can collect 4500 liters of sap (@1.5 liter/ spadix) or produce 675 kg sugar (@15% recovery) per month. Sap is sold @ Rs. 15 per 200 ml as a ready to serve drink or it can be made as sugar, which is priced at Rs. 500 per kg fetching an income of Rs. 3,37,500 from 100 trees per month as against an average of Rs. 90,000 under traditional farming.

Commercialization of technology through technology transfer license empowers the entrepreneurs to hold ownership on non-exclusive basis for commercial production of the value added products and to further improve upon the quality and process. The technology of Kalparasa, coconut sugar and value addition have now expanded in all directions of the country, covering Kerala, Karnataka, Tamilnadu, Lakshadweep, Andhra Pradesh, Telangana, Maharashtra, Goa and West Bengal. ICAR-CPCRI has also trained Sri Lankan farmers for production of hygenic Kalparasa and coconut sugar. The sweetness of ICAR-CPCRI technology has now started kindling the taste buds by means of various confectionery, beverages, chocolates and other value added products.

Free of inorganic chemicals and food processing chemical agents, the Kalparasa and coconut sugar stand abreast of other sweeteners in the market. Use of Kalparasa and coconut sugar in nutrition and nutraceuticals as well as health foods to be promoted for market development. All these are aimed at entrepreneurship development, employment generation and sustained rural livelihood, ultimately giving better prospects of coconut cultivation and value addition.

केंरोफअसं
CPCRI

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Kudlu P.O., Kasaragod, Kerala - 671 124
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KALPA

SPECTRUM

High yielding cocoa

Cocoa collections from Mankuva and Adimaly from Idukki district of Kerala were assessed and identified with high bean index of 1.95 to 2.11 gram and a pod index of 10 pods to yield 1 kg dry bean per tree per year. This local type adapted to higher elevations recorded an average of 66-100 pods per tree per year with a high yielding potential of 5-6 kg dry beans with 9.52% shell, 90.6% nib recovery and 52.2% fat contents. Further this will be evaluated in lower hills and plains for the quantitative and qualitative parameters.

Theobroma pentagona type of cocoa with distinct five ribbed fruit arranged in close pairs of pentagonal form with narrow elongate shape and smooth surface was collected. This genotype has few white to pink beans and further utilized in breeding for expression of anthocyanin inhibitory genes and sterility mechanism in cocoa.

Pentagona tree

Pentagonal pod

Cocoa tree from Mankuva

Unripe pod

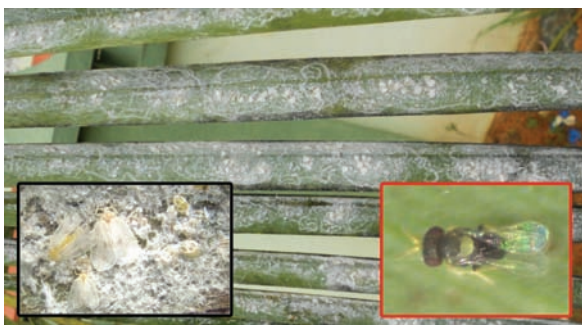
Ripe pods

Cocoa beans

Elain Apshara, S.

Emergence of invasive rugose spiraling whitefly, *Aleurodicus rugioperculatus* Martin in Tamil Nadu and Kerala on coconut

Rugose spiralling whitefly (RSW) (*Aleurodicus rugioperculatus* Martin), an invasive pest on coconut was reported from Pollachi, Tamil Nadu and Palakkad, Kerala during July-August 2016. It was subsequently reported other districts of Kerala and Andhra Pradesh. As a close relative of *Aleurodicus dispersus* Russell, *A. rugioperculatus* is identified by the presence corrugated operculum with a triangular and acute lingula. Eggs of *A. rugioperculatus* are elliptical laid singly and associated with irregularly spiralling deposits of white flocculent wax surrounding each egg in a semi-circular spiralling fashion on lower surface. Extensive desapping of the insect leads to the excretion of honey dew which subsequently gets deposited on the upper surface of the leaves. Despite heavy incidence of whitefly on coconut in certain pockets, no economic crop loss is indicated and therefore, there is absolutely no need for any panic. *A. rugioperculatus* is so sensitive to wet season and heavy rains and the recent deficit in monsoon (>35% in Kerala), which triggered a drop in relative humidity (up to 7% compared to the previous year), is the immediate reason for the flare up. The pest is effectively suppressed (>50%) by the aphelinid parasitoid, *Encarsia guadeloupae,* which was introduced along with *A. dispersus* in 1998. Management strategies include application of 1% starch, installation of yellow sticky traps, re-introduction of parasitized pupae in newly emerging areas and in severe cases spraying neem oil 0.5% is recommended.



Symptoms of white fly infestation on lower surface of coconut leaf. Inset: Magnified rugose spiralling whitefly and its parasitoid natural enemy *Encarsia* sp.

Chandrika Mohan, Josephrajkumar, A., Prathibha, P.S., Anjali, A.S., Renjith, P.B., Vinayaka Hegde and Krishnakumar V.

In vitro shoot regeneration from immature inflorescence of coconut (*Cocos nucifera* L.)

Immature inflorescence has shown to be a promising source of explants for coconut tissue culture. The immature inflorescences of 2-12 cm size collected from West Coast Tall palms after surface sterilization, the rachilla were sliced into 1-1.5 mm bits and cultured on four media combinations. The cultures were incubated in dark condition. Maximum callusing (92%) and minimum browning (1%) was observed in Y3 media supplemented with 1 ppm 2,4-D followed by Medium 72 with 10 ppm Picloram + 10 ppm Putricine + 1 ppm TDZ (87 %). The cultures in Y3 media subcultured into three different hormone combinations (Y3 I, Y3 II and Y3 III). Shoot like out growth was more in Y3 III (66%) followed by Y3 I (42%). After 8 months incubation in dark, the cultures were transferred to ½ MS I and ½ MS II and gradually shifted to light condition. Shoot regeneration was more in ½ MS supplemented with 1ppm each of NAA and BAP. The shoots developed from the floral primordial were transferred to rooting media. The stage of maturity of inflorescence was a very critical factor in the conversion of floral buds to vegetative shoots and it was found that inflorescence of size ranging 4cm-7.5cm was the best for the reversion. The study indicated the feasibility of developing an *in vitro* plant regeneration protocol with the use of immature inflorescence of coconut as the explants.

Shoot regeneration from immature inflorescence of coconut, a) one month after inoculation, b) six months after dark incubation, c) multiple shoot regeneration, d) plantlets in rooting media

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

'Push-pull' strategy for harvesting earthworms from vermicomposting tanks

'Push-pull' concept, a business management strategy, was adopted by Rothamsted Research, UK for insect management based on chemical ecology principle. This push-pull strategy was followed at ICAR-CPCRI to harvest earthworms from vermicompost heaps by employing integrated use of volatiles released by biological materials as forces of avoidance and attraction.

In the ready-to-harvest coconut leaf vermicomposting tanks, 'push–pull' strategy was adopted through the use of behaviour-modifying stimuli to earthworms to manipulate their migration from the vermicomposted heap to the adjacently laid fresh cowdung from where they were eventually collected, thus, making sorting of earthworms from vermicomposting tanks easy and labour-friendly.

To achieve this in the vermicomposting tanks, a thin strip of cow dung was spread on the periphery of vermicomposting heap after the composting process was over. At the same time, PVC pipes were inserted into the vermicomposted substrate and mustard solution was poured through these pipes. Mustard repelled earthworms from the vermicomposted substrate which was the 'push' component. The fresh cowdung, being a preferred food for the earthworms, attracted earthworms from the vermicomposted substrate which was the 'pull' component. Allyl isothiocyanate present in mustard seeds was responsible for 'pushing' the earthworms from the compost heaps and cowdung a known attractant was used for 'pulling' the earthworms.

'Push-pull' system of harvesting earthworms from vermicomposting tanks. Close up of cow dung at the periphery of vermicomposting coconut leaves heap (inset).

Murali Gopal and Alka Gupta

Weed management for control of nematodes

It was observed that, root-knot nematode (*Meloidogyne* spp.) attacking black pepper, okra, tomato, brinjal, turmeric, papaya, cucurbits *etc*. grown in the interspaces of coconut plantations. Despite intensive plant protection measures, the root-knot nematode (*Meloidogyne* spp.) attack continues to be a major threat in these crops in India. In a recent survey, seven weed species including dwarf copper leaf (*Alternanthera sessilis*), puvankurutala (*Vernonia cinerea*) and chick weed (*Ageratum conyzoides*) were identified as the host of root-knot nematode on which root-knot nematodes thrive. Therefore, for effective control, farmers are advised for removal and destruction of alternate weed hosts from the fields, bunds and neighboring areas and maintaining field sanitation to protect the intercrops from nematode attack and build up of nematode population in coconut based cropping system.

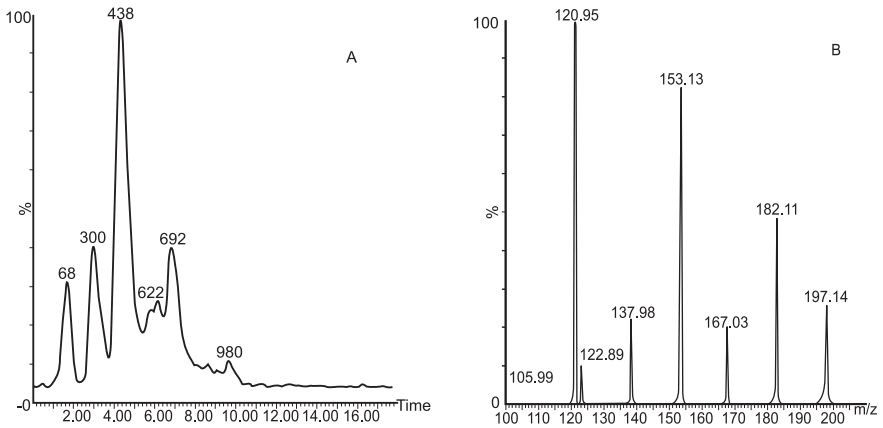
Nematode (*Meloidogyne* spp. infective stage) (A) attacked and (B & C) healthy weed (*V. cinerea*)

Rajkumar

Identification of Phenolic Acids and Flavonoids in Coconut Testa

Coconut testa is a rich source of polyphenolic compounds. Total of 28 phenolic compounds comprising sixteen phenolic acids and twelve flavonoid compounds were identified using UPLC-H class coupled with TQD-MS/MS. Out of sixteen phenolic acids, three phenolic acids belongs to monohydroxy benzoic acid derivatives (salicylic acid, p-hydroxy benzoic acid and 3-hydroxy benzoic acid); four belongs to dihydroxy benzoic acid derivatives (protocatechuic acid, vanillic acid, 2, 4-dihdroxy benzoic acid, gentisic acid); two trihydroxy benzoic acid derivatives (gallic acid and syringic acid); seven belongs to hydroxyl cinnamic acid derivatives (chlorogenic acid, ferulic acid, caffeic acid, p-coumaric acid, o-coumaric acid, sinapic acid and cinnamic acid). Among the twelve flavonoids, three belongs to flavan-3-ol (catechin, epicatechin and epigallocatechin); three belongs to flavonol (myristin, quercetin and kaempferol); one belongs to flavonol glycoside (rutin); two belongs to flavone (leteolin and apigenin); two belongs to flavanone (naringenin and hesperetin) and one belongs to coumarin derivative (umbelliferone).

M. Arivalagan



Characterization of phenolic compounds using chromatogram (LC-MS) of coconut testa, A - Total ion chromatogram; B - MS-MS fragmentation pattern of sinapic acid

IMPORTANT EVENTS

Culmination of Centenary Celebrations with a Kisan Mela

Sri Radha Mohan Singh, Hon'ble Union Minister of Agriculture and Farmer's Welfare, delivering inaugural speech

Kisan Mela was organized on 10th December 2016 to mark the culmination of the centenary celebrations of ICAR-CPCRI, Kasaragod. Shri Radha Mohan Singh, Hon'ble Union Minister of Agriculture and Farmer's Welfare, Govt. of India, was the chief guest of the programme. The Hon'ble Minister also inaugurated the 3rd International Symposium on Coconut Research and Development (ISOCRAD -3) and the Exhibition.

The Hon'ble Minister in his inaugural address spoke on the new policies of the Government and also touched upon the problems being faced by the farmers. He enlightened the participants on the Prime Minister's Krishi Sinchayi Yojana and the Crop Insurance scheme. He emphasised the need for the farmers to diversify from traditional agriculture and take up floriculture which has wide scope in the present day. He also exhorted the farmers to take up fish culture by taking advantage of the vast inland and marine water bodies with which our state is highly blessed. He directed the State Department of Agriculture to expedite the issue of Soil Health Cards to the farmers. He also touched upon e- markets for agriculture proceeds in the country which is of advantage to the farming community. He lauded the role played by CPCRI in the field of research and also in the activity of coconut seedling production in the state.

Shri P. Karunakaran Hon'ble Member of Parliament, Kasaragod, presided over the function. Dr. P. Chowdappa, Director, ICAR-CPCRI, welcomed the gathering.

Earlier in the day the Hon'ble Minister made a ceremonial planting of coconut seedling in the Centenary Coconut Park after formally inaugurating the park. The Hon'ble Minister also released four institute publications viz. "CPCRI - 100 years of scientific excellence", "Harvesting wisdom of coconut growers ","Coconut" & a special issue of "Indian Horticulture" magazine. "Kalpa Chocolate Bar" jointly developed by CPCRI and CAMPCO was also released by the Hon'ble Minister on the occasion.

Dr. Trilochan Mohapatra, Secretary DARE & Director General, ICAR, New Delhi, delivered the keynote address and spoke on the need to double production of coconuts to meet the demand. He emphasised on the need for value addition of coconut by embarking on suitable projects by the farmers to increase their income. He congratulated the scientists of the institute for their outstanding achievement in the field of Crop Improvement, Biotechnology, Crop Management, Pest & Disease control and value addition of coconut.

Shri Anant Kumar Hegde, Hon'ble Member of Parliament, Uttara Kannada, offered felicitation. He appealed to the researchers to bridge the gap between the research achievements and farmers practices. Shri N.A. Nellikunnu, Hon'ble MLA, Kasaragod, Shri A.G.C. Basheer, President, Kasaragod District Panchayath, Shri Sathish Chandra, President CAMPCO, Shri P.R. Muralidharan, Member, Coconut Development Board, Shri P. Pradeep, Principal Agriculture Officer, Department of Agriculture, former Directors of CPCRI, officials from various ICAR institutes participated in the programme.

The grand exhibition organized on the occasion had 105 stalls covering coconut and various valued added products, machinery, implements and nurseries. There was active participation of various ICAR institutes, Agriculture Universities, State Department of Agriculture, Agriculture Input Dealers and Self Help Groups in the programme.

Workshop on "Horticulture Development for Sub-Himalayan Terai Region" and "Kisan Mela-2016" at Mohitnagar

A Workshop on "Horticulture Development for Sub-Himalayan Terai Region" and "Kisan Mela -2016" was organized at Research Centre, Mohitnagar in the Jalpaiguri district of West Bengal during October 20-21, 2016 as part of the celebrations of 100 years of coconut research.

Shri Khageswar Roy, Hon'ble Member of Legislative Assembly (Rajganj), Govt. of West Bengal inaugurated the programme on 20th October, 2016. He complimented the research achievements made by ICAR-CPCRI to make coconut and arecanut sector more vibrant during the 100 years of research.

Dr. Chirantan Chattopadhyay, Hon'ble Vice Chancellor, Uttar Banga Krishi Viswavidyalaya, presided over the function and in his keynote address, urged the farmers to understand climatic change impact over North Bengal and encouraged them to adopt the scientific cropping systems, according to the changing climatic conditions. He also added that farmers should understand and take initiative for making of rain water harvest structure across North Bengal region.

Shri Khageswar Roy, Hon'ble Member of Legislative Assembly (Rajganj), Govt. of West Bengal inaugurating the Kisan Mela

Dr. D.R. Singh, Director, ICAR-NRC (Orchid) emphasized on the scope and opportunities of orchid cultivation and various vegetables along with plantation crops in Sub-Himalayan Terai regions.

Dr. P. Chowdappa, Director, ICAR-CPCRI, Kasaragod while welcoming the gathering, highlighted that adoption of coconut based mixed farming system may accelerate the economic growth of North Bengal region and introduced the value added products of coconuts developed by ICAR-CPCRI. He stressed that coconut/ arecanut based cropping system and value addition can enhance the profitability of farmers. Dr. P. K. Karak, Horticulturist, Shri S. Pal, Deputy Director of Agriculture, Jalpaiguri and Shri G. C. Biswas, DDM, NABARD, Jalpaiguri also graced the function.

In the afternoon of 20th October 2016, an interactive technical session on "Interface programme on arecanut based cropping system" was organized for farmers and extension officials. More than 650 farmers and officials from developmental departments attended the meeting.

On 21st October 2016 forenoon, a workshop on "Horticulture Development for sub Himalayan Terai Region" was organized for farmers and extension officials. In the afternoon session, an interactive farmer centric seminar on "Cocoa Production Technology for Sub-Himalayan Terai Region" was also arranged. Dr. K. Dhanapal, Deputy Director (Res), Spice Board, Gangtok, Dr. Pulak Kanti Bera, Joint Director (ENTO), Govt. of West Bengal, Dr. Jagadish Ch. Jana, Dean, Faculty of Horticulture, Dr. Soumen Moitra, Head, Floriculture, Dr. Partha Medha, Head, Plantation and Spices and Dr. Ranjit Chatterjee, Head, Vegetable Science took part in the Workshop and Interface programme. Around 800 farmers and officials attended the programme.

3rd International Symposium on Coconut Research and Development

The 3rd International Symposium on Coconut Research and Development (ISOCRAD-3) was organized from 10 - 12 December 2016 at ICAR-CPCRI, Kasaragod, Kerala. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR, inaugurated the symposium and called upon employment of genomic research to accelerate breeding and disease management. Uron N. Salum, Executive Director, Asia Pacific Coconut Community, Jakarta in his address congratulated Government of India, ICAR-CPCRI and Indian coconut farmers for organizing various programmes for commemorating the centenary of coconut research. Efforts of Coconut Development Board in promoting coconut producer companies for realizing better income for coconut farmers through

Dr. Trilochan Mohapatra, Hon'ble Secretary,
DARE & Director General, ICAR inaugurating ISOCRAD 3

adoption of scientific cultivations practices and value addition were described by A. K. Singh, Chairman, Coconut Development Board, India. P. K. R. Nair, Distinguished Professor, University of Florida, USA suggested to adopt a holistic approach focusing on the overall productivity and sustainability of the coconut-based agroecosystem as a whole, to cope with the increasing threats posed by climate change. N. M. Nayar, Formerly Director, ICAR-CPCRI in his key note address, outlined the present day impasse on policies on coconut sector (on trade, development and research) and suggested certain remedial steps such as bringing coconut as a mandate crop of World Agroforestry Centre and initiate a consortium to address issues related pests and diseases.

The symposium comprised of eight technical sessions: Germplasm Conservation and Utilization, Biotechnology for crop improvement, Enhancing input use efficiency, Management of pests and diseases, Climate change: Effects and mitigation, Value addition and product diversification, Agribusiness and entrepreneurship, and Research-extension interface and policy issues.

The major recommendations emerged during the sessions were (i) prevail upon CGIAR to include coconut as a mandate crop under ICRAF/WAC for better coordinated research among nations, (ii) make available the mapping population developed in Côte d'Ivoire to COGENT member countries for QTL mapping studies, (iii) networking of international laboratories for cryogene banking of pollen and cryopreservation of zygotic embryos/plumular tissues, (iv) evaluation of economics of organic farming studies over the years and replication of successful models, (v) address biosecurity issues of coconut in the wake of climate change, globalization, free trade and increased travel across the globe; a "Global Initiative on Pest and Disease Network of coconut" need to be formed involving all the coconut growing countries and organizations like COGENT and APCC, (vi) strict implementation of domestic quarantine to prevent the spread of diseases/ pests, (vii) validation of the InfoCrop-COCOCNUT model in other coconut producing countries, (viii) promotion of value added coconut products through market promotion, brand promotion and attractive and hygienic packing, and (ix) initiating policies and developmental interventions for enhancing the farmers' share in the value chain.

Encompassing these recommendations, the following 'Kasaragod resolution' was adopted in the Symposium: "The Third International Symposium on Coconut Research and Development (ISOCRAD 3), held at ICAR-Central Plantation Crops Research Institute, Kasaragod, India during 10-12 December 2016, resolved that COGENT should be strengthened and made vibrant to cater to conventional and complementary strategies like cryopreservation and pollen conservation of coconut germplasm and promote its safe international exchange, and support the establishment of international networks of coconut tissue culture, pests and diseases of coconut, genome analysis and special breeding programmes for abiotic and biotic stress management".

22nd Plantation Crops Symposium

The 22nd Plantation Crops Symposium (PLACROSYM) organized biennially was held from 15-17 December, 2016 at ICAR-CPCRI, Kasaragod, Kerala with the theme 'Leveraging Innovation System in Plantation Sector through Value Addition'. The inaugural session of the symposium commenced with a welcome address by P. Chowdappa, Director, ICAR-CPCRI, in which he highlighted the need for impetus for increased value addition to overcome the vulnerability of plantation sector to intermittent vagaries of price risks, market dynamics and climate changes. W.S. Dhillon, ADG (Horticultural Science), ICAR, in his inaugural address, emphasized the huge scope for plantation crops-based agribusiness in India with reference to processing and value added products. P. Rethinam, President, Society for Promotion of Oil Palm Research & Development,

Dr. Wasaka Singh Dhillon, Assistant Director General (HS-II) Inaugurating PLACROSYM 22 at ICAR-CPCRI, Kasaragod

in his address, outlined the need to develop an equitable and sustainable plantation sector, ensuring inclusive growth and internationally competitiveness. K.V. Peter, Director, World Noni Research Foundation, in his remarks, drew attention to the tremendous potential existing in India for the production and sale of value added products, both in the domestic and international markets. Delivering the keynote address soon after the inaugural session, P. Rethinam talked about the strategies for increasing the vegetable oil production in India through oil palm cultivation and doubling the income of oil palm growers.

The three day symposium was divided into seven technical sessions: Genetic Resources and Genomics, Input Use Efficiency, Impact of climate change on plantation sector, Mechanization & product development, Agribusiness & Policy Issues, and Reaching Stakeholders were held.

The major recommendations emerged during PLACROSYM-22 include; (i) greater synergy between the conventional breeding programmes and modern molecular tools and bioinformatics for reaping quick dividends in crop improvement, (ii) demonstration of technologies developed by Institutes in farmers' field for achieving the goal of doubling the income of farmer, (iii) utilization of soil heath cards for achieving higher nutrient use efficiency, (iv) prepare land suitability map may be prepared for different plantation crops, taking into consideration the future climate scenario, (v) compilation of data available on growth, yield and quality parameters in different plantation crops and its correlated with climate data to ascertain climate influence on plantation crops, (vi) concerted efforts need to be taken to establish 4-5 incubation centers' in every state for hands on training to entrepreneurs, (vii) establishing a war-room monitoring cell to monitor the imports through duty-free channels and channels with duty concessions, (viii) perceived attributes of pest management technologies to be taken into account for development of farmer friendly technology for enhancing adoption, (ix) hand holding of entrepreneurs for income and employment generation as achieved in spice sector to be replicated in suitable regions with funding from initiatives like make in India and start up India, and (x) large scale multiplication and distribution of bioagents for the management of pests should be strengthened by enhancing participation of local farming community.

National Workshop on Cryopreservation of Plant Germplasm

National Workshop on Cryopreservation of Plant Germplasm was conducted at CPCRI, Kasaragod on 2nd November 2016. Scientists from ICAR institutes, over 80 Ph. D scholars and Post Graduate students from Kerala Agricultural University, Central University of Kerala, Mangalore University and St. Aloysius College, Mangalore participated in the Workshop. Dr. K. Nirmal Babu, Director ICAR-IISR inaugurated the workshop and delivered a talk on 'In vitro conservation technique in spices plant genetic resource management'.

HUMAN RESOURCES DEVELOPMENT

Deputation Abroad

Dr. Anitha Karun, Principal Scientist and Head, Crop Improvement Division participated the Kick-off Meeting for the project: "Developing cryopreservation protocols for sub-tropical crops and establishing cryo-genebank at RDA in coordination with Bioversity International", co-organized by Bioversity International, Rural Development Administration (RDA) Republic of Korea, and the Philippines Coconut Authority (PCA), 22-24 November, 2016 at Legaspy, Philippines.

Dr. Anitha Karun (First on the right) along with the participants of Bioversity Meting in Philippines

Training attended

Name & Designation	Training Programme	Place & Duration
Ms. T.N. Ranjini, Scientist	Basic course on flow cytometry	BD-NCBS, TIFR, Bengaluru17th to 20th January, 2017
Dr. G. Rajeev, ACTO & APIO	Training to Nodal Officers on "RTI Online Portal"	October 25, 2016ICAR-NAARM, Hyderabad

Awards / Honours

Dr. M. Shareefa, Scientist was awarded the Best Oral Paper Presentation for the paper titled *'In vitro* shoot regeneration from immature inflorescence of coconut' (authored by Shareefa, M., Thomas, R.J., Sreelekshmi, J.S., Raju, C R and Anitha Karun) presented during *3rd International Symposium on Coconut Research and Development* (ISOCRAD-3) conducted at CPCRI, Kasaragod during 10-12th December 2016.

Dr. Jeena Mathew was awarded the Best Poster Award for the paper entitled "Assessment of major and secondary nutrient profile of coconut palms grown in different Agro Ecological Zones of South Kerala in the Technical Session "Enhancing Input Use Efficiency" presented at the ISOCRAD-3 held at ICAR-CPCRI, Kasargod from 10th to 12th December 2016.

Best poster award was bestowed upon for the research paper on "E-kalpa cloud based interactive mobile application for coconut farmers and stakeholders" by Anithakumari P., Merin Babu, Chowdappa P., and Krishnakumar, V. in the ISOCRAD-3, technical session on 'Research Extension Interface and policy issues" held at ICAR-CPCRI, Kasaragod from 10th to 12th December 2016.

The research paper entitled "Controlled delivery of ethyl 4-methyl octonate, the pheromone of coconut rhinoceros beetle, *Oryctes rhinoceros* L." by Subaharan, K., Eswarmoorthy, Pavankumar, B.V.V.S., Vibina Venugopal, Chalapathi Rao, N., Gaurav, S., Rajamanickam, S., Ganesan, S., Josephrajkumar, A., Maheswarappa, H.P., and Raveendran, P has been awarded the best oral presentation in the Technical Session "Management of Pests" at the ISOCRAD 3 held at ICAR-CPCRI, Kasaragod during December 10-12, 2016.

"Yield and duration of potato crop in Bihar under projected climate scenarios" by A. Abdul Haris *et al,* published in Journal of Agrometeorology (2015) Vol. 17(1): 67-73, adjudged as one of best papers published in the *Journal of Agrometeorology* during 2014 and 2015.

Dr. S. Kalavathi, Principal Scientist participated in the District level Children's Science Congress as Senior Judge on 07-11-16. She functioned as member, DPC of Technical cadre at ICAR-CIFT, Kochi on 21-12-2016.

Best original paper award was presented for the oral presentation on "Optimization and evaluation of ready to eat extruded snack from virgin coconut oil cake" by Shameena Beegum, M.R. Manikantan, Monika Sharma, M. Arivalagan, K.B. Hebbar and R.K.Gupta, in the technical session "Value addition and product diversification" of third international symposium on coconut research and development (ISOCRAD 3) held at ICAR-CPCRI, Kasaragod during 10-12 December, 2016.

Best Oral presentation Award was presented to Ms. T.N. Ranjini, Scientist, for a paper on "Variability studies in a multi potent medicinal tree *Terminalia chebula* Retz. at National Seminar on Forest and Tree based Land use Systems for Livelihood, Nutritional and Environmental Security" at Navasari Agricultural University, Gunjarat from December 21st to 23rd 2016.

Dr. Regi Jacob Thomas, Principal Scientist (Horticulture) was awarded Post Graduate Diploma in Intellectual Property Rights from IGNOU, New Delhi.

PUBLICATIONS

Research papers

Basavarajappa and Rajkumar 2016. Participatory rural appraisal: A systems approach for identification of problems by an agro-ecosystem analysis. *International Journal of Agricultural Sciences, 12*(1):123-133.

Hebbar, K. B., Subramanian, P., Sheena, T. L., Shwetha, K., Sugatha, P., Arivalagan, M. and Varaprasad P. V. 2016. Chlorophyll and nitrogen determination in coconut using a non-destructive method, *Journal of Plant Nutrition, 39*:11, 1610-1619, DOI: 10.1080 /01904167.2016.1161781.

Hebbar, K. B., Mukesh Kumar Berwal, Chaturvedi, V. K. 2016. Plantation crops: climatic risks and adaptation strategies. *Ind J. Plant Physiol.* DOI 10.1007/ s40502-016-0265-9.

Jagadeesh Patil, Rajkumar and Kesavan Subhaharan 2014. Virulence of *Steinernema carpocpasae* and *Heterorhabditis indica* against Coconut Rhinoceros Beetle, *Oryctes rhinoceros* L. (Scarabaeidae: Coleoptera). *Indian Journal of Nematology. 44*(1):73-81.

Jaganathan, D. 2016. Analysis of organic farming practices in arecanut in south India. *Journal of Community Mobilization and Sustainable Development, 11*(2): 206-214.

Jayasekhar, S., Chandran, K.P., Thamban, C. Jaganathan, D. and Muralidharan, K. 2016. Analyzing the trade competitiveness of Indian coconut sector in the liberalization regime. *Journal of Plantation Crops 44*(2):147-152.

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Alka Gupta, Murali Gopal, Deepthi Ravindran and George V. Thomas. 2016. Prevalence of potassium solubilizing bacteria in rhizosphere of coconut palms (*Cocos nucifera* L.) growing in different soil types. pp. 66.

Anitha Karun. Feasibility of collection and cryopreservation of coconut pollen during monsoon months for hybrid seed production pp. 36.

Anitha Karun. Genotypic variablity in coconut embryo cryopreservation. pp. 33.

Anitha Karun. Validation of pollen cryopreservation in coconut accessions. pp. 43.

Anithakumari, P., Merin Babu, Chowdappa, P., and Krishnakumar, V. 2016. 'e-kalpa' - cloud based interactive mobile application for coconut farmers and stakeholders. pp. 175.

Arivalagan, M Sugatha, P. Kanade, S. R. and Hebbar, K. B. Biochemical changes in coconut haustorium during different developmental stages. pp. 137.

Arivalagan, M., Hebbar, K.B, and Kanade, S.R. Phenolics, flavonoids and Antioxid ant potential of different solvent extracts of coconut (*Cocos nucifera* L.) haustorium. pp. 142.

Augustine Jerard, B., Niral, V., Samsudeen, K. and Gayathri, U.K., Pink husked coconut selection- a trait of promise. pp. 21.

Augustine Jerard, B., Niral, V., Samsudeen, K., Basavaraju, T.B., Prashanth, M. and Maheshwarappa, H.P. Kalpa Sreshta - a promising Dwarf x Tall coconut hybrid. pp. 18.

Basavaraju, T. B. and H. P. Maheswarappa. Coconut based cropping system with organic and integrated nutrient management for southern dry region of Karnataka. pp. 51.

Subaharan, K., M. Eswarmoorthy,. Pavan Kumar, B.V.V.S VibinaVenugopal, ChalapathiRao, N., Gurav, S., Rajamanickam, Ganesan, S. Joseph Rajkumar, A., Maheshwarappa, H. P., and Raveendran. P. Controlled delivery of Ethyl 4 Methyl Octonate, the pheromone of coconut Rhinoceros beetle, *Oryctes rhinoceros* Linn.

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Sujithra, M. Ecological safety of newer insecticides against larval parasitoids, Bracon brevicornis and Goniozus nephantidis of Coconut black head caterpillar, Opisina arenosella. pp. 103.

Surekha R. and Selvamani V. Impact of long term organic cultivation practices on soil heath and productivity of coconut. pp.

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Thangeswari, S., Rajendran , R and Maheswarappa, H. P. In vitro screening of fungicides against the growth of Ganoderma lucidum causing basal stem rot disease on coconut . pp. 99.

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Vinayaka Hegde, Sharadraj, K.M. and Prathibha, V.H. Trichoderma harzianum (CPTD28) - Effective in controlling diseases in coconut based cropping system. pp. 103.

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Anusree G.K., Alka Gupta, Murali Gopal., Panchami P.S. and George V. Thomas. Arecanut palms (*Areca catechu* L.) harbour phenotypically and genotypically diverse population of acid-tolerant *Bacillus* spp. in their root zones. pp. 132-133.

Anusree, G.K., Alka Gupta, Murali Gopal and George V. Thomas. Functional characterization of *Bacillus* spp. isolated from the rhizosphere of arecanut growing in extremely acidic soils of Kerala and Karnataka. pp. 134-135.

Arivalagan, M. , M.R. Manikantan, S. Sreejith, D. Balasubramanian, Kanade S.R. and Hebbar K.B. Biochemical characterization of coconut haustorium based extrudates. 247.

Augustine Jerard, B., Population improvement in coconut using West Coast Tall cultivar aiming high homogeneity for desirable traits. pp. 81.

Chandran K.P, Jose C.T, Jaganathan D, Jayasekhar S, and Muralidharan K. Incidence and spread of yellow leaf disease (YLD) of arecanut in Karnataka. p 267.

Devakumar, K. An improved device for coconut embryo extraction. pp. 246.

Elain Apshara, S. and Krithika, K.S. Evaluaton of selectve cocoa (*Theobroma cacao* L.) clones from Central and South America in their inital years of growth. pp. 71.

Gangaraj, K.P, Rajesh, M.K., Shradraj, K.M, Muralikrishna, K.S., Prathibha. V.H., and Vinayaka Hegde .Development of a novel *in vitro* inoculaton assay to investigate *Phytophthora palmivora*-coconut interactons. pp. 194.

Gayatri, U.K., Evalution of fruit component traits in conserved coconut accession of Pacific Ocean region. pp. 86.

Haritha, R.H., Indhuja. S, Jeena Mathew, Merin Babu, Anithakumari, P. Isolation and screening of plant growth promoting rhizobacteria associated with healthy coconut palms in root (wilt) disease endemic tract. p.190-191.

Indhuja, S. Isolaton and screening of plant growth promoting, rhizobacteria associated with healthy coconut palms in, root (wilt) disease endemic tract. pp. 190.

Jaganathan, D., Thamban C., Jayasekhar S., Chandran K.P. and Jose C. T. A multidimensional analysis of cocoa farming in Andhra Pradesh. pp 284-285.

Jayasekhar, S., Chandran K.P, Thamban C, Jaganathan D and Muralidhran K. Sectoral innovation system of coconuts in India: Institutional voids and organizational resilience. pp. 268-269.

Jose, C.T, Chandran, K.P, Muralidharan, K., Jaganathan,

D. and Jayasekhar, S. A robust covariance technique for data analysis. p 270.

Josephrajkumar, A., Subaharan, K., Chandrika Mohan, Shanavas, M., Sunny Thomas and Nampoothiri, C.K. Dynamics of rhinoceros beetle as influenced by pheromone trapping. pp. 160.

Kirankumar, V., Jayasekhar, S., Thamban, C. and Chandran, K.P., Changing coconut scenario in India (1960-2014). pp. 274.

Krishnakumar, V., Alka Gupta, Subramanian, P., Khadeejath Rajeela, T.H. and Indu, P. Soil biological properties and nutrient status of organic coconut based cropping system in different farmers' fields of Kerala. pp. 128.

Manjula C. Root anatomical characters of coconut (Cocosnucifera L.) growing in two different agro-climatic regions of Kerala. pp. 77.

Manikantan, M.R., Arivalagan, M., Balakrishnan, M., Kamalapreeetha, B. and Dharini, M. Prediction of thin layer convection drying characteristics of osmo-dehydrated coconut slices. pp 248.

Mathew A. C. Efficacy of water conservation measures in coconut plantations to enhance groundwater resource and coconut yield in West coast region. pp.99.

Murali Gopal, Alka Gupta, Jaganathan, D., Ravi Bhat and Chowdappa, P. Rhizosphere microbial status on yellow leaf diseased and healthy arecanut palms growing in Sringeri Taluk of Karnataka. p192.

Muralidharan, P. Jayasekhar and Mathew, A.C. Coconut chip's: Value chain. pp.273.

Muralikrishna, K.S, Rajesh, M.K., Sharadraj, K.M., Prathibha, V.H., Nagaraja, N.R., Sajini, K.K., and Anitha Karun. Screening for resistance to *Phytophthora meadii* in embryo cultured plantlets of *Areca triandra* and *Areca concinna*. pp. 85.

Nagaraja, N. R., Ananda, K. S., Sabana, A. A. and Rajesh, M. K. 2016. Simple sequence repeat marker-based molecular characterization and genetic diversity studies in cultivated and wild species of arecanut. pp. 47.

Nihad, K. and Krishnakumar, V. *Tagetus-Gomphrena* sequential cropping under coconut based farming system in coastal humid tropics. pp. 126.

Niral, V., Coconut milk and VCO recovery in selected accessions of coconut. pp. 82.

Pandiselvam, R., Manikantan, M.R., Sreejith, S., Shameena Beegum, P.P. and Bindu, J. Effect of processing parameters on functional and textural properties of coconut milk residue enriched extrudates. pp 229.

Prathibha, V.H., Vinayaka Hegde, Suresh, K.R., Sharadraj, K.M., Keerthana, U., Rachana, K.E. and Chowdappa, P. Phenotypic and molecular based identification of *Colletotrichum* spp. incitant of arecanut inforescence dieback disease. pp. 195.

Rachana, K.E. and Rajesh, M.K. Cloning and characterization of full length cDNA encoding coiled-coiled type NBS-LRR Resistance Gene Analogues in coconut. pp. 88.

Rajeev, M. S. and Muralidharan, P. Performance of turmeric varieties as intercrop in coconutgarden. pp. 117.

Rajesh, M.K., Sabana., A.A., Nagaraja, N.R., Muralikrishna, K.S., Ananda, K.S., and Anitha Karun Molecular characterization of arecanut (*Areca catechu* L.) and its wild relatives using Start Codon Targeted (SCoT) and RPB2 markers. pp. 89.

Rajkumar. Entomopathogenic nematodes: A novel approach for white grub management in coconut. pp. 197.

Rajkumar. Management of root-knot nematode (*Meloidogyne incognita*) infecting noni in coconut garden. pp. 188.

Ranjini, T.N., Niral,V., Surekha and Gayatri, U.K. Studies on weed diversity and density in coconut (*Cocos nucifera*) plots with different spacing. pp. 139.

Samsudeen, K., Evolution of progenies for assessing the influence of palm combinations to refine the selection of parents in coconut hybrid production. pp. 59.

Shafeeq Rahman, Rachana, K.E., Sabana, A.A., and Rajesh, M.K,. Expression analysis of genes involved in gibberellic acid biosynthesis in coconut pp. 84.

Shameena Beegum, P.P., Manikantan, M.R., Monika Sharma, Arivalagan, M., Hebbar, K.B. and Gupta, R.K. Feasibility of coconut milk residue for cold extrusion. pp. 240.

Shareefa, M., Thomas, R. J. and Nampoothiri, C.K. 2016. Standardization of seed nut storage method for Chowghat Green Dwarf variety of coconut. pp. 136.

Sivakumar, T., Naseema, A, Jiji, T., and Thomas George. Studies on in vitro reactions of fungicides on *Metarhiziummajus*, a bio control agent against rhinoceros beetle. pp. 189.

Subramanian P. Inter cropping of medicinal tree species in coconut based cropping system. pp. 137.

Thamban, C., Lijo Thomas, Nair, K. M. and Chandran, K.P. Analysis of contemporary profile of coconut farming – Espousing the need for nutrient management centric production strategy in Kerala. pp. 271.

Vinayaka Hegde, Sharadraj, K.M., and Prathibha, V.H.. Colocasia: An alternative host for arecanut pathogen *Phytophthora meadii*. pp. 196.

Neema M. Effect of charcoal in call genesis and embryogenic callus induction in coconut plumule culture .pp. 87.

Augustine Jerard B. Characterization of pink husked selection of coconut (Cocosnucifera L.). pp. 81.

Regi J. Thomas. Population improvement in coconut using West Coast Tall cultivar aiming high homogeneity for desirable traits.pp. 80.

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Indian Horticulture, January - February 2017, 62 (1)

Anitha Karun, M K Rajesh and Chowdappa P. Overcoming complexities in coconut improvement 82-84.

Chandrika Mohan and Joseph Rajkumar A. Reducing pest incidence for quality coconut 66-70.

Chowdappa, P. and Jayasekhar, S. Coconut: national and international scenario 3-9.

Hebbar K B, Manikantan M R and Chowdappa P. Kalparasa to boost rural economy 71-73.

Hebbar K B. Mitigating climatic changes for sustainable coconut production 56-59.

Krishnakumar V. Establishing coconut garden 23-28.

Maheswarappa H P, Subramanian P and Chowdappa P. Integrated

coconut farming system for stable income 29-33.

Mathew A C, Manikantan M R and Chowdappa P. Mechnization to reduce human drudgery in coconut production 60-65.

Muralidharan, K., Mathew, A.C. and Muralikrishna, H. Technologies at farmers' doorsteps 74-77.

Niral V, Augustine Jerard B and Chowdappa P. Coconut varieties for more return 15-22.

Ravi Bhat, Subramanian P and Chowdappa P. Coconut cultivation making small farmers cheerful 48-50.

Samsudeen, K., Thamban, C., Niral, V. and P Chowdappa. Ensuring quality planting material for sustainable coconut production 10-14.

Subramanian P, Krishnakumar V, Alka Gupta, Murali Gopal, Surekha and Chowdappa P. Exploring potential of organic coconut 34-41.

Thamban C, Anithakumari P and Jaganathan D. Empowering coconut stakeholders through extension 78-81.

Vinayaka Hegde, Prathibha V H and Chowdappa P. Enhancing farmers' income by diseases-free coconut 51-55.

The Cashew and Cocoa Journal, Special Issue on Cocoa, Vol. V, No.4, October-December 2016

Chowdappa, P., Thava Prakasa Pandian, R. and Chaithra, M. Integrated disease management. pp.30-33.

Chowdappa, P., Thava Prakash Pandian, R., Keerthana, U. and Chaithra, M. Cocoa mein rog prabandhan pp. 2-4 In Hindi.

Chowdappa, P.CPCRI: 100 Years in evolution, foundation in the colonial and the mansion in the independent India. pp.5-6.

Elain Apshara, S., Bhavishya and Kartika, K.S. Production systems and canopy architecture. pp. 24-29.

Elain Apshara, S.and Bhavishya. Harvesting and Processing. pp.42-44.

Elain Apshara, S.Cocoa Varieties developed at CPCRI. pp.15-18.

Jose, C.T., Nagaraja, N.R. and Purandhara, C. Transfer of technology. pp. 51-54.

Senthil Amudhan, M. and Elain Apshara, S. Antioxidant activity and Biological profile of cocoa clones. pp. 39-41.

Shivaji Hausrao Thube, Saneera, E.K. and Prathibha, P.S. Pests of Cocoa and their management. pp.34-38.

Suchithra, M.S., Prasanna, H.S. and Elain Apshara, S. Quality planting material production. pp.19-23.

Indian Journal of Arecanut, Spices and Medicinal Plants, Vol. 18 (4), October-December, 2016

Ananda, K. S. and Jose, C.T. Processing, Chemical Composition and Utilization of Arecanut. pp. 52-55.

Ananda, K. S., Nagaraja, N. R. and Chowdappa, P. Arecanut Varieties and Hybrids released by ICAR-CPCRI. pp. 16-21.

Ananda, K. S., Nagaraja, N. R. and Krithika, K. S. Quality Planting Material Production in Arecanut. pp. 22-25.

Chowdappa, P. and Homey Cheriyan. Arecanut: Production, Consumption and Marketing. pp. 6-15.

Chowdappa, P. CPCRI: 100 Years in Evolution, Foundation in the Colonial and the Mansion in the Independent India. pp. 3-5.

Chowdappa, P., Vinayaka Hegde, Thava Prakasa Pandian, R. and Chaithra, M. Arecanut Diseases and their Management. pp. 46-51.

Jose, C. T., Nagaraja, N. R., Jaganathan, D. and Purandhara, C. Transfer of Technology Programmes for Arecanut. pp. 67-72.

Karthika, K. S., Priya, U. K. and Ravi Bhat. Nutrient Deficiency Disorders and their Management in Arecanut. pp. 30-34.

Ravi Bhat, S. Sujatha, Bhavishya and Karthika, K. S. Nutrient Management for Sustained Productivity of Arecanut. pp. 26-29.

Ravi Bhat, Sujatha, S. and Chowdappa, P. Arecanut based Cropping System. pp. 35-41.

Saneera, E. K. and Shivaji Hausrao Thube. Arecanut Pests and their Management. pp. 42-45.

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Arvind K.Y., R. Rai, P.K. Dash, and S.V. Ramesh. Biotechnology of Plantation Crops-Date palm Pp: 689-697.

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TRANSFER OF TECHNOLOGY

Training programmes

ATMA interstate training on Integrated crop management and value addition in coconut for 22 farmers from Karur Dist, Tamil Nadu was conducted during 19-21 October 2016. Another batch of ATMA interstate training on Integrated crop management and value addition in coconut during 9-11 November, 2016 for the farmers of Namakkal, Tamil Nadu at CPCRI Kasaragod.

Training on Integrated crop management and value addition in coconut for 20 farmers from Belur, Hassan Dist, Karnataka was conducted on 7.11.16 at CPCRI Kasaragod. Training on 'Production of improved quality assured hybrid coconut seedlings for 26 farmers at CPCRI, Kasaragod was held on 25 November 2016.

No.	Name of training	Course Director & associate	No. of Participants	Days & duration
1	Hybridization techniques and palm health management in coconut' for 13 skilled pollinators/ supervisors	Dr. R.J. Thomas, PS and Dr. M. Shareefa	13 skilled technicians	Five days, November 11-15, 2016
2	Hands on Orientation Training on Soil Testing-A Tool for Soil Health Assessment	Dr. Jeena Mathew, Scientist	18 Agricultural Officers	October 24-28, 2016

A team of seventy progressive coconut farmers and members of Farmer Producer Company from Pollachi, Tamil Nadu visited the Regional Station during December 26-27, 2016 as part of ATMA-Exposure visit knowledge empowerment programme at the Regional Station, Kayamkulam. Another training on 'Identification of dwarf mother palms and procurement of seed nuts' for 30 Asst. Agricultural Officers / Agricultural Assistants from 11 Blocks of Kollam District was held on 28th December, 2016. A training programme on Floriculture based intercropping system in coconut garden was held on 29th November, 2016. A training programme on "Biofertilizers and Bioagents: Prospects and Application in Coconut based cropping system was conducted on 29th November, 2016 in which fifteen technicians from Pest Surveillance team of Bharnikavu and Vallikunnam panchayats participated. A training session on "Nutrient management in coconut including deficiency symptoms" in the training programme on Hybridization techniques and Plant Health Management in coconut was convened during 1-5, November, 2016 and 28-30 Dec. 2016.

One day workshop on Advances in Arecanut and Cocoa Production and Processing Technology was organized at ICAR-CPCRI, Regional Station, Vittal for 43 farmers and an Officer form Kalpavruksha Savayava Krishikara Sangha, Padumarnadu Beluvai, Mudabidre on 6th December, 2016.

Two numbers of FOCT "Friends of Coconut Tree" training programme for 6 days duration was organized on 29th November to 3rd December, 2016 and 19th to 24th December, 2016 at Research Centre, Mohitnagar. 20 trainee in each training were trained on coconut cultivation aspects including practice on coconut palm climbing.

Four numbers of training programme of two days duration was conducted in collaboration with KVK, Jalpaiguri during this period.

Training programme on "Cocoa cultivation and processing technique" was conducted at ICAR-CPCRI, RC, Kahikuchi from 24th to 26th October 2016 for 50 farmers from Assam and Meghalaya. A training for 30 farmers on "Black pepper production" was conducted at ICAR-CPCRI, RC, Kahikuchi on 28th December, 2016.

Off - campus training programmes

Training programme on 'Soil & water conservation techniques in coconut gardens' for 28 farmers at Puracherry held on 11th November, 2016.

Training programme on 'Soil & water conservation techniques in coconut gardens' for 30 farmers at Cheruthazham gramapanchayat held on 18th November, 2016.

Training programme on Water conservation practices in coconut farm for 175 farmers held on 5th Dec 2016 at Panayal in connection with World soil day celebration.

Awareness campaign was conducted at Kapad in Kannur District ((N 12°31.670, E- 074°54.157) regarding the recent incidence of Rugose spiraling whitefly Aleurodicus rugioperculatus Martin (Hemiptera: Aleurodidae). Around 25 farmers attended the campaign. About 100 coconut farmers of Kozhinjampara, Palakkad district, Kerala attended another awareness cum training on bio-suppression of rugose spiraling whitefly at Kozhinjampara on 23rd November, 2016. More than 100 coconut

farmers, Agricultural Officers and pesticide dealers of Pollachi, Tamil Nadu were sensitized on the biological suppression during 21-22 December, 2016 at Coconut Research Station, Aliyarnagar.

A training programme on pest management in coconut was conducted at Thekekara Kera gramam for farmers and palm technicians on 1st November, 2016. A farmer' seminar was convened on Integrated Pest management of coconut and Integrated Nutrient Management at Madapally, Kottayam on 22nd November, 2016. A training session on Pest and Disease Management of coconut as Organic Farming Perspective was held at East Kallada on 13th December, 2016.

A technical session on 'Mother palm selection and crop health management in coconut' as well as field level intervention for 30 selected farmers was convened at Poonjar Thekkekara (Kottayam District) on 18th November, 2016. A technical session on 'Hybridization techniques and nursery management in coconut' for farmers was held at RATTC, Kazhakkoottam, Thiruvananthapuram on 5th December, 2016.

A Centenary Training programme on Intercropping of high value crops in coconut garden for higher income and employment, was held at Kandalloor Panchayath, Alappuzha Dist., Kerala on 19th November, 2016.

A Training programme on compost preparation using coconut residues and community based coconut pest management was organized on 18th October, 2016 at Vellangalloor Panchayath, Thrissur district in which 62 farmers participated. A technical workshop on 'Technology integration and farmer participatory programmes for Keragramams was held at Perinad Panchayath on 24th October, 2016 In which 103 stakeholder representatives from 20 wards of the Panchayath attended.

A training on Fish Processing at Cherthala South as part of MGMG programme was convened on 20th December, 2016 and 23rd December, 2016. A stakeholder meeting for demonstration of bio-priming in coconut seedlings was held on 27th December, 2016.

A technical session on "Possibilities of Intercropping in coconut Garden for maximizing income" was conducted on 21st December, 2016 in the NABARD sponsored training programme at Navasakthi Trust, Thazhhava, Karunagappally.

Training programme on Mass Multiplication of Trichoderma and Training Cum Exposure Visit on Advances in Arecanut and Cocoa Production and Processing Technology was organized for 25 farmers from Cocoa Growers Association and Balpa Grama Vikasa, Balpa, Sullia Tk., Dakshina Kannada Dt., Karnataka at ICAR-CPCRI, Regional Station, Vittal on 4th October, 2016.

Field Day on Arecanut Based Multispecies Cropping System sponsored by Directorate of Arecanut and Spices Development (DASD), Calicut was organized at Palthady, Puttur Tk., Dakshina Kannada Dt., Karnataka on 25th October, 2016. More than 300 participants attended the Field Day and got benefitted.

Training programme for women farmers of Karnataka 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, Research Center, Kidu, Nettana, Puttur Tk., Dakshina Kannada Dt., Karnataka on 5th November, 2016. More than 125 participants attended the training and got benefitted.

One off farm training programme on "Plantation based cropping system for maximization of profit" was organized at Dholaguri of Coochbehar district. A total of 40 trainees attended the programme.

Exposure visit-cum- training programme was conducted for the 45 farmers of Manjeshwara, Kasaragod Dist and 42 farmers of Kannur Dist on 19th October, 2016 at CPCRI Kasaragod. Exposure visit-cum- training programme for the officials of 'Goa Bagayatda Sangh', Goa was conducted on 18th October, 2016 at CPCRI Kasaragod. Exposure visit-cum- training programme for the officials from Kollegal taluk, Chamrajnagar dist, Karnataka was conducted on 19th October, 2016 at CPCRI Kasaragod. Exposure visit-cum- training programme for the farmers from Taliparmba, Kannur was conducted on 20th October, 2016 at CPCRI Kasaragod. Exposure visit-cum- training programme for 40 farmers of Sirsi, Uttara Kannada Dist was conducted on 8th November, 2016.

Exposure visit of women self help group from Bongaigaon district, Assam to ICAR CPCRI RC, Kahikuchi of members.

Exposure Visit / Trainings

Farmers		Extn. Personnels		Students		Others	
No. of batches	No. of visitors	No. of batches	No. of visitors	No. of batches	No. of visitors	No. of batches	No. of visitors
04	116	01	02	11	571	10	35

Human resources development on coconut grafting technique

Canopy architecture engineering demonstration in cocoa

Post-harvest processing in cocoa

Visit to cocoa bean processing unit

Stakeholders Workshop – Farmers FIRST Programme

A Stakeholder workshop was organized at FFP panchayath on 26th November, 2017 at Pathiyoor on Problem Prioritization and Need analysis in coconut based farming systems for Farmer First Project wherein 63 stakeholder representatives actively participated. A continuation of problem prioritization and sensitization on FFP programmes and technologies to be integrated, organized focused group discussion (FGD) meetings and technical sessions were held during 26th December, 2016 and 30th December, 2016. A total of 101 and 60 farmers of various crop modules participated in the meetings respectively.

Training on Cocoa production and processing technology was conducted at ICAR-CPCRI, Regional Station, Vittal from 1st to 3rd December, 2016 with funding from Directorate of Cashewnut and Cocoa Development (DCCD), Cochin and a total of 55 farmers participated, among them 34 are women and 23 are from tribal communities.

Nematodes and root grub infestation in arecanut based cropping system at Karnataka

CPCRI jointly with KVK Bramahavar, Udupi, Karnataka conducted survey on nematodes and root grub infestation in arecanut plantations on the foots of Western Ghats at Shirlal village of Karkala taluk during November 2016 found several juvenile arecanut gardens (2 - 3 years old) were severely affected by root grub (Leucopholis spp.). A total of 65% of newly planted seedlings in and around the village were showed symptoms of root grub infestation with 1 to 2 grubs /m^2 of early third stage. In old gardens (15 year age) 18 - 20 % palms were found affected in a random throughout the gardens with 2 - 3 grubs/m^2. Advised the farmers to avoid planting of arecanut in traditional paddy fields, application of entomopathogenic nematodes and collection and destruction of adult beetles and grubs for continuous three years effectively suppress the root grub multiplication. Similarly, in black pepper planted in arecanut gardens found quick wilt incidence (10 - 15%) consist of root-knot nematode (Meloidogyne incognita.), burrowing nematode (Radopholus similis) and fungal (Phytophthora sp.) infestation was observed in visited gardens. Advised application of Trichoderma harzianum enriched neem cake (1kg/vine) during pre and post monsoon will suppress the disease incidence.

Radio / TV Programme

Dr. Arun Kumar Sit, Principal Scientist participated in West Bengal Regional Science Congress, 2016, Jalpaiguri Division, organized by Dept. Science and Technology, Govt. West Bengal on 7-8th November, 2016 and acted as Expert Panelist of the Panel discussion on "Problems of Horticulture and Plantation in North Bengal.

Exhibitions

The institute has participated in various national and international exhibitions and showcased the technologies for the benefit of farmers and other stakeholders.

1	'Agri fiesta/Farm show 2016' organized by RARS, Pilicode.	16-28 November 2016
2	'Technology meet' at Sreevalsam auditorium, Nileshwar.	18-19 November 2016
3	International workshop on Agro-Processing and Value Addition organized by Govt. of Kerala at Kanakakkunnu Palace, Thiruvananthapuram.	1-5 December 2016
4	Krishi Utsav organized by Shri Kshethra Dharmasthala Rural Development Project, Kumble at Baikatte Sri Ayyappa Bhajana Mandir ground, Paivalike.	17-18 December 2016
5	'5th National Minicoy Fest 2016' organized by Lakshadweep Administration and Dept of Tourism at Minicoy Island.	27-28 December 2016

Arranged our Institute exhibition stall at Palthady, Puttur Tk., Dakshina Kannada Dt., Karnataka in connection with the Field Day on Arecanut Based Multispecies Cropping System sponsored by Directorate of Arecanut and Spices Development (DASD), Calicut on 25-10-2016.

Arranged an exhibition stall at ICAR-CPCRI, Research Center, Kidu, Nettana, Puttur Tk., Dakshina Kannada Dt., Karnataka on 05.11.16 in connection with training programme for women farmers of Karnataka on 'Multi Species Cropping System in Arecanut Garden for Higher Income' sponsored by Directorate of Arecanut and Spices Development (DASD), Calicut.

KVK, Kasaragod exhibition was held in connection with Technology meet with ATMA on 17th &18th November, 2016, another exhibition in connection with centenary programme of RARS, Pilicode 18th to 25th Nov.2016 was also arranged.

KVK, Alapuzha exhibition stall was arranged in International Workshop and Exhibition on VAIGA (Value Addition for Income Generation in Agriculture) organized by Department of Agriculture Development & Farmers' Welfare, Government of Kerala at Kanakakkunnu Palace, Thiruvananthapuram from December 1-5, 2016.

MERA GAON – MERA GAURAV

ICAR- CPCRI, Kasaragod and its regional stations and research centres have implemented the MGMG initiative in collaboration with other stakeholders viz., Department of Agriculture, Krishi Vigyan Kendra, grama panchayat, input dealers, progressive farmers, SHGs etc. During October- December 2016, training programmes, demonstration on improved practices, farm advisory visits, mobile advisory services were organized in the selected villages for the benefit of farming community. A total of sixty four scientists adopted seventy villages for the overall development of the villages as given below :

Venue	No of scientists	No of adopted villages	No. of training programmes / meetings organized	No of farmers benefitted
CPCRI, Kasaragod	36	38	17	426
CPCRI, RS, Kayamkulam	13	16	14	375
CPCRI, RS, Vittal	9	9	7	384
CPCRI, RC, Kahikuchi	4	4	7	92
CPCRI, RC, Mohitnagar	2	3	5	167
Total	**64**	**70**	**50**	**1444**

Farm advisory visit at Bela, Badiadka

Demonstration on soil and water conservation at Pullur Periya

Demonstration on management of *Ganoderma* wilt in coconut at Veltholi


Kisan Gosti at Bharanikavu


Kisan Gosti at Chettikulankara


Farm advisory visit at Bharanikavu


Training on Fish processing at Cherthala


Kisan Gosti at Kopparethu


Training for farm women


Field day on arecanut based cropping system at Palthady, Puttur


Field visit to Manchi


Quiz competition at Palthady


Farm advisory visit at Pradhanpara


Farm Advisory visit at Kudipara


Kisan Gosti at Pradhanpara

KVK, KASARAGOD

Training programmes

Programme	No. of trainings	Participants		
		Male	Female	Total
On campus	19	215	145	360
Off campus	6	65	39	104
Total	25	280	184	464

Jai Kisan Jai Vigyan Diwas

Jai Kisan Jai Vigyan Diwas was celebrated at Ajanur panchayath on 29-12-2016 in which 50 farmers participated. In connection with the programme, 2 agricultural seminars were conducted on the topics such as Role of Pulse crops in Nutritional security and Scientific Banana cultivation.

Technology Week celebration

Technology week was conducted in collaboration with ATMA from 18-11-2016 to 24-11-2016 at Nileshwar by conducting Seminars, Interface programmes, exhibitions with 25 stalls showcasing technologies by CPCRI, KVK, Developmental departments, private companies etc. with participation of around 4000 farmers.

Rabi sammelan

A Rabi Sammelan was organized from 10th to13th December 2016 as part of the World soil day celebrations. A seminar on Soil Health management and drought mitigation measures was organized on 10th December which was very relevant in the current scenario as the district is facing severe drought situation.

An Exhibition was organized from 10th to 13th during the Kisan mela showcasing the recent technologies in the field of agriculture and allied aspects. More than one lakh farmers visited the stalls and got exposed to recent technologies and innovative products.

Following OFTs are under various stages of implementation

1. Management of rhinoceros beetle in coconut; 2. Varietal evaluation of dwarf coconut palm varieties; 3. Assessment of ITK, Boarep for preventing crop damages by wild boar; 4. Assessment of effectiveness of micronutrient in black pepper; and 5. Fortification of Nutrimix powder with coconut sugar.

The following FLDs are under various stages of implementation

1. Demonstration of gingelly varieties in paddy fallows; 2. Management of banana pseudostem weevil; 3. Introducing greater yam *Diascorea alata* variety; 4. Introducing lesser yam *Diascorea esculenta* variety; 5. Introduction of HYV of Green gram COGG- 8 in paddy fallows; 6. Introduction of Black gram (var. Vamban 6); 7. Introduction of fodder grass variety CO-5; 8. Introduction of short duration cassava variety Vellayani Hraswa; 9. Management of soft rot and nutritional deficiencies in HYV of ginger; 10. Demonstration of HYV of Turmeric – Prathibha; 11. Effect of seed treatment and soil application of *Pseudomonas fluorescens* against earhead disease of paddy; 12. Management of stem bleeding disease in coconut; 13. Mechanization in paddy; 14. Organic farming package for coconut in homesteads; 15. Demonstration of Micronutrient application in Banana; and 16. Demonstration of Minimal processing of Tendernut.

KVK, Alapuzha

ICAR –KVK-Alappuzha facilitated farmers of Muttar for a greener village

'Haritha Sobha', a unique programme for planting a variety of fruit and foliage tree plants in more than 300 households of Muttar village was launched as part of the National Innovations in Climate Resilient Agriculture (NICRA) project implemented by ICAR-KVK-Alappuzha.

Climate resilient technologies in paddy cultivation facilitated by ICAR-KVK-Alappuzha gaining popularity in Kuttanad region of Kerala.

ICAR-KVK-Alappuzha celebrated 'World Soil Day' at Mararikulam South Panchayath

'Maintaining the soil and water resources in healthy condition by following good agricultural practices for productivity enhancement and a healthy society' is the need of the hour. This message was conveyed in the 'World Soil Day celebrations' organized by the ICAR Krishi Vigyan Kendra – Alappuzha at Mararikulam South. Fertilizer recommendations based on the soil test for the major crops like coconut, banana, tubers, and turmeric were worked out and provided in the soil health cards ready for distribution to 250 farmers of the panchayath.

Smt. Indira Thilakan, President, Mararikulam South Gramapanchayath, distributing the soil health cards to farmers

Sri A.S. Jayamohan, Chairam, Welfare Standing Committee, Mararikulam South Gramapanchayath, addressing the farmers

PARTICIPATION IN SEMINARS/SYMPOSIA/CONFERENCES/WORKSHOPS

Name and designation	Title	Place and date
Dr. P. Chowdappa, Director, Dr. H. P. Maheswarappa, Project Coordinator (Palms), Dr. Ravi Bhat, Dr. K.B. Hebbar, Dr. (Mrs.) Anitha Karun, Dr. Vinayaka Hegde, Dr. C. Thamban, Dr. K.S. Anand, Heads, Dr. V. K. Chaturvedi, Dr. K. Muralidharan, Dr. MuraliGopal, Dr. (Mrs.) Alka Gupta, Dr. (Mrs.) V. Niral, Dr. Elain Apshara.S., Dr. P. Subramanian, Dr. K. Samsudeen, Dr. S. Kalavathi, Dr. Chandrika Mohan, Dr. P. Anithakumari, Dr. Regi J. Thomas, Dr. Josephrajkumar, Dr. C.T. Jose, Dr. S. Kalavathi, Dr. Chandrika Mohan, Dr. Anithakumari. P, Principal Scientists, Dr. Chandran K. P., Dr. K. Devakumar, Dr. V.K. Chaturvedi, Dr. S. Paulraj, Dr. Ramesh S.V., Sr. Scientists, Dr. Jayasekhar, S., Scientist Sr. Scale, Dr. D. Jaganathan, Dr. Prathibha V.H., Dr. V. Selvamani, Dr. (Mrs.) P.S. Prathibha, Dr. Prathibha V.H., Dr. Rajkumar, Mrs. Surekha, Dr. (Mrs.) M. Sujithra, Mrs. S. Neenu, Dr. (Mrs.) M. Neema, Mrs. G. Panjavarnam, Dr. Mr. Man Mohan Deo, Ms. Jilu V. Sajan, Ms. Ranjini T.N.Dr. N.R. Nagaraja, Dr. Merin Babu, Dr. Shareefa M., Dr. Jeena Mathew, Dr. (Mrs.) Karthika K.S., Mr. Bhavishya, Mr. Shivaji HausraoThube, Mr. Thava Prakasha Pandian, Ms. Suchithra M., Ms. Saneera E.K., Dr. Merin Babu, Dr. Shareefa M., Dr. Jeena Mathew, Scientists, Dr. K.K. Sajini, CTO and Dr. K.S. Muralikrishna, Tech. Assistant	3rd International Symposium on Coconut Research and Development (ISOCRAD-3)	ICAR-CPCRI, Kasaragod 10th-12th December, 2016
Dr. P. Chowdappa, Director, Dr. H.P. Maheswarappa, Project Coordinator (Palms), Dr. Ravi Bhat, Dr. K.B. Hebbar, Dr. Vinayaka Hegde, Dr. (Mrs.) Anitha Karun, Dr. V. Krishnakumar, Dr. C. Thamban, Dr. K.S. Ananda, Dr. Manoj Kumar T.S., Sr. P. Muralidharan, Heads, Dr. K. Muralidharan, Dr. Murali Gopal, Dr. (Mrs.) Alka Gupta, Dr. (Mrs.) V. Niral, Dr. Elain Apshara. S., Dr. Joseph Rajkumar, Dr. P. Subramanian, Dr. A.C. Mathew, Dr. K. Samsudeen, Dr. M.K. Rajesh, Dr. C.T. Jose, Principal Scientists, Dr. K.P. Chandran, Dr. M.R. Manikantan, Dr. K. Devakumar, Dr. S. Paulraj, Dr. Ramesh S.V., Sr. Scientists, Mr. S. Jayasekhar, Scientist Sr. Scale, Shareefa M., Dr. Indhuja, Sri Y. Diwakar, Dr. D. Jaganathan, Dr. V. Selvamani, Mr. M. Arivalagan, Dr. Rajkumar,	Plantation Crops Symposium (PLACROSYM-22)	ICAR-CPCRI, Kasaragod 15-17th December 2016 at

Dr. Y. Diwakar., Dr. (Mrs.) V.H. Prathibha, Mrs. Surekha, Dr. (Mrs.) M. Sujithra, Mrs. S. Neenu, Dr. (Mrs.) M. Neema, Mrs. Shameena Begum, Mrs. G. Panjavarnam, Mr. Man Mohan Deo, Dr. N.R. Nagaraja, Shri Bhukya Narsimha Swamy, Mrs. BandelaSravanthi, Mr. Shivaji Hausrao Thube, Mr. R. ThavaPrakashPandian, Mr. R. Pandiselvam, Ms. Ranjini T.N., Scientists, Dr. S. Leena, SMS, Dr. K.K. Sajini, Chief Technical Officer, Technical Assistant. M.S. Rajeev, T. Sivakumar, Asst Chief Tech. Officers and Dr. K.S. Muralikrishna		
Dr. (Mrs) Anitha Karun, Dr. Ravi Bhat, Dr. Vinayaka Hegde, Dr.C.Thamban, Dr. K.B. Hebbar, Heads,Dr. V. Niral, Dr. K. Samsudeen, Dr. M. K. Rajesh, Dr. S. ElainApshara, Dr.Regi Jacob Thomas Principal Scientists, Dr. K. Devakumar, Sr. Scientist,Dr.Shareefa M., Dr. N.R. Nagaraja, Ms.Suchitra M., Mr. Y. Diwakar, Dr. M. Neema, Dr.Aparna V., Ms.Ranjini T.N. Scientist, Dr. Muralikrishna, K.S. Technical Assistant.	Workshop on Cryopreservation of Plant Germplasm	ICAR-CPCRI, Kasaragod 02nd November 2016
Dr. Ravi Bhat, Head	Seminar on Cultivation of Plantation Crops	ZA&HRS, Brahmavar 15th November 2016
Dr. K.B. Hebbar, Head	Workshop on processing of Coconut Products	Kundapura 30th October 2016
Dr. V. Krishnakumar, Head	International Workshop on AgroProcessing and Value addition	Thiruvananthapuram 2nd December, 2016
Dr. S. Elain Apshara, Principal Scientist (Hort.), Nagaraja, N.R., Scientist	National conference on cashew and cocoa: production to marketing	Hotel Fidalgo, Panaji, Goa 7th to 8th November, 2016
Dr. Elain Apshara S., Principal Scientist	7th Indian Horticulture Congress-2016	ICAR- IARI, New Delhi 5th November 2016
Dr. A. Joseph Rajkumar, PS	Third National Meet of Entomologists-2016	ICAR-IIHR, Bengaluru 7-8 October, 2016
Dr. M.R. Manikantan, Sr. Scientist and Dr. R. Pandiselvam, Scientist	International Conference on Controlled Atmosphere and Fumigations	The Entomological Society of India, New Delhi 7-11th November 2016
Dr. Arun Kumar Sit, Principal Scientist	West Bengal Regional Science Congress, 2016	Jalpaiguri 7-8th November, 2016
Shri Sandip Shil, Scientist	International conference on statistics and big data bioinformatics in agricultural research	ICRISAT, Hyderabad 20th to 23rd November, 2016
Dr. S. Leena, CTO	State Level Workshop on Organic Farming Practices	RARS, Pilicode 17th November, 2016

CELEBRATIONS

Vigilance Awareness Week was observed at ICAR-CPCRI, RC, Mohitnagar from 31st October to 5th November, 2016. Rastriya Ekta Diwas was celebrated at ICAR-CPCRI, RC, Mohitnagar on 31st October, 2016 with a oath of sovereignty and unity.

Agricultural Education Day was organized at CPCRI Kasaragod on 03rd December, 2016.

DISTINGUISHED VISITORS

Dr. W.S. Dhillon, ADG, Hort. Sci., New Delhi and Dr. D.B. Singh, Director, ICAR-CITH, Srinagar, Jammu & Kashmir visited ICAR-CPCRI, RC, Kahikuchi on 03-11-2016.

OTHER INFORMATION

In-house training on RTI

Dr. G. Rajeev, ACTO, Kayamkulam conducted a training on "RTI Online Portal" on 28th November, 2016 to the officials involved in the RTI handling in the Institute. Shri Suresh Kumar, CAO, Shri H. Muralikrishna, CTO (Tech. Info.), Shri Sebastian A. George, CTO, Shri K.M. Jayarama Naik, AO, Shri K.T. Unni, PS attended the training.

Swachhta Pakhwada

The Swachhta Pakhwada activities (16th - 31st October, 2016) were launched at ICAR - CPCRI, Kasaragod, its Regional Stations at Kayamkulam, Kerala and Vittal, Karnataka as well as Research Centres at Kahikuchi (Assam), Kidu (Karnataka), Minicoy (U.T. of Lakshadweep) and Mohitnagar (West Bengal) on 17th October, 2016. Launching was with Swachhta Shapath plegde taking ceremony at 10.30 AM by all the staff members in taking the Swachhta Pledge. Cleaning activities for the entire fortnight have been carried-out as per the ICAR prescribed 11-point parameters for a clean and green environment and eco-friendly and sustainable farming.

PERSONALIA

PROMOTION

Name of the staff	From (Designation)	To (Designation)	w.e.f.
Shri. P.K. Sunil Kumar	Technical Assistant	Sr. Tech. Asst.	11-05-2015
Shri A.F. Mascarenhas	Sr. Technical Assistant	Tech. Officer (Elec. Engg.)	2-7-2015
Shri S. Manohara	Tech. Asst. (Vehicle)	Sr. Tech. Asst. (Vehicle)	29-06-2016
Shri K.N. Pankajakshan	Tech. Asst. (Vehicle)	Sr. Tech. Asst. (Vehicle)	29-06-2016
Shri A.K. Ramadas	Tech. Asst. (Vehicle)	Sr. Tech. Asst. (Vehicle)	29-06-2016
Shri V. Chandrashekhara Shetty	Tech. Asst.	Sr. Tech. Asst. (Vehicles)	29-06-2016
Shri Ramanna Gowda	Tech. Asst.	Sr. Tech. Asst. (Vehicles)	29-06-2016
Shri. T. Deyanandan Unnithan	Tech. Asst. (Vehicle)	Sr. Tech. Asst. (Vehicle)	29-06-2016
Shri Jagadish Roy	Tech. Asst. (Vehicle)	Sr. Tech. Asst. (Vehicle)	29-06-2016
Shri Gopinath Malakar	Tech. Asst. (Vehicle)	Sr. Tech. Asst. (Vehicle)	29-06-2016
Shri K. Devaraj	Technical Assistant (Jr. Engg.)	Sr. Technical Assistant (Jr. Engg.)	14-06-2015
Shri S. Sunil	Technician (Ele. Engg.)	Sr. Technician (Ele. Engg.)	18-08-2015
Shri Jagadish Royburman	Techinal Assistant (Farm)	Senior Technical Assistant (Farm)	09-11-2015

TRANSFER

Name of the staff	From (Place)	To (Place)	w.e.f.
Shri Man Mohan Deo	Scientist, ICAR-CPCRI, Kasaragod	Scientist, ICAR-IIPR, Kanpur	21-12-2016
Shri Bhukya Narashima Swamy	Scientist (Veg. Sci.), ICAR-VPKAS, Almora	Scientist (Veg. Sci.), ICAR-CPCRI, Kasaragod	15-11-2016
Smt. Bandela Sravanthi	Scientist (SP&M&AP), ICAR-NIASM, Malegaon,	Scientist (SP&M&AP), ICAR-CPCRI, Kasaragod	21-11-2016
Dr. Ramesh S.V.	Scientist (Ag. Biotech.), ICAR-IISR, Indore	Scientist (Ag. Biotech.), ICAR-CPCRI, Kasaragod	03-10-2016

RETIREMENT

Name	Designation	Place	Date
Dr. A. K. Gogoi	Principal Scientist	ICAR-CPCRI, RC, Kahikuchi	31-10-2016
Shri. R. Vijayan	Tech. Asst. (Vehicles)	ICAR-CPCRI, RS, Kayamkulam	30-11-2016
Smt. D. Lathikakumari	Assistant	ICAR-CPCRI, RS, Kayamkulam	30-11-2016
Shri N. Lakshmana	Upper Division Clerk	ICAR-CPCRI, RS, Vittal	30-11-2016
Shri K.G. Narayana Swamy	Sr. Technical Assistant	ICAR-CPCRI, Kasaragod	30-11-2016

भाकृअनुप
ICAR

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

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