

From the Director's Desk

Greetings from ICAR-IISR.

With the new role as Director of the Institute, there are new responsibilities and new challenges. But I am very happy to inherit a great Institute which has been very well guarded and transformed it in to its present status by my predecessors. My role is to sustain the good work done by them and I will try to achieve that goal. My colleagues in the Institute also deserve appreciation.

Institute witnessed many events during the last three months. I am thankful to Dr John Zachariah, Head, Crop Production and Post Harvest Technology, the then Acting Director who conducted the Institute Research Council meeting where all the research projects were discussed at length, fine tuned as per needs and a few new programmes were added. A few technologies were also recommended for extension agencies for transfer and notable among them is the technology for cardamom thrips control as thrips is becoming a severe threat to cardamom production.

Our ITM-BPD unit has licensed our improved ginger, turmeric and black pepper varieties to farmers. This would certainly augment the shortfall in planting materials of improved varieties of spices. Launch of our bioagents Powercap and Trichocap would benefit the farmers to maintain better plant as well as soil health.

Institute celebrated many events during the period. Major among them are Swachhta Pakhwara during 17-28 May 2016, World Environment Day on 5 June 2016 and International Day of Yoga on 21 June 2016. Mera Gaon Mera Gaurav programme is gaining momentum and our scientists are providing the requisite advise to the farmers of the adopted village.

With the onset of monsoon, planting of ginger, turmeric, cardamom *etc.* were taken up and all the planting has been completed by the end of June. Manuring and first round of Bordeaux spray has been completed in black pepper. As the monsoon is predicted to be normal, I hope and wish that spice farmers harvest good crop this year.



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K. Nirmal Babu

Research update

Black pepper is performing well in alternate germplasm site

The alternative black pepper germplasm block at Chettalli consisting of three year old crop has produced its first yield in 2015-16. The accession 959 has registered highest fresh weight of berries (1685 g) per vine followed by the accession 933 with the fresh weight of 1461 g. Also, in the DUS block of black pepper maintained at Chettalli, the cultivar Ponmani has recorded maximum fresh (3115 g) and dry (1002 g) yield per vine followed by the cultivar Karimunda with fresh (2084 g) and dry (703 g) yield per vine.



Cultivar Ponmani vine



Ponmani spikes

Actinomycetes for Phytophthora control

Crude culture filtrates of three potential actinomycetes viz., BP Act 1, BP Act 25, and BP Act 42 showed complete inhibition of sporangia formation of *Phytophthora capsici*. The anti fungal activity of the crude solvent extracts of three potential isolates showed that these metabolites are extracellularly produced and can be easily extracted using organic solvents and the compound(s) can be concentrated by evaporation in their active forms. Different actinomycetes isolates showed a variation in the activity profile with respect to the organic solvent used for extraction of anti-bacterial compounds which suggests that these potential metabolites produced, have inter-generic variations in their chemical signatures. The crude chloroform extract of isolate BP Act 1 showed highest activity against black pepper pathogen *Colletotrichum gloeosporioides* (75% inhibition) while ethyl acetate extract of BP Act 1 showed highest activity against *Sclerotium rolfsii* (67% inhibition).

ISSR markers for cardamom leaf blight

Studies on the causal organism of cardamom leaf blight revealed that ISSR primers could distinguish isolates of *Colletotrichum gloeosporioides* inciting cardamom leaf blight disease based on the virulence of pathogen. Twenty three ISSR primers were used in the study.

New database on Indian plant viruses

Indian Plant Virus DB, a new database on plant viruses reported from India has been developed and launched by Bioinformatics Centre. This database attempts to assemble information about different plant virus species infecting various crop plants in India, along with their host range, symptomatology, distribution, transmission, particle morphology, diagnosis, available sequence data and literature as a searchable database. Details of 129 species of plant viruses reported to occur are made available in this database. Feature like sequence comparison is added to the database, which can be used to compare between strains of a virus species or between virus species. Viro Blast provides users with the facility to check identity/similarity of a sequence against all available plant virus sequences. The database also contains a search window to search the viruses using their species name, host or disease. This database will help in comparison of different plant virus species occurring in India by providing all available resources under a single platform, thus making studies on plant viruses occurring in India simple and easy. The database can be accessed at: <http://220.227.138.213/virusdb/>.

Black pepper nursery at Omassery

The nursery established at Omassery under AWIPM is performing well. Cuttings are healthy and the cuttings are in great demand.



View of the nursery of George Nedumkallel established in Omassery





Personalia

Awards/ Honours/ Recognitions

Dr K. Nirmal Babu appointed as ICAR-IISR Director

Dr K. Nirmal Babu is appointed as Director, ICAR-Indian Institute of Spices Research, Kozhikode w.e.f. 1 July 2016. He is also the Project Coordinator, AICRP on Spices. Dr K. Nirmal Babu has 30 years of research experience in spices and has worked on spices genetic resources, breeding and biotechnology. He has more than 200 publications in well reputed international and national journals. He has edited many books on spices.

John Zachariah T

Functioned as Acting Director, ICAR-IISR, Kozhikode from 1 April to 12 June 2016.

Kandiannan K

Served as Nodal Officer for conducting ICAR-All India Entrance Examination for Agriculture (AIEEA) UG & PG in Kozhikode Centre on 21-22 May 2016.

Prasath D

Recognized as PG teacher (Horticulture) for post-graduate students, University of Horticultural Sciences, Bagalkot, Karnataka.

Santhosh J Eapen

Reviewer, Applied Soil Ecology.

Radio talk

John Zachariah T

Properties of spices and diseases, AIR, Kozhikode, 14 June 2016.

Prakash K M

Preparatory planting works for spices cultivation, AIR, Kozhikode, 8 June 2016

Suseela Bhai R

Kumil rogangale prathirodhikkan nadapadikal, AIR, Kozhikode, 20 June 2016.

Thankamani C K

Scientific cultivation of ginger- Interview, AIR, Kozhikode, 22 June 2016.

Trainings attended

Rajeev P

Impact assessment in Agricultural Extension at ICAR-NAARM, Hyderabad, 6-10 June 2016

News and events

Institute Research Committee Meeting

The Annual Institute Research Council (IRC) meeting of IISR was held during 28-29 April 2016, Dr. T. John Zachariah, Director (Acting) of the institute chaired the overall meeting. The session on Crop Improvement and Biotechnology & Social Science was chaired by Dr. P. Rajendran, Associate Director (Research), KAU, RARS, Ambalavayal, Kerala and Dr. B. Sasikumar, HD (Crop Improvement and Biotechnology). The session on Crop Production and Post Harvest Technology was chaired by Dr. T. John Zachariah, HD (Crop Production & PHT) and the session on Crop Protection was chaired by Dr. Santhosh J. Eapen, HD (Crop Protection). During these two days, the progress made in each of the projects was presented and discussed.

The following technologies emanated from various research programmes were recommended for extension agencies.

1. Insecticide spray schedule for control of cardamom thrips

The results of the trial (consisting of four promising insecticides (fipronil (0.005%), imidacloprid (0.0089%), spinosad (0.0135%) and quinalphos (0.05%)) indicated that thrips can be effectively and economically managed by three sprays (March, May and August) leading to less insecticide residues in the produce.

2. Biocontrol for cardamom thrips

Field trials with an entomopathogenic fungus, *Lecanicillium psalliotae*, undertaken at different agro-climatic conditions in Kerala and Karnataka indicated that basal application of the fungus (3-4 applications during May – September) was effective in controlling the thrips which was on par with chemical insecticides. The technology is ideal for adoption in organic horticulture.

3. Management of plant parasitic nematodes infesting black pepper

Field trials have indicated that drenching 0.1% carbosulfan 25 EC (0.125 a. i.) @ 5 l/plant at the base of plant twice (pre monsoon -May and post monsoon - October) a year OR applying fipronil 0.3 GR @ 50 g/plant at the base of



plant thrice (May, September and January) a year were effective for the management of plant parasitic nematodes infesting black pepper.

4. A new media for mass multiplication of entomopathogenic nematodes

A new artificial media for the mass production of infective juveniles of entomopathogenic nematodes was developed. By this technique around 23 lakh infective juveniles of EPN can be recovered from a single flask (250 ml). The cost of production is just Rs. 2 per flask. This media is unique as it supports multiplication of all three type of EPNs like *Steinernema*, *Heterorhabditis* and *Oscheius*. It is cheaper to other existing media like Wouts media (Rs. 6.5 /flask), egg yolk media (Rs. 11.83/flask), wheat flour media (Rs.18.1/flask) and dog biscuit media (Rs.13.19/flask). This technology is being patented as 'IISR-EPN Production Medium'.

5. Field diagnostics for Biovar specific detection of *Ralstonia solanacearum* infecting ginger (*Zingiber officinale*)

A strain specific and sensitive technique based on Real Time Loop Mediated Isothermal Amplification (Real Time- LAMP) was developed for detecting race 4 strain of *Ralstonia solanacearum* causing bacterial wilt in ginger. The method can be used to index both soil, water as well as seed rhizomes. There is no need for extraction of the genomic DNA as the technique is standardized with soil supernatant as the template. The time taken for detection is only 3-4 hours and the detection limit was found to be 103 CFU/g of soil or rhizomes. The technology can be easily adopted in field for pathogen-free site selection as well as selecting disease-free seed materials for planting.



IRC meeting in progress

Director General, ICAR holds discussions with Kerala based ICAR Institutes

Hon'ble Director General ICAR held a meeting of Directors and Project coordinators of Kerala based ICAR Institutes at Munnar on 16 April 2016. Dr T. John Zachariah, Acting Director and Dr K. Nirmal Babu, Project Coordinator attended the meeting and had a thorough discussion with DG on various programmes of the Institute and AICRP on Spices, problems faced by the institutes in implementation of various programmes, commercialization of technologies and other administrative issues.

Swachhta Pakhwara celebrations at ICAR-IISR

The Swachhta Pakhwara 2016 celebration was inaugurated by Dr. T. John Zachariah, Acting Director on 17 May 2016 with a Swachhta pledge by the staff members. On 18 May, staff members cleaned the laboratories and office building premises. Two guest lectures, one on scientific waste management by Dr. P.S. Harikumar, Scientist F, Centre for Water Resources Development and Management (CWRDM), Kozhikode and another on Environment & Health by Dr. T. Jayakrishnan, Associate Professor, Medical College, Kozhikode were delivered. Village cleaning campaign was also undertaken which was inaugurated by Mrs. Salini, Hon. Councillor, Ward No.15, Kozhikode Corporation on 25 May 2016.

Literary competition on essay writing (English and Malayalam), pencil drawing and poetry writing (English and Malayalam) were conducted. A demonstration on compost making and vermi compost preparation was organized at ICAR-IISR Dairy unit on 27 May 2016 by Dr. C.K. Thankamani, Nodal officer, in which staff members and members of Kattangat residential association participated. The chief guest Dr. T. Jayakrishnan, Associate professor, Medical college, Kozhikode gave away the prizes to the winners of various competitions during the valedictory function held on 28 May 2016. Swachhta Pakhwara celebrations were also organized at ICAR-IISR Farm, Peruvannamuzhi, Regional station Appangala, and KVK Peruvannamuzhi.





Campus cleaning by the staff



Dr T. Jayakrishnan addressing the staff

International Day of Yoga celebrated at ICAR-IISR

International Day of Yoga was celebrated with enthusiasm in all the three campuses of ICAR- Indian Institute of Spices Research, Kozhikode on 21 June 2016. Yoga Acharya K. M. Rajesh, Director, Swasthik Holistic Yoga Research Centre, Kozhikode was the chief guest for the occasion at Chelavoor campus. He briefed on the importance of yoga and need to adopt yoga as a holistic approach for good health. He also conducted a yoga demonstration cum training class in which all the categories of staff of the institute participated. At KVK, Peruvannamuzhi, Mr. K. Ramachandran, Kerala State Coordinator, Loka Samudaya Seva Sangham trained the staff on Yoga exercises to get health and fitness.



Yoga Acharya K. M. Rajesh addressing the staff



Yoga session at Peruvannamuzhi

World Environment Day celebrated

World environment day was celebrated at ICAR-IISR on 5 June 2016. Staff planted the samplings of various tree species near the water harvesting structure in C block. This was followed by an awareness talk on Illegal trade of wild resources by Dr B. Sasikumar, Head, Crop Improvement and Biotechnology, IISR, Kozhikode. At KVK, Peruvannamuzhi, the day was observed by planting of nutmeg grafts and mangosteen saplings.



Director (Acting) Dr T. John Zachariah planting a sapling

Intensification of Mera Gaon Mera Gaurav activity

Base line survey report covering ten selected wards with 300 -400 farm families each was submitted to local Agriculture Department office. Ten demonstration plots each of ginger variety IISR Mahima and turmeric variety IISR Prathibha were initiated in Kattippara panchayath. Two demonstrations of best management practices in black pepper were also initiated.

News from Library

Under the CeRA consortium 15 full text articles were supplied. Three issues of 'AGRI Tit bits' were published.



Purchased 1 book and added 11 other publications to stock. Library services were utilized by 153 internal and three external users. Biometric system was installed to record the entry to library stack.

ICAR - All India Entrance Examination for Agriculture (AIEEA) 2016

ICAR-IISR, Kozhikode organized ICAR - All India Entrance Examination for Agriculture (AIEEA) 2016 UG & PG on 21-22 May 2016 in Kozhikode Centre. There were 7374 candidates appeared for UG Entrance Examination in 15 centres on 21 May 2016 and 378 candidates appeared for PG Entrance Examination at one centre on 22 May 2016.

Hindi News

During this period, Hindi Cell published Masala Samachar (January-March 2016), Anusandhan Ke Mukhya Ansh 2015-16, Elaychi (Extension bulletin) and Summary of AICRPS Annual Report 2015-16.

Hindi Workshop

A Hindi workshop was organized at ICAR-IISR, Kozhikode, to popularize official language on 15 June 2016. Dr. V. Balakrishnan, Deputy Director (OL) delivered a lecture on Hindi Noting and Drafting.

OLIC meeting

The Official Language Implementation Committee meeting was held on 21 June 2016 under the chairmanship of Dr. K. Nirmal Babu, Director, ICAR-IISR Kozhikode.

Transfer of Technology

Technology inputs and Advisory services from ATIC

More than 700 stakeholders including farmers, students, officials and tribal youth availed the advisory services provided by the agricultural technology information centre. Varietal selection, land selection and preparation, nursery management and stress management were the major categories in which advisory service was provided. The total revenue generated from the sale of technology and information products was Rs. 332,348 during the period.

Extension activities

Kandiannan K & Srinivasan V

Consultancy visit to Craigmere Plantation, Kullakamby, Nilgiri district, Tamil Nadu on Yield improvement in black pepper and possibility of expanding its cultivation on 30 May 2016.

Mohammed Faisal Peeran

Visited Indian Vanilla Initiative nursery at Pollachi, Coimbatore, Tamil Nadu and interacted with Dr. Mahendran, a leader in vanilla export on 27 May 2016.

Training programmes for black pepper farmers from Wayanad

ICAR-IISR organized two one day training programmes focusing on black pepper cultivation for farmers from Wayanad district. The training programmes were conducted during 4-5 April in collaboration with Krishi Bhavans of Thariyode and Pozhuthana respectively. The training programme benefitted 86 farmers from Wayanad district.



Training for farmers from Pozhuthana, Wayanad district

Global Edu-Connect 2016

ICAR-IISR was one of the major participants in the exhibition titled Global Edu-Connect 2016 organized by JDIT Islam, Kozhikode during 10-14 April, 2016. Apart from the display of latest technologies of the institute, the personnel from IISR sensitized the visitors on the prospects of agricultural education and career opportunities in the field of agricultural research.

Training on pro tray technology in ginger organized at Tripura

A one day training programme was conducted for personnel from KVKs of Tripura to impart skills and increase awareness about pro tray based improved cul-





tivation of ginger on 15 April 2016. The training and demonstration of the technology was conducted at the Agartala Regional Centre of ICAR Research Complex for North East. About thirty personnel representing Krishi Vigyan Kendras were trained on pro tray technology for ginger cultivation. Planting material of improved ginger variety IISR Mahima was distributed during the training programme.



Training programme for KVK personnel at Tripura

Training programme on improved spice production technologies

ICAR IISR organized a customized training programme for nine farmers and two officials from Ariyallur during 20-22 June 2016. The training programme focused on addressing specific issues related to cultivation of spices in the district and technologies for management of natural resources like soil and water. Field visits were also arranged.



Farmers group from Ariyallur

Training on improved cultivation practices of turmeric for tribal farmers

A training session on turmeric cultivation was organized for tribal farmers of Wayanad on 24 June 2016 at Kalpetta, Wayanad. The training was conducted under the Trib-

al Sub Plan in collaboration with MSSRF, Puthoorvayal and State Bank of Travancore, Rural Self Employment Training Institute. The tribal farmers were provided with planting material of improved turmeric varieties (IISR Prabha and IISR Kedaram).



Training session on turmeric cultivation for tribal farmers of Wayanad

Activities of ITM-BPD Unit

Commercialization of technology

ICAR-IISR has entered into a Memorandum of Understanding (MoU) with Centre for Overall Development (COD), Thamarassery, Kerala on 9 June 2016 for commercialization of turmeric variety, IISR Alleppey Supreme and ginger variety, IISR Varada. The institute is successful in issuing of its first license for commercialization of black pepper variety "IISR Thevam" to Mr. Martin Manual, Thalayad, Kozhikode on 10 May 2016.



Signing of MoU with Centre for Overall Development (COD), Thamarassery

Market launch of biocapsules - 'Trichocap' and 'Powercap'

Launch programme of 'Powercap' and 'Trichocap' was organized on 27 June 2016 at ICAR-IISR Regional Station, Appangala, Karnataka in collaboration with the licensee



of the technology viz., M/s Codagu Agritech, Kushalnagar, Karnataka. The products were launched by Shri. Pratap Simha, Hon'ble MP, Mysore- Kodagu Lokasabha Constituency, Karnataka. A special seminar on "Latest advances & practices in pepper cultivation" was also arranged. About 200 participants including farmers, planters, officials from ICAR institutes, KVKs and State Agricultural Departments participated in the programme.



Hon'ble MP Pratap Simha releasing the biocapsules- Trichocap & Powercap at Appangala

Launching of 'MALU' Spice Powders

Malukart, a Kozhikode based new start-up company and an incubate of ICAR-Indian Institute of Spices Research (ICAR-IISR), Kozhikode has entered the fast-growing curry masala market by launching a slew of products under the brand name 'MALU' on 3 July 2016. The market launch and first sale was done by Dr. N. K. Krishna Kumar, DDG (HS), ICAR, New Delhi. The spice powders are made from freshly ground spices produced and packed at Spice Processing Unit of ICAR-IISR located at its Experimental Farm, Peruvannamuzhi. The products are available at Malukart showroom and on demand at www.malukart.com.



Dr. N. K. Krishna Kumar, DDG (HS), ICAR, New Delhi launching the MALU Spice Products and a customer receiving the first batch of products from DDG

Krishi Vigyan Kendra

On Farm Testing

During this period seven OFTs (consisting of 40 trials) were approved by ATARI.

1. Assessing the performance of yard long bean varieties Lola, Vellayani Jyothika and Githika in Kozhikode district
2. Assessment of comparative performance of tissue culture plants and suckers of Nendran banana under high density planting
3. Performance evaluation of grafted black pepper (continuing- third year)
4. Assessment of organic management practices against Sigatoka leaf spot in banana
5. Assessment of production performance of different breeds of poultry under homesteads
6. Scientific farming of milkfish (*Chanos chanos*) in brackish water ponds
7. Evaluation of different techniques for the production of dehydrated banana

Front Line Demonstration

Following are the approved FLDs (2016-17) which will be demonstrated in 106 farmers fields.

- Performance evaluation of rooted top shoots of high yielding varieties of black pepper
- Demonstration of soil application of banana micro-nutrient mixture viz. AYAR in nendran banana for higher yield
- Demonstration of hydroponics method of fodder production for dairy
- Demonstration of Java long pepper (*Piper chaba*) as a mixed crop in arecanut /coconut gardens
- Demonstration on integrated management of Tanjore wilt of coconut (continuing)
- Management of pseudo stem weevil in banana using the entomopathogenic fungus *Beauveria bassiana*





- Demonstration on feeding anionic mixture to prevent milk fever in cows
- Culture of fishes using formulated floating feed

Other activities

A total of 21 training programmes were organized for farmers, rural youth including women and 802 persons benefitted in these programmes. During the period, KVK provided 158 consultancy services to farmers and two diagnostic visits.



Training on jack fruit processing

Externally funded projects

Under the project funded by NABARD- “Lead Enthusiastic Agriculturist to Develop (LEAD) Farm by setting up of Agriculture Incubation Centre at KVK, Kozhikode” new mud road and three terraces were formed after clearing of area, laying of water drainage channels, etc. Three beneficiary groups leveled the area and prepared about forty beds and planted ginger & okra. Likewise, under DBT funded project on “Empowerment of rural women and youth in Kozhikode district through ornamental fish culture applying biotechnologies” the selected women group developed 25 backyard ornamental fish culture units at farmers’ fields as a sustainable livelihood for rural women.

Publications

Research papers

Anu Cyriac, Ritto Paul, Prasath D, Deepesh P V, Nirmal Babu K & Parthasarathy V A 2016 Transferability of ginger, turmeric and large cardamom SSR primers to small

cardamom (*Elettaria cardamomum* Maton). Journal of Tropical Agriculture 53(2): 107-115.

Balasubramanian S, Roselin P, Singh K K, John Zachariah T & Saxena S N 2016 Postharvest processing and benefits of black pepper, coriander, cinnamon, fenugreek and turmeric spices. Critical Reviews in Food Science and Nutrition 56(10): 1585-1607.

Bhat A I, Hohn T & Selvarajan R 2016 Badnaviruses: The current global scenario. Viruses 8: 177. doi:10.3390/v8060177.

Jayashree E & John Zachariah T 2016 Processing of turmeric (*Curcuma longa*) by different curing methods and its effect on quality. Indian Journal of Agricultural Sciences 86(5): 696-698.

Parthasarathy S, Thiribhuvanamala G, Mohammed Faisal P & Prabhakar K 2016 Partial characterization of toxins associated with stem end rot of mango caused by *Lasiodiplodia theobromae*. Journal of Applied and Natural Science 8(2): 559-564.

Pervez R, Eapen S J, Devasahayam S & Jacob T K 2016 Effect of temperature on infectivity and multiplication of entomopathogenic nematodes against shoot borer infesting ginger. Journal of Biological Control 29(4): 187-193.

Ratha Krishnan P & Venkatesan K 2016 Partitioning of rainfall in Acacia species of Indian Thar desert. Indian Journal of Agroforestry 18(1): 10-15

Sasi S & Bhat A I 2016 Optimization of cyclic somatic embryogenesis and assessing genetic fidelity in six varieties of black pepper (*Piper nigrum* L). Journal of Medicinal Plants Studies 4: 109-115.

Thankamani C K, Kandiannan K, Hamza S & Saji K V 2016 Effect of mulches on weed suppression and yield of ginger (*Zingiber officinale* Roscoe). Scientia Horticulturae 207: 125-130.

Umadevi P, Bhat A I, Krishnamurthy K S & Anandaraj M 2016 Influence of temperature on symptom expression, detection of host factors in virus infected *Piper nigrum* L. Indian Journal of Experimental Biology 54: 354-360.



Book chapters

Kandiannan K, Thankamani C K, Prasath D & Suresh J 2016 Seed certification standards for quality planting material production in spices. In: Malhotra S K, Kandiannan K, Mini Raj N, Neema V P, Prasath D, Srinivasan V, Homey Cheriyan & Femina (Eds.), Proceedings of National seminar on planting material production in spices, Directorate of Arecanut and Spices Development, Kozhikode, Kerala, pp.266-283.

Nybe E V, Mini Raj N & Kandiannan K 2016 Planting material production technology in vegetatively propagated perennial spice crops – black pepper, nutmeg, cinnamon, cambodge and tamarind. In: Malhotra S K, Kandiannan K, Mini Raj N, Neema V P, Prasath D, Srinivasan V, Homey Cheriyan & Femina (Eds.), Proceedings of National seminar on planting material production in spices, Directorate of Arecanut and Spices Development, Kozhikode, Kerala, pp.2-24.

Books edited

Malhotra S K, Kandiannan K, Mini Raj N, Neema V P, Prasath D, Srinivasan V, Homey Cheriyan & Femina (Eds) 2016 Advances in planting material production technology in spices, Proceedings – National seminar on planting material production in spices, Directorate of Arecanut and Spices Development, Kozhikode, Kerala, p.288.

Popular articles

Pervez R 2016 Adarak ki fasal ko sootkrimiyoona duara utpan rog evam prabandhan. Spice India (Hindi) 27(2): 20-23.

Praveena R, Sreeja K & Biju C N 2016 Elathinte mazhakkala rogangalum prathividhikalum. Krishiyankanam (Malayalam) 21(6): 43-44.

Papers presented in symposia/ seminars/ workshops /conferences

Kandiannan K, Thankamani C K, Prasath D & Suresh J, Seed certification standards for quality planting material production in spices. In: Advances in planting material production technology in spices, Proceedings – National seminar on planting material production in spices, Directorate of Arecanut and Spices Development, Kozhikode, 21-22 April 2016, pp.266-285.

Shylaja M R, Prasath D & Suresh J, Production of quality planting material in vegetatively propagated annual spice crops – ginger and turmeric. In: Advances in planting material production technology in spices, Proceedings – National seminar on planting material production in spices organized by Directorate of Arecanut and Spices Development, Kozhikode, 21-22 April 2016, pp.25-14.

Promotion

Name	Promoted as	w.e.f
Dr. Rashid Pervez	Principal Scientist	05-09-2014
Dr. D. Prasath	Principal Scientist	25-11-2014
Dr. E. Jayashree	Principal Scientist	15-12-2014
Dr. C.K. Sushama Devi (Retd)	Assistant Chief Technical Officer	01-01-2015
Mr. K. Faizal	Personal Assistant	25-05-2016



Transfer

Name	Post	Transferred from	Joined at
Dr. E. Radha	Chief Technical Officer	IISR Farm, Peruvannamuzhi	IISR, Chelavoor on 25 May 2016
Mr. M. Radhakrishnan	Finance & Accounts Officer	IISR, Kozhikode (Relived on 15-06-2016)	ICAR-SBI, Coimbatore

Retirement



Mr M Venu Nair
(SSS, 30-5-2016)



Mr P Chandu
(SSS, 31-5-2016)



Mr KT Muhammad
(T5, 31-5-2016)

Resignation

Name	Post	Date
Ms. V. Monica	SRF (Bioinformatics), PhytoFuRa	08-04-2016
Mr. V.P. Arun Raj	SRF (Bioinformatics), HVC Project	13-06-2016
Ms. K. Neethu Krishna	SRE, HVC Project	30-06-2016





SPICES NEWS

A newsletter of Indian Institute of Spices Research

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<http://www.spices.res.in/newsletter/index.php>

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