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## NEWS

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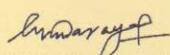
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*From Director's Desk*

Drastic climate changes in the past had brought down several civilized societies and put the mankind back into the time. Significant impact of lasting changes has been felt in the field of agriculture, human and animal activities across the globe commonly referred to as Climate Change. Climate change is caused by many factors such as biotic processes, solar flares, variations in amount of radiation received by Earth, tectonic plate movements, volcanic eruptions etc., of which certain human activities have also been identified as significant causes of recent climate change, often referred to as global warming. Countries with high human and animal population dependent on agriculture are more vulnerable to climate change. In India, with a population crossing 1200 million, climate change has become an important area of concern, due to imminent threat to food and nutritional security. Of many, the most significant negative impact predicted is the reduced yields by 4.5 to 9 percent in many food & fodder crops. Agriculture contributes about 16 percent to India's GDP and it is estimated that 4.5 to 9% reduction in yields due to climate change can bring down the GDP by 1.5 % per year. Realizing this, Government of India has accorded the highest priority to cope with climate change in agriculture sector and has identified agriculture as one of the eight national missions under the Prime Minister's National Action Plan on Climate Change. With this view, the ICAR has launched National Initiative on Climate Resilient Agriculture (NICRA) project in a network mode in February 2011 aiming at developing and popularizing climate resilient technologies.

We at IIHR, Bengaluru, a partner in the NICAR project have taken up work to enhance the resilience of Indian horticulture through development and application of improved production and risk management technologies, and their demonstration at specific sites on farmers' fields. Research work on phenotyping, genetic enhancement for tolerance to temperature & moisture stresses, grafting technique using root stocks for improving tolerance to flooding and tolerance/resistance to insect pests and diseases, pests surveillance in different geographical regions, systems to mitigate effects of flash flood, etc., are being undertaken. Simultaneously emphasis also is being given on conservation horticulture practices, carbon sequestration studies, and demonstration of proven technologies for adaptation in crop production systems. Alternate risk mitigation systems through natural resource management like in-situ moisture conservation, water harvesting, supplemental irrigation, improved drainage in flood prone areas, conservation tillage, artificial ground water recharge and water saving irrigation methods are also being studied besides introducing drought/temperature/flood tolerant varieties. The outcome of these studies would also form a base for developing contingency plan for management of natural calamities/disasters.

  
(C.K. Narayana)

## EVENTS

### Launching Workshop of RKVY Project

The Institute organized Launching Workshop of the RKVY project on 'Demonstration of bio-control of pests and diseases and integrated crop management practices in protected cultivation of vegetables and flowers' on February 26, 2014 at its campus. Dr. K. Ramakrishnappa, Additional Director (Farms and Nursery), Dept. of Horticulture, Govt. of Karnataka was the Chief Guest. Dr. C. K. Narayana, Director (A), IIHR, Bengaluru presided over the function. Launching the project, Dr. Ramakrishnappa explained the need for bio-control management of pests and diseases in horticultural crops and appealed to the project workers to develop a road map for popularizing eco-friendly technologies among the farmers.



*Dr. Ramakrishnappa addressing the participants*

More than 60 participants comprising of the project workers from the Institute, officers from Dept. of Horticulture, Govt. of Karnataka and a few progressive farmers growing vegetables under protected conditions participated in the workshop. Dr. B. Balakrishna, Project Leader presented the objectives and work plan of the project followed by a few presentations by the project workers.

### National Business Meet on Plant Protection in Protected Cultivation of Vegetables and Flowers

Indian Institute of Horticultural Research, Bengaluru and Society for Promotion of Horticulture, Bengaluru jointly organized a 'National Business Meet on Plant Protection in Protected Cultivation of Vegetables and Flowers' at Hotel Movenpick, Bengaluru on March 06-07, 2014. More than 160 participants comprising of farmers practicing protected cultivation, representatives from Indian and MNC companies, consulting firms, officers from Department of Horticulture, Govt. of Karnataka and other developmental departments, scientists / researchers from State Agriculture/Horticulture Universities & ICAR Institutes, representatives from input supply companies, entrepreneurs and NGO's participated in the Meet.

Dr. D. L. Maheshwar, Director, Dept. of Horticulture, Govt. of Karnataka inaugurated the Business Meet on March 06, 2014. Deliberations were made in three Business Sessions viz.,

Session I- Emerging issues in crop management, Session II- PHM, structures and marketing and Session III- Emerging issues in management of pests and diseases, and Institutional support. The Business Sessions were designed in such a way that various topical issues of importance were flagged for discussion by a Moderator having vast experience in the field of specialization with respect to the Session and supported by two observers from among the participants to take forward the deliberations, followed by discussions to draw a road map/ action plan. The concluding session was held on March 07, 2014 Chaired by Dr. N. K. Krishna Kumar, DDG (HS), ICAR, New Delhi and Co-chaired by Dr. K. Ramakrishnappa, Additional Director ( Farms and Nurseries), Dept. of Horticulture, Govt. of Karnataka. Various issues raised in the foregoing sessions were again flagged for discussion by the Chairman and action points and workable recommendations involving various stake holders of the sector were drawn.



*Dr. N. K. Krishna Kumar addressing the Session*

### Scientists and Farmers Interaction Meetings on Betelvine

The Institute organized 'Betelvine Growers – Scientists' Interaction Meet at various places in Karnataka with the basic objective of assessing the problems and prospects of betelvine cultivation in the country, technologies available, identification of research gaps and needs of farmers and traders, the details of which are presented below;

#### At Honnavara

The Meet was organized jointly with College of Horticulture, Sirsi, UHS, Bagalkot and Dept. of Horticulture, Zilla Panchayat, Honnavara at the Farmers Service Cooperative Bank, Hosakuli, Honnavara Taluk, Uttar Kannada district on January 07, 2014. Dr. N. Basavaraju, Dean, College of Horticulture, Sirsi inaugurated the Meet chaired by Shri Balakrishana Hegde, Chairman, Gram Panchyat, Hosakuli. Addressing the farmers Dr. Basavaraju spoke on importance of Raniyeje and its marketing. Sri Manjunatha Gowda, Member, Zilla Panchyat, Uttar Kannada stressed the need for fair price for the farmers. Shri Ramchandran Bhat a producer and betelvine merchant/ agent who had 50 years of experience in this field expressed the need for APMC facility for betelvine and maintenance of quality. Shri T. S. Naik, a betelvine marketing agent of

Honnavara insisted on following good production and packing practices. Smt Saroja S. Shet, Member, Taluk Panchayat addressing the gathering, requested the farmers to take the advantage of this meeting. Drs. T. Vasanth Kumar, K. Hima Bindu, M. A. Suryanarayana and M. R. Hegde from IIHR, Bengaluru participated in the interactions with the farmers.

#### At Bagalkot

The Institute organized the Meet jointly with UHS, Bagalkot on January 11, 2014. Dr. S. B. Dandin, Vice Chancellor inaugurated the meet. Drs. B. Raju, J. Venkatesh, M. B. Madalgere, and Kottekal, Nachegoweda from UHS, Bagalkot, Dr. Diddimani, DDH, Bagalkot, and Drs. T. Vasantha Kumar, K. Hima Bindu and M. A. Suryanarayana from IIHR, Bengaluru participated in the interactions.



*Dr. S.B. Dandin addressing at the Meet*

An exhibition displaying betelvine varieties viz., Godibangla, Hirehalli Local, Banasvadi, Maghai, Swarna Kapoori, hybrids (Hy 06-1, 6-4, 6-11, 7-36, 7-37, 8-20 and 8-23) and organic pesticides was organized for the benefit of the farmers. Dr. B. S. Harish, Asst. Prof., UHS, Bagalkot presented the present scenario of betelvine cultivation and highlighted the problems in betelvine cultivation. Dr. Sateesh Pathepur presented survey report of betelvine growing areas of Badami, Jamakandi, Basavana Bagewadi and Chikkodi taluks. Dr. M. H. Tatagar presented the insect pests of betelvine and their eco-friendly management practices and Dr. Raghavendra Nestha, presented the diseases of betelvine and their management. Drs. M. A. Suryanarayana, K. Hima Bindu and T. Vasantha Kumar presented on betelvine cultivation practices, crop improvement and importance of betelvine crop and the need for GI for widely growing cultivars respectively.

#### At Hirehalli

The Institute organized the Meet at KVK/CHES, Hirehalli on January 30, 2014. Dr. A. H. Rajasab, Vice Chancellor, Tumkur University inaugurated the Meet. Dr. T. Vasantha Kumar, briefed the purpose of the meet. Dr. Ashwath, ED, NHM, Dept. of Horticulture, Govt. of Karnataka, Shri Kumar Nagaraj, Member, ICAR Governing Body and Member APEDA and Sagarahalli Prabhu, President, Commerce and Industry Association, Tumkur were the special invitees. Dr. A. S. Sidhu, Director, IIHR, Bengaluru presided over the interactive meet.

A good number of betelvine growers/farmers and traders from all the above places actively participated in the discussions and made various recommendations for follow up by research organisations and universities.

#### National Meet on Betelvine - Farmers, Traders and Researchers Interface

Indian Institute of Horticultural Research, Bengaluru and Society for Promotion of Horticulture, Bengaluru jointly organized 'National Meet on Betelvine' at its campus on February 22-23, 2014. Eminent researchers from AICRP centers on Betelvine (ICAR and SAUs), CSIR (NBRI, CDRI), IIT-Kharagpur having expertise in the various aspects of the betelvine crop participated in the deliberations. More than 200 farmers from major betelvine growing states along with concerned officials/ scientists of the state and officials from the state departments of horticulture/agriculture of Karnataka attended the meet.

Padmabhushan Dr. M. Mahadevappa, Former Chairman, ASRB, New Delhi, Padmasree Dr. K.L. Chadha, Former DDG (Hort), ICAR, New Delhi., and Dr. D. L. Mahehsvar, Director of Horticulture, Govt. of Karnataka, the Guests of Honour on the occasion and Dr. N. K. Krishna Kumar, DDG (HS), ICAR, New Delhi who presided over function inaugurated the Meet. Addressing the gathering Dr. Krishna Kumar informed that betelvine as a heritage crop grown commercially in several parts of country by small and marginal farmers for their livelihood, needs to evolve technologies in the areas of crop production, post - harvest management and value addition to improve the economic returns to the growers. Dr. C. K. Narayana, Director (A), IIHR, Bengaluru welcomed the dignitaries and participants and Dr. T. Vasantha Kumar, Head, Medicinal Crops briefed the objectives of the Meet. A Souvenir, a Compendium, an Extension bulletin on Home recipes of betelvine, an Extension Folder on Betelvine cultivation and a Technical Bulletin on Pest management in betelvine were released on the occasion. Betelvine hybrid 06-4 developed by IIHR, Bengaluru was also released and presented to the farmers.



*Release of publications during Inaugural session*

An exhibition was arranged on the occasion showcasing genetic variability in betelvine crop across different states, production systems prevalent, insect pests and diseases

affecting the crop and technologies available. Padmasree Dr.K. L. Chadha inaugurated the exhibition. Farmers from different states had also exhibited their varieties. Various issues of importance and the problems, prospects and opportunities of betelvine cultivation were discussed in thematic technical sessions on crop improvement, crop production, crop protection, post-harvest management, value addition and marketing and came out with various recommendation. Field visit to CHES/KVK, Hirehalli and surrounding farmers' betelvine gardens was organized on February 23, 2014 for the benefit of the participants.

### 42<sup>nd</sup> Foundation Day Celebration of CHES, Chettalli

CHES, Chettalli celebrated its 42<sup>nd</sup> Foundation Day on February 01, 2014. Dr. S. D. Doijode, Principal Scientist & Head, Division of Extension, IIHR, Bengaluru was the Chief Guest. Progressive growers of Kodagu, working and retired staff of CHES, Chettalli and staff of KVK, Gonikoppal participated in the celebration. Shri Bose Mandanna, former Vice - President Coffee Board, Dr. Ramamurthy, Deputy Director of Research, Central Coffee Research Sub-station, Chettalli, Major Devaiah, Smt. K.T. Devaiah, Sri Ponnappa were the prominent invitees present on the occasion.



*Dr. S. D. Doijode addressing*

Five retired employees of CHES, Chettalli were felicitated on the occasion. Dr. S.D. Doijode appreciated the research and development activities and the progress made by the Station and assured full support for the development of the Station and fulfil the requirements of the growers of the region.

### 82<sup>nd</sup> Institute Joint Staff Committee Meeting

The Institute organized its 82<sup>nd</sup> IJSC meeting at CHES, Chettalli on January 04, 2014 under the Chairmanship of Dr. A. S. Sidhu, Director, IIHR, Bengaluru. All the elected members of IJSC, Members from office side participated in the meeting. Dr. P.C. Tripathi, Head, CHES, Chettalli who hosted the meeting presented the activities and achievements of the Station. Addressing the meeting Dr. A. S. Sidhu appreciated the good work done by the past and present IJSCs in bringing out and addressing various issues of common interest of the staff members.

### Review of Research Work of CHES, Chettalli

Dr. A. S. Sidhu, Director, IIHR, Bengaluru reviewed the research and development works of CHES, Chettalli on January

09, 2014. Some of the initiatives like establishing infrastructural facilities for research and the production of planting material of Coorg mandarin and other underutilized fruits were very much appreciated by the Director. He also visited various research blocks and laboratories and later addressed the staff members of the Station and hoped that the Station will continue to work with same spirit and enthusiasm.

### Hindi Workshops

The Official Language Implementation Committee of the Institute conducted Hindi workshops on 'Use of Official Language : Why & How', 'Noting & Drafting', 'Annual Program of Department of Official Language', 'Questionnaire of the Parliament Committee' and 'Office Procedures' at CHES, Bhubaneswar during February 04-05, 2014.

### International Women's Day

The Institute celebrated International Women's Day on March 18, 2014 at its campus by organizing a guest lecture on "Woman in Science" by Dr. Rohini, M. Godbole, Professor, Indian Institute of Science, Bengaluru, and Chairperson, Women in Science panel of Indian Academy of Science. Dr. C. K. Narayana, Director (A) presided over the function. Expressing deep concern about gender main streaming and women empowerment, Dr. Godbole informed that in the spite of policy changes to increase participation of women in science and development and also the fact that there has been a very high presence of women in science, students in schools and colleges with high levels of achievement, participation of women in research in science is low and appealed for equal opportunities to women in science and technology.

### DUS Test Monitoring Meeting

The Institute organized DUS test monitoring meeting of tomato and brinjal at IIHR, Bengaluru on January 20, and February 05, 2014 respectively. DUS monitoring of new entries of tomato at IIHR, Bengaluru was also organized. A total of 99 (39 entries for second season + 63 new entries for first season) new tomato entries from 12 seed companies were evaluated as per DUS test guide lines. Representatives from 10 seed companies participated in the DUS monitoring.

### Workshop for Institutional Linkage and Post Project Sustainability

The CHES, Bhubaneswar organized "One day NAIP workshop for institutional linkage and post project sustainability" on March 25, 2014, under the aegis of component 3 of NAIP operational in Mayurbhanj, Keonjhar and Sambalpur districts of Odisha for sustainable rural livelihood security (SRLS) with the objective to ensure post-project sustainability in the selected villages of Odisha. The workshop was inaugurated by Dr. R. S. Mishra, Head, RS-CTCRI, Bhubaneswar. Dr. H. S. Singh, Head of the Station, described various horticultural interventions undertaken in the NAIP areas. Dr. R. S. Mishra, appreciated the farmer



Dr. R. S. Mishra addressing the participants

oriented activities of CHES, Bhubaneswar. Officials of State Horticulture Department, KVK, OUAT Odisha, Odisha Tribal Empowerment and Livelihoods Programme (OTELP), Paradeep Phosphate Limited (PPL), World Vegetable Centre (AVRDC), Seed agencies, NGOs and some other progressive farmers participated in the workshop.

### Establishment of ATIC at CHES, Chettalli

The CHES, Chettalli established an Agricultural Technology information Centre (ATIC), a single window concept of dissemination of information and technologies in various fields of agriculture/horticulture and distribution of inputs to the farmers and general public, was inaugurated by Dr. S. D. Doijode, Principal Scientist & Head, Division of Extension and Training, IIHR, Bengaluru on February 01, 2014. Shri Bose Mandanna, former Vice President, Coffee Board, Dr. Ramamurthy, Deputy Director of Research, Central Coffee Research Sub Station, Chettalli, Major Devaiah, Smt K.T. Devaiah, Sri Ponnappa and staff of KVK & CHES Chettalli were present on the occasion.

### Establishment of Model Stall Fed Sirohi Goat Unit

The KVK, Gonikoppal has established a model stall fed Sirohi goat unit at its farm to assess the performance with respect to adoptability and economics of Sirohi goats. The unit is established with the financial assistance of Agricultural Technology Management Agency (ATMA) of Department of Agriculture, Government of Karnataka for the purpose of assessment, training and demonstration.

## RESEARCH

### Varieties/Technologies Identified

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

#### ❖ China Aster

- **Arka Aadya:** It is an individual plant selection from OP seeds of line No.173. It is spreading type, pink flowered (RHS



62.A, Red Purple Group), semi-double, floriferous, early flowering (66.44 days), high loose flower yield (178.56 g/plant), extended blooming period (16.11 days) and tolerance to lodging. It is recommended for loose flowers and for bedding purpose.

- **Arka Archana:** It is an individual plant selection from selfed seeds of line No. 15. It is spreading type, white flowered (RHS NN155.C, white group), semi-double, early flowering (69.40 days), high loose flower yield (222.62 g/plant), extended blooming period (18.44 days) and tolerance to lodging. It is recommended for loose flowers and for bedding purpose.



#### ❖ Arka Neelachal Kesari- An extra early colour mango clone (CHM-7):

The variety has the potential to fetch premium market price due to its early maturity (last week of March to mid of April), freedom from fruit fly, anthracnose, attractive peel colour and fragrance.



Flowering starts during mid-November and fruit setting completes by the end of December. The variety has the yield potential of 70-90 t/ha.

#### ❖ Arka Neelachal Vikram:

Considering the importance of high yielding variety under natural pollination system, a high yielding custard apple (*Annona squamosa*) clone (CHCA-7) been identified for release at CHES, Bhubaneswar. The variety has not only high yield potential but also good fruit quality in terms of fruit weight, pulp content, less seed content, high TSS and shelf life.



#### ❖ Arka Neelachal Shanti:

An inter-specific hybrid between spine gourd (*Momordica subangulata*) and teasel gourd (*Momordica dioica*) has been developed at CHES, Bhubaneswar by manipulating the ploidy level of spine gourd (from diploid to tetraploid). The F<sub>1</sub> hybrid combines the desirable attributes of spine gourd and teasel gourd. The plant morphology of the hybrid plant is intermediate between the parental species. While the anthesis of spine gourd takes place during evening hour (5-7 PM) and teasel



gourd at morning (4-6 AM), the synthetic species at mid night (12.30-1.00 AM). The fruit weight of spine gourd is < 20g and of teasel gourd is >40g while the fruit weight of the hybrid is 30-45g. A wide range of variation was observed among the hybrid plants in fruit and plant traits. The new hybrid can be propagated easily through stem cutting with ratoon potential and root cutting. Fruit set is as high as 90% due to natural pollination. It has also extended harvesting period (April to November) with high yield (5-7 kg/plant) potential.

- ❖ **Arka Neelachal Shyama:** A high yielding early brinjal variety developed at CHES, Bhubaneswar through selection (CHBL 35). It has spreading growth habit, and bears round to oblong fruit. Fruits are light green coloured masked with light pink colour. It has the yield potential of 34-36 t/ha. Fruit weight - 190-200g.



- ❖ **Arka Neelachal Prabha:** A high yielding chilli variety developed through selection (CHCL 92) at CHES, Bhubaneswar. It is a mid-season variety. Fruits mature in 65-75 days. It has an average pod yield of 493 g/plant and yield potential of 10.9 t/ha. Fruits are dark green and medium long (5-6 cm).



- ❖ Two improved tuberosc hybrids 'Prajwal' and 'Vaibhav' have been identified for release through AICRP on Floriculture. The brief descriptions of these hybrids are;
  - **Prajwal:** A single hybrid with large bold flowers and pinkish buds. It bears long, sturdy spikes. Loose flower yield is very high. Ideal for cut flower and loose flowers.
  - **Vaibhav:** A double hybrid with greenish buds. Spike yield is very high. Ideal as cut flower.

### Other achievements

- ❖ In tomato an advanced breeding line viz., BC1F1-26-9-2-35-5-3-7-5-2 (BC1F8-2) with triple disease resistance to ToLCV+BW+EB with high yield potential (50-60 t/ha in 140 days) has been developed from an inter-specific cross between *Solanum lycopersicum* (15 SB SB) x *S.*



*habrochaites* LA-1777. Plants are semi-determinate with good foliar cover. Fruits are medium large (80-85g.), oblate, firm (7.5 kg/cm<sup>2</sup>) with light green shoulder (Arka Vikas fruit type).



- ❖ A promising gynoceious line in cucumber, IIHR-101A-1-2- x Pickling cucumber 1 BC1F3 pt-19 cross derivative of European and Indian cucumber has been identified.
- ❖ In okra, among the wild species screened, *Abelmoschus angulosus* var. Grandiflorus showed combined resistance to YVMV and ELCV (0% incidence) and two advanced breeding lines viz., IIHR-10-11-344 and IIHR-10-11-444 were having combined resistance to YVMV and ELCV (0% incidences) under artificial inoculation conditions.
- ❖ In okra, pre released GMS based hybrid GMS-4 x 296-2 was found superior (23.3 t/ha) with 0% incidence of YVMV. Fruits are medium long (10 cm), short fruit diameter (1.3m), smooth, dark green and tender.
- ❖ In Pole type dolichos, high yielding advance breeding line IIHR 10-1 x IIHR 05-43(F4) IPS -1, with pod yield potential of 28 t/ha in 120-130 days and resistant to rust has been selected from the evaluation of 70 advance breeding lines of the cross IIHR 10-1 x IIHR 05-43(F4).



- ❖ In bottle gourd, a high yielding hybrid, IIHRBGH-10/42 has been developed which performed very well against the commercial check hybrids during both summer (48.16 t/ha) as well as *kharif* seasons (45.7t/ha) in 120 days duration. Fruits are medium long, cylindrical green ('Gutka' type).



- ❖ Two gynoceious bitter gourd plants viz., IIHRBTGy-491 and IIHRBTGy-492 were identified in the germplasm and are maintained by inducing hermaphrodite flowers by spraying Silver nitrate @250 ppm.



❖ *Integrated pond-horticulture and ornamental fish-horticulture:*

- i. Integrated pond-horticulture: Integration of aquaculture with horticultural crops like vegetables and fruit plants for better utilization of pond dike areas has been mooted in selected villages by CHES, Bhubaneswar. Vegetables like tomato, brinjal, cowpea, French bean, cabbage, cauliflower *etc.* and fruit plants like banana, papaya, pineapple were provided for cultivation on pond dike and adjoining areas of adopted ponds in selected villages of three districts of Odisha covering 313 farmers on 30.52 hectare areas.
- ii. Integrated ornamental fish-horticulture: Innovative approach of integration of ornamental fish farming with horticultural plants was promoted as an alternative for better utilization of adjoining area and areas surrounding ornamental fish units, water and organic waste recycling units by CHES, Bhubaneswar. A total of 72 households covering 0.63 hector area for integrated ornamental fish-horticulture has been promoted by the Station in selected villages of three districts of Odisha.

❖ *Promotion of underutilized cucurbits:* The CHES, Bhubaneswar has taken up promotion of cultivation of underutilized cucurbits on commercial scale by small and marginal farmers and tribal farmers of Bhubaneswar and adjoining areas of Odisha. Improved varieties of crops like teasel gourd, spine gourd, pointed gourd and ivy gourd developed by CHES, Bhubaneswar were provided to the farmers. More than 135 farmers have adopted these improved cucurbitaceous vegetables and their production technology. A farmer having 250 m. sq. area can earn Rs.5000/- per annum by cultivation of underutilized cucurbits.

❖ *Tribal Sub-plan on Promotion of Horticulture for Tribal Livelihood (TSP):* The CHES, Bhubaneswar has implemented a tribal sub-plan project on Promotion of Horticulture for Tribal Livelihood at Kashipur, Rayagada, Odisha. The site is located in the north eastern ghat of Odisha. Under this project 24 villages have been selected from eight tribal dominated gram panchayats *viz.*, Kashipur, Talajhiri, Chandragiri, Sunger, Mainkancha, Hadigura, and Manusagaon with 550 beneficiaries including 392 (71%) tribals. About 443 hectares of mango plantation (mostly on sloppy land) accommodating 1.77 lakh plants have been covered. These activities have been initiated and implemented in collaboration with

H A R P A L  
(Horticulture and Agriculture Related Panchayats Association). Critical inputs *viz.*, planting materials, fertilizers, pesticides, sprayers, *etc.* are made



available and technical knowhow on land preparation, basin making, nutrient management, intercropping, pest management and canopy management have also been provided for better orchard management and fruit yield. In the initial phase, fertilizers (Urea, DAP, MOP), gator sprayers and nursery kits were distributed among beneficiaries. Trainings were also imparted on planting techniques and soil and moisture conservation aspects including training programmes on mango nursery raising skill for tribal youth.

## HUMAN RESOURCE DEVELOPMENT

### Post Graduate Research and Education

#### Courses offered

Dr. Prabhakar, M. offered course no. VSC 601 entitled Advances in Vegetable Production Technology to Ph. D. student of UHS, Bagalkot.

#### IIHR Scientist as Chairman/Co-chairman/External Examiner

- Dr. Aswath, C. acted as External expert for Ph.D final examination of Mr. Pradeepa of Avinashalingam University for Women, Coimbatore.
- Dr. Rajasekharan, P. E. acted as a Panel member to adjudicate the Ph. D thesis entitled "Scaling up of microrhizome and minirhizome technology for disease free planting material production in ginger and turmeric" of Ms. C.P. Archana of Kannur University.
- Dr. Rajasekharan, P. E. acted as Chairman for adjudication of the Ph. D thesis entitled "Autechological studies on the river mangrove *Aegiceras corniculatum(L.) Blanco* in Kerala" of Gandhiji University, Kottayam, Kerala.
- Dr. Sreenivasa Rao, E. acted as Co-chairman for Ms. T. Vardhini Kumari for her thesis titled 'Standardization of techniques for induction of tetraploidy in watermelon (*Citrullus lanatus* Thunb.)' for award of Master's degree in Horticulture (Vegetable Science) to Dr. Y. S. R. Horticultural University, Venkataramannagudem, A.P.

#### Deputation Abroad

- Dr. Rao, M. S. was deputed to Abu Dhabi as the speaker for the Global Forum for Innovations in Agriculture (GFIA) at Abu Dhabi, United Arab Emirates during February 03-05, 2014 to showcase IIHR Innovations and Patented Technologies.

#### Training of IIHR Staff

- Dr. Srinivas, P. was deputed for a Short term course on 'Molecular cloning and expression: a meta-genomic approach' organized by Centre of Biotechnology, Siksha O Anusandhan University, Bhubaneswar during January, 20-25, 2014.

- Dr. Suresh, S. C. was deputed for one day training program on 'Recent advances in management of FMD' at IVRI, Bengaluru on January 30, 2014.
- Shri. Prabhakar, B. was deputed for one day master's training program on 'Production technology of black pepper' organized by Spices Board, Kodagu district at Cardamom Research Centre, Appangala on March 18, 2014.

### Participation in Seminar/ Conference/Meeting etc.

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

1. Dr. Doreyappa Gowda, I. N. - Technical talk on Pest Management in Food Industry organized by AFST(I), Bengaluru, Hotel Ashraya International, Bengaluru, January 04, 2014.
2. Dr. Singh, H. S. - Annual group meeting of scientists of AICRP on Cashew-2013, BCKV, Kalyani, West Bengal, January 05, 2014.
3. Mr. Prasanth, J.M. - Sandal wood based agro forestry models, Institute of Wood Science, Bengaluru, January 06-08, 2014.
4. Drs. Vasantha Kumar, T., Hima Bindu, K., and Suryanarayana, M. A. - Interaction meeting with scientists/farmers on betelvine, Honnavara, January 07, 2014.
5. Dr. Aswath, C. - Expert Committee on Agriculture Biotechnology, FVCK, Bengaluru, January 09, February 07, and March 10, 2014.
6. Drs. Vasantha Kumar, T., Hima Bindu, K. and Suryanarayana, M. A. - Interaction meeting with scientists/farmers on betelvine, UHS, Bagalkot, January 11, 2014.
7. Dr. Gajanana, T. M. - Half yearly meeting for monitoring and reviewing the progress of the foreign aided projects, Horticulture Division, ICAR, New Delhi, January 16, 2014.
8. Drs. Narayanan, C. K., Reddy, Y. T. N., Kurian, Reju M., Dinesh, M. R., Krishna Reddy, M., Shivashankara, K. S., Sreenivasa Murthy, D., Tripathi, P. C., Sankar, V., Singh, H. S. and Mrs. Jayanthimala, B. R.- Group discussion of AICRP on Fruits, Dr. Balasahib Sawant Konkan Krishi Vidyapeeth, Dapoli, January 22-25, 2014.
9. Dr. Aswath, C. - EC meeting of National Academy of Biological Science, Chennai, January 26, 2014.
10. Dr. Sadashiva, A.T. - Discussion about possible collaborative projects between AVRDC and ICAR; meeting convened by DDG (HS), New Delhi, January 29, 2014.
11. Dr. Debi Sharma - Ninth Meeting of Pesticide and Pesticide Residue Sectional Committee FAD-1, New Delhi, January 29, 2014.
12. Dr. Girija Ganeshan - Workshop on MSME Entrepreneurship Development Program, organized by Dun & Bradstreet and State Bank of Hyderabad, Bengaluru, January, 30, 2014.
13. Drs. A. S. Sidhu, Vasantha Kumar, T., Hima Bindu, K. and Suryanarayana, M. A. Hegde, M. R. and Prabhakar, M. - Betelvine growers and scientist's interaction meet, KVK, Hirehalli, January 30, 2014.
14. Dr. Rajiv Kumar and Mr. Chandra Prakash - International Conference on Biodiversity, Bio-resources and Biotechnology, Mysore, Karnataka, January 30-31, 2014.
15. Mr. Jagadish, K. N. - Relevance of organic farming in Indian agriculture, National Institute of Advance Studies, IISc, Bengaluru, February 03-04, 2014.
16. Mrs. Bhuvaneswari, S. - 2<sup>nd</sup> International Conference on Agricultural and Horticultural Sciences (Agri-2014) OMICS Group Conferences, Hyderabad, February 03-05, 2014.
17. Drs. Narayana, C. K. and Tripathi, P. C. - Awareness cum training program on provisions of Protection of Plant Varieties and Farmer's Right Act-2001, KVK, Gonikoppal, February 06, 2014.
18. Dr. Narayana, C. K. - Centenary Celebration of Indian Society of Soil Science, GKVK, Bengaluru and Golden Jubilee Celebration of UAS, Bengaluru, February 08, 2014.
19. Mr. Jagadeesan, A. K. - Regional Official Language Conference organized by the Department of Official Language, Govt. of India, CSIR - Structural Engineering Research Institute, Taramani, Chennai, February 10, 2014.
20. Dr. Loganandhan, N., Dr. Suresh, S. C., Prasanth, J. M., Jagadish, K.N., Hanumanthe Gowda, B., Prabhakar, B. and Veerendrakumar, K. V. - Pre-action plan meeting of south Karnataka KVKs, GKVK, Hebbal Campus, Bengaluru, February 10-11, 2013.
21. Dr. Narayana, C. K. - Meeting of Directors of IARI, IIHR and CIAE, PG School IARI, New Delhi, February 12, 2014.
22. Dr. Narayana, C. K. - Round table meeting on transgenic crops under the Chairmanship of Prof. M.S. Swaminathan, NASC complex, New Delhi, February 12, 2014.
23. Dr. Gajanana, T. M. - National conference on horticulture industry in India - special reference to Karnataka - challenges and opportunities, College of Agriculture, Bijapur, February 12-14, 2014.



24. Drs. Singh, H. S., Mandal, S., Kundan Kishore, Srinivas, P., Sangeetha, G. and Deepa Samant - AZRA Silver Jubilee International Conference on Probing Biosciences for Food Security & Environmental Safety, CRRI, Cuttack, February 16-18, 2014.
25. Drs. Narayana, C. K., Dinesh, M. R. and Gajanana, T. M. - Annual technical review and planning meeting and NPSC meeting of UNEP-GEF project, NRC for Citrus, Nagpur, February 13-15, 2014.
26. Dr. Loganandhan N. and Mr. Jagadish, K. N. - ZREP meeting of UAS- Bengaluru, February 19, 2014.
27. Dr. Sudhakar Rao, D.V. - Indo-German International Seminar on Plastic Application in Food Industry organized by Organization of Plastic Processors of India, Lalit Ashok Hotel, Bengaluru, February 20-21, 2014.
28. Drs. Narayana, C. K., Murthy, B.N.S., Sampath Kumar, P., Rekha, A., Vasugi, C., Dhananjaya, M. V., Rajiv Kumar and Singh, T. H. - Biodiversity International sponsored Brainstorming Session and Training-cum-Demonstration on Cryopreservation and *In vitro* Conservation in Horticultural Crops organized by Society for Promotion of Horticulture in collaboration with IIHR, Bengaluru, IIHR, Bengaluru, February, 21-22, 2014.
29. Drs. Narayana, C. K., Rao, T. M., Dhananjaya, M. V., Aswath, C., Sadashiva, A.T., Prabhakar, M., Hebbar, S. S., Nair, A.K. and Girija Ganeshan - Review Meeting of ICAR Seed Project - XII Plan on Horticulture Component, IIHR, Bengaluru, February 22, 2014.
30. Drs. Narayana, C. K., Vasantha Kumar, T., Hima Bindu, K., Suryanarayana, M. A., Shivashankara, K. S., Gajanana, T. M., Sudha, M., Venugopalan, R., Prabhakar, M., Hebbar, S.S., Nair, A.K., Panneerselvam, P., Selvakumar, G. and Bhuvanewari, S. - National meet on betel vine-interface between farmers, traders and researchers, IIHR, Bengaluru, February 22-23, 2014.
31. Drs. Rao, T. M., Tejaswini, Sujatha A. Nair, Sangama and Krishna Reddy, M. - XXIII group meeting of AICRP on Floriculture, PAU, Ludhiana, February 25-27, 2014.
32. Drs. Narayana, C. K., Doijode, S. D., Balakrishna, B., Prabhakar, M., Krishna Reddy, M., Rao, M. S., Gangavisalkshi, P. N., Hebbar, S. S., Nair, A. K., Pillai, K. G., Senthil Kumaran, G., Sudhakar Rao, D. V., Selva Kumar, G. and Gaddagimath, P. B. - Launching workshop of RKVY project on Demonstration of bio-control of pests and diseases and integrated crop management practices in protected cultivation of vegetables and flowers, IIHR, Bengaluru, February 26, 2014.
33. Dr. Tiwari, R. B. - Hindi *Takniki Sangosthi* 2013-14 organized by TOLIC, ISRO, Bengaluru, February 26, 2014.
34. Dr. Srinivasa Murthy, D. - Sensitization workshop on IPV6, NASC Complex, New Delhi, February 27, 2014.
35. Drs. Hima Bindu, K., Suryanarayana, M. A. and Singh, H. S., Dhananjaya, M. V. - 8<sup>th</sup> Review meeting of DUS test centers of PPV and FRA, UAS, Dharwad, February 28 to March 01, 2014.
36. Dr. Loganandhan N., Prabhakar, B. and Suresh, S. C. - Final action plan meeting of Karnataka KVKs, UAS, Dharwad, March 03-05, 2014.
37. Dr. Ganeshan, S., Mr. Sivakumar, P. and Ms. Kavitha - Partnership and capacity building skills for the NAIP BPD Units staff and clients organized by ABI - ICRISAT in collaboration with ISBA, Royal Orchids, Bengaluru, March 04-05, 2014.
38. Drs. Narayana, C. K., Doijode, S. D., Hegde, M. R., Bakakrishna, B., Nita Khandekar, Chithiraichelvan, R., Prabhakar, M., Hebbar, S. S., Nair, A. K., Krishna Reddy, M., Chowdappa, P., Gangavisalakshi, P. N., Pillai, K. G., Shivashankara, K. S., Debi Sharma, Tejashiwini, Senthil Kumaran, G., Satisha, G. C., Selvakumar, G., Panneerselvam, P., Loganandhan, N., Jagadish, K. N. and Hanumanthegowda, B., Gaddagimath, P. B. - National business meet on plant protection in protected cultivation of vegetables and flowers, Bengaluru, March 06-07, 2014.
39. Dr. Sudha, M. - The annual review workshop 2014 of component-1, NAIP-PIU, NASC Complex, New Delhi, March 07-08, 2014.
40. Dr. Narayana, C. K. - Custodian farmers meet, Central Island Agricultural Research Institute, Port Blair, March 19, 2014.
41. Drs. Prabhakar, M. and Nair, A. K. - Workshop on Diatomaceous earth as a source of silicon in different crops in India, Hotel Movenpick, Bengaluru, March 19-20, 2014.
42. Dr. Gopalakrishnan, C. - International conference on crop productivity and sustainability-shaping the future, Baba Farid College, Bathinda, March 20-21, 2014.
43. Dr. Senthil Kumaran, G. - XVI Annual workshop of AICRP on Mushroom, Rajendra Agricultural University, Samastipur, Bihar, March 20-21, 2014.
44. Dr. Varalakshmi, B. - International conference on bitter gourd (BiG2014), ICRISAT, Hyderabad, March 20-21, 2014.
45. Dr. Srinivas, P. - Final workshop on Success and sustainability of livelihood improvement in Mayurbhanj, Keonjhar and Sambalpur districts of Odisha organized by Consortium Lead Institution CIFA, Bhubaneswar, March 21, 2014.
46. Dr. Doreyappa Gowda, I. N. - National conference on value chain management in mango, organized jointly by UHS, Bagalkot, DOH & KSMD & MC Ltd., GOK, Horticultural Research and Extension Center, Hogalagere, Srinivasapura, Kolar, March 21, 2014.

47. Dr. Sudha, M. - IMC meeting of Directorate of Cashew Research, Puttur, March 22, 2014.
48. Dr. Sudha, M. - Annual review workshop of NCAP Network project on market intelligence, NIABM, Bikaner, Rajasthan, March 24-25, 2014.
49. Dr. Gopalakrishnan, C. - National conference on recent advances in biosciences – bioblooms-2014, Department of Life Sciences, M.S. Ramaiah College of Arts, Science and Commerce, Bengaluru, March 28, 2014.

### Special / Guest lectures delivered

The scientists of the Institute delivered special lectures/guest lectures on various topics as detailed below:

- Dr. Aswath, C. - Myths and Facts of GM at Science Club, National College, Basavangudi, January 22, 2014.
- Dr. Sadashiva, A. T. - Prospects of seed production of tomato, brinjal and chilli in Gujarat State during one day Brain storming workshop on vegetable and forage crops seed production, AAU, Anand, January 30, 2014.
- Dr. Sudha Mysore - Emerging business models in agriculture - public sector, industry linkage, PPP models at the NAIP Sponsored Management Development Program for Researchers, NARRM, Hyderabad, January 31, 2014.
- Dr. Aswath, C. - Micro propagation in quality control for seed technology in the International training course on organizing and implementing an effective national seed quality control system, February 01, 2014.
- Dr. Sadashiva, A.T. - Seed production in tomato and chilli in the International training course on organizing and implementing an effective national seed quality control system, February 01, 2014.
- Dr. Sreenivasa Rao, E. - Seed production methodology of melons in the International training course on organizing and implementing an effective national seed quality control system, February 01, 2014.
- Dr. Singh, T. H. - Hybrid seed production in brinjal in the International training course on organizing and implementing an effective national seed quality control system, February 01, 2014.

- Dr. Sadashiva, A. T. - Protection of plant varieties and farmers' rights act and DUS guidelines in various vegetables such as tomato, brinjal and okra, February 05, 2014.
- Dr. Aswath, C. - Can biotech guarantee the food and nutrition security?, India Bio, Bengaluru, February 11, 2014.
- Mrs. Swathy, P. B. - Mushroom cultivation and vermicomposting at Samudaya Bhavan, Hulithala Village, Margod, February 14, 2014.
- Dr. Reddy, T. M. - Vermicomposting, *Trichoderma harzianum* and mushroom cultivation at Tolur Shettalli, Somwarpet taluk, Kodagu in a program sponsored by Extension Division, Coffee Board, Somwarpet, February 21, 2014.
- Dr. Singh, T. H. - Hybrid seed production techniques in tomato and brinjal during the training program on vegetable seed production and marketing organized by NSC, February 24, 2014.
- Mrs. Swathy, P. B. - Mushroom cultivation and vermicomposting at Besoor village of Shanivarsanthe, Kodagu, February 25, 2014.
- Dr. Krishna Reddy, M. - Integrated disease management in vegetable crops during the training program on vegetable seed production and marketing organised by NSC, Bengaluru, February 25, 2014.
- Dr. Varalakshmi, B. - Seed production techniques in cucurbits during the training program on vegetable seed production and marketing' organized by NSC, Bengaluru, February 28, 2014.
- Dr. Sudhakar Rao, D.V. - Post-harvest management of mango at the Knowledge sharing workshop on tropical fruits-banana, mango and pomegranate for value chain management and farm profitability enhancement-2014 organized by Confederation of Horticulture Association of India (CHAI), New Delhi, at Coimbatore, March 02, 2014.
- Dr. Tripathi, P. C. - Possibilities of growing underutilized fruits in coffee based system at the Annual General Body Meeting of Karnataka Planters Association, Madikeri, March 14, 2014.

### Training

### TRANSFER OF TECHNOLOGY

#### At Hesaraghatta, Bengaluru

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	Improved vegetable production technology including protected cultivation	03-04.01.2014	85
2	Improved vegetable production technology for farm women of Chitradurga	03-05.02.2014	30

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Sl. No	Title of the training	Dates	No. of participants
3	Improved vegetable production technology for farmers of Chikkaballapur	06-07.02.2014	30
4	Protected cultivation of vegetable crops	07.02.2014	09
5	Dry flower technology and establishment of nutrition garden at Honnenahalli, Rajanukunte for the farm women	11-12.02.2014	35
6	Good agricultural practices for different vegetable and fruit crops with reference to climate change for officers of various State Development Departments	11-18.02.2014	
7	Integrated pest and disease management in horticulture crops for the Extension Staff from Gaya, Bihar.	24-28.02.2014	25
8	Production technology for horticulture crops for farmers from Washim	05-07.03.2014	31
9	Mushroom cultivation for economic and nutritional upliftment for rural women	17-18.03.2014	10
10	Grapes (Post harvest technology and production tips)	17.03.2014	20
11	Improved vegetable production technology for farm women of Chitradurga.	25-27.03.2014	51

### IIHR, Bengaluru scientists as resource persons

The following scientists of the Institute participated as a resource person in various training programs conducted during the period;

- Dr. Sudhakar Rao, D. V. - One day orientation training program on pomegranate export to pomegranate farmers at Hosadurga, Karnataka organized by Karnataka Agribusiness Development Corporation, Bengaluru, January 09, 2014.
- Dr. Murthy, B.N.S.-Second training programme for selected progressive pomegranate farmers at Hosadurga, Chitradurga district conducted by Karnataka Agri Business Development Corporation, February 04, 2014.
- Dr. Dinesh, M. R. - Awareness-cum-training on PPVFR organized at KVK, Gonikoppal, January 10 and February 06, 2014.
- Dr. Reddy, Y. T. N. - Third integrated training programme for selected progressive mango growers at Mango Development Centre, Hogalakere Farm, Srinivasapura, Kolar organised by Karnataka Agri Business Development Corporation, February 25, 2014.
- Dr. Sampath Kumar, P. - Crop Seminars on Grapes



Group photo of special training on improved vegetable production technology

organized by Coromandel International Limited at Chikkaballapur and Vijayapura, February 25-26, 2014.

- Dr. Reddy, Y. T. N. - Seminar on grafting methods, package of practices of guava and mango crops organised by Chittoor District Agriculturists Service Society at Penumuru Mandal, Chittoor, March 14, 2014.
- Dr. Saxena, A. K. - Production of quality pomegranate (three programs) at Hosadurga organized by KABDC, Bengaluru, January- March 2014.

### At CHES, Chettalli

The Central Horticultural Experiment Station, Chettalli organized the following training programs under tribal sub-plan.

Sl. No	Title of the training	Dates	No. of participants
1	Training for tribal farmer at Awaregunda village, Siddapura.	24.02.2014	73
2	Training for tribal farmers at Dodda Reshme village of Chennangi, Virajpet Taluk.	26.02.2014	102
3	Piggery management and mushroom cultivation for tribal farmers at Awaregunda village, Siddapura.	10.03.2014	25
4	Demonstration cum training on mushroom cultivation, back yard poultry management and piggery for tribal farmers of Awaregundaat KVK, Gonikoppal.	13.03.2014	25

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Sl. No	Title of the training	Dates	No. of participants
5	Training program for tribal farmers of Dodda Reshme and Chikka Reshme.	17.03.2014	67
6	Training for tribal farmer at Awaregunda village, Siddapura.	17.03.2014	34
7	Skill up gradation on nursery management, apiary, vegetable, mushroom.	24.03.2014	14

### Six month gardeners' trainings programme

The CHES, Chettalli organized a six months training programme for rural men and women hailing from Kodagu region under the aegis of National Horticultural Mission and Dept. of Horticulture, Govt. of Karnataka commencing from January 31, 2014. All the aspects of nursery management and horticulture in which in house classes and field training with comprehensive course material was provided to trainees. The trainees were given piece of plots for experimental propagation of fruit crops particularly to learn techniques on budding, air layering, grafting and cuttings. Trainees were also taught production technology of fruits, vegetables, flowers, spices, plantation crops.



### At CHES, Bhubaneswar

The Central Horticultural Experiment Station, Bhubaneswar organized the following trainings.

Sl. No	Title of the training	Date
1	Integrated horticulture.	17-24, 01.2014
2	Production technology of vegetable crops.	17-22.02.2014
3	Mango nursery raising skill for tribal youth.	07-13.03.2014
4	One day training programme for lead farmers and technology providers on high income technologies and institutional linkage for post project sustainability under NAIP.	26.03.2014



Dr. H. S. Singh distributing inputs to trainees during training on Mango nursery raising skill for tribal youth

### At KVK, Hirehalli

The KVK, Hirehalli organized the following training programs;

Sl. No	Title of the training	Date
1	Fodder crops development in collaboration with Karnataka Milk Federation, Tumkur and ZARS, Mandya.	27.01.2014
2	Coconut climbing and plant protection measures-Friends of coconut tree	25-29.03.2014

### 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, 45 training programs were conducted in different disciplines for the benefit of 647 farmers and 829 farm women. A total of 1476 participants were benefited from these need based trainings.

Discipline	No. of trainings	No. of Participants		Total
		Male	Female	
Horticulture	08	121	74	195
Home science	18	143	572	715
Livestock	07	127	115	242
Plant protection	07	158	38	196
Soil Science	05	98	30	128
<b>Total</b>	<b>45</b>	<b>647</b>	<b>829</b>	<b>1476</b>

### KVK faculties as resource persons

The following faculties of KVK participated as a resource person in various programs conducted during the period

- Devauah, K. A. - Field day on banana at Halligattu, Virajpet taluk organized by Dept. of Horticulture, 03.03.2014.
- Prabhakar, B. - PPV & FRA awareness cum training at CPCRI-RS-Kidu, 25.03.2014.
- Prabhakar, B. - *Krishi Uthsava* at Konanur, Arakalagud taluk, Hassan organized by SKDRDP, 25.02.2014.
- Prabhakar, B. - Field day on banana at Paka, Madikeri organized by Dept. of Horticulture, 27.01.2014

- Veerendrakumar, K.V. -*Krishi Uthsava* at DATC, Kudige organized by Dept. of Agriculture,25.03.2014
- Veerendrakumar, K. V. - Field day on paddy at Kadangamaroor, Virajpet taluk organized by Dept. of Agriculture,14.02.2014.

### Media Meet at KVK, Gonikoppal

The NAIP sub-project on mobilizing mass media support for sharing agro information, IIHR, Bengaluru organized a media meet and showcasing of IIHR, developed technologies at Krishi Vigyan Kendra, Gonikoppal on March 21, 2014. More than 35 media persons of Kodagu district, participated in the meeting. Dr. Nita Khandekar, CCPI of the NAIP project highlighted the objectives of the program. Dr. B. Balakrishna, Co-CCPI of the project presented the recent technologies in the field of fruit crops, vegetable crops, flower crops,



Mr. P.B. Gaddagimath addressing media persons

medicinal and aromatic crops developed by IIHR, Bengaluru. Shri P.B. Gaddigimath, Co-CCPI requested media persons to give wide coverage on IIHR technologies which are more beneficial to the farmers of the district. Dr. P.C.Tripathi, Principal Scientist and Head, highlighted the technologies developed by CHES, Chettalli. An exhibition was arranged depicting ongoing activities and technologies adopted by the farmers for the benefit of the media persons. A visit to demonstration blocks and plant propagation units of the KVK was organized in the afternoon.

### Field Days / Campaigns/Awareness Programs/etc.

#### Field day on banana

The KVK, Gonikoppal organized a field day on enhancement of bunch size in banana variety Grand naine at Thorenoor village of Somwarpet taluk on February 20, 2014. The technology of distal end feeding of banana bunch and foliar nutrition of banana with Banana Special; a micronutrient formulation developed by IIHR, Bengaluru were demonstrated in the field of Mr. Venkatesh at Thorennor. More than 40 farmers participated in the field day.

#### Mango campaign on fruit fly management

Kuruvallu village of Tumkur taluka, Karnataka is an important mango producing village having 552 ha of mango under cultivation and 154 farmers are actively involved in mango

cultivation and marketing. Since mango fruit fly has become a major problem in the region, the KVK, Hirehalli organised a mango campaign on February 05, 2014 at Kuruvallu village. About 50 farmers participated in the campaign program. The KVK Subject Matter Specialist demonstrated method of installation of fruit fly trap and explained the other management practices to be followed. About 100 fruit fly traps were distributed to the farmers free of cost. A mango farmers association was formed with 20 members and named as "Kuruvallu Mango Farmers Association".

#### Animal health camps

The KVK, Gonikoppal organized five animal's health camps in collaboration with the Department of AH & VS and ATMA program on the theme of awareness and vaccination against FMD disease in animals. During the camps 303 cows, 162 buffaloes, 105 pigs and 17 goats were vaccinated.

#### Awareness cum training program on PPV & FRA

The KVK, Gonikoppal organized one day awareness cum training program on Protection of Plant Varieties and Farmers Rights Act, 2001 on February 05, 2014. More than 100 participants including farmers of Kodagu, scientists from IIHR, Bengaluru, IISR Appangla, KVK Gonikoppal and state govt. officials participated in the program. Dr. C. K. Narayana, Director(A), IIHR, Bengaluru presiding over the program explained the importance of knowledge, intellectual properties rights and the benefits of PPV&FRA. DUS guidelines in various fruits viz., mango, guava and other fruit crops., vegetables viz., tomato, brinjal, okra etc. and spices viz.,cardamom, black pepper, turmeric and ginger were explained by Dr. A.T. Sadashiva, Dr. M. R. Dinesh, from IIHR, Bengaluru and Dr. Senthil Kumar, IISR Regional Station Appangla respectively. An exhibition was also organized on this occasion to exhibit black pepper and rice varieties identified by the farmers.

#### Awareness programme on foot and mouth disease

The KVK, Gonikoppal in collaboration with the department of animal health and veterinary sciences organized a one day 'Sensitization cum training program for district veterinarians' on February 13, 2014. Dr. Aiyappa, Deputy Director, AH & VS, Kodagu inaugurated the program. Dr. Ramakrishna, Principal Scientist, IVRI, Bengaluru and Dr. Madhukar, Institute of Wild Life Sciences, Kodagu sensitized the gathered veterinary practitioners on outbreak of foot and mouth disease in animals and its management.

#### Interface meet on paddy fallows

The KVK, Gonikoppal and College of Forestry, Ponnampet jointly organized an interface program on utilization of paddy fallows at KVK, Gonikoppal on February 04, 2014. Twenty two foreign delegates who visited College of Forestry for study purpose interacted with the scientists, experts and academicians and progressive farmers on problem and prospectus of paddy fallows in Kodagu district. Dr. P. C. Tripathi, Principal Scientist and Head, CHES, Chettalli, Dr. Kushalappa, Professor, College of Forestry and SMSs of KVK, Gonikoppal participated in the interaction.

## Field Demonstrations

The Division of Extension and Training took up the following field demonstrations

- Arka Rakshak (IIHR) (Tomato hybrid ) and CRT's in tomato cultivation - six demonstrations at Kolar, Chikkaballapura and Bengaluru districts
- IPM in vegetable crops - ten demonstrations at Bengaluru rural, Kolar and Chikkaballapura

The CHES, Chettalli took up field demonstration of integrated crop management of chilli hybrid Arka Meghana on two ha belonging to 20 farmers at Hebbale and Handli villages of Somwarpet taluk.

## Field visits/Surveys

- Dr. M.R. Dinesh toured Hosanagar area in Shimoga and collected indigenous pickling mango varieties, January 04-07, 2014.
- Drs.T. Vasantha Kumar, K. Hima Bindu and M.A. Suryanarayana visited betelvine gardens in Badami (Bagalkot Dt.) and Kudachi (Bijapur Dt.), January 10, 2014.
- Drs. R. Chithiraichelvan, P. Sampath Kumar and T. Sakthivel surveyed off-season production of custard apple at Bijapur from February 14-15, 2014.
- Dr. B.N.S. Murthy, visited NBPGR, New Delhi for collection of pomegranate accessions received from USDA, ARS, National Clonal Germplasm Repository, 3201, Straloch Road, University of California, Davis CA 95616-8607, February 18-19, 2014.
- Dr. Anil Kumar Nair visited North Karnataka district as a member of the committee to assess the damage caused to horticultural crops due to hailstorm accompanied by heavy rains occurred on March 08, 2014.
- Drs. G. Senthil Kumaran, A. Carolin Rathinakumari and Shri. P. Dayanda visited the onion fields raised by IIHR

## 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.	Scientific chilli cultivation.	Chandana, Bengaluru	06.01.2014	M. Prabhakar
2.	Amaranth varieties released by IIHR, Bengaluru.	Chandana, Bengaluru	10.01.2014	B. Varalakshmi
3.	GM crops.	Chandana, Bengaluru	13.01.2014	C. Aswath
4.	Banana field day.	Chandana, Bengaluru	13.01.2014	A report
5.	Sapota orchard management.	Chandana, Bengaluru	14.01.2014	-
6.	Nutrient management in vegetable crops.	Chandana, Bengaluru	20.01.2014	M. Prabhakar

animal drawn onion seeder and IIHR manual drawn onion seeder in the villages of Chikkaballapur (Dt.) and Chintamani (Tk.), March 11 and March 21, 2014.

- Drs. M.R. Dinesh and B.N.S. Murthy undertook survey of Andamans for locating wild species of mango from March 16 - 18, 2014 and participated in the meeting of stakeholders followed by field visit, March 19, 2014.
- Dr.C.K. Narayana, surveyed on unmarketable tomato during harvesting to marketing from Agrahara village, Dasanapura Hobli, Mathadahalli, Bengaluru North to K.R.Market, Bengaluru.
- Dr. C.K. Narayana, visited grape garden of Dr. Vinod, at Rajanakunte to witness the transport of grapes from Bengaluru to Sangli, Maharashtra.

## Exhibitions

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

Sl. No.	Event	Place and date
1.	Technology Week for Women in Agriculture	27.01.2014 at CHES, Bhubaneswar
2.	Foundation Day Celebration of CHES, Chettalli	01.02.2014 at CHES, Chettalli
3.	Krishi Vasanth - 2014	09-13.02.2014 at CICR, Nagpur
4.	Exhibition on Betelvine	22-23.02.2014 at IIHR, Bengaluru
5.	Eastern Zone Regional Agricultural Fair	26-28.02.2014 at CRRI, Cuttack

## Commercialization of technologies

During the period between January - March, 2014 an amount of Rs. 39, 72,720/- was generated as revenue (IP revenue) by commercializing 15 technologies to 19 companies/clients.

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Sl. No.	Topic	Channel	Date	Resource person
7.	Incubation activities of HTM BPD.	Udaya News	05.02.2014	M. Sudha
8.	Betelvine farmers interface meeting at KVK, Hirehalli.	Chandana, Bengaluru	09.02.2014	A report -
9.	Production technology of coffee.	Channel Coorg	22.02.2014	K. V. Veerendra Kumar and B. Prabhakar
10.	Biological control of tomato diseases.	Chandana, Bengaluru	24.02.2014	Girija Ganeshan

### Revenue generated by mushroom lab

An amount of Rs. 6,79,915.00 was realised through sale of spawn and RTF bags and trainings.

### 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.12,59,514.00.

### General visitors

- A total of 796 farmers, 1309 students and 20 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 380 farmers from 14 different places in Odisha and other states, sponsored by 9 different organizations / agencies / NGO's visited CHES, Bhubaneswar for exposure in horticultural technologies and got benefitted.

## PUBLICATIONS

### Research Papers

1. Bharathi, L. K., Singh, H. S. and John, J. K. (2014). A novel synthetic species of *Momordica* (*M. X suboica* Bharathi) with potential as a new vegetable crop. *Genet Resour. Crop Evol.*, DOI 10.1007/s10722-014-0092-7.
2. Bharathi, L. K., Singh, H. S., Shivashankar, S. and Ganeshamurthy, A. N. (2014) Characterization of a fertile backcross progeny derived from inter-specific hybrid of *Momordica dioica* and *M. subangulata* subsp. *renigera* and its implications on improvement of dioecious *Momordica* spp. *Sci. Hort.*
3. Bharathi, L. K, Singh, H. S., Shivashankar, S., Ganeshamurthy, A. N. and Sureshkumar, P. (2014). Assay of nutritional composition and antioxidant activity of three dioecious *Momordica* species of South East Asia. *Proc. Natl. Acad. Sci., India, Sect. B Biol. Sci.*84 (1): 31-36 DOI 10.1007/s40011-013-0205-7.
4. Bhuvanewari, S. and Narayana, C.K. (2013). Evaluation of different types of packages for road transportation of papaya. *International Journal of Innovative Horticulture*, 2(1): 95-98.
5. Bhuvanewari, S., Udhayakumar, R. and Narayana, C. K. (2014). Quality and shelf life of fresh cut onion as affected by slicing method and packages. *Journal of Extension and Research*, 16(1&2) 4-6.
6. Chethana, B. S., Girija Ganeshan, Archana S. Rao, Bellishree, K. (2013). Bioefficacy of botanicals, bioagents and fungicides against purple blotch of onion. *Environment & Ecology*, 31 (2B): 947-952.
7. Dilip K. Lakshman., Savithiry Natarajan, Sudhamoy Mandal, Amitava Mitra (2013). Lactoferrin derived resistance against plant pathogens in transgenic plants. *Journal of Agricultural and Food Chemistry*, 61: 11730-11735. <http://pubs.acs.org/doi/abs/10.1021/jf400756t>.
8. Pillakenchappa Kavitha, Kodthalu S. Shivashankara, Vala K. Rao, Avverahally T. Sadashiva, Kundapur V. Ravishankar and Gonchigar J. Sathish. (2014). Genotypic variability for antioxidant and quality parameters among tomato cultivars, hybrids, cherry tomatoes and wild species. *J. Sci. Food Agric.*, 94:993-999. DOI 10.1002/jsfa.6359.
9. Raizada, A., Khola, O. P. S., Mishra, P.K., Manivannan, S., Loganandhan, N. and Mandal, D. (2014). Farmer innovations and initiatives in natural resource conservation in the southern region. *Indian Association of Soil and Water Conservationists, Deharadun, India. Pp 107.*
10. Rajiv Kumar (2013). Genetic variability, heritability, correlation analysis for quantitative traits in Asiatic *Lilium*. *Indian Journal of Horticulture*, 70(4): 555-559.
11. Rajiv Kumar (2014). Performance of exotic gladiolus (*Gladiolus hybridus*) for off season under Meghalaya conditions. *Indian Journal of Agricultural Sciences*, 84(1): 164-166.

12. Ranjitha, K., Narayana, C. K. and Roy, T. K. (2013). Aroma profile of fruit juice and wine prepared from Cavendish banana (Mus sp., Group AAA) cv. Robusta. *J. Hort. Sci.*, 8(2): 2013.
  13. Sharma, K. K., Mohapatra, S., Ahuja, A. K., Deepa, M., Sharma, D., Jagdish, G. K., Rashmi, N., Battu, R. S., Sharma, Balwinder, S. K., Parihar, N. S., Sharma, B. N., Kale, V. D., Nakat, R. V., Walnuj, A. R., Singh, G. Kuldeep K. Ravivanshi, Devi, S. and Noniwa, R. (2014). Safety evaluation of flubendiamide and its metabolites on cabbage and persistence in soil in different agroclimatic zones of India. *Environment Monitoring and Assessment*, DOI 10.1007/s10661-014-3645-5.
  14. Shivaramu, K., Rami Reddy, P. V. and Suryanarayana, M. A. (2013). Infestation of gall thrips, *Corycophthrips inquilinus* A. on *Terminalia chebula* Retz. a medicinally important plant. *Pest Management in Horticultural Ecosystems*, 19(2):264-265.
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  18. Vijaya Kumar, K. V., Gangappa, E., Nagaraju, N., Ramesh, S., Padmaja, A. S. and Pitchaimuthu, M. (2014). Comparative transmission, varietal reaction and management of yellow vein mosaic virus in okra. *J. Myco Pl. Pathol.* 44(1)-253-259.
- orchard health management of bael. (<http://krishisewa.com/cms/articles/production-technology/372-bael.html>).
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  - Samant, D., Singh, H. S. and Srinivas, P. (2014). Commercial fruit ripening: hazards and alternatives of calcium carbide. *Sabujima*, 22: 21-24.
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  - Srinivas, P., Behera, S., Mishra, A. V. and Samant, D. (2014). Chhatu ku saitiba pranali (Odia). *Krishakbandhu Annapurna*, 22:201(1):39.
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  - Srinivas, P., Samant, D. and Singh, H. S. (2014). Culture of consuming fresh fruits. *Sabujima*, 22: 18-20.
  - Veerendra Kumar, K. V. and Prabhakar, B. (2013). Pest and disease management in Coorg mandarin. *Krish Mithra*, January, 2014, pp33-34.

#### Books/Chapters in Books

- Bharathi, L. K., Behera, T. K., Sureja, A. K., Joseph, J. K. and Todd C. Wehner (2013). Snakegourd and pointed gourd : botany and horticulture, *In : Horticultural Reviews*, Volume 41, (Ed.) Janick, Jules, ISBN 978-1-118-70737-1, John Wiley & Sons. pp:457-495.
- Pitchaimuthu, M. (2014). Watermelon *In: Hand Book of Vegetables*, Chapter 16, Vol. III, (Eds. K. V. Peter and P. Hazra ) pp 557-605, Studium Press.
- Senthil Kumaran, G., Muthamil selvan, M., Chellamuthu, K. M., Jacob, S., Annamalai, K. and Kritinamurthi, S. (2013). *Valarthamizhilil Arival- Uzhavaum Unavaum*. Tamil book Published by All India association for scientific tamil. Tanjore. ISBN:978-93-81102-60-2.
- Sidhu, A. S., Sudha Mysore and Rao, E. S. (2013). How much improved vegetable varieties have helped in mitigating food and nutrition insecurity in India: An assessment. *In: The Basics of Human Civilization-Food, Agriculture and Humanity*, Volume -II-FOOD. Eds. PNASF, Bengaluru, pp 94 - 103.
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#### Popular Articles

- Bharathi, L. K., Singh, H. S., Srinivas, P., Samant, D. and Mishra, A. V. (2014). Kaakada chaasar vaigyanik paddhati (Odia). *Krishakbandhu Annapurna*, 22:202(2): 8-10.
- Bhuvanewari, S. (2014). Fresh cut fruits and vegetables for ready to cook and eat. *Agrotechnol*, 2(4):141. <http://dx.doi.org/10.4172/2168-9881.S1.007>.
- Samant, D. (2014). Branch bending: a simple technique for crop regulation in guava. (<http://www.krishisewa.com/cms/articles/production-technology/390-branch-bending-guava.html>).
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- Tripathi, P. C., Veerendra Kumar, K. V., Prabhakar, B., Sadashiva, A. T., Aghora, T. S. and Dinesh, M. R. (2014). Compendium- Awareness and Training Program on Protection of Plant Varieties and Farmers' Rights, KVK, Gonikoppal, Coorg District, Karnataka, pp 39.
- Varalakshmi, B. (2014). Vegetable Amaranth *In: Hand Book of Vegetables- Chapter 14, Vol. III., (Eds. K. V. Peter and P. Hazra) pp 487-520, Studium Press.*

#### Extension Folders

- George, S., Sane, A., Gadagimath, P. B., Ranjitha, K., Narayanaswamy, B., Kanupriya, Bhattacharya, M., Sujatha, A., Khandekar, N., Chandrasekaraiah, K., Jagadish, K. N. and Chandesh, C. (2013) Folder on women friendly technologies with 6 leaflets. IIHR, Bengaluru.
- Prabhakar, B. and Veerendra Kumar, K. V. (2013). Production technology of black pepper, Extension folder No: 14: 1-4, KVK, Gonikoppal.
- Prabhakar, B. and Veerendra Kumar, K.V. (2013). Production technology of banana, Extension folder No: 16: 1-4, KVK, Gonikoppal.
- Prabhakar, B. and Veerendra Kumar, K.V. (2013). Production technology of coffee, Extension folder No: 15: 1-4, KVK, Gonikoppal.
- Suresh, S. C. (2013). Goatary farming, Extension folder no: 17: 1-4, KVK, Gonikoppal.
- Suresh, S. C. (2013). Back yard poultry rearing, Extension folder, KVK, Gonikoppal.
- Veerendra Kumar, K. V, Prabhakar, B. (2013). Safe use of pesticides in agriculture, Extension folder No: 13: 1-4, KVK, Gonikoppal.

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- Tripathi, P. C., Prabhakar, B., Veerendra Kumar, K. V., Suresh, S. C. and Devaiah, K. A. (2014). Proceedings of agricultural technology week celebration, KVK Gonikoppal, December 10-13, 2013.

#### Proceedings/Abstracts/Souvenirs

- Bhuvaneswari, S. and Narayana, C. K. (2014). Postharvest practices in betelvine *In: Souvenir, National Meet on Betelvine: Farmers, Traders and Researchers Interface, IIHR, Bengaluru, February 22-23, 2014.*
- Carolin Rathinakumari, A. and Senthil Kumaran, G. (2014). Development and evaluation of animal drawn onion seeder. *In: Souvenir, 48<sup>th</sup> Annual Convention of ISAE and Symposium on Engineering Interventions in Conservation Agriculture, MPUAT, Udaipur, February 21- 23, 2014, pp 117.*
- Gajanana, T. M., Sreenivasa Murthy, D. and Dakshinamoorthy, V. (2014). Economic analysis of production and

marketing of betelleaves – a review, *In: Compendium on betelvine, IIHR, Bengaluru, February 22-23, 2014, pp.76-80.*

- Ganeshan, S., Sudha, M. and Vasantha Kumar, T. (2014). Betelvine – need for identifying good practices and custodian farming community for on farm conservation and utilization, *In: Souvenir on National Meet on Betelvine, IIHR, Bengaluru, pp. 23-26.*
- Gopalakrishnan, C. and Rashmi B. Artal (2014). Effect of *Pseudomonas fluorescens* and *Bacillus subtilis* against *Ralstonia solanacearum* and seedling vigour index of tomato under *in vitro*, National Conference on Recent Advances in Biosciences – Bioblooms 2014, Dept. of Life Sciences, M.S. Ramaiah College of Arts, Science and Commerce, Bengaluru, March 28, 2014, abst. No. 38-39.
- Gopalakrishnan, C., Rashmi B. Artal and Thippeswamy, B. (2014). Bio-efficacy of *Pseudomonas fluorescens* and *Bacillus subtilis* against bacterial wilt of tomato caused by *Ralstonia solanacearum* E.F. Smith (Yabuuchi *et. al.*). *In: Proceedings of the International Conference on Crop Productivity and Sustainability-Shaping the Future. Baba Farid College, Bathinda, Punjab, March, 20-21, 2014, pp. 67-70.*
- Hema Bisht, David, K. J., Jayanthi Mala, B. R and Deepa Bhagat (2014). Chemical profiling of *Bactrocera dorsalis* and *Bactrocera caryeae* using proton NMR spectroscopy. *In: Souvenir and Abstracts, National Conference on Frontiers in Applied Spectroscopy (NCOFIAS), Bengaluru, February 13-14, 2014.*
- Hima Bindu, K., Suryanarayana, M. A. and Vasantha Kumar, T. (2014). Compendium–National Meet on Betelvine-Farmers, Traders and Researchers Interface, IIHR, Bengaluru, February 22- 23, 2014, pp-158.
- Hima Bindu, K., Suryanarayana, M. A. and Vasantha Kumar, T. (2014). Genetic improvement in betelvine- opportunities and challenges. *In: Compendium- National Meet on Betelvine – Farmers, Traders and Researchers Interface, 2014, IIHR, Bengaluru, February, 22-23, pp 6-11.*
- Naga Chaithanya, M. V., Dinesh, M. R., Vasugi, C., Lakshmana Reddy, D. C., Sailaja, D. and Aswath, C. (2014). Microsatellite based DNA fingerprinting of guava (*Psidium guajava*) genotypes. *In: International Conference on Biodiversity, Bioresources and Biotechnology organized by Association for the Advancement of Biodiversity Science, Mysore, January 30-31, 2014, pp 105.*
- Narayana Swamy, B., Suryanarayana, M. A. and Vasantha Kumar, T. (2014). An analysis of betelvine growers and need assessment. *In: Souvenir, National Meet on Betelvine –Farmers, Traders and Researchers Interface, IIHR, Bengaluru, February, 22-23, 2014, pp 17-19.*

## PAPERS PRESENTED IN SEMINAR/ SYMPOSIUM/CONFERENCE ETC.

- Panneerselvam, P. and Ganeshmurthy, A. N. (2014). Biofertilizers for betelvine. 2014. In: Souvenir - National Meet on Betelvine – Farmers, Traders and Researchers, Interface, IIHR, Bengaluru, February 22-23, 2014. pp 8-11.
- Rajiv Kumar and Bidyut C. Deka (2014). Biodiversity in wild flora of north eastern region. In: Abstracts, International Conference on Biodiversity, Bioresources and Biotechnology, Mysore, January 30-31, 2014, pp. 21-22.
- Rao, E. S. (2013) Prospects and considerations for development of synthetic varieties in onion. In: Proceedings of Brain Storming Session on Crop Improvement and Seed Production of Onion, Nasik, March 15, 2014, pp 13-28.
- Shivashankara, K. S. (2014). Physiology and chemistry of betelvine (*Piper betle* L). In: Compendium, National Meet on Betelvine – Farmers, Traders and Researchers Interface, IIHR, Bengaluru (Hima Bindu, K., Suryanarayana M.A. and Vasantha Kumar T. eds), February 22-23, 2014, pp 26-31.
- Suryanarayana, M. A., Vasantha Kumar, T., Hima Bindu, K. and Loksha, A. N. (2014). Status of betel vine cultivation in Karnataka. In: Compendium-National Meet on Betelvine –Farmers, Traders and Researchers Interface, IIHR, Bengaluru, February, 22-23, 2014, pp. 119-123.
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- Vasantha Kumar, T. and Yele Shashidhara. (2014). Yele Mallappa Settaru – The visionary of a bygone era. In: Souvenir, National Meet on Betelvine –Farmers, Traders and Researchers Interface, IIHR, Bengaluru, February, 22-23, 2014, pp-119-123.
- Vasantha Kumar, T., Suryanarayana, M. A. and Himabindu, K. (2014). Souvenir- National Meet on Betelvine - Farmers, Traders and Researchers Interface, IIHR, Bengaluru, February 22-23, 2014. PP-42.
- Venu, S. A., Senthil Kumaran, G. and Manjula, B. (2014). Development of a zero energy cooling transportation vehicle for perishable commodities. In: Book of invited lectures and abstracts of Regional Science Conference based on Science and Technology for Harnessing Natural Resources towards Sustainable Development, Karnataka Science & Technology Academy (KSTA) Bengaluru, University of Agricultural Sciences, Raichur, January 04-05, pp 85.

### **National Seminar (NFPTRD – 2014) on Emerging Food Processing Technologies for Rural Development, Gandhigram Rural Institute, Gandhigram, Tamil Nadu, January 04-05, 2014.**

- Senthil Kumaran, G. - Labour and energy saving machinery for mushroom cultivation.

### **International Conference on Emerging Food Safety Risks: Challenges for Developing Countries, NIFTEM, Sonapat, Haryana, January 09-12, 2014.**

- Soudamini Mohapatra- Residue evaluation of difenoconazole and propiconazole on pomegranate and their risk assessment.

### **Meeting on Innovation and Mechanization in Arecanut Farming and Processing Organized by Arecanut Research and Development Foundation, Varanashi Towers, Mission Street, Mangalore, January 16, 2014.**

- Senthil Kumaran, G. - Mechanization options in arecanut farming and processing.

### **Half yearly Meeting for Monitoring and Reviewing the Progress of the Foreign Aided Project, Horticulture Division, ICAR, New Delhi, January 16, 2014.**

- Gajanana, T. M. - Progress report of UNEP-GEF project on conservation and sustainable use of cultivated and wild tropical fruit tree diversity: promoting sustainable livelihoods, food security and ecosystem services– (Chittoor site).

### **International Conference on Biodiversity, Bioresources and Biotechnology, Mysore, Karnataka, January 30-31, 2014.**

- Rajiv Kumar- Biodiversity in wild flora of north eastern region.
- Chandra Prakash - Genome wide analysis of alpha – crystalline – HSP P23 – like super family in *Solanum lycopersicum* associated with small heat shock proteins.

### **National Seminar on Agriculture and Bio-security in Changing Scenario, ASEPAN, Visva-Bharati, Sriniketan, West Bengal, February 01-03, 2014.**

- Deepa Samant - Performance of mango hybrid 'Amrapali' in Odisha under varying drip irrigation regimes and mulching.

### **2<sup>nd</sup> International Conference on Agriculture and Horticultural Sciences Organized by OMICS Group, Radisson Blu Plaza Hotel, Hyderabad, February 03-05, 2014.**

- Vasugi, C. - Evaluation of intergeneric hybrid progenies of papaya for PRSV tolerance and fruit quality.
- Rekha, A. and Ramanjinappa, V. - Standardization of Induction temperature in *Musa* cultivar Grand Naine to analyze temperature tolerance.

- Rekha, A. and Ramanjinappa, V. - Wild Bee Hee Kela (BB) (*Musa balbisiana*) and its reaction to prolonged moisture stress.
- Bhuvanewari, S. - Fresh cut vegetables for ready to cook and eat.

**National Seminar on Organic Farming in Indian Agriculture, NIAS, IISC Campus, Bengaluru, February 03-04, 2014.**

- Prabhakar, M., Hebbar, S. S., Nair, A. K., Shivashankara, K. S., Panneerselvam, P., Rajeshwari, R. S. and Bharathi, K. - Scope and potential of organic farming in vegetable crops.

**7<sup>th</sup> National Seminar on Emerging Climate Change Issues and Sustainable Management Strategies, February 08-10, 2014.**

- Srinivas, P. - Commercial protected fruit and vegetable nurseries in rural Odisha combating climate adversaries.

**National Conference on Horticulture Industry in India - Special Reference to Karnataka - Challenges and Opportunities, College of Agriculture, Bijapur, February 12-14, 2014.**

- Gajanana, T.M., Hegde, M. R. and Sidhu, A. S. - Technology led horticultural growth in India with special reference to Karnataka.
- Gajanana, T.M., Sreenivasa Murthy, D., Sudha, M. and Dakshinamoorthy, V. - Export performance of pomegranate from India - challenges and opportunities.

**AZRA Silver Jubilee International Conference on Probing Biosciences for Food Security & Environmental Safety organized by Applied Zoologists Research Association (AZRA), Central Rice Research Institute, Cuttack, Odisha, February 16-18, 2014.**

- Kundan Kishore - Inconsequential floral visitors ensure reproductive success in sapota.
- Sangeetha, G.- Report on occurrence of preharvest anthracnose on unripe banana fruits in Odisha.
- Mandal, S. - Inducing cell wall-bound phenolic compounds in eggplant (*Solanum melongena*) by elicitors.
- Srinivas, P. - Characterization of phosphate solubilizing microorganisms isolated from rhizospheres of different fruit crops
- Srinivas, P. - Diversity of soil microbial status in subtropical fruit ecosystem in Odisha.

**National Meet on Betelvine- Farmers, Traders and Researchers Interface, IIHR, Bengaluru, February 22-23, 2014.**

- Hima Bindu, K. - Status of crop improvement and research needs.

**Hindi Takniki Sangosthi 2013-14 organized by TOLIC, Bengaluru, ISRO, Bengaluru, February 26, 2014.**

- Tiwari, R. B. - *Apada prabandhan hetu prasanskrit khadya padarthon ki upayogita* (Hindi).

**National Business Meet on Plant Protection in Protected Cultivation of Vegetable Crops organized by IIHR, Bengaluru, Moven-Pick, Bengaluru, March 06-07, 2014.**

- Debi Sharma - Pesticide residue and their management in protected cultivation.
- Sudhakar Rao, D.V. - Innovations in PHM of protected cultivated produce for domestic and export markets.

**HTM BPD Review & Final Workshop of Component - 1, NAS Complex New Delhi, March 07-08, 2014.**

- Sudha, M. - Annual progress report of HTM BPD of IIHR, Bengaluru.

**International Conference on Crop Productivity and Sustainability-Shaping the Future, Baba Farid College, Bathinda, Punjab, March 20-21, 2014.**

- Gopalakrishnan, C. - Bio-efficacy of *Pseudomonas fluorescens* and *Bacillus subtilis* against bacterial wilt of tomato caused by *Ralstonia solanacearum* E.F. Smith (Yabuuchi et. al.)

**Bitter Gourd Conference (BiG2014) organized by AVRDC, Taiwan, ICRISAT, Hyderabad, March 20-21, 2014.**

- Varalakshmi, B., Pitchaimuthu, M., Sreenivas Rao, E., Krishnamurthy, D., Suchitha, Y. and Sanna Manjunath, K. S. - Identification, preliminary characterization and maintenance of gynoeious plants, IIHRBTGy-491 and IIHRBTGy-492 in bitter gourd.
- Varalakshmi, B., Shivashankar, S., Shivashankar, K. S., Raghupathi, H. B., Pitchaimuthu, M., Sreenivas Rao, E., Suchitha, Y., Krishnamurthy, D., Sumathi, Pavithra, K. C. and Roy, T. K. - Genetic variability and association of nutritional, nutraceutical and medicinal properties in bitter gourd germplasm.
- Singh, B., Pandey, Sudhakar, Choubay, T., Behera, T. K., Varalakshmi, B. Manoj Sreevastav, Astik Jha and Uppadhyay, D. K. - Development and validation of DUS test guidelines of bitter gourd.

**National Conference on Value Chain Management in Mango Organized by University of Horticultural Sciences, Bagalkot in association with Dept. Of Horticulture, Govt. of Karnataka and Karnataka State Mango Development and Marketing Corporation, (KMDC) & HREC, Hogalagere, Srinivasapura, Kolar, March 20 -22, 2014.**

- Reddy, Y. T. N. - HDP and canopy management in mango.
- Doreyappa Gowda, I. N. - Processing and value addition in mango.

- Sudhakar Rao, D.V. - Post-harvest management of mango.
- Carolin Rathinakumari, A. - Role of machinery/tools for mango.

**Annual Review Workshop of NCAP Network Project on Market Intelligence, NIABM, Bikaner, Rajasthan, March 24-25, 2014.**

- Sudha, M. - Progress report w.r.t. NCAP network project on Market Intelligence

### HONOURS/RECOGNITIONS/AWARDS

- Horticultural Technology Management - Business Planning and Development Unit of IIHR, Bengaluru has been adjudged as Top performing BPD among the newly sanctioned BPD by ABI - ICRISAT.
- Dr. Rajiv Kumar received 'Young Scientist Award' from the Society for Scientific Development in Agriculture and Technology, Meerut for outstanding contribution in the field of Floriculture & Landscape Gardening on the occasion of National Conference on Emerging Problems and Recent Advances in Applied Sciences: Basic to Molecular Approaches at Ch. Charan Singh University, Meerut, during January 8-9, 2014.
- Dr. Rajiv Kumar has been nominated as a 'Fellow' of Association for the Advancement of Biodiversity Science, Belgaum, Karnataka on January 12, 2014.
- Dr. Rajiv Kumar has been nominated as member in the editorial board of journals viz., 'Current Horticulture', Ghaziabad and 'Hortflora Research Spectrum', Meerut.
- The poster paper entitled "Development of a zero energy cooling transportation vehicle for perishable commodities" presented by Venu S.A., Senthil Kumaran, G. and Manjula, B. was awarded first prize for the best poster at the Regional Science Conference based on "Science and Technology for Harnessing Natural Resources towards Sustainable Development" held at University of Agricultural Sciences, Raichur during January 04-05, 2014.
- The paper entitled "Microsatellite based finger printing in guavas presented by Dr. C. Aswath received Best paper award in the International Conference on Biodiversity, Bioresource and Biotechnology held at Mysore during January 30-31, 2014.
- The working model on "Low cost cooling storage structure for shelf life extension of horticulture produce" presented by Venu, S.A., Senthil Kumaran, G., Carolin Rathinakumari, A. and Dayananda, P. was awarded First prize at the National Conference on Food Technology held at IICPT, Tanjavur during February 07-08, 2014.
- The posters paper entitled "Diversity of soil microbial status in subtropical fruit ecosystem in Odisha" and "Report on occurrence of pre-harvest anthracnose on unripe banana in Odisha", were awarded Prof. P. Kameswara Rao Best Poster Paper Award to Dr. P. Srinivas and Dr. G. Sangeetha respectively during AZRA Silver Jubilee International Conference on Probing Biosciences for Food Security & Environmental Safety organized by Applied Zoologists Research Association (AZRA) and Division of Crop Protection at Central Rice Research Institute, Cuttack during February 16-18, 2014.
- Dr. Tripathi, P. C. has been nominated as a Member of Institute Management Committee of IIHR, Bengaluru for the period of three year (2013-16).
- Dr. Aswath, C. was nominated as a Panel Member for Regulatory Issues and Challenges for the Agri biotechnology Sector in the Panel Discussion on Evaluation of Agribiotechnology Regulations in CII Conference on Agri biotechnology organized at Chennai on March 24, 2014.
- Dr. Singh, H. S. has been nominated as Member of Technical Support Group (TSG) of Directorate of Horticulture, Government of Odisha.
- Dr. Sudhakar Rao, D.V. has been nominated as subject matter expert for quality testing of apples transported by train from Delhi to Bengaluru through specially designed insulated and ventilated container as a part of trail run conducted by NHB, Ministry of Agriculture, Government of India.
- Dr. Anil Kumar Nair was nominated as a Member of the team constituted by NHB for the accreditation of two horticultural nurseries in Chikkaballapur district of Karnataka.
- Dr. Rajasekharan, P. E. acted as a Panel member to adjudicate agricultural practices of Kurichiyam, MullaKuruman, Thachanaden Muppen and Wayanadan Chetti of Wayanad district, Kerala.
- Dr. Murthy, B.N.S. was nominated as a Member of the 'National Advisory Committee' constituted by University of Horticultural Sciences, Bagalkot for the "National Seminar on Pomegranate Production, Post-Harvest Technology and Marketing : Challenges and Opportunities" held at Bagalkot during April 11-13, 2014.
- Dr. Sudha, M. acted as a panelist in NAIP sponsored Management Development Program for Researchers, at NAARM, Hyderabad on January 31, 2014.
- Dr. Gajanana, T. M. acted as Chairman of the Technical Session: Innovations in Horticulture, National conference on Horticulture Industry in India with Special Reference to Karnataka – Challenges and Opportunities, jointly organized by UAS, Dharwad and Indian Society of Agricultural Economics, Mumbai during February 12-14, 2014.
- Dr. Senthil Kumaran, G. acted as the Co-chairman of the Technical Session on Technologies for Fruit and

Vegetable Preservation in the National Seminar (NFPTRD – 2014) on Emerging Food Processing Technologies for Rural Development held at Gandhigram Rural Institute, Gandhigram, Tamil Nadu during January 04-05, 2014.

- Dr. Tripathi, P. C. acted as Co- chairman of a Session during AICRP Annual Workshop at Dr. Bala sahib Sawant, Konkan Krishi Vidyapeeth, Dapoli, Maharashtra, during January 22-25, 2014.
- Dr. Manjunatha Rao, T. acted as Co-chairman for the Technical Session I during the Interactive meeting on Male sterility systems in horticultural crops – present status and future strategies held at IIHR, Bengaluru on January 24, 2014.
- Dr. Manjunatha Rao, T. acted as Co-chairman for the Technical session in the XXIII Group Meeting of AICRP on Floriculture held at PAU, Ludhiana during February 25-27, 2014.
- Dr. Singh, H. S. acted as Co-chairman of Technical Session III - Crop Protection in AICRP on Cashew-2013 on January 05-07, 2014.
- Dr. Singh, H. S. acted as Co-chairman of the Session on Pest Management in the Group Discussion of AICRP on Fruits at Dapoli, Maharashtra held during January 22-25, 2014.
- Dr. Manjunatha Rao, T. was invited to act as one of the judges for evaluating flower exhibits during Republic Day flower show held at Lal bagh, Bengaluru.
- Dr. Rajasekharan, P. E. was invited as one of the judges to judge the best stalls at Sasthra Jalakam – The National Science Expo and also acted as outside expert to evaluate the abstracts submitted for 26<sup>th</sup> Kerala Science Congress at Kalpetta, Wayanad, Kerala during January 28-31, 2014.
- Dr. Rajasekharan, P. E. was invited to act as Jury to adjudicate Dr.S.Vasudev award of Kerala State Council for Science Technology and Environment (KSCSTE),Thiruvananthapuram.
- Dr. Singh, H. S. acted as Member in a committee for judging of the applications for Annual Awards to the various categories of the staff at CIFA, Bhubaneswar on March 12, 2014.
- Dr. Gajanana, T. M. acted as the Rapporteur for the Session IV: Panel discussion on farmers' problems, marketing, initiatives and support from departments during the National Meet on Betelvine at IIHR, Bengaluru, February 22-23, 2014.

## PERSONALIA

### Promotion

The following staff members have been promoted to the next grade through assessment

#### Scientific

- Dr. Ashok Kumar Ahuja, Sr. Scientist (Soil Science) - promoted to Principal Scientist w. e. f. 01.01.2011.

- Dr. Sangamma, Sr. Scientist - promoted to Principal Scientist w. e. f. 01.01.2011.
- Dr. G. Senthil Kumaran, Sr. Scientist – promoted to Principal Scientist w. e. f. 01.01.2011.
- Dr. K. Bhanuprakash, Sr. Scientist (Plant Physiology) - promoted to Principal Scientist w. e. f. 03.05.2012.
- Dr. G.C.Sathisha, Sr. Scientist, (Soil Science) - promoted to Principal Scientist w. e. f. 14.07.2012.
- Dr. Laxman, R. Hunashikatti, Sr. Scientist (Plant Physiology) - promoted to Principal Scientist w. e. f. 25.07.2012.
- Dr. R. Venugoplan, Sr. Scientist (Economics & Statistics) - promoted to Principal Scientist w. e. f. 08.08.2012.
- Dr. L. R. Varalakshmi, Sr. Scientist, (Soil Science) - promoted to Principal Scientist w. e. f. 29.09.2012.
- Dr. T. Sakthivel, Sr. Scientist - promoted to Principal Scientist w. e. f. 16.12.2012.
- Dr. M. A.Suryanarayana, Sr. Scientist – promoted to Principal Scientist w. e. f. 18.12.2012.
- Dr. M. V. Dhananjaya, Sr. Scientist – promoted to Principal Scientist w. e. f. 22.12.2012.

NB: Principal Scientist pay scale: 37,400 - 67,000 + RGP of Rs. 10,000

- Dr. G. Selva Kumar, (Soil Science) – promoted to Senior Scientist in the Pay scale of Rs.37400-67000+RGP of Rs.9000/-w. e. f. 22.06.2012

#### Technical

- Shri S. A. Sreedhar, ACTO (Lab) - promoted to Chief Technical Officer w. e. f. 03.02.13.
- Shri H. L. Jayaram, ACTO (Lab) -promoted to Chief Technical Officer w. e. f.03.02.13.
- Shri V. Dakshinamoorthy, ACTO (Lab) - promoted to Chief Technical Officer w. e. f. 03.02.13.
- Shri K. Reddappa, Sr. Technical Officer (Lab)-promoted to ACTO (Lab) w. e. f. 01.07.2012.

#### Transfer

- Dr. G. Karunakaran, Sr. Scientist (Genetic and Plant Breeding) has been transferred from CHES, Chettalli to CHES, Hirehalli w. e. f. 07.01.2014.

#### Superannuation

- Dr. A. S. Sidhu, Director, IIHR, Bengaluru retired from Council Service w. e. f. 31.01.2014(AN).
- Dr. K. Srinivas, Principal Scientist, IIHR, Bengaluru retired from Council Service on attaining the age of 62 years w. e. f. 31.03.2014(AN).
- Dr. K. C. Mohan, Chief Technical Officer (Library), IIHR, Bengaluru retired from Council Service on attaining the age of 60 years w. e. f. 31.03.2014(AN).

- Shri. B. B. Bopaiah, Sr. Technical Officer, CHES Chettalli, retired from Council Service on attaining the age of 60 years w. e. f. 31.01.2014(AN).
- Smt. B. A. Kusuma, Assistant Administrative Officer, CHES, Chettalli retired from Council Service on attaining the age of 60 years w. e. f. 31.03.2014(AN).
- Smt. Susheelamma, SSS, IIHR, Bengaluru retired from Council Service on attaining the age of 60 years on 31.01.2014(AN).
- Shri. Rafeeq Ahmed, SSS, IIHR, Bengaluru retired from Council Service on attaining the age of 60 years on 31.01.2014(AN).

#### Miscellaneous

- Dr. C.K. Narayana took over the charge of Director, IIHR, Bengaluru on acting basis w.e.f. 01-02-2014.
- Dr. K. Srinivas took over charge as Incharge Head, Division of Fruit Crops w.e.f. 16-01-2014.
- Dr. M. Prabhakar took over charge as Incharge Head, Division of Vegetable Crops w.e.f. 16-01-2014
- Dr. A. Vani took over charge as Incharge Head, Division of Biotechnology, w.e.f. 16-01-2014

### VISITORS

#### IIHR, Hesaraghatta, Bengaluru

1. Dr. P. S. Pandey, National Coordinator, NAIP, Component - 1 (04.01.2014)
2. Dr. Dyno Keatinge, Director General, AVRDC, The World Vegetable Center, Taiwan, Deputy Director (Research), AVRDC, Taiwan (11.02.2014).
3. Dr. Warwick Easdown, Regional Director AVRDC-The World Vegetable Center, South Asia Regional Office, ICRISAT Campus, Patancheru - 502 324 Hyderabad, Andhra Pradesh (11.02.2014).

4. Shri. G. V. Krishna Rao, Additional Chief Secretary cum Development Commissioner Govt. of Karnataka (17.02.2014).
5. Dr. K. Ramakrishnappa, Additional Director (Farms and Nurseries), Dept. of Horticulture, GOK, Bengaluru (26.02.2014).
6. Padmabhushan Dr. M. Mahadevappa, Former Chairman, ASRB, New Delhi (22.02.2014).
7. Padmasree Dr. K. L. Chadha, Former DDG (Hort), ICAR, New Delhi(22.02.2014).
8. Dr. D. L. Mahehsvar, Director of Horticulture, GOK, Bengaluru (22.02.2014).
9. Dr. N.K. Krishna Kumar, DDG (HS), ICAR New Delhi (22.02.2014).
10. Dr. Rohini, M. Godbole, Professor, Centre for High Energy Physics, Indian Institute of Science, Bengaluru (18.03.2014).

#### CHES, Chettalli

1. Shri. N. Kumar (Member, Governing Body of ICAR, New Delhi), Tumkur, Karnataka (12.03.2014).
2. Dr. Anand Raj, Director, IISR, Calicut, Kerala (06.01.2014)

#### CHES, Bhubaneswar

1. Dr. S. B. Dandin, Vice-Chancellor, UHS, Bagalkot (24.01.2014).
2. Dr. P. Parvatha Reddy, Former Director, IIHR, Bengaluru (24.01.2014)
3. Dr. Lalitha Anand, Former Head, Division of Biotechnology, IIHR, Bengaluru (24.01.2014).

#### KVK, Gonikoppal

1. Mr. N Kumar, Member, ICAR General Body, New Delhi

#### KVK, Hirehalli

1. Dr. A.H. Rajasab, Vice Chancellor, Tumkur University, Tumkur (30.01.2014).

For further details contact:

**DIRECTOR,**  
**Indian Institute of Horticultural Research,**  
**Hesaraghatta Lake Post, Bengaluru – 560 089**

Published by : Director, IIHR, Hesaraghatta Lake Post, Bengaluru-560 089  
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