



# SPICES NEWS



Indian Institute of Spices Research, Marikunnu (P.O.), Kozhikode (Calicut), Kerala, India  
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## From the Director's Desk

When we ENVISION 2050 the prime objective should be to put forth strategic research agenda that would take India to the forefront in spices production and trade. Another objective should be to develop new ideas to drive investment and innovation in spice production. Our diligence and resilience has resulted in the establishment of a strong base of research expertise in spices with research excellence in a number of key strategic areas. However, it is imperative that we strive to build on this base and consolidate the strengths that have emerged from our past experience. Besides, our overriding focus should be on those areas that have direct ramifications to the future societal needs. This is because the world forty years into the future would not be what it is today, it would be vastly and fundamentally different. Though it is hard to imagine the society's needs, outlook, preferences, tastes, liking and disliking in 2050, one thing that is anybody's guess is that the society would have emerged from a period of social and economic transformation that would have changed virtually every aspect of human life. Presently we are working on developing alternative agricultural systems to address the growing ecological, social, and economic concerns that arose from intensive agriculture, which relied on exogenous inputs. New paradigms of agriculture like organic farming, biodynamic farming, GAP etc. are various avatars of alternative agricultural systems that aims at enhancing the quality of the environment. This will, however, not suffice in 2050 especially with there being increased demand for food and energy combined with pressure on land conversion, leading to further climate change. This in turn may affect productivity and availability of land. Therefore, what is expected in 2050 is ideally a risk free permanent agricultural system that will require very low inputs at far lower prices but at the same time would fetch more profits. This requires path breaking research agenda that may presently appear fictitious but would become a reality and come to fruition in 2050. Some of these include 'vertical farming' to make maximum use of a small amount of space by filling glass houses with plant beds stacked high one above the other; Nano-seed varieties with in-built pesticides that will release under certain environmental conditions; Nano-clay capsules containing nutrients, growth stimulants and biocontrol agents designed for slow release of active ingredients; Smart fertilizer and pesticide delivery systems which can respond to environmental changes thereby facilitating controlled release of their cargo (slowly or quickly) in response to different signals e.g. magnetic fields, heat, ultrasound, moisture; pH etc.; Nano-formulations (nanodispersions/ nanoemulsions) of herbicide designed to attack the seed coating of weeds and prevent weed germination; Nanotechnology-enabled devices like stand-alone nano sensors linked into a GPS system for real-time monitoring of soil conditions and crop growth; Development of super sensors for detecting a specific molecule that is associated with the condition of a system. One can think here of detection by sensing metabolic products or direct detection of a pathogen in the rhizosphere, rhizoplane and in plant parts; Biosensors for detecting spoilage of post harvest spice products by sensing metabolic products of spoilage bacteria or direct detection of spoilage bacteria. In addition to the re-engineering of existing plants, novel plant varieties may be developed using synthetic biology; a new branch of technoscience that draws on the techniques of genetic engineering, nanotechnology and informatics. These are just a few ideas that are in the conceptual stage. Probably, some of these would come to bearing even before 2050. Such ideas would not only transform agriculture, but will also help in shaping new and better food systems that will lead to a new and a better quality of life.

(M Anandaraj)

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## Research Update

### Germplasm conservation

A total of 426 black pepper germplasm accessions were planted at CHES, Chettalli, to serve as alternate pepper germplasm block.

### Detection of *Piper yellow mottle virus* (PYMoV) in black pepper anthers

PCR based study showed presence of *Piper yellow mottle virus* in anthers of black pepper suggesting the possibility of its occurrence in pollens.

### Outreach Programme on Diagnosis and Management of Leaf Spot Diseases in Field and Horticultural Crops

The efficacy of fungicides against anthracnose disease of black pepper and potential native bio-control agents, botanicals and fungicides against leaf blight of cardamom have been validated under nursery conditions.

### Investigations on the endophytic and rhizospheric microflora associated with cardamom and allied genera

Isolations made from different plant parts including leaves, petioles, pseudostem, roots and rhizomes of *Ammomum* sp. yielded both fungal as well as bacterial isolates. Among the plant parts, the isolates had more preference for pseudostem followed by rhizomes and roots.

### Diversity of rhizome & root rot pathogens and their antagonists in cardamom

Surveys were repeated in the hot spots to study the temporal variation of rhizome and root rot pathogens and morphological characterization of selected isolates has been completed.

### *Garcinia* genomic DNA sequences

Genomic DNA sequences of eight *Garcinia* species, namely *G. indica*, *G. gummi-gutta*, *G. cowa*, *G. lancifolia*, *G. tinctoria*, *G. pedunculata*, *G. mangostana* and *G. subelliptica*, have been released on 5 September 2012 in NCBI Data base with the accession numbers JX472233 to JX472241.

## Personalia

### Awards/ Honours/ Recognitions

#### Deputation abroad

#### Anandaraj M

Deputed as Resource Person for International Workshop cum Demonstration of pest and disease

control to Ho Chi Minh City, Vietnam during 6–9 August 2012.

#### Anandaraj M

Chairman of the R&D Committee of International Pepper Community.

K C Mehta Award – 2011 by Indian Phytopathological Society, New Delhi.

President of Indian Phytopathological Society, New Delhi, for the year 2013.

Chaired plenary session of Sixth International Symposium on Zingiberaceae, University of Calicut, 10 September 2012.

#### Sasikumar B

Member, Advisory Committee, Department of Biotechnology, Calicut University.

Member, World Spice Organization, Kochi.

Chaired the session on Horticulture and Crop Improvement, Sixth International Symposium on family Zingiberaceae, University of Calicut, 10–13 September 2012.

#### Thankamani C K

Member, Committee for Midterm Review of NHM Idukki Pepper Package.

### Participation in Symposia/ Seminars/ Workshops/ Conferences/ Meetings

#### All Scientists

23<sup>rd</sup> Annual Group Meeting of AICRP on Spices, IISR, Kozhikode, 29 September-1 October 2012.

#### Aiswarya

#### Prakash K M

Seminar and mass campaign on Sughandhi Black pepper rehabilitation Project findings in Vellamunda Krishi Bhavan, Wayanad, 4 July 2012.

#### Anandaraj M

Workshop on *Organic Cultivation of Spice Crops*, Padannakkad, 2 July 2012.

Inaugural function of COGENT meeting, Cochin, 7-8 July 2012.

21<sup>st</sup> Annual Group Meeting of AICRP on Palms, Madurai, 11-12 July 2012.

75<sup>th</sup> Meeting of Spices Board, Kochi, 17 July 2012.

ASRB Meeting for Career Assessment System for Senior Scientists - 27 July, 12-14 August & 27 September 2012.

Meeting of the Directors/Project Coordinators of Horticulture Division, New Delhi, 23 July & 23 August 2012.

Knowledge Meet, New Delhi, 21-22 August 2012.

Meeting with the Hon'ble Minister of State for Agriculture & Food Processing Industries, Coimbatore, 25 August 2012.

Inaugural Session of *Zingiberaceae*, University of Calicut, Thenhipalam, 10 September 2012.

IPC Meeting, Spices Board, Cochin, 11 September 2012.

**Anandaraj M**

**Ankegowda S J**

**Jacob TK**

National Consultation on the *Integrated development of Uttara Kannada district of Karnataka*, Karwar Research Centre of CMFRI, Karwar, 1 September 2012.

**Anandaraj M**

**Kandiannan K**

Meeting of Turmeric Farmers Association, Erode, Tamil Nadu, 25 August 2012.

**Ankegowda S J**

44<sup>th</sup> Scientific Advisory Committee meeting, Krishi Vigyan Kendra, Gonikoppal, 21 July 2012.

Group meeting on *Integrated nutrient management in coffee*, Central Coffee Research Institute, Balehonnur, 19 July 2012.

Visit to AICRP on Spices, to assess the growth and development of cardamum in CVT trial, Sakleshpur and Mudigere, 18 July 2012.

Field day on black pepper at Murugarajendra Estate, Madapur, 14 September 2012.

**Devasahayam S**

National Workshop on *Technologies for Organic Spice Production in the Humid Tropics*, Padannakkad, 2 July 2012.

Third Standing and Working Committee Meeting of PLACROSYM XX, Coimbatore, 19 July 2012.

Working Group Meeting on Plant Health Management, Thiruvananthapuram, 5 & 30 July and 24 August 2012.

Sectoral Session on Science & Technology, Emerging Kerala 2012, Kochi, 13 September 2012.

**Anandaraj M**

**Hamza S**

**Kandiannan K**

**Nirmal Babu K**

**Prasath D**

**Sasikumar B**

**Shamina A**

Sixth International Symposium on the family *Zingiberaceae*, Department of Botany, University of Calicut, 10-13 September 2012.

**Hamza S**

**Jacob T K**

Seminar and mass campaign on Sughandhi Black pepper Rehabilitation Project findings, Panamaram Grama Panchayath Hall, Wayanad, 3 July 2012.

**Ishwara Bhat A**

R & D Committee meeting of International Pepper Community, Spices Board, Kochi, 11 September 2012.

**Jayashree E**

Two day workshop to finalise the project proposal on *Secondary Agriculture*, IASRI, New Delhi, 8-9 August 2012.

Meeting on *Traceability in Nutmeg and handing over of nutmeg dryer*, Kurukutty Panchayat, Ernakulam, 17 August 2012.

**Jayashree E**

**Leela N K**

Training programme on *Food Safety and Supply Chain Management in Spices/ Botanical Ingredients*, Ernakulam, 17-21 September 2012.

**Johnson George K**

Chaired the session on *Crop Improvement*, Annual Research Council Meeting of ICRI, Spices Board, Kochi, 1 August 2012.

**John Zachariah T**

National Workshop cum Training on *Technologies for Organic Spice production in the humid tropics*, 2 July 2012.

Codex Committee for spices organized by Spices Board, Kochi and World Spice Organization, Spices Board, Kochi, 11 September 2012.

Chaired the session on Crop Management of 23<sup>rd</sup> group meeting of AICRPS, IISR, Calicut, 30 September 2012.

**John Zachariah T**

**Nirmal Babu K**

Quinquennial review of AICRP Centres, Acharya NG Ranga Agricultural University, Hyderabad, 22-24 August 2012.

QRT review of AICRP centres, College of Horticulture, TNAU, Coimbatore, 6-7 September 2012.

**Manoj P S**

Seminar on *Hi-tech farming*, Kannur, State Horticulture Mission – Kerala in connection with 2<sup>nd</sup> International Horti-expo 2012, 22 September 2012..

**Prasath D**

Training on *Intellectual Property Rights and Biotechnology*, NAARM, Hyderabad, 21-25 September 2012.

**Praveena R**

Short Course on "*Plant Disease Diagnostics: Theory and Practices*", Division of Crop Protection, Central Potato Research Institute, Shimla, Himachal Pradesh, 4-13 July 2012.

**Santhosh J Eapen**

National Seminar cum Training on Technologies for Organic Spice Production in the Humid Tropics, College of Agriculture, Padannakkad, 2 July 2012. Regional Meet of Bioinformatics Coordinators, Fisheries College, Mangalore University, 6 September 2012.

Group Meeting on Crop Health Management, State Planning Board, Thiruvananthapuram, 13-14 September 2012.

**Srinivasan V****Suseela Bhai R**

Review meeting of Sugandhi Black Pepper Project, RARS, Ambalavayal, 11 September 2012.

**Thankamani C K**

NHM Review meeting, GKVK, Bangalore, 18-19 July 2012.

**Utpala Parthasarathy**

Workshop cum Training on *Computational Techniques in discovery of agronomically important crop Genes*, National Agricultural Bioinformatics Grid (NAIP), 24-29 September 2012.

## News and events

**News from Bioinformatics Centre**

The fifth Executive Committee meeting of the Bioinformatics Centre was held on 07 September 2012 at IISR, Kozhikode. Apart from Director, heads of Divisions and other institute members, Shri. S. Raghavan (Jt. Secretary, DBT, New Delhi), Dr. T. Madhan Mohan (Adviser, DBT, New Delhi), Shri. K.A. Abdul Nazeer (Assoc. Professor, NIT, Calicut), Dr. G.K. Rajanikant (Coordinator, BIF, NIT, Calicut) attended the meeting. The meeting reviewed the progress of work and approved the work to be taken up during the XII Plan.



During the period, the centre undertook research work on functional annotation of whole genome sequence of *Phytophthora*, functional annotation of SNPs present in *Phytophthora capsici*, genome mining of endophytic bacteria, protein-protein interaction studies between cuticular collagen of nematodes and variants of Bt toxin and development of a plant viral database.

**News from Human Resource Development**

Neema Malik, JRF (CSIR-UGC), attended training on *Plant Genetic Engineering* during 3-17 September 2012, Madurai Kamaraj University, Madurai.

**News from ITMU**

The ITMU has awarded a non exclusive license to Mr. Tom C. Antony, a nutmeg grower and owner of Cheripurath Nursery, Chengalam, Kottayam, Kerala for propagation of and sale of IISR Viswashree nutmeg grafts and budded plants. IISR Viswashree is an elite nutmeg variety developed by Mr. B. Krishnamoorthy, Dr. J. Rema and Mr. P. A. Mathew.



Dr. M. Anandaraj, Director awarding the License to Mr. Tom C. Antony. Also seen Mr. B. Krishnamoorthy, Head Crop Improvement and Dr. Sheeja TE., Member Secretary, ITMU.

**News from Library**

Three issues of the electronic version of 'AGRI titbits' were published. The scope of digital institutional repository *Dspice* was widened with more institute publications. Forty three CeRA requests were catered online and received 5 articles as print/online. A demonstration of Mendeley Institutional Edition was arranged on 8 August 2012 for HDs and Library committee members. Around 57 external users and 1270 internal users made use of the library facilities.

**Hindi Saptah**

Hindi Saptah was celebrated during 17-22 September 2012. Dr. M. Anandaraj, Director, IISR, Calicut, presided over the inaugural function. During the week, various literary competitions were conducted in Hindi for the staff and Dr. H. C. Joshi, Director (OL), ICAR,

New Delhi, the chief guest of valedictory function, distributed prizes to the winners. The official language magazine of the Institute, *Masaloon ki Mehak*, was also released on this occasion.

### **National group meeting of AICRP on Spices**

XXIII Workshop of All India Coordinated Research Project on Spices (AICRPS) was held at IISR, Kozhikode during 29 September to 1 October 2012. The national group meeting was inaugurated by Dr. Umesh Srivastava, ADG (Hort), ICAR. In his inaugural address he stressed the need for concerted efforts to guard against biopiracy of spices germplasm, urban horticulture for food and nutritional security, varieties resistant to biotic and abiotic stress for different agro ecological zones of the country and climate change and green chemicals for crop management. Dr. M. Anandaraj, Director, IISR, Calicut, Dr. V. A. Parthasarathy, Emeritus Scientist and former Director, IISR, Calicut, Dr. Balraj Singh, Director, NRCSS, Ajmer and Dr. K. Nirmal Babu, Project Coordinator (AICRPS) also addressed the gathering.

The Group meeting (XXIII Workshop) was attended by nearly 100 spice research workers across the country. The workshop deliberated on the progress made in 12 mandate crops under the coordinated project and prioritized research areas for the next five year plan period. The workshop identified eleven technologies on spices production and management for transfer to extension agencies and ten high yielding varieties of spices for Central/State release. Dr. S. Edison, Former Director, CTCRI, Trivandrum & the First Project coordinator, AICRPS, chaired the plenary session.



## हिन्दी अनुभाग

संस्थान में राजभाषा कार्यान्वयन समिति की बैठक डा. एम. आनन्दराज, निदेशक की अध्यक्षता में 4 अगस्त 2012 को संपन्न हुई। बैठक में राजभाषा कार्यान्वयन की गतिविधियों का निरीक्षण तथा भविष्य के लिये लक्ष्य निर्धारित किये गये। संस्थान में 14 सितम्बर को हिन्दी दिवस तथा हिन्दी सप्ताह 17 से 22 सितम्बर 2012 तक आयोजित किया गया। हिन्दी

सप्ताह के उद्घाटन समारोह में डा. एम. आनन्दराज निदेशक ने हिन्दी में अधिक कार्य करने के लिये शपथ दिलायी तथा अधिकारियों तथा कर्मचारियों से राजभाषा का सम्मान तथा उसका अधिकाधिक उपयोग का आह्वान किया। इस अवधि में विभिन्न हिन्दी प्रतियोगितायें जैसे अनुशीर्षक लेखन, हिन्दी अक्षर से शब्दों का लेखन, स्मृति परीक्षण, अनुच्छेद पठन एवं लेखन, आशु भाषण, गीत, अन्ताक्षरी, टिप्पणी एवं मसौदा लेखन आदि आयोजित की गयी। हिन्दी सप्ताह का समापन समारोह 22 सितम्बर 2012 को संपन्न हुआ जिसमें डा. हरीश चन्द्र जोशी, निदेशक; राजभाषा, भारतीय कृषि अनुसंधान परिषद मुख्य अतिथि थे। इस समारोह में मुख्य अतिथि ने संस्थान की राजभाषा पत्रिका मसालों की महक के प्रथम अंक का विमोचन किया तथा उन्होंने विभिन्न प्रतियोगिताओं के विजेताओं को पुरस्कार वितरण किये। इस अवसर पर उनके द्वारा वर्ष 2011.12 में राजभाषा कार्यान्वयन के लिये कर्मचारियों को राजभाषा पुरस्कार से भी सम्मानित किया गया।



दिनांक 24 सितम्बर 2012 को नगर राजभाषा कार्यान्वयन समिति की अर्धवार्षिक बैठक में श्री. बी. कष्णमूर्ति, प्रभागाध्यक्ष, फसल सुधार प्रभाग, डा. राशिद परवेज़, वरिष्ठ वैज्ञानिक एवं हिन्दी अधिकारी तथा सुश्री. एन. प्रसन्नकुमारी, हिन्दी अनुवादक ने भाग लिया तथा बैठक में डा. राशिद परवेज़ ने संस्थान की राजभाषा कार्यान्वयन रिपोर्ट प्रस्तुत की। पंजाब नेशनल बैंक, कोषिकोड में 12 जुलाई 2012 को यूनिकोड पर आयोजित कार्यशाला में श्रीमती. एन. प्रसन्नकुमारी ने भाग लिया। रिपोर्टाधीन अवधि काल में मसालों की महक, अनुसंधान के मुख्य अंश 2011.12 तथा मसाला समाचार; अप्रैल-जून 2012 को प्रकाशित किया।

### **News from SARANI**

SARANI, organized the Annual Club Day and Onam celebrations on 25 August 2012. As a part of the celebration, *Pookkalam* competition and variety entertainment programmes were conducted and prizes were distributed to the winners. Dr. S. Devasahayam, Head, (Crop protection) distributed SARANI Merit Awards to the children of the staff

who secured the highest grade in the 10<sup>th</sup> Std, CBSE and SSLC examinations held during the years 2011 and 2012.

### **Distinguished visitors**

Dr. H.P. Singh, Former DDG (Hort.), 7 August 2012.

Dr. Harish Chandra Joshi, Director (OL), ICAR, New Delhi, 22- September 2012.

Dr. Umesh Srivastava, ADG (Hort.), 29 September 2012.

Dr. S.K. Malhotra, Principal Scientist, ICAR, New Delhi, 29 September 2012.

Dr. Balraj Singh, Director, NRCSS, Ajmer, 29 September 2012.

## **Transfer of Technology**

### **Technology inputs and Advisory services from ATIC**

A total of 234 farmers availed advisory services from ATIC. The institute participated in Emerging Kerala-2012, the Global Investors Meet organized by the Kerala State Industrial Development Corporation held at Kochi, during 12-14 September. The institute represented a pavilion showcasing technologies developed by the Institute. During the quarter 526 students visited the center on study tour.

### **Training of extension functionaries**

Twenty five persons were trained on *Garcinia* butter extraction at CHES, Chettalli.

## **Krishi Vigyan Kendra**

### **Front Line Demonstration**

- Demonstration of HYVs of black pepper in 4 farmers' plots.
- Production of quality seed materials of ginger variety, *IISR Varada*, in 10 farmers' plots.
- Production of quality seed materials of turmeric variety, *IISR Prabha*.

### **On Farm Testing**

- Assessment of performance of high quality fodder grass, *Thumpurmuzhi-1*, in upland condition
- Induction of flowering in Oloor mango through paclobutrazol application combined with INM and IPM in 5 farmers' fields in Aroor, Calicut.

## **Publications**

### **Research Papers**

Jayashree E, Visvanathan R & John Zachariah T 2012 Quality of dry ginger (*Zingiber officinale*) by different drying methods. Journal of Food Science and Technology. DOI 10.1007/s13197-012-0823-8. Published on line on 5-9-2012.

Pervez R, Eapen S J, Devasahayam S & Jacob T K 2012 Efficacy of some entomopathogenic nematodes against insect pests of ginger and their multiplication. Nematologia Mediterranea 40 (1): 39-44.

Pervez R, Leela N K & Eapen S J 2012 Nematicidal activity of *Strychnos nuxvomica* leaf and its constituents against the *Radopholus similis* infesting black pepper (*Piper nigrum* L.). Current Nematology, 22 (1 & 2): 49-53.

Sangeetha K, Rosana O B & Eapen S J 2012 EST secretome analysis of *Radopholus similis* nematode. Online Journal Bioinformatics 13(1): 103-119.

Simi Mohan, Utpala Parthasarathy, Asish G R & Nirmal Babu K 2012 Evaluation of genetic stability of micropropagated plants of three species of *Garcinia* using random amplified polymorphic DNA (RAPD) and inter simple sequence repeat (ISSR) markers. Indian Journal of Biotechnology 11: 341-343.

Utpala Parthasarathy, Nandakishore O P, Senthil Kumar R, Nirmal Babu K, Zachariah T J & Parthasarathy V A 2012 Chromatographic fingerprinting and estimation of organic acids in selected *Garcinia* species. International Journal of Innovative Horticulture. 1(1): 68-73.

### **Papers presented in symposia/ seminars/ workshops/ conferences**

Viral disease of black pepper - diagnosis and management. In: National Workshop Cum Training on technologies for organic spice production in the humid tropics, College of Agriculture, KAU, Padannakkad, 2 July 2012 (Bhat A I).

Transcriptomics approaches for gene discovery in Plants - a case study in *Piper*. Agri-2012, International Conference on Agricultural & Horticultural Sciences, Hyderabad International Convention Center, India, 14-15 September 2012 (Johnson George K, Vijesh Kumar I P & Anandaraj M).

Loop mediated isothermal amplification and its application in detection of pathogens. Lecture delivered at the ICAR sponsored short course, CPCRI, Kasaragod, 22 September 2012 (Bhat A I). The following research papers were presented in 6<sup>th</sup> International Symposium on the family *Zingiberaceae*, Calicut University, 10-13 September 2012:

## Plenary lecture

Biotechnological interventions for crop improvement in *Zingiberaceous* crops – Ginger, Turmeric and Small cardamom (Nirmal Babu K)

## Oral presentation

Barcoding – a tool to discriminate economically important Indian *Curcuma* (*Zingiberaceae*) species (Parvathy A, Swetha V P, Sheeja T E & Sasikumar B).

Chemoprofiling of a few Indian *Curcuma* (*Zingiberaceae*) species based on volatile oil components (Syamkumar S & Sasikumar B).

Identification of novel conserved microRNAs from ginger (*Zingiber officinale*) by EST based comparative genomic (Santhi R, Keerthi T R & Sheeja T E)

Isolation and characterization of NBS-LRR-resistance genes in *Zingiber officinale* and *Curcuma amada* (Karthika R, Suraby E J, Prasath D & Anandaraj M).

Molecular characterization of *Curcuma* species (*Zingiberaceae*) using 18S rRNA sequence (Syamkumar S & Sasikumar B).

Next generation sequencing for understanding plant pathogen interaction in *Zingiberaceae* (Prasath D & Anandaraj M).

Turmeric in Indian religion and tradition (Sasikumar B).

Variation in the essential oil profile of fresh and dried rhizomes of ginger and turmeric (Leela N K, Hamza S, Vipin T M & Sasikumar B).

## Poster presentation

Cloning pal gene fragments from turmeric (*Curcuma longa* L.) using degenerate primers (Shamina Azeez, Rahul P R & Sheeja T E).

Evaluating the antimicrobial properties of *Curcuma amada* against phytopathogens (Karthika R, Prasath D, Suseela Bhai R, Leela N K & Anandaraj M).

Genetic diversity analysis of popular varieties and cultivars of turmeric (*Curcuma longa*, *Zingiberaceae*) using ISSR/RAPD markers (Syamkumar S & Sasikumar B).

Ginger (*Zingiber officinale*) occurs in the wild? (Sasikumar B, Saji K V & Prasath D).

Influence of flowering on yield and quality in turmeric (*Curcuma longa* L.), (Kandiannan K, Anandaraj M, Utpala Parthasarathy, Thankamani C K & John Zachariaiah T).

'Prathibha' – A high yielding open pollinated progeny variety of turmeric (Sasikumar B, Prasath D & Saji K V).

## Books

Pervez R & Prasannakumari N 2012 Masaloon ki Mehak, IISR, Calicut, pp. 74.

## Book chapters

Devasahayam S & Jacob T K 2012 Root mealybugs-Emerging insect pests of black pepper (*Piper nigrum*). In: Thomas S K (Ed.) Beneficial and Harmful Insects of Indian Sub-continent (pp. 50-57). LAMPERT Academic Publishing, Germany.

## Extension pamphlets

### Manoj P S

Vilakalku samrakshanamekan *Pseudomonas* Kumil rogangalkethirae *Trichoderma*

## Popular Articles

Hamza S & Srinivasan V & Dinesh R 2012 Turmeric for Health and Wealth. Haritha Bhoomi (Malayalam), 3(4): 26-27.

Manoj P S & Arumuganathan T 2012 Vazhayude ennam kootti kooduthal varumanam, Karshakasree, September, 18(19): 12.

Manoj P S & Arumuganathan T 2012 Vazhakalku tonic banana special. Karshakan, September, 20(9): 32.

Pervez R 2012 Suttrakrimi ki samasya evam samadhan. Malabar Jyoti, 13-15.

Pervez R & Eapen S J 2012 Masaloon mein sutrkrimiyoon ki samasya evam samadhan. Masaloon ki Mehak, 38-40.

Pervez R 2012 Masaloon ke aushdiya gun. Masaloon ki Mehak, 67-68.

Utpala Parthasarathy, Asish G R, Nandakishore O P & Parthasarathy V A 2012 Garcinia Butter-ideal confectionary oil with multipurpose uses. Food marketing and technology (Indian Edn.) 3(2):19-22.

## Lectures delivered

### Ankegowda S J

*Scientific cultivation of black pepper*, Kodagu Women Coffee awareness group, Kushalnagar, 5 September 2012.

*Cardamom, ginger and black pepper agronomic practices* for Gardeners' training programme of CHES, Chettalli, 7 and 13 September 2012.

*Scientific cultivation of black pepper* for farmers from Wayanad Coffee Growers association, 21 September 2012.

### Biju C N

*Cultivation practices of black pepper*, Training programme for gardeners, IHR & CHES, Chettalli, 7 September 2012.

### Jacob T K

*Pest and disease management in black pepper*, Mass campaign on pepper cultivation in Wayanad, Panamaram, Wayanad, 3 July 2012.

*Black pepper technologies and control of quick wilt*, Karnataka Planter Association Meeting, Bengaluru, 27 September 2012.

**John Zachariah T**

*Variability in flavouring constituents in major spices – important information for RTE industry*, Global Symposium on RTE foods – Addressing challenges in the value chain in the food processing industry, Hotel Taj Gateway, Ernakulam, 25 September 2012.

**Praveena R**

*Cultivation Practices of Cardamom*, Training programme for gardeners, IIHR & CHES, Chettalli, 10 September 2012.

**Santhosh J Eapen**

*Tips on scientific writing and communication*, Training for research fellows, IISR, Calicut, 16 August 2012.

*Next Generation Sequencing & Data Analysis*, ICAR sponsored Short Course on Application of Bioinformatics for Crop Improvement and Disease Diagnostics, CPCRI, Kasaragod, 22 September 2012.

**Radio Talk****Prakash K M**

Bush pepper for cultivation in homesteads, AIR, Calicut, 19 September 2012.

**New Appointment**

Name	Designation	w.e.f
Dr Suma Mohan S	Research Associate	06.09.2012
Sri Muneeb A M	SRF	16.07.2012
Sri Rahul P Raj	JRF	10.08.2012
Ms Habeeba N T	JRF	04.09.2012
Ms Aparna Pradeep S	Lab Assistant	25.07.2012

**Promotion**

Name	Designation	w.e.f
Smt N Prasannakumari	Technical Officer T-6	29.06.2011
Sri H C Rathish	Driver T-3	16.06.2009
Sri T C Prasad	Driver T-3	29.06.2011
Sri T R Sadasivan	JTA T-3	29.06.2011

**Resignation**

Name	Designation	w.e.f
Mrs Nazia Sherif	Programme Assistant (T3)	13.07.2012



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भारतीय कृषि अनुसंधान परिषद

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