



IIHR

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NEWS

Volume 35, No. 2

www.iihr.ernet.in

APRIL - JUNE, 2014

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From Director's Desk

According to a Credit Analysis and Research Limited (CARE) ratings report on Indian pesticide industry, it is estimated in 2009 that India loses approximately 18% of crop yield valued at Rs 90,000 crore due to pest attacks each year. Losses due to insect pests in Indian agriculture have been estimated from time to time and found that the losses in post-green revolution era have shown an increasing trend than in the pre-green revolution era. The 4th National Agrochemicals Conference 2014 recommended banning those pesticides which are hazardous to biodiversity. The crop loss due to pest may vary from 15 to 30 per cent depending upon the crop, climate and its change, crop growing situations and in some cases it may even go up to 50 per cent or more causing enormous loss to the farmers. While use of chemical pesticides has been the answer to manage these pests and bring down the loss considerably to low levels, misuse, over use and indiscriminate use of pesticides has led to problems of pesticide resistance, pest resurgence, and contamination of different components of the environment apart from many health hazards to humans and animals. The gradual rise in the exports of pesticides from India can be mainly because of gradual shift in production base of high pollutant chemicals from United States and European countries to developing countries in Asia. Further, successful new technologies in manufacture of pesticides coupled with low cost, advantaged India in the last few years to become one of the major pesticide producing countries in the world. The severity of pest problems has been changing with the developments in agricultural technology and modifications of farming practices. Anecdotal evidences also indicate rise in the losses, despite increasing use of chemical pesticides. At the same time, there is a rising public concern about the potential adverse effects of chemical pesticides on the human health, environment and biodiversity. This has resulted in search for alternative methods for pest management in crops. Plant protection research in the National Agriculture Research System has generated many technologies and came out with a new strategy which is often referred to as 'Integrated Pest Management (IPM)'. Biological control of pests, a component of IPM, using a host of bio-control agents like predators and micro-organisms holds enormous potential and promise in the changing scenario of pest complex in various crops, more particularly in horticultural crops. IPM can provide better pest control and crop economics than the conventional chemical control. Special emphasis is being given to this new field of research at IIHR, Bengaluru, integrating several factors including those related to development and dissemination of technology and also socio-economic, institutional and policy issues. The IIHR, Bengaluru has already developed and standardized a good number of technologies for many horticultural crops and a few have been commercialized which have shown better pest control and crop production economics than the conventional chemical control methods. Some of these technologies have even been granted patents in India and abroad. I am sure, in the coming years these technologies would definitely yield better monetary benefits to the farmers apart from reducing harmful effect of chemical pesticides to the ecosystem.

(T. Manjunatha Rao)

EVENTS

Mango Diversity Fair

The Institute organized a Mango Diversity Fair under the UNEP-GEF Project on Conservation and Sustainable Use of Cultivated & Wild Tropical Fruit Diversity: Promoting Sustainable Livelihoods, Food Security and Ecosystem Services at its campus on June 03, 2014. Dr. Srinath Dikshit, Zonal Project Director, Directorate of Transfer of Technology, Bengaluru was the Chief Guest and Dr. S. B. Dandin, Formerly Vice Chancellor and Dr. B. Raju, Vice Chancellor (Acting), UHS, Bagalkot were the Guests of Honour. Dr. Manjunatha Rao, Director, IIHR, Bengaluru presided over the event. Work done under the project were presented by Dr. M.R. Dinesh for Chittoor site, Dr. Vasudev for Sirsi site and Dr. S.K. Singh for Pusa site. Dr. B. Raju felicitated five farmers as “custodians of genetic diversity” for maintaining indigenous mango varieties in their orchard. Dr. Lingaiah, Dean, Post Graduate and Research Center, Bengaluru campus, UHS, Bagalkot released flyers entitled, ‘Traditional practices of mango growing at Chittoor’ and ‘Indigenous varieties of mango’ brought out on this occasion.



The felicitated custodian farmers along with the guests

Dr. Srinath Dikshit inaugurated Mango Diversity Fair arranged on this occasion. More than 300 unique varieties maintained by the Division of Fruit Crops, IIHR, Bengaluru were exhibited. One hundred and sixty indigenous varieties viz., Appemidi, suitable for pickling from the Western Ghat region were also displayed. In addition, certain coloured indigenous varieties and value added products of mango were also displayed by six KVKs and NGO representatives. An interaction meeting between the farmers and scientists was also organized in which problems faced by the farmers in the production of quality mango fruits were dealt with.

National Seminar in Hindi

The Institute organized a National Seminar in Hindi on *Khadya evam Poshan Suraksha Mein Krishi Vigyan evam Proudhyogiki Ki Bhumika* (Role of Agricultural Science and Technology in Food and Nutritional Security) during June 04-05, 2014. The main objective of the seminar was to encourage writing and presenting scientific papers in Hindi by the staff of different ICAR institutes.

Prof. Anand Das Gupta, Indian Institute of Plantation Management, Bengaluru was the Chief Guest and inaugurated the seminar on June 04, 2014 under the Chairmanship of Dr. T. Manjunatha Rao, Director, IIHR, Bengaluru. A technical bulletin in Hindi entitled, ‘IIHR Utkrishtatha Ki Or’ (IIHR - A journey towards excellence) was released on the occasion.

A total of 30 papers were presented in five sessions during the seminar. Scientists and technical staff of IIHR, Bengaluru, Indian Agricultural Research Institute, New Delhi, Directorate of Groundnut Research, Junagarh, Gujarat, Central Institute for Cotton Research, Nagpur, Maharashtra, Central Inland Agricultural Research Institute, Port Blair, Indian Institute of Spices Research, Calicut, Kerala, Central Research Institute for Dry land Agriculture, Hyderabad, Central Inland Fisheries Research Institute, Bengaluru, Krishi Vigyan Kendra, Hirehalli and Indian Space Research Organization, Bengaluru participated in the seminar. During the seminar 10 best paper awards were distributed. Dr. A. Murugan, CIARI, Port Blair, Dr. Anil Kumar Mishra, IARI, New Delhi, Dr. Punit Mohan, CICR, Nagpur, Dr. M. Loganandhan, KVK, Hirehalli, Dr. Rashid Parvez, IISR, Calicut, Dr. Rajiv Kumar, Smt. V. Radhika, Dr. G. Senthil Kumaran and Dr. B. Narayanaswamy, IIHR, Bengaluru and Smt. Pratima Pandey, NARC, Kathmandu, Nepal were among the awardees.



Inauguration of the seminar by lighting the lamp

83rd Institute Joint Staff Council (IJSC) Meeting

The 83rd IJSC meeting was held at IIHR, Bengaluru under the Chairmanship of Dr. T. Manjunatha Rao, Director, on June 11, 2014. Dr. M. R. Hegde, Chairman, RMCU, Sh. Charles Ekka, Senior Administrative Officer, Sh. P. Balabrahmaiah, Chief Finance & Accounts Officer, Sri R.N. Pandey, Garden Superintendent, Sri Tittu Kumar, Member Secretary (Official side) participated from office side while Shri A.N. Lokesh, Secretary IJSC, Shri S.M.A. Ahmed, CJSC member, Shri S. Hanumantharayappa, Shri P.T. Mahanthesh, Shri. T.S. Rajanna, Shri Shivarudrappa, Shri D. Krishnappa and Shri N. Hanumanthappa, members represented staff side. Addressing the members, the Chairman, highlighted the importance of IJSC for the welfare of staffs in the Institute and requested the members to come forward to discuss problems of general nature being faced by staff or any pending issue. Shri Tittu Kumar, Member Secretary, official side initiated the proceedings of the meeting with all the members of IJSC.



Dr. T. Manjunatha Rao addressing the IJSC

Action taken points of last meeting and new agenda items were discussed in detail.

Review of 4th NABMGR Meeting

The Institute hosted the meeting of Directors of all institutes under the Horticulture Division (SMD) of ICAR, New Delhi convened by DDG (HS), ICAR, New Delhi on May 30, 2014 at its campus to review the action taken on the recommendations made for horticulture during the 4th NABMGR meeting held at NBAII & IIHR, Bengaluru. Dr. Rekha Choudhary representing NBPGR, New Delhi gave a brief presentation about the mandate of the National Advisory Board on Management of Genetic Resources.



Dr. N.K. Krishna Kumar addressing the participants

Dr. N. K. Krishna Kumar, DDG (HS), ICAR, New Delhi addressing the participants presented issues related to horticultural plant genetic resources and informed that XII plan EFC of Crop Science Division has allocated Rs. 1.5 crores to establish clonal repositories for horticultural crops in CITH, Srinagar and NBPGR, Hyderabad. Regarding collections of germplasm from outside India, he appreciated the efforts made by the pomegranate breeder/curator at IIHR, Bengaluru in introducing 132 accessions through NBPGR and appealed to all the institutes under Horticulture SMD to collaborate with NBPGR to collect germplasm from outside India and solicited proposals for introducing trait specific PGR for processing with other ministries. He also requested NBPGR to identify one person exclusively for each crop linking with one nodal PGR scientist at each institute. Institute wise action taken

report on the recommendations of the 4th meeting of NABMGR held during October 2013 was discussed with the Directors of the respective institute and finalized for presentation at the 5th NABMGR meeting to be held at NBPGR, New Delhi on June 16-17, 2014. A total of 22 horticultural research institutes under the Horticulture SMD of ICAR participated in the review meeting.

Review Meeting of DUS Workers

The Institute organized Review meeting of all DUS workers to discuss administrative and scientific matters related to DUS testing in horticultural crops under the Chairmanship of Dr. T. M. Rao, Director at IIHR, Bengaluru on June 12, 2014. The meeting was attended by Dr. R. R. Hanchinal, Chairperson, PPV & FRA, New Delhi, Dr. R. C. Agrawal, Registrar General, PPV & FRA, New Delhi and Drs. K. Madhavi Reddy, T. H. Singh, N. Mohan, T. S. Aghora, B. Varalakshmi, M. Pichaimuthu, E. S. Rao, M. R. Dinesh, B. N. S. Murthy, Sampath Kumar, Vasugi, C., Ashwath, C., Lakshman Reddy, Meenakshi Srinivas, Tejswini, Dhananjaya and Sujatha Nair.

World Environment Day 2014

The KVK, Hirehalli celebrated World Environment Day 2014 on the theme 'Small Islands and Climate Change' with the official slogan for the year 2014 'Raise Your Voice Not The Sea Level' at Siddaganga High School near KVK, Hirehalli on June 05, 2014. Amla seedlings from KVK were distributed to the students and planted in the school campus.

CHES-Industry Interaction Meet

The CHES, Bhubaneswar organised Industry Interaction Meet in association with IIHR, Bengaluru on June 30, 2014. Dr. T. Manjunatha Rao, Director, IIHR, Bengaluru inaugurated the Meet. Mr. S. K. Chaddha, Director, Directorate of Horticulture (DoH), Govt of Odisha, Dr. S. S. Nanda, Dean, Directorate of Extension Education, OUAT, Bhubaneswar and Dr. S. C. Panwar, NHB, Bhubaneswar graced the Meet. Addressing the participants Dr. Manjunatha Rao appealed to the participants to take benefit of technologies. Dr. A. Krishnamoorthy, Chairman, ITM & CPC, IIHR, Bengaluru briefed the participants about the Meet and its relevance for popularization of the IIHR/CHES technologies among the



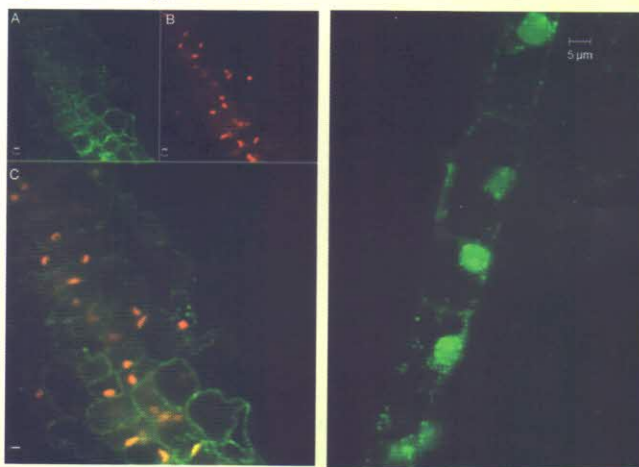
Publication being released during the meet

RESEARCH

New Finding

Cytobacts and Peribacts: The ubiquitous intracellular colonizing endophytic bacteria

Investigations into the source of tissue culture contaminants in different horticultural species where the shoot tip is generally employed as the explant material brought out the ubiquitous presence of bacterial endophytes in various plant parts surviving largely in a non-cultivable form. The term endophyte is used to describe microorganisms that colonize plants internally without any apparent adverse effects on the host, often present in fewer numbers primarily colonizing the intercellular region in roots. Staining the tissue sections of different banana cultivars with the Live-Dead bacterial staining kit containing SYTO-9 coupled with confocal laser scanning microscopy (CLSM) has brought out abundant bacterial colonization along the cell boundary (Fig. left - A, B, C.). Further investigations adopting bright field microscopy on fresh tissue sections as well as cell, callus and protoplast preparations after proper cell permeabilization treatments showed abundant live intracellular bacteria (Fig. right). This is the first record of documentation that the plants harbor abundant endophytic bacteria inside healthy cells as living entities. There are two niches of intracellular colonization viz., cytoplasmic dwellers and inhabitants in the perispace between cell wall and plasma membrane. The terms 'Cytobacts' and 'Peribacts' respectively, have been coined to describe the organisms in the above two niches. These observations have considerable implications in basic plant biology and agricultural applications.



Left: (A) SYTO-9 stained green fluorescing bacteria along the cell peri-space (B) nuclear staining by propidium iodide (C) superimposed image Right: Enzyme permeabilized banana leaf-sheath tissue showing green fluorescing cytoplasmic bacteria with SYTO-9 staining.

Varieties/Technologies Identified

The variety and technology identification committee (VTIC) of the Institute has identified the following varieties/technologies for release.

farmers. Dr. H. S. Singh, Head, CHES, Bhubaneswar briefed about the horticultural technologies of CHES, Bhubaneswar. A total of 17 entrepreneurs who participated in the deliberations signed "Letter of Interest". An exhibition was also put up to display the horticultural technologies developed by IIHR, CHES and RC-CTCRI. Two publications viz., Technologies of IIHR - A Glimpse and Technologies of CHES and CHES - A Glimpse were released on the occasion.

Quarterly Meeting of OLI, CHES, Bhubaneswar

CHES, Bhubaneswar organized the second quarterly meeting (April-June) of Official Language Implementation on June 30, 2014 under the Chairmanship of the Dr. T. Manjunatha Rao, Director, IIHR, Bengaluru and Co-chairmanship of Dr. H. S. Singh, Head, CHES, Bhubaneswar. Dr. Deepa Samant, Chairperson, Hindi Cell, CHES, Bhubaneswar presented the agenda items for discussion. Mrs. Suvasini Pradhan, Personal Assistant and Mr. Banshidhar Mohapatra, AF&AO presented the quarterly report on the progressive use of Official language at the Station. The Director, IIHR, Bengaluru appreciated the initiatives taken by the Station to achieve the targets prescribed in the annual programme of the Dept. of Official language, Govt. of India.

World Veterinary Day

The KVK, Gonikoppal and Dept. of Animal Health and Veterinary Services, Kodagu jointly organized World Veterinary Day at its campus on April 26, 2014. Shri. T. B. Jayachandra, Minister for Veterinary Science, Govt. of Karnataka, the Chief Guest on the occasion inaugurated the Veterinary Day. Addressing the gathering Shri. Jayachandra highlighted the need for conservation of local breeds of livestock for incorporation of disease resistance and for better prosperity in the livestock sector in the state. Dr. Narasimhan, an ornithologist and wild life photographer gave a guest lecture on the occasion. Dr. P. C. Tripathi, Principal Scientist and Head, CHES, Chettalli, Dr. K. P. Aiyappa, Deputy Director, Department of AH&VS, Smt. Sri Vidya, Chief Executive Officer, Zilla Panchayath were also present on the occasion. A total of 65 district veterinary practitioners participated in the program.



Shri T. B. Jayachandra inaugurating the Veterinary Day

- Two mango hybrids H12 and H14 from the parentage Amrapali x Arka Anmol were identified for release by the VTIC of the Institute. These hybrids have a strong tendency for regular bearing and are semi-vigorous. The fruits are medium sized with an average weight of 230-250 g. The shape of the fruit resembles Arka Anmol and the pulp quality is towards Amrapali. The TSS is 21-22°B and pulp is deep yellow colored. The fruits have excellent keeping quality.



Mango hybrid H12

Other Achievements

Powdery mildew resistant lines in bottle gourd: Two lines viz., IIHR-8 (PDI-9.9) and IIHR-77 (PDI-10.0) and two lines IIHR-3 (PDI-17.4) and IIHR-19-1 (PDI-12.2) have been identified as resistant and moderately resistant respectively from the germplasm pool. These lines can be used as resistant source in the breeding programs for the development of powdery mildew resistant bottle gourd varieties.



Powdery mildew resistant bottle gourd germplasm, IIHR-8 (background) and the highly susceptible germplasm, IIHR-25 (foreground)

Cleft grafting of Passion fruit for multiplication of healthy plants: Passion fruit vines are usually propagated by stem cuttings. These cuttings produce roots profusely and become ready for planting within three months. Passion fruit plants raised from cuttings face problems of higher infection of *Phytophthora* root rot under high temperature and high humidity conditions. Almost 30 to 80 percent plants die within two years of planting. To avoid these problems, an experiment was



conducted at CHES, Chettalli to find out suitable time and method for grafting of passion fruit on comparatively tolerant yellow passion fruit rootstock. It was observed that cleft grafting of passion fruit variety Kaveri (scion) on yellow passion fruit root stock gave higher success in rainy season with highest success (75%) in the month of September. Lower success (30 %) was reported in March month. It was concluded that cleft grafting in the month of September is suitable for multiplication of grafting of passion fruit under Coorg conditions.

Fructification in Shimeji mushroom (*Hypsizygus tessulatus*):

Fructification was obtained in a new culinary medicinal mushroom called Shimeji mushroom (*Hypsizygus tessulatus*). This mushroom is not yet cultivated in India due to non-availability of commercial production technology and spawn. The Mushroom laboratory, IIHR, Bengaluru has successfully obtained fructification on sterile paddy straw, paddy straw powder and sawdust at 15±2°C for both white and brown forms. This will further bring about diversity of Indian mushroom industry.



Brown and white Shimeji mushrooms

HUMAN RESOURCE DEVELOPMENT

Post Graduate Research and Education

IIHR Scientist as Chairman/Co-chairman/External Examiner

1. Dr. Sudhakar Rao, D.V. acted as an external expert for the thesis of Ms. Pushkala Ramachandran, Ph. D student, Department of Home Science, Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, Ananthapur, Andhra Pradesh on April 18, 2014.
2. Dr. Narayana, C. K. conducted student's *viva voce* for the Post Graduate degree at Gandhigram Rural University, Dindigul on May 01, 2014.
3. Dr. Sankar, V. acted as external examiner for final *viva voce* examination of Ph. D. student, Department of Vegetable Crops, Horticultural College and Research Institute, TNAU, Coimbatore on May 08, 2014.
4. Dr. Rajasekharan, P. E. was nominated as Chairman of the Adjudication Committee of Ph.D student, Jayakrishnan, G. for the thesis entitled "Autoecological studies on the river mangrove *Aegiceras corniculatum* (L.) Blanco in Kerala", Mahathma Gandhi University Kottayam, Kerala.
5. Dr. Rajasekharan, P. E. was nominated as Member Ph. D Adjudication Committee of the following thesis of the students;

- Ravikumar, P. - Ethno-agricultural practices of Kurichiyar, Mullakuruman, Thachanaden Muppen and Wayanadan Chetti of Wayanad district, Kerala, Mahatma Gandhi University, Kottayam, Kerala.
- Archana, C. P. - Scaling up of microtubule and microtubule technology for disease free planting material production in ginger and turmeric, Kannur University.
- Binoy Jose - Induction of genetic variation through *in vitro* methods in *Pumpkin rosea* L., Kannur University.
- Krishna Kumar, G.- Phyto-pharmacological and tissue culture studies on *Ophiorrhiza prostrata* D. Don, Kerala University.
- 6. Dr. Madhavi Reddy, K. evaluated Ph. D. (Hort.) thesis entitled "Exploitation of heterosis for growth, earliness, yield and resistance to bacterial wilt in brinjal (*Solanum melongena* L.)" submitted by Ms. Syed Sadarunnisa to Dr. YSR University of Horticulture Sciences, Tadepalligudem, Andhra Pradesh.
- 7. Dr. Madhavi Reddy, K. evaluated M.Sc. (Hort.) thesis entitled "Morphological Characterization and evaluation of jack bean (*Canavalia ensiformis* (L.) DC.) genotypes for yield and quality characters" submitted by Ms. Pradeepthi Lenkala to Dr. YSR University of Horticulture Sciences, Tadepalligudem, Andhra Pradesh.
- 8. Dr. Girija Ganeshan acted as a member in M.Sc student's final qualifying colloquium of Mr. Bharathkumar, V., UHS, Bengaluru on June 10, 2014.
- 9. Dr. Rajasekharan, P. E. was nominated as Co-chairman/member for two students of M.Sc., Horticulture, College of Horticulture, Mudigere, University of Horticultural Science, Shimoga.
- Drs. Prabhakar, M., Loganathan, N., Ramesh, P. R., Prashanth, J. M., Jagadish, K. N. and Hanumante Gouda, B. - Workshop on horticulture development, IAT, Bengaluru, April, 24-25, 2014.
- Dr. Narayana, C. K. - Interactive conference of the Vice Chancellors and Directors convened by Secretary, DARE & DG, ICAR at NASC Complex, New Delhi, April 28, 2014.
- Dr. Singh, H. S. - 1st Technical support group meeting of MIDH under OHDS, Director of Horticulture, Bhubaneswar, April 28, 2014.
- Dr. Narayana, C. K. - EFC meeting of CRP on water management, Krishi Bhavan, New Delhi, April 29, 2014.
- Dr. Sudhakar Rao, D.V. - One day workshop regarding ripening of mango organized by Department of Horticulture, Government of Karnataka, Shimoga, April 29, 2014.
- Dr. Narayana, C. K. - XXIV meeting of ICAR Regional Committee No. VIII, Trivandrum, May 02-03, 2014.
- Mr. Prabhakar, B. - Annual review workshop of KVKs, CMFRI, Cochin, May 05-08, 2014.
- Dr. Sudhakar Rao, D.V. - Workshop on potentials of processing and value addition in agro/dairy/poultry and fish products, State Planning Commission Chennai, Government of Tamil Nadu, May 08, 2014.
- Drs. Doreyappa Gowda, I.N. and Sudhakar Rao, D.V. - Seminar on production technology, post-harvest management, processing and marketing of mango organized by the SADH, ZP, Nanjangud and JSS Krishi Vigyan Kendra, Suttur, Mysore, May 13, 2014.
- Drs. Sulladmath, V. V. and Dinesh, M. R. - *Krishi Jayanthi* (Agriculture Fair) organized by Swarnavalli Krishi Prathisthana, Sondha, Uttara Kannada, May 13, 2014.
- Dr. Sulladmath, V. V. - International symposium on jackfruit (*Artocarpus heterophyllus*) and bread fruit (*Artocarpus altilis* Fosberg) of the tropics: genetic diversity, management, value addition and marketing strategies, UAS, Bengaluru, May 15, 2014.
- Dr. Murthy, B. N. S. - ICAR-DAC interface meeting, New Delhi, May 15-16, 2014.
- Dr. Singh, H. S. - State level research council meeting-2014, OUAT, Bhubaneswar, May 20, 2014.
- Drs. Ravindra, V., Upreti, K. K., Shivashankara, K. S., Tripathi, P. C., Singh, H. S. and Kundan Kishore - National seminar-cum-workshop on physiology of flowering in perennial fruit crops organized by Society for Development of Sub tropical Horticulture, CISH, Lucknow, May 24-26, 2014.
- Dr. Srinivas, P. - National symposium on plant pathology in genomic era, IGKV, Raipur, Chhatisgarh, May 26-28, 2014.

Completion of Degree

- Ms. Prathibha, G. student, M.Sc (Hort.), UHS, Bagalkot completed her thesis entitled "Extraction and quantification of lycopene from tomato peel (*Solanum lycopersicum* L.) cv. Arka Rakshak and its utilization for value added products" under the supervision of Dr. Narayana, C. K.

Participation in Seminar/ Symposium/Conference/ Meeting etc.

The following scientists participated in various national and international seminar/symposium and conference/workshop/meeting etc.

- Dr. Thomas Pious - Indo-German workshop, Department of Microbiology, IARI, New Delhi, April 07-10, 2014.
- Dr. Panneerselvam, P. - National conference on productivity and sustainability: role of agriculturally important microorganisms, UAS, Bengaluru, April 10-12, 2014.
- Dr. Ganeshan, S. - Focal group meeting on NBA related matters, NAARM, Hyderabad, April 14, 2014.

- Drs. Narayana, C. K., Sangeetha, G. and. Deepa Samant - Global conference on technological challenges & human resources for climate smart horticulture: issues & strategies, Navsari Agricultural University, Navsari, May 28-31, 2014.
- Drs. Manjunatha Rao, T., Narayana, C. K., Tiwari, R. B., Tripathi, P. C., Nair, A. K., Sudhakar Rao, D.V., Rajiv Kumar, Achalapariurna, Bhuvanewari, S., Senthil Kumaran, G., Carolin Rathinakumari, A., Loganandhan, N. and Jagadish, K. N. - National seminar in Hindi on the role of agricultural science and technology in food and nutritional security, IIHR, Bengaluru, June 04-05, 2014.
- Drs. Manjunatha Rao, T., Pitchaimuthu, M. and Mr. Chandra Prakash, M. K. - Impact of capacity building programs under NAIP, jointly organized by NAIP, ICAR and IFPRI, NAAS Complex, New Delhi, June 06-07, 2014.
- Dr. Sankar, V. - One day workshop on policy dialogue on future of coffee based economy of Kodagu organized by Agricultural Scientists Forum of Kodagu in association with Coorg Planters Association, Madikeri and ISEC, Bengaluru, Coorg International Hotel, Madikeri, Coorg, June 07, 2014.
- Dr. Saju George - Three day sensitization training program on technology management in agriculture, NAARM, Hyderabad, June 09-11, 2014.
- Dr. Singh, H. S. - National conference on mango production, improvement, post-harvest management and trade, BAU, Sabour, Bhagalpur, Bihar, June 10, 2014.
- Drs. Manjunatha Rao, T. and Ganeshan, S. - Fifth meeting of the National Advisory Board on management of genetic resources organized by NBPGR, New Delhi, June 16, 2014.
- Drs. Doreyappa Gowda, I.N. and Sudhakar Rao, D.V. - Workshop on post-harvest technologies in mango for processing and export organized by the Department of Horticulture, Government of Andhra Pradesh in association with APEDA, Hyderabad, Chittoor, June 17, 2014.
- Dr. Ganeshan, S. - Institute research council meeting of CIARI, Port Blair, Andaman, June 19-20, 2014.
- Dr. Saju George, Prabhakar, B. and Dr. Suresh, S. C. - TSP review meeting, CHES, Chettalli, June 21, 2014.
- Dr. Sangeetha, G. - One day LANSA-MSSRF workshop on using Google to track and improve research impact, DRWA, Bhubaneswar, Odisha, June 23, 2014.
- Drs. Madhavi Reddy, K., Varalakshmi, B., Pitchaimuthu, M., Singh, T. H., Bharathi, L. K. and Ganeshan, S. - XXXII Group meeting of All India Coordinated Research Project on Vegetable Crops, IGKV, Raipur, Uttaranchal, June 24-27, 2014.
- Dr. Tripathi, P. C. - Institute management committee meeting of IIHR, Bengaluru, June 27, 2014.
- Dr. Singh, H. S. - 22nd meeting of ICAR Regional Committee, CIFRI, Barrackpore, Kolkata June 27-28, 2014.
- Dr. Ganga Visalaskhy, P. N. - 23rd Bio- control workers group meeting on biological control of crop pests, OUAT, Bhubaneswar, June 27-28, 2014.
- Drs. Gajanana, T. M. and Venugopalan, R. - Brainstorming session on monitoring and evaluation of agricultural research, education and extension for development (AREE4D), jointly organized by NAAS and ISEC, ISEC, Bengaluru, June 28, 2014.
- Dr. Senthil Kumaran, G. - Tenth meeting of agriculture and food processing equipments sectional committee, FAD 20, as a Primary Member, BIS, New Delhi.

Special Lectures/ Talks Delivered

- Dr. Tiwari, R.B. delivered a Technical talk in Hindi on "Swathya vardak khadya padarthon ka badta bazar" at the Indian Institute of Sciences, Bengaluru on June 06, 2014.

TRANSFER OF TECHNOLOGY

Training

At IIHR, Hesaraghatta

The Division of Extension and Training in association with other divisions of the Institute organized the following training programs.

Sl. No	Title of the training	Dates	No. of participants
1.	Refresher programme on mushroom cultivation at Shreeramanahalli, Rajanagunte (off campus).	10.04.2014	94
2.	Production technology of custard apple hybrid- Arka Sahan for the farmers of Jalna, Maharashtra.	22.04. 2014	14
3.	Orientation program on mushroom production at KVK, Senapati, Manipur (off campus training).	13-14.05.2014	120

Sl. No	Title of the training	Dates	No. of participants
4.	Improved vegetable production technology for the farmers and officers of Chikkaballapura.	20-21.05.2014 24-25.06.2014 27-28.06.2014	30 30 28
5.	Entrepreneurship development through mushroom spawn production and mushroom cultivation.	05-13.06.2014	23
6.	Post-harvest handling and processing of fruits and vegetables for the farmers of Manipur.	17-22.06.2014	25

At CHES, Chettalli

CHES, Chettalli organized the following training programs at the Station during the period.

Sl. No	Title of the training	Dates	No. of participants
1	Skill up-gradation and input distribution to tribal farmers.	28.04, 16.05, 02.06, 09.06, 11.06, 2014	400
2	Integrated nematode management in fruit crops and vegetables.	15.05.2014	15

At CHES, Bhubaneswar

Three Days Training on Commercial Vegetable Cultivation

CHES, Bhubaneswar organized a three days training program on 'Commercial Vegetable Cultivation' at the Station during April 23-25, 2014. Twenty farmers from NAIP project area of Keonjhar district participated.

At KVK, Gonikoppal

Upgrading the knowledge of different stakeholder viz., farmers, farm women, rural youths and extension functionaries in agriculture and its allied fields is one of the mandates of the Krishi Vigyan Kendra. During the period, 16 training programs were conducted in different disciplines for the benefit of 196 farmers and 352 farm women. A total of 548 participants were benefited from these need based trainings.

Discipline	No. of trainings	No. of participants		Total
		Male	Female	
Horticulture	02	108	34	142
Home science	02	-	58	58
Livestock	05	34	184	218
Plant protection	07	54	76	130
Total	16	196	352	548

Apart from this KVK, Gonikoppal organized two on campus training programs for the "District Bhoochetana Farmers Facilitators" in collaboration with the Department of Agriculture, Govt. of Karnataka and ICRISAT, Hyderabad on May 13-17 and May 20-24, 2014 benefiting 75 farmers facilitators.

At KVK, Hirehalli

The KVK, Hirehalli organized one on campus two off campus and one sponsored training programs as given below;

- On campus training on mushroom cultivation, June 19, 2014, 12 people participated.
- Off campus training on post-harvest technology in mango at Neralapura, Tumkur, May 15, 2014 and on natural resources management at Vaddarahalli, Tumkur, May 24, 2014, 50 and 17 people participated respectively.
- Sponsored program on plantation crops management, UAS, Bengaluru, May 28, 2014, 17 people participated.

Field Days / Campaigns/Awareness programs etc.

Mango Field Day

The CHES, Bhubaneswar organized a Mango Field Day on May 18, 2014 at its station with an objective of strengthening the public understanding on varietal diversity, fruit quality, marketing channel and related aspects. About 100 participants from ICAR (CRRI, CIFA, CTCRI, and DWM), state departments, mango growers, mango lovers, farm women and consumers attended the program. In his inaugural speech, Sh. A. Chandra, Special Secretary, Govt. of Odisha, Chief Guest on the occasion highlighted the importance of mango in health and income and called upon the farming community to avail government schemes and technical support from CHES, Bhubaneswar to take up mango plantation at their fields. Dr. H. S. Singh, Head, EHES, Bhubaneswar briefed about the research activities of the Station. Dr. B. N. Sadangi, Head, CRRI emphasized the effective dissemination of horticultural technology, especially for farm women. Dr. Kundan Kishore highlighted the importance of maturity indices and mango maturity methods with ethylene gas. Dr. Srinivas described the post-harvest management of mango for quality and better shelf life. An exhibition showcasing mango diversity in the region was organized on the occasion.

Field Day on Brinjal Shoot and Fruit Borer

The Institute organized a field day on Bio-intensive management of brinjal shoot and fruit borer at HD Kote, Mysore on June 16, 2014 under the DST-SSTP project "Development and dissemination of bio-intensive management of brinjal shoot and fruit borer, *Leucinodes orbonalis* in Karnataka and transfer of technology on mass production of *Trichogramma chilonis* at farmer's level.

Field Demonstrations

The Division of Extension and Training took up the following field demonstrations at various places in the farmers' fields.

Sl. No.	Title of Demonstrations	Locations	No. of Demos
1.	Prevention of spongy tissue with 'Arka Saka Nivarak', an environment safe formulation of IHR, Bengaluru.	Ratnagiri, Belgaum, Dharwad, Mysore, Doddaballapur, Gouribidanur	6 Nos.
2.	Tomato hybrid-Arka Rakshak and CRT's in tomato cultivation.	Kolar, Chikkaballapura Bengaluru	6 Nos.
3.	IPM in vegetable crops.	Bengaluru rural, Kolar, Chikkaballapura	10 Nos.
4.	IPM in brinjal.	Hosahallipalya, Agrahara	2 Nos.
5.	IPM in bhendi.	Hosahallipalya, Agrahara	2 Nos.
6.	Varietal interventions and cultural practices of China aster.	Pammanahalli, Gollarahatti, Hirehalli	6 Nos.

- Apart from this KVK, Gonikoppal took up one OFT on IISR ginger var. Varada for assessing yield and quality at Kunda and Hathur villages of Virajpet taluk of Kodagu district and two FLDs viz., INM in banana (Grand Naine) using micro nutrient formulation (Arka Banana Special) of IHR, Bengaluru in two villages of Sowmwarpet taluk of Kodagu district and INM in black pepper using micro nutrient formulation (Pepper Special) of IISR, Calicut in three villages.

Field Visits/Surveys

- Dr. Sankar, V. and Prashanth Kumar, G. M. made seven exploration visits during the period to Thiayagadur, Canoncadu, Hebbategiri, Mandalpatti, Sreemangala, Kurchi, Siddapur, Kandakarai and Chiklihole areas, Rasalpur and Dubare forests of Kodagu and Kushal nagar areas for collection of carmabola, avocado, Kommepannu, Kakkade pannu, mango, jamun and kokam germplasm.
- Drs. Tripathi, P. C., Sankar, V. and Ms. Shilpasri visited Subramanaya Estate, Suntikoppa, Kaodagu to give technical advice on vegetable cultivation and pest management on April 18 and May 03, 2014.
- Dr. Narayana, C. K. visited the fields of chrysanthemum at Tharati and Ajjihalli, Koratagera taluk, Tumkur district for assessment of unmarketable wastes & PHL of chrysanthemum on May 23, 2014.
- Dr. Narayana, C. K. visited banana field at Navsari to observe and study the contract farming for export of banana (Grand Naine) and packhouse operations of M/s. Desai Fresh Exports on May 30, 2014.
- Dr. A. Carolin Rathinakumari and Shri. P. Dayanda visited Dibburhalli village of Chikkaballapur (Tk.) to demonstrate animal drawn onion seeder developed by IHR, Bengaluru on June 11, 2014.
- Drs. Meera Pandey and Senthil Kumaran visited KVK, Gonikoppal in connection with establishment of mechanized spawn production laboratory on June 17-18, 2014.
- Dr. Narayana, C. K. visited Alpine Wineries and Grape orchards, Kaveri Valley, off Mysore Road to see the grape orchards and the wine making process on June 20, 2014.
- Drs. Suryanarayana, M. A. and Hima Bindu, K. visited betelvine fields and interacted with the growers in Haluvalli and Bettgere villages of Mudigere (Tq) on June 25, 2014.
- Drs. Sadashiva, A. T., Hebbar, S. S., Singh, T. H. and Kashinath, B. L. visited the five acres plot of triple disease resistant F1 hybrid of tomato, Arka Rakshak of Mr. M. Babu, a progressive farmer at Hennagara Village, Aneka Taluk, Bengaluru to offer suggestions for better crop management during June 2014.

TV/Program

The following television programs on various aspects of horticulture were given by the scientists of the Institute.

Sl. No.	Topic	Channel	Date	Resource person
1.	Mango harvesting technology.	Doordarshan, Bengaluru	16.04.2014	Prasanth, J. M.
2.	Management of important horticultural crops during summer.	Doordarshan, Bengaluru	23.04.2014	Narayanaswamy, B.
3.	Production and management of sapota.	Doordarshan, Bengaluru	07.05.2014	Prasanth, J. M.
4.	Inter Zonal Cross Learning visit to KVK Hirehalli & NICRA village.	Doordarshan, Bengaluru	15.05.2014	Report
5.	Mango harvester and its usage.	Doordarshan, Bengaluru	28.05.2014	Narayanaswamy, B.
6.	Cause and prevention technology of spongy tissue in Alphonso mango.	Doordarshan, Bengaluru	05.06.2014	Ravindra, V.
7.	Mango low cost ripening chamber - IIHR technology.	Doordarshan, Bengaluru	05.06.2014	Jagadish, K. N.
8.	Recent advances in cultivation of black pepper.	Coorg channel	05.06.2014	Prabhakar, B.
9.	Mango ripening in the field Neralapura, Tumkur.	Doordarshan, Bengaluru	06.06.2014	Jagadish, K. N.
10.	Plant protection in pepper cultivation.	Coorg channel	08.06.2014	Veerendrakumar, K.V.
11.	Importance of vaccination (F&M, HS) in animals.	Coorg channel	12.06.2014	Suresh, S.C.

Radio talks

The following radio talks were given by the staff of IIHR, Bengaluru.

Sl. No.	Topic	Date	Resource person
1.	Okra cultivation.	26.05.2014	Pitchaimuthu, M.
2.	Management of soil, water and nutrient in drought situation (Radio Siddhartha).	17.06.2014	Ramesh, P. R.
3.	Integrated pest and disease management in horticultural crops of Tumkur district(Radio Siddhartha).	17.06.2014	Hanumanthe Gowda, B.
4.	Dryland horticulture technologies. (Radio Siddhartha).	17.06.2014	Prasanth, J. M.
5.	Seed production and other important activities during drought. (Radio Siddhartha).	17.06.2014	Somashekhar
6.	Improved varieties of brinjal.	18.06.2014	Singh, T. H.
7.	Advanced production technology and improved varieties of chilli.	19.06.2014	Madhavi Reddy, K
8.	Leafy vegetable varieties released by IIHR, Bengaluru and their production technology.	20.06.2014	Varalakshmi, B.
9.	Pea cultivation and varieties.	23.06.2014	Mohan, N.
10.	Tuberose cultivation.	30.06.2014	Meenakshi Srinivas

Exhibitions

The Institute and its regional stations organized/participated in the following exhibitions

Sl. No.	Event	Place and date
1.	Workshop on Horticulture Development.	IAT, Bengaluru, 24-25.04.2014
2.	Eastern Zone Regional Agricultural Fair - 2014(CHES, Bhubaneswar).	Adivasi Ground, Bhubaneswar 24-26.05.2014
3.	Mango Diversity Fair.	IIHR, Bengaluru, 03.06.2014

Technology Transfer

Farm Mechanization

The Section of Agricultural Engineering fabricated and supplied the following machineries developed by the Institute:

1. One animal drawn onion seeder for demonstration at Mahali, Ludhiana.
2. Five animal drawn onion seeder for demonstration at Chitradurga.
3. 240 Nos. of mango harvesters for the farmers of Chittoor area.
4. 200 Nos. of mango harvesters for the farmers of Bhubaneswar.

Tribal Sub-plan on Promotion of Horticulture for Tribal Livelihood (TSP)

Under the Tribal Sub-Plan, CHES, Bhubaneswar distributed critical inputs like plastic crates-2600, IIHR Mango Special - 1600 kg, farm tools-250 sets, mango harvester-600, nursery kits-29 sets, mango fruit fly trap-6000, sprayers with protective cloths-30 sets and pesticides among the beneficiaries to disseminate the feasible technologies and to make the cultivation more profitable. Out of 550 beneficiaries, 350 tribal farmers harvested about 160 tonnes of mango variety Amrapali. The average fruit weight was 250g and TSS was 22°B. There was negligible incidence of fruit fly and anthracnose. Most of the produce was sent to Bhubaneswar for sale with the help of HARPAL

Commercialization of Technologies

- The Arka Microbial Consortium and the fungal cultures used for preparation of fermented cocopeat have been licensed to the Department of Horticulture, Government of Karnataka and M/s Bloom Biotech, Chikmagalur respectively on a non-exclusive basis.
- Four fruit based RTS beverage technologies viz., RTS of Amla, Jackfruit, Kokum and Banana were transferred and Licensed to Mr. Naveen Hegde of M/s. ITOR FOODS, Hulgola, Sonda Cross, Sirsi, Uttar Kannada, Karnataka.
- The technology on mass production of *Trichogramma chilonis* was transferred to Mr. B. Hanumanthagowda, SMS, KVK, Hirehalli under the DST _ SSTP project

“Development, dissemination of bio-intensive management of brinjal shoot and fruit borer, *Leucinodes orbonalis* in Karnataka and transfer of technology on mass production of *Trichogramma chilonis* at farmer’s level.

Revenue Generated by Mushroom Laboratory

An amount of Rs. 4, 14,175/- revenue was generated by Mushroom laboratory through sale of spawn (Rs. 3,02,345/-), RTF bags (Rs. 6930/-) and training (Rs. 1, 04,900/-).

Sale of IIHR Technological Products through ATIC

The technological products of IIHR viz., Banana Special, Mango Special, Vegetable Special, Citrus Special, Trichorich-N, *Pseudomonas fluorescens*, *Paecilomyces lilacinus*, Microbial Consortium, Pongemia Soap, Neem Soap, Sealer cum Healer, Vegetable fruit fly traps and lures, Institute Publications, VCDs and DVDs, Vegetable Seeds Kit & Sample Packets, PHT products, Sapota, Mango and Lime Harvesters etc. were sold through the ATIC, IIHR, Bengaluru to the visiting farmers and general public and generated a revenue of Rs. 9, 87,461-00

General Visitors

- A total of 394 farmers, 629 students and 33 others/officers visited the Institute at Hesaraghatta, Bengaluru. The visitors were taken round the Institute farm and laboratories and the activities and achievements of the Institute were explained to them by the staff of Division of Extension and Training.
- A total of 471 farmers from 14 different places in Odisha, Andhra Pradesh and Tamil Nadu sponsored by nine different organizations / agencies / NGO's, 30 trainees from PD Watershed, Keonjhar, Odisha and 72 students from OUAT, Bhubaneswar visited CHES, Bhubaneswar for exposure in horticultural technologies.
- A total of 1125 farmers from Karnataka, Kerala, and Tamil Nadu visited CHES, Chettalli for exposure in horticultural technologies, planting material and consultancy services.

PUBLICATIONS

Research Papers

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- Biswajit Mondal, Loganandhan, L. and Raizada, A. (2014). Meteorological drought and coping strategies by small and marginal farmers in semi-arid Karnataka. *Ind. J. Soil Conservation*, **42**(1):54-61.
 - Chethana, B. S., Girija Ganeshan, Archana, S. Rao and Bellishree, K. (2013). Bioefficacy of botanicals, bioagents and fungicides against purple Bbotch of onion. *Environ. Ecology*, **31** (2B):947-952.
 - Hanumanthaiah, R., Venugopalan, R., Gowda, D. M., Padmini, K., Manjunath, V., Mallikarjuna, G. B. and Thippeswamy, S. (2014). Statistical models for evolving crop-logging technique in brinjal. *Ind. J. Agri. Sci.*, **84**:665-668.
 - Khangarakpam, G., Kumar, R., Seetharamu, G. K., Rao, T. M., Dhananjaya, M. V., Venugopalan, R. and Padmini, K. (2014). Seed setting studies in China aster (*Callistephus chinensis* (L.) Nees). *Prog. Agric.*, **14**(1):189-191.
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 - Krishnamurthy S. L., Madhavi Reddy, K. and Mohan Rao, A. (2013). Genetic variation, path and correlation analysis in crosses among Indian and Taiwan parents in chilli (*Capsicum annuum* L.). *Veg. Sci.*, **40** (2):210-213.
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 - Mohapatra, S., Veena, S.S., Pandey, M. and Deepa, M. (2012). Biodegradation of gammahexachlorocyclohexane by various *Pleurotus* Species. *Pesticide Res. J.* **24**(2): 212-216.
 - Muttappanavar, R. D., Sadashiva, A. T., Vijendrakumar, R. C., Roopa, B.N. and Vasantha, P.T. (2014). Combining ability analysis of growth, yield and quality traits in cherry tomato (*Solanum lycopersicum* var. Cerasiforme). *Molecular Pl. Breeding*, **5**(4): 18-23.
 - Muttappanavar, R. D., Sadashiva, A. T., Vijendrakumar, R. C., Vasantha, P.T. and Geeta, S.V. (2014). Assessment of quality and bio-chemical traits of parents and F₁ hybrids of Cherry tomato (*Solanum lycopersicum* var. Cerasiforme). *Green farming* **5**(3):408-410.
 - Nanje Gowda, N.A. and Senthil Kumaran, G. (2014). Design and development of a hot water paddy straw pasteurizer for mushroom cultivation. *Agricultural Mechanization in Asia, Africa and Latin America*, **45**(2):11-18.
 - Rajiv Kumar and Yadav, D.S. (2013) Evaluation of gerbera genotypes for cut flower quality under polyhouse. *Crop Improv.* **40**(1):98-100.
 - Rama Krishna, K. and Sudhakar Rao, D. V. (2014). Effect of chitosan coating on the physiochemical characteristics of guava (*Psidium guajava* L.) fruits during storage at room temperature. *Ind. J. Sci. Techno.* **7**(5):12-16.
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- Narayana, C. K. (2014). Technological challenges in post-harvest management of horticultural crops. *In: Shodh Chintan* (Eds. A.K.Srivastava, Babita Singh, N.L.Patil, Timur Ahlawat, Alka Singh), ASM Foundation, New Delhi & Jain Irrigation Systems Pvt. Ltd. Jalgaon.

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Proceedings/Abstracts/Souvenir

- Tripathi, P. C. and Karunakaran, G. (2012). *Bharat main alpa upyogi uposhna katibandhiya phalon ki kheti ki sambhawanayain* (Hindi). pp.33-36. Souvenir, Hindi Seminar, IIHR, Bengaluru.

PAPERS PRESENTED IN SEMINAR/ SYMPOSIUM/CONFERENCE ETC.

Indo-German Workshop, Department of Microbiology, IARI, New Delhi, April 07-10, 2014.

- Thomas, P. - The intra-plant ecosystem of bacterial endophytes.

National Conference on Productivity and Sustainability: Role of Agriculturally Important Microorganisms, UAS, Bengaluru, April 10-12, 2014.

- Panneerselvam, P., Prajwala, M., Sneha, P., Sindhu, B.L., Saritha, B., Poovarasana, S. and Ganeshamurthy, A. N. - *Actinobacteria*- a potential bio-control agent against banana wilt causing *Fusarium oxysporum* f. sp. *cubense*.
- Panneerselvam, P., Selvakumar, G. and Ganeshamurthy, A. N. - Arka microbial consortium for sustainable vegetable production.
- Saritha, Panneerselvam, P., Sindhu, B. L., Sneha, P., Prajwala, M., Poovarasana, S. and Ganeshamurthy, A. N. - Bio-control potential of *Streptomyces* sp against plant pathogenic *Alternaria solani*.

One Day Workshop on Ripening of Mango Organized by Department of Horticulture, Government of Karnataka, Shimoga, April 29, 2014.

- Sudhakar Rao, D.V. - Low cost ripening of mango.

Workshop on Potentials of Processing and Value Addition in Agro/Dairy/Poultry and Fish Products, State Planning Commission, Chennai, Government of Tamil Nadu, May 08, 2014.

- Sudhakar Rao, D.V. - Conversion of horticulture processing waste into wealth.

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- Doreyappa Gowda, I. N. - Value added products from mango.

- Sudhakar Rao, D. V. - Post harvest management of mango.

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- Murthy, B. N. S. - Production technologies recommended for tropical fruit crops.

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- Dinesh, M. R.- Differential scope of molecular / traditional breeding for regularity in bearing habit of fruit crops.
- Geetha, G. A., Shivashankara, K.S. and Reddy, Y. T. N. - Varietal variations in bisexual and male flower production response to time of flowering in mango.
- Kundan Kishore -Temporal variation in flowering behavior and sex expression in mango under tropical humid climate of Odisha.
- Ravindra, V. - Physiological signals, environmental cues and their interactions for introduction of flowering in perennials – lessons for mango.
- Singh, H. S. - Incidence of mango malformation in coastal region of India.
- Tripathi, P. C., Jayanthimala, B. R., Sunanda, S. and Sankar, V. - Studies on flowering pattern of Coorg Mandarin as influenced by changing climatic conditions.
- Tripathi, P. C., Sankar, V., Jayanthimala, B. R., Sunanada, S. and Karunakaran, G. -Studies of flowering behavior of avocado accessions under humid tropical conditions of Coorg region.
- Upreti, K. K. - Regulatory roles of phytohormones and carbohydrates of flowering in mango.

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- Srinivas, P. - Incidence of post-harvest diseases in different mango varieties in coastal Odisha.

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- Deepa Samant - Effect of *in situ* rain water harvesting and mulching on growth and yield of guava variety Arka Amulya.
- Narayana, C. K. - Challenges in post-harvest management and loss reduction in horticultural crops.
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- Doreyappa Gowda, I. N. - Processing and value addition in mango for better profits.

National Hindi Seminar on Role of Agricultural Science and Technology in Food and Nutritional Security, IIHR, Bengaluru, June 04-05, 2014 2014.

- Achala Paripurna - Recently released varieties/hybrids in fruits and vegetables from IIHR.
- Bhuvanewari, S., Senthil Kumaran, G. and Narayana, C. K. - Design and development of storage box for shelf life extension of coriander leaves.
- Jagadish, K. N., Hegde, M. R. and Saju george - *Aam mein fal makhi ke niyantran hetu feromon jaal ki upyogita.*
- Jagadish, K. N., Hegde, M. R. and Amarananjundeshwara, H.- *Aam ka seedha vipnan: kisanon ke fayde.*
- Loganandhan, N., Jagadish, K. N. and Shankara, M. H. - *Jalvayu parivarthan ke daur mein krishi vividheekaran ke madhyam se mahila sashaktikaran.*
- Narayanaswamy, B., Hegde, M. R. and Saju George – PTD - a sustainable innovative method.
- Rajiv Kumar, Dhananjaya, M. V., Sridhar, V. and Sriram, S. - *Gerbera Ki Sanrakchit Krishi.*
- Rajiv Kumar, Manjunatha Rao, T. and Janakiram, T. - *Arka Aadya and Arka Archana: China aster Ki Nai Kisme.*
- Senthil Kumaran, G., Carolin Rathinakumari, A. and Dayananda, P. - Design and development of animal drawn onion seeder.
- Tripathi, P. C. and Sankar, V. - *Kokam vans ke paundhon ka arthik aur ausadhiya mahatva.*
- Sudhakar Rao, D. V. - *Falon ko krithrim roopse pakane sahi vidhi.*
- सुधाकर राव, डी.वी. - अलग-अलग सिकोड़कर आवरित करने के द्वारा फलों व सब्जियों की भण्डारण अवधि बढ़ाना एवंताजगी का अनुरक्षण.

DUS Review Meeting, PPV&FRA, New Delhi, June 12, 2014.

- Vasugi, C. - DUS progress on papaya.

One Day Workshop on Post-Harvest Technologies in Mango for Processing and Export Organized by the Department of Horticulture, Government of Andhra Pradesh in Association with APEDA, Hyderabad, Chittoor, June 17, 2014.

- Doreyappa Gowda, I. N. - Processing and value addition in mango.

- Sudhakar Rao, D. V. - Post-harvest management aspects of mango.

National Conference on Challenges and Opportunities for Production and Supply Chain of Pomegranate Organized by UHS, Bagalkot at Bagalkot, June 17-19, 2014.

- Murthy, B. N. S. - Breeding on pomegranate.

XXXII Group Meeting of AICRP on Vegetable Crops, IGKV, Raipur, June, 24-27, 2014.

- Madhavi Reddy, K. - Progress of hybrid trials of chilli, capsicum & cole crops 2013-14.

HONOURS/RECOGNITIONS/AWARDS

- IIHR, Bengaluru has been awarded first prize of the prestigious “RAJARSHI TONDON RAJBHASHA AWARD” for the year 2012-13 for implementing the Official Language Policy of Govt. of India effectively at the Institute in the category of ‘C’ region. Dr. C. K. Narayana, Director received the award in a function organized at ICAR, New Delhi, April 28, 2014.
- Team led by Dr. Abraham Verghese along with Dr. P. D. Kamala Jayanthi, Dr. T. N. Shivananda has been selected for the Biotech Product & Process Development and Commercialization Award for the year 2014 by Ministry of Science & Technology, DBT, New Delhi.
- A research paper entitled “Intense association of non-culturable endophytic bacteria with antibiotic-cleansed *in vitro* watermelon and their activation in degenerating cultures by Thomas, P. and published in Plant Cell Rep. (30: 2313-2325) has been awarded the Excellent Research Paper for 2013-14 from the Vision Group on Science and Technology (VGST), Dept of IT, BT and Science & Technology, Govt. of Karnataka. The award carries a cash prize of Rs. 25,000/- and a citation, and the same was presented to him by Shri. Siddaramaiah, Hon. Chief Minister of Karnataka and Bharat Ratna Prof. CNR Rao, at the VGST-Award function at the Indian Institute of Science, Bengaluru, June 16, 2014.
- A research paper entitled ‘Variability in capsaicinoid content and phylogenetic analysis of AT3 and Acyltransferase gene in chilli (*Capsicum annuum* L.) by Naresh, P., Madhavi Reddy, K., Krishna Reddy, M. and Ravishankar, K. V. has been awarded Harbhajan Singh Award for Best Research Paper by Indian Society of Vegetable Science for the year 2012.
- A research paper entitled “Bio-control potential of *Streptomyces* sp against plant pathogenic *Alternaria solani*” by Saritha, B., Panneerselvam, P., Sindhu, B. L., Sneha, P., Prajwala, M., Poovarasan, S. and Ganeshamurthy, A.N. was awarded Best Research Paper at the National Conference on Productivity and Sustainability: Role of Agriculturally Important Microorganisms at UAS, Bengaluru, April 10-12, 2014.
- A research paper entitled “Effect of *in situ* rain water harvesting and mulching on growth and yield of guava variety ‘Arka Amulya’ in eastern India” by Deepa Samant *et al.* was awarded the Best Paper Award, at the Global conference on technological challenges and human resources for climate smart horticulture-issues and strategies at NAU, Navsari, Gujarat, India, May 28-31, 2014.
- A research paper entitled “Design and development of animal drawn onion seeder” by Senthil Kumaran, G., Carolin Rathinakumari, A. and Dayananda, P. was awarded First prize for the oral presentation in the National Hindi Seminar on the Role of Agricultural Science and Technology in Food and Nutritional Security at IIHR, Bengaluru, June 04-05, 2014.
- A research paper entitled “PTD - a sustainable innovative method” by Narayanaswamy, B., Hegde, M. R. and Saju George was awarded Best paper in the National Hindi Seminar on the Role of Agricultural Science and Technology in Food and Nutritional Security at IIHR, Bengaluru, June 04-05, 2014.
- A research paper entitled “*Jalvayu parivarthan ke daur mein krishi vividheekaran ke madhyam se mahila sashaktikaran*” by Loganandhan, N., Jagadish, K. N., and Shankara, M. H., was awarded second prize in the National Hindi Seminar on the Role of Agricultural Science and Technology in Food and Nutritional Security at IIHR, Bengaluru, June 04-05, 2014.
- A research paper entitled “*Krishi mein data mining ka prayog*” by Radhika, V. was awarded second prize in the National Hindi Seminar on the Role of Agricultural Science and Technology in Food and Nutritional Security at IIHR, Bengaluru, June 04-05, 2014.
- A research paper entitled “*Arka Aadya and Arka Archana: China aster Ki Nai Kisme*”, Rajiv Kumar, Manjunatha Rao, T. and Janakiram, T. was awarded second prize in the National Hindi Seminar on the Role of Agricultural Science and Technology in Food and Nutritional Security at IIHR, Bengaluru, June 04-05, 2014.
- A research paper entitled “Biochemical characterization of oxidative burst during interaction between *Solanum lycopersicum* and *Fusarium oxysporum* f. sp. *lycopersici*” by Sudhamoy Mandal *et al.* has been adjudged as “Most Cited Article” in Physiological and Molecular Plant Pathology (Scopus).
- Certificate of Excellence in Reviewing has been awarded to Dr. Sudhamoy Mandal, by Physiological and Molecular Plant Pathology (a reputed Elsevier journal) in recognition of an outstanding contribution to the quality of the journal. Only awarded once a year to a small hand-picked selection of reviewers, as identified by the journal Editors and Editor-in-Chiefs.
- Dr. Narayana, C. K. was elected as Fellow of National Academy of Biological Sciences, Chennai.

- Dr. Madhvi Reddy, K. has been conferred Fellow 2014 of Indian Society of Vegetable Science (ISVS), Varanasi.
- Dr. Selvakumar, G. has been selected as an Associate of the National Academy of Agricultural Sciences w.e.f. 01-01-2014.
- Dr. Meera Pandey was nominated as a member of the Organizing Committee of the 8th International Conference on Mushroom Biology and Mushroom Products to be held during November 19-22, 2014 at New Delhi.
- Dr. Rajasekharan, P. E. was nominated as a Member of the Advisory Committee of the Community Agro biodiversity Resource Center in the meeting held at STEC-JNTBGRI Campus, Puthenthope, Kazhakuttam, April 07, 2014.
- Dr. Narayana, C. K. chaired Technical Session -12 (Innovations in shelf life enhancement, value addition and marketing) & the Plenary Session during the Global Conference on Technological Challenges in Climate Smart Horticulture, NAU, Navsari, Gujarat, May 28-30, 2014.
- Dr. Narayana, C. K. served as Chairman of Technical Session & Member of Judging Panel during the National Hindi Seminar on The Role of Agricultural Science & Technology in Food and Nutritional Security, IIHR, Bengaluru, June 04-05, 2014.
- Dr. Ganeshan, S. acted as Co-chairman of Technical Session on Management of Genetic Resources in Vegetables at the XXXII Group Meeting of All India Coordinated Research Project on Vegetable Crops, IGKV, Raipur, Uttaranchal, June 24-27, 2014.
- Dr. Shivashankara, K. S. acted as Rapporteur for a session on Physiological and biochemical basis of environmental regulation of flower induction at the National Seminar cum Workshop on Physiology of Flowering in Fruit Trees, CISH, Lucknow, May 24-26, 2014.
- Dr. Singh, T. H. acted as Rapporteur for the session on Private-Public-Partnership during XXXIIAICRP (VC) Group Meeting at IGKV, Raipur, June 24-27, 2014.
- Dr. Rajiv Kumar acted as Rapporteur in Technical Session-II during the National Hindi Seminar on the Role of Agricultural Science and Technology in Food and Nutritional Security at IIHR, Bengaluru, June 04-05, 2014.

PERSONALIA

New entrant

Scientific staff

- Dr. Chakravarthy, A. K. has been appointed as Head, Div. of Entomology & Nematology at IIHR, Bengaluru w.e.f. 01.04.2014(FN).
- Mr. Nazeeb Naduthodi has been appointed as Scientist (Fruit Science) at CHES, Chettalli w.e.f. 08.04.2014.

- Ms. Linta Vincent has been appointed as Scientist (Fruit Science) at IIHR, Bengaluru w.e.f. 08.04.2014.
- Ms. Ponnamm Naresh has been appointed as Scientist (Veg-Science) at CHES, Bhubaneswar w.e.f. 09.04.2014.
- Dr. Priti S. Sonavane has been appointed as Scientist, (Pl.Patho.) at CHES, Chettalli w.e.f. 09.04.2014.
- Ms. Anushma, P. L. has been appointed as Scientist (Fruit Science) at IIHR, Bengaluru w.e.f. 08.04.2014.
- Mr. Awachare Chndrakant Madhav has been appointed as Scientist (Fruit Science) at CHES, Hirehalli w.e.f. 09.04.2014.

Selection

Scientific staff

- Dr. Saju George, Scientist(SS) has been appointed to the post of Programme Co-ordinator at KVK Gonikoppal w.e.f. 03.05.2014 (AN).

Promotion

Scientific staff

1. Dr. Varalakshmi, L. R., Senior Scientist has been promoted as Principal Scientist w.e.f. 29.09.2012.
2. Dr. Balakrishna, B. Senior Scientist has been promoted as Principal Scientist w.e.f. 13.12.2012.
3. Dr. Narayanaswamy, B. Senior Scientist has been promoted as Principal Scientist w.e.f. 26.03.2013.

Transfer

Scientific Staff

- Dr. Uma Maheshwari, Scientist (Nematology) has been transferred from CPRS, Ooty to IIHR, Bengaluru w.e.f. 02.06.2014 and posted in Div. of Entomology & Nematology.
- Dr. Manjunath, B. L., Principal Scientist has been transferred from ICAR Complex for Goa to IIHR, Bengaluru w.e.f. 02.06.2014 and posted in Div. of Soil Science & Agricultural Chemistry.
- Dr. Senthil Kumar, R. Principal Scientist (Hort-Fruits Sci.) has been transferred from Cardamom Research Centre, Appangala, Calicut to CHES, Chettalli w.e.f. 24.06.2014 (FN).

Technical Staff

- Mr. Biju, K., Sr. Tech. Asst. (Comp. Lab) has been transferred from IIHR, Bengaluru to CHES, Hirehalli w.e.f. 24.04.2014.
- Mr. Bhojappa Gowda, M., Technical Officer has been transferred from IIHR, Bengaluru to DCR, Puttur (mutual transfer) w.e.f. 07.06.2014 (AF).
- Shri. Lakshmesh, Senior Technical Officer has been transferred from DCR, Puttur to IIHR, Bengaluru w.e.f. 11.06.2014.
- Mrs. Shilpashree, V. M., Technical Assistant (Lab.) has been transferred from CHES, Chettalli to IIHR Bengaluru w.e.f. 12.06.2014.

Administrative Staff

- Mrs. Sunita Kumari, Assistant has been transferred from IIHR, Bengaluru to National Bureau of Fish Genetic Resource, Lucknow on her own request w.e.f. 01.04.2014 (FN)

Superannuation

Scientific Staff

- Dr. Chithraichelvan, R. Principal Scientist, IIHR, Bengaluru retired on superannuation from council's service w.e.f. 30.04.2014.

Technical Staff

- Mr. Appanna, H.C. T-5(T.O) (Field), CHES, Chettalli retired on superannuation from council's service w.e.f. 30.04.2014.
- Mr. Harishchandra, A.A. T-1(Field), CHES, Chettalli retired on superannuation from council's service w.e.f. 30.04.2014.
- Mr. Dasappa, TO (Field), IIHR, Bengaluru retired on superannuation from council's service w.e.f. 31.05.2014 (AN).
- Mr. Ravi, M.B. T-5(T.O) (Field), CHES, Chettalli retired on superannuation from council's service w.e.f. 31.05.2014.
- Mr. Chandrashekara, TO (Field), IIHR, Bengaluru retired on superannuation from council's service w.e.f. 30.06.2014 (FN).

Skilled Support Staff

- Mr. Venkanna, H., Skilled Support Staff, IIHR, Bengaluru retired from Council service on attaining the age of 60 years on 30.04.2014
- Mrs. Vijayalaxmi, Skilled Support Staff, IIHR, Bengaluru retired from Council service on attaining the age of 60 years on 30.04.2014.
- Mr. Chennaraju, H. K., CHES, Chettalli retired on superannuation from council's service w.e.f. 31.05.2014.

Attachment Training

The following Scientists of the Institute have been relieved from their duty to enable them to join for three months Professional Attachment Training

Sl. No	Name of the scientist	Date of relieving
1.	Mr. Nazeeb Naduthodi, Scientist (Fruit Science)	09.05.2014
2.	Ms. Linta Vincent, Scientist (Fruit Science)	09.05.2014
3.	Ms. Ponnamm Naresh, Scientist (Veg. Science), CHES, BBSR	09.05.2014
4.	Dr. Priti. S. Sonavane, Scientist (Pl. Pathol.), CHES, Chettalli	17.05.2014
5.	Ms. Anushma. P. L. Scientist (Fruit Science)	09.05.2014
6.	Mr. Awachare Chandrakant Madhav, Scientist (Fruit Science)	09.05.2014

Miscellaneous

- Dr. Manjunatha Rao, T. Principal Scientist & Head, Division of Ornamental Crops has taken over the charge of Director, IIHR, Bengaluru on acting basis w.e.f. 07.05.2014.
- Dr. Hedge, M. R. Principal Scientist has taken over charge as In-charge Head, Div. of Extension & Training w.e.f. 05.05.2014.
- Dr. Doreyappa Gowda, I.N. Principal Scientist has taken over charge as In-charge Head, Div. of Post - Harvest Technology w.e.f. 07.05.2014.
- Dr. Sulladmath, V.V. Principal Scientist has taken over charge as In-charge Head, Div. of Fruit Crops w.e.f. 31.05.2014.

VISITORS

IIHR, Hesaraghatta, Bengaluru

- Dr. N. K. Krishna Kumar, DDG (HS), ICAR, New Delhi (30.05.2014).
- Dr. Rekha Choudhary, NABMGR, NBPGR, New Delhi(30.05.2014).
- Dr. P. Manivel, Director I/C, DMAPR and PC MAPB (30.05.2014).
- Dr. Srinath Dikshit, Zonal Co-ordinator, Transfer of Technology, Bengaluru (03.06.2014).
- Dr. S. B. Dandin, Formerly Vice Chancellor, UHS, Bagalkot (03.06.2014).
- Dr. B. Raju, Vice Chancellor (Acting), UHS, Bagalkot (03.06.2014).
- Dr. Lingaiah, Dean, PG and Research Center, Bengaluru, UHS, Bagalkot (03.06.2014)
- Prof. Anand Das Gupta, IIPM, Bengaluru (04.06.2014).
- Dr. R. R. Hanchinal, Chairman, and Dr. R. C. Agarwal, Registrar General, PPV&FRA, New Delhi (12.06.2014).
- Dr. Jun Acedo, Dr. Yoonpyo and Dr. Hsin Yi, AVRDC, Taiwan (25.06.2014).
- Dr. Peter Hanson, Tomato Breeder and Dr. Lawrence, Virologist, AVRDC-the World Vegetable Center, Taiwan (26-6-2014).

CHES, Chettalli

- Dr. Lawande, K. E., Vice Chancellor, Dr. Bala Saheb Konkan Krishi Vidyapeeth, Dapoli, Maharashtra (14-15.04.2014).
- Dr. Anand Raj, Director, Indian Institute of Spices Research, Calicut, Kerala (21.06.2014).

CHES, Bhubaneswar

- Mr. A. Chandra, Special Secretary, Govt. of Odisha (18.05.2014).

- Mr. S. K. Chaddha, Director, Directorate of Horticulture (DoH), Govt of Odisha (30.06.2014).
- Dr. S. S. Nanda, Dean, Directorate of Extension Education, OUAT, Bhubaneswar (30.06.2014).
- Dr. S. C. Panwar, NHB, Bhubaneswar (30.06.2014).
- Dr. T. Manjunatha Rao, Director (A), IIHR, Bengaluru (30.06.2014).
- Nepalese delegates comprising of Senior Scientists of Department of Agriculture, Govt. of Nepal (20.05. 2014).

KVK, Hirehalli

- Dr. P. Manivel, Director I/C, DMAPR and PC MAPB (29.05.2014).
- Mr. Jaspreet Sidhu, Consultant, Advisory Services and Mr.T. Sayooj, M/S Ernst & Young Co., Bengaluru (27.05.2014).
- One hundred and fifty students from Maruti Vidya Kendra, Tumkur (30.05.2014).

- Dr. Prabhu Kumar, ZPD Zone I, Ludhiana & Dr. Y. G. Prasad, Coordinator, TDC of NICRA, CRIDA, Hyderabad and Principal Scientists of ZPD I & ZPD VIII. (12.05.2014).
- Dr. Prabhu Kumar, ZPD, Zone I, Ludhiana, Dr. H.S. Dhaliwal, Dean, PAU, Ludhiana, Dr. Keshava, Principal Scientist, ZPD Zone I, Ludhiana and team of 20 Programme Co-ordinators from Zone I (13.05.2014).
- Dr. A. R. Sadananda, Maize Seed Systems Specialist for South Asia & Dr. B.S.Vivek, Maize Breeder from International Maize and Wheat Improvement Centre (CIMMYT) (08.05.2014).
- Dr. D. L. Maheshawar, Director, Dept. of Horticulture, Govt. of Karnataka, Dr. Eshwarappa & Dr. Prabhakar, Consultants to Dept. of Horticulture (24-25.04.2014).

KVK, Gonikoppal

- Mr. T. B. Jayachandra, Minister for Veterinary Science, Govt. of Karnataka (26.04.2014)

For further details contact:

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Published by : Director, IIHR, Hesaraghatta Lake Post, Bengaluru-560 089
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 Phone : 080-28466420-423, 28446140-143
 Website : www.iihr.ernet.in
 Editing : Gaddagimath, P.B.
 Production : Publication Committee, 2014-15
 Printed at : Precision Fototype Services, Bengaluru-560 008, ©: 9845044311, precision_new@yahoo.co.in