

From the Director's Desk

At the outset, I wish all @ IISR a very happy and happening 2014.

The United Nations has declared the year 2014 as the International Year of Family Farming (IYFF). While in the broader sense this is a welcome move that would mainstream Family Farming to alleviate worldwide hunger, my dream is to make 2014 as 'the year of initiatives', be it in the scientific field or administration or any other realm within the ambit of the Institute. I sincerely wish to make IISR a broader, deeper and even more influential platform that blends together scientists, technical and supporting personnel, staffs of the administration and accounts, including the SRFs & RAs. Let us make this a remarkable journey of discovery and bring together scientific experiments, findings and personal experiences and collaborate and integrate across disciplines, across traditional boundaries and bring together and sharpen our skills to sustain the research agenda we wish to work on.



Dr. V S Korikanthimath inaugurating the SYMSAC VII

In fact, the year 2013 set the tone for some landmark achievements in terms of infrastructure. For instance, our Centralized Laboratory of Advanced Research became fully functional, the ambitious Business Planning and Development Unit was launched and new polyhouse complex and a mega water harvesting structure, heretofore a dream, became a reality. On the research front, we threw conventional thinking out the window by adopting unique and novel quality planting material production techniques in black pepper, ginger and turmeric, new farmers participatory nutmeg variety was proposed for release and the studies on Phytophthora acquired a new meaning through whole genome sequencing. More remarkable was the filing of four patents on micronutrient mixtures and two on PGPR delivery processes, facilitated by the ITMU of the Institute. From the point of view of the Indian Society of Spices, the VII Symposium on Spices and Aromatic Crops (SYMSAC) held recently at Madikeri was a stupendous success that drew participants from all disciplines adding a multi-disciplinary aura to the gathering.

These achievements are significant and bode well for the future. However, let us not sit back and relax. Obviously, it is not the time to take a breather. Instead, let us try to consolidate and build on our strengths and prepare a road map that is unshakable and creates awareness on technologies that are state of the art and at the same time are simpler, sustainable and user friendly. Let us breed new initiatives through our preternatural and unique ability and seamlessly combine scientific acumen, sophistication and ingenuity with freshness and curiosity.

(M Anandaraj)

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Research Update

New method of orthotrope multiplication in black pepper (*Piper nigrum* L.)

The continuous demand for quality planting material created a novel idea of producing orthotrope on vertical 2m column, one feet diameter made of welded wire mesh filled with composted pasteurized cocopeat and vermicompost. Plant cuttings of two varieties viz., IISR Thevam and Panchami were allowed to trail on the column and each cutting produced around 20 nodes in four months. Another interesting and notable feature was that, 48.8% of IISR Thevam and 35.8% Panchami plants produced lateral branches within four months time, whereas, when vines were allowed to grow horizontally on the bed containing the same medium, runners with 15 nodes were produced. This system of growing the vine on vertical column can be effectively utilized for the production of top shoots for planting material production.



Dr. M Anandaraj, Director, IISR, inspecting the black pepper vine health on vertical column

Inset: Vines with lateral branches on vertical column

Soil-less nursery mixture for black pepper multiplication using plug-trays

Investigations on the effect of different combinations of soil-less coir pith based nursery mixtures on rooting and growth of black pepper cuttings in the nursery revealed that composted coir pith with *Trichoderma* and vermicompost is an ideal potting medium for the black pepper nursery without much additional cost. It can also

be adopted by commercial nurseries. Rooted cuttings from terminal portion (11-15th nodes) showed better growth parameters compared to middle and basal portions. Similarly, higher nursery growth parameters were recorded in the cuttings planted with full leaf. Use of *Trichoderma* and vermicompost enriched coir pith in black pepper nurseries minimizes chemical fungicides usage. Also, *Trichoderma* that colonizes the root system of seedlings will help in preventing the infection by pathogens in the main field.



Rooted black pepper cuttings in soil-less culture in plug trays

Novel encapsulation technique for the delivery of agriculturally important microorganisms

A successful encapsulation technique for delivery of agriculturally important microorganisms has been developed. This technique was tested using plant growth promoting rhizobacteria (*Bacillus amyloliquefaciens*; IISR GRB 35) for growth promotion and disease control in ginger. The encapsulation process is simple, does not require sophisticated equipments and comes at low investment. Other advantages include reduced cost and easy handling and transport, no harmful byproducts, less requirement of inorganic and inert material, storage at normal temperature and more importantly, enhanced shelf life. Besides, this encapsulation technique can be used to deliver all kinds agriculturally important microorganisms viz., N fixers, nutrient solubilizers/mobilizers, PGPR etc. Also, this technique can be used to store pathogenic bacterial cultures without loss of virulence. Patent for this process has been filed and commercialization is in progress by the BPD unit of IISR.



Gelatine capsules containing PGPR *Bacillus amyloliquefaciens* IISR GRB 35

Complete genome sequencing of *Piper yellow mottle virus* (PYMoV) infecting black pepper, betelvine and Indian long pepper

The genome sequencing of PYMoV from black pepper, betelvine and Indian long pepper was completed. The genome length varied from 7549 to 7607 nucleotides in different hosts and all the three genomes possess four open reading frames (ORFs). Whole genome sequence comparison showed an identity of 89 to 99% with one available PYMoV sequence, while it ranged from 39 to 56% with other badnavirus species indicating that badnavirus infecting black pepper, betelvine and Indian long pepper are different strains of PYMoV.

DNA barcoding for detection of adulterants in traded cinnamon

DNA barcoding was used to detect the presence of adulterant, *Cinnamomum cassia*, in traded market samples of true cinnamon using the barcoding loci *rbcL*, *matK* and *psbA-trnH*. The amplification and sequencing success was 100% for *rbcL* and *psbA-trnH* while, *matK* failed to amplify the market samples. *rbcL* locus showed higher interspecific divergence while, *psbA-trnH* exhibited lower interspecific divergence. SNPs specific to *C. cassia* were detected in *rbcL* locus in two out of the five market samples studied thereby confirming the presence of *C. cassia* adulteration in commercial samples of true cinnamon. Out of the three loci, *rbcL* locus proved to be efficient in tracing out adulterants in traded cinnamon.

Nutrient advisories based on soil analysis for Kozhikode district

About 18,000 soil samples representing the entire Panchayats of Kozhikode district were analyzed for important physicochemical properties including major and micronutrients to generate nutrient advisories. All the soils were acidic with 50% of the samples being strongly acidic, 54% of the samples were medium in N and K, 61% of the samples had high to extremely high available P levels, 52% were adequate in Ca, 80% were low to very low in Mg, 92% were adequate in Zn, while 60% were adequate in B. Nutrient advisory cards with site specific recommendations have been issued to the farmers of all the Panchayats.

Mycelial compatibility studies in *Colletotrichum* isolates

Twenty isolates of *Colletotrichum* were collected from different plant species in cardamom – black pepper cropping system and tested for mycelial compatibility. The isolates from Liberian coffee (*Coffea liberica*), clove and cardamom (Malabar ecotype) were found to be more compatible with other isolates. Whereas, isolates from silky oak, avocado, Robusta coffee, dadap and mango were found to be less compatible with other isolates tested. Among the endophytes isolated from Mysore ecotype, the fungal isolates viz., MS 1, MS 2, MS 3, MS 12 and MS 13 had superior antagonistic activity against *C. gloeosporioides* under *in vitro* conditions, compared with other isolates.

In vitro evaluations of different fungicides against rhizome rot pathogens of cardamom

Among the seven fungicides tested against *Pythium vexans*, combination products viz., captan + hexaconazole and carboxin + thiram were found to be effective under *in vitro* condition. Tebuconazole and carboxin + thiram were found effective against *Rhizoctonia solani* whereas, tebuconazole was superior over other fungicides against *Fusarium oxysporum* under lab condition.

Personalia

Awards/ Honours/ Recognitions

Ankegowda S J

Elected as Vice President, Indian Society for Spices, Kozhikode for the period 2013-2015.

Bhat A I

External expert in the Selection Committee for the selection of Senior Research Fellow for an ICAR funded ad-hoc project at CPCRI, Kasaragod, 7 October 2013.

Key note speaker at the National workshop on 'Plant tissue culture and *Agrobacterium* mediated transformation' held at the Inter University Centre for Genomics and Gene Technology, University of Kerala, Thiruvananthapuram, 16 December 2013.

External examiner for final Ph.D. *Viva-Voce* examination at the Division of Plant Pathology, IARI, New Delhi, 31 December 2013.

Biju C N

Elected as Joint Secretary, Indian Society for Spices, Kozhikode for the period 2013-2015.

Dhanya K

Dr. V.S. Korikanthimath Award for the best Ph.D. thesis on Spices, Medicinal & Aromatic Crops for the thesis entitled "*Detection of probable plant based adulterants in selected powdered market samples of spices using molecular techniques*" at SYMSAC VII held at Madikeri, Karnataka during 27-29 November 2013 (Guide: Dr. B. Sasikumar, IISR, Kozhikode).

Hamza S, Kandiannan K, Krishnamurthy K S, Leela N K & Srinivasan V

Admitted as Fellow of Indian Society for Spices, Kozhikode

Jayashree E

Elected as Treasurer, Indian Society for Spices, Kozhikode for the period 2013-2015

Pervez R, Jacob T K, Devasahayam S & Eapen S J

Dr. H.S. Mehta Memorial Award for best poster presentation for the paper entitled 'Infectivity of entomopathogenic nematodes against *Lema* sp. infesting turmeric', at SYMSAC VII held at Madikeri, Karnataka during 27-29 November 2013

Sangeetha K P, Suseela Bhai R & Srinivasan V

Dr. J.S. Pruthi Award for the best research paper for the paper entitled '*Paenibacillus gluconolyticus*, a promising potassium solubilizing bacterium isolated from black pepper (*Piper nigrum* L.) rhizosphere' published in Journal of Spices and Aromatic Crops, 21 (2012) 2: 118-124.

Sasikumar B, Dhanya K, Parvathy V A, Swetha V P & Sheeja T E

Dr. Alapatti Prasada Rao Award for best poster presentation for the paper entitled 'Biological adulterants of traded black pepper with special reference to their detection using DNA markers' at SYMSAC VII held at Madikeri, Karnataka during 27-29 November 2013

Thankamani C K, Srinivasan V, Krishnamurthy K S & Kandiannan K

Dr. J.S. Pruthi Award for the best research paper for the paper entitled 'Effect of *Azospirillum* sp. and nutrients on yield of black pepper (*Piper nigrum* L.)' published in Journal of Spices and Aromatic Crops, 20 (2011) 1: 9-13.

Deputation Abroad**Anandaraj M**

As Chairman of IPC, Dr M. Anandaraj, Director, IISR was deputed to attend 41 Session of International Pepper Community Meeting at Kuching, Sarawak, Malaysia during 11-13 November 2013 for presenting the outcome of II R&D Committee meeting held at IPC Secretariat, Jakarta during 28-30 August 2013

Jayashree E

Completed the NAIP International Training Programme on Nutraceuticals at Michigan State University, 15 August to 15 November 2013.

Participation in Symposia/ Seminars/ Workshops/ Conferences/ Meetings**All Scientists**

VII Symposium on Spices and Aromatic Crops (SYMSAC-VII), Madikeri, Karnataka, 27-29 November 2013.

All Scientists and Technical Officers

Awareness programme on Entrepreneurship Development, IISR, Kozhikode, 6 December 2013.

Aiswariya K K

Workshop on implementation of plant health management scheme, Thiruvananthapuram.

Anandaraj M

Conducted an inquiry at CARI as per order from DDG (H), Port Blair, A & N Islands, 7-11 October 2013

Inaugurated Workshop on Science communication through folk media at Central University Transit Campus at Padannakkad, Kasaragod, Kerala, 23 October 2013

South Zone meeting of IPS at Thiruvananthapuram, 24 October 2013

XXIV group meeting of AICRP on Spices, Plenary session, CRSS, Jagudan, Gujarat, 26 October 2013

Submitted Inquiry report to DDG (H), ICAR, New Delhi, 28 October 2013

41 Session of International Pepper Community Meeting at Kuching, Sarawak, Malaysia, 11 to 13 November 2013

Meeting on various issues pertaining to agriculture and allied sectors in Karnataka and way forward at NIANP, Bengaluru, 21 November 2013

Reviewed the arrangements made for SYMSAC-VII at Madikeri, Karnataka, 22 November 2013

Organized and participated in SYMSAC-VII at Madikeri, Karnataka, 27-29 November 2013

Interactive Workshop on administrative and financial matters for the ICAR institutes located in southern region at NAARM, Hyderabad, 9- 10 December 2013

ASRB selection committee meeting, ICAR, New Delhi, 12-13 & 19 December 2013 and ASRB screening committee meeting, 18 December 2013

Chaired PLACROSYM Working cum Standing Committee Meeting, IISR, Kozhikode, 16 December 2013

Ankegowda S J

International Krishi Mela, University of Agricultural Sciences, GKVK, Bengaluru, 10 November 2013.

Halli habba, Krushika, Malandur, Chickamagalur, 1 December 2013.

Paddy Field Day, University of Agricultural and Horticultural Sciences, Ponnampet, 10 December 2013.

XVI Foundation Day Celebration, Agricultural Scientists Forum of Kodagu (ASFK), Ponnampet, 10 December 2013.

Agricultural Technology Week- 2013 celebrations, KVK, Gonikoppal, 10-13 December 2013.

National Conference of Plant Physiology - 2013 on Current Trends in Plant Biology Research, Directorate of Groundnut Research and Junagadh

Agricultural University, Junagadh, in association with Indian Society for Plant Physiology, New Delhi, 13-16 December 2013.

Ankegowda S J & Thankamani C K

National Conference on Spices: Recent Advances and Future Strategies, University of Agricultural and Horticultural Sciences (UAHS), Shimoga, 19-21 December 2013.

Bhat A I

National Symposium on Pathogenomics for Diagnosis and Management of Plant Diseases, CTCRI, Thiruvananthapuram, 24-25 October 2013.

Doctoral Committee meeting at the Department of Applied Botany, Mangalore University, 2 December 2013.

National workshop on Plant tissue culture and *Agrobacterium* mediated transformation, the Inter University Centre for Genomics and Gene Technology, University of Kerala, Thiruvananthapuram, 16 December 2013.

Biju C N

National Symposium on Pathogenomics for Diagnosis and Management of Plant Diseases, CTCRI, Thiruvananthapuram, 24-25 October 2013.

Training course on IPM in major crops for farmers and field functionaries of Tripura state, ICAR Regional Station for NEH Region, Lembuchera, West Tripura, 20 November 2013.

Training programme on Plant quarantine - National regulations and procedures, NIPHM, Department of Agriculture and Cooperation, Ministry of Agriculture, GOI, Rajendranagar, Hyderabad, Andhra Pradesh-500 030, 4-9 December 2013.

Technical programme on Scientific coffee and pepper cultivation in connection with Agricultural Technology Week – 2013, KVK, Gonikoppal, Karnataka, 13 December 2013.

Dinesh R

Final review meeting of Application of Microorganisms in Agriculture and Allied Sectors (AMAAS), NBAIM, Mau, 23-24 October 2013.

Dinesh R, Hamza S & Sheeja T E

Review meeting of the Project Sugandhi: Black pepper Rehabilitation Package for Wayanad, RARS, Ambalawayal, 10 December 2013.

Dinesh R & Srinivasan V

National workshop on Soil fertility evaluation -

Towards a state framework for XII and XIII five year plan, Hotel Mascot, Thiruvananthapuram, 8-9 October 2013.

Jacob T K

Workshop on Agriculture based integrated development of hilly areas of Kerala, Kannur, 8 October 2013.

Seminar on pesticide issues in cardamom, Irulam, Wayanad.

Monthly meeting of ATMA, IISR, Kozhikode, 25 October 2013.

Jayarajan K

Nodal Officers workshop, NAIP project SSC for NARS, UAS, Bengaluru, 15-16 November 2013.

Jayashree E

NHM sponsored state level seminar on Production, processing and marketing of nutmeg, as technical expert in the technical panel discussion on nutmeg, KVK, KAU, Thrissur, 18 December 2013.

John Zachariah T

Short course on High-tech interventions in seed spice production and value addition, NRCSS, Ajmer, 9 October 2013.

XXIV group meeting of AICRPS, CRSS, Jagudan, Gujarat and Chaired session on Crop Production, 24-26 October 2013.

Kandiannan K & Srinivasan V

Review Meeting of RFD Mid-Term Achievements, NASC, New Delhi, 28 October 2013.

Leela N K

Workshop on Codex- Principles and Procedures, Hotel Renaissance Cochin, Palarivattom, Kochi, 3 October 2013.

IX Meeting of National Steering Committee of Projects on Application of Electronics for Agriculture & Environment (eAgriEn), PESIT, Bengaluru, 18-19 November 2013.

First Shadow Committee Meeting of Codex Committee on Spices & Culinary Herbs, Udyog Bhavan, Ministry of Commerce, New Delhi, 19-21 December 2013.

Manoj P S

Financial review committee meeting of KVKs, KAU, Thrissur, 26 November 2013.

Training on application of decision support system in irrigated agriculture, CWRDM, Kozhikode, 11-13 December 2013.

Manoj P S & Prakash K M

VIII National Conference of KVKs, UAS, Bengaluru, 23-25 October 2013.

Nirmal Babu K, Prasath D, Senthil Kumar R, Thankamani C K & Utpala P

XXIV group meeting of AICRP on Spices, CRSS, Jagudan, Gujarat, 24-26 October 2013.

Pradeep B

Research-Extension-Farmers interface & workshop on LEADS at SAMETI, Thiruvananthapuram, 17-18 December 2013.

Prakash K M

National workshop on Soil fertility evaluation, Thiruvananthapuram, 8-9 October 2013.

Praveena H D

Exhibition of Agriculture Technology Week, KVK, Gonikoppal, 10-13 December 2013.

Exhibition of Kisan Mela, CPCRI Research Station, Kidu, 17-18 December 2013.

Praveena R

Training programme on pest surveillance, NIPHM, Hyderabad, 3-10 October 2013.

Symposium on Pathogenomics for Diagnosis and Management of Plant Diseases, organized by Indian Phytopathological Society (South Zone), CTCRI, Thiruvananthapuram, 24-25 October 2013.

Group meeting of Culture collections of importance in agriculture and allied sectors, NBAIM, Mau, 10 December 2013.

Monthly Technology Advisory Services meeting under ATMA, Kozhikode, 25 October and 23 November 2013

Monthly Technology Advisory Services meeting under ATMA, Kasaragod, 12 December 2013

Rashid P

National Symposium on Nematodes: A Friend and Foe of Agri-horticultural Crops, Dr. YSP University of Horticultural and Forestry, Solan (HP), 21-23 November 2013.

TOLIC sponsored Hindi workshop on OL rules, Hindi software and Noting and drafting, BSNL Conference Hall, Kozhikode, 19 December 2013.

Santhosh J Eapen

National Symposium on Pathogenomics for Diagnosis and Management of Plant Diseases, CTCRI, Thiruvananthapuram, 24-25 October 2013

Group meeting of Plant protection scientists, IISR, Kozhikode, 03 December 2013

PLACROSYM Working cum Standing Committee Meeting, IISR, Kozhikode, 16 December 2013.

Saji K V

National Conference on Agrobiodiversity Management for Sustainable Rural Development, NAARM, Hyderabad, 14-15 October 2013.

Short course on Recent advances in conservation of genetic resources of plantation crops, ICAR funded training programme, CPCRI, Kasaragod, 22-31 October 2013.

Senthil Kumar C M

Seminar on Technological Options in Production and Post Harvest Management in Ginger, Talamalai, Talavadi, Tamil Nadu, 11 October 2013.

Subject matter training on bioinformatics – *In vitro* to *in silico* approaches in entomology, NBAII, Bengaluru, 18-30 November 2013.

National Conference on Spices, UAHS, Shimoga, Karnataka, 19-21 December 2013.

Senthil Kumar R

VIII National Symposium: Noni for Sustainable Wellness, GKVK Campus, UAS, Bengaluru, 29-30 October 2013.

The Brain storming session, Institute of Bioresources and Sustainable Development (IBSD), Imphal, Manipur, 11-12 November 2013.

Litchi Field Day, CHES, Chettalli, 17 December 2013.

Sheeja T E

Workshop on Valuation and pricing of agricultural technologies, NASC Complex, New Delhi conducted under the auspices of Agrinnovate India Ltd., 26 November 2013.

Suseela Bhai R

National Symposium on Pathogenomics for Diagnosis and Management of Plant Diseases (IPS Southern Zone), CTCRI, Thiruvananthapuram, 24-25 October 2013

Brain storming session on Microbial culture collection in India, NBAIM, Kusmaur, Mau, UP, 10 December 2013

Meeting on Pesticide related issues in agricultural crops, organised by UPASI Tea Research Foundation at Spices Board, Cochin, 20 December 2013.

Sushama Devi C K

Two days workshop on Implementation of automated library management system using Koha open source software, CIFT, Kochi, 12-13 December 2013.

Umadevi P

ICAR sponsored winter school on Frontier technologies in the area of biotechnology on gene isolation, characterization and breeding with reference to abiotic stress related genes, NRCPB, New Delhi, 10-30 December 2013.

Radio Talk**Jacob T K**

Insect pest management in black pepper, Janvani Community Radio, Panoor, Kannur, 7 October 2013.

Santhosh J Eapen

Biological control of pests and diseases, Janvani Community Radio, Panoor, Kannur, 8 October 2013.

News & Events

ITM-BPD Unit

The first Entrepreneurship Development Programme was conducted on 6 December, 2013 at IISR Kozhikode. More than hundred people including spice researchers, entrepreneurs, progressive farmers, representatives of farmers' clubs, self help groups and developmental agencies participated in the programme. Dr. P. Sreekantan Thampi, Deputy Director (Publicity), Spices Board, Cochin highlighted the business opportunities in spice sector like processing industries, organic production, production of quality, disease free and high yielding planting materials, mixed farming, etc. Mr. K. P. Padmakumar, District Development Manager, NABARD, Malappuram and Mr. M. Ajith Kumar, Chief Manager, Federal Bank, Kozhikode also spoke during the occasion. Dr. C. Thamban, Principal Scientist, CPCRI, Kasaragod and scientists from IISR also delivered lectures on opportunities for entrepreneurship development in spice processing.

Dr. M. Anandaraj, Director, IISR presided over the programme and said that the BPD unit is an attempt to incubate new and innovative ideas of farmers and entrepreneurs in to viable and profitable business. Technologies for commercialization were also displayed by IISR and KVK; six entrepreneurs enrolled as members in the BPD Unit on that day.



Dr. M. Anandaraj delivering the presidential address during the EDP in spices



An entrepreneur interacting with experts and IISR scientists

- The ITMU facilitated filing of six patent applications at Indian Patent Office through National Research and Development Corporation (NRDC), New Delhi.
- ITMU conducted consultancy visits to licensee fields at Karnataka for certifying the quality of seed materials of ginger and turmeric

Symposium on Spices, Medicinal and Aromatic Plants (SYMSAC VII)

Indian Society for Spices (ISS) in collaboration with IISR, Kozhikode, IIHR, Bengaluru, DASD, Kozhikode and ICAR, New Delhi organized SYMSAC VII: *Post-harvest Processing of Spices and Fruit Crops* during 27-29 November 2013 at

Hotel Crystal Court, Madikeri, Karnataka. Dr. M. Anandaraj, President, ISS & Director, IISR, Kozhikode welcomed the gathering. Dr. V.S. Korikanthimath, Former Director, ICAR Research Complex for Goa inaugurated the Symposium. Dr. M.M. Mustafa, Director, NRCB, Tiruchirappalli presided over the function. Dr. M.N. Venugopal, former Head, CRC (Appangala), IISR inaugurated the exhibition. Dr. John Zachariah, General Convener of the Symposium, IISR proposed vote of thanks. During the inaugural session many awards viz., Dr. J.S. Pruthi Award, Dr. V.S. Korikanthimath award, Sugandhasree best farmer award and ISS Fellow awards were presented. Inaugural session was followed by four technical sessions viz., tree spices research, production technologies, post harvest losses and developmental programmes. Many recommendations including mechanization, packaging, production technologies, region specific good agricultural practices, post harvest management, underutilized and minor fruits, quality testing of inputs etc. emerged during the discussions.



Dr. M. Anandaraj, Director, IISR conducting the plenary session



Dr. M.M. Mustafa, Director, NRCB presenting the Sugandhasree award

Institute Research Committee Meeting

The midterm Institute Research Council meeting for the year 2013-14 was held during 4-5 December 2013. Dr. M. Anandaraj, Director chaired the review meeting. He highlighted the importance of newly developed project evaluation system of ICAR for RPF II and III. He emphasized that priority should be given to result oriented projects. During these two days, the progress made in each of the projects was presented and discussed. Midcourse corrections in technical programmes were made and constraints in executing the work elements identified.

News from Human Resource Development

The HRD committee met six times during the period. The committee recommended two Scientists and one Chief Technical Officer to attend short term trainings / short term workshops. The Committee revised the norms of M.Sc/M.Tech. project work and M. Phil, Ph.D. & Post M.Sc./M.Tech. training programmes. During this period 4 students joined for conducting their project work in M.Sc/M.Tech.

Farm Development Activities at Chelavoor Campus

- A water harvesting structure with a capacity of 20 lakh litres has been constructed to conserve rain water.
- Drip irrigation has been installed for spice crops as a measure to utilize water effectively.
- Ginger and turmeric cultivation was taken up in about 2 ha of newly developed land.



Water harvesting structure



Terracing of land in progress



Ginger cultivation at Chelavoor

Consultancy Processing Cell

Ankegowda S J & Kandiannan K

Visited Harrisons Malayalam Ltd., Wayanad, for Black pepper yield estimation, 6, 7 & 13 December 2013

News from Library

Two demonstrations *i.e.*, Springer e-Books and EBSCO e-Books were conducted in the library. Three issues of e-version of 'AGRI titbits' were published. 40 CeRA requests were catered online. 8 external users and 720 internal users made use of the library facilities. 48 new books were added to the library stock.

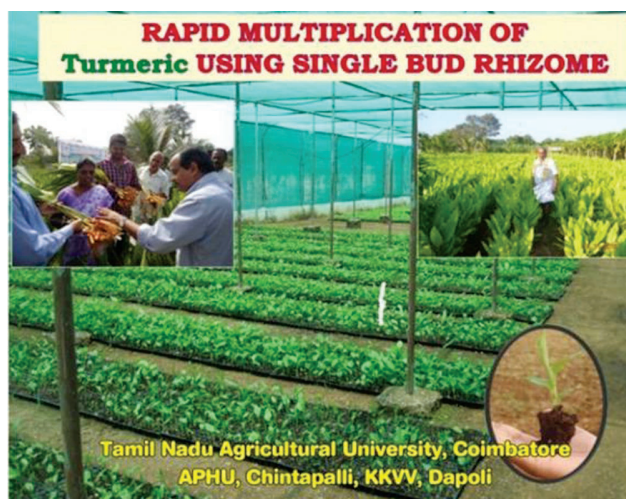
National Group Meeting of AICRPS

XXIV Workshop on AICRP on Spices was held at Sardar Dantiwada Agricultural University, Jagudan, Gujarat during 24-26 October 2013. Dr. S.K. Malhotra, ADG (Hort.), ICAR, New Delhi inaugurated the programme on 24 October 2013 and Dr. N.K. Krishna Kumar, DDG (Hort.) presided over the Plenary Session on 26 October 2013. Around 100 participants attended the programme. There were six technical sessions *viz.* Genetic Resources, Crop Protection, Crop Improvement, Crop Management, Varietal Release and Transfer of Technology. During the workshop, four high yielding and high quality spice varieties

like Keralasree (nutmeg), Duggirala Red (turmeric), LCC 234 (coriander), and HM-348 (fenugreek) were recommended for release.



Plenary session of AICRPS workshop in progress



Technology developed by AICRPS centres

News from SARANI

The club arranged farewell function in connection with the superannuation of two club members, Mr. B. Krishnamoorthy, Head, Crop Improvement and Mr. V. Sivaraman, Technical Officer. A farewell lunch also was arranged on 30 November 2013.



A snap from farewell function

हिन्दी अनुभाग

संस्थान में दिनांक 23 सितम्बर से 5 अक्टूबर 2013 तक हिन्दी पखवाडा मनाया गया। दिनांक 5 अक्टूबर 2013 को हिन्दी पखवाडे का समापन समारोह डा. एम. आनन्दराज, निदेशक की अध्यक्षता में संपन्न हुआ। डा. जगदीप सक्सेना, प्रभारी हिन्दी एकक, भारतीय कृषि अनुसंधान परिषद, नई दिल्ली समारोह के मुख्य अतिथि थे। इस अवसर पर उन्होंने संस्थान की राजभाषा पत्रिका मसालों की महक का विमोचन किया तथा हिन्दी पखवाडे के दौरान आयोजित विभिन्न प्रतियोगिताओं के विजेताओं को पुरस्कार वितरण किये। उन्होंने अपने सम्बोधन में राजभाषा के महत्व पर प्रकाश डाला।

दिनांक 31 अक्टूबर 2013 को राजभाषा कार्यान्वयन समिति की बैठक डा. एम. आनन्दराज, निदेशक की अध्यक्षता में संपन्न हुई। दिनांक 07 नवंबर 2013 को श्रीमती शीला पी. जे, उप निदेशक (रा भा) तथा श्रीमती उमा, सहायक तकनीकी अधिकारी, सी एम एफ आर आई, कोचि द्वारा संस्थान में राजभाषा कार्यान्वयन संबन्धी निरीक्षण किया गया। प्रस्तुत तिमाही में मसाला समाचार (अंक 24 खंड 3) को प्रकाशित किया।

दिनांक 06 दिसंबर 2013 को नगर राजभाषा कार्यान्वयन समिति की उपसमिति की बैठक में सुश्री. एन. प्रसन्नकुमारी ने भाग लिया। दिनांक 19 दिसंबर 2013 को नगर राजभाषा कार्यान्वयन समिति द्वारा प्रयोजित हिन्दी कार्यशाला में सुश्री अनुपमा एन. के. ने भाग लिया।



हिन्दी पखवाडे का समापन समारोह

Externally Aided Projects

Title of project	Investigators	Funding agency	Period	Outlay (Rs. Lakhs)
Integrated Pepper Research and Development Project for Northern Kerala	Dr. V. Srinivasan	Planning Board, Govt of Kerala	2013-16	33

Transfer of Technology

Extension Activities

Aiswariya K K

Conducted a three days training programme on Bee keeping as an income generating enterprise and for increased productivity of crops, 28-30 October 2013.

Participated in a seminar on Pest and disease management in nutmeg, Chalakkudy, Thrissur, 12 December 2013.

Kandiannan K & Rajeev P

Visited Turmeric FLD Fields in Vijayawada, Guntur District, Andhra Pradesh, 4 November 2013.



Farmers in front of FLD on turmeric variety IISR Prathibha at Guntur District Andhra Pradesh



Bumper growth and yield of IISR Prathibha at Guntur District

Krishnamurthy K S, Santhosh J Eapen & Thankamani C K

Visited demonstration plots of the Project Sugandhi: Black pepper Rehabilitation Package for Wayanad in Wayanad District, 9 December 2013

Sasikumar B

Visited the field of Mr. Sivenesan, a farmer from Gundlupet, Karnataka, growing IISR Alleppey Supreme turmeric, performing well in the region. He could get a multiplication rate of 1:40 during the year 2012. Ginger (IISR Varada) plot of Mr. Abdul Latheef at Gundlupet (under the licence agreement with NHRDF), was also visited.



Mr. Sivenesan's IISR Prathibha turmeric



IISR Varada ginger of Mr Abdul Latheef

Suseela Bhai R

Visited State Agriculture Nursery, Koothali, Kozhikode for nursery inspection, 5 October 2013

Technology Inputs and Advisory Services from ATIC

Two hundred and sixty four farmers availed advisory services by direct visits. 200 from Calicut district, 40 from other districts of Kerala and 24 from outside state visited the centre. 83 students from various institutions visited the centre on study tour. During the period, ATIC generated an income of Rs 107844 through sale of planting materials and technology products.

Outreach Extension

- ❖ Institute participated in national level exhibition held in connection with SYMSAC VII at Madikeri during 27-29 November 2013. An exhibition stall was put up in Agriculture and Marketing Fair organized by the Block Panchayat of Perambra, Kozhikode during 20-24 December 2013
- ❖ Under Sugandhi Project: Pepper Rehabilitation Package for Wayanad, an awareness seminar on scientific cultivation of black pepper was organized at Ambalavayal on 30 November 2013
- ❖ The Monthly Technology Advisory meetings (MTA) under ATMA, Kozhikode were held on 25 October, and 23 November at IISR, Kozhikode

Training for Extension Functionaries

A four day course on Production management and PHT of spices was organized for the officers from the Department of Horticulture and Food processing during 18-22 November 2013.

Krishi Vigyan Kendra

Front Line Demonstration

The following front line demonstrations were conducted during the period

1. Demonstration of upland rice variety *Vaisakh* conducted in 10 farmers' field
2. Popularization of grass carp for controlling submerged aquatic weeds
3. Popularization of bucket filter in maintaining water quality of ornamental fish culture tanks

4. Demonstration of shade tolerant HYVs of black pepper
5. Popularization of pepper production through bush pepper production technology
6. Integrated disease management of *Phytophthora* foot rot of black pepper
7. High density planting of tissue culture nendran banana
8. Fertility in anoestrus cows following CIDR treatment



FLD on upland rice

On Farm Testing

The on farm testing of the following technologies was carried out.

1. Evaluation of growth performance of fishes using formulated feed.
2. Effectiveness of IISR nutrient mix for high yield and quality in ginger
3. Performance evaluation of sandless nursery mixture for black pepper serpentine nursery
4. Seed production of pearl spot in fresh water
5. Management of root mealybug in banana
6. Management of pseudostem weevil in banana
7. Management of foot rot of black pepper
8. Bio stimulation of lactation milk yield in dairy cattle
9. Bio stimulation of estrus induction and conception rate in crossbred heifer

Trainings Conducted

A total of 47 training programmes were conducted during October to December 2013.

Publications

Research Papers

Anoop K and Suseela Bhai R. 2013. Host range study of turmeric rhizome rot pathogen *Pythium aphanidermatum* on selected Zingiberaceae members. International Journal of Research in Pure and applied Microbiology 3(4): 113-115.

Barnwal P, Singh K K, Kumar R & Zachariah T J 2013 Thermal properties of cryo-ground powder of black pepper (Panniyur 1). Journal of Spices and Aromatic Crops 22(2): 148-153

Biju C N, Praveena R, Ankegowda S J, Darshana C N & Jashmi K C 2013 Epidemiological studies on black pepper anthracnose caused by *Colletotrichum gloeosporioides*. Indian Journal of Agricultural Sciences 83(11): 1199-1204.

Deepa K, Sheeja T E, Santhi R, Sasikumar B, Anu Cyriac, Deepesh P V & Prasath D 2013 A simple and efficient protocol for isolation of high quality functional RNA from different tissues of turmeric (*Curcuma longa* L.) DOI: 10.1007/s12298-013-0218-yK (Springer).

Dinesh R, Anandaraj M, Kumar A, Srinivasan V, Bini Y K, Subila K P & Aravind R 2013 Effects of plant growth promoting rhizobacteria and NPK fertilizers on biochemical and microbial properties of soils under ginger (*Zingiber officinale*) cultivation. Agricultural Research (Springer) 2: 346-353.

Hamza S, Srinivasan V & Dinesh R 2013 Management of acid soils under major spice crops. Indian Journal of Arecanut, Spices & Medicinal Plants 15(3): 3-6.

Jayashree E & Visvanathan R 2013 Development of a hand operated diamond cut mesh drum abrasive ginger peeler. Journal of Spices and Aromatic Crops 22(2): 174-180.

John Zachariah T 2013 Functional foods and phytomedicines from spices. Processed Food Industry 16(12): 20-29.

Krishnamurthy K S, Ankegowda S J, Srinivasan V & Hamza S 2013 Influence of carbohydrates, mineral nutrients and plant hormones in alternate bearing of black pepper (*Piper nigrum* L.) American Journal of Plant Science 4: 1960-1967.

Sheeja T E, Anju P R, Shalini R S, Siju S, Dhanya K & Krishnamoorthy B 2013 RAPD, SCAR and conserved 18S rDNA markers for a red-listed and endemic medicinal plant species, *Knema andamanica* (Myristicaceae). Physiology and Molecular Biology of Plants 19(2): 245-250.

Sheeja T E, Hima Bindu K, Anto P, Dhanya K, Siju S & Vasantha Kumar T 2013 A SCAR marker based method for sex determination in dioecious betel vine (*Piper betle*). Indian Journal of Agricultural Sciences 83(12): 1409-10.

Sheeja T E, Rosana O B, Swetha V P, Shalini R S, Siju S, Dhanya R, Rahul P R & Krishnamoorthy B 2013 The 18S rDNA gene discriminates between red-listed and unexplored ethnomedicinal species of *Myristicaceae* restricted to humid tropics of India. Genetic Resources & Crop Evolution. (DOI 10.1007/s10722-013-0060-7) (Springer).

Sheeja T E, Sabeesh C, Shabna O V, Shalini R S & Krishnamoorthy B 2013 Genetic diversity analysis of *Myristica* and related genera using RAPD and ISSR markers. Journal of Spices and Aromatic Crops 22(1): 38-46.

Sheeja T E, Uma G, Sasikumar B, Saji K V & Rahul P R 2013 Genetic diversity study in *Piper* spp. using inter simple sequence repeat (ISSR) markers. Journal of Spices and Aromatic Crops 22(2): 111-119.

Shiva K N, Zachariah T J, Leela N K & Mathew P A 2013 Performance of paprika and paprika alike chillies (*Capsicum annum* L.) under warm humid tropics. Journal of Spices and Aromatic Crops 22(2): 222-227.

Siju S, Dhanya K, Sheeja T E, Sasikumar B, Bhat A I & Parthasarathy V A 2013 Novel polymorphic microsatellite markers from turmeric, *Curcuma longa* L. (*Zingiberaceae*). Acta Botanica Croatica Journal. 72(2): 407-412.

Srinivasan V, Kandiannan K & Hamza S 2013 Efficiency of sulphate of potash (SOP) as an alternate source of potassium for black pepper (*Piper nigrum* L.). Journal of Spices and Aromatic Crops 22(2): 120-126.

Utpala Parthasarathy, Nandakishore O P, Nirmal Babu K & Senthil Kumar R 2013 Comparative effectiveness of inter-simple sequence repeat and randomly amplified polymorphic DNA markers to

study genetic diversity of Indian *Garcinia*. African Journal of Biotechnology 12(46): 443-451.

Books

Sasikumar B, Dinesh R, Prasath D, Biju C N & Srinivasan V (Eds.) 2013 Souvenir and Abstracts, National Symposium on Spices and Aromatic Crops (SYMSAC VII): *Post harvest processing of spices and fruit crops*, Indian Society for Spices, Kozhikode, Kerala, India.

Book Chapters

Anandaraj M, Pervez R & Devasahayam S 2013 Masaloon ko hani pohchaney wale rog, keet evam sutrkrimi evam unka parbandhan. In: Vigyan Anusandhan evam Vikas (Eds. Jindal & Sheron P), DRDO, New Delhi, pp.94-115.

Balakrishnan M, Jayashree E, Thirupathi V & Viswanathan R 2013 Spices and condiments. Hand Book of Agricultural Engineering, Indian Council of Agricultural Research, New Delhi, pp.559-581.

Dinesh R, Srinivasan V & Hamza S 2013 Soil Fertility, Kozhikode District. In: Soil Fertility Assessment and Information Management for Enhancing Crop Productivity in Kerala (Eds. Rajashekar P, Nair K M, Rajasree G, Suresh P & Narayankutty M C), Kerala State Planning Board, pp.305-327.

Extension Pamphlet

Prakash K M 2013 Vermicompost, KVK, IISR, Pruvannamuzhi, Calicut, 8p.

Jhansirani P, Kandiannan K, Senthil Kumar C M, Subramanian C, Chitra R, Saravana Kumar T, Kumar N & Mariappan C 2013 Black pepper nursery techniques (In Tamil), TNAU, Coimbatore, 12p.

Technical Report

Thankamani C K & Johny A K 2013 Annual report, AICRPS, IISR, Kozhikode, 108p.

Popular Articles

Anandaraj M 2013 Masala fasloon ke rog evam prabandhan. Masaloon ki Mehak, pp.30-32.

Dinesh R, Hamza S & Srinivasan V 2013 Bush Kali mirch. Masaloon ki Mehak, pp.47-48.

Hamza S & Srinivasan V 2013 Black Gold, Farmers to remember, Kerala Karshakan, 59(3): 47-48.

Hamza S, Srinivasan V & Dinesh R 2013 Masaloon ki kheti: kuch mehtabpoorn pramarsh. Masaloon ki Mehak, pp.49-52.

Pervez R & Eapen S J 2013 Masaloon fasloon ke adrsh shaturoo- sutrkrimi. Masaloon ki Mehak, pp.44-46.

Pervez R, Eapen S J & Devasahayam S 2013 Ketnasham Sutrkrimi -ke shktishali javik niyantran karak. Masaloon ki Mehak, pp.36-37.

Prakash K M 2013 Adukkalayilum Koon Valartham, Kerala Karshakan October 2013, pp.34-35.

Srinivasan V & Pervez R 2013 Haldi ki javik kheti. Masaloon ki Mehak, pp.41-43.

Santhosh J. Eapen 2013. Pochonia – a newcomer in fungal bioagents (in Malayalam). *Kerala Karshakan* November 2013, P 52.

Lectures Delivered

Biju C N

Integrated pest management in ginger with reference to soft rot management in the state of Tripura, Training course on IPM in major crops for farmers of Tripura state (65 farmers) and Training course on IPM in major crops for field functionaries (75 officials) of Tripura state at ICAR Regional Station for NEH Region, Lembuchera, West Tripura organized by ICAR Regional Station for NEH region, Lembuchera, 20 November 2013.

Hamza S

Integrated nutrient management with special emphasis on micronutrients to vegetables and banana. Farmers training programme organized by Vegetable and Fruits Promotion Council of Kerala (VFPCCK), Kakkoor, Kozhikode, 13 November 2013.

Mitigation of micronutrient deficiencies in banana and vegetables. Farmers training programme, organized by VFPCCK, Vellannur, Kozhikode, 26 November 2013.

Nursery management in black pepper, Farmers training programme, Krishi Bhavan, Meppadi, Wayanad, 30 November 2013.

Soil Health and nutrient management in banana and vegetables, Farmers training programme organized by VFPCCK, Thangilkadavu, Mavoor, Kozhikode, 24 December 2013.

Jacob T K

Pest management in spice crops, Vengeri, Kozhikode, 10 October 2013.

Insect pest management in ginger & turmeric in Training for Officers of Horticulture, Uttarakhand, at IISR, Kozhikode, 19 November 2013.

Jayashree E

On farm processing and value addition in ginger, turmeric and tree spices, IISR, Kozhikode, 21 November 2013.

John Zachariah T

Opportunities, challenges and strategies to develop functional food and phyto medicines from spices, In: short course on 'High-tech interventions in seed spice production and value addition', NRCSS Ajmer, 9 October 2013.

Johnson George K

Gene expression analysis in response to water deficit stress in black pepper (Piper nigrum L.), NCPP 2013 (National Conference of Plant Physiology - 2013 on Current Trends in Plant Biology Research), Directorate of Groundnut Research (ICAR), Junagadh, Gujarat, 13-16 December 2013.

Kandiannan K

Production technology and PHT in ginger crop, District Level Seminar on 'Production Technology, Post Harvest Management of Ginger Crop', Talamalai, Talavadi organized by Myrada Krishi Vigyan Kendra, Erode District, Tamil Nadu, 11 October 2013.

Prasath D

Comparative transcriptome analysis for gene discovery and marker development, Short course on Recent advances in conservation of genetic resources of plantation crops, CPCRI, Kasaragod, 30 October 2013.

Ginger varieties and seed ginger, Training programme on Production management and post harvest technology of spices, District Horticulture Training Office, Dehradun at IISR, Kozhikode, 19 November 2013.

New Appointment

Name	Post	w.e.f.
Mr. M. Radhakrishnan	Finance & Accounts Officer	9-12-2013

Rajeev P

Technologies developed by IISR during the EDP organized by the BPD Unit, IISR, 12 November 2013

Research Highlights of IISR during the state level Research-Extension-Farmer interface organized at Thiruvananthapuram under the ATMA, Department of Agriculture, 7-8 December 2013

Technical seminar on *Five Year Plan and Agriculture*, Institute study circle, IISR, 23 December 2013

Saji K V

Black pepper production system management in a farmers awareness programme jointly organized by KAU, Padannakad and IISR, Kozhikode, 28 October 2013.

Santhosh J Eapen

Next generation sequencing; Data analysis is the bottleneck, Invited lecture in National Seminar on Applications of Bioinformatics in Agriculture, CPCRI, Kasaragod, 12 November 2013

Safe use of pesticides and issues on label claims. Training for Agricultural Officers and Assistants, Farmers Training Centre, Vengeri, Kozhikode, 13 November 2013

Senthil Kumar C M

Pest and disease management in ginger, Talamalai, Talavadi, Tamil Nadu, 11 October 2013.

Plant protection in black pepper, Kolli Hills, Tamil Nadu, 10 December 2013.

Senthil Kumar R

Bioresources and sustainable development in North East, the Brain storming session at IBSD, Imphal, Manipur, 11-12 November 2013.

Suseela Bhai R

Diseases of spices and their management, Vengeri, Kozhikode, 10 October 2013

Diseases of black pepper for the planters meet organized by MSSRF, Kalpetta at Kaniampetta, Wayanad, 29 October 2013

Retirement



Smt. Marinnanamma
(1/10/13)



Smt. K.P. Devaki
(31/10/13)



Shri B. Krishnamoorthy
(30/11/13)



Shri V. Sivaraman
(30/11/13)



Shri K.P. Gangadharan
(31/12/13)

Resignation

Name	Post	w.e.f
Ms. Poonam Rani	Assistant	16-12-2013



SPICES NEWS

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