



ICAR-IIHR

Newsletter



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DIRECTOR'S DESK

Horticultural commodities are rich in phytochemicals essential for human health and nutrition. In spite of the efforts invested in increasing awareness on the consumption of horticultural commodities, there is no significant increase in the consumption of fresh fruits and vegetables in the last few decades. Based on the estimation of product availability (production data, combined with import/ export), only a few countries appear to have enough fruits and vegetables to fulfil the per capita recommendation of the World Health Organization of 400 g per day. In India, though we have surplus production of fruits, the estimated per capita availability of fruits is 207.9 g per day which is still below the recommended quantity of 230 g per capita per day. The main reason for this is the faster perishability of horticultural commodities resulting in significant postharvest losses, which include both quantitative and qualitative losses. The quantitative losses refer to reduction in mass or volume, which reduces the quantity of produce available for consumption, while qualitative losses relate to decrease in nutrition, caloric value, safety issues, consumer acceptability, and subsequently the economic value of the produce.



These postharvest losses occur throughout the supply chain at all stages of handling. Postharvest losses could be curtailed and better price realization could be achieved for farmers by following certain improved post-harvest operations and small-scale technologies. Here at ICAR-IIHR, Bengaluru, we have developed various simple post-harvest practices which are easily adoptable, cost effective (low cost, often showing immediate profitability), and have wider adaptability. Some of these postharvest management practices include use of harvesting tools to avoid mechanical damage and losses, use of harvesting containers that do not press, crush or puncture the produce, following sorting and grading practices, better curing and pre-cooling practices, field packing, simple post-harvest treatments like hot water treatment, edible coatings, modified atmosphere packaging, individual shrink wrapping to avoid weight loss and extend shelf life, use of simple on-farm/ off farm storage structures and cold storage protocols for extending the marketable period for better and profitable disposal of the harvested produce, consumer packaging of high value produce and supplying to supermarkets as a means of income generation, use of low-cost safe ripening technologies as a small scale business to earn income. Also we have standardized the

optimum concentration of different novel plant growth regulators viz., 1-methylcyclopropane and salicylic acid for extending their storage life of horticultural produce.

Additionally, at ICAR-IIHR, we have developed various technologies for value addition in various fruits and vegetables. Some of them include fruit concentrate beverages from mango, aonla, kokum, guava and passion fruit; Ready-to-Drink beverages from jackfruit, bitter gourd, mango, passion fruit, guava, pineapple, aonla and water melon; osmodehydrated products from aonla, guava, pineapple, jackfruit and papaya; fruit bars from mango, guava, and papaya; culinary pastes from onion, garlic, ginger and green chillies; wine from banana and sapota; brine preservation of mango slices; minimal processing for onion, cabbage, carrot, garlic, coriander leaves, cucumber, French beans and radish; probiotic juices from pomegranate, mango and pineapple; avocado products like powder, chutney and bread spread. We have also developed technologies for preparation of cookies and chocolates from jack seed powder, thereby ensuring the utilization of by-products.

To reduce the drudgery involved in postharvest operations we have developed equipment and machineries like fruit harvesters for mango, sapota, lime and pomegranate; fruit size graders, onion detopper, raw mango slicer, peeler and cube cutter; raw jackfruit peeler, pomegranate aril extractor, garlic bulb breaker, watermelon seed extractors, solar power operated tricycle cart and vending van for marketing of fresh fruits and vegetables. These equipments have helped farmers in overcoming labor shortage and have enabled faster processing of fruits and vegetables, a problem that was efficiently addressed during the pandemic. Thus, ICAR-IIHR has consistently been in the forefront, to support farmers market their horticultural produce through good times and bad.



Dr. BNS MURTHY
Director, ICAR-IIHR

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VARIETIES & TECHNOLOGIES RELEASED

Arka Veera - Cucumber variety

Arka Veera is a high yielding open pollinated variety having tolerance to downy mildew. It is an inbred line developed through individual plant selection of IIHR-588-1-1-5-26. It is an early flowering variety, female flowers appear at 3rd node, taking 27-34 days for first female flower appearance and 42-45 days for first picking of fruits. The average fruit weight is 180 g with 12-14 fruit per plant, fruits are light green, cylindrical and smooth; rich in calcium, potassium, magnesium and zinc, phenols, flavonoids and consequently has high antioxidant activity. It yields 28.5 t/ ha in 90-100 days, and suitable for round the year cultivation.



Arka Mushroom Nutri-Cereal Cookies

It is a zero maida (refined flour) product with millet flour and mushroom powder as the base ingredients. It is a zero white sugar and zero preservative product. It has higher protein content (13.5-15%) than commercial millet cookies (6-7%), higher calcium content and much lower carbohydrates.



Varieties identified for release & notification at National level

The AICRP (VC) Variety Identification Committee chaired by Dr. A.K. Singh, DDG (HS) met on 8th Sept 2021, and reviewed the data for the years, 2017-18, 2018-19 & 2019-20 and identified the following entries developed by ICAR-IIHR for release and notification at the national level.

Crop	Code	Name of the Entry	Zone
Chilli hybrid	2017/CHIHBY-2	Arka Khyati	VII
Chilli hybrid	2017/CHIHBY-5	Arka Swetha	IV
Ridge gourd hybrid	2017/RIGHBY-1	Arka Vikram	IV & VIII

RESEARCH HIGHLIGHTS

Standardization of Vegetative Propagation in Papaya

For induction of lateral shoots in papaya for vegetative propagation, detopping of 5 month old plants and spraying benzyl adenine @ 100 ppm + GA₃ @ 200 ppm recorded maximum number of side shoots. Spraying of GA₃ @ 200 ppm effectively increased length of side shoots.

Side shoots in decapitated papaya plants



Wedge grafting was more successful (72%), while side grafting (38%) was the least successful. Wedge grafted papaya plants were field planted after one month of grafting and were compared with seedling plants of same age, after three months of planting: grafted plants recorded lower plant height (65 cm) and internodal length (2.1 cm), maximum stem girth (9.5 cm), while seedling plants recorded higher plant height (90 cm) and internodal length (3.5 cm) and lower stem girth (6.6 cm). Grafted plants produced flower buds within 3 months of planting at 55 cm height from the ground, while seedling raised plants continued to grow during the vegetative phase.



Grafted papaya plants in reproductive phase after 3 months of planting



Seedling papaya plants in vegetative phase after 3 months of planting

The first harvest was done at 9 to 10 months after planting in grafted plants, while it was 12-13 months in seedling raised plants. Fruit weight and volume was higher in grafted plants compared to seedling plants.



Bearing habit in grafted (left two rows) and seedling (right two rows) papaya plants.

For induction of rooting in papaya cuttings, 1.5- 2.0 month old shoots treated with 750 ppm IBA and planted in cocopeat enriched with AMC resulted in 52% rooting within 2 months after planting, while 3 months old shoots recorded 24% rooting after 2 months of planting. Tender shoots (lesser than 1.5 months old) did not induce any rooting even after two months. Field planted rooted cuttings flowered at 45 cm above the ground within 4 months after planting and the first fruit was harvested at 8 months after planting.



Rooting of cuttings in different aged shoots
(Left: 3 months old shoot, middle: 1.5-2 months old shoot and right: <1.5 months old shoot)



Fruiting in plants raised from cuttings

Improvement of Coorg Mandarin and Avocado through Mutation

The LD₅₀ values of 200 Gy and 75 Gy were standardized for Coorg mandarin and avocado respectively, by using seeds as planting material. This will enhance the genetic diversity and help in identification of elite genotypes.



Chilli: Highly pungent chilli accessions viz., IIHR 4501, IHR 4550 and IHR 4569 were identified. Among the F₁ hybrids developed for high pungency, IIHR_BJH1 was promising yielding up to 5 kg red ripe fruits per plant under polyhouse conditions with capsaicinoid content of 7,28,333 SHU; SCAR markers for mitochondrial genome were used to study the diversification of male sterile lines, to group the CGMS lines being maintained at ICAR-IIHR. Candidate genes linked to anthracnose fruit rot resistance loci in chilli have been identified.

Okra: Sources of resistance to *Fusarium* wilt, nematodes, powdery mildew and jassids were identified.

Cucumber: Three parthenocarpic gynoecious lines, viz., IIHR-434-5, IIHR-435-2 and IIHR-436-1 were developed.

Bottle Gourd: Two promising lines BG-8-1 & BG-6-3 (INGR21215 & INGR21147) for powdery mildew resistance and three lines BG-114-1, BG-114-3 & BG-95 (INGR21146, INGR21145 & INGR21148) for gummy stem blight disease resistance were registered with NBPGR, New Delhi.

Ash gourd: Fifty three germplasm accessions were collected from NBPGR, New Delhi.



Promising ash gourd accessions AG 3-54 & AG 3-46

Soilless Production Technology for Cowpea and Dolichos

The soilless cultivation of cowpea and dolichos, under open conditions, using - 170 ppm N-NO₃, 35 ppm P and 215 ppm K - recorded better growth, highest number of pods (46.02), average pod weight (5.93 g) and yield (272.7 g/ plant and 19.09 t/ ha). Cowpea varieties *Arka Suman* (5.54 g pod weight and 272.5 g yield per plant and 19.07 t/ ha) and *Arka Garima* (6.37 g pod weight and 272.8 g/ plant and 19.10 t/ ha) recorded almost on par yield. In dolichos, application of 170 ppm N-NO₃, 35 ppm P and 215 ppm K recorded better growth and biomass, highest number of pods (51), average pod weight (5.13 g) and yield (261.4 g/ plant and 18.3 t/ ha). The dolichos variety *Arka Sambharam* recorded higher pod numbers and yield (56.8 pods, 288.6 g/ plant and 20.21 t/ ha) compared to *Arka Amogh* (45.2 pods, 234.2 g/ plant and 16.39 t/ ha) under open soilless cultivation.



Growth and pod setting of cowpea and dolichos under soilless culture

Effect of Photoperiod Manipulation in Cut Chrysanthemums

Significantly higher stalk length (101.89 cm), early flower bud initiation (49 days), early flowering (70 days) and better flower quality were recorded in photoperiodic module, viz., long Days (15 hours light, 9 hours dark) up to crop age 4-5 Weeks + short Days (9 hours light, 15 hours shade) after 5 weeks up to flower bud initiation across the different varieties of chrysanthemum.

Chilli Harvester

An engine operated chilli harvester was designed and developed. It has the following main components: prime mover, rotary harvesting drums, collecting chamber and power transmission mechanism. The power was taken from prime mover engine through bevel gears and belt and pulley mechanism to rotate a standardized rotary drum with combing pegs. The field capacity is about 0.2 ha/ h.

Chilli Harvester



NEWS & EVENTS, SUCCESS STORIES**Events under Azadi Ka Amrut Mahotsav**

Title/ Theme of the Campaign	Program Dates	No. of participants
<i>National Campaigns</i>		
<i>Atmanirbhar Krishi</i> - ICAR Foundation Day; Tree plantation campaign	16.07.2021	100
Agriculture and Nutrition: The way of Tribal Agriculture, Entrepreneurial Potential of Mushroom Technologies for Nutritional and Income Security in India, (Virtual)	25.08.2021	301
Food and Nutrition for Farmers, ICAR-IIHR, Bengaluru	26.08.2021	75
Food and Nutrition for Farmers, CHES, ICAR-IIHR, Bhubaneswar	26.08.2021	50
Curtain raiser for International Year of Millets 2023 - Campaign on Nutri-Garden and Tree Plantation; Distribution of planting materials and seed kits, ICAR-IIHR, Bengaluru	17.09.2021	250
International Year of Millets 2023, CHES, ICAR-IIHR, Bhubaneswar	17.09.2021	68
<i>Mahila Kisan Diwas</i> - Equity and Empowerment, by Mrs. Chayaa Nanjappa, Founder partner, Nectarfresh, Karnataka	15.10.2021	50
World Food Day - Challenges in the food front, by Dr. S.V. Hittalamani, Additional Director of Horticulture (Retd.), GoK	16.10.2021	105
Agriculture and Environment: The Citizen Face: Interaction with school children. Dr. B Narayanaswamy, PS & Coordinator of program	08.11.2021	69
Agricultural Education Day - Reaching out to School Children	03.12.2021	76
<i>Jai Kisan Jai Vigyan Week: Uttam Kheti-Unnat Kisan</i> : Lectures on integrated farming systems based mango production & improved production technologies for tomato	30.12.2021	50
<i>Regional campaigns</i>		
Seedballs making event was organised at KVK, Hirehalli, Tumakuru, to promote afforestation of nearby forest area with neem, pongamia, tamarind, <i>Melia dubia</i> , jamoon, bamboo etc.	08.07.2021	50
Sustainable Integrated Cropping System Models for Enhancing Income of Farmers: Dr. N. Ravisankar, Principal Scientist (Agronomy) & Project Coordinator (AICRP-IFS) as guest speaker	24.07.2021	65
National Nutrition Week: Precision Nutrition, Dr. Usha Antony, Dean, College of Fish Nutrition & Food Technology, Chennai, as guest speaker	03.09.2021	75
Skill Agriculture for Hill Agriculture coinciding with Himalayan Day, by Dr. R. Venkatasubramanian, Director, ICAR-ATARI, Bengaluru	09.09.2021	107
Mass Campaign for Large-scale Use of Climate Resilient Technologies & Methods, ICAR-IIHR, Bengaluru	28.09.2021	100
Use of Climate Resilient Technologies and Methods, CHES, Bhubaneswar	28.09.2021	65

Awareness Campaign on Germplasm Registration in Horticultural Crops (Online): Guest speakers, Dr. Anjali Kak Kaul, PS, Division of Germplasm Conservation, ICAR-NBPGR, & Dr. Rajiv Kumar, PS, Division of Flower & Medicinal Crops, ICAR-IIHR	01.10.2021	220
Training cum input distribution of Dolichos varietal demonstration	29.10.2021	60
Demonstration of composting of crop residues using tuberose leaves, flower stalks and other farm wastes at Hosadurga village, Kanakapura taluk	11.11.2021	20
Conservation, Management and Utilization of Horticultural Genetic Resources for Livelihood and Nutritional Security. Training was inaugurated by Padmabhushan Dr. R.S. Paroda, Chairman, TAAS & Former DG, ICAR; the valedictory session was presided by Dr. A.K. Singh, DDG (HS)	22.11.2021-26.11.2020	220
Off-campus Awareness Program: Technologies - Onion Production - Scientific Hints, at Cheluru, Bagepalli taluk, Chikkaballapur District	07.12.2021	120
National Mushroom Day celebration at High school, NGO Peoples Trust, Sriramanahalli, Rajankunte, Bengaluru	23.12.2021	56
ICAR-IIHR Technologies in Creating Entrepreneurial Opportunities for Small Holding Farmers	29.12.2021	50
Workshop on Science Communication for students, scientists and faculty of National Agricultural Research System: Resource persons were Dr. Dinesh, C. Sharma, Former Editor, India Science Wire, Vigyan Prasar & Jawaharlal Nehru Fellow; & Ms. Sneha Verghese, Research Scholar of Journalism, Osmania University & Assistant Section Officer, ICAR-CRIDA	29.12.2021	150
ICAR-KVK, Hirehalli, Tumakuru in collaboration with Bureau of Indian Standards, Bengaluru, organized 'Awareness/ Sensitization Program on BIS Activities, eBis & Quality Control Orders Relevant to Food and Agriculture Department', for manufacturers, farmers, SHGs, NGOs and dealers of farming equipment	30.12.2021	58

Institute foundation day

ICAR-IIHR organized its 55th Institute Foundation Day on 7 Sep, 2021, presided by Dr. B.N.S Murthy, Director; Shri N. Munirathna, Hon. Minister of Horticulture, GoK, was the distinguished guest, Dr. Ashok Dalwai, CEO, National Rainfed Area Authority, Gol, delivered the lecture on 'Role of Horticulture in Indian Economy'. During the event, several varieties, technologies and publications were released; farmers and staff of the Institute were felicitated with awards.



(Left) Dr. B.N.S Murthy, Director;
(Right) Shri N. Munirathna, Hon.
Minister of Horticulture, GoK

World Zoonoses Day

An awareness program on zoonotic diseases on World Zoonoses Day-2021 was held on 7 July, 2021 at Chikkadoddavadi village, Koratagere Taluk, Tumakuru, under the NICRA project of ICAR-KVK, Hirehalli, Tumakuru, in collaboration with ICAR-NIVEDI, Bengaluru, with the participation of 50 farmers.



16th Parthenium Awareness week

Parthenium Awareness Week, was observed at CHES, ICAR-IIHR, Bhubaneswar and CHES, Chettalli, from 16-22 Aug, 2021. The harmful impact of parthenium to environment, agriculture production and human health and need for complete eradication of parthenium were emphasised. Dr. V. Sridhar, Principal Scientist (Agril. Entomology) spoke on 'Parthenium Awareness cum Eradication program at ICAR-IIHR.



Parthenium Awareness Week, at CHES, Bhubaneswar & Chettalli

Official Language Implementation

CHES, ICAR-IIHR, Bhubaneswar, observed Hindi Week, from 14-21 Sep, 2021. Mrs. Abha Mishra, Head, UNDP, Odisha Office, Bhubaneswar, inaugurated the program; various competitions were conducted. The Chief Guest of the valedictory function was Dr. Anil Kumar, Director, ICAR-Central Institute for Women in Agriculture, Bhubaneswar.



International Year of Millets 2023, CHES (ICAR-IIHR), Chettalli

International Year of Millets 2023, Campaign on Nutri-Garden and Tree Plantation, was organized at CHES, Chettalli on 17 Sep, 2021, with 120 participants. The guests were, Smt. Raseena, Gram Panchayat Member, Ponnathmote village, and Smt. Thilaka, K., Head

Mistress, Govt. High School, Chettalli. Planting materials were distributed, and millet based nutritious food and snacks were served.



International Year of Millets 2023

Hindi Week, CHES (ICAR-IIHR), Chettalli

ICAR-IIHR-CHES, Chettalli, celebrated Hindi Week from 16-21 September, 2021, by conducting competitions among the staff. The Chief Guests of the Valedictory function were Mr. Manoj, Hindi Teacher, and Mr. Satyanarayana, Head Master, Govt. High School, Chettalli.



Hindi Week

Inauguration of Diploma in Agricultural Extension Services for Input Dealers (DAESI)

The one-year DAESI program was inaugurated at ICAR-KVK, Hirehalli, Tumakuru, on 18 Sep, 2021, in collaboration with SAMETI, UAS, Bengaluru, MANAGE, Hyderabad, and Dept. of Agriculture, Tumakuru. The program was inaugurated by Dr. B.N.S. Murthy, Director, ICAR-IIHR, Bengaluru, who highlighted the farmer friendly horticultural technologies released by ICAR-IIHR, Bengaluru, for enhancing production and profitability for farmers.



Inauguration of DAESI program

Workshop on Dragon fruit

A workshop on dragon fruit was organized by CHES, ICAR-IIHR, Bhubaneswar, on 30 Sep, 2021, in hybrid mode, on prospects, production technology, post-harvest management, nutraceutical value and marketing of dragon fruit. More than 80 participants - horticulture

officers, extension functionaries, farmers and university students - attended the program. Farmers of Boudh, Nayagarh, Mayurbhanj, Baripada, Dhenkanal, Jagatsighpur, Khurdha, Puri and Cuttack participated in the workshop.



Special Swachhata Campaign, CHES (ICAR-IIHR), Chettalli

CHES, Chettalli organized a special Swachhata campaign from 2-31 Oct, 2021, to commemorate 153rd birth anniversary of Mahatma Gandhiji and 75th Year of independence, with the participation of 200 people. Gandhi Jayanthi celebrations, Swachhata Pledge and cleaning campaigns in schools and public places were carried out. A lecture on organic farming and windrow composting was demonstrated to Kandakere village farmers.



Special Swachhta Campaign

Foundation Day, CHES (ICAR-IIHR) Bhubaneswar

CHES (ICAR-IIHR) Bhubaneswar, celebrated its 29th Foundation Day on 6 Nov, 2021. Dr. G.C. Acharya, Head i/c gave an account of activities and achievements, welcomed Dr. B.N.S. Murthy, Director, ICAR-IIHR, former officials, Heads of Divisions of ICAR-IIHR, and the guests joined virtually. Two successful farmers, Sri. Sangram Kesari Pradhan, Boudh, (for adopting mango + pineapple intercropping) and Sri. Surendra Kumar Mallick, Cuttack, (for commercial cultivation of underutilized cucurbits) were felicitated for adoption and promotion of ICAR-IIHR technologies.



Blood Donation Camp at the Institute in collaboration with TTK blood bank on 10 Nov, 2021 wherein 68 donors including staff and students, donated blood.

**Blood donation camp****India International Science Fest**

A webinar on 'Open Science: Making Science Accessible, Inclusive and Equitable' was organized on 27 Nov, 2021. Dr Sridhar Gutam, Senior Scientist (AICRP Fruits) & Board Member, AgriXiv, delivered the lecture. About 80 participants, including scientist, students and faculties from ICAR Institutes participated.

**World Soil Day Celebration**

World Soil Day 2021 was observed on 7 Dec, 2021 at ICAR-IIHR, Bengaluru, to create awareness among farmers to halt salinization and boost soil productivity. Prof. Narayana Gowda, K., Former Vice Chancellor, UAS, Bengaluru, and President of International Society of Extension Education (INSEE), Nagpur, emphasised that many of the problems in agriculture today is related to soil fertility. Dr. B.N.S. Murthy, Director, ICAR-IIHR emphasised the need to monitor water quality especially due to increasing salinity related problems, and proposed model village concept for demonstration of Soil Health Cards. Soil Health Cards were distributed to farmers under the MGMG program.

**World Soil Day**

Kisan Diwas 2021

ICAR-IIHR, Bengaluru, celebrated Kisan Diwas 2021 on 24 Dec, 2021, by felicitating three farmers who have adopted ICAR-IIHR technologies. Soil Health Cards were distributed to 13 farmers of MGMG villages.

**5th National Symposium on Plant Protection in Horticulture (NSPPH2021)**

Commemorating the International Year of Fruits and Vegetables 2021, Association for Advancement of Pest Management in Horticultural Ecosystem (AAPMHE) in association with ICAR-IIHR, Bengaluru, organized the 5th National Symposium on Plant Protection in Horticulture (NSPPH-2021), in virtual mode, from 27-29 Dec, 2021, with the participation of 200 delegates. An exclusive brain storming session on *Thrips parvispinus* was conducted to deliberate on the burning problem in chillies, on 29 Dec, 2021. Dr. A.K. Singh, DDG (HS), Dr. S.C. Dubey, ADG (PP & B), Dr. Vikramaditya Pandey, ADG (HS-1) from ICAR, New Delhi; Dr. Sagar Hanuman Singh, Director General, NIPHM, Hyderabad, Dr. B.N.S. Murthy, Director, ICAR-IIHR, Bengaluru, and Dr. M. Krishna Reddy, Head, Division of Crop Protection, stressed on development of eco-friendly and sustainable pest management packages for the benefit of the farming community. Dr. V. Sridhar, Principal Scientist & President (AAPMHE) and Dr. R. Umamaheswari, Senior Scientist & Secretary (AAPMHE), Division of Crop Protection, ICAR-IIHR, Bengaluru, organized this symposium.

**National Symposium on Plant Protection in Horticulture (NSPPH2021)****Swachhata Pakhawada, CHES, ICAR-IIHR, Bhubaneswar**

Swachhata Pakhawada was held from 16-31 Dec, 2021, at CHES, ICAR-IIHR, Bhubaneswar, and included Swachhata Pledge, awareness programs, cleanliness drive and plantation program at Sai Saraswati School, Dumduma, UP High School, Dumduma, and Government High School, Jadupur. On 23 Dec, 2021, Kisan Diwas was celebrated at Ganeswarpur, Cuttack, adopted under Farmers FIRST program, with participation of 50 farmers.

Swachhata Pakhwada-2021, ICAR-IIHR-CHES, Chettalli



Swachhata Pakhwada was celebrated from 16-31 Dec, 2021, with Swachhata Pledge taking, cleaning of office premises, public places and creating awareness on cleanliness were carried out; as also front-line demonstrations of composting, water harvesting and safe disposal of plastics. More than 80 DAESI trainees from KVK Gonikoppal, College of Horticulture, Mysuru, 50 SCSP trainees from Mudigere, 20 students from Field Marshal Cariappa

College, Madikeri, were introduced to our technologies. The Chief Guest Smt. Shabana M. Sheikh, JDA, Madikeri, spoke on the different state government schemes available to the farmers.

Kisan Diwas, ICAR-IIHR-CHES, Chettalli



Kisan Diwas (Farmers Day) was celebrated at CHES, ICAR-IIHR, Chettalli, on 23 Dec, 2021, with more than 40 farmers. The farmers were made aware of the schemes available at state department and Krishi Vigyan Kendra and new technologies of ICAR-IIHR for doubling their income.

Kisan Diwas

Interaction with State Bank of India Officials

Interaction of ICAR-IIHR staff with officials of State Bank of India, Hesaraghatta branch, was conducted on 28 Dec, 2021, wherein the various facilities available with the bank were introduced.

Diagnostic field visits

A diagnostic field visit was conducted in Ganeswarpur, Satyabhamapur, Salepur & Arilo Sasan among 10 areas of Cuttack, by CHES, ICAR-IIHR, Bhubaneswar, to assess the upsurge and damage escalation of rugose spiraling whitefly (RSW) in coconut and banana plantation. Untimely rainfall coupled with high relative humidity might cause the sudden upsurge of the RSW. Natural enemies such as *Encarsia* sp. are the primary defence to RSW; Further, regular monitoring is a key strategy to track RSW for timely management.



Rugose spiraling whitefly (RSW) incidence in coconut and banana plantation

SUCCESS STORIES

Arka Nikita: An area of 15 guntas of okra Arka Nikita F₁ hybrid was successfully grown during the winter season (September last week 2021 sowing) at Hessaraghatta village by Mr. Nagaraju. He earned Rs.50,000/- while the expenditure incurred was Rs.15,000, with a net profit of Rs.35,000/-. The farmer is satisfied about yield and quality of the produce, since its consumer acceptance is very high.



Arka Nikita performance in the farmer's field

Under MIDH, through the Directorate of Arecanut and Spices Development, Ministry of Agriculture & Farmers Welfare, Calicut, LCV resistant chilli F₁ hybrids Arka Tejasvi, Arka Yashasvi, Arka Tanvi, Arka Saanvi and Arka Gagan were demonstrated at UHS, Bagalkot, UAHS, Dharwad and Rajmata during the period.



Performance of Chilli F₁ hybrids Arka Saanvi & Arka Gagan at MHREC, UHS, Bagalkot during kharif 2021

HUMAN RESOURCE DEVELOPMENT

Awards and Recognition

- Dr. Pritee Singh received the 'Young Scientist Award' from the Society for Scientific Development in Agriculture and Technology (SSDAT) during July, 2021
- Dr. Pritee Singh received best oral presentation award for the paper 'Profiling of bioactive constituents of *Garcinia indica* (kokum) accessions', in International Web Conference on 'Innovative and Current Advances in Agriculture and Allied Sciences (ICAAAS-2021)', Meerut, UP, 19-21 Jul, 2021
- Dr. Deepa Samant, Editorial Board Member of Souvenir and Conference Book of International Web conference on Innovative and Current Advances in Agriculture and Current Advances in Agriculture and Allied Sciences (ICAAAS-2021), organized by Society of Scientific Development in Agriculture and Technology, Meerut, UP, 19-21 Jul, 2021
- Dr. Kundan Kishore was Co-Chair of Technical Session of National Seminar on Horticulture for Next Generation in Eastern India, organized by BAU, Sabour, 05-06 Aug, 2021

- Dr. K. Madhavi Reddy received Foundation Day Award of Excellence 2021 as Best Teacher in ICAR-IIHR, Bangalore, on 07 Sep, 2021
- Dr. Deepa Samant received 'Major R.S. Yadav Award-2020' from Society for Recent Development in Agriculture, Meerut, UP, in 4th Global Meet on 'Science and Technology for staying healthy and feeding ever-growing population worldwide', organized by Hi Tech Horticultural Society and Prerna Foundation, Meerut, UP, 12-13 Sep, 2021
- Dr. P. Nandeeshha was expert for evaluation of PhD papers presented in UAS Bangalore Science Week 2021, in Crop Improvement section, 27-30 Sep, 2021
- Dr. K. Hima Bindu, served as expert for selection of a Technical Consultant for Karnataka State Medicinal Plants Authority, Mallewaram, Bengaluru
- Dr. A. Carolin Rathinakumari received best oral presentation award for research paper 'Design and Development of an Efficient Pomegranate Aril Extraction Mechanism', and served as Co-Chairman for the technical session on 'Renewable Energy in Food Processing/ Waste Utilization in Food Industry' in 'International Conference on Global Trends in Food Processing and Food Safety', held at Tamil Nadu Agricultural University, 12 Oct, 2021
- Dr. B.L. Patil was DG, ICAR nominee Expert Member of the Assessment Committee for promotion of Scientists (Agri. Biotechnology), in ICAR-CTCRI, Trivandrum, 02 Nov, 2021
- Dr. B.L. Patil was external expert in CSIR Assessment Committee for promotion of Scientists, in Biosciences & Biotechnology, at CSIR-NBRI, Lucknow, 16-18 Nov, 2021
- Dr. A. Carolin Rathinakumari received best oral presentation award for research paper 'Energy Requirement for Onion Cultivation in Karnataka State', and served as Co-Chairman for the technical session on 'Renewable Energy in Food Processing/ Waste Utilization in Food Industry', in 55th Annual Convention of ISAE on 'Challenges and Technological Solutions for Ensuring Food, Water and Energy Security', held at Patna, Bihar, 23-25 Nov, 2021
- Ponnamm Naresh, Meenu Kumari, G.C. Acharya, G. Sangeetha and P. Srinivas, were awarded Best e-poster for 'Exploring local germplasm of Eastern and North-Eastern India in vegetable crops', in national training program on 'Conservation, management and utilization of horticultural genetic resources for livelihood and nutritional security', organized by ICAR-IIHR, 22-26 Nov, 2021
- Dr. K. Hima Bindu served as member of core group formed by the Karnataka State Medicinal Plants, to prepare a vision document for the state of Karnataka, at TDU, Bangalore, 29 Nov, 2021
- Dr. Rajendiran, S., was awarded Best Oral Presentation for paper entitled 'Study on interrelationship among soil, water, plant health and productivity of mango orchards of Ramanagara and Srinivaspura regions of Karnataka' in International Web conference on Global Research Initiatives, Sustainable Agriculture & Allied Sciences (GRISAAS-2021), 13-15 Dec, 2021, organized by Astha Foundation, Meerut, UP
- Dr. Deepa Samant received Best Oral Presentation award for the paper 'Influence of summer and winter branch bending on yield and quality of guava', in the international web conference on 'Global Research Initiatives for Sustainable Agriculture and Allied Sciences (GRISAAS-2021)', 13-15 Dec, 2021
- Dr. Deepa Samant was Co-chairperson of Technical Session V: Food processing, value addition and post-harvest technology, in international web conference on 'Global Research Initiatives for Sustainable Agriculture and Allied Sciences', 13-15 Dec, 2021

- Dr. Deepa Samant was Co-organizing Secretary International web conference on ‘Global Research Initiatives for Sustainable Agriculture and Allied Sciences’, organized by Astha Foundation, Meerut, UP, 13-15 Dec, 2021
- Dr. Shamina Azeez was nominated as Expert (Plant Biochemistry), by the Director General, ICAR, in the Assessment Committee for CAS for career promotion of ARS Scientists (Plant Biochemistry) of IISR, Calicut, Kerala, 21 Dec, 2021
- Dr. K. Hima Bindu chaired a session on cultivation, sustainable management enterprise and trade of medical plants in The Karnataka Moolika Utsava and Paramparika Vaidya Sammelana, organized by Karnataka Biodiversity Board and Karnataka Medicinal Plants Authority in collaboration with Parmparika Vaidya Parishath - Karnataka and The University of Trans-Disciplinary Health Sciences and Technology (TDU-FRLHT) on 23 Dec, 2021 at Pavada Basavanna Devara Matha, Nelamangala
- Dr. Rajendiran, S., was awarded Young Scientist Award-2021 at 12th International Conference on Agriculture, Horticulture and Food Science (ICAHFS-2021) at Hotel Landmark, Shimla, 29-30 Dec, 2021, by The Society of Tropical Agriculture, New Delhi
- Dr. Safeena, S.A., was conferred with Research Excellence Award 2021, by Institute of Scholars (InSc), Ministry of MSME, GoI for the research paper ‘Studies for Determination of Air Pollution Tolerance Index of Ornamental Plant Species Grown in the Vertical Landscape System’, authored by Safeena S.A., Shilpa Shree K.G., P. Naveen Kumar, Tarak Nath Saha and K.V. Prasad
- Dr. B.L. Patil was selected for the Fulbright-Nehru Academic & Professional Excellence Fellowship (2022-23), by United States-India Educational Foundation (USIEF), to visit University of California, Davis, USA, for 9 months
- Dr. Petikam Srinivas was awarded the Fellow of International Society of Noni Science, Dec 2021
- Dr. G.C. Acharya was nominated as member of Task Force on production and productivity of fruit and vegetable crops for Odisha, under Directorate of Horticulture, Govt. of Odisha
- Dr. G.C. Acharya was nominated as a member of Expert Advisory Group for Floriculture under Directorate of Horticulture, Govt. of Odisha
- Dr. Kundan Kishore was External Expert for comprehensive examination of PhD student of Division of Fruit Pomology, PAU, Ludhiana
- Dr. Deepa Samant was external examiner for thesis evaluation and viva-voce of M.Sc (Ag.) Horticulture student of GBPUA&T, Pantnagar, Uttarakhand
- Dr. G.C. Acharya acted as member of the Technical Support Group Meeting for Directorate of Horticulture, Govt. of Odisha
- Dr. G.C. Acharya acted as a member of technical committee for scrutiny of RKVY funded proposals submitted to Govt. of Odisha
- Dr. G.C. Acharya acted as a member of Technical Committee for ‘Jackfruit Mission’ under Directorate of Horticulture, Govt. of Odisha
- Dr. G.C. Acharya acted as member of Departmental Promotion Committee of ICAR-NRRI for clearance of probation period of administrative staff
- Dr. G.C. Acharya attended the 22nd Scientific Advisory Committee Meeting of KVK, ICAR-NRRI and KVK, Deoghar, OUAT
- Dr. G.C. Acharya acted as member of RKVY Incubation Committee for selection of Entrepreneurs under VIKAS-RABI, ICAR-NRRI

- Dr. G.C. Acharya was member of expert committee for selection of technical products for pest management for the year 2021-22
- Dr. V. Sridhar was elected as “Fellow of Royal Entomological Society” (London, UK).
- Dr. V. Sridhar was elected as President, “Association for the Advancement of Pest Management in Horticultural Ecosystems”, Bengaluru for the period 2021-2023.
- Dr. V. Sridhar was Organising secretary, 5th National Symposium on Plant Protection in Horticulture held during 27-29 Dec, 2021
- Dr. V. Sridhar was Organising Secretary for Brainstorming session on “Tackling invasive thrips, *Thrips parvispinus*” on 29 Dec, 2021.

Invited/ Lead Talks in Conferences/ Symposia

- Dr. B.L. Patil, delivered a Guest lecture (Virtual) on ‘Cutting edge Technologies for Management of Viral Diseases in Crops’, organised by www.agricultureinformation.com, 19 July, 2021
- Dr. Kalaivanan, D., presented a lead talk on ‘Soilless cultures for business development and entrepreneurship’, in webinar on Entrepreneurship Orientation Program in Medicinal and Aromatic Plants - III, held at ICAR-DMAPR, Boriavi, Anand, Gujarat, on 26 July, 2021
- Dr. C. Aswath, Safeena, S.A. and M.R. Rohini served as Training Co-ordinators for on-campus training on ‘Hydroponics in Vegetable, Flower and Medicinal Crops’, 31 July, 2021, jointly organized by ICAR-IIHR and Society for Promotion of Horticulture
- Dr. Kundan Kishore delivered an invited lecture on ‘Prospects and researchable issues in guava growing under hill and plateau region of Odisha’ in the Webinar organized by ICAR-Research Complex for Eastern Region FSRCHPR, Ranchi, 03 Aug, 2021
- Dr. Kundan Kishore delivered a lead lecture in national seminar on ‘Horticulture for Next Generation in Eastern India’, BAU, Sabour, 05-06 Aug, 2021
- Dr. C. Aswath, Safeena, S.A. and M.R. Rohini served as Training Co-ordinators for online training on ‘Hydroponics in Vegetable, Flower and Medicinal Crops’, 07 Aug, 2021, jointly organized by ICAR-IIHR and Society for Promotion of Horticulture
- Dr. K. Madhavi Reddy was resource person in IDP-NAHEP project webinar training on ‘Seed production of vegetable crops: A lucrative venture’, & delivered talk on ‘Seed production of Solanaceous vegetable crops’, on 26 Aug, 2021 (Virtual)
- Dr. Kundan Kishore delivered an Invited lecture on ‘Canopy architecture in fruit crops Digital Training Program on Fruit Science Research: Progress & Prospects’, RPCAU, Pusa, 1-8 Sep, 2021
- Dr. Kalaivanan, D., delivered an invited talk on ‘Cocoponics: A new method of growing vegetables in soilless culture’, in webinar series as part of Azadi Ka Amrut Mahotsav organized at ICAR-Directorate of Cashew Research, Puttur, Karnataka, on 09 Sep, 2021
- Dr. G.C. Acharya delivered a lecture on ‘Horticulture-based Entrepreneurship through technology interventions for high value vegetable crops’ on 14 Sep, 2021 in training program on ‘Promoting women Agripreneurship through crop-livestock-fisheries technology’ organized by ICAR-CIWA and MANAGE, 14-18 Sep, 2021
- Dr. B.L. Patil delivered an invited lecture (virtual) on ‘Papaya ringspot disease: A global menace and its management through RNAi’, in International Symposium on Tropical Fruits (ISTF)-2021, 28-30 Sep, 2021

- Dr. V. Sridhar delivered invited lecture (virtual) on 'Impact and management of biotic stresses on insect pests' at National Institute of Food Technology Entrepreneurship and Management, Kundli, Haryana, 4 Oct, 2021.
- Dr. K. Madhavi Reddy was Course Director of Indo-German Collaborative Program training on 'Seed Production in Tomato & Peppers', 4-6 Oct, 2021 (Virtual)
- Dr. Deepa Samant delivered a lecture on 'Commercial nursery management: CHES model nursery', 04 Oct, 2021, in training program at CHES, Bhubaneswar, 4-8 Oct, 2021 under RKVY
- Dr. Laxman, R.H., delivered a lecture (Virtual) on 'Impact of Climate Change on Horticulture Crops and Management of Abiotic Stresses', in AICTE Training And Learning (ATAL) Academy Online Elementary FDP on 'Smart Production Technologies for Horticultural Crops (Combating climate change through Innovations and sustainability)', organised by National Institute of Food Technology Entrepreneurship and Management, 4-8 Oct, 2021
- Dr. Ravishankar, K.V., delivered lecture on 'Application of molecular markers to assess genetic purity of vegetable crops seed', in International webinar on Capacity Building on Seed Production, organized by ICAR-IIMR, Hyderabad, & ICAR-IIHR, Bangalore, 6 Oct, 2021
- Dr. B.L. Patil delivered an invited lecture (Virtual) on 'Current scenario of tomato diseases in India and their management', in 36th Annual Tomato Disease Workshop, organised by Vineland Research and Innovation Centre, Vineland Station ON, Canada, 2 Nov, 2021
- Dr. Kundan Kishore delivered an invited lecture on 'Emerging technologies in post-harvest management of horticultural crops' in the webinar organized by GBPUAT, Pantnagar, 2 Nov, 2021
- Dr. G.C. Acharya imparted a training on 'After care and canopy management in fruit crops' on 03 Nov, 2021 during the exposure visit of OTELP plus field level staff
- Dr. G.C. Acharya conducted a session on 'Improved varieties and scientific management practices of vegetables' on 09 Nov, 2021 under the program 'Leveraging Institutional Innovations for inclusive and market led agricultural growth in Eastern India', organized by ICAR-NRRI, Badamba, Cuttack
- Dr. G.C. Acharya delivered a lecture on 'Integration of Horticulture in IFS' on 11 Nov, 2021 in training program on 'Integrated Farming System for Farmers' organized by ICAR-NRRI
- Dr. Ravishankar, K.V., delivered a lecture on 'Prospecting whole genomes and genomic resources for DNA markers and diagnostics of plant, microbes and insects', in Hands-on training program-cum-workshop in Basic molecular biology techniques, organized by Center for Biotechnology Research, UHS, Bagalkot, 13 Nov, 2021
- Dr. G. Senthil Kumaran, presented an invited paper on 'Advances in Mechanization and automation of Horticultural Crops', in the XV Agricultural Science Congress, BHU, Varanasi, 13-16 Nov, 2021
- Dr. B.L. Patil delivered an invited lecture on 'Biotechnological interventions for management of Plant Viral diseases', in 5th Agri-Biotech India Summit, organized by Inventicon Business Intelligence, Novotel, Hyderabad, 17-18 Nov, 2021
- Dr. K. Madhavi Reddy was a resource person in online training program on 'Conservation, Management and Utilization of Horticultural Genetic Resources for Livelihood and Nutritional Security', held by ICAR-IIHR, 22-26 Nov, 2021, and delivered a lecture on 'Vegetable genetic resources: Diversity, distribution, conservation and utilization'

- Dr. Laxman, R.H., delivered a lecture on 'Climate change impacts, phenotyping strategies and climate smart technologies in horticulture', in online training on Conservation, management and utilization of horticultural genetic resources for livelihood and nutritional security, 22-26 Nov, 2021
- Dr. G.C. Acharya delivered a lecture on 'Intercropping of flower crops in fruit/ vegetable cultivation', in the training program on 'Advances in cultivation of marigold and tuberose', under SCSP, 24 Nov, 2021
- Dr. K. Madhavi Reddy delivered a talk on 'Recent advances in chilli crop improvement', at Foundation for Advanced Training in Plant Breeding (ATPBR) Webinar Series 11, on 09 Dec, 2021, to Vegetable Crop Breeders of Private Seed Industry
- Dr. Ramesh K.V., attended an international conference on 'Vegetable Research and Innovations for Nutrition, Entrepreneurship and Environment (ICVEG-21)', organized by Indian Society of Vegetable Science (ISVS), Varanasi, Uttar Pradesh, 14-16 Dec, 2021
- Dr. G. Senthil Kumaran presented paper on 'Solar Powered Tricycle Cart for Fruits and Vegetable Vending', authored by G. Senthil Kumaran, A. Carolin Rathinakumari, S. Bhuvaneswari and H.S. Oberoi in the 'International Conference on Emerging Green Energy Technologies and Environmental Sustainability', held at Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, 20 Dec, 2021

Trainings Attended

- Ms. Radha R. Banakar attended an online training course on 'Road Map for KVKs to Enhance Mushroom Production and Consumption' ICAR-IIHR, Bengaluru, 09-11 Aug, 2021
- Dr. R.H. Laxman attended an online training on 'An Introduction to Climate Change: Science, Politics and Impacts', conducted by AAETI, CSE, New Delhi, 16-27 Aug, 2021
- Dr. B. Hanumanth Gowda attended a training module in 'Sericulture for Krishi Vigyan Kendra (KVKs), CSR&TI, (Central Silk Board), Mysuru, Karnataka, 13-17 Sep, 2021
- Shri. K.N. Jagadish attended a training module in 'Sericulture for Krishi Vigyan Kendra (KVKs), CSR&TI, (Central Silk Board), Mysuru, Karnataka, 13-17 Sep, 2021
- Dr. Ramesh, K.V., attended an online training program on 'Strategies for climate risk management and resilient farming', organized jointly by ICAR-CRIDA, Hyderabad, & MANAGE, Hyderabad, Telangana, 20-24 Sept, 2021
- Ms. M. Malarvizhi attended an online training program on 'Statistical Techniques for Data Analysis in Agriculture', conducted by IASRI, New Delhi, 04-13 Oct, 2021
- Dr. K. Madhavi Reddy attended an online Management & Leadership Development Program conducted by Institute of Rural Management (IRMA), Anand, Gujarat, 21-22 Oct, 2021
- Dr. Ramesh, K.V., attended a national webinar on 'Crop Diversification: A way towards Nutritional Security', organized by ICAR-Research Complex for Eastern Region, Patna, Bihar, 26 Oct, 2021
- Dr. Soma Shekhar attended a national online training on 'Horticulture Genetic Resources Conservation and Utilization', ICAR-IIHR, Bengaluru, 22-26 Nov, 2021
- Dr. K. Bhanu Prakash attended an online training on 'Proteomics Data Analysis', organized by the Centre for Agricultural Bioinformatics (CABin), ICAR-IASRI, New Delhi, 24-26 Nov, 2021
- Shri. J.M. Prashanth attended an online training on 'Plant Health Management Amidst Covid Challenges and Strategies', ICAR-CPCRI, Kasargod, 01-03 Dec, 2021

- Shri. K.N. Jagadish attended an online training program on 'Enhancing Resilience through Entrepreneurship' (Online), ICAR-NAARM, Hyderabad, 06-10 Dec, 2021
- Shri. N. Jayasankar attended an online training program on 'Advances in Web and Mobile Application Development', ICAR-NAARM, Hyderabad, 06-10 Dec, 2021
- Shri. J.M. Prashanth attended an online training on 'IIHR Technologies', ICAR-IIHR, Bengaluru, 17-18 Dec, 2021

NEW INITIATIVES

MANAGE Sponsored Special training for Certified Farm Advisors on Fruit crop technologies

A special 15-day (09-23 Dec, 2021) training program on ICAR-IIHR Fruit Crop Technologies was organized by ICAR-IIHR, Bengaluru in collaboration with MANAGE, Hyderabad, to facilitate extension professionals to qualify as Certified Farm Advisors. Twenty seven officials and entrepreneurs from eight states (Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Maharashtra, Haryana, and Bihar) participated in this program. Dr. R. Venkattakumar, Head i/c, Division of Social Sciences & Training (SS & T), Drs. R. Senthil Kumaran and V. Sankar, PS, Division of SS & T, and Dr. N. Balasubramani, Director & PC (CCA), MANAGE, Hyderabad, briefed the gathering about the course. Dr. B.N.S. Murthy, Director, ICAR-IIHR, Bengaluru, delivered the Presidential Address. The training included lectures and practical classes by IIHR scientists on ICAR-IIHR technologies for fruit crops, high density planting in mango and canopy management in custard apple, advances in mango, pomegranate, papaya, guava, banana, custard apple, grape, sapota and jamun production technologies and opportunities in appemedi mango, potential future crops and their production technologies, integrated water management practices, integrated nutrient management practices, integrated pest and nematode management, integrated disease management in fruit crops, value addition in fruit crops, mechanization in fruit crops. Exposure visits to ICAR-IIHR CHES, Chettalli, IIHR-KVK Gonikoppal, and JSS-KVK, Suttur, Mysore, were organized.



TRAINING PROGRAMS ORGANIZED

i. On-Campus Trainings

Title of the Program	Date From-To	No. of participants
ICAR-IIHR, Bengaluru		
Refresher training program (RTP) for MANAGE, Hyderabad, participants on Value Addition Opportunities in Horticulture for Established Agriprenuers under ACABC scheme.	14-16 Jul, 2021	52
Arka Kiran Cultivation	16.07.2021	6
ICAR-IIHR Horticultural Technologies for Doubling Farmers' Income, for farmers of Theni district, Tamil Nadu	16.07.2021	34

Future Fruit Crops, for trainees from Rohtas, Bihar	17.07.2021	2
Arka Supreme, for a participant from Kakinada, Andhra Pradesh	19.07.2021	1
Arka Kiran, for participants from Gottigere, Bengaluru Rural	20.07.2021	6
Hydroponics in Vegetable, Flower and Medicinal Crops	31.07.2021	34
Hydroponics in Vegetable, Flower and Medicinal Crops	07.08.2021	40
ICAR-IIHR Technologies, for farmers from Dharmapuri, Tamil Nadu	09-11 Aug 2021	25
Soilless Terrace Gardening	10.08.2021	57
Production of Fermented Cocopeat and Soilless Cultivation of Vegetables	13.08.2021	109
ICAR-IIHR Vegetable Technologies, for participants from Harur, Dharmapuri, Tamil Nadu	19.08.2021	25
Entrepreneurial Potential of Mushroom Technologies for Nutritional and Income Security in India	25.08.2021	300
Technology Backstopping for Agri-Extension: Indian Experiences, in collaboration with MANAGE	25.08.2021	300
Nutritional Security and Enhancing Income through Horticultural Crops	26.08.2021	54
Training and exposure visit to IIHR, for farmers from Dharmapuri, Tamil Nadu	01-03 Sep, 2021	20
Seed Production in Papaya	06.09.2021	1
ICAR-IIHR Technologies, for officials of Lakshadweep	07-09 Sep, 2021	3
Skill Agriculture for Hill Agriculture	09.09.2021	107
ICAR-IIHR Fruit Crops Technologies, for farmers from Krishnagiri, Tamil Nadu	13.09.2021	2
Soilless Terrace Gardening	28.09.2021	68
ICAR-IIHR Technologies, for farmers of Dharmapuri, Tamil Nadu	28-30 Sep, 2021	30
Germplasm Advisory Committee of ICAR-IIHR	01.10.2021	210
Soil Health Management, for participants from Kanakapura Taluk	05.10.2021	5
Production of Fermented Cocopeat and Soilless Cultivation of Vegetables	08.10.2021	51
ICAR-IIHR Horticultural Technologies, for extension officers, Dept. of Agri. & Farmers Welfare, Govt. of Tamil Nadu	14.10.2021	14
Varieties and Technologies of ICAR-IIHR in Flower and Medicinal Crops Suitable for NEH Region	17.11.2021	51
Advances in Horticultural Technologies, for KVK officials and farmers in Chengalpattu, Tamil Nadu	21.10.2021	27
ICAR-IIHR Horticultural Technologies, for farmers of Kanchipuram, Tamil Nadu.	22.10.2021	28
Latest Horticultural Technologies of ICAR-IIHR, for officials of Dept. of Horticulture, Tamil Nadu.	22.10.2021	94
ICAR-IIHR Technologies, for farmers of Kanchipuram and Chengalpattu, Tamil Nadu	22.11.2021	35
ICAR-IIHR Technologies, for officers from Maharashtra	26.10.2021	4

Good Agriculture Practices of Voluntary Certification Scheme for Medicinal Plant Produce (VCSMPP)	27.10.2021	50
Plant Germplasm Conservation, Management & Registration	28-30 Oct, 2021	2
Germplasm Registration in Horticultural Crops	22-26 Nov, 2021	220
Advances in Flower Crops Technologies including Seed Production, for officials of Haryana State Horticulture Agency	23-25 Nov, 2021	6
Pollen Cryopreservation	06-10 Dec, 2021	2
Fruit Crop Technologies Module–II, for Certified Farm Advisors (CFA)	09-23 Dec, 2021	27
Improved Production Technologies of Ornamental Crops	13.12.2021	8
Farmers' Training Program and Interaction on Natural Resource Farming	16.12.2021	27
ICAR-IIHR technologies for promotion through KVKs, for KVK professionals of ATARI Zone XI	17-18 Dec, 2021	70
Workshop on Science Communication	29.12.2021	183
Integrated Farming Systems based Mango Production & Improved Production Technologies for Tomato	30.12.2021	40
CHES, Bhubaneswar		
Canopy Management and Rejuvenation of Mango	30.07.2021	15
Training cum Exposure Visit for FPOs of AP	17.09.2021	30
Farm Based Science & Technology Interventions for Socio-Economic Development of Nabarangpur, Odisha, under RKVY S&T project	04-08 Oct, 2021	
Training cum awareness program on Vegetable Seed Production on Commercial Scale	27.10.2021	60
Use of Improved Technologies in Horticultural Crops for Enhancing Farm Productivity and Profitability, under Farmer FIRST program, in Biswanathpur, Cuttack; implemented by ICAR-National Rice Research Institute, Cuttack	30.12.2021	80
ICAR-KVK, Hirehalli		
Oyster Mushroom Cultivation	02.11.2021	14
Value addition of BAKAHU (Bale Kai Hudi-Raw banana powder)	20.11.2021	38
ICAR-KVK, Gonikoppal		
Agro-Forestry & Their Importance	12.07.2021	78
Scientific Piggery Management, in collaboration with DATC Kudige, ATMA, Kodagu	15.07.2021	45
EDP on Bird Eye Chilli Value Addition and Marketing	15.09.2021	31
EDP training on Production, Value Addition & Marketing of Birds Eye Chilli	22.09.2021	35
Crop Productivity Improvement through Water Management	23.09.2021	41
Soil Health Management for Paddy, Black Pepper and Coffee	24.09.2021	28
Farm Animal Health Management & Vaccination	28.09.2021	55
Value Addition in Fruits & Vegetables	29.09.2021	27
Scientific Poultry Farming	30.09.2021	31

Scientific Mushroom Cultivation	12.10.2021	28
Scientific Mushroom Cultivation & Food Processing	21.10.2021	25
Solid Waste Management in association with NRLM, Virajpet	25-30 Oct, 2021	40
Micro Nutrient Management in Plantation Crops	08.11.2021	38
Awareness programme on use of BEE Star Labelled Energy Efficient Pump Sets & Water Conservation	18.11.2021	75
Scientific Mushroom Cultivation	23.11.2021	31
Agriculture and Environment: the citizen face, for school children	26.11.2021	40
Scientific Mushroom Cultivation	27.11.2021	31
Natural Farming	30.11.2021	67
Scientific Fish Farming	03.12.2021	41
Soil Health Management	05.12.2021	31
Scientific Mushroom Cultivation	20.12.2021	27
Scientific Bee Keeping	23.12.2021	38

ii. Off-Campus Trainings

Title of the Program	Date From-To	No. of participants
ICAR-IIHR, Bengaluru		
Machinery for Onion Cultivation, at Narasipura, Coimbatore, Tamil Nadu.	24.07.2021	75
Machinery for Onion Cultivation, at Giriypura, Chikmagalur, Karnataka	21.09.2021	200
Machinery and Technology for Onion Cultivation and Processing, at ICAR-KVK, Gandhigram Rural Institute – DTBU, Gandhigram, Tamil Nadu	26.10.2021	79
Machinery and Technology for Onion Cultivation and Processing, at ICAR-KVK, Veterinary College and Research Institute Campus, Namakkal, Tamil Nadu	27.10.2021	126
Machinery and Technology for Onion Cultivation and Processing, at ICAR-KVK, TNAU, Sandhiyur, Salem, Tamil Nadu	28.10.2021	120
Windrow Composting of Farm and Kitchen Wastes, at Association of People with Disability (APD), Lingarajapuram, Bangalore	28.12.2021	75
CHES, Bhubaneswar		
Production of Quality Planting Material of Horticultural Crops for Crop Diversification, Goudaguda, Tentulikhunti, Nabarangpur, Saruguda, Nandahandi, Dongriguda, Kosagumuda	18, 20, 21 Jul, 2021	56
Commercial Horticulture for Tribal Livelihood and Seed Distribution Programs, Mohana, Gajapati, Kashipur, Rayagda Kanteikoli, Mohana	23, 24 Aug, 2021; 26, 27 Nov, 2021	39
Good Agricultural Practices for Pineapple as an Intercrop, Balanda, Boudh	31.08.2021	40
Seed Production, Poijhari, Balipatna, Khorda	25.11.2021	29

Technology Transfer for Commercial Horticulture And Impact Assessment, Gualigorada, Satyabadi, Puri	29.11.2021	57
CHES, Chettalli		
Off-campus training on Nutri Garden at Chikkadoddavadi village of Koratagere Taluk	23rd August 2021	15
ICAR-KVK, Gonikoppal		
Popularization of Weather-Based Apps by DAMU, Kodagu, Kunjalageri, Virajpet	02.08.2021	28
Integrated Disease management in Ginger, Chikkaluvara, Somwarpet	04.08.2021	55
Weather Based Agro-Advisory Services, Torenuru, Virajpet	04.08.2021	31
Organic Farming and Adoption of Management Practices based on Prevailing Weather Conditions, Besaguru and Belluru, Kodagu	04.08.2021	27
Rabies Awareness Program, Forestry College, Ponnampet	30.08.2021	62
Horticulture Nursery Management, Ponnampet	31.08.2021	37
Brucellosis in Bovines, T-Shettigeri, Ponnampet	08.09.2021	73
Organic Farming & Agro-advisory Services, Bageri, Kodlipete	09.09.2021	31
Scientific Ginger Cultivation, Chikkaluvara	14.09.2021	28
Coffee, Black Pepper and Arecanut Garden Management for Higher Yield, Maldare	04.10.2021	35
Backyard Poultry Farming, Surlabbi	28.10.2021	31
Mushroom Cultivation, in collaboration with NRLM, Sampaje	11.11.2021	38
Scientific Piggery Farming, Betulli, Shirangali, Somwarpet, Surlabi	24.11.2021; 24, 27 Dec, 2021	41
Scientific Black pepper Cultivation, Margode, Karadigodu, Siddapura	26.11.2021; 14.12.2021	37
Improved Production of Black Pepper, Murnad	12.02.2021	35
Scientific Mushroom Cultivation, Chennayana	06.12.2021	33
Backyard Poultry Farming, Sajjalli, Somwarpet, Yadanadanadu	20, 21 Dec, 2021	51
ICAR-KVK, Hirehalli		
Assessment of Drought Tolerant and High Yielding Varieties in Groundnut, Veerammanhalli & H.B. Halli		3
Assessment of Bio Formulations for Improving Productivity, Quality and Management of Disease in Pomegranate, Venkatapura, Kumbarahalli and Bukkapattana		3
Assessment of Chilli Hybrids for Disease Resistant and Higher Productivity, Veerammanahalli, Badavanahalli & Tanganahalli		3
Assessment of Fodder Grass Crops as Inter Crop in Coconut Garden for <i>In Situ</i> Moisture Conservation, Kodegenahalli, Badavanahalli		3

iii. Field Demonstrations

a. On-Farm Trials

Trials Conducted	Location	No. of Trials
ICAR-IIHR, Bengaluru		
Hot water treatment unit for papaya	Raipur	1
ICAR-KVK, Hirehalli		
Ridge gourd variety Arka Prasan	Rangasamudra, ID Halli, Madhugiri	1
ICAR-KVK, Gonikoppal		
Performance of Kadaknath Poultry for Backyard Poultry Farming in Hilly & High Rainfall Areas	Madikeri, Kodagu	5
Assessment of different Plant Growth Promoting Microbes for Plant Health Management in Black Pepper	Devarapura	5
Assessment of Chilli hybrid for resistance to Leaf Curl Disease and their Suitability to Kodagu Region	Chikkaluvara	5

b. Front-Line Demonstrations

Topic	No. of FLDs organized
Soilless Vegetable Cultivation Demonstration, under RKVY project, BBMP parks, schools, colleges, temples and trusts in Bengaluru	10
Short Duration Finger millet var. KMR-630 for Delayed Monsoon	10
Water Saving and High Nutritional Aerobic Paddy Paustic-9	10
Integrated Crop Management in Tomato	5
Disease Resistant French Bean variety – Arka Arjun for Higher Productivity	5
Integrated Crop Management in Chilli – Arka Harita	5
Integrated Crop Management in Onion	10
Arka Prasan Ridge Gourd Variety for Higher Productivity	10
Mucuna (<i>Mucuna pruriens</i> L.) for Improvement of Soil Properties in Coconut	20
High Yielding Tuberose Variety Arka Prajwal	5
Castor Hybrid ICH-66 as an Intercrop in Ground Nut Cropping System for Additional Returns	10
Fodder Sorghum CoFS 31 for Increased Fodder Productivity	10
Marvel Grass-Perennial Fodder (<i>Dicanthium annulatum</i>) for Small Ruminants	5
Foxtail Millet Variety DHFt 109-3: Demonstration, Value Addition and Market linkage	10
Brown Top Millet: Demonstration, Value Addition and Market linkage	10
Red Rice Variety <i>Sahyadri Kempu Mukthi</i> for Higher Yield	5
Management of Ascariasis & Anaemia in Piglets	10
Integrated Approaches for Dairy Calf Management	5
Bush pepper for Additional Income for Farm Women	10
P-Solubilizers to enhance the P- Uptake for Coffee Yield	10
Integrated Management of Premature Fruit Drop in Coffee	10
Integrated Disease Management in Ginger	10




c. Exhibitions

Event and Location	Venue & Date
Krish Mela - 2021	University of Agricultural Sciences, Bengaluru; 11-14, November 2021
Vanijya Utsav Exporters Conclave Cum Exhibition	Hotel Lalith Ashok, Bengaluru, 22-23 Sep, 2021
UAHS Krishi Mela-2021	UAHS, Shivamogga, 12-13 Nov, 2021
XV Agricultural Science Congress, BHU Varanasi	BHU Varanasi, 13-16 Nov, 2021
Field day on paddy and integrated farming system, Ponnampet, Virajpet, Kodagu	Agriculture & Horticulture Research Station, Ponnampet, 30 Nov, 2021
Krishi Vasthu Pradarshana, Madikeri, Kodagu	Goda Samaja Bhavan, Madikeri, 27 Dec, 2021

iv. Media Coverage (Radio, TV programs, Newspaper articles)

Media	Number
Television	07
Radio	03
Newspaper articles	11

v. Agricultural Technology Information Centre (ATIC):

-  During July to December 2021, **4100** farmers/ students/ stakeholders visited ATIC.
-  About **630** telephone queries were answered.
-  An income of Rs.39,29,157/- was generated from the sale of ICAR-IIHR technology products.

REVENUE GENERATION

Service	Number	Revenue (Rs.)
ICAR-IIHR, Bengaluru		
Technology licensing		67,18,330
Contract Service(Testing)	92	13,16,514
Contract Research (Paid up trial)	8	42,66,864
Consultancy service (Field visit)	5	1,07,970
Training	4	74,673
Planting Materials Sold		12,64,085
Farm Produce		3,31,753
Others		2,65,877
Total		1,43,46,066
CHES, CHETTALLI		
Revenue*		1211939
Revolving fund		1621733

*Revenue from sale of planting materials, farm produce, mushroom spawn, oyster mushroom, *Trichoderma*, honey bee box, black pepper, fruit fly trap, vegetable seed kit

Material Transfer Agreement for 'Chilli CGMS Line MS1 (A & B Lines)', 'Chilli CGMS Line MS2 (A & B Lines)' & 'Chilli PMR Line MSI (PMR 14)' has been signed with ELLORA Natural Seeds Pvt. Ltd., Aurangabad, Maharashtra.



Arka Minimally Processed Onion technology transferred to Green Orbit Farms LLP, Chittoor Dist., AP



Arka Crushed Tomato technology transferred to KVK, Kheda Gujarat



MoU for Arka Decomposer technology exchanged with M/s Amruth Organics, Chitradurga



License Agreement for Registration & Commercialization of Farmer's tamarind variety 'Lakshmana'

NEW TECHNOLOGIES INCLUDED IN ITMU PRICE LIST FOR COMMERCIALIZATION - JUL-DEC 2021

Technology Name	License fee without royalty (Rs.)
Arka Kalyan (Onion)	3,00,000
Primers, Methods and Kit thereof	1,00,000
Arka Red (Gerbera; 25 tissue culture multi shoot bottles)	20,000
Arka Mushroom Nutri-Cereal cookies (all 5 types)	15,000
Arka Mushroom Jowar cookies alone	4000
Arka Mushroom Maize cookies alone	4000
Arka Mushroom Little millet cookies alone	4000
Arka Mushroom Bajra millet cookies alone	4000
Arka Mushroom Finger millet cookies alone	4000
Arka Vertical Garden Model	5000

GST @18% to be charged for the above technologies

DISTINGUISHED VISITORS

ICAR-IIHR, Bengaluru

- Dr. O.P. Dutta, Former Head, Division of Vegetable Crops, ICAR-IIHR, and Dr. T.H. Gowda, Deputy Registrar, PPV&FRA, visited on the Division of Vegetable Crops, for Okra DUS monitoring, on 20.12.2021
- Dr. Balaprasad, IFS, Ex CEO, NMPB, visited Division of Flower & Medicinal crops on 28 Dec, 2021
- Dr. R. Murugesan, Chief Engineer, Er. Shanthi Sunder Raman, Superintending Engineer, Er. S. Kavitha, Asst. Engineer, and Er. P. Karthikeyan, Asst. Engineer, Dept. of Agricultural Engineering Department, Govt. of Tamil Nadu, visited ICAR-IIHR, Bengaluru, on 31 Dec, 2021 to discuss about machinery and technologies for horticultural crops, for promotion among famers of Tamil Nadu through state government schemes



ICAR-KVK, Gonikoppal

- Dr. G.R. Pennobalishwamy, State Nodal Officer, SAMETI (South), UAS, Bengaluru, Smt. Shabana Sheikh, Joint Director, Dept. of Agriculture, Kodagu, and Dr. B.N.S. Murthy, Director, ICAR-IIHR, Bengaluru, attended the inaugural function of DAESI program on 18 Aug, 2021
- Shri. Madhu Kumar, Forest Range Officer, Kodagu, attended the celebration of 'International Year of Millets 2023', and national campaign on *Poshan Abhiyan* and tree plantation on 17 Sep, 2021

PERSONNEL

Promotions

- Dr. M.K. Chandra Prakash, Senior Scientist (Computer Application) has been promoted to Principal Scientist w.e.f. 11.04.2019
- Dr. Reena Rosy Thomas, Senior Scientist (Computer Application) has been promoted to Principal Scientist w.e.f. 27.12.2019
- Smt. M. Sangeetha Assistant, has been promoted to Assistant Administrative Officer w.e.f. 01.10.2021
- Sh. R.G. Ramesh, Administrative Officer, has been promoted to Senior Administrative Officer w.e.f. 13.10.2021
- Smt. Pooja Kumari, Assistant, has been promoted to Assistant Administrative Officer (through LDCE) w.e.f. 14.12.2021

Transfers

- Dr. Sangeetha, G., Principal Scientist, transferred from CHES, Bhubaneswar, to ICAR-IIHR, Bengaluru, w.e.f. 01.07.2021

- Shri. G.G. Harakangi, CAO, transferred from ICAR-IIHR, Bengaluru, to ICAR-NDRI, Karnal, w.e.f. 31.08.2021
- Dr. Venkataravanappa, Scientist, transferred from ICAR-CHES, Chettalli to ICAR-IIHR, Bengaluru, w.e.f. 14.09.2021
- Dr. L.K. Bharathi, Principal Scientist, transferred from ICAR-IIHR, Bengaluru, to ICAR-CTCRI, Thiruvananthapuram, w.e.f. 01.10.2021
- Shri. Chandrakanth Madhav Awachare, Scientist, transferred from ICAR-IIHR, Bengaluru, to ICAR-CTCRI, Thiruvananthapuram, w.e.f. 1.10.2021
- Dr. C. Mahadevaiah, Scientist, transferred from ICAR-SBI, Coimbatore, to IIHR, Bengaluru w.e.f. 1.10.2021
- Ms. Ramya, H.R., Scientist, transferred from ICAR-CSSRI, Karnal, to ICAR-IIHR, Bengaluru, w.e.f. 04.10.2021
- Dr. Vivek Hegde, Scientist, transferred from ICAR-CTCRI, Thiruvananthapuram, to ICAR-IIHR, Bengaluru, w.e.f. 11.10.2021
- Shri. Muralidhara, B.M., Scientist, transferred from ICAR-DCR, Puttur, to ICAR-IIHR, Bengaluru, w.e.f. 07.10.2021
- Shri. Chandra Kumar, C., Senior Technical Officer, transferred from ICAR-CHES, Chettalli, to ICAR-IIHR, Bengaluru, w.e.f. 11.10.2021
- Shri. T., Viswanathan, AAO, ICAR-CIFT, Cochin, promoted to Administrative Officer & transferred to ICAR-IIHR, Bengaluru, w.e.f. 15.11.2021
- Shri. V. Raghuraman, SAO, ICAR-CMFRI, Cochin transferred to ICAR-IIHR, Bengaluru, w.e.f. 22.12.2021

Superannuation

- Shri. Munibyrappa, Technical Assistant (Lab) retired on 31.07.2021
- Smt. Bhagyamma, A., Senior Technician (Field/ Farm), retired on 31.07.2021
- Shri. N. Jayaramaiah, Technical Officer, retired on 31.07.2021
- Smt. H.L. Lalitha, Skilled Support Staff, retired on 31.07.2021
- Shri. D. Venkatesh, Skilled Support Staff, retired on 31.07.2021
- Shri. D. Venkataramanappa, Skilled Support Staff, retired on 31.08.2021
- Shri. B. Lokanath, AAO, retired on 30.09.2021
- Shri. Venkataramanappa, Skilled Support Staff, retired on 30.09.2021
- Shri. R. Ravi, Skilled Support Staff, ICAR-CHES, Chettalli, retired on 30.09.2021
- Shri Venkateshwar Rao, Technical Officer, retired on 31.10.2021

Voluntary Retirement

- Smt. V. Radhika, Scientist, retired voluntarily on 09.11.2021

Demise

Shri. R. Jayaram, Skilled Support Staff, expired on 03.09.2021



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