

# सी.आई.एस.एच. समाचार CISH NEWS

01 जनवरी / January - 30 जून / June, 2022

संख्या/Number : 01

## निदेशक की कलम से FROM THE DIRECTOR'S DESK

मुझे जनवरी से जून 2022 की अवधि के लिये सी.आई.एस.एच. समाचार प्रकाशित करते हुए हर्ष है और इसमें आम के पुष्पन, फलन तथा बेल की तुड़ाई का मौसम शामिल है। संस्थान ने अपनी अनुसंधान गतिविधियों को समय-समय पर परिभाषित राष्ट्रीय नीतियों, भा.कृ.अनु.परि. के निर्देशों और माननीय प्रधान मंत्री द्वारा किए गए संदेशों के माध्यम से संरेखित किया है। संस्थान ने पिछले कुछ दशकों के दौरान जैविक खेती के क्षेत्र में उल्लेखनीय प्रसिद्धि अर्जित की है और अब 'प्राकृतिक खेती' की तरफ प्रगतिशील है। संस्थान ने आरबी रोड परिसर को प्राकृतिक खेती और एकीकृत कृषि प्रणाली पर अनुसंधान के लिए जैविक खेत के रूप में सीमांकित किया है। संस्थान के 39वें स्थापना दिवस के अवसर पर बहुप्रतीक्षित 'सीआईएसएच संग्रहालय' और 'आम संग्रहालय' का उदघाटन हुआ और देश को समर्पित किया गया। संस्थान ने 'मैंगो मेला' का भी आयोजन किया, जिसकी सर्वत्र सराहना हुई।



संस्थान ने एक डीकंपोजर (कम्पोस्ट बूस्टर) तकनीक का सफलतापूर्वक विकास और व्यावसायीकरण किया जिसमें उच्च अपक्षयी एंजाइम गतिविधियों के साथ रोगाणुओं (बैक्टीरिया और कवक) का संघ शामिल है। आम में पुष्प संक्रमण में प्रोटिओमिक अंतर्दृष्टि द्वारा फूलों के विकासात्मक शरीर क्रिया विज्ञान से जुड़े जैविक मार्गों और नियामक तंत्रों का एक वृहद अध्ययन किया गया। एक क्विंटल दशहरी आम की खेती में खर्च का आर्थिक अनुमान लगाया गया, और इससे संबद्ध महत्वपूर्ण बाधाओं की पहचान करी गई जिनका उपयोग सरकारी एजेंसियों द्वारा नीतिगत निर्णयों के लिए किया जा सकता है। संस्थान द्वारा विकसित फ्रूट वाइन और साइडर के व्यावसायीकरण की अपार संभावनाओं हैं और इस दिशा में प्रारम्भिक प्रगति हुई है।

एससीएसपी, फार्मर फर्स्ट और अन्य किसान केंद्रित कार्यक्रमों ने हमें कृषक समुदाय से जुड़ने और प्रासंगिक रहने में मदद करी है। संस्थान ने किसान मेला, गोष्ठी और प्रदर्शनियों में भाग लेने के अलावा दो समझौता ज्ञापनों पर भी हस्ताक्षर किए, एवं अंतर्राष्ट्रीय महिला दिवस और स्थापना दिवस मनाया। आजादी का अमृत महोत्सव के तहत, किसानों और काश्तकारों के बीच जागरूकता पैदा करने के लिए इस अवधि के दौरान कई वेबिनार और बैठकें आयोजित हुईं। मुझे सी.आई.एस.एच. न्यूज के नवीनतम अंक को प्रस्तुत करते हुए अपार प्रसन्नता है, जो इस अवधि के दौरान संस्थान की गतिविधियों का दर्पण है।

*नीलिमा गर्ग*  
(नीलिमा गर्ग)

I am happy to bring out CISH NEWS for the period of January to June 2022, and it encompassed flowering and fruiting seasons for mango and jamun as well as harvesting season for bael. The institute aligned its research as per national policies defined from time to time through ICAR directives and also through messages made by the honorable PM. The institute has made remarkable progress fame in organic farming during last few decades and now is geared for "Natural farming". The institute demarcated RB Campus as Organic farm for research on natural farming and integrated farming systems. The much awaited CISH Museum that houses "Aam Sangrahalay" was dedicated to the country on the auspicious occasion of Foundation day on 1st June 2022. Institute also organized "Mango Mela that was much approved by the stake holder and pupnic".

Institute successfully developed and commercialized a Decomposer (compost booster) technology which contains consortium of microbes (bacteria and fungi) with high degradative enzyme activities. Proteomic insights into floral transition in mango provide an overview of the biological pathways and regulatory mechanisms associated with developmental physiology of flowering. The economics of one quintal Dashehari mango cultivation in Lucknow, UP was worked out and important constraints were identified that may be used for policy decisions by the government agencies. Fruit wines and ciders developed by the institute have immense market potentials and are also now under various stages of commercialization.

Programs of SCSP, Farmers First and other farmer centric programs helped us to stay connected and provide advisories and relevant information to the farming community. The Institute signed two MoUs, celebrated International Women's Day and Foundation Day apart from its participation in Kisan mela, Goshtis and exhibitions. Under Azaadi ka Amrut Mahotsav, a number of webinars and meetings were organized during this period for the awareness generation among different stakeholders. I am extremely happy to present the current issue of CISH NEWS as a mirror of Institute activities during the period.

*Neelima Garg*  
(Neelima Garg)

## NEW INITIATIVES

### Natural Farming at RB Road Campus

In response to the call by Hon'ble Prime Minister of India, ICAR-CISH Lucknow intensified its experimentation on natural farming. The Institute on the auspicious day of Basant Panchmi adopted four cows provided by Cow Shelter located at Kaneri village near Nagram in Lucknow district and sheltered at Rae Bareli (RB) Road Campus. Puja rituals were performed by Dr. Neelima Garg, Director of the Institute who highlighted the achievements of the Institute in the field of organic farming and preparation of organic inputs during the last 20 years. The institute has already developed CISH-Bioenhancer, Biozapper and the complete packages for organic production for various crops like mango, guava, vegetables, etc. The RB Road campus of the institute was declared as an organic farm for research on natural farming and integrated farming system.

The support from Shri. Radheshyam Dixit, Convener, UP Gau Seva Aayog and Dr. D.K. Sharma, Chief Veterinary Officer, Lucknow and active efforts of Dr. S. K. Shukla, Principal Scientist, ICAR-CISH proved fruitful in rehabilitation of stray cows towards the goal of natural and chemical free farming. If such efforts are made in future through other ICAR, SAUs and KVKs, it will bring a sea change in agriculture. The programme was attended by the scientists and other officers of the institute.



### CISH Establishes Museum in the 75<sup>th</sup> Year of Independence

To commemorate the 75 years of Independence; an initiative was taken by the Institute to develop and dedicate a Museum which displays the achievements, besides showcasing the technologies developed and for attracting audience to get a glimpse and witness the extensive collections of mango and guava as national active germplasm sites and one of the world largest germplasm repository. Under the dynamic leadership of the Director, Dr. Neelima Garg, the museum committee comprising of Dr.P.L. Saroj (Chairman), Dr. D. Pandey, Dr. H.S. Singh, Dr. Anil Verma, Dr. Gundappa as members, and Dr. S.C. Ravi (Member Secretary) worked strenuously, designed, arranged and presented the museum hall. The salient achievements of each division of the Institute has been displayed as posters and organized in sequential orders under six sections. The Museum houses an array of fruit models representing popular global mango varieties, information on the institute developed varieties/hybrids in various mandate fruit crops like mango, guava, bael and jamun, specimens of processed and value added products of different mandated fruits and success stories of institute developed technologies being displayed as posters. Some of the success stories includes organic production of fruits and vegetables, rejuvenation of old mango orchards, high





density plantations and plant architecture in guava, vegetative propagation techniques in mango and guava, popularization of banana cultivation in north India, protected cultivation of vegetables, insect traps etc. Information on some of the technologies commercialized through Agri-business Incubation Centre of the Institute and Outreach programs of Farmer's first, SCSP, MGMG are also highlighted presentations in the Museum. The genesis and history of the Institute is displayed in the Museum which covers the information of its start as Central Mango Research Station on September 4, 1972 under the aegis of ICAR-Indian Institute of Horticultural Research, Bengaluru, subsequently upgraded to a full-fledged Institute as Central Institute of Horticulture for Northern Plains (CIHNP) on June 1, 1984, and later renamed to the present name as Central Institute for Subtropical Horticulture on June 14, 1995. A model of the Institute building plan and future infrastructure development prospects are also displayed in the Museum.



This museum was opened to public during the occasion of 39th foundation day on June 1, 2022 in the gracious presence of Sh. Dinesh Pratap Singh, Hon'ble Minister of State (Independent Charge) Horticulture, Agricultural Marketing, Agricultural Foreign Trade and Agricultural Exports, Govt. of Uttar Pradesh and Smt. Jai Devi, BJP Member of Legislative Assembly, Malihabad, Lucknow. As a Chief Guest, the Hon'ble Minister addressed the farmers, Institute staff and invited guests and assured his fullest support to the Institute for its outreach in technology transfer and appreciated the Scientists for their achievements in subtropical horticulture. Dr. Neelima Garg, Director presided over the function and envisaged that Museum is the hallmark of Pride and Prestige to the Institute and expressed her gratitude to CISH family for the excellent work and coordinated team efforts.

## RESEARCH HIGHLIGHTS

### Proteomic insights into floral transition in mango

Comparative proteomic insights into mango floral transition using 2-DE of vegetative and floral leaf

tissue (cv. Dashehari) was performed to resolve and differentiate protein species that display variable abundance. Proteins were phenol-extracted from the leaf and separated on 2D gels at pH 4-7. Total 301 spots were detected, out of which 16 were identified as differentially expressed based on p value ( $p \leq 0.05$ ) and a 2-fold change. Using Citrus Genome Database, these 16 spots were identified based on PI and MW values and proteins classified into eight primary pathways associated to flowering. The percentage of proteins associated with floral transition were transcriptional regulation (28%), flowering time (8%), hormonal signalling (12%), phenylpropanoid pathway (12%), signal transduction (28%), cell structure (4%), transport (4%) and protein synthesis (8%), while protein moieties involved in transcriptional regulation and signal transduction were found to be enhanced in floral tissue. Five genes were shortlisted for gene expression analysis which indicated that SAM protein involved in the biosynthesis of polyamines, spermidine and spermine has association with flowering, fruit development, and stress responses. Furthermore, ARF (Auxin Response Factor), serine/threonine kinase gene members were also found to play critical role in determining floral development process in mango consistent with those obtained through 2 DE. Protein species that are involved in phenylpropanoid pathway were also identified, showing the process of mango flowering from a new perspective beyond the conventional view. This study on mango proteomics provides an overview of the biological pathways and regulatory mechanisms associated with developmental physiology of flowering. It may act as an important resource for exploring the complex molecular and proteomics mechanisms in flower biology.

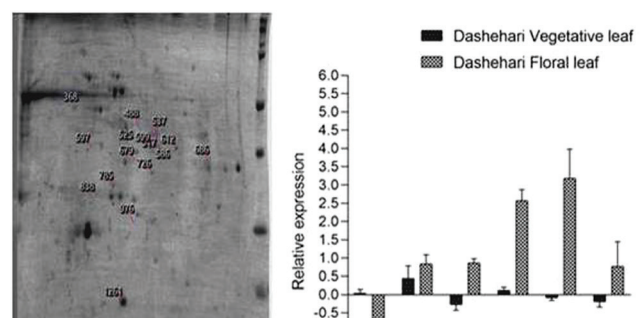


Fig. (A) Two-dimensional electrophoretic pattern of soluble leaf proteins in mango cv. Dashehari. Protein spots identified based on the significant difference ( $p < 0.05$ ) and  $\geq 2$ -fold protein change in abundance (up or down) are indicated with a spot number. (B) RT-PCR analysis of genes encoding Differentially Expressed Proteins.

### Decomposer (compost booster) technology developed commercialized by ICAR-CISH

ICAR-CISH, Lucknow has developed a microbial consortium, comprising of certain microorganisms that has potential in accelerating the composting rate.

The product proved to be useful in fast degradation of complex organic substrates. Moreover, organic agriculture is being promoted for decreasing inorganic footprints; the product will prove useful in improving soil health by making nutrients available to plants.

Food processing waste is produced in large quantities around the world and contains high levels of lignocelluloses. Although some value-added products are extracted from processing waste, the vast majority of waste is currently unutilized and discarded in the open environment. These wastes undergo violent chemical reactions, releasing toxic gases into the environment. This leads to hazards such as environmental degradation, soil pollution, and water pollution. The pace of composting depends upon types of soil, soil conditions and types of microflora present in the soil. However, composting can be enhanced by adding useful microbes to the soil in the form of compost booster. To tackle the issue of managing the processing waste, a consortium was developed by the institute, to convert the waste into compost within one month. It contains consortium of microbes (bacteria and fungi) with high degradative enzyme activities which aids the decomposition rate and the compost obtained through this method is rich in NPK content compared to traditional way of compost preparation. There is a lot of demand for such products in the market, as processing waste management is a big issue for the industry. Now this novel technology is under process of commercialization to M/s. Ranaji Biotech (India) Pvt. Ltd, Kanpur. The institute is also receiving the requests for obtaining the license of this technology from firms situated in various parts of the country.

### Economics and constraints in Dashehari Mango Cultivation in Lucknow, UP

The economics of Dashehari Mango cultivation was worked out in Lucknow District of Uttar Pradesh and the total cost of cultivation was estimated at Rs. 1,64,563.00 ha<sup>-1</sup>. The total cost comprised of variable cost as well as fixed cost component. Initial establishment cost of the orchard was obtained from newly established orchards and the same was amortized for the entire economic life of mango orchard and included in the fixed cost component. Besides, depreciation, rental value and interest on fixed capital were also considered in the calculation. Variable cost included all the working expenses incurred by the farmers and was calculated as Rs. 79,927.00 ha<sup>-1</sup>. Farmers realized the average yield of 102 Q ha<sup>-1</sup>. The cost of producing one quintal mango was estimated at Rs. 1,613.00.

Particulars	Amount (Rs. ha <sup>-1</sup> )
<b>Variable cost</b>	
A. Human Labour	11,940.00
B. Tillage	4,729.00
C. FYM and fertilizer	2,951.00
D. Plant Protection Chemicals	36,830.00
E. Irrigation	9,150.00
F. Packaging and Transportation	9,098.00
G. Interest on working capital (@ 7 % of A-F)	5,229.00
<b>Total variable cost (sum of A-G)</b>	<b>79,927.00</b>
<b>Fixed cost</b>	
A. Amortized establishment	18,476.00
B. Depreciation	1,200.00
C. Rental Value of land	50,000.00
D. Interest on fixed capital (@10 % of A-C)	6,968.00
<b>Total Fixed cost (sum of A-D)</b>	<b>76,644.00</b>
<b>Managerial cost (10% of total variable cost)</b>	<b>7,993.00</b>
<b>Total Cost of Cultivation</b>	<b>1,64,563.00</b>
<b>Yield (Q)</b>	<b>102.00</b>
<b>Gross returns</b>	<b>1,66,879.00</b>
Net returns over variable cost	86,952.00
Net returns over total cost	2,316.00
<b>Cost of Production (Rs. Q<sup>-1</sup>)</b>	<b>1,613.00</b>

### Constraints in mango production

Changing insect pest dynamics due to climate change, lack of awareness among farmers about quality insecticides/pesticides, lack of safe method of harvesting and packaging, market glut during peak production season, negligible processing facilities and absence of crop insurance in mango were the major constraints faced by the producers.

### Policy interventions

- ❖ State Government must ensure availability of quality insecticides and pesticides.
- ❖ Inclusion of mango in PMFBY.
- ❖ Extension efforts for promoting safe harvesting through harvesters.
- ❖ Transportation and packaging subsidies / dedicated train facilities for distant marketing of mangoes directly from the farmers/ FPO.
- ❖ Mango processing facilities to be promoted through cluster and ODOP.

### Fruit Wines and Ciders Developed by ICAR-CISH

With the growing health awareness among masses in the modern world, consumption of fruits and their products is increasing as they are rich in vitamins, flavanoids, fibre and minerals. As a result, world over processed food market is flooded with various kinds of fruit products like purees, jams, jellies, juices, nectars,



RTS beverages, candies, preserves, etc. Fermentation using *Saccharomyces cerevisiae* yeast is a traditional way of fruit preservation. However, fermented fruit beverages other than grape wine and apple cider are not yet available commercially in the market. Keeping this in view, ICAR-CISH, Lucknow has developed a number of fermented fruit beverages that are endowed with characteristic fruity aroma and taste. Unlike liquors, which contain high amount of alcohol with no nutritional benefit, these beverages are better suited to health due to presence of good amounts of vitamins and anti-oxidants.

### Fruit Ciders

Ciders are low alcoholic beverages that contain roughly 4-5 per cent ethanol. Such drinks may be referred as 'ladies wine' due to their mild sweetness and very low pungency. As ciders have been produced from fruit pulp or juices, these contains pleasant fruity flavour and sweet-astringent taste that is acceptable to all. The Institute has developed ciders from mango, guava and aonla.

### Raw Mango Cider

Raw mango is rich source of acid, vitamins and minerals. The raw fruits are generally utilized in the preparation of traditional products like pickle, chutney, dried slices, powder, green mango beverage, etc. A partially fermented low alcohol beverage has been developed by the institute from raw mango fruits which is a highly refreshing drink with good nutritional supplements. It is mildly sweetened with a good balance of taste and astringency. It contains around 4.0 per cent alcohol, 17.7° B TSS, 0.55 per cent acidity and 7.33 mg100 g<sup>-1</sup> Vitamin-C. Raw mango cider is a novel product having good marketing prospects.

### Guava Cider

Guava (*Psidium guajava*) is one of the richest sources of vitamin-C and pectin apart from carbohydrates and minerals. A limited range of products from guava, including jelly, cheese, juice, etc., are available. The institute has developed guava cider as a novel product through fermentation. It is a mildly fermented beverage with pleasant taste and aroma. It is highly nutritious and refreshing, easily digestible, and invigorative. Guava cider contains 13° B TSS, 4 per cent alcohol, 0.45 per cent acidity and 33 mg 100 g<sup>-1</sup> Vitamin-C. The product has good marketing potential.

### Aonla Cider

Aonla (*Emblica officinalis* Gaertn) is a fruit with high nutritional and medicinal properties and a rich source

of vitamin-C and polyphenols, which are highly potent anti-oxidants, defining the fruit's therapeutic character. Despite such good qualities, the fruit is not preferred for fresh consumption due to its astringent taste. The fruit is mainly utilized in the preparation of traditional products like preserve, candy, juice, supari, powder, churan, etc. The institute has developed partially fermented aonla cider for consumption by all age groups. Aonla cider is a highly refreshing low alcoholic drink having 10° B TSS, 4 per cent alcohol, 66 mg100 g<sup>-1</sup> Vitamin-C and 0.4 per cent polyphenols. It is sweet, astringent and good for health. Keeping in view the increasing production of aonla in the country, cider can be promoted both in national and international markets.



### Fruit Wines

Wine is a product obtained by alcoholic fermentation of grape juice or pulp or even juices of other fruits. Wines are moderate to high alcoholic drinks that have high pungency with no sweetness. The fruit wines produced by the Institute have moderate ethanol content of around 10 per cent. The fruit wines score over liquor as they contain fruity flavour and nutritional components of particular fruit. The Institute has developed wines from mango, bael, mulberry and mahua.

### Mango Wine

Mango ripe fruit is rich in carbohydrates and fibre besides containing appreciable amounts of Vitamin-A ( $\beta$ -carotene), Vitamin-C and minerals. Owing to the presence of a highly potent anti-oxidant substance 'Lupeol' in the pulp, the fruit acquires high therapeutic significance. ICAR-CISH has developed an excellent quality of mango wine possessing natural aroma of mango coupled with unique blend of taste and astringency. The wine, prepared through fermentation of ameliorated pulp employing *Saccharomyces cerevisiae*, comprised 8.8° B TSS, 0.58 per cent acidity; 0.97 mg 100 ml<sup>-1</sup> ascorbic acid; 0.05 per

cent tannins; 1.04 per cent reducing sugar; 1.82 per cent total sugar and 10.4 per cent alcohol. Owing to good sensory qualities, the wine has fair potential for commercialization.

### Mulberry wine

Mulberry is a primary source of food for silkworms. In general, there are three types of Mulberry, white, red and purple. The fruits have medicinal properties and delicious taste when consumed fresh; however, processing of Mulberry for juice is not a commercial practice. Fruits are normally discarded due to their short storage life and lack of economy of scale. Mulberry fruits have been reported to exhibit a variety of biological activities, such as anti-thrombotic, antioxidant, antimicrobial, anti-inflammatory and neuron-protective. Wine prepared from red mulberry variety MI-497 had attractive deep red colour, 7.6°B TSS; 0.34 per cent acidity; 0.16 per cent tannins; 0.23 per cent reducing sugar; 0.41 per cent total sugar; 2.89 mM antioxidants; 10.17 mg per cent anthocyanin and 11 per cent alcohol. HPLC detected the presence of phenolics compounds viz. gallic acid, p – coumaric acid, catechins, kaempferol and epi-catechin.



### Bael Wine

Bael (*Aegle marmelos*) is an important indigenous fruit of India with high nutritional and therapeutic values. The pulp has soothing effect on stomach owing to presence of large amount of mucilaginous compound. The fruit is rich in carbohydrates and fibre apart from containing appreciable amounts of vitamins, minerals and polyphenols. Its mineral and vitamin contents include calcium, phosphorus, iron, carotene, thiamin, riboflavin, niacin and ascorbic acid. Despite such high nutritional profile, little attention has been paid on development of products from bael, except for beverage and preserve (murabba). CISH has developed an excellent quality bael wine, possessing natural bael aroma coupled with unique blend of taste and astringency. The wine, prepared

through fermentation of ameliorated pulp, comprises 14.8° B TSS; 0.87 per cent acidity; 2.35 mg 100 ml<sup>-1</sup> ascorbic acid; 0.36 per cent tannins; 5.82 per cent reducing sugar; 6.51 per cent total sugar and 8.6 per cent alcohol. Owing to good sensory qualities, the wine has fair potential for commercialization.

### Mahua flower wine and vermouth

Mahua (*Bassia latifolia*), termed as Kalpavriksha, is the highly valued tree among tribal communities. Besides other uses, mahua flowers are used for preparation of potable liquor using indigenous tribal technology. However, the drink thus prepared is of low quality and is sometimes health hazardous. Moreover, one disadvantage with liquor is that it contains mostly alcohol and all other naturally present nutrients of the substrate are destroyed during the process of distillation. A process has been standardized at ICAR-CISH, Lucknow, for developing good quality mahua wine by fermenting fresh flower juice. The burnt rice flavour of mahua was suppressed by using lemon peel. This improved wine is comparable to any commercial standard wine. It contains 10 per cent alcohol, 5.2° B TSS, 0.63 per cent acidity, 4.24 mg 100 ml<sup>-1</sup> ascorbic acid and 0.19 per cent tannins. Mahua vermouth is the spiced wine supplemented with Indian herbs like black pepper, cinnamon, clove, cumin, fenugreek, large cardamom, nutmeg, fennel and Indian Cassia.

## PROGRAMMES ORGANIZED

### 46<sup>th</sup> Institute Research Committee Meeting

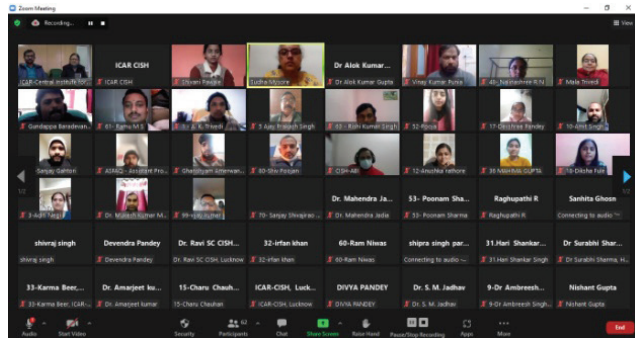
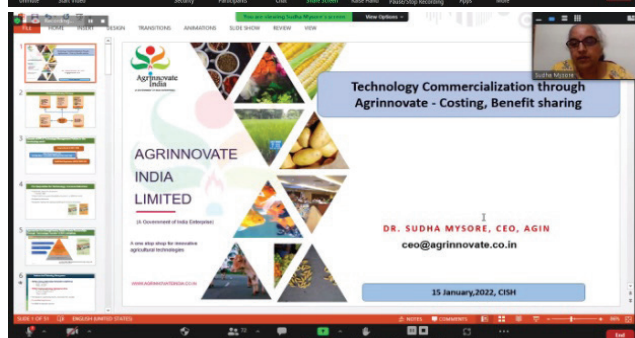
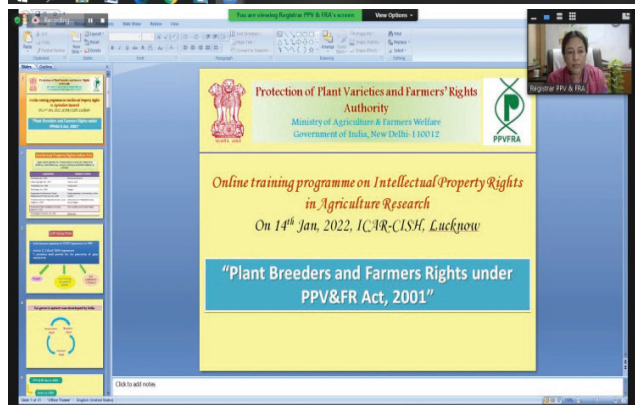
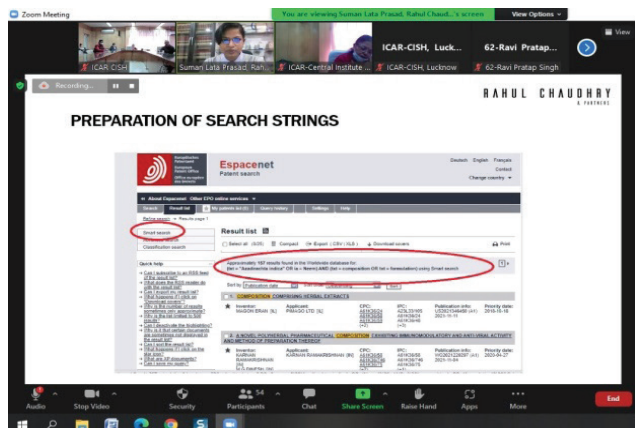
Forty-sixth meeting of Institute Research Committee was held on February 1, 2022. Dr. Neelima Garg, Director and Chairperson of Institute Research Committee discussed the initiatives to be taken up for the promotion of Natural Farming as per the directives of Hon'ble PM. Dr. S.K. Shukla, Principal Scientist & PI presented the details of research activities of the project entitled "Development of natural farming system models for subtropical horticultural crops"

### Online training programme on "Intellectual Property Rights in Agriculture Research"

ICAR-CISH, Lucknow organized an online training programme on "Intellectual Property Rights in Agriculture Research" during January 10-15, 2022. About 90 participants attended the training programme from various research institutes and Universities across the country. During the training, the extensive knowledge were given about the importance of IPR, types of IPR & law governing them, hands on patent search, patent filing, Breeders and Farmers right under PPV&FR Act-2001, geographical indications,



agribusiness incubation system, technology valuation, commercialization etc. to the participants.



**One day training-cum-workshop on “Entrepreneurship Development in Oyster Mushroom Production”**

ICAR-CISH, Lucknow organized one day training-cum-workshop on February 16, 2022 on ‘Entrepreneurship Development in Oyster Mushroom Production’ under Farmer’s FIRST project. More

than 15 farmers from adopted villages; Navipanah, Mohammad Nagar Talukdari and Meethenagar of Malihabad blocks participated in the programme. The main objective of this workshop was to build livelihood for rural youth through mushroom production. Principal Scientist, Dr. P.K. Shukla gave lectures on various aspects of ready-to-fruit mushroom bag production technology and marketing. With introduction of oyster mushroom, he underlined about the material required for its production and the various stages of compost preparation. Dr. Maneesh Mishra coordinated the program.



**Training on propagation methods of sub tropical fruits and preparation of commercial products of guava**

ICAR-CISH, Lucknow organized seven days training programme on “Propagation methods of subtropical fruits and preparation of commercial products of guava during March 22-28, 2022 sponsored by ATMA Sawai Madhopur, Rajasthan. Eleven farmers from Sawai Madhopur district of Rajasthan were present. At the outset, Dr. Neelima Garg, Director underlined the importance of propagation methods of subtropical fruits like mango, guava, bael, jamun etc. and scope and establishment of modern nursery, concept of high density plantation and suitable varieties of fruit crops etc aspects that will help in perk up the income of farming communities. She also stressed about the various processed and value added products of



fruits to reduce the losses. The subjects covered in training were: establishment of orchards, production technology, important varieties of guava and mango and its cultivation methods, organic fruit production, high density planting and canopy management, important insect pest and diseases of guava and their integrated management, processing and value addition of fruit crops, identification of maturity standards of mango and guava etc.. Dr. Naresh Babu, Principal Scientist, Dr. Vishambhar Dayal, Scientist and Sri Arvind Kumar, ACTO coordinated the programme.



### 'AZADI KA AMRIT MAHOTSAV' PROGRAMMES

#### Training-cum-interface meeting

ICAR-CISH, Lucknow organized a training-cum-interface meeting programme on "Safe Mango Harvesting and post harvest Management" on June 18, 2022. This program was organized to create awareness among SCSP farmers about mango harvesting and its post harvest management. Being the mango harvesting season, this programme also aimed to train the mango growers for safe mango harvesting, ripening and management of jelly seed. Dr Bharti Killadi, Principal Scientist told the SCSP farmers about jelly seed and its effective management. Dr. Karma Beer, Scientist highlighted about mango harvesting, safe ripening, packaging and export of mango to various European and Gulf countries. He also demonstrated the CISH

Mango Ripener sachet and operation of Mango Harvester for safe harvesting of mangoes. During the programme Dr. Sharad Kumar Dwivedi, Scientist and Dr. Vishambhar Dayal, Scientist attended to the queries of the farmers related to mango cultivation. The total 65 SCSP farmers participated including women shelf help group, progressive farmers and youth. The programme was coordinated by Dr. Karma Beer, Scientist.



#### Interaction dialogue for promoting mango exports

ICAR-CISH, Lucknow organized a farmer-scientist interaction program on May 21, 2022 involving progressive mango growers, scientists and APEDA officials for identifying and addressing the gaps stalling mango exports from Uttar Pradesh with focus on Dashehari mango. This program was organized on the theme 'Atmanirbhar Bharat: One District One Product- Local to Global'. On this occasion, Dr. (Mrs.) Neelima Garg, Director, ICAR-CISH said that Dashehari mango produced in Lucknow and neighboring districts has a vast potential for export. She exhorted the farmers to adopt the best management practices to ensure that their Dashehari fruits meet the global export standards. Dr. C. B. Singh, Regional Head, APEDA discussed the role of various pre- and post-harvest practices in enhancing the cosmetic appeal of mango fruits that plays a crucial role in consumer acceptability of the Indian mangoes abroad.



He opined that proper harvesting, pre-cooling, grading and packaging were critical to ensure competitiveness in mango exports. He urged the farmers to apply only recommended pesticides while maintaining pre-harvest interval and maximum residue limit standards. Citing the success story of Zardalu mango exports from Bihar, he expressed his views to take leads for Dashehari export using their model. He also encouraged Dashehari mango growers to collaborate with other stakeholders in the mango supply chain involving State Horticulture Department, APEDA, testing and certification agencies, pack-houses and exporters etc. to harness the export potential. Er. A. K. Verma, Senior Scientist delivered a lecture on the topic 'Safe harvesting, ripening and storage practices for promoting mango exports' and described in detail various post-harvest operations for producing the best quality mangoes for export. Earlier, Dr. R. A. Ram, Head, Crop Production Division welcomed all the participants and informed them about the importance of Atmanirbhar Krishi. He also briefed about the use and benefits of CISH Bio-enhancer in horticultural crops. CISH Bio-enhancer was also provided to the farmers free-of-cost. Some of the farmers raised their queries including problems in Horti-net registration which were replied by the panel. This program was attended by about 50 participants including mango growers and CISH staff. The program was coordinated by Dr. Anshuman Singh, Senior Scientist.



### National Webinar on Clean Milk Production for Better Health and Price

ICAR-CISH, Lucknow organized a webinar on 'Clean Milk Production for Better Health and Price' on January 6, 2022, which aimed to create mass awareness on importance of hygiene and sanitary measures during procurement, processing as well as sale of milk and milk products for improving human health and financial upliftment. Dr. (Mrs) Neelima Garg, Director, emphasized the importance of indigenous cow breeds for milk production and income generation of farmers and stakeholders. The keynote speaker of the programme, Dr. Latha Sabikhi,

Principal Scientist, Dairy Technology Division, ICAR-National Dairy Research Institute, Karnal gave a talk on "Clean milk for better health and price". Fifty farmers and other stakeholders including scientists, researchers and academicians from various ICAR institutes and universities of India participated in this programme. The webinar was coordinated by Dr. P. Barman and Dr. Karma Beer.



### Webinar-cum-Farmers Scientist Interaction Meeting on 'Fresh Water Aquaculture-Diversified source of Income'

ICAR, CISH, Lucknow organized a webinar-cum-Farmers-Scientist Interaction Meeting on 'Fresh Water Aquaculture-diversified source of income' on February 5, 2022. This program was organized under 'Azadi ka Amrit Mahotsav' aimed to create mass awareness among farmers and stakeholders about importance of fresh water aquaculture for generating the income throughout year and improving the nutritional requirement through fresh water agriculture. Dr. Neelima Garg, Director told about the importance of fresh water agriculture for generating the income and improving the nutritional requirement for ideal health of farming communities. Dr. Sharad Kumar Singh, Principal Scientist, ICAR-National Bureau of Fish Genetic Resources, Lucknow presented the keynote address on "Fresh water Aquaculture-Diversified source of income". He elaborated the present status of fish farming in India and emphasized on the availability of essential nutrient in fishes.

During his deliberation he explained the farmers about sustainable carp farming and rearing of fingerling. The queries of farmers related to fish farming was replied by guest speaker. A total of 50 participants including CISH Staff, researchers and farmers from Lucknow associated with the Farmer's First Project participated. The webinar was coordinated by Dr. R. A. Ram and Dr. Karma Beer.

### Webinar on Atmanirbhar Bharat - Harnessing potential of pulses for import substitution

ICAR, CISH, Lucknow organized a webinar on 'Atmanirbhar Bharat – Harnessing potential of pulses for import substitution' on April 8, 2022 under 'Azadi ka Amrit Mahotsav'. The Keynote speaker of the webinar, Dr. Aditya Pratap, Principal Scientist, Crop Improvement Division, ICAR- Indian Institute of Pulses Research, Kanpur highlighted the importance of pulses for health benefits, research achievements in field of pulses, high yielding and short duration varieties of pigeon pea, lentil, moong, pea, cow pea, gram and rajma. He also explained about the management practices involved for higher production of pulses by adopting the integrated pest management practices. During his deliberation he highlighted about the bio-fortified variety of lentil IPL-220. Fifty participants including scientists, researchers and academicians from institutes and farmers from Malihabad, Lucknow associated with the Farmer's First Project joined the programme. The webinar was coordinated by Dr. Karma Beer and Dr. Anshuman Singh.



### 'Kisan Bhagidari, Prathmikta Hamari' Campaign under Azadi Ka Amrit Mahotsav

ICAR-CISH, Lucknow and its Krishi Vigyan Kendra, Malda (West Bengal) organized a programme on 'Kisan Bhagidari, Prathmikta Hamari' Campaign on April 26 and 28, 2022 under 'Azadi ka Amrit Mahotsav'. This programme was aimed to create

mass awareness about importance of mechanization in production and processing of fruits and vegetables. The programme started with an inaugural address by Dr. Neelima Garg, Director, ICAR-CISH, Lucknow. The keynote speaker of the programme Dr. Maneesh Mishra, Principal Scientist, highlighted about increase in income of horticulturists through technology transfer by adopting the genuine planting materials and high yielding cultivars of fruits and vegetable crops. Er. Anil Kumar Verma, Senior Scientist, delivered a talk on importance of mechanization in production and processing of fruits and vegetables. He also demonstrated mango fruit bagging technique and discussed its benefits to the farmers. The programme was organized in hybrid mode in which 80 participants were present. The programme was coordinated by Dr. Karma Beer.



### PARTICIPATION IN EXHIBITIONS

#### Vegetable cum Flower Show-2022 organized at Rajbhawan, Lucknow

Directorate of Horticulture and Food Processing, Lucknow organized three days (March 4-6, 2022) Vegetable and Flower Show at Rajbhawan, Lucknow. Scientists and Technical Officer of ICAR-CISH participated and showcased the institute technologies. The show was inaugurated by Hon'ble Governor of Uttar Pradesh, Smt. Anandi Ben Patel as Chief Guest on March 04, 2022. ICAR-CISH displayed various items in the show viz., Hydroponic system for growing vegetables of tomato, lettuce and salad, Guava varieties (Lalit, Lalima and Shweta), Bael varieties (CISH B1 and CISH B2), Jamun (J-37 and J-42), processed fruit products, mango harvester, mechanical device for removing leaf webber in mango and ready to fruit bag of oyster mushroom that were big attraction for visitors at the institute stall. More than 5000 visitors including officials from various departments, farmers, women, students, youths visited the stall and benefited from the information on advance technologies developed by the institute. Scientists (Dr. Naresh Babu, Dr. S.R. Singh, Dr. P.K.



Shukla) and Technical Officers (Er. D.K. Shukla, CTO and Shri. Arvind Kumar, ACTO) took feedback from the visitors and solved their queries regarding cultivation, plant protection and processed products of fruits crops.



### National Farmers Day organised by Integral University, Kursi Road, Lucknow

ICAR-CISH participated and displayed its technologies in the National Farmers Day organised by Integral University, Kursi Road, Lucknow at their campus on March 12, 2022. An exhibition was also arranged related to agricultural technologies during the occasion, which was inaugurated by Hon'ble Vice Chancellor of Rani Lakshmi Bai Central Agricultural University, Jhansi, Prof. Panjab Singh. Dignitaries present on the occasion included Prof. S.W Akhtar, Chancellor & Founder of Integral University, Dr. R.K. Mittal, President, Indian Agricultural Universities Association (IAUA), New Delhi & Vice Chancellor of Sardar Ballabhbai Patel University of Agriculture and Technology, Meerut and Dr. Sanjay Singh, Director General, UPCAR, Lucknow. Several dignitaries, students and farmers visited the stall and made aware about institute technologies. Improved varieties of Bael (CISH B1 and CISH B2), grafted fruit plants, vermi compost, CPP, liquid manure of Neem, Jevamrit, Biozaper, Bio enhancer, fermented fruit products, processed fruit products like juices, squash,



pickle, candies, pulp, vinegar, ciders, mango fiber, Aonla herbal tea, fruit wines and Mango Harvester were crowd pullers. Dr. Bharati Killadi, Principal Scientist, Dr.V. Dayal, Scientist, Dr. P.N. Barman, Scientist, Mr. Arvind Kumar, ACTO and Mr. Sanjay Kumar, SSS participated in the event.

### Workshop-cum-exhibition on "Cultivation of aromatic & medicinal plants in Uttar Pradesh"

ICAR-CISH participated and displayed its technologies in two days workshop on "Cultivation of aromatic & medicinal plants in Uttar Pradesh" organised by State Agriculture Management Institute (SIMA) at its Rehmankhera campus during March 22-23, 2022. Workshop was inaugurated by Additional Chief Secretary (Agriculture) Dr. Devesh Chaturvedi through online. Dr. Pankaj Tripathi, Director, SIMA, Rehmankhera presided the function on March 22, 2022. Several experts discussed about possibilities, challenges and solutions of cultivation of aromatic & medicinal plants in U.P. Dr. Neelima Garg, Director, ICAR-CISH delivered lecture on value addition of medicinal plants for health and wealth. The workshop concluded on March 23, 2022 and Shri Alok Sinha Agriculture Production Commissioner of Uttar Pradesh was the chief guest of the closing ceremony. Several dignitaries including Director SIMA, Rehmankhera, Ex Director and Dy. Directors of SIMA, farmers and entrepreneurs visited the institute's exhibition stall and showed interest in fruit based probiotic drinks, herbal tea tablets, mango fibres and improved varieties of Bael. Dr. Devendra Pandey, Dr. S.K. Shukla, Shri Sanjay Kumar and Shri Arvind Kumar, participated in the event.





## Regional Krishi Mela at Dr. Rajendra Prasad Central Agriculture University, Pusa, Samastipur, Bihar

ICAR-CISH Regional Research Station and Krishi Vigyan Kendra, Malda participated in the Regional Krishi Mela organized by Dr RAU, Pusa, during March 12-14, 2022. Different technologies and food products of Jagriti International FPO were displayed. During the mela many dignitaries visited the stall and the Institute stall won II prize for display.



## EVENTS AND CELEBRATIONS

### International Women Day

ICAR-CISH, Lucknow celebrated the International Women Day by organizing a capacity development program for the women farmers of Lucknow district on March 8, 2022. The theme of this capacity development program was 'Empowering women farmers with skill and knowledge'. On this occasion, Dr. Neelima Garg, Director exhorted the women farmers to increasingly harness value addition in fruits and vegetables for assured returns and nutritional security of their families. She informed the gathering



that ICAR-CISH has developed several high-value processed products in fruits like mango, guava, aonla, bael and jamun, and all possible efforts are underway to commercialize such products in collaboration with women's Self Help Groups, Farmer Producer Organizations and other stakeholders. She assured the women farmers for all the technical support from the institute for their present and future endeavors. Dr. Anju Bajpai, Principal Scientist delivered a talk on the subject 'Nutri-genomics for women health'. On this occasion, 10 women beneficiary farmers under SCSP program were felicitated for their outstanding efforts in initiating and popularizing the commercial farming and kitchen gardening of horticultural crops. A total of 117 knapsack sprayers were distributed among the women and other farmers. The program was attended by 120 farmers including 60 women farmers. Dr. Anshuman Singh, Dr. P. Barman and Dr. V. Dayal coordinated this programme.

### Kisan Mela

A *Kisan Mela* was organized jointly by Indian Oil Seeds and Produce Export Promotion Council, Mumbai, Ministry of Commerce, GOI, Indian Institute of Oil Seed Research, Hyderabad, and ICAR-CISH-Krishi Vigyan Kendra, Malda with support from Agrani Neo Farmers Producer Company Ltd., Habibpur on March 12, 2022 at Malda, WB. In this Mela, about 1000 women farmers participated in the awareness programme on sesame cultivation. Many dignitaries, viz. Dr. Sujatha (Director, IIOR, Hyderabad), Mr. Suresh Ramrakhiani (CEO, IOPEPC), Mr. Ramesh Kolath (Dy CEO, IOPEPC), Mr. Mridul Halder (Additional District Magistrate General, Malda), Dr. Rajni from AICRP Unit (Sesame), Jabalpur and





experts like Dr. Ramesh (Principal Scientist, IIOR), Dr. Ramya (Sr. Scientist, IIOR), Dr. Pandey (AICRP-Sesame, Jabalpur), Dr. Gupta (AICRP-Sesame, Jabalpur) graced the occasion. During the Kisan Mela, an awareness programme was organized on sesame cultivation and various prospects of Sesame cultivation were discussed. At the end, vote of thanks was proposed by Dr. Shailesh Kumar (SMS Fisheries).

### Farmer's fair organised by ICAR-CISH, KVK, Malda (West Bengal)

Fair-cum-farmers scientist interaction programme was organised by ICAR-CISH, Krishi Vigyan Kendra, Malda (W.B.) on April 26, 2022 under theme *Kisaan Bhagidari Prathamikta Hamari*. In this programme a live telecast of Hon'ble Agriculture Minister & Farmers Welfare was broadcasted to farmers and farm women of Malda District. Farmers-Scientist interaction was held on Natural farming, cultivation of millets, Oils seeds, coconut and Bio-fortified crops coconut with active participation of resource persons from office of Deputy Director (Horticulture), Asst. Director Agriculture (Soil Science), Dr. Dipak Nayak, Sr. Scientist & Incharge, Mr. S. Jaykumar, Coconut Dev. Board, Fulia, Dr. Shailesh Kumar, SMS, Fisheries, Mr. V.V. Diptikar, TO, Mr. Nabin Kr. Das, STA and resource person from MSME, Kolkata, Government of India. More than 300 participants were benefitted from this programme.



### 39<sup>th</sup> Foundation Day of ICAR-CISH, Lucknow

On June 1, 2022, the institute celebrated its 39th foundation day with great pomp and grandeur. Mango diversity exhibition, mango food festival, Ikka tour of the institute and mango eating competition were important attractions of the day. On this occasion, the Chief Guest, Minister of State (Independent Charge) for Horticulture, Shri Dinesh Pratap Singh inaugurated the CISH-Museum of the institute which also houses Aam Sangrahalaya. He appreciated the technologies developed by the institute and suggested popularizing the technologies by printing letters or folders in simple Hindi so that it reaches to common people through village heads. The MLA of Malihabad region, Smt. Jai Devi was also present as a special guest. On this occasion, kits were distributed to the beneficiaries of SCSP. In this kit, farmers were provided with a mango harvester and packets of micronutrient mixture

and bio-catalyst each. Dr. Neelima Garg, Director briefed about the achievements of the institute since its inception. A Kisan Goshthi was also organized on this occasion on the topic 'Manage after Harvesting Management'. On this occasion, Dr. Pankaj Tripathi, Director of State Institute of Agricultural Management, Dr. Vishal Nath, Er. Anil Verma addressed the farmers on various topics. In addition to the scientists, employees of the institute, about 200 farmers and 200 other visitors including school and college students participated in the programme.



### ENTREPRENEURSHIP DEVELOPMENT PROGRAMMES

#### Webinar on value addition and processing of fruit and vegetables

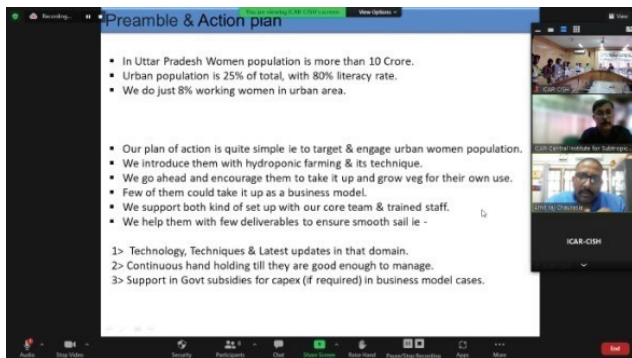
Institute organized one day webinar on January 25, 2022 to deliberate on the opportunities in value addition and processing of fruit and vegetables. The subject expert Dr. R.B. Tiwari from ICAR-IIHR, Bengaluru presented the details of Post Harvest technologies developed by them. He also detailed about the commercial enterprises/start-ups working in field of post harvest technologies. The importance of dehydration, osmotic dehydration and freezing dehydration were also emphasized for value addition of fruit and vegetables. Dr. Neelima Garg, made presentation on the development of various products and technologies such as fruit cider, fruit wines, probiotic drinks, fibre enriched biscuit, Aonla-prash and herbal chew. The programme was co-ordinated by Dr. Maneesh Mishra, PI, Agri-Business Incubation

Centre of CISH Lucknow. Scores of entrepreneurs, students, scientists and farmers participated in the programme through virtual mode.



### Entrepreneurs Incubation Meet

ICAR-CISH Agri-Business Incubation Centre organized an “Entrepreneurs Incubation Meet” on March 23, 2022 at the Institute. During the meet, various budding hortipreneurs from Kerala, Madhya Pradesh, Uttarakhand and Uttar Pradesh presented their startup concepts and proposals on different horticultural technologies in the form of PPT presentation. They interacted and discussed their entrepreneurial ideas directly with the Director, Dr. Neelima Garg and various scientists of the institute in their specialized areas. A total of nine entrepreneurs and eight scientists joined the Entrepreneurs Incubation Meet. Dr. Maneesh Mishra, P.I., Agri-Buisness Incubation Centre appraised about the current scenario of horticulture startups in India, process and procedure pertaining to incubation at ABI and its growth.



## OUTREACH PROGRAMS OF SCSP

### Distribution of Marigold seed under Scheduled Caste Sub Plan

ICAR-CISH, Lucknow organized marigold seed distribution program on January 17, 2022 under Scheduled Caste Sub-Plan. About 60 farmers from villages like Ranimau, Bansigarhi and Kakrabad participated. On this occasion, Director and other senior officers besides Nodal Officer of Scheduled Caste Sub-Plan, Dr. Vishambhar Dayal Scientist were present. Dr. Neelima Garg emphasised that good profit can be earned by cultivating marigold and other products like incense sticks, extracts and beauty products be made from it. While addressing the farmers in the meeting, Nodal Officer reiterated that marigold

being a popular flower, plays an important role in wedding ceremonies, social and religious functions for decoration. He trained the farmers about suitable soil, climate, selection of marigold varieties, use of manure and fertilizers, sowing of seeds, plantation, irrigation and pest and weed control. Special emphasis was given to raising of nursery and good agronomic practices.



### Marigold Farmers' field visit

Dr. Vishambhar Dayal (Nodal Officer, SCSP) visited the field of farmers cultivating commercial marigold in the adopted village Karjhan, Kakori block, on June 13, 2022. Marigold flower seeds were distributed to more than 150 farmers under the plan. The nuances of commercial marigold cultivation and marketing of marigold flower was explained by the Nodal Officer and advisory on use of fertilizers was given. Practical training on pest management and production of disease free marigold crop was also done. Farmers' opinion on the effect of using CISH Fasalshakti (Micro Nutrients) developed by ICAR-CISH was also collected. Farmers expressed gratitude to the institute for providing help in cultivating marigold flowers under Scheduled Castes Sub-Plan.





**MoU SIGNED**

**MoU with Newtraway LLP, Lucknow**

A Memorandum of Understanding (MoU) was signed between ICAR-CISH, Lucknow and Newtraway LLP, Lucknow on February 21, 2022 for commercialization of CISH-Hot Water Dispersible Aonla-Herbal Tablet. Dr. Neelima Garg, Director, ICAR-CISH, Mr. Dipanker Mukherjee, Incubate & proprietor, Newtraway LLP, Dr. Maneesh Mishra, PI (ABI), Dr. Ravi, S.C., I/c ITMU and Chief Technical Officer Mr. Sanjay Singh were present in the event.



**Training-cum-Exposure visit of Officers/ farmers/ Students**

Several training-cum-exposure visits were organized in the institute's research farms for state government officers and farmers from various districts of Bihar, MP and Uttar Pradesh. It was aimed to popularize technologies like rejuvenation of unproductive mango orchards, high density planting of mango and guava, management of irregular bearing in mango, intercropping, espalier and container gardening of guava, integrated management of insect and diseases, improved varieties of mango and guava, grafting, planting methods, crop diversification, etc. The farmers' visits were sponsored by ATMA and coordinated by Dr. Naresh Babu, Principal Scientist and Shri. Arvind Kumar, ACTO. Students from Agriculture College also visited the institute as part of their course curriculum.



**MoU with M/s GT-Biosciences**

A Memorandum of Understanding (MoU) was signed between ICAR-CISH, Lucknow and M/s GT-Biosciences Pvt Ltd, Nagpur on June 20, 2022 for commercialization of insect trap technologies.

S.N.	Date	Place	Sponsor	Number of Farmers/ officials/students
1.	15.02.2022	Gopalganj district, Bihar	ATMA , Bihar	56 farmers and two officials
2.	16.02.2022	Gaya district, Bihar	ATMA , Bihar	26 farmers and two officials
3.	09.03.2022	Kochas, Nauhatta, Vikramganj, Chenari, Dinara, Nausa & Rohtas blocks of Rohtas district of Bihar	ATMA, Rohtas, Bihar	30 farmers including one official
4.	15.03.2022	State Agriculture Management Institute, Rehmankhara, Lucknow	Public Service Commission Uttar Pradesh	19 newly selected Assistant Statistical Officers
5.	23.03.2022	23 blocks of Patna district of Bihar	Indira Gandhi Institute of Cooperative Management, Lucknow	44 farmers and two Assistant Technology Managers
6.	26.03.2022	Chhapra district of Bihar	ATMA , Bihar	37 farmers
7.	30.03.2022	Siwan, Bihar and Katni, M.P.	ATMA, Siwan district of Bihar and ATMA, Katni Madhya Pradesh	30 farmers including 3 officials
8.	05.05.2022	Janta College Bakewar Etawah Uttar Pradesh	-	106 students of B. Sc. (Ag) VIII Semester and five faculty members
9.	10.05.2022	Bhagalpur	ATMA, Bhagalpur	9 Zardalu Mango farmers



## PERSONALIA

**Promotion****Scientist**

Dr. Anshuman Singh, Scientist (Hort.) was promoted to the next higher grade of Sr. Scientist in RGP 8000/- w.e.f. 04.10.2019.

Dr. Vishambhar Dayal, Scientist (Fruit Science) was promoted to the next higher grade in RGP 7000/- w.e.f. 01.07.2019.

**Administration**

Sh. Hardev Singh, UDC was promoted to the post of Assistant w.e.f. 09.03.2022 through LDCE.

**Transfer**

Dr. Antara Das, Scientist (Agricultural Biotechnology) joined ICAR-CISH, Lucknow on intra-institutional transfer from RRS Malda on 02.03.2022.

Dr. Sanjay Kumar Singh, Sr. Scientist (Hort. Fruit Science) joined ICAR-CISH, Lucknow on inter-institutional transfer from ICAR-NRC Litchi, Muzaffarpur, (Bihar) on 01.04.2022 (F.N).

Sh. Ningthoujam Samarendra Singh, Scientist (Agricultural Chemicals) joined ICAR-CISH, Lucknow on inter-institutional transfer from ICAR-CIFRI (RC), Guwahati on 13.05.2022 .

Dr. Ashok Kumar Pr. Scientist (Environmental Science) was relieved in the forenoon of 09.05.2022 to join at ICAR-National Centre for Orchids, Pakyong (Sikkim) on inter-institutional transfer.

Dr. Pranath Barman, Scientist (Horticulture) was transferred w.e.f. 09.05.2022 to join at ICAR-CISH Regional Research Station, Malda (West Bengal) on intra-institutional transfer.

**Retirements****Scientific Staff**

Dr. A.K. Singh, Pr. Scientist retired on 31.03.2022.

**Technical Staff**

Sh. Anil Kumar Singh, C.T.O. retired on 31.05.2022

Sh. Yamuna Prasad Mishra, T.O. retired on 30.06.2022.

Sh. Ravindra Kumar Mishra, T.O. retired on 30.06.2022.

**Skilled Support Staff**

Sh. Kailash Chandra., S.S.S. retired on 31.01.2022

Sh. Vishram, S.S.S. retired on 30.06.2022

Sh. Rambali, S.S.S. retired on 30.06.2022

## DISTINGUISHED VISITORS



स्वच्छ भारत, समृद्ध भारत



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