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Cover page: CIPHET Developed
Technologies & *Meri Mati Mera Desh*
activities

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From the Director's Desk

The mid-year quarter (July – September) is a critical period for the storage of almost all commodities. This is the period when the Monsoon is most active in almost all parts of the country and this decides the fate of Indian agriculture, and thereby the national economy, to a great extent. The noteworthy accomplishments of ICAR-Central Institute of Post-Harvest Engineering & Technology (ICAR-CIPHET) including two AICRP projects, the Regional Station, Abohar and the KVK, Fazilka for this period in 2023 are being highlighted in this issue.



As we celebrated the 77th Independence Day of the country and 95th Foundation Day of ICAR, it was our proud moment that eight CIPHET technologies were certified by ICAR, New Delhi with the issuance of technology certificate on 16th July 2023 on the 95th ICAR Foundation Day. In the technology transfer domain, ICAR-CIPHET successfully disseminated the knowledge for producing groundnut-based flavored beverages, curd, and paneer to one firm. Moreover, collaborative agreements were signed with three industries through Memoranda of Understanding (MoUs).

In this quarter, we have developed prototypes of a Table-top vacuum frying system, RGBD MODULE to identify and locate apples on trees and mechanical and infrared-based systems for improved dehulling of Kodo millet, jackfruit seed peeler and plastic check dam for water management in hilly and semi-arid regions. Processes have been developed for gluten-free savorys, high-value compounds from crop residues, jaggery-based kulfi, and RTS beverages from specialty fruits. These promising technologies have ample scope of refinement and commercialization in the near future. The scientists could publish good research papers in peer-reviewed journals and abstracts in conferences. We conducted a series of training programmes for the farmers, State Govt. Officials and the KVK officials from different states of the country.

During the quarter, we organized many events including a celebration of the 77th Independence Day of India, *Har Ghar Tranga Abhiyan* and *Meri Mati Mera Des*. Our dedicated scientists have actively participated in many professional workshops and seminars; academic and application research has been published in the form of research and popular articles, book chapters and news articles. It is a matter of happiness that seven new personalia joined the institute in the capacity of scientist, Head of Division and Head of KVK, while one of the institute staff got selected as Head of Division. I am proud to share that one scientist of the institute received an international award for his doctoral work. Let me end my message with optimism that the coming days will be more fruitful and will bring pride and prestige to the institute, its staff and the entire stakeholders.

Ludhiana, November 2023

(Nachiket Kotwaliwale)
Director, ICAR-CIPHET

RESEARCH HIGHLIGHTS

Development of millet-based gluten-free muffins using hydrocolloid

Gluten, present in certain cereals namely, wheat, rye, and barley, is essential for the desired quality of bakery products. However, individuals with celiac disease experience limitations in their food choices and a decreased variety in their diet due to the limited availability of gluten-free options, particularly in the realm of bakery products. Millets are nutritionally superior to the main cereal crops-wheat and rice owing to their comparatively higher protein, mineral, vitamins, and fiber contents. The development of bakery products without gluten is quite challenging. Hence, an attempt was made to prepare gluten-free muffins using barnyard and foxtail millets with the addition of xanthan gum, a hydrocolloid to the level of 0-0.5% (flour wt. basis). The muffin samples were evaluated for height, crust color, hardness, and sensory acceptability. For barnyard millet muffins, the addition of xanthan gum significantly ($p \leq 0.05$) increased the muffin height and color values (at 0.4% level) whereas there was an observed significant ($p \leq 0.05$) decrease in the hardness of the barnyard millet-based muffins. The addition of xanthan gum showed a positive effect on sensory acceptability, with the highest overall acceptability score (OAA) of 7.25 at 0.5%. In the case of foxtail millet muffins, the hardness of the muffins was significantly decreased at 0.3% addition of xanthan gum however, sensory acceptability was adversely affected. Also, a non-significant difference in muffin height and lightness was observed. It can be concluded that the addition of hydrocolloids affects the quality traits of muffins depending on the type of millet flour used.



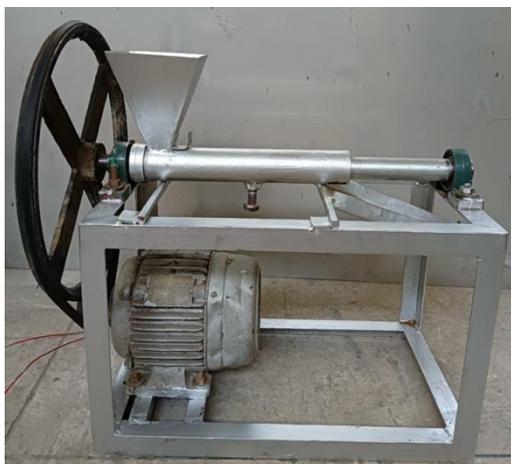
Barnyard millet muffins

Barnyard millet muffins crumb

Performance evaluation of mechanical and infrared-based pre-processing systems for improved dehulling of Kodo millet

Dehulling, the process of removing the outer husk from Kodo millets, is a critical step in the post-harvest processing of millets to enhance their nutritional quality and utilization. The present study investigated the performance of mechanical and infrared-based pre-processing systems to enhance the dehulling parameters of Kodo millet (*Paspalum scrobiculatum* L.). In the pre-processing step, Kodo millet samples were scratched before dehulling using a screw pitch type mechanism of varying shaft speeds (250, 350, 450 rpm) and moisture content (6 - 12%, w.b.), and in Infrared treatment, variable voltages (200, 220, and 240 V) for different time intervals (3 - 7 min) were applied to Kodo millet grains. The effects of these pre-milling treatments on the dehulling process were evaluated in terms of dehulling efficiency, grain recovery, and broken percentage. The results indicated that the pre-processing and infrared treatments significantly improved the dehulling efficiency of Kodo millet compared to without these treatment

methods for unpolished dehulled Kodo. The pre-processing and infrared facilitated the weakening of the husk-to-grain bond and enhanced its separation from the grain. The dehulling efficiency, recovery, and broken were 92.75%, 62.23%, and 3.92 with pre-processing and 84.76%, 58.77%, and 5.79% with infrared treatment, respectively. In control, the dehulling efficiency, recovery, and broken were 76.68%, 52.57%, and 8.05%, respectively. This finding contributes to optimizing these treatments with dehulling methods for Kodo millet, which can be extended to other millet grains. Further investigations will focus on scaling up the developed pre-processing system for industrial applications while considering economic viability and potential commercialization.



Mechanical Pre-processing system



Infrared-based pre-processing systems

Development of RGB-D Module for detection and localization of apples

RGB-D module is developed with the user interface to extract depth information of detected apples using depth frames acquired from RGB-D camera. The user interface of the RGB-D module was developed using C# and Flask for the user interface and camera control, and Python for the backend and Application Programming Interface (API) of detection model. The whole development is done using Python platform. Virtual environments and Python library dependencies are installed on Anaconda (python distribution platform). Intel RealSense SDK API is used for camera interfacing with the RGB-D module's Graphical User Interface(GUI). The RGB (Red-Green-Blue) frame is used to detect objects using the YOLO (You Only Look Once) detection model. The network returns the class and bounding box of the detected object. The coordinates of bounding box are used to get depth data of the corresponding bounding box from the depth frame. The developed vision system can identify apples within its range in an outdoor orchard environment. Leveraging deep learning techniques, the system excels in positively identifying apples occluded by the branches of a tree. Furthermore, it possesses the capability to recognize and categorize obstacles, including leaves and branches, enabling it to calculate the optimal trajectory for extracting the apples.



User interface of Module

Image Corpus Created: Image corpus created for two apple varieties grown in Kashmir region.

Dataset Object	Apple	
Category	Red Velox, Red Gala	
Type of data	Images, videos, and text files	
Data set size	Red Velox: 1.2 TB	Red Gala: 300GB
Statistical classification of fruit instances	Red Velox: 42,357	Red Gala: 9223
Image resolution	These images are captured at resolutions: 6000×4000 (24MP)	
Data Format	Raw and analyzed	
Data acquisition devices	Canon EOS 1500 D for images, DJI pocket 4k for high-resolution videos, RealSense D455 for depth data, Gimbal for stabilization of the camera	
How data captured	Images with various factors including shading, overlapping, and different light at different angles are collected, and the apple trees are captured at different angles and distances. Apples close to the camera are used as closed object targets, and those far away from the camera are used as small object targets to fulfill more conditions of the dataset.	
Data source location and time	High-density apple orchards in Kashmir during the harvesting season of 2022	
Dataset Complexity	The dataset is further enriched by the presence of complex ambient lighting. Datasets have images with low lighting conditions and cloudy conditions.	
Dataset can be used for subject areas	Image Processing, Image Identification, Image classification, object detection, computer vision, artificial intelligence, and deep learning, yield forecasting/estimation, etc.	



Sample images

Extraction of hesperidin and pectin from immature droppings of kinnow

The immature droppings of kinnow fruits (IDKF) previously considered as farm waste are now being considered of economic importance due to their phytochemical properties. Like other citrus fruits, IDKF are believed to contain considerable amounts of hesperidin, a well-known glycoside that is part of the flavanone subgroup but there is a dearth of scientific literature about the quantity and quality of this bioactive compound. Several properties, viz. antioxidant, anti-inflammatory, anti-tumor, antibacterial, anti-depressant, and neuroprotective activity, protecting the cardiovascular and gastrointestinal systems have been reported for this flavonoid compound. Similarly, IDKF may be a source of pectin, a naturally occurring heteropolysaccharide, generally extracted from kinnow peels. It also shows excellent gelling properties and stability; thus, find applications in the healthcare, pharmaceutical, and food industry. The present study has been conducted to extract hesperidin and pectin from IDKF. Different solvents DMSO: Ethanol (1:1 v/v), NaOH and HCl, 50% ethanol, methanol, and acidified methanol have been evaluated for extraction of hesperidin. The best results were obtained from acidified methanol having hesperidin and pectin yield of 3.88% and 4.7%, respectively.



Extracted hesperidin

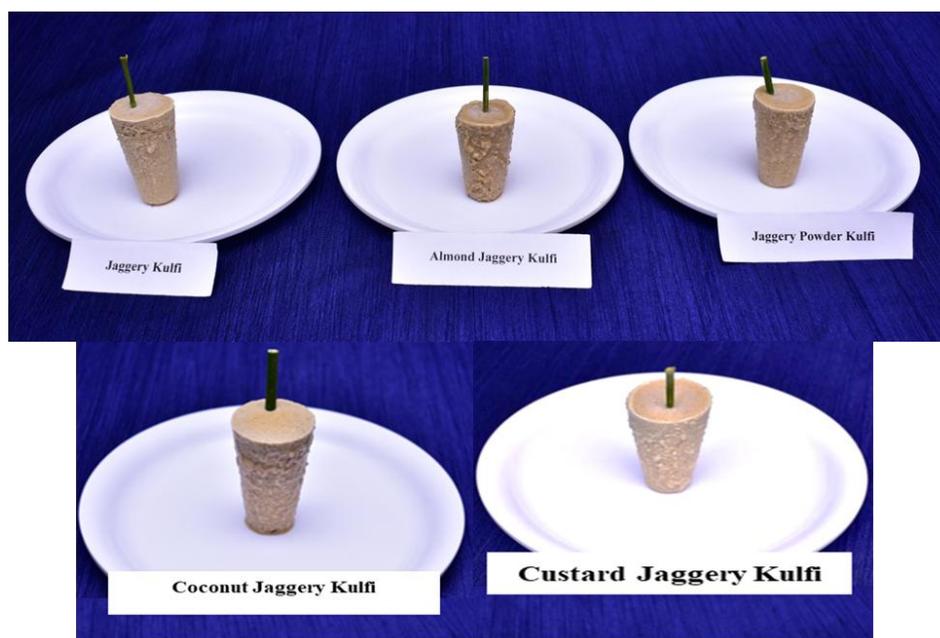
Extracted pectin

AICRP on PHET

Standardized process protocol for the preparation of jaggery-based kulfi (Anakapalle Center)

Process technology to prepare jaggery-based kulfi was developed. Five different combinations of jaggery-based kulfi *i.e.*, Jaggery kulfi, Jaggery powder kulfi, Almond jaggery kulfi, Coconut jaggery kulfi, and

Custard powder jaggery kulfi were prepared by heating the full-fat milk on a low flame until the mixture was thickened with the addition of following ingredients like jaggery powder, powdered almonds, cashew nuts, coconut powder, custard powder, cardamom and vanilla essence based on required quantity as per the combination. This mixture was poured into kulfi moulds and kept overnight in a refrigerator. Sensory evaluation was carried out based on colour, flavour, taste, and mouthfeel for all five combinations of jaggery-based kulfi with 25 judges of different age groups. Sensory evaluations were carried out by using the Fuzzy Logic Concept method, which showed that almond jaggery kulfi is ranked first among five different combinations of jaggery kulfi followed by jaggery powder kulfi. The nutritional composition for 100 g jaggery-based kulfi is energy 698 kcal, protein 16.6 g, carbohydrate 76.4 g, calcium 3.94 mg and iron 5.2 mg.



Production and characterization of cocoa pod activated carbon and its application in purification of oil (Tavanur centre)

Cocoa pod is about 70% of the weight of cocoa fruit. Generally, cocoa pod contains very high lignin around 14-28%, cellulose 19.7-26.1%, and hemicellulose 8.7-12.8% which can be converted to carbon after the pyrolysis (carbonization) process. At the preparatory stage, the cocoa fruits were broken and the seeds were removed. Empty cocoa pods were cut into small pieces and sun-dried to a moisture content of 7% wb. The resulting product was then weighed, grinded, and sieved through a mesh size of 80 μm . Carbonization was done using a pyrolysis process in a muffle furnace. The charcoal obtained after the carbonization stage was filtered using an 80 μm sieve. The resultant powder was then treated with HCl solution for 24 h for chemical activation. The activated carbon was filtered and washed using distilled water until it reached a pH of 7, then drained and dried at 110°C in a cabinet drier for 1 h. From the preliminary trials; it was observed that the quality parameters of developed activated carbon were on par with ASTM standards.



Raw cocoa pods



Dried cocoa pods



Grinded dried cocoa pods



Pyrolysed carbon @ 300°C



Activation by HCl



Activated carbon

Development and performance evaluation of jackfruit seed peeler (Tavanur Centre)

Ripe jackfruit bulbs find common usage in both fresh consumption and canned products, the latent potential of jackfruit seeds, characterized by their rich carbohydrate and protein content, has been underutilized in culinary applications, thus leading to a significant loss in the post-harvest phase. The seed coat removal is one of the most difficult and time-consuming process. Generally, it is done manually and only a skilled person can do the work properly. The peeling machine even for small scale is not available commercially. Manual peeling is a tedious and time-consuming process. Based on a preliminary study the meticulous design and fabrication of the jackfruit seed peeler was developed, which uses the principle of impact and abrasion forces to achieve precise and efficient peeling. The machine incorporates a robust frame assembly constructed from high-quality mild steel angles, ensuring stability and durability during operation. The outer cylinder, crafted from stainless steel, supports the inner perforated cylinder, which plays a pivotal role in the peeling process. The rotating disc, meticulously engineered with a diameter of 305mm and a thickness of 10mm, facilitates controlled rotation, enabling optimal impact and abrasion. A perforated sheet, strategically welded onto the disc, enhances the abrasion process, ensuring thorough removal of the seed coat. The machine's operation is powered by a 0.75 kW motor integrated with a Variable Frequency Drive (VFD), enabling precise control over rotational speed. In the primary trials, the peeler exhibited a peeling efficiency of 87% at 30 Hz frequency and 1 minute time. The rigorous performance evaluation and optimization of process parameters are underway.



Jackfruit seed peeler

Process protocol for the preparation of comminuted hill lemon fruit juice RTS beverage (Solan Center)

The peel of hill lemon which comprises 30% of the fruit holds more ascorbic acid, phenolics, and minerals than fruit segments and is thrown away as waste after processing of fruit. Comminuted hill lemon juice containing both parts (peel and juice) can be used to enhance the functional value of beverages. The present study was conducted with the objective of developing the process protocol for the preparation of comminuted hill lemon juice RTS beverage. The initial step involved washing and cutting of hill lemon fruit into equal halves along with peel followed by removal of seeds and grating of halves by using a pulper. The resulting slurry was then transferred to a hydraulic press to extract comminuted hill lemon juice. Afterward, extracted hill lemon juice was filtered through a muslin cloth. To achieve the desired acidity level of 0.3%, various combinations of comminuted hill lemon juice were tested. Juice at the 7% level displayed the highest scores for colour (8.2), body (8.0), flavour (8.5), and overall acceptability (8.3). Furthermore, comminuted drinks exhibited significantly enhanced antioxidant activity (7.6%) and phenolic content of prepared RTS beverages than the resulting values obtained for RTS drinks made up from of Hill lemon juice (without peel).

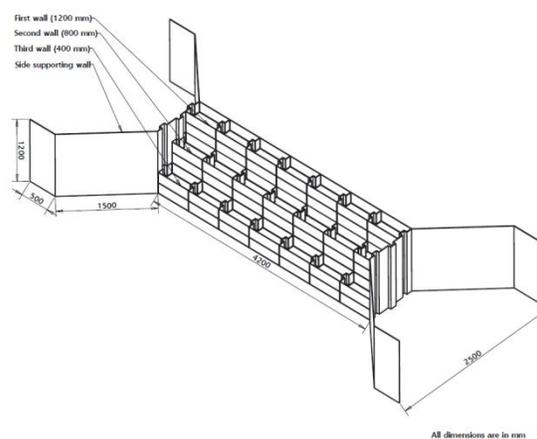
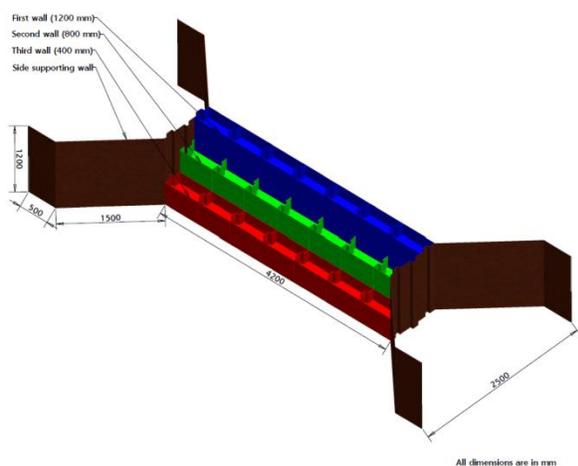


Hill lemon comminuted juice RTS beverage

AICRP on PEASEM

Development of plastic check dam for water management in hilly and semi-arid regions (ICAR-VPKAS, Almora)

In hilly regions, the majority of soil loss is due to water erosion during rainy periods and surface water availability for irrigation and drinking purposes is a major concern during the lean period. Therefore, to control surface runoff, spring water management in streams, reduce soil loss, and create a temporary storage structure for irrigation, the FRP-based plastic check dam is a potential solution for rainwater harvesting in hilly regions. A FRP-based plastic check dam for water management in the hilly region has been designed and developed having dimensions (60 × 30 × 20 cm) for water management in the hilly region. The shear force acting on block size was 44.1 N/m². The horizontal water pressure acting on the box was 11.25 kg. The height of the check dam is variable up to 1.2 m and it may be adjusted according to the need for water storage. This structure can be used to reduce scour, reduce velocity dissipate energy of water, prevent erosion, and settle sediment in an unlined channel. The developed structure was tested in field conditions and satisfactory results were found.



Farmers' First Project (FFP)

FFP Team facilitated the exposure visit of 35 KVK officials at Uppal Farm, Rahon, and Khalsa farm, Balachour, SBS Nagar during the capacity building training programme of KVK officials from ATARI-Zone VIII. They visited an established modern 3-pan chemical-free jaggery production plant and the team also briefed them about the complete process of jaggery production, the difference between traditional and modern methods of jaggery production, and the market demand for small-sized cubes and candies. They also visited the established Agro-processing centre, Khalsa Farm, and various unit operations of primary and secondary processing of cereals, pulses & spices were also demonstrated to them.



FFP Team conducted a meeting with 15 beekeepers of Dhuri, Sangrur. The team discussed with them honey production practices, migration of bee boxes, honey processing methods used, honey quality aspects, and market demand. They were also enlightened about scientific and modern methods of honey processing, the benefits of modern honey processing as compared to traditional practices, proper packaging, brand development, and FSSAI registration. They were also encouraged to form a farmer interest group (FIG) in order to establish a custom processing centre at Dhuri.



FFP Team gave a demonstration on the processing of honey and dal wadi to Mrs. Gurdev Kaur from Ludhiana, Punjab. The team also elaborated her on the benefits of modern honey processing plants, mechanization aspects of the traditional wadi-making process, benefits in entrepreneurship development in the processing of wadis and honey, packaging and brand development, etc.



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Popular Articles

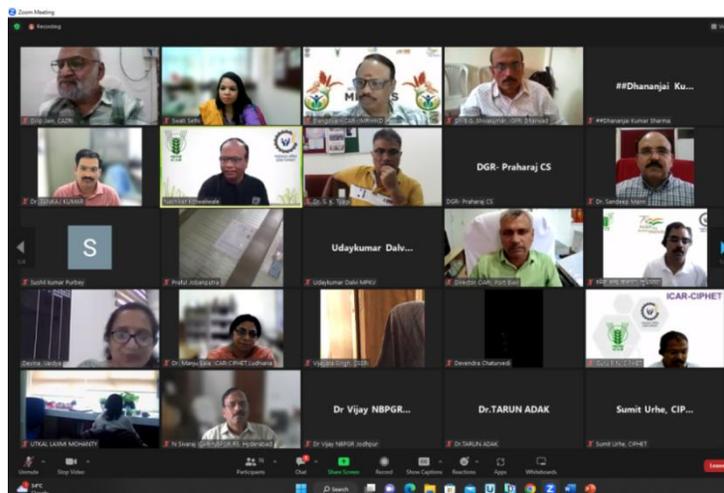
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EVENTS/ACTIVITIES

- **34th IRC meeting of ICAR-CIPHET:** The 34th IRC meeting of ICAR-CIPHET, Ludhiana was held during 20-21 July, 2023 at ICAR-CIPHET, Ludhiana under the Chairmanship of Dr. Nachiket Kotwaliwale, Director, ICAR-CIPHET. All the Project Coordinators, HOD's, and scientists of ICAR-CIPHET, Ludhiana, and Regional Station, Abohar participated in the meeting. The meeting was conducted with the agenda for the presentation of new project proposals, the progress of the ongoing projects, and the final project report of the completed projects. In addition, a few promising proposals for RPP-IV were also presented. All the scientific staff of the institute participated with great enthusiasm and presented their projects. The meeting was successfully organized for two days.
- **Webinar on Millet Processing and Value Addition:** ICAR-CIPHET scientists coordinated an online webinar on millet processing and value addition under *Azadi Ka Amrit Mahotsav* was organized on 31 July, 2023. The webinar was attended by 115 participants including Directors, Scientists, and students from different research institutes and universities.

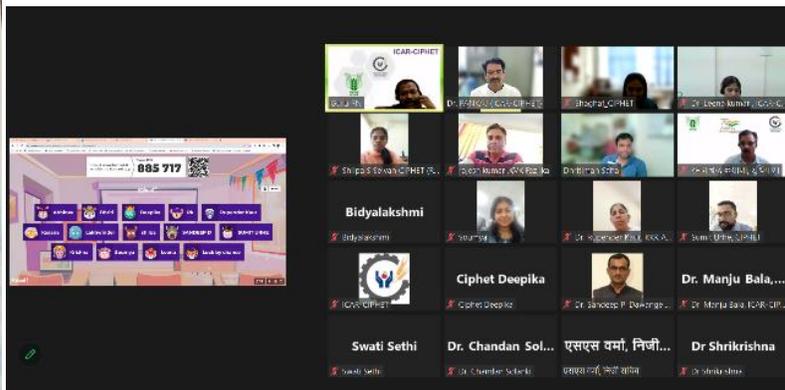


- **Independence Day Celebration and Har Ghar Tranga Abhiyan:** National flags were distributed among staff and contractual persons of ICAR-CIPHET on 14 August 2023 under *Har Ghar Tranga Abhiyan*. These flags were hoisted at every home on 15 August, 2023 on the occasion of Independence Day. 77th Independence Day was celebrated with great enthusiasm at ICAR-CIPHET Ludhiana and Abohar. Dr. Nachiket Kotwaliwale, Director ICAR-CIPHET Ludhiana, and Dr. Amit Nath, Head HCP hoisted the National Flag. All staff members and contractual labour were present on the occasion.



- ***Meri Mati Mera Desh* activities**

On 25 August 2023, an engaging quiz competition centered on India's monumental Independence movement unfolded under the banner of the "*Meri Mati Mera Desh*" Programme. The competition had four captivating rounds, each having ten multiple-choice questions, all intricately linked to the saga of India's hard-fought struggle for independence. The program was conducted using innovative '*Kahoot freeware*', a sophisticated tool that ingeniously harnesses participants' responses and response times to seamlessly unveil the victors, all in an impeccably fair manner.



ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana organized an extempore competition and oath activities to celebrate the ‘Meri Maati Mera Desh’ initiative of the Government of India. An extempore was organized on the theme ‘Veeron Ka Vandan’ on 1 September, 2023. ICAR-CIPHET staff and the trainees (B. Tech students from 4 different agricultural engineering colleges in India) participated in this competitive event. On 6 September, 2023, ‘Panch Pran’ was taken by all the staff of the institute in the presence of Dr. Nachiket Kotwaliwale, Director,



‘Panch Pran’ Shapath under Meri Maati Mera Desh’



“Meri Maati Mera Desh’ - Extempore Speech Competition on the theme ‘Veeron Ka Vandan’

EXTENSION ACTIVITIES

A. Trainings

Training programme	Participants	Duration
Farmers Trainings		
Post-Programme Management of Agricultural Produce	10	3-7 July, 2023
Processing Techniques for Value Addition of Rose Petals (Organised under CRP-SA Project on Bioactive Compounds)	2	13-14 July, 2023
Post-Programme Management of Agricultural Produce for participants/farmers from Dhule District, Maharashtra	22	24-28 July, 2023
Pest and Disease Management in Kharif Crops at ICAR-CIPHET, Abohar	21	13 July, 2023
Preparation of Vermi Composting at ICAR-CIPHET, Abohar	30	14 July, 2023
Student Trainings		
Post-Harvest Handling and Processing of Horticultural Crops for B. Tech. Students from Suresh Gyan Vihar University, Jaipur	3	1-31 August, 2023
Introduction to Post Harvest Engineering and Technology for B. Tech. Students from the College of Technology and Engineering, MPUAT, Udaipur (Rajasthan)	3	
Introduction to Post Harvest Engineering and Technology for B. Tech. Students from the College of Agricultural Engineering, JNKVV, Jabalpur	9	
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from Dr. D. Y. Patil College of Agril. Engg. & Tech., (Affiliated to M.P.K.V., Rahuri) Talsande, Hatkanangale, Kolhapur, Maharashtra	5	11-15 September, 2023
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from the College of Agricultural Engineering & Technology, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar	6	16 August -18 September, 2023
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from Sardar Valla Bhai Patel University of Agriculture and Technology, Meerut (U.P.) at ICAR-CIPHET, Abohar	3	1-31 August, 2023
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from Dr. D. Y. Patil College of Agril. Engg. & Tech., (Affiliated to M.P.K.V., Rahuri) Talsande, Hatkanangale, Kolhapur, Maharashtra	6	16 August -18 September, 2023
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from the College of Agricultural Engineering & Technology, Dr. Rajendra Prasad	7	24 August - 22 September, 2023

Central Agricultural University, Pusa, Samastipur, Bihar		
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from College of Agricultural Engineering & Technology Punjab Agricultural University, Ludhiana, Punjab	7	07 September – 05 October, 2023
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from Acharya N.G. Ranga Agricultural University, Dr. NTR College of Agricultural Engineering, Bapatla, Andhra Pradesh	7	11 September -10 October, 2023
Introduction to Post Harvest Engineering and Technology for B. Tech. (Agril. Engg.) Students from five different colleges	28	1-30 September, 2023
Officers Trainings		
Capacity building of Agricultural Extension Professionals for Promoting Agro-Processing ATARI Zone-VIII	36	7-11 August, 2023
Capacity building of Agricultural Extension Professionals for Promoting Agro-Processing ATARI Zone-IX	5	11-15 September, 2023
Testing of Post-Harvest Machinery	4	3-7 July, 2023

B. Visits

College/Institute	No of visitors	Date of visit
National Innovation Foundation -India	1 (O) +2 (F)	22 August, 2023
Dr. D.B. Shakyawar, Director, ICAR-National Institute of Natural Fibre Engineering and Technology, Kolkata	1 (O)	21 August, 2023
Dr. Rahat Ashraf, Assistant Professor, RIMT University School of Agricultural Sciences and Technology Mandi Gobindgarh (Punjab)	21 (O)	24 August, 2023
Dr. Munil Kumar Sukham, Principal Scientist, ICAR-CIFE, Mumbai	1 (O)	24 August, 2023
Anand Agricultural University, Gujarat	30 (S) + 1(O)	21 September, 2023
College of Agricultural Engineering, Punjab Agricultural University, Ludhiana	200 (S) + 1(O)	22 September, 2023

*S-Students, O-Officials, F-Farmer

C. Awareness Programmes

Programme title	Number of beneficiaries	Date
Plantation Campaign under <i>Meri Maati Mera Desh</i> campaign at ICAR-CIPHET, Abohar	52	18 August, 2023
18 th Parthenium Awareness Programme at ICAR-CIPHET, Abohar	52	18 August, 2023

D. Mela/ Exhibitions

- ICAR-CIPHET showcased the Institute’s technologies in the ‘Mechanization, Precision Farming and Value Addition’ segment of the Technology Exhibition organized on 15-18 July, 2023 to mark the ICAR Foundation Day. Technology posters related to cereal processing, horticultural crop processing, and fish processing were visited by many visitors from different sectors including industry, academia, and public administration. The farmers, entrepreneurs, and students visiting the exhibition showed keen interest in the Institute technologies.



- ICAR-CIPHET showcased the Institute’s technologies in *Kisan Mela/ Pashu Palan Mela* in the College of Veterinary Science, GADVASU, Ludhiana during 14-15 September, 2023.



KVK ACTIVITIES

A. Awareness Programmes

S. No.	Programme title	Date	Number of beneficiaries
1.	Awareness Program under <i>Meri Maati Mera Desh</i> and Parthenium Awareness Campaign at Mayadevi Memorial Adersh School, V.P.O Kera Khera	21 August, 2023	63
2.	Health Check-Up Camp under OFT at Baluana Village	3 August, 2023	57

3.	Village Level Awareness Program under the Crop Residue Management Project at Khipawali	25 August, 2023	72
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Various awareness programmes carried out by KVK, Abohar

B. Exhibitions

Sr. No.	Programme Title	Venue	Duration
1.	Technology Day and Exhibition on ICAR Foundation day	KVK, ICAR-CIPHET, Abohar	16-18 August, 2023



Technology day celebration and exhibition on ICAR foundation day

C. Trainings

S. No.	Training Title	Number of Participants	Duration
1.	Cultivation, Nutritional Aspect and Value Addition of Small Millets at KVK, ICAR-CIPHET, Abohar	27	9-11 August, 2023

2.	Nursery Management at KVK, ICAR-CIPHET, Abohar	20	22-24 August, 2023
3.	Animal Feed Management at Ghallu (Fazilka)	54	25 August, 2023



Various trainings organized by KVK, Abohar

OTHER ACTIVITIES

Participation in Conferences/ Seminar/ Symposia/ Workshop/ Meetings

Name of the Official	Title of the programme	Name of conference/ seminar/ symposia/ workshop/ meetings	Date
Dr. Thingujam Bidyalakshmi	Online workshop programme on CAD	Training organized by ICAR-CIAE, Bhopal	7 July - 6 August, 2023
	Deliberation on the comments received on IS 18267: 2023	Virtual meetings organized by FAD, BIS	11 August, 2023

AWARDS & RECOGNITIONS

Awards

Name of the Awardee	Name of Award	Awarded from
Dr. Vikas Kumar	Ph.D. Degree	Tamil Nadu Dr. J. Jeyalalitha Fisheries University
Dr. Dhritiman Saha	Best PhD Thesis Award 2023 for a thesis entitled, "Evaluation of Machine Learning Techniques for Image-Based Quality Assessment of Chickpea"	Canadian Society of Bioengineering during 23-26 July, 2023, at Lethbridge, Alberta, Canada

Dr. D. N. Yadav Ms. Surya Tushir Dr. Swati Sethi Dr. R K Singh Dr. S N Jha Dr. Sangita Bansal Dr. Suman Kapila	Certification of technology entitled, 'Microbial Method for Production of Protein Isolate/Concentrate from Oilseed Cakes/Meals with Inventors'	ICAR, New Delhi on 16 July, 2023
Dr. Armaan Ullah Muzaddadi Dr. Vikas Kumar	Certification of Technology entitled, 'Fish Dressing-cum-Waste Collection System'	ICAR, New Delhi on 16 July, 2023
Dr. Sandeep Mann	Certification of Technology entitled, 'Taro Peeling Machine'	ICAR, New Delhi on 16 July, 2023
Dr. R.K. Vishwakarma Dr. Mridula Devi	Certification of Technology entitled, 'Mechanized System for Primary Roasting of <i>Makhana</i> '	ICAR, New Delhi on 16 July, 2023
Dr. R.K. Vishwakarma Dr. Mridula Devi	Certification of Technology entitled, 'Popped <i>Makhana</i> Grading Machine'	ICAR, New Delhi on 16 July, 2023
Dr. Armaan Ullah Muzaddadi Dr. Vikas Kumar	Certification of Technology entitled, 'Fish Descaling Hand Tool (2-sides bristled)'	ICAR, New Delhi on 16 July, 2023
Dr. K. Narsaiah	Certification of Technology entitled, 'Cool Tower for Production of Microcapsules from High Melting Fats and Waxes'	ICAR, New Delhi on 16 July, 2023
Dr. K. Narsaiah	Certification of Technology entitled, 'Encapsulated Curcumin in Microcapsules for Use as Food Ingredient'	ICAR, New Delhi on 16 July, 2023

MoU SIGNED

S. No.	Title of the Project	Contracting Party	Duration	Type of Consultancy
1.	Performance Evaluation of Stand-Alone Industrial Camera and Mobile Based Grain Analyzer (EASY 360)	M/s Upjao Agrotech LLP, Ahmadabad	11 July, 2023 (06 months)	Consultancy
2.	Development of Rice Bran Protein Rich Gummies and Flavoured Powder Premix	M/s HAUCH Ecovations Pvt. Ltd., Ludhiana, Punjab-141010	5 August, 2023 (1 year)	Contract Research
3.	Post-Harvest Management of Minor	Chhattisgarh State Minor Forest Produce (Trading and Development)	August, 2023 (05 year)	Contract Research-Colloborative

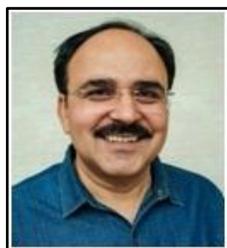
	Forest Produce	Co-operative Federation Limited		
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TRANSFER OF TECHNOLOGY

S. No.	Technology	Firm	Date of Licensing
1.	Ground-based Flavoured Beverage, Curd and Paneer	Mrs. Anita Rakesh Jain, Surat, Gujarat	6 September, 2023

PERSONALIA

Joining



Dr. Sandeep Mann passed M. Tech from CCS Haryana Agricultural University, Hisar, and Ph. D from Punjab Agricultural University, Ludhiana in Processing & Food Engineering. He served as Assistant & Associate Professor in the Faculty of Agriculture SKUAST-Jammu from 2001 to 2013 and contributed towards teaching research and extension work. Dr. Mann has more than 58 publications including research papers, technical bulletins, book chapters, practical manuals, and popular articles. Throughout 23 years of outstanding service in the National Agricultural Research System Experience in the field of Post-Production Processes Mechanization and Value Addition. He conferred with MASHAVE fellowship of Israel in the year 2012, ISAE Team award 2022 and visited the University of Manitoba, Canada in the year 2013. Under the Farmer FIRST programme of ICAR, he along with his team created five commodity interest groups and established seven processing facilities in the Nawanshahr District of Punjab to increase farmers' income. Dr. Sandeep Mann joined as Head Agricultural Structure and Environmental Control Division of ICAR-CIPHET, Ludhiana on 11 July, 2023.



Dr. Amit Nath joined as Head, ICAR-CIPHET Regional Station, Abohar on 14 July, 2023 and he previously worked as Principal Scientist (Food Technology) at ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut, UP, India. He received Master degree from Central Food Technological Research Institute (CFTRI), Mysore, India in the year 1995 and Ph.D. degree from Indian Institute of Technology (IIT), Kharagpur, India in the year 2007 and MBA from IGNOU, New Delhi, India in the year 2008. He already worked in fifteen research projects, filed two patent, published more than 70 research papers in peer-reviewed National & International journals, five books and 45 book chapters. He visited Hangjhou, China under Overseas Fellowship program under, DBT, Govt. of India, New Delhi in the year 2010. He established Pack house facilities (1 ton/day) in the ICAR Complex, Umiam, India under DBT, Govt. of India. Designed and developed HTST air puffing system, low-cost portable biomass fired dryer and CFB packaging systems. He also guided and formulated Detailed Project report (DPR) for bankable projects and commercialized different products (viz., instant ginger candy, *elaeagnus latifolia* and *prunus nepalensis* beverage, blended squash) to NERAMAC, Guwahati and packaging design for fresh ginger transport to NHB, Guwahati, India during 2008-10. He has been conferred with Dr. J.S. Pruthi Award (2013) by AFST (India), Kunwar Saxena

Bahadur Award (2014) from SRDA, Meerut, India and IAHF Fellow (2017) from Indian Association of Hill Farming, India.



Ms. Shilpa S Selvan born and brought up in Kanhangad, Kasaragod (Kerala) graduated in Agriculture Engineering from Kerala Agricultural University, Thrissur in 2017. Thereafter she obtained Master's degree in Processing & Food Engineering from Acharya N.G. Ranga Agricultural University, Guntur (Andhra Pradesh) in 2019. Further she got admitted in ICAR-Central Institute of Agricultural Engineering, Bhopal, an Outreach Campus of IARI, New Delhi for doctoral studies till 2023 before joining the Agricultural Research Services (ARS). She is a recipient of ICAR-NTS Scholarship (2017), ICAR-Senior Research Fellowship (2019) and qualified ASRB-NET during 2021, respectively. She has published few research papers/review articles, book chapters and popular articles. She joined Horticultural Crop Processing division of ICAR-Central Institute of Post-Harvest Engineering & Technology (CIPHET), Regional Station, Abohar, Punjab as a Scientist (Agriculture Structure & Process Engineering) on 20 July, 2023.



Dr. Abhinav Dubey holds a Ph.D. and M.Tech. from ICAR-Indian Agricultural Research Institute, New Delhi, with specialisation in Agricultural Processing & Structures. Dr. Dubey's research portfolio revolves around the development of cost-effective farm drying and storage structures, specifically designed to reduce post-harvest losses, benefiting the vast majority of small and marginal farmers. Notably, he achieved the top ranking in both his B. Tech. (Agricultural Engineering) and M.Tech. (Agricultural Engineering) batches. His academic achievements also include being awarded the prestigious ICAR-Junior Research Fellowship and the ICAR-IARI Merit Medal Fellowship. Furthermore, Dr. Dubey has secured the first position nationally in the ICAR-JRF 2016, ICAR-SRF 2018, and IARI Ph.D. entrance examination 2018. He has also been an awardee of ICAR-National Talent Scholarship and has qualified GATE 2016 featuring among top 50 candidates. In initial stages of his career, he has authored four research papers, several popular articles, and authored a book titled "Recent Trends in Agricultural Engineering". He joined ICAR-CIPHET at Division of Agricultural Structures & Environmental Control on July 21, 2023.



Er. Sumit Bhausahab Urhe born in 1996 belongs to a small village-Guha situated in Rahuri Tehsil of Ahmednagar district of Maharashtra. He did his B.Tech. in Agricultural Engineering from Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri in 2017, He secure 4th rank in MCAER PG entrance examination and also secured AIR 4th rank in ICAR-PG (JRF) exam during 2017. He completed his M.Tech. in Post Harvest Technology from Indian Agricultural Research Institute (IARI), New Delhi during 2017-19. After that he secured AIR 1st rank in ICAR-SRF (Agricultural Processing and Food Engineering) and also 1st rank in IARI Ph.D. entrance exam in 2019 and continued his Ph.D. from IARI, New Delhi. He also qualified ASRB-NET during 2019 and 2021. He is recipient of IARI PG and Ph.D. fellowships during his masters and Ph.D. at IARI. He has published few research/review articles, book chapters, and popular articles. Er. Sumit qualified Agricultural Research Service (ARS-2021) exam in 2023 and he joined as a Scientist, Food Grains & Oilseeds Processing Division of ICAR-Central Institute of Post-Harvest Engineering and Technology (CIPHET), Ludhiana, Punjab on 21 July, 2023.



Ms. Soumya Subhashree Mohapatra, born and raised in Cuttack, Odisha graduated in Agriculture from Odisha University of Agriculture and Technology, Bhubaneswar in 2018. She obtained her MSc degree in Agricultural Economics from ICAR-National Dairy Research Institute, Karnal (Haryana) in 2020. She has secured Best MSc. Thesis Award from ICAR-NDRI, Karnal for her Masters' research work entitled 'Economic analysis of milk and milk products in Haryana: A value chain approach'. Further, she got admitted to ICAR-NDRI, Karnal for Doctoral degree before joining the Agricultural Research Service (ARS) in 2023. Ms. Soumya is a recipient of ICAR- Junior Research Fellowship (2018), ICAR-Senior Research Fellowship (2020), and UGC-NET-Junior Research Fellowship (2022). Her research area of interest includes value chain analysis of agri-food systems, impact assessment, economic evaluation of technologies, agri-market analysis studies, *etc.* She has published a few research publications, review articles, popular articles, book chapters, and conference proceedings. Currently, Ms. Soumya joined ICAR- CIPHET, Ludhiana as a Scientist (Agricultural Economics) in the Transfer of Technology (ToT) Division on 21 July, 2023.



Dr. Shrikrishna Nishani was born in 1990 in an agrarian family. He hails from Dharwad district of Karnataka. He completed his elementary education in Dharwad. He obtained his Bachelor of Technology (B.Tech.) degree in Agricultural Engineering from the College of Agricultural Engineering (CAE), UAS Raichur in 2012. He qualified for the ICAR entrance exam for PG and was admitted to the Indian Agricultural Research Institute (IARI). He did his Master of Technology (M.Tech.) in the Division of Post-Harvest Technology at IARI, New Delhi in 2014.

He obtained his Doctoral Degree from IARI in the year 2021. He has published a number of publications, book chapters, and articles. He joined as a Scientist in the Division of Agricultural Structures and Environment Control (AS& EC) of CIPHET Ludhiana on July 21, 2023.



Dr. Arvind Kumar Ahlawat did M.Sc. (Ag.) and Ph.D. in Agricultural Botany (Genetics & Plant Breeding) from CCS University, Meerut (Formerly Meerut University, Meerut). He joined Quality testing lab of wheat at Directorate of Wheat Research, Karnal as T-II-3 on 3rd June 1995. Then on 24th December 1998, he joined PI&M section in ICAR Krishi Bhavan and from 27th June 2001 to till 31 August 2023, he worked in Grain quality lab at ICAR-IARI, New Delhi. He developed a first-class facility for the evaluation of quality traits of food crops and

evaluated physicochemical, biochemical, rheological and nutritional traits (grain Fe and Zn) of wheat, pearl millet and rice and has analyzed product making quality of wheat for bread, chapatti, cookies, muffins etc. He has published more than 54 peer-reviewed research articles especially related to wheat quality traits of high impact in national and international journals. He is associated in the development of 14 wheat varieties released and notified by the SVRC/CVRC. Quality trait specific 09 wheat genetic stocks were registered with NBPGR, New Delhi. He is also associated in the development of a portable 'Durum Identification Kit' and a cost effective 'Test Weight Measurement Device' for greater accuracy. He has contributed in the development of nullisomic (1A, 6A) and di-telosomic (6AL) lines of durum wheat as part of developing celiac safe wheat genotypes. On 1 September 2023, he joined as Senior Scientist -cum -Head, KVK, Fazilka, Abohar.

ICAR-CIPHET in News

पशु आहार प्रबंधन पर एक दिवसीय प्रशिक्षण कार्यक्रम का आयोजन



गांव घल्लू में आयोजित कार्यक्रम में शिरकत करते गांववासी।

सवेरा न्यूज़/धर्मवीर अबोहर: कृषि विज्ञान केंद्र अबोहर द्वारा पशु आहार प्रबंधन पर प्रशिक्षण कार्यक्रम का आयोजन घल्लू गांव में 25 अगस्त को आरजीवी रील लुधियाना के फील्ड ऑफिसर रतन सिंह के सहयोग से करवाया गया। इस कार्यक्रम का संवाहन डॉक्टर रूपेंद्र कौर विशेषज्ञ गृह विज्ञान एवं प्रभारी कृषि विज्ञान केंद्र द्वारा किया गया। डॉक्टर अमनोल मेहरोत्रा टेक्टरनरी डॉक्टर घल्लू द्वारा पशु आहार प्रबंधन के विभिन्न घरेलू तरीकों के बारे में जानकारी साझा करते हुए पशुओं को मौसमी बीमारियों से बचाने के विभिन्न तरीके पर भी विस्तारपूर्वक बताया। डॉक्टर रूपेंद्र कौर ने कृषि विज्ञान केंद्र द्वारा चलाई जाने वाले विभिन्न कार्यक्रम एवं गतिविधियों की जानकारी देते हुए महिलाओं को स्वयं सहायता समूह से जुड़कर पशुपालन एवं डेयरी में अपना योगदान स्थापित करने के लिए प्रेरित किया। इस कार्यक्रम में कुल 55 प्रतिभागियों ने भाग लेकर कार्यक्रम को सफल बनाया।

पौधशाला प्रबंधन पर 3 दिवसीय प्रशिक्षण कार्यक्रम का समापन



प्रतिभागियों को प्रमणपत्र दितरित करते आयोजक।

सवेरा न्यूज़/कथुरिया अबोहर: कृषि विज्ञान केंद्र अबोहर द्वारा पौधशाला प्रबंधन पर 22 से 24 अगस्त को 3 दिवसीय व्यावसायिक प्रशिक्षण कार्यक्रम का आयोजन पृथ्वीराज मुख्य सहायक तकनीकी अधिकारी कृषि विज्ञान केंद्र सीफेट अबोहर द्वारा करवाया गया। इस प्रशिक्षण के अंतर्गत पौधशाला प्रबंधन के विभिन्न पहलुओं जैसे योजना पौध प्रबंधन के विभिन्न तरीके पौधशाला में पौध संरक्षण पौधों के रखरखाव जानकारी से संबंधी जानकारी वीडियो प्रेजेंटेशन द्वारा प्रयोगिक जानकारी दी गई, मुख्य वक्ताओं में डा. अनिल सांगवान निदेशक क्षेत्रीय खोज केंद्र पीरयू अबोहर, डॉक्टर जगदीश अरोड़ा किसान सलाहकार सेवा केंद्र अबोहर, राजेश कुमार एसीटीओ एवं डॉक्टर रूपेंद्र कौर विशेषज्ञ गृह विज्ञान एवं प्रभारी कृषि विज्ञान केंद्र उपस्थित थे। सभी प्रतिभागियों को डॉ. अमित नाथ प्रमोकर अध्यक्ष क्षेत्रीय केंद्र अबोहर ने प्रतिभागियों को प्रमाण पत्र वितरित किए। इस प्रशिक्षण में 20 प्रतिभागियों ने भाग लेकर कार्यक्रम को सफल बनाया।



बाजरा उत्पादन, पोषण व मूल्य संवर्धन पर 3 दिवसीय प्रशिक्षण कार्यक्रम

अबोहर, 11 अगस्त - कृषि विज्ञान केंद्र, सीफेट अबोहर द्वारा बाजरा उत्पादन, पोषण व मूल्य संवर्धन पर 3 दिवसीय व्यावसायिक प्रशिक्षण कार्यक्रम का आयोजन 9 से 11 अगस्त 2023 को किया गया। यह कार्यक्रम अंतर्राष्ट्रीय कोलोन वर्क के उपलब्ध में आयोजित किया गया। 'बाजरा' संवर्धन राजेश कुमार, महासक सहायक तकनीकी अधिकारी, डॉ. अनिल सांगवान, कृषि विज्ञान केंद्र, सीफेट अबोहर, प्रमुख वक्ताओं के रूप में शामिल हुए। कार्यक्रम के अंतर्गत बाजरा उत्पादन, पोषण व मूल्य संवर्धन पर 3 दिवसीय व्यावसायिक प्रशिक्षण कार्यक्रम का आयोजन 9 से 11 अगस्त 2023 को किया गया। यह कार्यक्रम अंतर्राष्ट्रीय कोलोन वर्क के उपलब्ध में आयोजित किया गया। 'बाजरा' संवर्धन राजेश कुमार, महासक सहायक तकनीकी अधिकारी, डॉ. अनिल सांगवान, कृषि विज्ञान केंद्र, सीफेट अबोहर, प्रमुख वक्ताओं के रूप में शामिल हुए।



प्रतिभागियों को संबोधित करते संस्था-के निदेशक डा. अनिल सांगवान।

नेतृत्व में व्यवस्थापक प्रशिक्षण डॉ. अमनोल द्वारा करते थे। प्रशिक्षण के अंतर्गत बाजरा उत्पादन, पोषण व मूल्य संवर्धन पर 3 दिवसीय व्यावसायिक प्रशिक्षण कार्यक्रम का आयोजन 9 से 11 अगस्त 2023 को किया गया। यह कार्यक्रम अंतर्राष्ट्रीय कोलोन वर्क के उपलब्ध में आयोजित किया गया। 'बाजरा' संवर्धन राजेश कुमार, महासक सहायक तकनीकी अधिकारी, डॉ. अनिल सांगवान, कृषि विज्ञान केंद्र, सीफेट अबोहर, प्रमुख वक्ताओं के रूप में शामिल हुए।

पसली प्रबंधन व स्कूल स्तरीय जागरूकता कार्यक्रम करवाया



पसली प्रबंधन व स्कूल स्तरीय जागरूकता कार्यक्रम करवाया। कार्यक्रम का आयोजन 29 अगस्त (कागम) कृषि विज्ञान केंद्र अबोहर और केन्द्रीय कक्षाएं उत्तरांचल इन्स्टीट्यूट ऑफ एग्रीकल्चरल साइंसेस के बीच के बीच किया गया। इस कार्यक्रम का आयोजन प्रशिक्षण परीक्षा के दिनांकितों अनुसार लक्ष्य प्राप्त करने के लिए किया गया। कार्यक्रम में पसली प्रबंधन और स्कूल स्तरीय जागरूकता कार्यक्रम करवाया गया। इस कार्यक्रम का आयोजन प्रशिक्षण परीक्षा के दिनांकितों अनुसार लक्ष्य प्राप्त करने के लिए किया गया। कार्यक्रम में पसली प्रबंधन और स्कूल स्तरीय जागरूकता कार्यक्रम करवाया गया। इस कार्यक्रम का आयोजन प्रशिक्षण परीक्षा के दिनांकितों अनुसार लक्ष्य प्राप्त करने के लिए किया गया।



स्वास्थ्य जांच शिविर में शिरकत करते बल्लूजना की महिलाएं।

कृषि विज्ञान केंद्र द्वारा स्वास्थ्य जांच शिविर का आयोजन

कृषि विज्ञान केंद्र द्वारा स्वास्थ्य जांच शिविर का आयोजन। कार्यक्रम का आयोजन 20 अगस्त को कृषि विज्ञान केंद्र अबोहर द्वारा बल्लूजना गांव में आयोजित किया गया। शिविर का आयोजन कृषि विज्ञान केंद्र द्वारा, आगनवाड़ी सुरक्षादाता रवीना व आगनवाड़ी कार्यकर्ताओं तथा स्वास्थ्य विभाग के कार्यकर्ताओं के सहयोग से करवाया गया। इस शिविर के दौरान 57 बच्चों को स्वास्थ्य जांच की गई। शिविर का आयोजन कृषि विज्ञान केंद्र द्वारा, आगनवाड़ी सुरक्षादाता रवीना व आगनवाड़ी कार्यकर्ताओं तथा स्वास्थ्य विभाग के कार्यकर्ताओं के सहयोग से करवाया गया। इस शिविर के दौरान 57 बच्चों को स्वास्थ्य जांच की गई। शिविर का आयोजन कृषि विज्ञान केंद्र द्वारा, आगनवाड़ी सुरक्षादाता रवीना व आगनवाड़ी कार्यकर्ताओं तथा स्वास्थ्य विभाग के कार्यकर्ताओं के सहयोग से करवाया गया। इस शिविर के दौरान 57 बच्चों को स्वास्थ्य जांच की गई।

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ICAR - CIPHET, Ludhiana signed MoU with MDU, Rohtak

ICAR - CIPHET, Ludhiana signed MoU with MDU, Rohtak. 18th May 2023, Rohtak. ICAR - Central Institute of Post-Harvest Engineering and Technology, Ludhiana, and Maharshi Dayanand University, Rohtak entered into an agreement to collaborate in the area of Academics, Research, and Outreach. The Memorandum of Understanding was signed by Dr. Nachiket Kotwaliwale, Director, ICAR - CIPHET, Ludhiana and Dr. Gulshan Lal Taneja, Registrar, MDU, Rohtak today at MDU, Rohtak. The function was chaired by Dr. Rajveer Singh, Vice Chancellor, MDU, Rohtak. The MoU will pave the way for the training and dissertation of the university students, collaborative research projects, and exchange of experts in various outreach programs conducted by both the institutions in areas of food processing and other frontiers of mutual interest.

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