



# KALPA

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**ICAR-CENTRAL PLANTATION CROPS RESEARCH INSTITUTE**

Kasaragod, Kerala - 671 124





# From the Director's Desk

## Excess water to deficit condition: The changing phase

Rainfall during South-West monsoon recorded was 10% above normal during this year. It was even more in most of the coconut and arecanut growing tracts in the country. Rainfall during October to December period is very crucial for soil moisture management. Erratic rainfall during North-East monsoon is often decisive on the occurrence of drought. The ICAR-Central Plantation Crops Research Institute has developed and popularized agronomic practices and engineering structures for in situ water conservation in coconut and arecanut gardens. Putting these in place, along with receding of South-West monsoon is important. Together with this, the water-saving drip

irrigation schedules developed by the Institute will alleviate the effect of moisture deficit. In view of this, water conservation turned out to be the most important factors of sustainable production in these crops. Adopting water conservation techniques within the plantations would also contribute to 'Jal Sanchay', the vision of our Hon'ble Prime Minister. Incidentally, the second phase of 'Jal Shakti Abhiyan', the mission-mode water conservation campaign was also got initiated from 1<sup>st</sup> October 2020. The Institute has organized this campaign, along with the two KVKs. There were various activities including a Kisan Mela at Kasaragod on 2<sup>nd</sup> October 2019, on the occasion of 150<sup>th</sup> birthday of Mahatma Gandhi. Various other programmes were also conducted to mark the occasion.

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## SPECTRUM

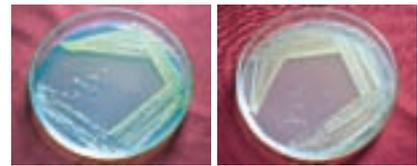
### Leaf blight disease in arecanut: First report on the pathogen *Pantoea* spp.

An outbreak of leaf blight/stripe disease was noticed in juvenile arecanut palms (up to 7 years of age) in Shikaripur and Channagiri Taluks of Shivamogga region of Karnataka during 2018-2019. The characteristic symptoms observed as dark green, water soaked linear lesions or stripes alongside or parallel to the midrib of the leaf let and its main veins. The margin of the lesions is usually straight and also wavy in some leaves due to lateral spread. The bacterial infection leads to partial or complete blighting of the leaves and the entire crown may be affected especially in the

seedlings. Five bacterial isolates were purified from infected samples collected from disease endemic areas. These isolates were characterized as Gram-negative, yellow or beige pigmented and rod shaped bacteria. All these isolates were identified as *Pantoea* spp. and further confirmed by biochemical characterization using VITEK system and 16S rRNA gene sequence analyses. Pathogenicity tests also demonstrated that all the five *Pantoea* isolates were pathogenic to arecanut. This is the first record of *Pantoea* spp. causing leaf blight disease in arecanut.



Blight disease affected arecanut leaves and bacterial ooze in infected leaves



Colony of *Pantoea* spp. on nutrient agar

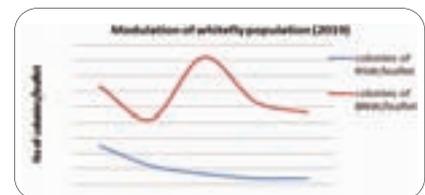
Prathibha V.H.,  
Thava Prakash Pandian  
and Vinayaka Hegde

### Co-existence of exotic whiteflies and competitive displacement

With the dominance of rugose spiralling whitefly (RSW), *Aleurodicus rugioperculatus* observed on coconut during the initial phase of introduction in 2017 at Kayamkulam, Kerala, co-occurrence of two nesting whiteflies viz., *Paraleyrodes bondari* and *Paraleyrodes minei* was subsequently recorded during 2018. Hence, co-existence of three exotic whiteflies : (*A. rugioperculatus*, *P. bondari* and *P. minei*) was common on palm

leaflets in 2018 with fluctuating population of each species in different seasons. However, in 2019, *Paraleyrodes minei* was significantly reduced and relatively absent on coconut palms in Kayamkulam. Bondar's nesting whitefly (BNW), *P. bondari* had dominated on coconut during June – December 2019 (4.0) slowly replacing *A. rugioperculatus* (1.0) by competitive displacement principle. This is a new report on the competitive displacement of one

exotic whitefly (*A. rugioperculatus*) by another non-native whitefly (*P. bondari*) infesting coconut from Kerala, India.



Josephraj Kumar, A., Merin Babu Chandrika Mohan and Anes, K.M.

### A new and virulent *Steinernema* sp. effective against red palm weevil grubs

A new entomopathogenic nematode (EPN), *Steinernema* sp. CPCRI0804 discovered from Kerala, India was found to be highly effective against the grubs and pupae of red palm weevil in leaf petiole bioassay. Aqua suspension of *Steinernema* sp. CPCRI0804 @ 400

IJs in 4 ml water introduced inside the pre-inoculated coconut leaf petiole induced 100% mortality of grubs and pupae within a week's time. The emergence of EPN from the cadaver after incubation for four days confirmed the mortality of the red palm weevil grubs and pupae

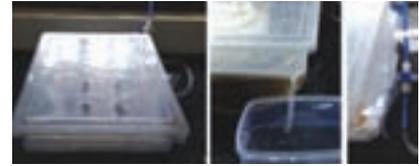
due to EPN infection and subsequent septicaemia by the symbiont bacteria. This virulent nematode sustained in water for more than nine months period without any additives. The species level identification of the EPN is in progress.

Anes, K.M. and Josephraj Kumar, A.

## A novel extractor of infective juveniles from cadaver developed

A novel extractor of infective juveniles (IJ) from the EPN-infected *Galleria mellonella* cadaver employed in *in vivo* mass production of EPN was developed. This semi-automatic extractor can be used successfully in the upscaling of EPN in the laboratory. In this extractor, filter paper is not required for the IJs movement as the

emerging infective juveniles migrate to the water suspension through thin water film developed due to high humidity inside the chamber. The common phorid fly infestation on EPN cadavers is also completely eliminated up keeping good hygiene and thus good quality IJs are harvested using this product.



EPN extraction device

*Anes, K.M., Jinu Sivadasan and Josephraj Kumar, A.*

## Management of root grubs using EPN infected *Galleria* cadavers

Different field delivery mode of native strains of entomopathogenic nematodes, *Steinernema carpocapsae* (CPCRI - SC1) and *Heterorhabditis indica* (CPCRI - HI1) were studied by releasing through aqueous soil drench @ 10 lakh IJs and placement of EPN infected greater wax moth, *Galleria mellonella* cadavers @ 5 numbers around the rhizosphere of each coconut and arecanut juvenile palms infested with root grubs (*Leucopholis* sp.) during pre monsoon and post monsoon



Cadavers infested with EPN, *Heterorhabditis* and *Steinernema*

seasons. In both these treatments, significantly higher reduction of grub population (51.2%) was observed compared to 45.8% with respect to application of aqueous suspension. Higher persistence of

EPN was noticed when they were delivered through cadavers in the plantation ecosystem.



View Infective juveniles under microscope

*Rajkumar and Sujithra, M.*

## Cinnamon butterfly infestation in coconut based multicropping system

Severe defoliation in the cinnamon seedlings intercropped in coconut based multicropping system was noticed which is caused by the larvae of cinnamon butterfly *Chilasia clytia* Linnaeus (Papilionidae: Lepidoptera) during November 2019. The per cent defoliation ranged from 20 to 100%. Early instar damages the new flush and tender leaves whereas later instars voraciously feed on the slightly matured leaves. Newly hatched larva are jet black in

colour with yellow dorsal line and white patches while the grown up larvae are dark black and yellow colour with red spots all over the body. Pupa is elongated and brownish black and lasted for more than 10 days. Adults are large sized swallowtail black butterfly. The pest was kept under check by manual collection of the larvae and spraying the young cinnamon tender and mature leaves with chlorpyrifos @ 2 ml/ litre.



Defoliation by larva of *C. clytia*; Late instars feeding cinnamon leaves; Pupa; and Adult

*Sujithra, M., Rajkumar and Subramanian, P.*

## Comparison of different fermentation methods of cocoa beans

Three methods of cocoa fermentation in wooden box, basket and plastic tray carried out

with alternate days by turning during post monsoon season in the month of October. Wet beans with

mucilage contained in box is 18 kg; in basket 9 kg and in tray 10 kg. Initial TSS was recorded to be 9, 8,

and 7 °Brix in order. Temperature of fermentation mass in box, basket and tray were 45, 44, and 34 °C on the first day, which increased considerably during fermentation. On the first day of fermentation, pH of sweating was 3.06, 3.1, and 3.4, and of the beans was 3.84, 4.26, and 3.92: Both were increased to 5.05, 6.1, and 5.48 respectively on the fourth day. Fermentation took 7 days in box and basket, whereas it took 9 days in plastic tray. Single dry bean weight obtained is 0.9-1 g in box, whereas it is 1.1-1.2 g both in basket and tray methods. Shelling percentage was 19.5, 17.5, and 15.6; nib recovery 82.6, 82.7, and 84.6%; and fat content is 45.9, 47.0,

and 45.5% respectively in box, basket and tray methods. With less quantity of wet beans, basket and tray methods were found to be good for primary processing.

Box fermentation of three basic types of cocoa, 5 kg each of Criollo, Forastero, Trinitario and a mixture of 50% Forastero + 50% Trinitario were carried out to check the processing ability. Criollo took 5 days and others took 7 days for completion of fermentation. TSS of mucilage on the first day was 10-12 °Brix which is lower than 14-15 °Brix recorded during main season June. On first turning the TSS reduced to an average of 7 °Brix among genotypes. pH varied from 3.41-3.6,

3.3-4.16 and 3.87-4.24 among cocoa types on first and alternate days. Titrable acidity (meq/g) in these treatments was 0.82-3.17; 0.38-1.58; 0.79-1.89; and 0.5-1.20 in order. Titrable acidity increased on second day of turning and thereafter decreased. Sun drying was faster during this season with less fungal infection. Single dry bean weight ranged from 0.9-1.5g in these methods. Shelling percentage 16.1, 16.5, 16.9, and 15.0, nib recovery 82.4, 82.6, 75.3, and 83.9%; and fat content 44.8, 47.2, 51.1, and 47.5% were observed under these treatments.

*Elain Apshara, S. and  
Senthil Amudhan, M.*



## IMPORTANT EVENTS

### Krishi Mela and Horti Fair

A mega Krishi Mela and Horti Fair was conducted at ICAR-CPCRI Research Centre, Kidu during 12-13 October 2019. The Krishi Mela was inaugurated by Shri S.R. Satishchandra, President, Central Arecanut and Cocoa Marketing and Processing Cooperative Ltd. (CAMPCO). Dr. Anitha Karun, Act. Director, ICAR-CPCRI presided over the function.

Shri Nithyananda Mundoodi, President, Committee of Management, Kukke Shree Subramanya Temple inaugurated the Horti Fair. Shri. Radhakrishna Borker, President, Taluk Panchayath, Puttur released handouts on pest and disease management of coconut, arecanut and cocoa. Smt. Sharada Dinesh Gowda, President, Grama Panchayath, Bilinele; Shri. P.P. Varghese; Member, Zilla Panchayath, Kadaba, Shri. Satish Kalige, Ward Member, Bilinele, and Shri. Bhanu Prakash, Project Director, ATMA and Deputy Director of Agriculture, Mangalore, offered felicitations.



Inaugural function of Kisan Mela

Shri. Nalin Kumar Kateel, Hon'ble Member of Parliament, Dakshina Kannada and Shri Angara S., MLA, Sullia inaugurated the seminars on 13 October 2019.



Address by  
Shri Nalin Kumar Kateel, Hon'ble MP

### The highlights of Krishi Mela are:

- ◆ Interface programme on soil and water conservation organized in collaboration with ATMA, Dakshina Kannada district.



Valedictory address by  
Shri Shri Vidyaprasanna Teertha Swamiji

- ◆ Seminar-cum training programme on Crop Production Technologies in Arecanut sponsored by Directorate of Arecanut and Spices Development, Kozhikode
- ◆ Seminar-cum training programme on Crop Production Technologies in Cocoa sponsored by Directorate of Cashewnut and Cocoa Development, Kochi
- ◆ Workshop on Honey bee farming sponsored by Department of Horticulture, Government of Karnataka.
- ◆ Quiz and Essay writing competition for farmers.
- ◆ An exhibition with a participation of over 80 agencies.

As a precursor, three training programmes on Arecanut and Coconut based Cropping System & Management of pests and diseases were conducted in Kidu, Belthangady, and Vittal. The Directorate of Arecanut and Spices Development, Kozhikode provided financial assistance for the same.

Shri Shri Vidyaprasanna Teertha Swamiji, Kukke Subrahmanya Mutt

was the chief guest for valedictory function.

## Jal Shakthi Abhyan Kissan Mela

ICAR KVK, Kasaragod organized Kisan Mela as part of Jal Shakthi Abhyan on 2 October, 2019 at ICAR CPCRI, Kasaragod wherein 700 farmers participated. Seminar on water harvesting and micro irrigation, exhibition, method demonstrations, film shows and field visits, and Farmer Scientist interface were conducted. Dr. Anitha Karun, Director, ICAR-CPCRI, Kasaragod inaugurated the Kisan Mela. The

dignitaries included Shri Ashok Kumar V.M., Nodal Officer, Jal Shakthi Abhyan, Kasaragod district, Shri P.V. Umesh, Deputy Director (Horticulture), Dept. of Agricultural Development and Farmers Welfare, Kasaragod and Shri Jyothis Jagannath, DDM, NABARD. Technical sessions were held by Dr. A.C. Mathew, Principal Scientist, ICAR-CPCRI, Kasaragod, Dr. Abdul Hakkim V.M., Professor, College of Agriculture, Padannakkad, Dr. P. Subramanian, Principal Scientist, ICAR-CPCRI and Dr. C. Thamban, Principal Scientist, ICAR-CPCRI.



Dr. Anitha Karun, Director (Acting) inaugurating the interface and Kisan Mela



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### Research articles

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prospects for control in a changing world, Abstract Book. XIX International Plant Protection Congress, 10-14 November, 2019, Hyderabad, pp 30.

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## TRANSFER OF TECHNOLOGY

### Producer Organization with CPCRI as Promoting Institution

A Farmer Producer Company 'Odanadu Farmer Producer Company Limited' from Pathiyoor (Alappuzha) was registered under Ministry of Corporate Affairs, Government of India, with support of NABARD for a total budget of Rs.11.40 lakh under technology support from ICAR-CPCRI, Regional Station, Kayamkulam. The major activities envisaged are coconut based integrated farming systems with value addition and marketing of coconut, production and marketing of sesamum and turmeric, inland fisheries and duckery etc. A MoU was signed between NABARD and ICAR-CPCRI.

### On campus training programme

#### Training programme on coconut based integrated farming

A training was organized at ICAR-CPCRI, Kasaragod during 14-18 October 2019 in collaboration with National Institute of Agricultural Extension Management (MANAGE), Hyderabad with a participation of 20 extension personnel.

#### Entrepreneurship development programmes

Training on organic cultivation of coconut and value addition sponsored by National Horticulture Board for the second batch of

selected young farmers and entrepreneurs from Lakshadweep islands was held during 15 November to 3 December 2019 at ICAR-CPCRI, Kasaragod.



Participants of the training programme jointly conducted by ICAR-CPCRI & MANAGE



Lakshadweep farmer participants in the NHB sponsored training programme

Another training programme on honeybee farming and prospects under SCSP was held at ICAR-CPCRI, Kasaragod during 22-23 November, 2019. Twenty five participants belonging to SC community attended. In valedictory programme, each trainee was given beehives with honey bees and other accessories. Smt. Meenarani, District Welfare Officer, Kasaragod distributed items to the trainees. Dr. Anitha Karun, Director, ICAR-CPCRI presided over the function.



Smt. Meenarani, District Welfare Officer, Kasaragod handing over beehives to the beneficiaries under SCSP

### RAWE Trainings

A RAWE training programme for 22 BSc (Agriculture) students of College of Agriculture, Vellayani was conducted at ICAR-CPCRI, Regional Station, Kayamkulam during 28 November 2019 to 3 December 2019. They were oriented to the research and outreach activities of ICAR-CPCRI and research methodologies. The students presented model research proposals which were

evaluated by the scientists of the Institute.



Participants of the hybridization training

**Training programme on Integrated pest and disease management in Coconut** at ICAR-CPCRI, Kasaragod on 8 November, 2019. Programme for 50 farmers was inaugurated by Shri A. A. Jaleel, President, Mogral Puttur panchayath.

**Training programme on Integrated pest and disease management in Coconut** for extension officials was conducted on 15 November, 2019 at ICAR-CPCRI, Kasaragod.

**Training programme on Hybridization technique in coconut** was conducted at CPCRI, Kasaragod on 26 December 2019 for palm climbers of TxD pollination unit, Chalode (Department of Agriculture & Farmers' Welfare, Government of Kerala)

### Training on Decentralized coconut seedling production

A training programme on 'Decentralized coconut seedling

production' was conducted at ICAR-CPCRI, Regional Station, Kayamkulam during 19-20<sup>th</sup> December 2019. The training was attended by 24 participants nominated by Coconut Producers Society/Coconut Producers Federation engaged in establishment of coconut nursery under the Dept. of Agriculture, Govt. of Kerala funded project 'Technology support for coconut hybridization/production of semi-tall varieties'.

### Off campus programmes

Scientist-Farmer interface programme on Effective utilization of technologies for sustainable coconut farming was conducted at Pulingome on 04.12.2019 in collaboration with Coconut Producer Society. Dr. Anitha Karun, Director (Act.), ICAR-CPCRI inaugurated the programme. Prior to the interface programme Director and team of scientists visited arecanut orchards at Palavayal.

District level awareness programme on "Integrated Pest and disease management in coconut based cropping system" was conducted in Peringome – Vayakkara, Kannur district on 23 October, 2019.

Training programme for farmers on Integrated pest and disease management in Coconut was held at Chemnad, Kasaragod on 23 November, 2019.

### Interface programmes

Directorate of Arecanut and Spices Development (DASD), Calicut,



Dr Anitha Karun, Director (Acting) handing over agricultural machinery to SCSP beneficiaries



Dr. Anitha Karun, Director (Act.) and team of scientists visiting arecanut orchards at Palavayal

sponsored training programme on 'Crop production technologies in arecanut' was organized on 13<sup>th</sup> October, 2019 at ICAR-CPCRI, Research Center, Kidu.

Directorate of Cashewnut and Cocoa Development (DCCD), Cochin, sponsored training programme on 'Crop production technologies in cocoa' was organized on 13<sup>th</sup> October, 2019 at ICAR-CPCRI, Research Center, Kidu.

### Radio programme

Dr. C. Thamban, Principal Scientist (Agrl. Extension) presented a radio talk on 'Effective utilization of microirrigation technology for sustainable crop production' which was broadcast by All India Radio, Kannur on 28 October 2019.

Dr. K. Nihad, Sr. Scientist (Horticulture) on 'Floriculture as a women-friendly business venture' Vayalum Veedum programme All India Radio, Thiruvananthapuram Date of broadcast: 27 December 2019.

### Television programme

Dr. C. Thamban, Principal Scientist (Agrl. Extension) presented a television talk on 'Adoption of

microirrigation technology in coconut gardens-Status and strategies' which was telecast by Doordarshan Kendra, Thiruvananthapuram (10-11 October 2019).

### Diagnostic field visit on the incidence of root (wilt) disease in Nagercoil, Tamil Nadu

A scientific team comprising Dr. P. Subramanian and Dr. A. Joseph Rajkumar, Principal Scientists and Dr. Merin Babu, Scientist visited Konam, near Nagercoil, Tamil Nadu on 09.10.2019 and recorded the incidence of root (wilt) disease on a few juvenile palms planted underneath a coconut garden aged 35 years. The juvenile palms exhibited yellowing and marginal necrosis symptoms along with weakened and characteristic bending of spear leaf. About 5.8% juvenile palms took up the infection probably around some uprooted tall palms which were previously diseased. In addition, palms surrounding the diseased palms also picked up the disease faster. Leaf rot disease was also observed in a few diseased palms. Application of bio-suppressive

compost, management for leaf rot disease, introduction of root (wilt) disease tolerant coconut varieties/hybrids and crop pluralism strategies were suggested for inclusive farming in the garden.

### Exposure Visits

One day exposure visit cum trainings were conducted on six occasions on 'Hybrids and hybridization in coconut', 'Disease management in coconut', 'Community extension approaches for pest management of coconut', 'Scientific coconut based IFS systems', 'Soil test based nutrient management', 'Coconut management strategies for healthy crop and income' and 'Integrated nematode management for coconut and intercrops' at ICAR-CPCRI, Regional Station, Kayamkulam. A total of 177 farmers got benefitted from the programmes.

One day programme on 'Motivation programme for school students towards coconut farming' was organized at Gayathri Central School, Kayamkulam on 05.12.2019 wherein 500 students were exposed to farming through 'Agricultural quiz programme' followed by planting of coconut seedlings in the school premises.



## MERA GAON - MERA GAURAV

The decentralized coconut seedling production programme under the *Kera Nanma* was found to be very successful through effective linkage with Krishi Bhavan and committed farmers in the three adopted villages. Scientists from ICAR-CPCRI supported the selection of good quality mother palms and thereafter the entire process of harvesting, sowing, maintenance and disbursal of

coconut seedlings could be made by farmers themselves and sold out the seedlings to the needy farmers in the village. Training on secondary agriculture and Kisan Credit Card (KCC) scheme were infused among the farming community in the village for holistic adoption.

Farmers training on 'Coconut palm health management' was

conducted for Scheduled Caste Farmers of Velanchira MGMG village on 13 November 2019.



Training farmers on seednut sowing at Chunakkara, Kerala

## Krishi Vigyan Kendra, Kasaragod

### A pilot project of honey in nutrition

"*Thenkurunnu*", was started by KVK Kasaragod, in collaboration with Royal Honey and Bee Farm Kolichal on 21 October 2019 at 14<sup>th</sup> ward Anganwadi of Mogral Puthur. Dr. Anitha Karun, Director CPCRI inaugurated the programme. As a pilot project the programme aims to include 10 ml honey in the daily diet of kids of the Anganwadi of Mogral Puthur for a year.

### Fertilizer Application Awareness Programme

The programme was conducted on 22 October 2019 at College of Agriculture, Padannakkad. Live telecasting of launching programme of the event by Hon'ble Union Minister for Agriculture and Farmers Welfare Shri Narendra Singh Tomar was web streamed. Dr. P. R Suresh, Associate Dean, College of Agriculture, Padannakkad inaugurated the programme; Dr Anitha Karun, Director, ICAR CPCRI was the guest of honour.

### Pre Vaiga Sammelan

Technical sessions on Value addition of agricultural produces and marketing were conducted at

College of Agriculture, Padannakkad on 23 November 2019.

### Kisan Divas Celebration

Seminar on organic farming was conducted at Kondevoor, Mangalapady Panchayath on 23 December 2019.

### National Food Security Mission

Grain cowpea var Pantalayani 1 and green gram BGS 9 for 25 and 50 acres respectively was distributed under NFSM at Majibail, Meenja, Mugu, Neerchal and Badiadka.

### Paramparagat Krishi Vikas Yojana (PKVY)

Selection of plots and farmer beneficiaries under Paramparagat Krishi Vikas Yojana (PKVY) was initiated in Bambrana and Sheni village.

### Frontline demonstrations

FLD on Coconut vinegar production technology was introduced to 5 entrepreneur groups and VCO based wheat muffins to 3 entrepreneur groups. FLD on improved high yielding variety of fodder grass var. Sampurna is ongoing in 10 farmer households.

High yielding grain cow pea var. DC 15 was introduced in 10 farmers' plots in 5 ha area at Karichery of Pallikkare gram panchayat. HYV of rice Pournami MO - 23 was introduced in 10 farmers' plots in 10 acres area. FLD on demonstration of Hybrid Cashew 130 was laid out in 5 plots at Sheni village.

### Field day on mechanisation in paddy

Field day on mechanization of paddy was conducted on 28 November 2019.

### On farm trials

OFT on assessment of yard long bean varieties in 5 farmers' plots at Karichery of gram panchayat has been initiated, the varieties included being Manjery, Jyothika and Geethika.

### Training programmes

Training programmes on coconut vinegar production technology, VCO based muffins and bakery products, value addition of seasonal fruits, arrowroot processing, grafting in vegetables, cassava processing, mat nursery preparation and mechanisation in agriculture were organised during October to December 2019.

## Krishi Vigyan Kendra, Alappuzha

### Animal Health Campaigns

were organized on 19 November & 19 December, 2019 at Primary Milk Societies in Chakkulam, Thalavady and Muttar.

### RAWE Programme

A batch of 21 students from College of Agriculture Vellayani, KAU underwent the KVK module of RAWE programme during 4-7

December, 2019.

### EDP on layer chicks production using portable incubator

Entrepreneurship Development Programme on layer chicks production using portable incubator started at Thalavady village under NICRA project on 19 December 2019.



Animal health campaign



## CELEBRATION

### Hindi Chetana Maas

Hindi Chetana Maas was observed with various programmes and competitions for staff. Valedictory function was conducted on 23 October 2019 under the chairmanship of the Director (Act.) Dr. Anitha Karun.



Honouring staff members for doing their official work in Hindi as part of Hindi Chetna Mas celebrations

### Celebration of 150 Years of Mahatma

Fortnight-celebrations to mark 150 years of Mahatma was organized at ICAR-CPCRI (Headquarter and other centers) from 17 September to 2 October 2019 with various programmes for staff, students etc. Shri. K.R. Kannan, veteran freedom fighter hailing from Nileswaram was the chief guest of the valedictory function held on 2 October 2019 at Kasaragod.



Veteran Freedom Fighter Shri. K. R. Kannan addressing staff on 2 October 2019

### National Kisan Diwas

ICAR-CPCRI, Regional Station, Kayamkulam and ICAR-KVK, Alappuzha convened National Kisan Diwas on December 23, 2019 commemorating the birth

anniversary of Shri Choudhary Charan Singh, former Prime Minister of India on the theme 'Synergising



Staff members taking National Integrity Pledge

coconut Technologies to Counter Climate Change and Doubling income' Shri. KK Anilkumar, Ward councillor, Kayamkulam Municipality presided over the function. During the event a quiz and an exhibition were also organized.

### Rashtriya Ekta Diwas

Rashtriya Ekta Diwas was celebrated commemorating 144<sup>th</sup> birth anniversary of Sardar Vallabhbai Patel on 31 October 2019 at ICAR-CPCRI, Kasaragod, Dr. Anitha Karun, Director (Act.) administered the National Integrity Pledge. A unity run was also organized. At ICAR-CPCRI, Regional Station, Kayamkulam, Dr. S. Kalavathi, Acting Head of the regional station administered Rashtriya Ekta Diwas pledge to the staff and flagged off 'Run for unity' by the staff.

### Vigilance Awareness Week

Vigilance Awareness Week was observed at this institute and its regional stations and research centres from 28 October to 2 November 2019. It was inaugurated by Dr. Anitha Karun, Director (Act.). Staff members took the 'Integrity Pledge' on the day. Various programmes including competitions were conducted to

create awareness among institute staff and students of nearby schools. Sri V. Unnikrishnan, Inspector of Police, Vigilance and Anti-Corruption Bureau, Kasaragod was the chief guest of the valedictory function.

At ICAR-CPCRI, Regional Station, Kayamkulam Dr. S. Kalavathi, Acting Head of this regional station inaugurated the observance of the week on 28 October 2019 by administering the Integrity Pledge to all the staff members. Essay competition on the theme "Integrity - A Way of life" in english and malayalam was conducted on 30 October, 2019. Mr. V. Suresh Kumar, IPS, Superintendent of Police (Rtd.) and former Police Chief, Alappuzha district, was the chief guest of the valedictory function on 2 November, 2019.



Director and staff taking the 'Integrity Pledge'

### Agricultural Education Day

A workshop on 'Agriculture-A Smart Profession for Next Generation' was conducted on 3 December 2019 at ICAR-CPCRI, Regional Station, Kayamkulam as part of Agricultural Education Day commemorating the birth anniversary of Dr. Rajendra Prasad, the first Union Minister of Food and Agriculture. The workshop was inaugurated by Dr. R. Chandramohan, Former Head, Division of Crop Protection, CPCRI, Kasaragod and chaired by Dr. S. Kalavathi, Acting Head, ICAR-

CPCRI, RS, Kayamkulam. An agricultural quiz competition and an elocution contest for students was held.



Dr. R. Chandramohanam, Former Head, CPCRI, inaugurating the programme

## Swachhta Pakhwada

Swachhta Pakhwada was observed in ICAR-CPCRI Headquarters and other centers (including KVKs) during 16-31 December 2019 with the focal theme 'Plastic Se Raksha – Swachhata Hi Suraksha'. Various activities such as taking pledge, conducting awareness programmes, cleaning drive, display of technologies on utilization of organic wastes/ generation of wealth from waste etc. were conducted.

The Nation-wide awareness campaign on *Swachhata Hi Seva-2019* was organized at ICAR-CPCRI, Regional Station, Kayamkulam in association with Santhwanam

## World Soil Day

World Soil Day was observed on 5 December 2019 at Headquarters and other centers. Mr. Subash Babu, K., Deputy Director of Agriculture, Farmers' Training Centre, Kozhikode was the chief guest in the programme at Kasaragod. At Pathiyoor Grama Panchayath, the programme was inaugurated by Smt. Leela Gokul, Pathiyoor Panchayath President. Krishi Vigyan Kendra, Alappuzha organized a

programme in Mavelikkara Block. Shri K. Reghu Prasad, President, Mavelikkara Block Panchayath inaugurated the programme and distributed soil health cards. A total of 144 soil health cards were distributed to farmers.



Mr Subashbabu, DDA, FTC Kozhikode distributing soil health cards to farmers

Cultural and Charitable Trust, Krishnapuram involving representatives from Kayamkulam Municipality and Krishnapuram Panchayat during 1-2 October 2019. A total of 93 members including office staffs participated in the campaign. The wastes from the institute premises were collected, segregated and handed over to Kayamkulam Municipality Suchitwa Mission for disposal on 26<sup>th</sup> October 2019.

ICAR-CPCRI, Regional Station, Kayamkulam organized various events as envisaged in the *Swachhta Pakhwada* during 16-31 December 2019. Pledge was undertaken by all staff under the leadership of Dr. S. Kalavathi, Acting Head with display of awareness banners at the strategic points of

the Institute on 16.12.2019. The Regional Station has organized a mobile campaign in Krishnapuram Panchayat and Kayamkulam Municipality to deliver the message of the *Swachh Bharat* activity to the general public and students of Govt. UP School, Krishnapuram.



Institute staff members actively participated in the Swacch Bharat programmes

## Awards/ recognition

Dr. Regi Jacob Thomas, Principal Scientist received second prize in National Coconut Challenge 2019 conducted by Kerala Startup Mission for the concept 'Modified ground pollination technique for hybridization in coconut'. The prize was distributed on 3<sup>rd</sup> November 2019 during International Coconut Conference & Exposition conducted at Hotel Taj Gateway, Kozhikode.

Jayasekhar S, Sr. Scientist (Ag Econ) was awarded Dr. R.T. Doshi Best Research Paper Presentation Prize at the 27th Agricultural Economics Research Association (AERA)

Conference held at PAU, Ludhiana during 17-19 December 2019.

Certificate of appreciation was awarded to ICAR-CPCRI, Kasaragod at 4<sup>th</sup> National Workshop of 'Nodal Officers - ICAR Research Data Repository for Knowledge Management' for proactively implementing ICAR Research Data Management Guidelines.

Dr. T. Sivakumar, SMS (Entomology) of the KVK won the best oral presentation award for the paper on 'Use of QR codes to facilitate the learning experience of farmers' in

the International conference on "Extension for Strengthening Agricultural Research and Development" during Dec 14 -16, 2019 at JSS, Mysore.



Dr. Trilochan Mohapatra, Secretary (DARE) & DG (ICAR) conferring the certificate of appreciation to Dr. S. Jayasekhar, Nodal Officer, Knowledge Management



## HUMAN RESOURCE DEVELOPMENT

### Training attended

Name & Designation	Name of the programme	Place & Date
Dr. T. Sivakumar SMS (Entomology) KVK, Alappuzha	Fruit Fly: Surveillance and management	NIPHM, Hyderabad. 21 – 25 October 2019
Dr. K. Muralidharan, Acting Head, Div. of Social Sciences, Dr. C. Thamban & Dr. K.P. Chandran, Principal Scientists, Dr. S. Jayasekhar, Sr. Scientist, Shri H. Muralikrishna, CTO (Tech. Info.), Smt. K. Shobha, CTO, Sebastian A. George, CTO, K. Shyama Prasad, ACTO and Shri V. Balakrishna, Technical Officer	A workshop on 'Development communication - Changing platforms and new paradigms	ICAR-CPCRI, Kasaragod 31 October 2019
Dr. Paulraj, Scientist, ICAR-CPCRI, Kasaragod, Smt M.P. Jayashree, SMS, Kasaragod, Shri M.S. Rajeev, SMS (Agronomy) and Dr. S. Ravi, SMS (Animal Husbandry), KVK, Alappuzha	Trainers Training Programme of the Agricultural Skill Council of India	GKVK, Bengaluru 20 – 22 November 2019
Shri Jagadish Roy Senior Technical Assistant, ICAR-CPCRI, RC, Mohitnagar Automobile Maintenance, Road Safety and Behavioral Skills	Trainers Training Programme of the Agricultural Skill Council of India	ICAR-CIAE, Bhopal. 27 November to 3 December 2019
Dr. Jeena Mathew Scientist (Social Science), ICAR-CPCRI (RS), Kayamkulam	Recent Advances in Soil Carbon Sequestration and Stabilization for Soil Health Improvement and Climate Change Mitigation	ICAR-ISS, Bhopal. 10– 19 December 2019
Dr. Krishna Prakash Scientist, Crop Improvement Division, ICAR-CPCRI, Kasaragod	Recent Advances of Bioinformatics in Agricultural Research: A Practical Perspective	ICAR-IASRI, New Delhi 12 - 21 December 2019
Shri Shivaji Hausrao Thube Scientist (Entomology), ICAR-CPCRI, RS, Vittal	Statistical and Machine Learning Techniques for modeling and Forecasting Agricultural Data	ICAR-IASRI, New Delhi 20 December 2019 to 9 January 2020



## COMMERCIALIZATION OF TECHNOLOGY

During October to December, 2019, seven technologies were commercialised to eight parties by the Institute as per the details given below. An amount of Rs. 8,40,000/- have been collected as technology transfer fees.

MTA for transfer of 12 coconut varieties to LA Ferme De Peter LLP,

Tirunelveli exchange of entomopathogenic nematode (EPN) isolates with Kerala Agricultural University on 29 August 2019 for research work under Ph.D and M.Sc. degree students of Kerala Agricultural University and other technologies were signed during the period. Required technical guidance on

mass production of EPNs and host insect *Galleria mellonella* and culture maintenance were also provided from the Institute.



Licensing of varieties to M/s LA Ferme De Peter LLP, Tirunelveli

Sl. No	Technology	Date	Transfer Fees Rs.	Entrepreneurs details
1	Trichoderma Coir Pith Cake	09-10-2019	5,000	M/s Phytotonic Private Limited, Raghavarajapuram (Village and Post), Railway Kodur (Mandal), YSR Kadapa District – 516105, Andhra Pradesh.
2	Collection of fresh and hygienic Kalparasa and production of natural coconut sugar	15-10-2019	1,00,000	Deputy Director (Agri Business), Department of Agricultural Marketing & Agribusiness, Kanyakumari District, Tamil Nadu
		04-11-2019	1,00,000	Deputy Director (Agri Business), Department of Agricultural, Marketing & Agribusiness, Kattupudukulam, Pudukkottai – 622001, Tamil Nadu.
3	Preservation protocol for trimmed tender coconut	16-11-2019	15,000	Hemanth E.M., Green Mansion, P.O. Mamba, Paleri Anjarkandy – 670611, Kannur
4	Utilisation of ABL facility for production of Coconut Sap Chiller	22-11-2019	25,000	Kalyaniram Polyplast Pvt. Ltd., Baikampady Industrial Area, Mangalore, Karnataka
5	Licensing of coconut varieties - Kalpa Jyothi, Chowghat Orange Dwarf, Kalpasree, Kalparaksha, Kalpa Surya, Kalpa Haritha, Kera Keralam, Kalpatharu, Kalpa Pratibha, Kera Chandra, Chandra Kalpa, Kera Bastar	29-11-2019	5,40,000	M/s. LA Ferme De Peter LLP, Muvirunthali Village 627951, Tirunelveli District, Tamil Nadu
6	Matured coconut water based value added products	03-12-2019	15,000	M/s Arun Grit Pvt Ltd., Mylapore, Chennai – 600004, Tamil Nadu.
7	Virgin Coconut Oil (VCO)	11-12-2019	40,000	Mr. Anoop Dominic, Halkal, Jadkal (PO), Udupi (Dt), Karnataka – 576233.
<b>Total</b>			<b>8,40,000</b>	

## Participation of Scientists in Seminars/Symposia/ Conference/Workshops

Name & Designation	Title of Programme	Place & Date
Dr. V. Selvamani, Scientist	8 <sup>th</sup> Asian-Australasian Conference on Precision Agriculture	PAU, Ludhiana 14-17 October 2019
Shri M.S. Rajeev, SMS (Agronomy)	Workshop on "Establishment of Nutrigardens"	Directorate of Extension, Mannuthy 24 October 2019
Dr. P. S. Prathibha, Dr. Jilu V. Sajan, Scientists	19 <sup>th</sup> International Plant Protection Conference	International Convention Center, Hyderabad 10-14 November 2019
Dr. P. Subramanian, Principal Scientist	Global Organic Convention	Society of Agriculture Research and Development Agronomy Section, College of Agriculture, Nagpur 10 November 2019
Dr. P. Anithakumari, and Dr. A. Joseph Rajkumar, Principal Scientists	19 <sup>th</sup> International Plant Protection Conference	International Convention Center, Hyderabad 10-14 November 2019
Indhuja S, Scientist (Ag. Microbiology)	International Conference on New Horizons in Biotechnology (NHBT-2019) organised by CSIR-NIIST and BRSI	Thiruvananthapuram, 20-24 November 2019
Dr. Arun Kumar Sit, Principal Scientist	4 <sup>th</sup> Regional Science and Technology Congress	Alipurduar College, 18-19 December 2019
Dr. Jayasekhar S., Senior Scientist	Fourth National Workshop of Nodal Officers- ICAR Research Data Repository for Knowledge Management	NASC, ICAR, New Delhi 10-11 December 2019
	The 27 <sup>th</sup> Agricultural Economics Research Association Conference	PAU, Ludhiana 17-19 December 2019
Dr. T. Sivakumar, SMS (Entomology)	International conference on "Extension for Strengthening Agricultural Research and Development"	JSS, Mysuru 14 -16 December 2019

### New Projects

Project on 'Intercropping cinnamon in coconut garden' was

initiated during 2019. Dr. Ravi Bhat, Head (Act.), Division of Crop

Production is the principal investigator of the project.

## Distinguished visitors

Smt. G. Jayalakshmi, IAS, Chairman, Coconut Development Board along with Mr. Saradindu Das, CCDO and Mr. Pramod P. Kurien, Assistant Director visited tissue culture lab, bio-control lab and experimental fields of ICAR-CPCRI, Regional Station, Kayamkulam, KVK, Alappuzha and demonstration units on 27 December, 2019.



Chairperson and Chief Coconut Development Officers, CDB, Kochi, interacting with scientists at ICAR-CPCRI, RS, Kayamkulam

## PERSONALIA Retirement

Name of Staff	Designation	Place	Date
Sri R. Sanalkumar	CTO	ICAR-CPCRI, KVK Kasaragod	01.11.2019 (FN) Voluntary retirement
Sri Balappa Gowda	SSS	ICAR-CPCRI, RC, Kidu	30.11.2019
Sri Bhukya Narshima Swamy	Scientist	ICAR-CPCRI, Kasaragod	Resigned on 07.12.2019
Sri N. Ramakrishnan	ACTO	ICAR-CPCRI, Kasaragod	31.12.2019
Sri Jagadish Royburman	Sr. Tech. Asst.	ICAR-CPCRI, RC, Mohitnagar	31.12.2019

## OBITUARY



**K.V.A. Bavappa**  
(1930-2019)

With profuse sorrow and grief, we inform the sudden demise of Dr. K.V.A. Bavappa, Former Director, ICAR-CPCRI, Kasaragod on 1 October, 2019. He worked as an Agronomist and Arecanut Specialist at the Central Arecanut Research Station, Vittal from 1956 and was instrumental in evolving the popular 'Mangala' variety of arecanut. He became the first Director of the ICAR-CPRI, Kasaragod in 1970 and continued till 1977 and again during 1982 - 1987. Director and staff of ICAR-CPCRI pray the Almighty that the departed soul may rest in peace.



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