किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद
Agri search with a human touch

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FROM THE DIRECTOR'S DESK

मुझे जुलाई से दिसंबर 2021 के दौरान संस्थान द्वारा की गई अनुसंधान उपलब्धियों एवं अन्य गतिविधियों को लिखने में बहुत खुशी हो रही है। संस्थान ने संयुक्त राष्ट्र के पर्यावरण विकास कार्यक्रम को ध्यान में रखते हुए अनुसंधान गतिविधियों में तेजी से प्रगति की है, जिसका उद्देश्य उर्वरकों एवं कीटनाशकों के उपयोग को कम करके जलवायु परिवर्तन के प्रभावों को कम करना है। अमरूद में जड़ ग्रंथि सूत्रकृमि प्रतिरोध विकसित करने के उद्देश्य से अमरुद की वन्य प्रजाति *सीडियम कैटिलयानम* उपजाति *ल्यूसिडम* सबाइन की पहचान की गयी एवं उसे जीरो गॉल इंडेक्स एवं एगमास इंडेक्स के साथ *मेलोइडोगाइन एंटेरोलोबी* के खिलाफ जांचा गया। प्रोटिओमिक और ट्रांसक्रिप्टोमिक अध्ययनों ने प्रतिरोधी प्रजातियों में प्रतिरोधी जीन, प्रोटीन और मेटाबोलाइट्स के लक्षण वर्णन में मदद की। जड़ ग्रंथि सूत्रकृमि रोग के प्रबंधन एवं पौधों की वृद्धि को बढ़ाने में *स्यूडोमोनास एरुगिनोसा* तथा *बैसिलस* प्रजाति के उपचार के माध्यम से अमरूद में सफलता दर्ज की गई। संस्थान ने माननीय प्रधान मंत्री श्री नरेंद्र मोदी जी द्वारा छोटे एवं सीमांत किसानों के लाभ हेतु देशी गाय आधारित प्राकृतिक खेती को अपनाने के लिए दिए गए आह्वान के साथ भी कदम बढ़ाया है। प्राकृतिक खेती के सबसे महत्वपूर्ण घटक, जीवामृत में जैव रासायनिक एवं पादप वृद्धि गुणों का पता लगाया गया। आंवला और बेल कैंडी को सूक्ष्मजीवों के माध्यम से बेहतर बनाने की तकनीक विकसित की गई है तथा इसके उप–उत्पाद से प्रोबायोडिक पेय का एक नया उत्पाद बनाया गया है। इस दौरान संस्थान ने अन्य गतिविधियाँ जैसे कि वैज्ञानिक– कृषक बैठक तथा कृषकों, स्वयं सहायता समूहों, छात्रों एवं सैन्य कर्मियों हेतु प्रशिक्षण का भी आयोजन किया। किसानों हेतु छत्रक प्रबंधन तकनीक, आम एवं अमरूद की उन्नत बागवानी, निर्यात क्षमता में वृद्धि एवं कचरे से धनार्जन विषयों पर किसान गोष्ठियों का आयोजन किया गया। संस्थान ने विभिन्न राष्ट्रीय कार्यक्रमों जैसे विश्व खाद्य दिवस, सतर्कता जागरूकता सप्ताह, राष्ट्रीय एकता दिवस, संविधान दिवस और विश्व मृदा दिवस को भी मनाया। पोषण–वाटिका अभियान एवं वृक्षारोपण कार्यक्रम, विशिष्ट स्वच्छता अभियान, अमृत भारत महोत्सव, जय किसान जय विज्ञान सप्ताह, किसान दिवस, महिला किसान दिवस, कृषि शिक्षा दिवस कुछ ऐसे कार्यक्रम थे जो संस्थान में मिशन मोड तरीके से आयोजित किए गए। संस्थान ने इस अवधि के दौरान संस्थान अनुसंधान समिति एवं अनुसंधान सलाहकार समिति बैठक भी आयोजित की, जिसमें भाकृअनुप के दिशानिर्देश को ध्यान में रखकर परियोजनाओं का पुनर्गठन किया गया। संस्थान के कृषि व्यवसाय इंक्यूबेटर केंद्र ने विभिन्न बैठकों के आयोजन द्वारा कई समझौता ज्ञापनों पर हस्ताक्षर किये। हिंदी के उपयोग को बढ़ावा देने एवं लोकप्रिय बनाने हेतु हिंदी कार्यशाला और हिंदी सप्ताह का आयोजन उत्साह के साथ किया गया। संस्थान में पूर्व उप महानिदेशक, डॉ. एच.पी. सिंह और पूर्व निदेशक, डॉ. आर.के. पाठक जैसे कई विशिष्ट आगंतुकों का स्वागत किया गया।

नीलिमा गर्ग

It gives me immense pleasure to place research achievements and other activities undertaken by institute staff during July to December 2021. The institute made rapid strides in research activities based on UN environment program that aims to mitigate climate change impacts by minimizing use of fertilizers and pesticides. Prebreeding intitaives aimed at developing root knot resistance in guava, identified *Psidium cattleyanum* var. *lucidum* Sabine with zero gall index and egg mass index when screened against *Meloidogyne enterolobii* and validated by proteomic and transcriptomic studies. Success in management of guava wilt and decline was recorded through treatment of *P. aeruginosa* and *Bacillus* sp. in managing the root knot disease and enhancing the plant growth. The Institute also aligned with a call given by our hon'ble PM Shri Narendra Modi ji to adopt indigenous cow based natural farming for the benefit of small and marginal farmers. Biochemical and PGP properties of Jeevamrita, the most important component of natural farming, was done. Further, improved preparations of Aonla and Bael candies through microbial interventions were also developed that bring about a novel product of probiotic drink. The Institute conducted various Scientist-Farmer interface meetings and trainings for the farmers, Self Help Groups, students and military personnel. Kisan Goshthis were organized on the most pertinent topics of canopy management, improved technologies of mango and guava cultivation, enhancing export potential and wealth from waste among others. The Institute also celebrated national events like World Food Day, Vigilance Awareness Week, National Unity Day, Constitution Day and World Soil Day by organizing various activities. Nutri Garden Campaign and Tree Plantation Program, Special Swachhta Campaign, Amrut Bharat Mahotsav, Jai Kisan Jai Vigyan Week, Kisan Diwas, Mahila Kisan Diwas, Agriculture Education Day were few programs that were conducted in a mission mode manner. IRC and RAC meetings were organized for restructuring of projects to meet ICAR mandate. The institute ABI centre continued its impact on agribusiness incubation by organizing various meets and signing MoUs. Hindi Karyashaala and Hindi Saptaah were organized with fervour to promote and popularize use of Hindi. Institute was happy to welcome many distinguished visitors like Former DDG Dr. H.P. Singh and Former Director Dr. R.K. Pathak.

(Neelima Garg)

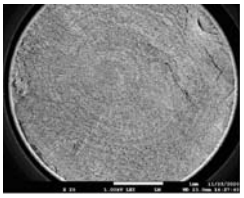
RESEARCH HIGHLIGHTS

Meloidogyne enterolobii resistant rootstock species for guava

As a pre-breeding initiative towards developing elite root knot nematode (RKN) resistant rootstock lines for guava, 10 members of Myrtaceae family were screened against RKN (*Meloidogyne enterolobii*) infection causing guava decline. Three species such as *Psidium cattleyanum* var. *lucidum* Sabine, *Syzygium cumini* (L.) Skeels and *Syzygium zeylanicum* (L) DC; were recorded to have intact roots without gall formation and healthy rooting system. These species are considered as resistant crop wild relatives (CWR) of guava with RKN resistance. Morpho-physiological characterization of the aerial shoot system of afore-mentioned species, revealed that the gas exchange and physiological parameters (transpiration rate, Fv/Fm, photosynthetic rate, CO_2 assimilation rate) were minimally affected. Similarly, underground root system examination indicated that the gall index and egg mass index valued to be zero indicating their immune nature to RKN infection. Even among them, one species *viz*., *P. cattleyanum* var. *lucidum* Sabine, often called as cattle or strawberry guava, a very close wild relative to *Psidium guajava*, showed more profuse root system and was scored as highly resistant CWR to RKN. Leathery shiny leaves with high wax content, dense leaves, smaller ovate or ellipsoidal leaves similar to that Jamun are the key features of this species. It is considered to be tolerant to shade and high levels of soil salinity. It is sometimes synonymously referred as *Psidium araca.* Quite contrarily, *Psidium chinensis*, *P. guineense* and *P. guajava* showed significant reduction in gas exchange parameters with high gall and egg mass indices and were found to be highly susceptible. Transcriptome, proteome and metabolome studies have helped in characterization of the resistant genes, proteins and metabolites in *P. cattleyanum* var. *lucidum* Sabine that contributes for the resistance mechanism.

Cattley/Strawberry Guava (*Psidium cattleyanum* sub sp. *lucidum*)

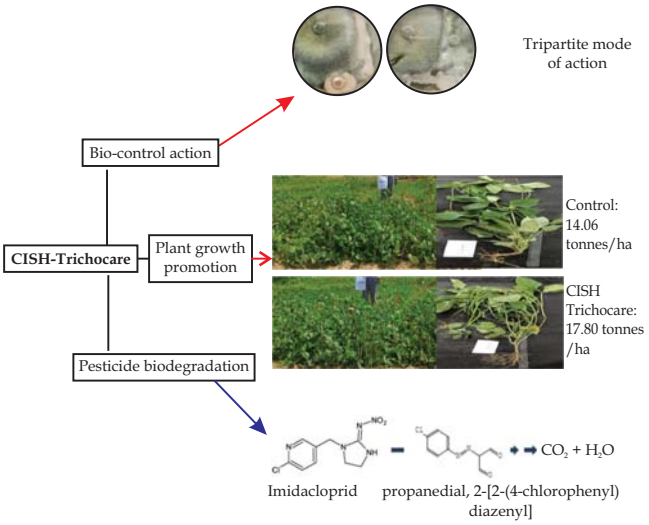
Intact roots No gall formation, Sturdy healthy roots



Scanning electron microscopy of RKN challenged root tissue showing clear internal root tissues

CISH-Trichocare : A soil and plant health restoration product

CISH-Trichocare is a microbial based bioformulation which works in tripartite mode for restoration of soil and plant health. In terms of soil health, the PGP microbes present in CISH-Trichocare produced copious amounts of IAA, NH_3, HCN (20 - 45 µg mL^{-1}), solubilize P, K & Zn (range from 35 - 50 µg mL^{-1}) and showed high dehydrogenase and fluorescein diacetate activities. It showed efficient biocontrol action (more than 90%) against potential plant pathogens like *Fusarium oxysporum*, *Colletotrichum gloeosporiodes*, *Pythium aphanidermatum* and *Ceratocystis fimbriata* within 5 days of time interval. Biodegradation potential of this product for imidacloprid achieved more than 90% degradation under 30 days of incubation. It was also evaluated under field condition on cowpea (*Vigna unguiculata*) crop at I block of ICAR-CISH, Lucknow and its performance was recorded to be better in terms of crop production (17.8 tonnes ha^{-1}) as compared to the uninoculated control (14.06 tonnes ha^{-1}). Hence, CISH-Trichocare can act as a Green technology over agrochemical and would be promising tool for sustainable production of crops under subtropics.



Success in bio-management of guava wilt and decline

Experiments using bio-control agents for the management of guava wilt and decline caused by *Fusarium oxysporum* and *Meloidogyne enterolobii* complex were conducted under controlled conditions. The application of bio-control agents (10^6 cfu mL^{-1} kg^{-1} soil) , panch gavya, vermi compost (100 g), cow pat pit (50 g) and for fluopyrum (1 mL) were compared. The growth of plants inoculated with both the pathogens and treated with biocontrol agents (*Pseudomonas aeruginosa* alone; *Bacillus* sp. alone; *Purpureocillium lilacinum* + *Bacillus* sp.;

Trichoderma asperellum + *Bacillus* sp.; vermi compost + *Bacillus* sp.; and vermi compost + *P. aeruginosa*) was recorded higher than uninoculated control. Minimum colonization of roots by *F. oxysporum* was recorded in treatment containing *P. lilacinum,* panch gavya 2.5 mL, vermi compost + *Bacillus* sp. and vermi compost + cow pat pit. The root-knot index caused by *M. enterolobii* was recorded minimum in plants in following order: *P. aeruginosa* followed by panch gavya 25 mL, *Bacillus* sp., *P. lilacinum* + *Bacillus* sp., vermi compost + *P. aeruginosa* and vermi compost + *Bacillus* sp.. The aforementioned results indicated that *P. aeruginosa* and *Bacillus* sp. were the most effective treatments in managing the root knot disease and enhancing the plant growth. The performance of *P. aeruginosa* and *Bacillus* sp. in enhancing the growth was better than fluopyrum but a little bit inferior in suppressing the nematode infection.

Treated with *Pseudomonas aeruginosa*

Untreated inoculated

Uninoculated Control

Jeevamrita: Microbial insight for plant growth promotion

Jeevamrita is most important component of natural farming and used for seed/seedling treatments and soil application for improving the soil health. Microbial enumeration and characteristics of jeevamrita was evaluated in different selective media by using spread plate technique.The maximum number of microbial colonies were observed on Pikovskaya's agar medium(10^8x10^6 cfu mL^{-1}), Rose Bengal agar (88x10^6 cfu mL^{-1}), M.R. agar (80x10^6 cfu mL^{-1}), Nutrient agar(60x10^6 cfu mL^{-1}), Kings B agar(60x10^6 cfu mL^{-1}) and Jenson's agar medium (55x10^6 cfu mL^{-1}). In case of other medium like CRYEMA (22x10^6 cfu mL^{-1}), actinomycetes agar (5 x10^6 cfu mL^{-1}) and in N-free malate medium (5x10^6 cfu mL^{-1}) colony forming units were observed.

Based on morphological characterization, total 03 bacteria (J2, J4, and J6) were screened from jeevamrita, all the bacteria were G^+ and all bacteria were tested for PGP properties, including P-solubilization, siderophore production, Zn solubilization and HCN production. Test isolates J2, J4 & J6 showed positive results for P-solubilization, siderophore production and Zn solubilization. All the bacterial isolates were also tested for biochemical characterization including different enzymatic action and sugar utilization. In this all isolates showed positive results for utilization of citrate, glucose, melibiose, malonate, raffinose, and trehalose. All isolates were positive for catalase. Test isolates J2 & J4 showed positive results for most of the biochemical tests (Table 1 & 2).

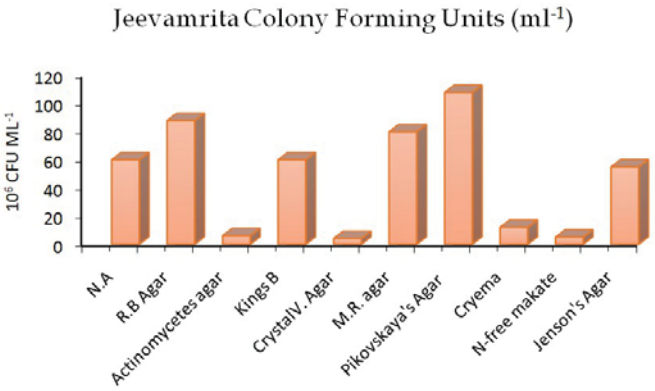


Fig 1. Colony forming unit per mL (cfu mL^{-1}) of jeevamrita in different media

Table 1. Identification and PGP test of microorganisms isolated from Jeevamrita

S. No.	Code	Zn solubilisation	P solubilisation	Siderophore Production
1	J2	+++	++++	++++
2	J4	+++	+++	+++
3	J6	++++	+++	+

Table 2. Biochemical test of Jeevamrita

Test name	Principle	J2	J4	J6
ONPG	Detects β-galactosidase activity	+++	++++	-
Lysine utilization	Detects Lysine decarboxylation	++++	++++	++
Ornithine utilization	Detects Ornithine decarboxylation	++++	+++	-
Urease	Detects Urease activity	+++	++++	+
Nitrate reduction	Detects Nitrate reduction	++++	++	++++
Citrate utilization	Detects capability of organism to utilize citrate as a sole carbon source	++++	++++	++++
VogesProskauer's	Detects acetoin production	+++	++	++
Malonate utilization	Detects capability of organism to utilize sodium malonate as a sole carbon source	++++	++++	++++
Esculin hydrolysis	Esculin hydrolysis	++++	++++	-
Xylose	Xylose utilization	++++	++++	-
Adonitol	Adonitol utilization	++++	++++	-
Rhamnose	Rhamnose utilization	++++	++++	-
Cellobiose	Cellobiose utilization	++++	++++	-
Melibiose	Melibiose utilization	++++	++	++++
Saccharose	Saccharose utilization	+	++++	++++
Raffinose	Raffinose utilization	++++	+++	++++
Trehalose	Trehalose utilization	++++	++	++++
Glucose	Glucose utilization	++++	++++	++++
Lactose	Lactose utilization	++++	++++	-
Catalase	Aerobic /Facultative aerobic	++	+	+++

Improved Aonla and Bael Candy Preparation through Microbial Intervention

Technology has been standardized for preparation of improved aonla and bael candies through microbial interventions. Aonla slices were first subjected to lactic acid fermentation and then osmodehydration. The slices were then dried in electric dehydrator, packed in polyethylene pouches and stored at room temperature. The technology produces health-promoting by-product in the form of aonla and bael probiotic drinks, containing high population of intestine-friendly *Lactobacillus* bacteria. The additional product from same source material will lead to generation of additional economic return.

Improved Aonla and Bael candy

Aonla and bael probiotic drinks

TRAININGS ORGANIZED

Guava pulp processing and value added product under Farmers-FIRST project

A training cum workshop on 'Guava pulp processing and value added products' was organized on August 24, 2021 at village Mohammadnagar Talukedari. A total of 20 trainees of Swavalamban, a Women Self Help Group, participated in this workshop. Dr. Alok Gupta, Scientist trained the participants to make juice, jam, jelly and RTS from guava pulp. Trainees were also apprised about scientific method to store, packaging and marketing the guava pulp after processing.

One day training program on Button and Oyster mushroom production

One day training program was organized on October 21, 2021 on 'Button and Oyster mushroom production', by

Dr. P.K. Shukla in which 6 students from BBAU, Lucknow; 3 from CBGPG College, Bakhshi ka Talab, Lucknow; and 12 rural youths (Farmer's FIRST project) participated. The major purpose of this training was to introduce the participants with mushroom production technology and to establish long term relationship for enabling commercial production. Rural youth conveyed their readiness to grow mushroom immediately after training and the students of CBGPG College also planned to go for commercial production.

Establishment of mushroom unit

A training of army personnel was organized at Cantonment, Lucknow during December 16-17, 2021 for establishment of 'Mushroom Production Unit' on request of Major Navneet Kumar, Sena Chikitsa Corps Abhilekh, Cantonment, Lucknow. The training of five soldiers deputed for the task of 'Cultivation of Mushrooms' was conducted on December 17, 2021 and over 50 officers and soldiers of the unit attended lecture delivered by Dr. P.K. Shukla, regarding nutritional and medicinal values of different species of mushroom; and their production technology. The ABI Incubatee of ICAR-CISH, Mr. Vivek Singh also participated in the program and displayed ready to fruit bags of button mushroom. Dr. Neelima Garg, Director, ICAR-CISH addressed the gathering and expressed her gratitude towards Brigadier Saijvir Singh and assured wholehearted support from Institute. About 21 bags of oyster mushroom were spawned and placed for spawn-run. The trainees were also guided for the requirement of mushroom cultivation room, and accordingly the work on construction of cultivation rooms was initiated by utilizing waste tin/ asbestos sheets and wood. The production target was fixed from

20-25 kg per day for consumption in 'Army Mess' feeding over 400 soldiers of the unit.

MEETING

25th meeting of Research Advisory Committee

Twenty fifth meeting of Research Advisory Committee (RAC) of the Institute was convened through online mode on July 22, 2021 under the Chairmanship of Dr. N. Kumar, Vice Chancellor, Tamil Nadu Agricultural University, Coimbatore, Tamilnadu. The RAC Members, Dr. Chandish Balal (Ex. Director, ICAR-NBAIR, Bengaluru), Dr. Jai Singh (Ex. Director, ICAR-CIPHET, Ludhiana), Dr. A.N. Ganeshmurthy (Dean, College of Agriculture, Central Agricultural University, Imphal Manipur), Dr. Ambika, B. Gaikwad (Principal Scientist, ICAR-NBPGR, New Delhi) participated in the deliberations along with Director, ICAR-CISH, PME

Chairman, all the scientists and Heads of respective divisions. The committee reviewed the ongoing research work in the Institute and presented its recommendations/suggestions for future research work.

45th meeting of Institute Research Committee (IRC)

Forty-fifth meeting of Institute Research Committee was held on October 12, 13 and December 13, 2021 to review the progress made in ongoing research projects and approval of restructured/new projects as per the Agricultural Research Management System. Twenty two projects were approved. It was decided to include government mission, PM's vision, Aatmnirbhar Bharat and Vocal for Local in the newly proposed research projects. Further more research on drone led agriculture, nano-technology, artificial intelligence could be initiated and intellectual property right protection arising out of projects should be envisaged. Five new crops viz., banana, papaya, avocado, strawberry and blueberry have been added to the mandate of the institute.

FARMERS SCIENTISTS INTERFACE

Scientist-Farmer's interaction meet under FARMER-FIRST project

ICAR-CISH, Lucknow organized Scientist-Farmer's interaction meet under FARMER-FIRST project on August 13, 2021. The meeting was aimed to solve the problem of costly fodder for the milch animals. A total of 35 farmers (mango growers) from the adopted village of Malihabad block participated in the meeting. During the meeting, seeds of perennial Sorghum and root slips of

Panicum grass were distributed to the farmers. Dr. S.K. Shukla, Principal Scientist conducted the program and Dr. Maneesh Mishra (PI, FFP) coordinated the program.

Farmers Scientists Interface on "Climate Resilient varieties, Technologies and Practices" & Live Telecast of Hon'ble Prime Minister

ICAR-CISH, Lucknow organized Farmer-Scientist interaction meeting on 'Climate Resilient Varieties, Technologies and Practices' on September 28, 2021. More than 100 farmers from Malihabad participated in the program. In this program, Shri Archaya Chandra Bhushan Tiwari, famous environmentalist and popularly known among masses as '*Ped Baba*' was present as chief guest. Scientists and farmers attended online address of Hon'ble Prime Minister Shri Narendra Modi, in which 35 crops varieties with special traits, were released and virtual inauguration of ICAR-National Institute on Biotic Stress Management (NIBSM) Raipur was done. The PM interacted with the farmers across the country and bestowed Green Campus award to the agriculture universities. On this occasion, farmers were informed about the impact of climate change on pest and diseases of plants, climate smart practices of pest and disease management of horticultural crops, climate smart vegetable production. The chief guest of function distributed fruit fly traps, plants of banana (G-9), guava (CISH Dhawal) and seed kit of vegetables to the particpant farmers.

Kisan Goshthi-cum-Farmers Scientist Interface at RRS Malda

A *Kisan Gosthi*-cum-Farmers Scientist Interface was also organized at RRS & KVK, Malda (West Bengal) on

September 28, 2021 under the theme of 'Climate resilient varieties, technologies and practices'. Scientists briefed about climate resilient agriculture, climate smart agriculture to the farm women and villagers. About 105 farmers and farm women got benefitted from this interaction and participated in the PM live telecast program.

National Conclave on Natural Farming and Farmer-Scientist Interaction

ICAR-CISH, Lucknow organized an interaction program of more than 230 farmers of Malihabad and Maal areas ensuring their virtual/on-line participation in the 'National Conclave on Natural Farming' organized at Anand, Gujarat on December 16, 2021. Farmers were extremely inspired by the elaboration of Hon'ble Governor of Gujarat, Acharya Dev Vratji regarding preparation of various organic inputs like Jeevamrit, Ghan Jeevamrit, Beejamrit, etc and their role in maintaining soil organic carbon and soil health. On this occasion, Dr. Neelima Garg, Director of the institute welcomed Dr. R.K. Pathak, Ex-Director, ICAR-CISH who exhorted the farming community regarding importance of cosmic farming, role of organic inputs and bio-enhancers in natural farming. The special guest Mr. Radheshyam Dixit, the coordinator from UP *Gau Sewa Aayog* also discussed with farmers about various government schemes to conserve and protect cow and promote cow based farming. He also elaborated on various efforts made by *Gau Seva Aayog* for marketing of cow based products to help farmers. The program was conducted by Dr. S.K. Shukla, Principal Scientist.

Kisan Gosthi on Wealth from Waste

A *Kisan Gosthi* was organized on the topic of 'Waste to Wealth' in Dhakwa village of Malihabad block on October 12, 2021. The Gram Pradhan Shri Vishambharnath was present as chief guest and more than 150 farmers participated in the programme which was also organized through virtual mode. Director, Dr. S. Rajan, deliberated on the progress and strides made by the Institute towards rewards of vermicompost from waste. Dr. R.A. Ram informed the farmers about benefits of organic manure, organic farming and the side effects of chemical farming. He also popularized microbial consortia products of the Institute among the farmers. The program was coordinated by Dr. Anju Bajpai, Principal Scientist and organized by Dr. Maneesh Mishra, Principal Scientist.

Kisan Gosthi for enhancing export potentail

Awadh Aam Utpadak Evam Bagwani Samiti (AAUBS), a community based organization, engaged in improving the income of mango-grower's, organized a *Kisan Gosthi* in collaboration with ICAR-CISH, Lucknow on November 25, 2021. More than 200 farmers participated in this program. Dr. S. Rajan, Director, ICAR-CISH, Dr. Sugriv Shukla, Deputy Director, Export Cell, Shri A.K. Srivastava, MD, HAFED, Shri T.P. Choudhary, Additional Director Agriculture and Dr. R.K. Tomar, Director, Horticulture Department, Uttar Pradesh were present in the gosthi. The main aim of this gosthi was to discuss the possibilities of export of horticulture crops in Uttar Pradesh. During the programme, Dr. Hari Shankar Singh, Dr. Ram Avadh Ram, Dr. Govind Kumar and Dr. Israr Ahmed were felicitated for the development of new technologies. Plant saplings were distributed to the farmers by Dr. Raghuveer Singh (President, AAUBS), Shri Upendra Singh (Secretary, AAUBS) and other guest members.

Kisan Gosthi at Ganchapa, Kanth, Shahjahanpur

ICAR-CISH, Lucknow organized a *Gosthi* cum training program entitled, *'Aam aur amrud ki unnat bagvani takniki'* in a mango orchard located in the village Ganchapa of Kanth block of Shahjahanpur district on December 07, 2021. The KVK, Shahjahanpur helped in organizing the program in which scientists of KVK and more than 80 farmers participated. Dr. S.K. Shukla and Dr. P.K. Shukla, Principal Scientists discussed about the production and protection technologies of mango, with emphasis on decline or wilt of mango trees. Dr. Dushyant Mishra, Principal Scientist deliberated about the benefits of guava production. Dr. R.A. Ram, Principal Scientist explained about the use of organic products available at village in crop production. The folders on 'Mango wilt disease management' and 'Management of mango thrips' were distributed to the farmers.

Kisan gosthi and demonstration of mango canopy management technologies

ICAR-CISH organized a *Kisan Gosthi* and demonstration of mango canopy management technologies at Hannikhera, Raipur village in Maal block of Lucknow on December 21, 2021. On this occasion, Dr. Neelima Garg, Director of the Institute stressed about the need for judicious pruning of mango trees in accordance with the age of trees. She also emphasized on the importance of safe harvesting, post-harvest handling and value addition of mango fruits in order to enhance the farmers' income. Mr. Siyaram Yadav, Village Pradhan informed the scientists about the problems faced by mango farmers. Dr. S.K. Shukla and Dr. Dushyant Mishra, Principal Scientists described different steps of refined mango rejuvenation technology developed by the Institute and demonstrated the process of pruning mango trees. Dr. Devendra Pandey, Principal Scientist advised the farmers to adopt newer varieties like Ambika and Arunika of mango and Shweta; Dhawal, Lalit and Lalima of guava. Dr. R.A. Ram described the organic production technologies and preparation of organic inputs like jeevamrit, amritpani, etc for maintaining soil health and crop productivity. Dr. P.K. Shukla, Principal Scientist and Dr. Gundappa, Scientist advised the farmers for needbased spray of chemicals at critical stages to minimize the number of sprays and reduce the cost of production. Dr. Vishambhar Dayal, Scientist organized the program.

CELEBRATIONS

Vigilance Awareness Week-2021

ICAR-CISH, Lucknow observed Vigilance Awareness Week from October 26- November 1, 2021 with a theme of 'Independent India@75: Self Reliance with Integrity'. On this occasion, the pledge was taken by staff of the institute on October 26, 2021. Banners and posters were displayed on the main gate of the institute and other places. All the employees were sensitized to ensure eradication of corruption, transparency in purchase procedures, punctuality and honesty. During the week, awareness about preventive vigilance was amplified through organization of workshop and essay competition. The staff also visited school and panchayat for sensitizing students and other citizens about vigilance awareness to reduce corruption in the form of bribe and to inculcate sense of conduct, sincerity and punctuality among the students of primary and college institutions.

National Unity Day-2021

National Unity day was celebrated on the birth anniversary of Sardar Vallabh Bhai Patel at the R.B Road Campus on October 31, 2021. Dr. Shailendra Rajan, administered the oath to the employees for protecting the unity, integrity and soveregnity of the nation as a tribute to Sardar Patel. He highlighted the contribution of the country's first Deputy Prime Minister in integration of many princely states and advocated harmony and unity as nations' strength. The prize winners of the painting competeition held on October 28, 2021 during vigilance awareness week were felicitated with certificates and prizes.

Constitution Day

Constitution Day was celebrated on November 26, 2021. On this occasion, Dr. S. Rajan, Director of the Institute addressed the staff and briefed about importance of Indian Constitution. The staff of the Institute also attended online address of our Hon'ble President Shri Ram Nath Kovind, Vice President M. Venkaiah Naidu, Prime Minister Shri Narendra Modi and Lok Sabha Speaker Shri Om Birla. The digital form of updated constitution was released by the Hon'ble President for public access and the staff took pledge of constitution.

World Soil Day-2021

ICAR-CISH, Lucknow celebrated World Soil Day-2021 at Kakrabad village of Lucknow district on December 5, 2021 in which 70 farmers including farm women participated. The theme of the World Soil Day-2021 was 'Halt soil salinization and enhance soil productivity'. Dr. S.K. Shukla highlighted the importance of soil for agriculture and also discussed the methods of preparing various organic inputs like jeevamrit, amritpani, vermicompost, NADEP compost, biodynamic compost, vermiwash, panchagavya for maintaining soil health and enhancing crop productivity. Dr. Dinesh Kumar educated the farmers on the importance and enhancing the availability of various macro and micronutrients through judicious application of manures and chemical fertilizers. The program was conducted by Dr. Vishambhar Dayal, Scientist & Nodal Officer, SCSP.

FIELD DAY

Field day under Farmer's FIRST project

ICAR-CISH, Lucknow organized Field Day on August 27, 2021 under Farmers FIRST Project. Dr. Maneesh Mishra (PI, FFP), Dr. R.A. Ram and Dr. A.K. Verma visited the farms of adopted village Mohammadnagar Talukdari and Nabipanah of Malihabad block. Scientists observed the mango based poultry farming, fish culturing, intercropping like turmeric, yam, panicum grass, vermicomposting in mango orchards and the performance of organised inputs developed by the institute. The scientists also interacted with farmers and solve their horticulture related problems.

AWARENESS PROGRAMS

Nutri Garden Campaign and Tree Plantation Program

An awareness program was organized under the theme of 'Nutri-Garden Campaign and Plantation Drive' in Kakrabad and Meethenagar villages of Lucknow district

and distribution of plants and plantations drive at KVK, Dhaura (Unnao district) on September 17, 2021 under Nutricereals Mega convention for International Year of Millets 2023. At KVK, Dhaura; Dr. S. Rajan, Director, ICAR-CISH addressed 150 farm women, farmers, anganwadi workers and girls. About 12,000 saplings of mango, guava, aonla, lime, bael, drumstick, pointed gourd, banana and broccoli were distributed to them. A total number of 525 farmers participated in the plantation program including more than 225 women. Campaign on Nutri Garden and Tree Plantation was also organised in association with IFFCO and KRIBHCO at the premises of ICAR-CISH, RRS & KVK, Malda (West Bengal), where 15 girls and 45 farm women were made aware about the importance of various types of millets and its benefits for the health. Sixty trees were planted in the campus of ICAR-CISH, RRS & KVK, Malda and 60 plants were distributed to the farmers.

Special Swachhta Campaign (2nd-31st Oct 2021)

Swachhta campaign was carried out in a mission mode manner in campuses of ICAR-CISH and RRS, Malda, W.B. under the stewardship of its Director Dr. S. Rajan. During this year, the country is celebrating *Azadi ka Amrut Mahotsav:* India @ 75, the banner with Swachhta theme was displayed at all prominent places as per ICAR directives, so that it catches the eye and invokes imagination of all countrymen. The pledge was taken by all staff members reiterating their resolution to fulfil wishes of Mahatma Gandhi for a Clean India. Realizing the need for application of Agriculture technologies for minimizing domestic and farm waste, reducing carbon emissions and restoration of soil health, newly launched ICAR technologies were popularized at village Sanyasi Bag, in which CISH team and other eminent members of the civil Society participated. Some pamphlets were distributed to the participants on Ekcel Decomposer Capsule, *in-situ* decomposition technology for rice-wheat residue, family net vessel compost (FNVC) and farm waste compost. The Institute faculty also participated in a webinar series. A painting competition was organized in the residential campus in which children in various age groups participated with enthusiasm and showed that the current generation is equally concerned about health of mother planet earth. Director, ICAR-CISH briefed the reporter that they have used social media platforms like Facebook and Twitter along with Newspaper to have a larger outreach among youth in agriculture. Dr. Anju Bajpai, Nodal officer coordinated the activities.

Swachhta Pakhwada (16th-31st December 2021)

During the fortnight, campaign of Swachh Bharat Mission (December 16-31, 2021), the institute organized a Farmer- Scientist interface on 16th December in which farmers from Mal and Malihabad blocks participated in a big way. Dr. Neelima Garg, Director endorsed the role of organic farming practices in improving soil health and informed about the progress made during last two decades in composting and waste utilization through microbial interventions. The institute took a drive for removing plastic littering in the soil and efforts were made to educate staff for overcoming our plastic obsession. Further, *Kisan Diwas* was celebrated on 23rd December and several VIPs including Former DDG (Horticulture) Commissioner (H), GOI, Dr H.P. Singh felicitated 20 farmers from neighbouring villages who have taken up organic farming practices for ornamental and vegetable farming. The institute staff took various drives in the villages for awareness campaign and also warned about complacency in Covid appropriate behaviour. Dr Anju Bajpai, Nodal Officer, coordinated the activities.

ORGANIZATION OF WEBINARS

Role of fruits and vegetables in food & nutritional security

ICAR-CISH, Lucknow organized a webinar on 'Role of fruits and vegetables in food and nutritional security' on the occasion of National Nutrition Week under *Azadi ka Amrit Mahotsav* program on September 27, 2021. The purpose of this program was to create awareness

amongst masses about the nutritional and health benefits of consuming more fruits and vegetables. The program was attended by scientists, research scholars and academicians from various ICAR institutes and Universities of India. The keynote speaker of the Session Dr. Pritam Kalia, former Emeritus Scientist, Ex-Head, ICAR-IARI, New Delhi talked about 'Nutraceuticals and bio-fortification of vegetables'. He projected a clear understanding of the importance of vegetables as source of nutraceuticals and bio-fortified foods for tackling hunger and malnutrition problem in developing world. Dr. R.A. Ram, Principal Scientist, ICAR-CISH shared benefits of roof top gardening of fruits and vegetables and emphasized on utilization of municipal solid wastes as well as kitchen wastes for organic production of horticultural crops. Dr. P. Barman and Dr. Karma Beer, Scientists coordinated the program.

Webinar Series during Special Swachhta Campaign

Under Special National Swacchata Campaign, ICAR-CISH, Lucknow organized webinar series on 'Waste reduction for a healthy plant'. The first lecture was delivered by Dr. N. Garg on October 22, 2021, on 'Waste utilization and wealth generation'. The use of microbial technologies was advocated for converting postharvest waste into various products that brings additional income for farming family and processing industry. Another important aspect was covered by Dr. H. S. Singh who deliberated upon increased relevance of climate change concerns and use of agro-ecosystem services provided by nature and use of biological control in an integrated pest system under the topic 'Agro-ecosystem cleanliness. Do we have alternatives of pesticides?' on October 23, 2021. The program was coordinated by Dr. Anju Bajpai, Principal Scientist.

World Food Day Webinar on 'Protected Cultivation of Horticultural Crops for Food and Nutritional Security'

A webinar on 'Protected Cultivation of Horticultural Crops for Food and Nutritional Security' was organized on the occasion of World Food Day on October 16, 2021, in which Padma Shri Dr. Brahma Singh presented the keynote address. Dr. S. Rajan, Director welcomed the chief guest and other participants and Dr. Anju Bajpai, introduced the chief guest to the participants. Protected cultivation of high-value horticultural crops was highlighted as an innovation-driven sector, which holds immense potentials to revolutionize the horticultural production by enhancing productivity and produce quality, extending the harvest season, conserving the natural resources, bringing marginally productive lands under cultivation and generating employment opportunities for women, youth and landless labourers. Giving specific examples, the speaker informed that protected cultivation has revolutionized horticultural production in environmentally harsh regions like Ladakh. Given these benefits, private entrepreneurs are increasingly investing in protected horticulture. He observed that given continual refinements in technology, protected cultivation is slowly paving the way for automation of Indian horticulture industry which has vast potential to attract the educated and innovative youth towards the world of horticulture. He informed the participants about emerging avenues in this field including climate-controlled hi-tech horticulture, bio-film (biodegradable) mulching, affordable hydroponics production technologies, aeroponics, aquaponics for fish cultivation, micro-greens, floating cultivation, vertical farming and kitchen cabinet. He called upon the policy makers to establish a National Institute on 'Protected Cultivation'. This webinar was attended by about 45 stakeholders including scientists and students. The webinar was coordinated by Dr. Anshuman Singh and Dr. Karma Beer.

Webinar on Entrepreneurship Development in Horticulture: A New Paradigm

A webinar on "Entrepreneurship Development in Horticulture: A New Paradigm" was organized by Agri-Business Incubation (ABI) Centre, ICAR-CISH on November 16, 2021. Dr. R. Nagaraja Reddy, Sr. Scientist and P.I., Medi-Hub TBI from ICAR-Directorate of Medicinal and Aromatic Plants Research (DMAPR), Anand, Gujarat explained about the importance, uses and role of medicinal and aromatic plants in entrepreneurship development. Another speaker, Mr. S. Santhosh, CEO, Entrepreneurship Development and Innovation Institute (EDII), Trichy highlighted the recent trends in agri-business and role of incubation helping in

agri-startups. A total of 52 startups, entrepreneurs, scientists, academicians, students, women entrepreneurs and technical staff participated across the country. The event was organized by Dr. Maneesh Mishra, Principal Scientist and P.I., ABI, ICAR-CISH.

DEMONSTRATIONS

Demonstration of Broccoli cultivation

Demonstration of Broccoli cultivation was carried out on September 13, 2021 under Farmers-FIRST Project at farmers' field at Nabipanah, Mohammadnagar Talukedari and Mithenagar of Malihabad block. ICAR-CISH-Fasal Shakti and ICAR-CISH Bio-Enhancer developed by the institute were given to the farmers for testing on broccoli cultivation. Farmers were also provided with information about the importance of micronutrients and soil micro-organisms in farming.

Paclobutrazol Application

One-day demonstration of Paclobutrazol application was done on September 27, 2021, at Bharawan village. About 30 farmers from the Malihabad area participated in the event. Dr. V.K. Singh, Emeritus Scientist, deliberated about proper use of paclobutrazol in mango orchards and traces of paclobutrazol residues in soil and plant systems, thereby advocating careful use which is cost-effective and environmental friendly. Dr. Gundappa interacted with farmers about the pest outbreak and how to manage it. Farmers were made aware of the importance of using insecticides and paclobutrozol judiciously in order to increase the income.

MoU SIGNED

MoU with Sai Enterprises, Lucknow

ICAR-CISH, Lucknow signed a 'Memorandum of Understanding' with Sai Enterprises, Lucknow on September 8, 2021. This MoU will facilitate the marketing holder for timely supply of CISH-Glue Trap. Dr. S. Rajan, Director, ICAR-CISH, Mr. Isha Raza, proprietor, Sai Enterprises along with Principal Scientists, Dr. H. S. Singh and Dr. Maneesh Mishra were present on the occasion.

Balaji Agro Foods, Lucknow

ICAR-CISH, Lucknow inked 'Memorandum of Understanding' with Balaji Agro Foods, Lucknow on October 26, 2021. Dr. A.K. Bhattacharjee, Dr. Maneesh Mishra, Dr. Ravi S.C., and Mr. Saurabh Shukla, Balaji Agro Foods Lucknow along with Dr. S. Rajan, Director,

ICAR-CISH were present. The firm has developed four mango based immunity booster products namely, Sanjivaniprash, MangiFLEX, Moringa Plus and Chocodip with technical support and research guidance of the Institute.

Dr. RML Avadh University

A memorandum of understanding (MoU) was signed between ICAR-CISH, Lucknow and Dr. Ram Manohar Lohia Avadh University, Ayodhya on November 20, 2021. This initiative of collaboration will facilitate the students of RML Avadh University for training and post graduate research at ICAR-CISH. This MoU will also help in enhancing skill and technical expertise of the young researchers.

VISIT OF FARMERS/TRAINERS/ INPUT DEALERS & STUDENTS

Farmers from various districts of the country visited institute's experimental fields and farm as part of their exposure visits to gain knowledge about various horticulture technologies. They were apprised about high density planting of mango and guava; rejuvenation of old mango orchards, intercropping, vertical farming of vegetables, management of irregular bearing in mango, integrated management of insect and diseases; espalier and container gardening of guava etc. Farmers were also informed about grafting, planting methods, improved varieties of mango and guava, crop diversification, etc. Dr. Naresh Babu, Principal Scientist and Shri. Arvind Kumar, ACTO coordinated these visits.

Farmers Educational Tour from Munger, Bihar

A group of 56 farmers including women from Sangrampur, Tarapur, Havelikhadakpur, Tetiabumber, Asarganj, Bariarpur, Jamalpur, Dharera and Sadar Munger blocks of Munger district of Bihar visited the experimental field of ICAR-CISH, Lucknow on July 28, 2021. The visit was sponsored by ATMA, Munger, Bihar in collaboration with Indira Gandhi Institute of Cooperative Management, Rajajipuram, Lucknow.

Farmers from Jamui, Bihar

A group of 40 farmers from different blocks of Jamui district of Bihar visited the experimental field of ICAR-CISH, Lucknow on August 10, 2021. The visit was sponsored by ATMA, Jamui, Bihar.

Farmers from Arwal, Bihar

Twenty farmers along with 2 officials from Kaler, Karti, Kurtha and Bansi blocks of Arwal district of Bihar visited the experimental field of ICAR-CISH, Lucknow on August 26, 2021. The visit was sponsored by ATMA, Arwal, Bihar in collaboration with Indira Gandhi Institute of Cooperative Management, Rajajipuram, Lucknow.

Visit of students to ICAR-CISH RRS & KVK, Malda under DAESI programme

Under 'Diploma in Agriculture Extension Services for Input dealer' (DAESI) of Agriculture Training Centre, Malda West Bengal, a group of 40 students visited the experimental fields, processing units, pulse and oil mill units, rain water harvesting system, fish ponds and other farming machinery of ICAR-CISH RRS & KVK Malda on September 14, 2021. Dr. Anatara Das, Scientist explained the students about honey processing, milling of pulses and oils, vermicompost production integrated farming with fish and poultry, etc. Dr. Shailesh Kumar (SMS-Fisheries Science) described the benefits of integrated farming system, poly net house and greenhouse for higher income.

Visit of Farmers from Shivpuri, M.P.

A group of 15 farmers along with 1 officer from Kolaras, Basarwas, Pohri, Narwar and Karera blocks of Shivpuri district of Madhya Pradesh visited the experimental fields on September 17, 2021. The program was sponsored by Department of Horticulture, Shivpuri, Madhya Pradesh.

Students Exposure Visit

One hundred students of B.Sc (Agriculture) final year along with four faculty members from Sam Higginbottom University of Agriculture, Technology and Sciences, Naini, Prayagraj, Uttar Pradesh visited ICAR-CISH in two batches on October 20 and 21, 2021. During the visit of fruit processing laboratory, microbiology laboratory and soil science laboratory, Dr. Neelima Garg, Principal Scientist, Dr. Govind Kumar, Scientist and Dr. V.K. Singh, Chief Technical Officer explained them about value addition of mango and guava, development of microbial bio-inoculants for horticultural crops and collection and analysis of soil samples, respectively.

Input dealers visit from Barabanki district, U.P.

A group of 88 dealers of pesticides/ insecticide/ seeds/ fertilizers along with two officials from Banki, Harak, Trivediganj, Hydergarh, Sidhaur, Ramsanehighat, Puredelhi, Dariabagh, Sirauligauspur, Mashauli, Deva, Nindura and Fatehpur blocks of Barabanki district of U.P. visited the Institute orchards on October 22, 2021. This visit was sponsored by District Agricultural Plant Protection Office, Barabanki under DAESI for Input Dealers program.

Visit of Farmers from Bhind, Madhya Pradesh

A group of 15 farmers along with 1 officer from Ater, Gohad, Mahgaon and Lahar blocks of Bhind district of Madhya Pradesh visited the experimental field of ICAR –CISH, Lucknow on November 11, 2021. This visit was sponsored by Department of Horticulture, Bhind, Madhya Pradesh.

Training cum Exposure list of Farmers from Satna, Madhya Pradesh

A group of 15 farmers including officials from Nagaud, Amarpatan, Uchehara, Ramnagar and Suhawal blocks of Satna, Madhya Pradesh visited the experimental fields of ICAR–CISH, Lucknow on November 18, 2021. This visit was sponsored by Department of Horticulture, Satna, Madhya Pradesh.

Intra-state visit of Farmers from Hardoi, Uttar Pradesh

A group of 60 farmers including two officials from Kachhauna, Kothawa, Sandila and Behdara blocks of Hardoi, Uttar Pradesh visited the experimental fields of ICAR-CISH, Lucknow on November 27, 2021. The visit was sponsored by Department of Horticulture, Hardoi, Uttar Pradesh.

Farmers' Study Tour from Sonbhadra district, Uttar Pradesh

A group of 50 farmers and two officials from Robertsganj, GhorawaL, Chatra, Nagwa blocks of Sonbhadra district of Uttar Pradesh visited the experimental fields of ICAR–CISH, Lucknow on December 17, 2021. Dr. (Mrs) Neelima Garg, Director, ICAR-CISH, Lucknow apprised the farmers about improved post harvest management technologies and preparing juices/ squashes and other value added products from fruits for fetching more income. This visit was sponsored by Department of Horticulture, Sonbhadra, Uttar Pradesh.

State Level Farmers Exposure Visit

A group of 55 farmers including women and two officials from Ashoyer, Bahua, Telyani, Bhitaura, Haswa, Malwan, Khajuha, Arain, Hathgaon, Bijaypur blocks of Fatahpur district of Uttar Pradesh visited the institute on December 18, 2021 to participate in Agro-Vision UP 2021. This visit was sponsored by ATMA Department of Horticulture, Fatehpar district, Uttar Pradesh. Dr. Tarun Adak, Sr. Scientist and Mr. Hemant Kumar Pandey, Technician coordinated the visit.

AGRI-BUSINESS INCUBATION

Online entrepreneurs' interaction meeting

ICAR-CISH, ABI Center Lucknow organized an online entrepreneurs' interaction meeting on August 23, 2021. Fifteen budding horti- entrepreneurs from Uttar Pradesh, Madhya Pradesh, West Bengal and Haryana attended the meeting through video conferencing. At the outset of meeting, Dr. Maneesh Mishra (PI, ABI), enumerated the achievements and activities of the centre.

During the meeting, participants presented and shared their startup proposals to the Institute. Dr. S. Rajan, Director, ICAR-CISH, Lucknow interacted with all participants and discussed their startup proposals.

PROGRAMS ORGANIZED UNDER *AMRUT BHARAT MAHOTSAV*

Various programs were organized by the institute under *Amrut Bharat Mahotsav* which was done under the leadership of Director, ICAR-CISH, who, underlined about improved horticultural technologies developed by ICAR-CISH to enhance the farmers' income, while conserving the natural resources. Dr. R.A. Ram, Dr. Anshuman Singh and Dr. Karma Beer were involved in organization of various activities.

Online Scientist-Farmer Interaction Meeting

ICAR-CISH, Lucknow organized an online Scientist-Farmer Interaction Meeting on July 16, 2021. Dr. R. A. Ram, Principal Scientist briefly informed about objectives of the '*Amrut Bharat Mahotsav*' program and the efforts being made by the Institute for making the farmer's self-reliant (atmanirbhar) in horticultural crop production. Dr. S. Rajan, Director presented an overview of the CISH technologies and initiatives for empowering the farmers and augmenting their incomes. He said that the institute is making all possible efforts for empowering the farmers and rural youth by promoting entrepreneurship and resource sharing, creating Farmer Producer Organizations and women's Self-help Groups, developing 'Seed Villages', and improving farmers' skills for improved supply chain management in mango and other crops. About 40 farmers from Nabipanah, Dhakwa, Bhadwana and Mohammadnagar Talukedari village of Lucknow district participated in this programme.

Training program

On occasion of ICAR foundation day on July 16, 2021, a Training program was conducted by ICAR-CISH, Lucknow and RRS & KVK, Malda. About 124 SC farm women of Habibpur block participated in the program. They were made aware about handcrafting, preparation of jute bags, mats and drawing furnishing items, etc., for their income generation. Further, a demonstration was conducted on eco-friendly jute retting technology with NINFET-SATHI (powder based material which helps in microbial growth and accelerates the retting processes with high quality jute fiber) for accelerated jute retting.

The participants were guided and trained by expert from ICAR-National Institute of Natural Fibre Engineering and Technology, Kolkata on jute retting and its further utilization.

Scientist-Farmer Dialogue on 'Food and Nutrition for Farmers'

ICAR-CISH, Lucknow organized a Scientist-Farmer Dialogue on the topic 'Food and Nutrition for Farmers' on August 26, 2021. A total 50 farmers from adopted village of SCSP along with 10 representatives of Self Help Groups/Non-Government Organizations (e.g., Swavalamban Mahila SHG, Vijeta Kalyan Foundation, Samhayi, etc.) were present in program. Dr. S.R. Singh apprised about the various aspects of establishment of Nutri-Garden for year round availability of chemical free fruits and vegetables. Dr. Maneesh Mishra gave information about the 'Farmers-FIRST project' and various aspects to perk up the income of farmers. Dr. S. Rajan, Director briefed the farmers about the bioactive compounds found in different types of fruits and vegetables and the health benefits from them. After the meeting, *Kagazi* lemon saplings were distributed to the farmers and other participants. Dr. Anshuman Singh, Scientist conducted the program.

Scientist-Farmer interaction at RRS Malda

ICAR- CISH RRS, Malda organized a Scientist-Farmer interaction meeting on the topic 'Food and Nutrition for Farmers' at SC and ST adopted villages of Habibpur block on August 26, 2021. During the program, Dr. Antara Das, Scientist and Dr. Shailesh Kumar, SMS interacted with farmers. Dr. Shailesh Kumar discussed with the farmers about balanced diet and their benefits. He also underlined about source and role of proteins, carbohydrate, micronutrients such as vitamins & minerals in human health.

Innovator-Farmer Meet for promoting Nutri-sensitive Agriculture and Horti-entrepreneurship

ICAR- CISH, Lucknow organized an Innovator-Farmer Meet on the theme 'Nutri-sensitive Agriculture' on September 3, 2021. A total of 100 participants including 30 Self-Help Groups and FPO members, horti-innovators and progressive horticulturists attended the program. Dr. Ashok Kumar, Principal Scientist informed about increasing the farmers' income through nutri-rich non-conventional vegetable crops. During the program, some participants also shared their success stories and experiences in mango-based integrated farming, production of quality planting material, organic vegetable production and value addition. At the end of program, Dr. S. Rajan exhorted the members of newly formed *'Mal Mango Farmer Producer Organization'* and the *'Durga Shakti'* SHG to apply innovative ideas for mango production, processing and marketing, including greater emphasis on Dashehari mango *amavat* (mango leather) that has huge market potential. Dr. Anshuman Singh, Scientist coordinated the program.

Mahila Kisan Diwas

ICAR- CISH, Lucknow celebrated *'Mahila Kisan Diwas'* on October 15, 2021. A training on 'Entrepreneurship development from Dashehari mango pulp processing' was organized at Mohammadnagar Talukedari village of Malihabad block, Lucknow by a self-help group *'Swavalamban'* established by ICAR-CISH, Lucknow to empower rural women. A total of 15 women farmers from *'Swavalamban'* and 15 members of Society for Conservation of Mango Diversity, Kasmandi kalan participated in the training program. Women farmers were trained about mango pulp processing, packaging, storing and marketing. During the training, the farmers were also instructed on how to prepare value added RTS from the stored mango pulp. This program was also organised by ICRA-CISH RRS Malda, W.B. at Uttar Kharibari of Habibpur block. Further emphasis was laid down among the members to cultivate pluses and oilseeds in rice fallow land. Importance of nutritious kitchen garden was discussed with distribution of vegetable seeds to them. A total 60 women farmers benefitted from this program.

Scientists-Students Interaction

ICAR-CISH, Lucknow organized a Scientists-Students interaction meeting on the theme 'Agriculture and Environment: The Citizen Face: interacting with school children (the future leaders and citizens)' at Vidyasthali Inter College, Kanar, Malihabad, Lucknow on November 1, 2021. During the interaction, several students raised queries related to insect-pest outbreaks, off-season vegetable cultivation, mango-based farming systems, natural resource conservation, etc. that were replied by the scientists. Mrs. Anshu Sharma, Principal, Vidyasthali said that such extra-curricular activities and interactions with experts were necessary to inculcate a sense of environmental responsibility among the school children. The programme was attended by about 200 students, school faculty and other staff. The program was coordinated by Dr. Anshuman Singh and Dr. Karma Beer.

Interaction with school children on "Waste to Wealth Management" on Agriculture Education Day

An interaction program with 100 students of Mahatma Gandhi Inter College, Malihabad, Lucknow on the occasion of Agriculture Education Day on 3rd December, 2021 was organized. The aim of the programme was to sensitize the school children about various agricultural technologies and opportunities involved in agriculture field. Dr. Neelima Garg, Director, ICAR-CISH, Lucknow addressed the school children about the importance of Agricultural Education Day. She also talked about the Waste to Wealth Management. She highlighted the improved horticultural technologies developed by ICAR-CISH to convert the waste into useful products that

can generate income for the farmers and stakeholders. Principal of the Mahatma Gandhi Inter College, Malihabad, Lucknow expressed his desire to conduct a visit of school children to the institute for giving exposure about various research activities carried out at the institute.

Agriculture and Environment: The Citizen Face

An interaction program with the students of Vidhyasthali Kanar Inter College, Malihabad on the theme 'Agriculture and Environment: The Citizen Face' was arranged at ICAR-CISH, Lucknow on November 26, 2021. The aim of the program was to sensitize the school children about various environmental issues in context of horticultural crop production. Students visited the experimental field and research laboratories of the Institute. The program was coordinated by Dr. Anshuman Singh and Dr. Karma Beer.

JAI KISAN JAI VIGYAN WEEK

Farmer-Scientist-Student Interaction meet

A Farmer-Scientist-Student Interaction meet was organized on December 23, 2021 (Rashtriya Kisan Diwas) to mark the beginning of week-long *Jai Kisan Jai Vigyan* celebrations. On this occasion, Dr. Neelima Garg, Director, said that scientific value addition is critically important for getting maximum economic returns from horticultural crops, and for converting fruit and vegetable processing wastes into wealth. She informed that ICAR-CISH has developed a range of high value fruit and vegetable products and efforts are underway to popularize and commercialize them by creating market linkages with farmers SHGs, farmer producer organizations and by promoting horti-preneurship. She encouraged the farmers to adopt such value addition technologies with emphasis on processing of mango pulp for augmenting their incomes. She also exhorted the student trainees to acquire state-of-the-art knowledge and skills from ICAR-CISH; as horticultural industry offers vast career and business opportunities in the fields of research, technology development, technical services, consulting and horti-based startups, among others. Earlier, Dr. R.A. Ram, Head, Crop Production Division presented an overview of various organic and biodynamic horticultural practices for producing pesticide free, nutri-rich and premium quality horticultural crops. Dr. Dushyant Mishra, Principal Scientist discussed in detail about short- and medium-term canopy management strategies to rejuvenate senile and unproductive mango orchards. This program was attended by about 30 farmers, 25 student trainees and Institute staff. Dr. Anshuman Singh and Dr. Karma Beer coordinated the program.

Expert lecture

An expert lecture by Dr. R.K. Pathak, Ex-Director, CISH, Lucknow was organized on December 24, 2021 on the occasion of week-long *Jai Kisan Jai Vigyan* celebrations. Dr. Pathak delivered atalk on 'Role of Agriculture Fraternity in Celebration of *Azadi ka Amrut Mahotsav*. At the outset, he remarked that a proactive participation of scientific fraternity in various outreach programs was the key to disseminating innovative farm technologies at the farmers' doorsteps. He encouraged the scientific fraternity to pay greater attention to understanding and resolving the varied problems faced by the horticultural producers to achieve the goals of *Atmanirbhar Krishi* and doubling the farmers' income in a time bound manner. Dr. Pathak observed that inferior produce quality, problem of pesticide residues, heavy environmental pollution and poor returns to the growers are some of the major challenges facing Indian horticulture industry. He opined that natural and organic farming of horticultural crops could sustainably address most of such concerns with added benefit of pesticide-free and superior quality produce for domestic consumption and export. The program was attended by about 30 scientists and other stakeholders. This program was coordinated by Dr. R. A. Ram, Head, Crop Production Division and Dr. Anshuman Singh, Scientist.

Farmer-Scientist Interaction meet under Jai Kisan Jai Vigyan week

A Farmer-Scientist Interaction meet on December 27, 2021 on occasion of week-long *Jai Kisan Jai Vigyan* celebrations. The programme was briefed by Dr.

Neelima Garg, Director, ICAR-CISH, Lucknow. During this interaction Dr Maneesh Mishra, Principal Scientist discussed about "Recent initiatives by ICAR- CISH for developing the horti-preneurs" and he highlighted agri-business incubation, Start-ups in horti-preneurship, existing practices of technology commercialization and processing of guava, ginger etc. During the interaction farmers wished to know about agri-business incubation (ABI) unit. Shri Sharad Verma briefed the farmers about entire process of form filling and registration for ABI. This program was attended by about 50 farmers and Institute staff. Dr. Karma Beer and Dr. P. Barman coordinated the program.

OTHERS

हिंदी कार्यशाला का आयोजन

केन्द्रीय उपोष्ण बागवानी संस्थान, रहमानखेडा, लखनऊ में दिनांक 21 अगस्त 2021 को हिंदी कार्यशाला का आयोजन किया गया। हिंदी कार्यशाला में मुख्य वक्ता डॉ. सुशील कुमार शुक्ल, प्रधान वैज्ञानिक ने व्याख्यान दिया। कार्यालय के दैनिक कार्यों में हिंदी के उपयोग पर प्रकाश डाला गया तथा वैज्ञानिक लेखों को हिंदी में प्रकाशित करने का सुझाव दिया, जिससे जनसामान्य को विज्ञान में हो रही सामयिक प्रगति से लाभान्वित होने का अवसर मिलेगा। इसके अतिरिक्त इन्होंने "गाजर घास एक राष्ट्रीय समस्या एवं समन्वित प्रबंधन" पर चर्चा की। कार्यशाला में संस्थान के वैज्ञानिकों, तकनीकी एवं प्रशासनिक वर्ग के अधिकारियों व कर्मचारियों ने भाग लिया। बैठक के अध्यक्षता संस्थान के प्रभारी निदेशक डॉ. घनश्याम पाण्डेय द्वारा की गयी तथा कार्यक्रम का संचालन नोडल अधिकारी (राजभाषा) श्री अनिल कुमार सिंह ने किया।

हिंदी सप्ताह का आयोजन

संस्थान में 14 से 20 सितंबर, 2021 तक हिंदी सप्ताह का आयोजन किया गया। हिंदी सप्ताह 14 सितंबर, 2021 को हिंदी दिवस समारोह के साथ शुरू हुआ। जिसमें गृह मंत्रालय राजभाषा विभाग द्वारा निर्धारित राजभाषा प्रतिज्ञा ली गयी। एक हिंदी कार्यशाला का आयोजन भी किया गया, जिसमें डॉ. निर्भय नारायण गुप्ता, पूर्व महाप्रबंधक, केन्द्रीय भण्डारण निगम उत्तर प्रदेश एवं उत्तरांचल ने हिंदी भाषा और साहित्य के इतिहास पर व्याख्यान दिया। उन्होंने एक आधिकारिक भाषा के रूप में हिंदी के महत्व के विषय में भी बात करी। इस अवसर पर, संस्थान के निदेशक डॉ. शैलेन्द्र राजन ने भारत के लोगों को एक साथ जोड़ने में हिंदी की भूमिका रेखांकित किया। हिंदी सप्ताह के दौरान, हिंदी निबन्ध, हिंदी काव्य पाठ, हिंदी वाद–विवाद, हिंदी में कार्य प्रोत्साहन पुरुस्कार, हिंदी टंकण प्रतियोगिता का आयोजन किया गया। वैज्ञानिक, प्रशासनिक, तकनीकी और गैर हिंदी भाषियों के लिए विभिन्न श्रेणियों में प्रतियोगिताओं का आयोजन किया गया। इसके अलावा, 20 सितंबर, 2021 को एक राष्ट्रीय स्तर के हिंदी कवि सम्मेलन का आयोजन किया गया, जिसमें पांच प्रतिष्ठित कवियों ने अधिकारियों और कर्मचारियों के लिए इतिहास से संबंधित, राष्ट्रवादी कविताओं का पाठ किया।

Meditation Camp organized at ICAR-CISH

A three day meditation camp was organized at ICAR-CISH, Lucknow from November 15- 17, 2021. More than 50 scientists, officers and staff participated. The meditation related lecture was delivered by Shri R.S.L. Srivastava, Trainer, Heartfullness Mediation Centre, IIM Road, Lucknow. During the three day camp, participants were exposed to techniques of cleansing mental garbage besides practicing meditation. It was highlighted that role of mediation is not limited to control of anger but also helps in increasing the efficiency of the employees. After meditation session, the staff members shared their experiences about it.

Felicitation of gardeners on the occasion of National Farmers Day

ICAR-CISH, Lucknow organized National Farmers Day program on December 23, 2021. Former Deputy Director General (Hort.) of the Indian Council of Agricultural

Research, Dr. H.P. Singh was the chief guest and Dr. A.K. Johri was Special Guest of the program. Shri Upendra Kumar Singh (Secretary, *Avadh Aam Utpadak Bagwani Samiti,* Lucknow), Shri Rai Ajaypati Rai (Progressive Farmer) and other guests were also present. More than 150 students, entrepreneurs and farmers participated in the program. On this occasion Dr. H.P. Singh emphasized on increasing the income of the farmers through science and technology based farming. Progressive farmer Mr. Rai Ajayapati Rai informed that farmers can double their income by adopting off-seasonal crops. Dr. Neelima Garg, Director said that the need of the hour is to increase the income of the farmers by processing the horticulture crops. During the program, Dr. H.P. Singh honored 10 farmers of Scheduled Castes Sub-Plan and 10 farmers of Farmer-FIRST Project with Utkrisht Krishak Samman. The farmers expressed their gratitude towards the institute by receiving the award.

Distinguished Visitors

Dr. H.P. Singh, Former Deputy Director Genral, ICAR, Krishi Bhawan, New Delhi visited intitute on December 23, 2021.

PERSONALIA

Promotion

Scientist Staff

1. Dr. Bharati Killadi, Sr. Scientist granted promotion to the next higher grade of Pr. Scientist w.e.f. 12.07.2021.

Administrative Staff

1. Sh. Sajeevan Lal Gautam, Assistant granted promotion to the next higher grade of Assistant Administrative Officer w.e.f. 01.07.2021

Transfer

Scientific Staff

1. Dr. P.L. Saroj, Pr. Scientist got transferred from ICAR-CIAH, Bikaner and joined our Institute on 20.12.2021(FN).
2. Dr. A.K. Bhattacharjee, Pr. Scientist got relieved on 20.11.2021 (afternoon) and joined ICAR-KAB-II, Pusa, New Delhi.

Technical Staff

1. Sh. Afroz Sultan, Technical Officer (Programme Assistant-LT) got transferred from KVK Buxar under ICAR-Research Complex for Eastern Region, Patna (Bihar) and joined ICAR-CISH on 01.10.2021(FN).

Administrative Staff

1. Sh. Sujeet Kumar Verma, got transferred from ICAR-DWR, Maharajpur, Jabalpur, MP and joined here as SAO on 16.10.2021(FN).
2. Sh. D.K. Agnihottri, Sr. Fin.& Ac. Officer got transferred from ICAR-IIPR, Kanpur, UP and joined here on 16.10.2021(FN).

Retirements

Scientific Staff

1. Dr. Ghanshyam Pandey, Pr. Scientist (Horticulture) and Head (I/c) Crop Production Division, superannuated on 30.09.2021.
2. Dr. S. Rajan, Director superannuated on 30.11.2021.

Supporting Staff

1. Sh. Bhola Nath S.S.S., retired on 31.07.2021
2. Sh. Ram Shwaroop, S.S.S., retired on 30.11.2021
3. Sh. Budha, Sh. Mathura and Sh. Bhai Lal (S.S.S.) retired on 30.12.2021.

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