



KALPA

CPCRI Newsletter

Volume 36 No. 1 January – March, 2017



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





From The Director's Desk

Prosperity Through Value Chains

Agricultural 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.

CONTENTS

03 Spectrum

06 Important Events

08 Publications

10 Human Resources Development

11 Distinguished Visitors

11 Transfer of Technology

16 Participation in Seminar/Symposia/Conferences

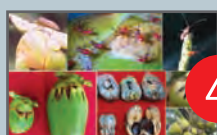
17 Celebration

18 Other Information

18 Personalia

19 Technology Commercialization

19 Mera Gaon Mera Gaurav





SPECTRUM

Bacterial assisted solubilization of zinc in soil matrix

Clay loamy alkaline (pH 8.0-8.5) soils, low in available zinc (0.31 to 0.60 ppm), was bacterized with three most efficient zinc solubilizing micro-organisms for the purpose of solubilizing complexed zinc available in this soil.

Sub-soil samples were collected at weekly intervals till 50th day after inoculation by zinc solubilizers and analysed for soluble zinc by atomic absorption spectrophotometer. Moisture levels in the soil were maintained all the while using sterilized water. Available zinc levels in soils inoculated with the selected zinc solubilizing bacteria showed increase, with *Micrococcus luteus* CUK5 inoculation recording

highest levels. In uninoculated control treatment, available zinc level showed no change throughout the seven weeks experimental period. Additionally, Electrical Conductivity levels in soils inoculated with zinc solubilizers showed increase in comparison to

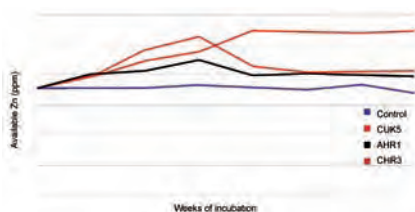


Fig. 2. Variation in zinc level

uninoculated soils, as measured at the end of the experiment (50th day). However, there was no change in the pH status of all the



Fig. 1. Samples with zinc solubilizing microorganisms

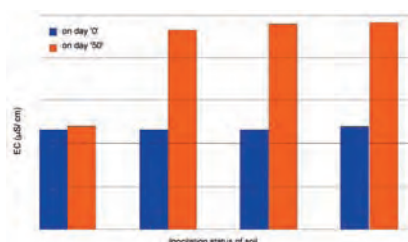


Fig. 3. Variation in electrical conductivity

treatment soils throughout the experimental period.

Alka Gupta and Selvamani, V.

Spread of invasive rugose spiraling whitefly and its molecular identification

Initial occurrence of invasive rugose spiraling whitefly (RSW), *Aleurodicus rugioeperculatus* in West Coast of South India has expanded further to East Coast region of Andhra Pradesh (Kadiyam of East Godavari district) and Tamil Nadu (Pattukottai of Thanjavur district) during February 2017. Unscientific mode of transport of pest-infested coconut seedlings from Thrissur, Kerala to Kadiyam, Andhra Pradesh and from Pollachi, Tamil Nadu to Pattukottai, Tamil Nadu are the immediate reasons for spread to East Coast of South India. Strengthening domestic

quarantine and complete disinfection of RSW-infested coconut seedlings before transport to pest-free zones is

strictly advocated. Molecular characterization of cytochrome oxidase 1 (CO1) gene from *A. rugioeperculatus* indicated host

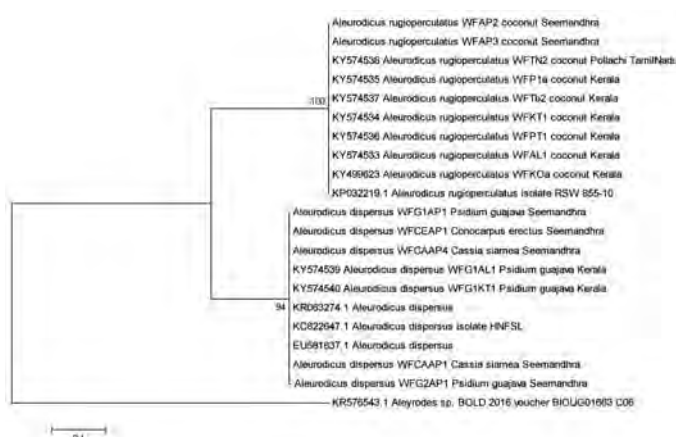


Fig. 4. Phylogenetic tree of whiteflies

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

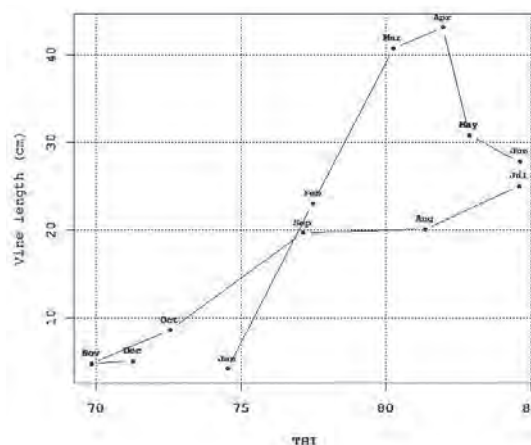


Fig. 9. Vine length of black pepper cuttings for sub-Himalayan Terai region



IMPORTANT EVENTS

Industry Day “Dream Big Kalpa 2017”

Industry Day was observed at ICAR-CPCRI, Kasaragod on 31st 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 19th Research Advisory Committee (RAC) meeting was convened at ICAR-CPCRI, Kasaragod on 18th and 19th 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 DDG (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 2nd 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

- Jha U.C., Basu P., Shil S. and Singh N.P., 2016. Evaluation of drought tolerance selectin indices in chickpea genotypes. *International Journal of Bio-resource and Stress Management*, **7**(6): 1244-1248.
- Kalavathi S., Jeena Mathew, Jacob Kurien, Anilkumar B., Nampoothiri C.K., Muralidharan K. and Subramanian P. 2017. Participatory technology assessment and refinement for evolving climatesmart adaptations in the management of coconut based farming systems under coastal sandy soil conditions of South Kerala, India. *Ecology, Environment and Conservation*, **23**(1): 581-591.
- 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.
- Srinivasan T. and Chandrika Mohan. 2017. Population growth potential of *Bracon brevicornis* Wesmael (Braconidae: Hymenoptera): A life table analysis. *Acta Phytopathologica et Entomologica Hungarica*, doi: 10.1556/038.52.2017.010.
- 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.
- Sajjananath 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.

- Jissy George. 2017. From fruit pulp to clothes. *Karshakasree*, **23** (2): 89-90.
- Jissy George. 2017. Many more products from pepper. *Karshakasree*, **23** (3): 82.
- Jissy George. 2017. New machineries for food processing. *Karshakasree*, **23** (1): 90.
- Sunny Thomas, Shanavas, M., Josephraj Kumar, A. and Chandrika Mohan (2017) Coconut and Ceremonies (In Malayalam) March 2017. *Indian Coconut Journal* **8**(3): 16-17.
- Thamban C., and Jayasekhar S. 2016. Naliker a gavesana reethisasthram parisodhana vidheyamakumbol (Malayalam). *Indian Naliker Journal* **7**(12) : 09-13.
- Thamban C. 2016. Nalikerathinte natti kera samrudhi veendedukkan (in Malayalam). *Panchayathraj*. **56** (5): 17-20.
- Thamban C. 2016. Thengolakkumundu kadha parayan (Malayalam). *Gramabhumi* **39**(5): 32-33.
- 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 sthapan a shathabdh aghoshangal samapichu. (Malayalam) *Indian Naliker 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.
- Thamban C., Prathibha V.H. and Chandran K.P. 2016. Integrated management of Ganoderma/Thanjavur wilt: Need for farmer participatory interventions. *Indian Coconut Journal*. **59** (9): 09-11.
- Thamban C., Subramanian P. and Jayasekhar S. 2016. Management of coconut garden during rainy season. *Indian Coconut Journal*. **59** (2): 08-12.
- Thamban C., Subramanian P. and Leena S. 2017. Mazhavyathiyanangal thengu krishikkundakunna aghathavum athu laghookarikkunnathinulla margangalum. *Indian Naliker Journal* **8** (1): 5-9.
- 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.
- 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. Kalavasthavyathiyanavum Keralathile thengu thottavila mekhalayum (Malayalam). In: Prasad, R.M. (Ed). Kalavasthavyathiyanavum karshika mekhalayum. Farm Care Foundation, Thrissur. pp 105-113.

Thamban C. 2016. Keragaveshana nettangalum Keralathile thengukrishiya (Malayalam). In: Vanaja, T. (Ed.). Thaliyola: Kera gaveshana sathabdippathippu (1916-2016). Directorate of Extension, Kerala Agricultural University, Thrissur. pp:159-162.

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 1st "International Symposium on Coconut Tissue Culture", held during 13th and 14th 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 12th March, 2016. During the three-minute programme which

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 m³ 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

Awards

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 7th and 8th 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 17 th to 20 th January, 2017
Dr. Sandip Shil, Scientist	Computational approaches for next generation sequencing (NGS) data analysis in agriculture	ICAR-IASRI, New Delhi 8 th -21 st February, 2017
Dr. V. Niral, Principal Scientist	Competency enhancement programme for effective implementation of training functions by HRD Nodal Officers of ICAR	ICAR-NAARM, Hyderabad 20 th -22 nd February 2017



DISTINGUISHED VISITORS

Name and designation	Date	Place visited
Shri P. V. Velayudan, Director, MSME-DI, Thrissur	31 st January, 2017	ICAR-CPCRI, Kasaragod
Dr. H.P. Singh, Former DDG (Horticultural Science), ICAR, New Delhi	18 th February, 2017	ICAR-CPCRI, 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 13th 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 3rd 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 4-5th February, 2017 in which 62 participants attended. Training programmes on scientific turmeric cultivation as intercrop in coconut garden 20th February, 2017, Navara paddy in coconut garden 23rd February, 2017 and sesamum cultivation 28th 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 18th 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 4th March, 2017. Organized an one day orientation programme on "Micro irrigation in coconut" to farmers of Chavara Block on 4th 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 28th 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 20th

February, 2017 to 25th February, 2017 and 13th March, 2017 to 18th 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 21st 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 27th January, 2017 at Pathiyoor panchayath and the training session was handled by Dr. G. Suja, Principal Scientist, ICAR-CTCRI, Thiruvananthapuram.

Off-Campus Training

Training on arecanut based cropping system for enhancing profitability was organized on 23rd 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 21st 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 21st 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 25th 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 13th February, 2017. A sensitization campaign on rugose spiraling whitefly was conducted at Kadiyam, Rajahmundry, East Godavari on 17th 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 9th 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 21st March, 2017. Training on Jack fruit processing at Cherthala South on 10th March, 2017 24 women SHG members.

Keragramam training programme on plant protection in coconut was conducted at Thekkekkara on 25th 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 21st March, 2017. Seminar on organic farming under Coconut Based Farming Systems at Cherthala South was conducted on 27th 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 27th 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 6th January, 2017. Interface programme on 'Value addition in coconut' was organized during 10th - 11th January 2017 at MYRADA KVK, Erode, Tamil

Nadu. 'Stakeholders Interface Meeting on Palmyrah Neera and its Value Addition' was organized on 25th 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

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 31st January, 2017 to 3rd 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.



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

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 13th 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 21st January, 2017.

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

KVK, Kasaragod

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

Scientific Advisory Committee Meeting

The 21st Scientific Advisory Committee meeting of KVK Kasaragod was conducted on 28th 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%.

Training programmes

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

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 7th 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

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 14th & 15th, 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

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 8th 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 24th 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 21st 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
Total	16	253	177	430

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 21st 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 17th 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 'Kadaknath 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 Principal Scientist	National Conference cum-Workshop on: "Kasaragod : Towards a New Regional Development Agenda"	Nehru Arts & Science College, Kanhangad 16-01-2017
Dr. Chandrika Mohan, Principal Scientist	Discussion Meeting on Management of black headed caterpillar, <i>Opisina arenosella</i>	ICAR-CPCRI, Kasaragod 30-01-2017
Dr. A. Joseph Rajkumar, Principal Scientist	National Seminar on Recent Trends in Life Sciences	University College, Thiruvananthapuram 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 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 18-03-2017 to 19-03-2017
Dr. P. Muralidharan, Head, KVK, Alappuzha	Workshop on 'Skill Development in Agriculture' XIII Agricultural Science congress on 'Climate Smart Agriculture'	NAARM, Hyderabad 20-02-2017 UAS Bangalore 21-24 February 2017
Dr. T. Sivakumar, SMS, KVK, Alappuzha	National Seminar on biodiversity conservation and farming systems for wetland ecology	RARS, Kumarakom, Kottayam 22-23 February, 2017
Smt. Jissy George, Dr. S. Ravi and Dr. K. Sajnanath, SMSs	Second KVK Symposium	TNAU Coimbatore 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 Kottakkakom 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 28th 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 26th 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 8th 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. Lakshmikanth 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 8th March, 2017.



Women's Cell members at CCRS, Balehonnur



PERSONALIA

Transfers

Name & Designation	From (Place)	To (Place)	Date
Dr. R. Sudha Scientist (Fruit Science)	ICAR-Central Potato Research Station, Ooty, Tamil Nadu	ICAR-CPCRI, Kasaragod	08-03-2017
Dr. (Ms.) Daliyamol, Scientist (Plant Pathology)	ICAR-NBAII, Bengaluru	ICAR-CPCRI, Regional Station, Kayamkulam	27-03-2017
Shri Nazeeb Naduthodi 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 10,000	Mr. Yeshwanth T P, Bengaluru, Karnataka Mr. Ramesan Pilathottathil, Kozhikode, Kerala
Collection of fresh and hygienic Kalparasa and production of natural coconut sugar	15,000 15,000 15,000	Smt. Raksha Dayanand, Bangalore Ms. Pavithra S, Coimbatore, Tamilnadu Bihar Agricultural University, Bhagalpur
Production of coconut chips	15,000 15,000 15,000	Mr. P. Dayanand, Bengaluru, Karnataka Mr. Joseph Dominic, Kanjirapally, Kottayam, Kerala 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 60,000	Smt. Raksha Dayanand, Bengaluru 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.
Total	5,97,500	



MERA GAON MERA GAURAV

ICAR- CPCRI, Kasaragod and its regional stations and research centres have implemented the MGMT 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 MGMT 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
Total	1926	1064	878	726	1168	1438



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



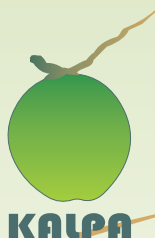
Interface meeting on pest management in coconut at Kopparethu



Demonstration on nursery bed preparation



हर फसल, हर ऊपर
किसानों का हमसफर
मानवी कृषि अनुसंधान परिषद
AgriSearch with a human touch



Published by: Dr. P. Chowdappa, Director

Compiled and edited by: Dr. P. Chowdappa, Shri H. Muralikrishna and Dr. M.K. Rajesh

Photo credits: Shri K. Shyama Prasad and Shri E.R. Asokan

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

Printed at: Niseema Printers, South Kalamassery, Kochi - 683109, Ph: 0484 2550849

Readers of this publication may understand that all material contained in this is for knowledge-sharing purposes only and does not represent ICAR's authority or endorsement. The contents of this publication is for non-commercial purpose only. ICAR-CPCRI may not be held liable for any of the contents of this publication.