



# KALPA

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**ICAR-CENTRAL PLANTATION CROPS RESEARCH INSTITUTE**  
Kasaragod, Kerala - 671 124





# From The Director's Desk

## Prosperity Through Value Chains

**A**gricultural value chains bring prosperity to the rural community by means of movement of whole range of goods and services necessary for an agricultural product from the farm to the consumer. These value chains are in operation from olden days. However, our present effort is to bring the small-scale farmers to be included in the existing or more systematic value chains to extract greater benefits from the chain, either by increasing efficiency or by carrying out activities along the value chain.

Producers as entrepreneurs on one hand and the consumers remaining closer to the entrepreneurs on the other, bridge the gaps in value chain and form a better and conducive atmosphere for growth, leadership and value addition. ICAR-CPCRI has been taking a lot of efforts to support enterprising farmers to bring them in to the value chain and making them prosper in this endeavor. The plantation crops play a pivotal role in providing direct and indirect employment for millions. The processing and related activities centered on the coconut, arecanut and cocoa crops, generate employment opportunities for over four million people in India.

ICAR-CPCRI through its entrepreneurship activities alone, has created employment to around 1200 people. Presently more than 50 Small Scale Industries have started operations. These include entrepreneurship in various technologies developed by the Institute, such as, collection of fresh and hygienic Kalparasa and production of natural coconut sugar, nanomatrix for delivery of pheromone for the management of red palm weevil and rhinoceros beetle, know-how on preservation of carbonated tender coconut water, coconut water based value added products, production of VCO, production of Kalpa Krunch, production of coconut vinegar, coconut leaf vermicomposting technology, utilization of *Metarhizium anisopliae* culture, cryopreservation of coconut pollen, arecanut tissue culture, production of desiccated coconut powder, coconut zygotic embryo culture design and drawing of various machineries for virgin coconut oil (VCO) production and coconut chips unit, snow ball tender nut machine, shell fired copra dryer, coconut de-shelling machine, tender coconut punch and cutter, etc.

Self-help groups have taken up the product value addition and mass multiplication of bio-agents at panchayat level, there by employing the unemployed youth. Utilization of ICT for marketing, price forecasting, market speculations, demand forecasting, etc. would enable value chain processes to progress at a greater pace.

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restriction on *Cocos nucifera* and *Musa* sp. whereas, *Aleurodicus dispersus* encompassed a wider host range of *Psidium guajava*, *Cassia siamea* and *Conocarpus*

*erectus*. Despite egg spirals of *A. rugioperculatus* being observed in homestead plants of Kerala and nursery plants in Andhra Pradesh, RSW could not

complete life cycle in other hosts successfully.

*Josephraj Kumar, A., Chandrika Mohan, Merin Babu and Vinayaka Hegde*

## Coreid bug management in coconut

Nymphs and adults of coreid bug (*Paradasynus rostratus* Dist.) feed on the tender buttons

and immature nuts of coconut palms and cause spindle-shaped necrotic lesions on the feeding

parts. Extensive de-sapping on buttons results in tremendous shedding of buttons leading to barren bunches whereas feeding on immature leads to crinkling, puny and distortion of nuts. Though restricted in Southern Kerala initially, feeding damage has expanded to all districts of Kerala in the recent times due to modulations in maximum temperature and relative humidity. Among the new molecules evaluated, two sprayings of Chlorantraniliprole (0.018%) and neem oil (0.5%) on infested palm bunches reduced pest damage in coconut by 75.55% and 73.89%, respectively.

*Chandrika Mohan, Renjith, P.B. and Josephraj Kumar, A.*



Fig. 5. Coreid bug infestation on coconuts

## Organic forage in coconut gardens



Fig. 6. Cultivation of Hybrid Napier forage crop as intercrop in coconut garden (on cover page).

Organic cultivation package of Hybrid Napier (Var. Co-3) fodder grass was standardized by the application of cow dung slurry (3750 litres), vermicompost (2000 kg) and *Azospirillum* (3.5 kg) in the 60% interspaces of root (wilt) diseased coconut garden (1 ha) at Kayamkulam. An average yield of 126.9 t/ha could be realized by harvesting fodder grass six times in a year at 45 days interval. Besides recording higher plant height (219.4 cm)

and leaf length (222.7 cm), the crude protein content (9.3%) and fibre content (8%) was also found to be maximum. Considerable nut yield increase in coconut to the tune of 32, 16.7 and 3.8% was registered in apparently healthy, disease early, disease middle palms, respectively due to higher irrigation frequency and supply of cow dung slurry in the interspaces.

*Nihad, K., Abdul Haris, A., Jeena Mathew and Indhuja, S.*

## Management of root-knot nematodes in papaya under coconut based cropping system

An investigation on root-knot nematode (*Meloidogyne incognita*) infestation was conducted under the experiment "Standardization of nutrient management for selected papaya varieties in newly planted coconut garden" at ICAR - CPCRI, Regional Station, Kayamkulam. The varieties planted under this trail were Red lady, CO 8 and Arka Prabhat with four nutrient management in factorial RBD design. Among the varieties Var. Arka Prabhat had higher incidence (65%) of nematodes followed by CO 8 (46.2%) and Red Lady (38.7%). The roots of infested plants were

indexed by counting the number of knots/ or galls based on its width (0.5-1.5 cm). It was found that plants supplied with rock phosphate + vermicompost and + sulphate of potash exhibited lesser disease incidence (33.3%) with lower root knot index (RKN - 1.8). This treatment also recorded the highest growth and yield performance in coastal sandy loam soil condition. In the present investigation it was revealed that plants supplied with adequate nutrition have higher resistance or tolerance to RKN. Nematode infestation can be managed through application of *Trichoderma* enriched neem



Fig. 7. Nematode infected papaya plant showing yellowing (inset) knots/galls on papaya roots due to nematode; severely infested papaya roots

seed kernel powder @ 1-2 kg/ plant or planting marigold (*Tagetes erecta*) around the plant basin or in the interspaces of coconut plantations.

Rajkumar and Nihad, K.

## Suitable month for raising rooted cuttings in sub-Himalayan Terai region

A weather- rooted cutting growth model for black pepper raising in sub-Himalayan Terai region has been standardised. The field experiment in this study was conducted during January 2014 to December 2016 in nursery of the Research Centre, Mohitnagar. Recordings on growth rate at monthly intervals, number of leaf, leaf length and width, vine length at four months of cutting and primary roots were carried out along with environmental factors like temperature, rainfall and humidity. Temperature humidity index measure was computed, and the growth characteristics of the rooted cuttings were

modeled using multiple regression approaches. The vine length of black pepper cuttings for sub-Himalayan Terai region was observed to be 40.7 cm to 43.1 cm (-maximum) at 80-82 Thermal heat index (HTI) level which prevailed during the months of March and April. Criteria for model selection were viz. RMSE, AIC and BIC measures. The regression model depicts that with the increase of THI value up to certain level, the vine growth is increased and vice versa. An important conclusion

was made in this study that April is the best month for raising rooted cuttings in that region.

Arun Kumar Sit and Sandip Shil

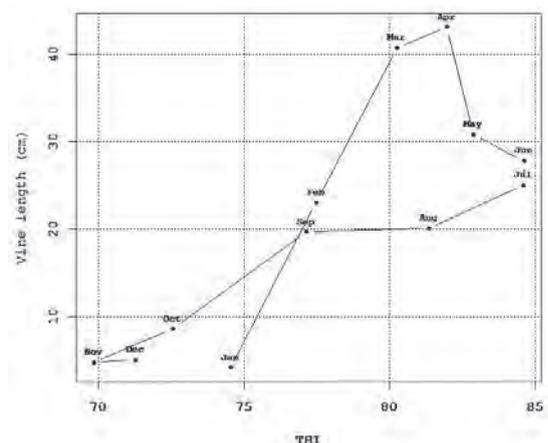


Fig. 9. Vine length of black pepper cuttings for sub-Himalayan Terai region



## IMPORTANT EVENTS

### Industry Day “Dream Big Kalpa 2017”

Industry Day was observed at ICAR-CPCRI, Kasaragod on 31<sup>st</sup> January, 2017. An Institute-Industry Interface, ‘Dream Big-Kalpa 2017’ was organised. Dr. P. Chowdappa, Director, ICAR-CPCRI, Kasaragod, presided over the programme. In his presidential address, he highlighted the issues related to competitive production of value added products for successful marketing. Shri P.V. Velayudan, Director, MSME-DI, Thrissur inaugurated the programme and called upon the stakeholders to make use of the new initiatives of Union Government on strengthening entrepreneurship in the country. He also mentioned about various schemes of Micro Small and Medium Enterprises (MSME) Department for the upcoming entrepreneurs.

Shri Jyotis Jagannathan, DGM, NABARD talked about credit availability and Shri D. Rajendran, General Manager, DIC, Kasaragod on assistance available from Industry Department for starting business ventures.

Shri C. M. Kamaraj, Industrialist, Coimbatore, appraised about emerging domestic and international markets for coconut products like virgin coconut oil (VCO) and coconut milk. Dr. K. Muralidharan, Principal Scientist, made a presentation on commercially important technologies developed at ICAR-CPCRI, followed by a panel discussion.

MoAs were signed for transfer of 12 technologies such as



Shri P.V. Velayudan, Director, MSME-DI, Thrissur inaugurating the industry interface programme at Kasaragod

‘Kalparasa’ and coconut sugar, VCO, coconut chips, ‘Kalpa Krunch’, etc. during the interface.



Participants visiting the exhibition on the technologies developed by the Institute

### Research Advisory Committee (RAC) meeting

The 19<sup>th</sup> Research Advisory Committee (RAC) meeting was convened at ICAR-CPCRI, Kasaragod on 18<sup>th</sup> and 19<sup>th</sup> February, 2017, under the chairmanship of Dr. H.P. Singh, Former DDG (Horticultural Science), ICAR, New Delhi.

The following RAC members were present: Dr. N. Kumar, Dr. D.M. Hegde, Dr. R.T. Patil, Dr. S.R. Bhat, Dr. P. Chowdappa, Official Members, Shri Suresh Kumar Shetty, Shri Shivakrishna Bhat, Non-official members and Dr. K.B. Hebbar, AHD (PB&PHT), Member Secretary.

The meeting was attended by All the Programme Leaders, Heads of Regional Stations, SICs of Research Centres and scientists from ICAR-CPCRI headquarters at Kasaragod and Regional Station, Vittal, and Research Centre and Kidu.



Dr. H.P. Singh, Former D.D.G. (Hort. Sc.) chairing the RAC meeting at Kasaragod

Dr. P. Chowdappa, Director (ICAR-CPCRI) welcomed the RAC members and presented activities and achievements of ICAR-CPCRI during the year 2016-17.

Dr. H.P. Singh, chairman RAC and other RAC members in their remarks, complimented the Director and scientists for their activities and achievements, and said that the coconut research and development has witnessed

a sea change over the years, right from pre-independence era.

Dr. H.P. Singh emphasized the leadership role played by ICAR-CPCRI in the development of cutting edge technologies and innovations and appreciated the work on neera and its products and partnership with industries for the benefit of the farmers. He stressed that the metagenomics could be used for understanding

the interaction of microbes in cropping systems. The need for diversification in coconut sector was also highlighted to make it more competitive and to enhance farmers' income. Scientific studies on water requirement and climate resilience are required. ICAR-CPCRI should take up leadership role in making neera and related products from other crops such as date palm and palmyrah. The RAC Committee also recommended more studies on the health aspects of coconut in its various forms and stressed on revisiting the work on biotechnology.

The meeting concluded in the evening with closing remark of RAC Chairman and Director, ICAR-CPCRI.

## Institute Advisory Committee meeting of the Farmers' First Project

Dr. P. Chowdappa, Director, ICAR-CPCRI chaired the first meeting of the Institute Advisory Committee meeting of the prestigious project of the Indian Council of Agricultural Research "Farmer FIRST programme" held at the Regional Station, Kayamkulam on 2<sup>nd</sup> March, 2017. Dr. V. Krishnakumar, Head, RS, Kayamkulam welcomed the gathering and briefed on the uniqueness of the Farmer FIRST programme in connecting the farmers with updated module-based scientific technologies of Farming, Dairy and Fisheries sectors towards accomplishing livelihood security through inclusiveness.



Institute Advisory Committee meeting of the Farmers First project at Kayamkulam

In his inaugural address, Dr. P. Chowdappa, Director, ICAR-CPCRI stressed on the dwindling natural resources and further envisaged on synchronized synergism cutting across all sectors for ensuring continuous income

generation through sustainable agriculture in organic mode. Dr. P. Anithakumari, Principal Scientist presented the salient activities of the programme. Future action plan was refined in the light of suggestions from experts.



## PUBLICATIONS

### Research Articles

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- Keerthana U., Nagendran K., Raguchander T., Prabakar K., Rajendran L. and Karthikeyan G. 2017. Deciphering the role of *Bacillus subtilis* var. *amyloliquefaciens* in the management of late blight pathogen of potato, *Phytophthora infestans*. *Proceedings of National Academy of Sciences, India, Sect. B: Biological Sciences*, doi:10.1007/s40011-017-0842-3.
- Rajkumar, Rachana K.E., Rajesh M.K., Sabana A.A., Nagaraja N.R., Shahin S. and Subaharan K. 2016. Molecular identification of entomopathogenic nematode isolate and its virulence to white grub, *Leucopholis burmeisteri* (Coleoptera: Scarabaeidae). *Vegetos* **29**: 4. doi: 10.4172/2229-4473.1000187.
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- Sujatha S., Bhat R. and Chowdappa P. 2016. Cropping systems approach for improving resource use in arecanut (*Areca catechu*) plantation. *Indian Journal of Agricultural Sciences*, **86** (9): 1113-1120.

### Presented Papers

- Jissy George and Muralidharan P. 2017 Processing and value addition of vegetables as a high income enterprises for women SHGs. *In: Proceedings of Second KVK Symposium 7 - 8 March, 2017, TNAU, Coimbatore.* pp. 134-135.
- Prathibha P.S., Subaharan K., Hegde V. and Sharadraj K.M. 2016. Dissipation of soil insecticide applied in arecanut garden for the management of root grubs, *Leucopholis spp.* *In: Book of Abstracts, 6th International Conference on "Technology Innovation and Management for Sustainable Development"*. 11-13 February 2016, ITM University, Gwalior, Madhya Pradesh. p. 145.
- Ravi S. and Muralidharan P. 2017. Low cost hydroponic fodder production for economic milk production from dairy cows. *In: Proceedings of Second KVK Symposium 7 - 8 March, 2017, TNAU, Coimbatore.* pp. 25-26.
- Sajnanath K. and Muralidharan P. 2017. Site specific nutrient management in banana for enhancing productivity in Onattukara sandy plains of Alappuzha district of Kerala. *In: Proceedings of Second KVK Symposium 7 - 8 March, 2017, TNAU, Coimbatore.* pp. 88-89.

### Popular Articles

- Chandrika Mohan, Josephraj Kumar A., Krishnakumar V. 2017. No pesticide for rugose whitefly management in coconut. *Kerala Karshakan*. **62** (6): 60-61 (in Malayalam).
- Jaganathan D. and Thamban C. 2017. Participatory approaches for enhancing technology utilization in coconut. *Indian Coconut Journal* **59** (11): 18-24.
- Jaganathan D., Nagaraja N. R., Jose C. T., Rajkumar, Ananda K.S. and Thamban C. 2017. Farmers' participatory demonstration on arecanut based cropping system A success story. *Indian Journal of Arecanut, Spices and Medicinal Plants*. **19** (1): 4- 9.
- Jeena Mathew and Krishnakumar V. 2017. Care our coconut trees - Concepts and management strategies. *Kerala Karshakan e Journal* **4**(10): 4-11.
- Jeena Mathew, Kalavathi S. and Krishnakumar V. 2017. "Thengu-Valaprayogathinu vazhikatti" (Malayalam). *Kerala Karshakan* **62**(9): 48-50.

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- Thamban C., Anithakumari, P. and Jaganathan, D. 2017. Empowering coconut stakeholders through extension. *Indian Horticulture*, **62**(1): 78-81.
- Thamban C., Jaganathan D. and Rajesh M. K. 2016. Centenary of CPCRI celebrated. *Indian Coconut Journal*. **59** (8): 22-23.
- Thamban C., Jaganathan D. and Rajesh M. K. 2016. Thottavila gavesana sthapanana shathabdhi aghoshangal samapichu. (Malayalam) *Indian Nalikerava Journal* **7**(12): 17-19.
- Thamban C., Mathew A.C., and Jaganathan D. 2017. Drip irrigation for sustainable coconut farming- Institutional and technology perspectives. *Indian Coconut Journal* **59** (11): 5-9.
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- Thamban C., Subramanian P. and Leena S. 2017. Mazhavyathiyanangal thengu krishikkundakunna aghathavum athu laghookarikkunnathinulla margangalum. *Indian Nalikerava Journal* **8** (1): 5-9.
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- Thamban C., Kalavathy S., Anithakumari P. and Jaganathan D. 2017. Extension approaches for reaching the farmers and stakeholders. *Indian Coconut Journal* **59** (9): 24-31.

## Technical Bulletins

- Josephraj Kumar A., Prathibha P.S., Merin Babu, Chandrika Mohan, Vinayaka Hegde, Krishnakumar V. and Chowdappa, P. 2017. *Red palm weevil in coconut. Knack to crack Trajectory*, ICAR-CPCRI, Regional Station, Kayamkulam, 28p.
- Thamban C., Subramanian P., Leena S. and Jesmi Vijayan. 2016. Thenginthottathile jalasamrakshanam. Department of Agriculture Development and Farmers' Welfare, Kasaragod. 14 p. (in Malayalam).

## Training Manuals

- Chandrika Mohan, Merin Babu, Josephraj Kumar A. and Krishnakumar V. 2017. Training Manual on 'Mass Production of Bio-control Agents and Health Management in Coconut'. ICAR-CPCRI, Regional Station, Kayamkulam. 59p.
- Subramanian P., Thamban C., Arivalagan M., Jaganathan D. and Jayasekhar S. 2016. Training Manual on 'Integrated Crop Management and Value Addition in Coconut'. ICAR-CPCRI, Kasaragod. 59p.

- Thamban C., Hebbar K. B. and Leena S. 2017. Kalavasthavyathiyavanam Keralathile thengu thottavila mekhalayam (Malayalam). In: Prasad, R.M. (Ed). Kalavasthavyathiyavanam karshika mekhalayam. Farm Care Foundation, Thrissur. pp 105-113.
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- Sajnanath K. and Muralidharan P. 2017. Soil testing for soil health management. Krishi Vigyan Kendra, ICAR-CPCRI, Regional Station, Kayamkulam.
- Ravi S., Reema Anand and Muralidharan P. 2017. Climate resilient management practises for dairy cows. Krishi Vigyan Kendra, ICAR-CPCRI, Regional Station, Kayamkulam.



## HUMAN RESOURCES DEVELOPMENT

### Deputation Abroad

Dr. Anitha Karun, Head, Crop Improvement and Dr. M. Neema, Scientist (Spices, Plantation, Medicinal and Aromatic Crops) were deputed for the 1<sup>st</sup> "International Symposium on Coconut Tissue Culture", held during 13<sup>th</sup> and 14<sup>th</sup> March 2017 at Bangkok, Thailand.



Dr. Anitha Karun and Dr. Neema M., along with other delegates at Bangkok, Thailand



### Limca National Record

To commemorate the Centenary Year, ICAR-Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala, organized a unique event in which 216 farmers planted 108 coconut seedlings of 18 varieties simultaneously at Centenary Park within the campus on 12<sup>th</sup> March, 2016. During the three-minute programme which

### Awards

started at 10.05 am, the farmers from various parts of the country planted one-year old seedlings in the previously dug pits of 1.5 m<sup>3</sup> in the 0.70 hectare plot. This event could gain a certificate of National Record from Limca Book of Records.

Mrs. Jissy George, SMS, KVK-Alappuzha bagged the best paper award for a paper on "Processing

and value addition of vegetables as a high income enterprises for women SHGs” in the session on ‘Processing and Value Addition and Market led Extension Programmes’ in the Second KVK Symposium conducted during 7<sup>th</sup> and 8<sup>th</sup> March, 2017 at TNAU Coimbatore.

## PG Studies

Shri Sandip Shil, Scientist (Agricultural Statistics) was awarded Ph. D. in Statistics for his thesis “An Empirical Study on support vector machine with functional genomic datasets specific to plantation crops” under guidance of Prof. Kishore K. Das, Department of Statistics, Gauhati University, Guwahati.

## Training attended

| Name & designation                   | Title of the programme  | Place and date  |
|--------------------------------------|---|---|
| Ms. Ranjini T.N., Scientist          | The basic flow cytometry  | NCBS, TIFR, Bengaluru<br>17 <sup>th</sup> to 20 <sup>th</sup> January, 2017 |
| Dr. Sandip Shil, Scientist           | Computational approaches for next generation sequencing (NGS) data analysis in agriculture                        | ICAR-IASRI, New Delhi<br>8 <sup>th</sup> -21 <sup>st</sup> February, 2017   |
| Dr. V. Niral,<br>Principal Scientist | Competency enhancement programme for effective implementation of training functions by HRD Nodal Officers of ICAR | ICAR-NAARM, Hyderabad<br>20 <sup>th</sup> -22 <sup>nd</sup> February 2017   |



### DISTINGUISHED VISITORS

| Name and designation   | Date                            | Place visited            |
|--|---------------------------------|--------------------------|
| Shri P. V. Velayudan, Director,<br>MSME-DI, Thrissur                   | 31 <sup>st</sup> January, 2017  | ICAR-CPCRI,<br>Kasaragod |
| Dr. H.P. Singh, Former DDG<br>(Horticultural Science), ICAR, New Delhi | 18 <sup>th</sup> February, 2017 | ICAR-CPCRI,<br>Kasaragod |



### TRANSFER OF TECHNOLOGY

## Training programmes

### International training

A Capacity building training programme sponsored by UNDP was conducted at Kasaragod during 9 to 11 February, 2017 to empower the people of Northern districts of Sri Lanka. Government officials, Scientist from Department of Palmyra, delegates from UNDP and an entrepreneur from Palm



Training of ‘Kalparasa’ production, for the participants from Sri Lanka during at ICAR-CPCRI, Kasaragod

Producer Company attended the training.

Exposure visit cum training programme on coconut production and processing technologies was conducted on 13<sup>th</sup> February, 2017 for 20 Officials of Coconut Development Board from Sri Lanka in collaboration with Indian Institute of Plantation Management, Bengaluru.

### On-campus trainings

Rural Agricultural Work Experience programme was organized during 27 Feb- 4 March 2017 for B.Sc., (Agri.) students of College of Agriculture, Padannakkad, Kerala.

Following training programmes were conducted at ICAR-CPCRI, Regional Station, Kayamkulam, "Hybridization techniques and palm health management in coconut" by Dr. Regi J. Thomas and Dr. M. Shareefa for six pollinators / supervisors, "Hybridization techniques in coconut" by Dr. Regi J. Thomas and Dr. M. Shareefa for three skilled pollinators from DSP Farm, Neriampalam, "Mass Production of Bio-control Agents and Health Management in Coconut" by Dr. Chandrika Mohan, Dr. A. Josephraj Kumar, and Dr. Merin Babu, Scientist for nineteen agricultural officers, "Mass Production of Bio-control Agents Fostering Coconut Health Management" by Dr. Chandrika Mohan, PS, Dr. A. Josephraj Kumar, and Dr. Merin Babu, for twenty agricultural assistants during 29-31 December, 2016 and 3-4 January, 2017, 2-4 January, 2017, 27 February to 2 March, 2017 and 20-23 February, 2017, respectively.

Training programme for 21 Coconut Producers Societies and 40 members of coconut plant protection surveillance group from 19 wards of Pathiyoor panchayath was conducted at the Regional Station, Kayamkulam on 3<sup>rd</sup> February, 2017. A total of 110 participants including People's representatives attended the programme. Another training programme on 'Coconut product diversification and processing



Officials of Coconut Development Board, Sri Lanka during field visit at Kasaragod

technologies' was convened during 4-5<sup>th</sup> February, 2017 in which 62 participants attended. Training programmes on scientific turmeric cultivation as intercrop in coconut garden 20<sup>th</sup> February, 2017, Navara paddy in coconut garden 23<sup>rd</sup> February, 2017 and sesamum cultivation 28<sup>th</sup> February, 2017) were organized in which 112 participants attended. Community field campaign and coconut plant protection was completed in ward 16 of Pathiyoor Panchayat with active participation of Kalpaka Coconut Producer Society and farmers.

Sixty-five farmers from Anamalai, Pollachi, Tamil Nadu visited the Regional Station, Kayamkulam during 5-6 January, 2017 as part of ATMA-Exposure visit knowledge empowerment programme and got acquainted with the management of rugose spiraling whitefly and root (wilt) disease of coconut.

'Gifted Students' from Alappuzha district were enlightened for "Promoting Scientific Temper"

during the "Talent Empowerment Programme" held at ICAR-CPCRI Regional Station, Kayamkulam on 18<sup>th</sup> March, 2017. Total 88 students participated in the programme.

A technical session on 'Biological control of pests of coconut' under 'Orientation programme on "Micro irrigation in coconut" was conducted on 4<sup>th</sup> March, 2017. Organized an one day orientation programme on "Micro irrigation in coconut" to farmers of Chavara Block on 4<sup>th</sup> March, 2017. A training session on 'Hybridization techniques in coconut' and "Advances in Coconut Pest Management" was conducted for 50 progressive farmers at Coconut Research Station (KAU), Balaramapuram, Trivandrum on 28<sup>th</sup> February, 2017 as a part of two day RKVY sponsored training programme.

Two training programme on 'Friends of Coconut Tree' (FOCT) 'Scientific Coconut Cultivation and Practice in Palm Climbing with Palm Climbing Device' were conducted respectively on 20<sup>th</sup>

February, 2017 to 25<sup>th</sup> February, 2017 and 13<sup>th</sup> March, 2017 to 18<sup>th</sup> March, 2017. The training programmes were sponsored by Coconut Development Board, State Centre, Kolkata. A total of 40 rural youths were trained in these programmes.

#### Farmer-First activities

Nineteen Farmers' focus group discussion and group meetings on general agricultural situation and coconut based farming system were conducted all wards of Pathiyoor Grama panchayat attended by 996 farmers. Training programme cum meeting of Coconut Producers Society of Pathiyoor panchayath was held on 21<sup>st</sup> January, 2017 in which 25 farmer leaders attended. Training programme on scientific cultivation of tuber crops with emphasis to organic cultivation practices was convened on 27<sup>th</sup> January, 2017 at Pathiyoor panchayath and the training session was handled by Dr. G. Sujja, Principal Scientist, ICAR-CTCRI, Thiruvananthapuram.

#### Off-Campus Training

Training on arecanut based cropping system for enhancing profitability was organized on 23<sup>rd</sup> March, 2017 for 125 farmers of Badiadka, Kasaragod.

A technical session on 'Coconut and its modern management perspectives with special emphasis to dwarf palms' was convened for 60 farmers at Erattupetta Block Panchayath Hall (Kottayam District) on 21<sup>st</sup> March, 2017 in connection with Karshika Vipanana Mela-2017. Participated in the awareness campaign and delivered a sensitization note on rugose spiraling whitefly to

Agriculture Department Officials on 21<sup>st</sup> February, 2017 at Coconut Research Station, Aliyarnagar (TNAU) convened by CIPMC, Trichy. A training session was conducted on Pest Management in Coconut during the Farmer Field School held at Pallickal, Bharanikavau Panchayat on 25<sup>th</sup> January, 2017 organized by ATMA and State Department of Agriculture Development and Farmers Welfare. A special talk on "Climate change-induced outbreak and suppression of rugose spiraling whitefly" was delivered at Research-Extension-Farmers interface held at Pala on 13<sup>th</sup> February, 2017. A sensitization campaign on rugose spiraling whitefly was conducted at Kadiyam, Rajahmundry, East Godavari on 17<sup>th</sup> February, 2017 to create awareness among nursery managers on the strict quarantine towards transport of coconut seedling from Kerala.

An off campus training programme on multiplication of *Trichoderma* in various substrates as part of Farmer First programme was conducted on 9<sup>th</sup> March, 2017 in which 63 participants from 19

wards of Pathiyoor panchayath participated.

A training on Coconut palm health management for 79 farmers of Thudanganad Farmers' Club, Thodupuzha was conducted on 21<sup>st</sup> March, 2017. Training on Jack fruit processing at Cherthala South on 10<sup>th</sup> March, 2017 24 women SHG members.

Keragramam training programme on plant protection in coconut was conducted at Thekkekkara on 25<sup>th</sup> February, 2017 where 35 farmers attended.

Seminar on organic farming and composting techniques for farmers of Pandalam Block under the Paramparagat Krishi Vikas Yojana (PKVY) was conducted on 21<sup>st</sup> March, 2017. Seminar on organic farming under Coconut Based Farming Systems at Cherthala South was conducted on 27<sup>th</sup> February, 2017 under the Paramparagat Krishi Vikas Yojana (PKVY) - 50 farmers attended the programme. Seminar on Coconut Plant Health Management at Mannancherry was conducted on 27<sup>th</sup> January, 2017 wherein 300 farmers attended.

## Interface Programmes

Scientist-Farmers Interface programme was conducted on 'Organic Farming Technologies for Plantation Crops' was organized at Kanhangad on 6<sup>th</sup> January, 2017. Interface programme on 'Value addition in coconut' was organized during 10<sup>th</sup> - 11<sup>th</sup> January 2017 at MYRADA KVK, Erode, Tamil

Nadu. 'Stakeholders Interface Meeting on Palmyrah Neera and its Value Addition' was organized on 25<sup>th</sup> February 2017 at Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad. More than 600 farmers and other stakeholders participated in the meeting.

## Exhibitions

Kisan Mela was organized by Govt. of Andhra Pradesh during 10-12 January, 2017 at Kakinada, East Godavari.

Institute could bag the first prize in the Regional Horti Fair held during 15-19 January 2017 at ICAR-IIHR, Bengaluru.

Institute participated in National Science Exhibition 2017 in



Exhibition stall of ICAR-CPCRI, Research Centre, Mohitnagar in West Bengal

connection with Kerala Science Congress at Thiruvalla during 26-30 January, 2017. Institute participated in Karshika Mela at Harippad organized by St. Thomas Orthodox Mission from 31<sup>st</sup> January, 2017 to 3<sup>rd</sup> February, 2017.

Institute also participated in 'Krishi Unnati Mela 2017' during 15-17 March, 2017 at ICAR-IARI, Pusa campus, New Delhi.

Mohitnagar Research Centre participated seven block level kisan melas during the months of January and February 2017 at Rajgung, Dhupguri, Mynaguri, Kalchini, South Matiali, Falakata, and Jalpaiguri, respectively. Mohitnagar Centre has set up exhibition stall during the national level Kisan Mela at ICAR-National Research Centre for Orchids, Pakyong, Sikkim.

## KVK, Kasaragod

KVK, Kasaragod had undertaken five On Farm Trials and 16 Front Line Demonstrations. KVK had organised various extension programmes which includes field visits to farmers plots, advisories to farmers over phone, diagnostic visits, agricultural seminars, workshops, field days etc. benefitting more than 4,000 farmers and farm women. KVK also organised and participated in three exhibitions.

The results of the following two FLDs were recorded during the period under report.

Greater yam *Dioscorea alata* variety, Sree Keerthi was introduced

in coconut homesteads of West Eleri panchayath. Lesser yam *Dioscorea esculenta* variety, Sree Latha was introduced in coconut homesteads W. Eleri panchayath. Seed treatment and soil application of *Pseudomonas fluorescens* against earhead disease of paddy, Mechanization in paddy, Introduction of fodder grass variety CO-5, were conducted during the period.

### Harvest Festival

Under the auspices of Krishi Vigyan Kendra, ICAR-CPCRI, Kasaragod, a Harvest Festival was organized at Paramba, West Eleri panchayath

## Radio talk/ TV programme

Dr. Regi J. Thomas, Principal Scientist (Horticulture) participated in Doordarshan Live Phone - in - programme (Telecasted in DD-4 Malayalam Channel) on 13<sup>th</sup> January 2017 on the 'Dwarf varieties suitable for Kerala conditions and management practices to be adopted'.

'Interview on Profitable rice farming' with Dr. P. Muralidharan, Head, KVK, Alapuzha was telecast in Nattupachcha programme in Manorama News Channel on 21<sup>st</sup> January, 2017.

All India Radio Trivandrum broadcasted a feature story on Farmers FISRT changing paradigm in research and Extension on 15<sup>th</sup> February, 2017.

on 10<sup>th</sup> January, 2017 in connection with the frontline demonstration on Introduction of greater yam and lesser yam.

### Scientific Advisory Committee Meeting

The 21<sup>st</sup> Scientific Advisory Committee meeting of KVK Kasaragod was conducted on 28<sup>th</sup> January, 2017 at CPCRI Kasaragod. The meeting was attended by 30 members including the Director of Extension, KAU, Scientists from ATARI, Bengaluru, Heads of divisions, CPCRI and Heads of various line departments from the district.

### National Food Security Mission Programme

Under this programme, green gram variety, Co 8 released by Tamil Nadu Agricultural University was introduced in Ajanur and Chemnad panchayaths covering an area of 10 ha. belonging to 25 farmers. Further, black gram variety, Vamban 6 released by Tamil Nadu Agricultural University was also introduced in the same area covering an area of 10 ha. The results showed that the yield of green gram was 347 kg/ha. and black gram was 266 kg/ha respectively. Due to severe and long spell of drought, crop growth was stunted and resulted in early flowering, poor pod formation and yield loss. In spite of such adversaries, an area of 20 ha was brought under pulses cultivation. The pods after removing seeds when soaked in water and fed to milch cows, milk yield increased to 20-25%.

### Pre - Rabi Agricultural Technology Meet

An Agricultural Technology Meet was organized in collaboration with Department of Agriculture & Farmer's Welfare, ATMA and Mararikulam North Grama Panchayath at Kanichukulangara Service Co-op bank Auditorium on 14<sup>th</sup> & 15<sup>th</sup>, January, 2017 to showcase new and successful technologies in the field of Agriculture and Animal husbandry. Dr. T. M. Thomas Issac, Hon. Finance Minister of Kerala inaugurated the meet. In the interface interactions

### Training programmes

| Programme    | No. of trainings | Participants |            |            |
|--------------|------------------|--------------|------------|------------|
|              |                  | Men          | Women      | Total      |
| On campus    | 17               | 112          | 185        | 297        |
| Off campus   | 10               | 164          | 268        | 432        |
| <b>Total</b> | <b>27</b>        | <b>276</b>   | <b>453</b> | <b>729</b> |

### Entrepreneurship Development Programmes

Minimal processing of fruits and vegetables and jackfruit in schools and among women groups on community basis was promoted. Women SHG's were mobilized for production and sales of coconut based nutraceutical/ medicinal products and nutraceutical foods and value added products of tapioca / sweet potato / raw jackfruit with minimal processing.

### Farmers Producer Company

A Farmers Producer Company, "Tulunadu Ecogreen Farmers Producer Company Limited", was registered with honey, organic

pepper and value added products from fruits and vegetables as the major products of the company. KVK, Kasaragod was identified as Producer Organization Promoting Institute (POPI) by NABARD for the formation of FPO. In connection with the formation of Farmers' Producer Company, three meetings were conducted for the Directors and Promoters of the company. Further, an exposure visit was conducted for the promoters and members of the company on 7<sup>th</sup> January, 2017 to honey processing units in and around Coorg Progressive honey keepers cooperative society. A total of 129 farmers were trained under FPO.

## KVK, Alappuzha

were made on the use of high yielding varieties, importance of soil health management, production and use of organic manures, integrated pest and disease management, coconut based integrated farming system, etc. This was followed by a session on "Value addition of Agricultural produce". More than 1000 farmers actively participated in the programme. A technology exhibition was also arranged with participation of 25 developmental agencies and an agricultural quiz competition conducted for the students.

### Resource conserving and eco-friendly technologies in paddy cultivation

Harvest festival of technology demonstration on 'Resource conserving and eco friendly technologies in paddy cultivation' was conducted at Kizhakke Munduveliparapu padasekharam of Muttar panchayath on 8<sup>th</sup> March, 2017. The technology demonstration was conducted as a part of 'National innovations in climate resilient agriculture' project being implemented by ICAR KVK Alappuzha. Shri Ashokan KVK, Standing Committee Chairman,

Alappuzha district panchayath, inaugurated the harvest fest. More than 75 farmers from the panchayth attended the meeting.

#### Field Days of Frontline Demonstrations (FLDs)

#### Hydroponic method of fodder production

A FLD on 'Hydroponic method of fodder production for dairy' conducted in Mararikulam and Mannanchery panchayaths. Field day was conducted on 24<sup>th</sup> March, 2017 at a beneficiary homestead. About thirty dairy farmers participated in the programme.

#### Amaranthus leaf spot management

Field day of the FLD on 'Amaranthus leaf spot management' was conducted at Mararikulam on 21<sup>st</sup> March, 2017 under the chairmanship of Mrs. Rema Sasi, Mararikulam South Grama Panchayath member. Technology of managing the disease using bioagents, *Trichoderma* and *Pseudomonas fluorescens* were imparted to about 30 farmers, who participated in the programme.

#### Training programmes

| Programme    | No. of trainings | Participants |            |            |
|--------------|------------------|--------------|------------|------------|
|              |                  | Men          | Women      | Total      |
| On campus    | 5                | 67           | 34         | 101        |
| Off campus   | 8                | 121          | 108        | 229        |
| Sponsored    | 3                | 65           | 35         | 100        |
| <b>Total</b> | <b>16</b>        | <b>253</b>   | <b>177</b> | <b>430</b> |

#### Oyster mushroom production

Field day of the FLD on 'Oyster mushroom production using banana pseudostem waste' was conducted at Gandhi Smaraka Kendram, subcentre, Mararikulam on 21<sup>st</sup> March, 2017. Shri P. C. Manoharan, Rtd. High School Headmaster and organic master farmer inaugurated the programme and interacted with the farmers. Scope of mushroom in nutrition, value added products from mushroom were elaborated. About 30 banana farmers participated in the programme.

#### Demonstrations of Pulses

In order to take forward the national priority on pulse production, FLD on green gram variety Co (gg) 8 and black gram

variety LBG 752 was carried out in coastal plains of Alappuzha district in Mararikulam South and Mannanchery panchayaths. Harvest festival and field day of the FLDs was conducted on 17<sup>th</sup> March, 2017. The harvest festival was inaugurated by the welfare standing committee chairman of Mararikulam South panchayth Shri A.S. Jayamohan in a function at Pollethai district of Alapuzha district.

#### Entrepreneurship Development Programmes

Entrepreneurship Development Programmes on 'Kadakknath Layer Chicks Production' in Aryad Panchayath, 'Value Addition in Banana' in Chingoli were the major ones.



### PARTICIPATION IN SEMINARS/SYMPOSIA/CONFERENCES/WORKSHOPS

| Name and designation                           | Title  | Place and date  |
|--|--|---|
| Dr. C. Thamban<br>Principal Scientist          | National Conference cum-Workshop on: "Kasaragod : Towards a New Regional Development Agenda" | Nehru Arts & Science College, Kanhangad<br>16-01-2017                 |
| Dr. Chandrika Mohan,<br>Principal Scientist    | Discussion Meeting on Management of black headed caterpillar, <i>Opisina arenosella</i>      | ICAR-CPCRI,<br>Kasaragod<br>30-01-2017                                |
| Dr. A. Joseph Rajkumar,<br>Principal Scientist | National Seminar on Recent Trends in Life Sciences   | University College,<br>Thiruvananthapuram<br>19-01-2017 to 20-01-2017 |

|   |   |  |
|---|---|--|
| Dr. A. Joseph Rajkumar, Principal Scientist and Dr. T. Sivakumar, SMS, KVK, Alappuzha | Brainstorming on Invasive rugose spiraling whitefly, <i>Aleurodicus rugioperculatus</i>                             | TNAU, Coimbatore<br>21-03-2017 to 22-03-2017                           |
| Dr. P. Antihakumari, Principal Scientist and Dr. M. Shareefa, Scientist               | National Review meeting and sensitization workshop of Farmer FIRST Project  | ICAR-NAARM, Hyderabad<br>18-03-2017 to 19-03-2017                      |
| Dr. P. Muralidharan, Head, KVK, Alappuzha   | Workshop on 'Skill Development in Agriculture'<br>XIII Agricultural Science congress on 'Climate Smart Agriculture' | NAARM, Hyderabad<br>20-02-2017<br>UAS Bangalore<br>21-24 February 2017 |
| Dr. T. Sivakumar, SMS, KVK, Alappuzha   | National Seminar on biodiversity conservation and farming systems for wetland ecology                               | RARS, Kumarakom, Kottayam<br>22-23 February, 2017                      |
| Smt. Jissy George, Dr. S. Ravi and Dr. K. Sajnanath, SMSs                             | Second KVK Symposium  | TNAU Coimbatore<br>07-03-2017 to 07-03-2017                            |



## CELEBRATION

### Productivity week observed at Kayamkulam

The 'Productivity Week' was celebrated during 12-18 February, 2017 at ICAR-CPCRI, Kasaragod. Various programmes like, wealth from waste through recycling, essay competition for students, increasing productivity through cropping systems, enhancing the efficiency of production process for coconut products and radio talk on increasing productivity were conducted for the benefit of farmers, students and other stakeholders.

At the Regional Station Kayamkulam, programme for empowering Kottakkom UP School students, Krishnapuram was held on efficient biomass recycling through vermicompost technology which makes farming sustainable and remunerative.

### National Science Day

An interactive meeting was organised for specially disabled students of Marthoma School for the Deaf, Cherkala and Government school for Blind, Vidyanagar on 28<sup>th</sup> February, 2017 to mark the occasion of National Science Day.

A special lecture by Prof. K. Girishkumar, Head, Department of Applied Chemistry, CUSAT, Kochi was held at RS, Kayamkulam.

In his inspiring lecture, he called upon the scientific fraternity to popularize science among school children and highlighted the application of chemistry in day to day life.

### Republic Day

Republic Day was observed in the headquarters, Regional Stations and Research Centres on 26<sup>th</sup> January 2017. Dr. P. Chowdappa, Director, delivered the Republic Day speech at Kasaragod.



Dr. P. Chowdappa, Director, ICAR-CPCRI, Kasaragod delivering the Republic Day speech



## OTHER INFORMATION

### Swachh Bharat Campaign

Regular cleaning works have been undertaken around the farm, tube well, office premises as well as different experimental fields showcasing cleanliness as part of clean and green farming.

### Women Cell Activities

The International Women's Day was celebrated at the Institute on the 8<sup>th</sup> March 2017 with the active participation of all staff members.

Dr. P. Chowdappa, Director, ICAR-CPCRI, presided over the function. Mrs. P.P. Maniamma, an advocate from Kragod, was the chief guest and delivered a talk on the general issues faced by working women in the society. Mrs. Sulochana Nair, Convener, Women's Cell, proposed the vote of thanks.

A demonstration class was also conducted on 'Empowerment through self-defense for women and girls' by Mr. Lakshmikant K., Indian Academy of Martial Arts, Mangalore. A food exhibition was also arranged concurrently by the members of the Women's Cell, including KVK beneficiaries.

The International Women's Day was observed for creation of awareness and empowerment of women cell/ ladies club members of ICAR-CPCRI, RS, Vittal. A team of 25 members visited Central Coffee Research Institute (CCRI), Balehonnur on 8<sup>th</sup> March, 2017.



Women's Cell members at CCRS, Balehonnur



## PERSONALIA

### Transfers

| Name & Designation                                  | From (Place)   | To (Place)                               | Date       |
|---|--|--|------------|
| Dr. R. Sudha<br>Scientist (Fruit Science)           | ICAR-Central Potato Research Station, Ooty, Tamil Nadu | ICAR-CPCRI, Kasaragod                    | 08-03-2017 |
| Dr. (Ms.) Daliyamol,<br>Scientist (Plant Pathology) | ICAR-NBAII, Bengaluru                                  | ICAR-CPCRI, Regional Station, Kayamkulam | 27-03-2017 |
| Shri Nazeeb Naduthodi<br>Scientist (Fruit Science)  | ICAR-IIHR, Bengaluru                                   | ICAR-CPCRI, Regional Station, Vittal     | 30-03-2017 |

### Promotion

| Name              | From (Designation)               | To (Designation)                                       | w.e.f.     |
|-------------------|----------------------------------|--|------------|
| Shri M. Ravindran | Assistant, ICAR-CPCRI, Kasaragod | Assistant Administrative Officer, ICAR-CPCRI, RC, Kidu | 06-02-2017 |

### Retirements

| Name                 | Designation           | Place                 | Date       |
|----------------------|-----------------------|-----------------------|------------|
| Shri K. Rama         | Skilled Support Staff | ICAR-CPCRI, Kasaragod | 31-03-2017 |
| Shri M. Parameshwara | Skilled Support Staff | ICAR-CPCRI, RC, Kidu  | 31-03-2017 |



## TECHNOLOGY COMMERCIALIZATION

| Technology   | Amount (₹)                 | Licensee  |
|--|----------------------------|---|
| Design drawings of snow ball tender nut machine                                    | 2,500                      | Mr. Murali Gopalan, Peddathalapalli, Krishnagiri, Tamil Nadu  |
| Production of coconut vinegar  | 10,000<br>10,000           | Mr. Yeshwanth T P, Bengaluru, Karnataka<br>Mr. Ramesan Pilathottathil, Kozhikode, Kerala  |
| Collection of fresh and hygienic Kalparasa and production of natural coconut sugar | 15,000<br>15,000<br>15,000 | Smt. Raksha Dayanand, Bangalore<br>Ms. Pavithra S, Coimbatore, Tamilnadu<br>Bihar Agricultural University, Bhagalpur            |
| Production of coconut chips  | 15,000<br>15,000<br>15,000 | Mr. P. Dayanand, Bengaluru, Karnataka<br>Mr. Joseph Dominic, Kanjirapally, Kottayam, Kerala<br>Mr. Zakaria C.H., Kannur, Kerala |
| Preservation of carbonated tender coconut water                                    | 25,000                     | Pavithra S., Coimbatore, Tamilnadu  |
| Production of virgin coconut oil (VCO)   | 40,000                     | Mr. P. Dayanand, Bengaluru, Karnataka   |
| Production of Kalpa Krunch   | 60,000<br>60,000           | Smt. Raksha Dayanand, Bengaluru<br>M/s Perambra Coconut Producer Company, Kozhikode, Kerala                                     |
| Nanomatrix for delivery of pheromone for management of coconut pests               | 3,00,000                   | M/s Bio Pel Organics & Formulations Pvt. Ltd., Kompally, Secunderabad.  |
| <b>Total</b>   | <b>5,97,500</b>            |   |



## 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 January - March, 2017 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 one villages for the overall development of the villages as given below.

No. of farmers benefitted by the MGMG programme

| Venue        | Visit       | Interface   | Demo       | Trained    | Advisory services | Literature support |
|--------------|-------------|-------------|------------|------------|-------------------|--------------------|
| Kasaragod    | 543         | 284         | 237        | 183        | 321               | 359                |
| Kayamkulam   | 654         | 354         | 361        | 204        | 407               | 503                |
| Vittal       | 456         | 214         | 189        | 192        | 209               | 408                |
| Kahikuchi    | 95          | 86          | 42         | 36         | 96                | 64                 |
| Mohitnagar   | 110         | 74          | -          | 43         | 84                | 58                 |
| Kidu         | 68          | 52          | 49         | 68         | 51                | 46                 |
| <b>Total</b> | <b>1926</b> | <b>1064</b> | <b>878</b> | <b>726</b> | <b>1168</b>       | <b>1438</b>        |



Dr. P. Chowdappa, Director, ICAR-CPCRI, addressing the farmers during the training on arecanut based cropping systems, at Neerchal



Interface programme on soil health management at Pullur Periya



Farm advisory visit to Kootakkani



Demonstration on soil and water conservation in coconut garden at Periya



Farm advisory visit to Bela



Training on organic farming at Cherthala south



Interface meeting on pest management in coconut at Kopparethu



Demonstration on nursery bed preparation



हर कदम, हर ऊपर  
किसानों का हमसफर  
भारतीय कृषि अनुसंधान परिषद  
*Agrisearch with a human touch*



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ICAR-Central Plantation Crops Research Institute, Kudlu P.O., Kasaragod, Kerala - 671 124  
Phone: 04994 232893, 232894, 232895, 233090, 232333 (Director); Fax: 04994 232322  
E-mail: chowdappa.p@icar.gov.in, cpcrinews@gmail.com  
Website: www.cpcri.gov.in; Facebook: cpcrikasaragod.kerala  
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