

From the Director's Desk



The year 2015 has indeed begun well and we have remained committed to our strategy of providing unstinting efforts to the spice production sector. The conferment of ISO 9001:2008 certificate has been a watershed in the history of our institute and it irrevocably proves that we have implemented a quality management system at IISR.

There are more reasons to be proud. Through our collective effort we proved our distracters wrong by successfully cultivating ginger and turmeric at Chelavoor campus. In fact, average yields of 7-8 kg/bed of 3m² was realized from sites that were once considered non-cultivable. The delivery of PGPR through encapsulation (biocapsules) is being tested on a large scale in Junagadh and our micronutrient formulations have been licensed to two more entrepreneurs for commercialization. This once again proves the stability and resilience of our technologies. I am also glad that the Spice Processing Unit at our Experimental Farm at Peruvannamuzhi is now fully functional and a few prospective entrepreneurs have registered with us for utilizing these facilities. It is also worth mentioning that the institute has signed an MOU with Kerala Industrial and Technical Consultancy Organisation Ltd., (KITCO) to promote entrepreneurs in agricultural processing.

We hosted four important events during the beginning of this year viz., National Science Day, National Symposium of the Indian Phytopathological Society (IPS), Review meeting of the outreach project on *Phytophthora*, *Fusarium* and *Ralstonia* diseases of horticultural and field crops (PhytoFuRa) and a DBT Sponsored Short-term Training Course. The National Science Day was celebrated with lot of fervour on 28 February 2015. Considering this year to be the International Year of Soils, we organized a soil test and advisory campaign and a lecture on soil related constraints in agricultural development was delivered by Dr P Jayaraj, Program Coordinator, KVK, Kannur. The IPS National Symposium on understanding host-pathogen interaction through science of omics was another major event successfully hosted by IISR during March 16-17, 2015 and the fifth review meeting of PhytoFuRa was held on 18 March 2015. The institute also successfully organized a DBT Sponsored Short-term Training Course on Next Generation Sequencing: Data Analysis and Annotation from March 17-20, 2015. I sincerely thank each and every one of you for the support you have always rendered to the organizers of these events.

The second meeting of the VII Research Advisory Committee held from 18-20 February 2015 under the Chairmanship of Prof. K V Peter has put forth valuable recommendations that need to be implemented with sincerity and dedication. They have rated our overall performance



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as encouraging and this clearly shows that we are striving for consolidation towards growth and progress. However the challenges are many. We will need to align our collective resolve to enable a constructive partnership that can realize the goal of sustainable development. A sustained level of high growth is indeed crucial and as researchers, we have a responsibility to create and secure a better future for the farming community and this is a challenge that we must rise to.

It is also time that we get together to forge a transformation that will not only take our institute to even greater heights but ensure that the fruits of research and development reach all the farmers and end users. We can certainly do it by believing in ourselves, by having faith in our capabilities and by having the determination to implement our ideas with conviction.



M Anandaraj

Research update

Sequential events in the colonization and proliferation of *Colletotrichum gloeosporioides* infecting black pepper

Sequential events involved in the infection process of *C. gloeosporioides* in black pepper were studied under laboratory conditions. Conidial germination was observed 4 h after inoculation. Higher percentage of germination was noticed when the conidia were in disaggregated condition which later produced melanized appressoria. Invading hyphae in the mesophyll cells and localized tissue death were noticed after 48 h. Acervulus initials were formed and mature acervuli with prominent setae were observed after 48 and 72 h, respectively. Several localized necrotic spots manifested on leaf surface after 72 h and the invaded epidermal cells turned brown, resulting in rapid collapse and death 72 h after inoculation.

Germplasm collection

Under the black pepper germplasm collection programme, survey was conducted in Mankulam forest range and 85 accessions were added to the germplasm pool. A Population of *Piper barberi* - an endangered species listed in the Red Data Book was located at the Anakulam forest range. Five ginger accessions including an extra bold type (Source: Mr. John Joseph, Kodencherry) were collected and conserved in the gene bank.



An extra bold type ginger added to the germplasm collection

LAMP (Loop Mediated Isothermal Amplification) for early detection of *R. solanacearum* biovar 3 race 4 infecting ginger

A set of six primers were designed from GyrB gene using LAMP Designer 1.12 and validated with ginger *R. solan-*

acearum isolates as well as *R. solanacearum* isolates from other solanaceous crops. Very specific amplification was obtained only for ginger isolates showing the high specificity of the LAMP primer. Further validation was done with soil DNA and genomic DNA of *R. solanacearum*. To standardize the sensitivity, different quantities of genomic DNA were amplified and the tests revealed that real time LAMP can amplify up to 50pg of the DNA. This technology can be used as a diagnostic method for testing ginger *Ralstonia* in the field before planting as well as for seed testing.

Characterization of the bacterial endosymbiont, *Wolbachia* in cardamom thrips

Studies indicated that the cardamom thrips, *Sciothrips cardamomi* harbours the bacterial endosymbiont, *Wolbachia* sub-group *Con* belonging to Super Group B in both male and female thrips collected from various cardamom growing districts in India. This is the first report of *Wolbachia* infection in cardamom thrips. The findings were published in Invertebrate Reproduction and Biology.

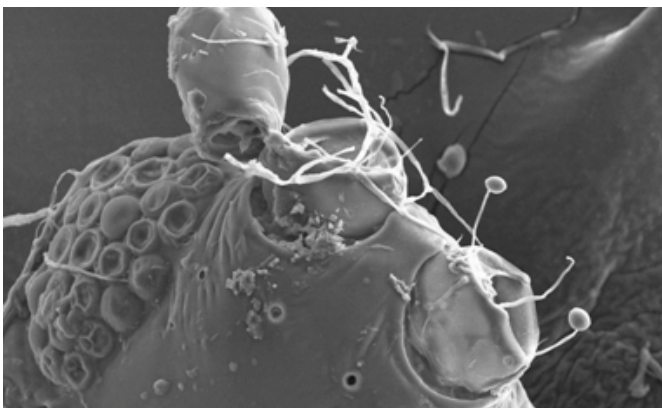


PCR amplification of the *wsp* gene for detection of *Wolbachia* groups in *Sciothrips cardamomi*. Lane 1 - Molecular weight marker; Lane 2 - *wsp* gene; Lane 3 - Super group A; Lane 4 - Super group B; Lane 5 - Subgroup Dei; Lane 6 - Subgroup Con; Lane 7 - Non template control.

Entomopathogenic fungus infecting cardamom thrips

An entomopathogenic fungus was isolated from infected cardamom thrips and identified as *Lecanicillium psalliotae* (Treschew) Zare & W. Gams (Ascomycota: Hypocreales). Bio-assay studies with purified conidial suspension confirmed the infectivity of the fungus to thrips. The fungus was able to cause up to 62.9% mortality under laboratory conditions at a dose of 1×10^7 conidia ml^{-1} . This is the first record of *L. psalliotae* in India and also a first report of a fungus infecting cardamom thrips. The findings were published in the journal BioControl.





Scanning electron micrograph of infected cardamom thrips

Personalia

Awards/ Honours/ Recognitions

ICAR-IISR gets ISO certification

ICAR Indian Institute of Spices Research, Kozhikode gets ISO 9001:2008 for implementation of Quality Management System which meets the requirements of ISO 9001:2008. The Certificate was issued on 10/03/2015 and is valid till 9/03/2018.



ICAR-IISR won Partnership Award from National Innovation Foundation

ICAR-IISR has won the Partnership Award instituted by National Innovation Foundation of India for fur-

thering the cause of the Grassroots Innovation Movement. Dr M. Anandaraj, Director received the award on behalf of the Institute. This consists of a cash award of Rs 50,000, citation and a memento.



ICAR-IISR RS Appangala bags II best exhibition stall award

II Best Exhibition Stall Award was awarded to ICAR-IISR Regional Station, Appangala, under Government Stall category, in Krishimela 2015 held at ICAR-CPCRI RS, Vittal during 10 January 2015.

Best Paper presentation award

Dr S.J. Ankegowda won the IInd Best Oral Presentation Award for the paper entitled, Evaluation of small cardamom genotypes for quality and yield authored by Ankegowda, S.J., Krishnamurthy, K.S. and Biju, C.N. in National Seminar on Sustainable horticulture *vis a vis* changing environment, organized by Horticultural Society of North East India, Nagaland during 26-28 February 2015.

Ishwara Bhat A

Chairman, Board of examinations for conducting Ph.D. Viva-voce at the Department of Applied Botany, Mangalore University, 11 March 2015.

Organizing Secretary for the conduct of 67th Annual meeting of Indian Phytopathological Society and National symposium on Understanding host-pathogen interac-



tions through Science of Omics, ICAR-IISR, Kozhikode, 16-17 March 2015.

Eapen S J

Chairperson, Session on Molecular Nematology, National symposium on Nematode management: A challenge to Indian agriculture in the changing climate, YASHADA, Pune, 8 January 2015.

Suseela Bhai R

Special invitee, the XIII meeting of biological Hazards Expert group for development of microbiological standards for spices-FSSAI, New Delhi, 20 March 2015.

Best poster award for the paper on Real Time loop mediated isothermal amplification – an advanced tool for the field diagnosis of *Ralstonia solanacearum* biovar 3 infecting ginger. In: National symposium on Understanding host-pathogen interactions through science of omics, ICAR-IISR, Kozhikode, 16-17 March 2015.

Deputation abroad

Dr M. Anandaraj, Director, ICAR-IISR who is the chairman of R & D committee of International Pepper Community was deputed to attend International Pepper Community meeting, held at Lampung, Indonesia during 23-25 March 2015. The main focus of the meeting was on quality planting material production in black pepper.

News and events

On-farm composting and recycling

Composting is an integral part of ICAR-IISR farm activities for effective recycling of organic waste, besides keeping premises neat and clean. The leaf fall from avenue trees and farm wastes are regularly converted into valuable manure. Both conventional compost pit and readymade compost bin (3.0 m x 1.0 m x 0.5 m) made with plastic sheet are placed at convenient locations for making compost. On an average 2.0 tonnes of compost is produced annually and used for potting mixture in the nursery.



Readymade compost bin



Ginger seedlings raised using on-farm compost in Pro-tray

67th Annual meeting of Indian Phytopathological Society and National symposium on Understanding host-pathogen interaction through science of omics

The 67th Annual meeting of Indian Phytopathological Society, New Delhi and National Symposium on “Understanding Host-Pathogen Interaction through Science of Omics” was held at ICAR-Indian Institute of Spices Research, Kozhikode during 16-17 March 2015. The event was inaugurated by renowned plant pathologist, Dr. Y.R. Sarma, FAO Consultant and former Director of ICAR-IISR. Dr. M. Anandaraj, Director, ICAR-IISR, and President of the Indian Phytopathological Society presided over and delivered the Presidential address in the inaugural meeting. Dr. S. Devasahayam, Head Division of Crop Protection, Dr. Pratibha Sharma, Secretary, Indian Phytopathological Society and Dr. A.I. Bhat, organizing secretary also spoke on the occasion.

The symposium consisted of three technical sessions on aspects like epidemiology, diagnostics, host-pathogen interaction and integrated disease management. A special Industry-Researchers interface session was held to bring





about better convergence of research priorities and requirements among the research institutions and industry stakeholders. Apart from this, different memorial award lectures, invited lead lectures and several poster presentations in frontier areas of plant pathology were also conducted during the meeting. About 200 delegates from different universities and institutes from different parts of the country took part in the event.

The symposium recommended the need for strict enforcement of bio-security and domestic quarantine in plant material movement. The forum also felt the need for certification of nurseries engaged in planting material production. It was also decided to convey the need to delineate bio-control from the purview of Central Insecticide Board as a chemical pesticide. Creation of a national database of plant pathogens, more extensive technology demonstration and skill enhancement for plant protection scientists shall be given priority in the activities of the society in the coming years.



Dr. Y.R. Sarma, FAO Consultant, inaugurating the National Symposium

National Science day celebrations at IISR

The National Science Day was celebrated at the Institute on 28 February 2015 at SJ hall. Dr. P Jayaraj, Programme Co-ordinator, KVK, Kannur delivered a lecture on management of soil health towards organic farming. He highlighted the role of healthy soil to produce clean and safe produce. The meeting was presided over by Dr. M. Anandaraj, Director IISR, Kozhikode. Dr. P. Rajeev Principal Scientist proposed vote of thanks.

A soil test and advisory campaign was also arranged, which was presided over by Dr. T. J. Zachariah, Head, Division of Crop Production & PHT. A lecture on soil health management was also delivered by Dr S. Hamza, Chief Technical Officer for the benefit of farmers. Soil samples brought by them were analysed and necessary

advices on soil health management were provided.

News from AICRP on Spices

A team consisting of Dr. K. Nirmal Babu, Project Coordinator and Dr. Utpala Parthasarathy, Chief Technical Officer from AICRP Spices, Kozhikode, Dr. Vikas Singh, OIC, AICRPS Pasighat centre, Mr. A. Hai, Horticultural Officer, Anjaw District of Arunachal Pradesh surveyed the large cardamom growing regions in Lohit and Anjaw Districts of Arunachal Pradesh to assess the status.



Large cardamom plantation in the hill slope of Anjaw district of Arunachal Pradesh

The same team with the participation and support of Mr. Chatri, Land Resource Officer and Mr. Goswami, Marketing Officer of Amalgamated Plantations surveyed Mon district of Nagaland, Longkhong village of Mon and Lungwah Village in Indo Burma border where large cardamom is extensively grown. They interacted with the chairman and farmers of the tribal Cluster about the intricacies of large cardamom cultivation.



Team interacting with tribal cluster of Lungwah village at Indo Burma border

The team observed that large cardamom in both states is cultivated in open sunlight leading to heavy sun scorching and leaf blight. Moisture stress and availability of quality planting material are major problems especially in Nagaland. Sporadic occurrence of viral disease Chirke in some plantations was observed. The team suggested moisture conservation methods to overcome drought for better yields.



ITMU-BPD Unit

Commercialization of technology

Four licenses were issued through NRDC to M/s. Rainbow Agri Life, Kadapa, Andhra Pradesh for the commercialization of micronutrient mixtures for black pepper, ginger, turmeric and cardamom. M/s. Shrey Agritech, Hubli, Karnataka has availed license for commercialization of micronutrient mixture for black pepper. An amount of Rs. 9.5 lakhs was generated through licensing of micronutrient technology. Two licenses of turmeric varieties were renewed.

ICAR-IISR has signed MOU with KITCO to promote entrepreneurship development

ICAR-IISR has entered into a Memorandum of Understanding with Kerala Industrial and Technical Consultancy Organization Ltd. (KITCO) on 31 March 2015 in an effort to jointly promote entrepreneurship development. IISR is planning to provide pre-incubation training, market potential studies etc. to the aspiring entrepreneurs through KITCO.



A snap shot of signing of MoU by ICAR-IISR Director and KITCO representative

ITMU Participated in Horticulture Institute-Industry Interface Meet

In an attempt to promote commercialization of technologies, ICAR-IISR participated and exhibited the technologies in the Fourth Horticulture Institute-Industry Interface Meet held on 10 February 2015, organized by ICAR-Indian Institute of Horticultural Research, Bengaluru.



Exhibition of IISR technologies at ICAR-IIHR, Bengaluru

Research Advisory Committee meeting

The second meeting of the VII RAC was held during 18-20 February 2015 at ICAR-IISR, Kozhikode with Prof. K.V. Peter, (Director, World Noni Research Foundation, Chennai and Former Vice Chancellor, Kerala Agricultural University) as Chairman and following dignitaries as members: Dr. M.R. Sudharshan, Former Director (Research), Spices Board, Kochi; Dr. M.N. Venugopal, Former Head, Cardamom Research Centre, Appangala; Dr. K.K. Sharma, National Coordinator, AINP on Pesticide Residues, ICAR-IARI, New Delhi; Dr M. Anandaraj, Director, ICAR-IISR. The salient findings of 10 Megaprojects comprising of 46 subprojects were presented by the Mega project leaders. The Project Coordinator (i/c), KVK also presented the achievements. All presentations were followed by thorough discussions and suggestions by the RAC. On 19 February 2015, the RAC visited ICAR-IISR Regional Station, Appangala as well as farmers' fields (Panya Estate, Suntikoppa; SLN Plantations, Chettalli). The team also visited Central Horticultural Experimental Station (CHES, Chettalli) to view the alternative black pepper germplasm site of ICAR-IISR as well as the plot planted with black pepper raised using pro-trays. The plenary session was held at 10.30 pm on 20 February 2015. The publication 'Research Highlights (2014-15)' was released by Dr. T. Janakiram, Assistant Director General (Hort.-II), ICAR, New Delhi.



A view of the inaugural session of RAC meeting





News from Human Resource Development

ICAR-IISR conducted DBT sponsored short term training course on Genomics and proteomics in plants and microbes towards translational research, January 21 – February 10, 2015. Eighteen trainees from ICAR institutions, SAUs and other Universities participated in the training programme. The course content was structured with basics to advanced genomics and proteomics techniques in three modules. The training was implemented with five core guest faculties, 5 in-house experts, 4 faculties from corporate/ private companies and a visit to a next generation sequencing service facility at Cochin.

Dr. M. Anandaraj, Director, ICAR-IISR was the course Director, Dr. D. Prasath and Ms. P. Umadevi were the course coordinators.



Participants of the training programme with the course Director, course coordinators and resource persons

News from Library

Subscriptions to Indian/foreign journals were renewed. Three issues of the electronic version of 'AGRI titbits' were published. 78 CeRA requests were catered online. 29 books, 23 e-books and 13 Thesis/Project Reports were added to the library stock. 13 books were added to the greenstone database. Institutional Repository 'DSpice' was updated with latest research publications. 38 external users and 790 internal users made use of the library facilities.

Consultancy Processing Cell

Ankegowda S J & Kandiannan K

Merryland Estate, Kunnalady, The Nilgiris District in Tamil Nadu for 'Black pepper yield improvement', 4 February 2015.

Biju C N

Travancore Rubber and Tea Company Ltd. Ambanaad, Kollam, 19-20 January 2015.

हिन्दी अनुभाग

राजभाषा कार्यान्वयन गतिविधिय

संस्थान में दिनांक ३० मार्च २०१५ को राजभाषा कार्यान्वयन समिति की बैठक डा. एम. आनन्दराज, निदेशक की अध्यक्षता में संपन्न हुई। बैठक में गत तिमाही में किये गये कार्यों की समीक्षा की गयी। इसके अतिरिक्त पिछले वर्ष राजभाषा कार्यान्वयन के लक्ष्यों को प्राप्त करने हेतु प्रयासों की समीक्षा एवं चर्चा हुई। संस्थान में दिनांक २० मार्च २०१५ को हिन्दी कार्यशाला आयोजित की गयी। प्रस्तुत कार्यशाला में श्रीमती बिन्दु वर्मा, कनिष्ठ हिन्दी अनुवादक, महा डाकपाल कार्यालय, कोषिकोड ने राजभाषा कार्यान्वयन विषय पर व्याख्यान दिया। इस कार्यशाला में संस्थान के १६ अधिकारियों एवं कर्मचारियों ने भाग लिया। प्रस्तुत तिमाही में मसाला समाचार (अंक २५ खंड ३) को प्रकाशित किया।

Transfer of Technology

Extension Activities

Ankegowda S J

Spoke on black pepper cultivation, farmer meeting organized by Horti Clinic, Department of Horticulture, Madikeri at Kusubur, 30 January 2015 (50pepper growers participated).

Inaugurated the Pepper field visit by KPA members at Mr. Maheskumar and Mr. M N. Karthik plantations, KPA black pepper field visit organized by Scientific committee of Karnataka Planter Association, 31 January 2015 (100 members).



Dr S.J. Ankegowda, Head, IISR RS Appangala inaugurating the Pepper field visit

Spoke on Scientific cultivation practices in cardamom at



Krishi Mela 2015 organized by Research and Extension Unit, UAHS, Sirsi, 11 February 2015 (500 members).

Spoke on black pepper, cardamom and ginger cultivation in farmers meeting organized by Department of Horticulture, Somwarpet, 16 February 2015 (100 members).

Delivered a lecture on Scientific cultivation of black pepper, ginger, large cardamom in farmer training programme for North East organised by Horti. Society of North East India, Nagaland University, SASRD, NU, Medziphema, 27 February 2015 (150 members).

Delivered a lecture on Spices cultivation in Krishi Utsav 2015 organised by Department of Agriculture, Madikeri, 11 March 2015 (200 members).

Spoke on ginger cultivation during visit of farmers from Hosadurga, Shimoga, 28 March 2015 (40 farmers).

Eapen S J

Visited farmers' plots at Perumanna, Kozhikode, 19 February 2015.

Prasath D

Delivered an extension lecture on Crop improvement and varieties in ginger and turmeric in Training programme on advances in production management and post harvest technology in major spices, sponsored by CARD, New Delhi for farmers from Meghalaya, 5 January 2015.

Sasikumar B

Participated in seven exhibitions



A view of one of the exhibitions organized by ICAR-IISR

Suseela Bhai R

Visited six nutmeg plots in Anakakmpoyil and one nutmeg plot in Peedikappara, Koompara, to understand various diseases reported.

Lectures delivered

Anandaraj M

The science of 'Omics' for Plant Pathologists, Presidential address during the 67th Annual meeting of Indian Phytopathological Society, New Delhi and National Symposium on "Understanding Host-Pathogen Interaction through Science of Omics" held at ICAR-Indian Institute of Spices Research, Kozhikode during 16-17 March 2015.

Genome projects - A primer of genomics, DBT sponsored training programme on Genomics & proteomics of plants and microbes towards translational research held at IISR during January 21-February 10, 2015.

Multi locus sequence typing of organism, DBT sponsored training programme on Genomics & proteomics of plants and microbes towards translational research, 22 January 2015.

Plant microbe interaction-defence proteins, DBT sponsored training programme on Genomics & proteomics of plants and microbes towards translational research, 22 January 2015.

Bhat A I

Laboratory biosafety procedures, DBT sponsored training programme on Genomics & proteomics of plants and microbes towards translational research, 22 January 2015.

PCR and its variants, DBT sponsored training programme on Genomics & proteomics of plants and microbes towards translational research, 23 January 2015.

Transformation, DBT sponsored training programme on Genomics & proteomics of plants and microbes towards translational research, 24 January 2015.

Biju C N

Crop production aspects of black pepper, Quality im-





provement training programme on black pepper organized by Spices Board at Masagodu, Somwarpet, Madikeri, 24 February 2015.

Crop production of pepper in Kodagu with focus on plant protection aspects, Regional seminar on cardamom and pepper organized by Spices Board and ICAR-IISR, Regional Station, Appangala, 26 February 2015.

Nursery management and plant protection in black pepper, Quality improvement training programme on black pepper organized by Spices Board at Bhagamandala, Madikeri, 09 March 2015.

Black pepper – crop production and disease management, farmers visit organized by M.S. Swaminathan Research Foundation, Kalpetta at ICAR-IISR Regional Station, Appangala, 23 March 2015.

Jacob T K

Pest management in black pepper, ginger and turmeric, for farmers from Meghalaya, ICAR-IISR, Kozhikode, 07 January 2015.

Insect pest management in spice crops, for Student beneficiaries from St. Thomas College, Kolencherry, 20 January 2015.

Production and protection technologies in ginger, turmeric and nutmeg, farmers meet (sponsored by DASD, Kozhikode). Naduvannur, Kozhikode, 22 January 2015.

Jayashree E

Technologies for commercialization from IISR-Kozhikode, Horticulture institute industry meet, ICAR-IIHR, Bengaluru, 10 February 2015.

Post harvest management in spices, National seminar on Spices under Mission for Integrated Development of Horticulture (MIDH) organized by Spices Board of India at TNAU, Coimbatore, 5 March 2015.

Post harvest technology and value addition in black pepper, ginger and turmeric, Training programme on Advances in production management and post harvest technology in major spices, sponsored by Centre for Agriculture and Rural Development, New Delhi for farmers from Meghalaya, 7 January 2015.

Post harvest processing of black pepper, for members of Kurumulaku samithi of Chathamangalam, 17 January 2015.

Post harvest processing and incubation facility for spices at ICAR-IISR, for final year B.Tech (Ag. Engg.) students from KAU, Tavanur, 3 February 2015.

Post harvest technology of pepper, ginger and turmeric, training programme organized under Mission for Integrated Development of Horticulture (MIDH) by ICAR-IISR at KVK, Peruvannamuzhi, 24 March 2015.

Post harvest technology and value addition in spices, training programme organized under Mission for Integrated Development of Horticulture (MIDH) by ICAR-IISR at KVK, Peruvannamuzhi, 26 March 2015.

Johnson George K

Farmers' rights under the PPV&FR Act and their contributions in the conservation of spice varieties, Wayanad seed fest organized by MSSRF, Kalpetta, 7 February 2015.

PPV&FR Act 2001- an appraisal, Awareness on PPV&FR Act, KVK, ICAR-IISR, Peruvannamuzhi, 21 March 2015.

Registration of farmers' varieties under PPV&FRA, Kinnannore, Kanhangad, Kasaragod, 27 March 2015.

Kandiannan K

Production management in ginger and turmeric, Training programme on Advances in production management and post harvest technology in major spices sponsored by Centre for Agriculture and Rural Development, New Delhi for farmers from Meghalaya at ICAR-IISR, Kozhikode, 5 January 2015.

Improved varieties in ginger and turmeric and recent advances in planting material production, workshop on Advances in spices production technology under XII plan programmes for NE States organized by ICAR-IISR, Kozhikode at ICAR Research Complex for NEH Region – Regional Office Jharnapani, Nagaland, 19-20 January 2015.

Quality planting material production, nutrient management and production techniques of black pepper, nutmeg and ginger, District Level Seminar on Spices production in Goa under Mission for Integrated Development of Horticulture (MIDH) organized by Spices Board at ICAR-CCARI, Goa, 28-29 January 2015.



Praveena R

Pest and disease management in black pepper, ginger, turmeric and nutmeg, Calicut Flower Show-2015, Marine Ground, Kozhikode, 8 January 2015.

Nursery, pest and disease management in black pepper, Black pepper training programme organized by M.S. Swaminathan Research Foundation, Muttill, Wayanad, 2 March 2015.

Pest and disease management in black pepper, ATMA farmers visit from Cheruvattur, ICAR-IISR, 3 March 2015.

Pest and disease management in nutmeg, Farmers visit from Thalikkulam, ICAR-IISR, 6 March 2015.

Ginger production technology, Training programme organized by ICAR-IISR and M.S. Swaminathan Research Foundation, Kaniampetta, Wayanad, 25 March 2015.

Sasikumar B

Improved varieties of ginger, turmeric and black pepper, Farmer's group from Meghalaya, ICAR-IISR, Kozhikode, 5 January 2015.

Improved varieties of black pepper, nutmeg, ginger and turmeric, District level seminar on spices production, Goa, 28-29 January 2015.

Improved varieties of spices, District level seminar on Spices, Agartala, Tripura, 9-10 February 2015.

Improved varieties of black pepper, ginger and turmeric, MIDH training sponsored by DASD, Kozhikode at KVK, Peruvannamuzhi, 24 March 2015.

Ginger production, Lecture to ginger farmers, CADC, MS Swaminathan Research Foundation, Wayanad, 26 March 2015.

Senthil Kumar C M

Integrated pest management in ginger and turmeric, Workshop on Advances in spices production technology under XII plan programmes for NE States organized by ICAR-IISR, Kozhikode at ICAR Research Complex for NEH Region - Regional Office Jharnapani, Nagaland, 19-20 January 2015.

Sharon Aravind

Genetic diversity in cardamom, farmers group under MSSRF from Wayanad, 23 March 2015.

Varada's success story

Mr. K.C. Joseph Inchakkal (70), Venappara, Kozhikode, a traditional ginger farmer came to know about IISR Varada 6 years back and procured 10 kg seed rhizomes. Since then he has been growing only Varada and reaping good dividends. During last year Mr. Joseph grew Varada in about 40 cents of leased land and obtained about 3000 kg clean produce. He gets a multiplication of 1:20 (one kg seed rhizome to twenty kg yield) but hasten to add that even a multiplication rate of 1:40 is an achievable yield with Varada under better management. He gets a dry recovery of about 23%.



Mr. Joseph with his harvested Varada

Technology inputs and Advisory services from ATIC

Seven hundred and thirty one farmers (including 151 farmers from other states) availed advisory services of ATIC during the period. Apart from this 694 students from different schools and colleges were given orientation to spices research programmes in the country. Five farmer groups benefited from sponsored exposure visits to the institute. The total revenue generated from the sale of technology and information products was Rs 2,83,345.

ICAR-IISR organizes training for farmers from Meghalaya

ICAR- Indian Institute of Spices Research organized a three day training programme on "Advances in production management and post harvest technology in major spices" for a group of 20 farmers from Meghalaya during 05-07 January 2015. The training programme was spon-





sored by Centre for Agriculture and Rural Development, Noida, New Delhi, a Non Governmental Organization working in the field of rural development.

ICAR-IISR conducted two day Workshop at Jharnapani

ICAR-Indian Institute of Spices Research conducted a two day workshop on “Recent advances in Production management and post harvest technology in spices” under XII Plan Programme for NE States during 19-20 January, 2015 at ICAR research Complex for NEH Region, Jharnapani. The workshop was attended by 30 officials from 8 KVKs in Nagaland and representatives from two NGOs and Central Institute of Horticulture, Dimapur. The sessions conducted included crop improvement in ginger and turmeric, production of quality planting material, organic cultivation practices, plant protection and post harvest technology and value addition. The workshop identified the need to popularize the improved varieties of ginger and turmeric through frontline demonstrations. It was also decided to promote the pro tray method of ginger cultivation through demonstrations conducted in KVKs to address the shortage of quality planting material.

Sponsored training programmes conducted at ICAR-IISR

The ICAR- Indian Institute of Spices Research conducted two one day on campus training programmes during March 2015. The training programme on black pepper was conducted on 3rd March, 2015 for 20 farmers from Kuruvattor Krishi Bhavan, Kozhikode. The training programme on ‘Improved production practices in nutmeg’ was conducted on 6 March 2015 for a group of 18 farmers from Thalikulam, Trichur.

Community Need Assessment workshop organized for tribal hamlet representatives

A Community Need Assessment workshop was organized by ICAR-IISR in collaboration with MS Swaminathan Research Foundation on 12 March 2015 at the Community Agro Biodiversity Centre of MSSRF at Kalpetta. Representatives from 18 tribal hamlets participated in the programme and a charter of requirements for improving the crop productivity in these hamlets were fi-

nalized during the programme.

ICAR-IISR organizes training programme on ginger cultivation for tribal farmers

ICAR-Indian Institute of Spices Research conducted a one day training programme on ginger cultivation in collaboration with Community Agro Bio diversity Centre, MS Swaminathan Research Foundation at Kanencherry tribal colony in Kaniambetta, Wayanad District on 26 March 2015. The training, conducted under the Tribal Sub Plan component of IISR, benefitted 70 tribal farmers. Each trainee was provided with five kilogram planting material of improved ginger variety, ‘Varada.’ Smt Rosily Thomas, President, Kaniambetta village panchayath presided over the inaugural function of the training programme.



Ms. Rosily Thomas inaugurating the distribution of ginger planting material to tribal farmers

ICAR-IISR handed over community assets for tribal hamlets at Puthenkunnu

As a part of its efforts to create tangible community owned assets for tribal communities under the tribal sub plan component, ICAR-Indian Institute of Spices Research handed over a Knapsack power sprayer of 20 litre capacity to Puthenkunnu Adivasi Karshaka Sangham, a cooperative institution of tribal farmers, at a function held at Community Agro Biodiversity centre, MSSRF, Puthoorvayal, Wayanad. The equipment was handed over to the representatives of the Puthenkunnu Adivasi Karshaka Sangham by Smt. T Ushakumari, Vice president, Wayanad District panchayath.





Handing over of sprayer to Puthenkunnu Adivasi Karshaka Sangham by Smt. T. Ushakumari

Front Line Demonstration

KVK conducted the following FLDs

1. Demonstration of high yielding foot rot tolerant variety of black pepper
2. Demonstration of use of PGRR encapsulated bio-capsules for management of soft rot of ginger
3. Introduction of a high yielding variety of amaranthus, Renusree
4. Seed production of pearl spot fish in fresh water area
5. Production and marketing of value added products
6. Demonstration on complete feed mixture
7. Demonstration on feeding anionic mixture to prevent milk fever in cows
8. Demonstration on integrated management of Tanjore wilt of coconut
9. Integrated farming system

On Farm Testing

The following OFTs are in progress

- a. Management of *Phytophthora* foot rot of black pepper (continuing.)
- b. Culture of Asian Seabass in brackish water ponds
- c. Performance evaluation of grafted black pepper
- d. Efficacy of termite soil for udder oedema in dairy cattle

Training Programmes

A total of 31 training programmes were organized for farmers, rural youth and extension functionaries. 1173 persons attended the programmes. KVK also participated in five exhibitions held at different places in Kerala.

Krishi Vigyan Kendra

Technology week celebrated

The technology week of Krishi Vigyan Kendra, Kozhikode “EruthumKathirum” was organized at KVK Peruvanamuzhi in collaboration with Agriculture Technology Management Agency (ATMA), Kozhikode from 20th to 24th March 2015. The programme was inaugurated by Dr. M. Anandaraj, Director, ICAR- Indian Institute of Spices Research, Kozhikode and was presided by Smt. P.K. Ranjini, Principal Agricultural Officer, Kozhikode. Smt. P.C. Sreelatha, Project Director (ATMA), Kozhikode and Dr. B. Sasikumar, Head, Division of Crop Improvement and Biotechnology & SIC, KVK, ICAR-IISR, Kozhikode delivered the Keynote address. Sri. James Edacheril, Chief Volunteer, Viswamitra Farmers’ club, Chakkittapara gave felicitation. Dr. P.S. Manoj, Programme Coordinator (i/c) KVK welcomed the gathering and vote of thanks was delivered by Mr. K.M. Prakash, Subject Matter Specialist, KVK. This four days programme covered various aspects such as coconut cultivation, family farming, dairying, ornamental fish culture, community efforts in conserving genetic resources, PPV & FRAct, agricultural credit schemes etc. An exhibition was also organized in connection with the technology week celebration at KVK premises showcasing the recent innovative technologies in agriculture and allied fields. Besides, on 23rd and 24th March, a district level training programme was organized on “Scientific production and processing of spices” under the sponsorship of Mission on Integrated Development of Horticulture (MIDH).





A view of KVK stall in one of the exhibitions

Publications

Research papers

Anandaraj M 2015 Status of plantation crops sector in India. *Journal of Plantation Crops* 43(1): 1-8

Deeshma K P & Bhat A I 2015 Complete genome sequencing of Piper yellow mottle virus infecting black pepper, betelvine and Indian long pepper. *Virus Genes* 50: 172-175.

Dinesh R, Anandaraj M, Kumar A, Bini Y K, Subila K P & Aravind R 2015 Isolation, characterization, and evaluation of multi-trait plant growth promoting rhizobacteria for their growth promoting and disease suppressing effects on ginger. *Microbiological Research* 173: 34-43.

Dinesh R, Leela N K, John Zachariah T & Anandaraj M 2015 Controversies surrounding coumarin in cassia: the good, the bad and the not so ugly. *Current Science* 108: 482-484.

Jacob T K, Senthil Kumar C M, Sharon D' Silva, Devasahayam S, Ranganath, H R, Sujeesh E S, Biju C N, Praveena R & Angegowda S J 2015 Evaluation of insecticides and natural products for their efficacy against cardamom thrips (*Sciothrips cardamomi* Ramk.) (Thysanoptera: Thripidae) in the field. *Journal of Spices and Aromatic Crops* 24: 133-136.

Kandiannan K, Anandaraj M, Utpala Parthasarathy, Thankamani C K and John Zachariah T 2015 Study on

yield and quality of flowered and non-flowered turmeric (*Curcuma longa* L.) plants. *Journal of Plantation Crops* 43(1): 71-73.

Neelam S, Agisha V N, Vibhuti M, Aditi K, Subaharan K, Vibina V, Suseelabhai R, Eapen S J & Kumar A 2015 Genetic analysis of plant endophytic *Pseudomonas putida* BP25 and chemo-profiling of its antimicrobial volatile organic compounds. *Microbiological Research* 173: 66-78 doi:10.1016/j.micres.2015.02.001.

Pervez R & Eapen S J 2015 Distribution of plant parasitic nematodes associated with black pepper in Idukki District, India. *Annals of Plant Protection Sciences* 23: 158-199.

Pervez R, Devasahayam S & Eapen S J 2014 Determination of LD₅₀ and LT₅₀ of entomopathogenic nematodes against shoot borer (*Conogethes punctiferalis* Guen.) infesting ginger (*Zingiber officinale* Rosc.). *Annals of Plant Protection Sciences* 22: 169-173.

Pervez R, Eapen S J, Devasahayam S & Dinsha M 2014 Characterization of entomopathogenic nematode, *Steinernema carpocapsae* from ginger (*Zingiber officinale* Rosc.) rhizosphere in India. *The Journal of Plant Protection Sciences* 6: 13-20.

Pervez R, Eapen S J, Devasahayam S & Jacob T K 2015 Natural occurrence of entomopathogenic nematodes associated with ginger (*Zingiber officinale* Rosc.) ecosystem in India. *Indian Journal of Nematology* 42: 238-245.

Pervez R, Jacob T K, Devasahayam S & Eapen S J 2014 Penetration and infectivity of entomopathogenic nematodes against *Lema* sp. infesting turmeric. *Journal of Spices and Aromatic Crops* 23: 71-75.

Pervez R, Revathi J, Eapen S J, Devasahayam S & Jacob T K 2015 Isolation and identification of symbiotic bacterium associated with the entomopathogenic nematode, *Heterorhabditis* sp. (IISR-EPN 01) from ginger rhizosphere. *Research Journal of Pharmaceutical, Biological and Chemical Sciences* 6: 339-343.

Sajitha P K & Sasikumar B 2015 Qualitative and quantitative variation in starch from four species of *Curcuma*. *Cytologia* 80: 45-50.



Senthil Kumar, C M, Jacob T K, Devasahayam S, Sharon D'Silva & Krishna Kumar N K 2015 Isolation and characterization of a *Lecanicillium psalliotae* isolate infecting cardamom thrips (*Sciothrips cardamomi*) in India. *Bio-Control* 60: 363-373.

Vijesh Kumar I P, Johnson George K, Rosana Babu O & Anandaraj M 2015 Quantitative RT-PCR analysis of *Phytophthora* specific genes expressed during *Phytophthora capsici*-*Piper colubrinum* interaction. *International Journal of Biotechnology and Research* 5: 1-8.

Books

Dinesh R, Biju C N, Praveena R, Senthil Kumar C M, Bhat A I & Anandaraj M (Eds.) Abstracts- National symposium on understanding host-pathogen interaction through science of omics, ICAR-Indian Institute of Spices Research, Kozhikode, Kerala, India, p.224.

Book chapters

Anandaraj M & Kandiannan K 2015 Bush pepper: Ideal for home and garden – a novel way to produce in large number. In: *Spices Handbook - 2015*. www.CommodityIndia.com. Fortell Business Solutions Pvt. Ltd., Bangalore, pp.6-9.

Anandaraj M, Pervez R, Dinesh R & Devasahayam S 2015 Masaloon fasloon ki unnat kheti ke liye unnat taknekiya. In: Jindal & Sheron P (Eds.) *Soochna aur samaz DRDO*, New Delhi, pp.227-231.

Ankegowda S J 2015 DUS testing of spices, In: *Training manual on Protection of Plant Variety and Farmers Right Authority*, published by KVK, Gonikoppal, pp.35-39.

Krishnamurthy K S, Kandiannan K, Chempakam B, Ankegowda S J & Anandaraj M 2015 Climate change impact on black pepper and cardamom. In: Choudhary M L, Patel V B, Mohammed Wasim Siddiqui & Syed Sheraz Mahdi (Eds.), *Climate Dynamics in Horticultural Science, Volume 1. Principles and Applications*, Apple Academic Press Inc., USA and Canada, pp.201-217.

Extension pamphlet

Ankegowda S J, Biju C N, Jayashree E, Prasath D, Praveena R, Senthil Kumar C M & Srinivasan V 2015 *Cardamom*. ICAR-IISR, Kozhikode, January, pp.18.

Popular article

Ankegowda S J & Biju C N 2015 Kariminasina balligala haladirogakke parihara. *Spice India (Kannada)* 28(1): 24-27.

Sasikumar B & Biju C N 2015 A new destination for cloves. *Spice India* 28(3): 4-8.

Sasikumar B & Biju C N 2015 Grambukrishiyaal Swantham Peruzuthicherthu Ambanaad Estate. *Spice India (Malayalam)* 28(3): 8-12.

Sasikumar B 2015 Myth, belief, reality and spices. *Spices Hand Book-2015*. CommodityIndia.Com. pp.32-35.

Sasikumar B, Rema J & Saji K V 2014 In trial of elite nutmeg. *Spice India* 27: 14-21.

Sasikumar B, Rema J, Saji K V & Lijo Thomas 2015 Scouting for elite nutmeg. *Spice India* 28: 24-25.

Sasikumar B, Saji K V, Rema J & Lijo Thomas 2015 Rare nutmeg variants. *Kerala Karshakan (Mal.)* 60: 48-49.

Papers presented in symposia/seminars/workshops/conferences

About 15 research papers were presented by scientists and research scholars of the institute during the period in various symposia / seminars / workshops / conferences.

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PhD awarded

Name	Title of thesis	University	Guide
Mr. Siljo, A.	Characterization and development of diagnostics for viruses infecting small cardamom (<i>Elettaria cardamomum</i> Maton)	Mangalore University	A I Bhat

Ph D Registration

Student	Topic	University	Guide
Ms. Blessy M. Baby	Identification of novel target genes in burrowing nematode (<i>Radopholus similis</i> Thorne) through genome wide transcriptome analysis	Mangalore University	Santhosh J Eapen

Promotion

Name	Promoted as	w.e.f
Mr. Prakash, P.	Technical Assistant (Driver)	01-06-2012

Transfer

Name	Post	Joined at
Ms. Anupama, N.K.	UDC to Jr. Accounts Officer	CRIDA, Hyderabad on 17-01-2015

Resignation

Name	Post	Date
Ms. Manjula, M.S.	JRF (Bioinformatics), DISC	21-01-2015





SPICES NEWS

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