

2024

# ICAR-CIPHET

## NEWS

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# From the Director's Desk

Dear Stakeholder,

It is with great pleasure that I present the fourth quarterly newsletter of 2024, highlighting the key achievements and activities of our institute over the past few months. Our continued efforts in research, innovation, and extension activities have contributed significantly to advancements in agricultural engineering and food processing.

On the technological front, we are proud to announce that a patent has been granted for one of our breakthrough technologies, reinforcing our commitment to innovation and intellectual property rights. Our AICRP centres have developed several technologies focused on post-harvest processing, food preservation, and sustainability, benefiting farmers, entrepreneurs, and the food industry. Our research in food processing has further enhanced techniques to improve quality, shelf life, and value addition, ensuring better utilization of agricultural produce while minimizing losses.

Alongside research, we have conducted various extension activities, including awareness programs, training sessions, and exposure visits for farmers, students, and industry professionals. These initiatives help to bridge the gap between research and practical implementation. I extend my sincere gratitude to our dedicated scientists, staff, and collaborators whose relentless efforts drive these achievements.

As we move forward, let us continue to innovate and collaborate for a more resilient and progressive agricultural sector.

(Nachiket Kotwaliwale)  
Director, ICAR-CIPHET

Ludhiana, 2024

## Research Highlights

## ICAR-CIPHET

❖ **Real-time sensor-based monitoring system of banana in supply chain under ICAR-NePPA**

Bananas are highly perishable and sensitive to environmental conditions such as temperature, humidity, and ethylene levels, making real-time monitoring essential to maintain quality from farm to market. Hence, a sensor-based monitoring system has been developed to enhance the supply chain management of bananas, focusing on maintaining optimal environmental conditions during transport, storage, and ripening. The compact, durable device system integrates advanced sensors to monitor critical parameters such as temperature, relative humidity, ethylene concentration, and GPS location in real time. The inclusion of a low-power paper display extends operational life, while the enclosed design protects internal components and improves usability. The system employs precision temperature and humidity sensors to ensure the maintenance of ideal conditions, preventing premature ripening or spoilage. An ethylene sensor tracks ripening stages by measuring gas concentrations, enabling dynamic adjustments to storage or transport conditions to control ripening rates. Data collected is transmitted wirelessly through Wi-Fi or SIM connectivity to a secure SQL database, where it is accessible via a web-based interface. Trials conducted demonstrated the system's reliability, with data such as temperature, humidity, and ethylene levels recorded over time to validate performance. For instance, ethylene concentrations were observed to increase progressively, correlating with ripening stages. The device was showcased at events like the Indian Mobile Congress and ICAR-CIPHET Kisan Mela. This system ensures quality retention, reduces losses, and supports sustainable banana supply chain practices.



### ❖ X-ray imaging and processing for internal quality assessment of mangoes

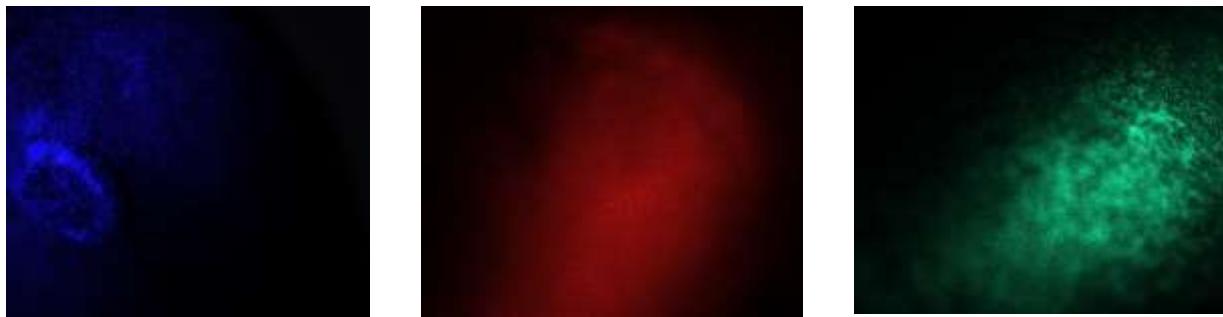
X-ray imaging technology is used for assessing the internal quality of mangoes, offering a non-destructive alternative to traditional methods. This objective focuses on utilizing X-ray imaging to detect internal defects such as spongy tissue and seed weevil infestation, which are critical factors affecting mango quality in Alphonso. The development process began with data acquisition and parameter optimization for X-ray imaging. Alphonso mango samples were subjected to imaging at varying voltages (40-80 kV) and currents (4-20 mAs) to determine the optimal settings for highlighting internal anomalies. The analysis identified 40 kV with 20 mAs and 50 kV with 20 mAs as ideal parameters for achieving high contrast and clarity in defect visualization. The X-ray imaging system is equipped with advanced components, including a dynamic detector with 85  $\mu$ m pixel resolution and a tunnel size of 130 x 120 mm, capable of processing up to one ton of mangoes per hour. This system integrates a push-out rejection mechanism, enabling automated segregation of mangoes with internal defects, thereby enhancing sorting efficiency. Image processing techniques were applied to improve the interpretability of X-ray images for spongy tissue detection. Methods such as blurring, grayscale conversion, histogram equalization, and adaptive thresholding were employed to enhance contrast and highlight defect-prone regions. Blurring reduced noise, facilitating a clearer focus on the mango structure, while grayscale conversion simplified the images for analysis. Histogram equalization improved visibility by enhancing subtle differences in tissue density, and adaptive thresholding created high-contrast binary images to delineate defect areas effectively. These preprocessing steps helped in preparing the dataset for model training. For spongy tissue defect classification, deep learning models such as MobileNetV3 and Xception were explored. MobileNetV3, optimized for resource efficiency, showed limitations with validation accuracy stabilizing at 60%, indicating some degree of overfitting. In contrast, the Xception model achieved superior results, with test accuracy reaching 84.88%, a balanced area under the curve (AUC) of 0.95, and high precision in distinguishing between spongy and non-spongy tissues in Alphonso mangoes. The robust performance of Xception highlights its potential for real-time applications in mango quality assessment.



X-ray with rejection mechanisms

### ❖ Imaging protocol and biospeckle dataset

Imaging protocol has been developed for observing the changes in biospeckle patterns of peaches under varied conditions over the period of time. The process has been optimized for generating speckle signatures of the peaches on the dedicated laser based biospeckle imaging facility. The imaging protocol was developed: comprising of lasers (632nm, 10W and 5 W and diode laser of 405



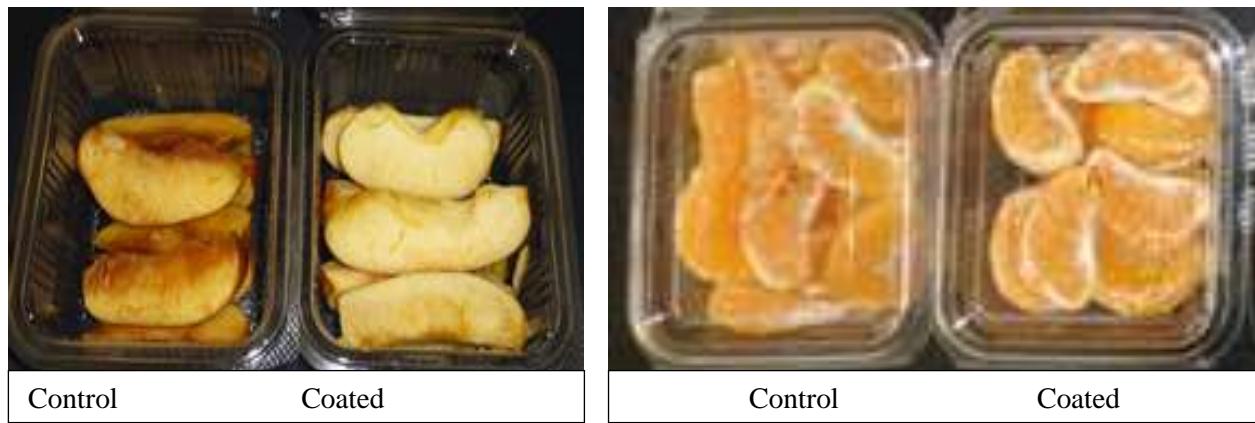
Sample bio-speckle signatures of peaches (*var. Alaxender*) captured using laser source of 5mW at (i) 405nm (ii) 650nm (iii) 532 nm

nm), beam expander (20x), filters, optical mirror, polarizer, CMOS camera with zooming lens of 2.8 having focal length of 50mm place at 30-45° from the incident light source and sample holder with X-Y translational state. The optimized protocol has been developed to study the chilling injury in the peaches during cold storage.

❖ **Shelf Life and Quality enhancement of Fresh-Cut Fruits Using Edible Aloe Vera and Cactus Coatings**

Minimally processed fruits are gaining popularity due to their convenience, freshness, and nutritional benefits. However, their short shelf life, susceptibility to oxidative browning, and rapid microbial infection pose significant challenges. To address these issues, this study explored the use of natural preservatives in the form of edible coatings made from Aloe vera and cactus mucilages. The goal was to enhance the quality and safety of fresh-cut apple slices and kinnow segments during storage. The edible coatings were prepared using different concentrations of Aloe vera (25%, 50%, 75%, and 100%) and cactus mucilage (10%, 20%, and 30%) in a base matrix containing 1% pectin and 0.5% glycerol. Fresh-cut fruit pieces were dipped in the mucilage solutions for 10 minutes, with distilled water-treated samples serving as controls. The coated fruit samples were packed in polypropylene boxes and stored at  $5 \pm 1^{\circ}\text{C}$  for 24 days. Various quality parameters, including weight loss, browning index, firmness, acidity, total soluble solids (TSS), ascorbic acid content, microbial load, and sensory quality, were monitored at three-day intervals. The findings indicated that higher concentrations of Aloe vera (75-100%) and cactus mucilage (20-30%) were most effective in maintaining fruit quality. These coatings significantly reduced weight loss, delayed enzymatic browning, improved firmness, and preserved nutritional attributes compared to control samples. Lower concentrations of the gels (25-50% Aloe vera and 10% cactus) had minimal effects on quality preservation. Aloe vera gel was particularly effective due to its superior germicidal properties and higher sensory acceptability. Apple slices coated with 75% Aloe vera gel showed no detectable pathogens or molds for up to six days and maintained lower browning levels compared to control samples even after 12 days. Kinnow segments coated with Aloe vera or cactus gel remained commercially viable for nine days, with no signs of fungal growth (e.g., *Botrytis cinerea*) or *E. coli* contamination, while control samples exhibited microbial loads exceeding 5.0 log CFU within six

days.



❖ **Consumer Acceptability Study of value-added products from groundnut milk processing waste**

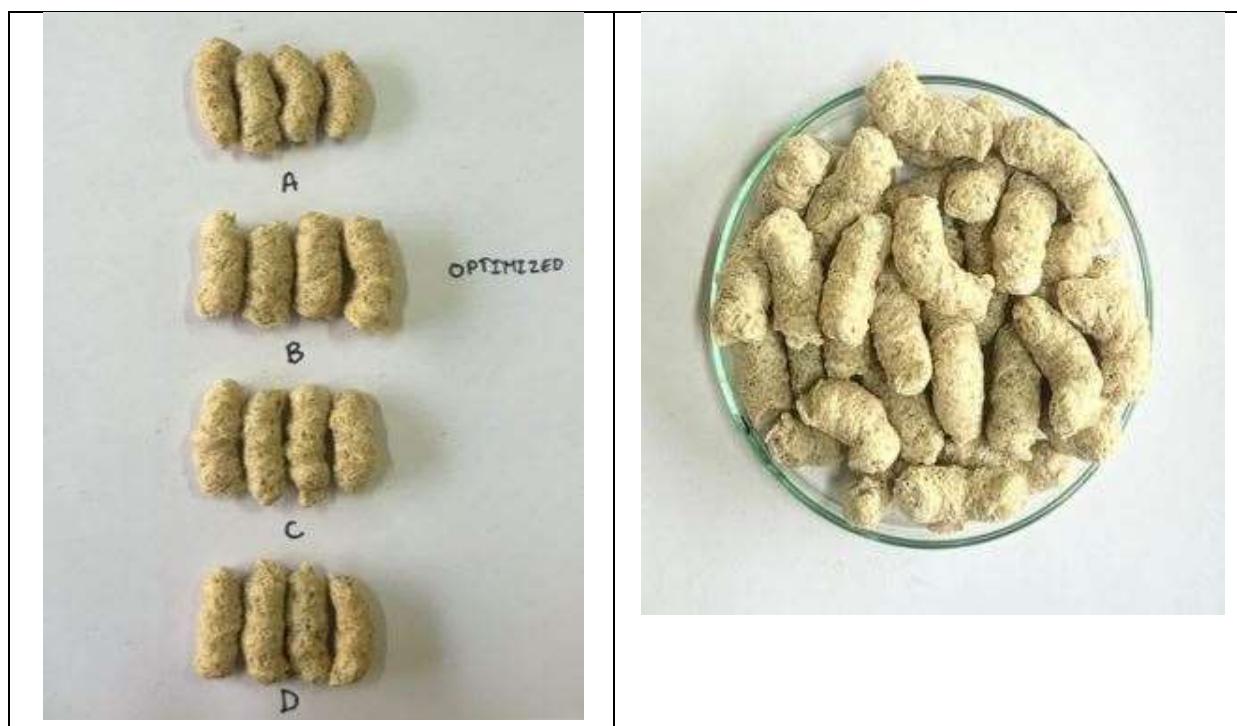
The primary consideration for selecting and eating a food commodity by today's consumers is the product's palatability or eating quality, and other quality parameters, such as nutrition and wholesomeness are secondary. To study the consumer acceptability, three value added products- whey mango beverage, high fibre peanut butter, and whipped cream developed and optimized from by-products obtained from peanut milk and tofu processing were given to CIPHET IIFA and Kisan mela attendees. About 200 participants were asked to taste each product and score the sensory parameters based on a 5 point hedonic scale, briefed and provided to them. Whey mango beverage was served in bottles, peanut butter and cream were spread in white bread and light salted biscuit. All the three products were scored 'like extremely' by majority of the consumers. Whey mango beverage was liked extremely for colour, texture, taste and aroma by 89.3, 70.7, 58.7 and 70.7 % of the consumers. Peanut butter was liked extremely for colour, texture, taste and aroma by 90.0, 74.7, 86.0 and 74.0 % of consumers. Whipped cream was liked extremely for colour, texture, taste and aroma by 70.0, 35.3, 70.7 and 64.7 %. The scores indicated that the products are well liked by the consumers and may succeed in the market.



Photo: whey mango beverage, high fibre peanut butter, whipped cream

### ❖ Development of millet based extruded snacks with special dietary requirements

Protein deficiency in India, especially among children, leads to stunted growth, weakened immunity, and cognitive issues, particularly in underprivileged areas. This study aims to address protein deficiency by developing high-protein (>19%) snacks from nutrient-rich ragi (finger millet) using extrusion technology. The extruded snacks were developed through trials using ragi, roasted Bengal gram, defatted soya meal, corn, and soy protein isolates. The final optimized formulation (40% ragi, 30% roasted Bengal gram, 20% corn, and 10% SPI) achieved a protein content of 19.68%, providing 6.89g of protein per 35g pack, meeting 22% of the recommended daily allowance for 10–12-year-old children. Pasting analysis showed peak viscosity at 676 cP and peak temperature at 84.6°C, indicating optimal gelatinization properties. Further, extrusion process parameters, namely, feed moisture content (13, 15 and 17%), screw speed (375, 425 and 475 rpm), temperature (100, 120 and 140 °C) and feed rate (0.09, 0.17 and 0.25 kg/min) were optimized using Boxe Behnken experimental design (Design-Expert, version 8, USA). Quality parameters like expansion ratio, bulk density, Water absorption index (WAI), water solubility index (WSI), hardness, in-vitro protein digestibility (IVPD), DPPH antioxidant capacity were studied. The expansion ratio, hardness, bulk density of the extrudates were the key indicators representing the degree of puffing and texture. The measured expansion ratio ranged from 2.940 to 3.266, while the bulk density varied between 0.102 and 0.187 g/cm<sup>3</sup>. The hardness of the extrudates, which was found to range between 28.32 to 50.27 N. Sensory evaluation (hedonic scale) showed high overall acceptability of 8.5. Additionally, a significant reduction in antinutritional factors was observed, with phytic acid and tannin content decreasing by approximately 17% and 41%, respectively, when compared to the composite feed material. Based on the RSM analysis, the optimal extrusion conditions were determined to be a feed moisture content of 15.3%, a screw speed of 428.6 rpm, a temperature of 124.4°C, and a feed rate of 0.17 kg/min. Under optimal conditions, the extrudates achieved a 3.245 expansion ratio, 0.1036 g/cm<sup>3</sup> bulk density, 3.654 g/g WAI, 31.459% WSI, 29.69 N hardness, and 60.81% IVPD, with a protein content of 19.68% and antioxidant activity of 28.45 μmol/g.



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### AICRP on PHET

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❖ **Development of mobile Bio-char unit for eco-friendly management of sugarcane crop residues (RARS, Anakapalle)**

Sugarcane bagasse is one of the largest waste products generated by the sugar industry. Improper disposal or inefficient management of this residue poses environmental challenges. There is a growing need for sustainable and eco-friendly methods to manage sugarcane crop residues and turn this waste into a valuable resource. Fabricated portable bio-char drum by adopting the design of CRIDA bio-char drum. Conducted experiments using sugarcane bagasse and produced bio-char at different reaction times of 8, 10, 12 and 14 minutes. The bio-char obtained at retention time of 14 minutes resulted in maximum bio-char recovery of 14%.



**Bio-char drum**



**Sugarcane Bagasse**



**Bio-char prepared from sugarcane bagasse**

❖ **Development of a Low-cost Mobile Reinforced Clay Pot Smoker for Meat and Fish (AAU, Khanapara).**

One mobile smoking machine has been developed with an inner clay pot chamber. The machine has two major components i.e. one external smoke generator and one smoke chamber which is built with a clay pot reinforced with a outer food grade SS Box. The external smoke generator is fitted with a 0.5 KW heater for burning the sawdust/ saw chips and the smoke generated is carried to the smoking chamber with the help of a galvanized pipe. The external smoke generator is also equipped with a blower fan to blow the smoke to the main smoke chamber. The main smoke chamber, which is made

up of clay, is fitted with 3 heating elements. Each heating element has a capacity of 1.0 Kw and the maximum temperature attainable inside the smoke chamber is 200°C. There are two meat trays inside the smoke chamber each having a capacity of 5.0 kg meat per tray. The upper lid of the smoke chamber is fitted with a fan to distribute the heat as well as smoke inside the chamber evenly.



Mobile Reinforced Clay-pot Smoker

❖ **Accelerated aging of cocoa mucilage wine through hydrodynamic cavitation (KAU, Tavanur).**

Cocoa wine was prepared based on the process protocol developed under AICRP on PHET, Tavanurcentre. The reactor's performance was evaluated with three venturi types: slit, orifice, and elliptical. Process parameters, including pressure and flow time, were analyzed for their impact on cavitation number, volumetric flow rate (VFR), total phenolic content (TPC), and energy released. Results highlighted the slit venturi at 3.5 bar pressure for 46 minutes as the optimal configuration. Comparative analysis showed that HC-treated wine had improved quality, including higher TPC, antioxidant activity, and vitamin C content, than both freshly prepared and aged wines, with desirable mineral content and lower titratable acidity.



Developed hydrodynamic cavitation.

❖ **Development and performance evaluation of chocolate enrobing machine (KAU, Tavanur)**

Shortbread cookies were selected for the enrobing studies. It was prepared and its properties were evaluated. Based on that, a chocolate enrobing machine was designed and developed. Development and performance evaluation of a modified chocolate enrobing machine for shortbread cookies involved optimizing variables such as chocolate flow rate, belt speed, and hot air flow. The ideal settings were determined to be a 4 kg/min flow rate, 2.5 m/min belt speed, and a  $3.3 \times 10^{-3}$  m<sup>3</sup>/s hot air flow. Under these conditions, the machine coated 190 cookies per hour with 94.7% efficiency, consuming 5.48 kWh. Sensory analysis highlighted that the optimized cookies scored higher than other samples, including commercial ones, with an overall acceptability score of 8.45. Physicochemical analysis showed the cookies had a 6.1 cm diameter, 20.9 mm thickness, and 2.94% moisture content, among other attributes. The machine's operation cost was Rs. 340/h, yielding a benefit-cost ratio of 1.05:1 and a payback period of 3.15 years.



Modified Chocolate Enrobing Machine and Its Working.

❖ **Development of automatic paddy straw based mushroom production and processing plant (OUAT, Bhubaneshwar).**

The motor-operated slider crank mechanism is designed for efficient cutting of paddy straw into uniform lengths for mushroom bed preparation. It reduces manual labor and ensures precise, intact cuts, promoting better mushroom production.



With an impressive capacity of 800 bundles per hour and a low power requirement of 0.375 kW, it is energy-efficient. Priced at Rs. 50,000, it offers an economical solution with a production cost of Rs. 0.30 per bundle. Requiring only one operator, the machine streamlines straw processing, making it ideal for large-scale farming while improving productivity and reducing manual drudgery in mushroom cultivation.

❖ **Multicrop processing machine (UAS, Bangalore).**

The Multicrop processing machine (MCP) is a versatile and efficient device designed for multiple post-harvest tasks, including groundnut stripping, decortication of groundnut and castor pods, maize shelling, and sunflower threshing, ensuring minimal damage to seeds and pods. Equipped with three attachments for stripping, shelling, and threshing, it separates groundnut pods, maize, sunflower, and castor seeds effectively, handling up to 75 kg of groundnut pods or 250 maize cobs per hour with over 98% efficiency and more than 95% seed germination. The MCP is compact, portable, and powered by a 0.5-1.0 hp motor, making it accessible for small to medium-scale farmers and processors. Economically, it is 3-4 times more cost-effective than purchasing separate machines for each crop, offering significant benefits to farmers, SHGs, seed processors, and small enterprises by reducing post-harvest losses and boosting income potential.



❖ **Development of a Low-cost Mobile Reinforced Clay Pot Smoker for Meat and Fish (AAU, Khanapara)**

The project addresses the need for affordable and efficient smoking devices, making traditional meat and fish preservation accessible to low-income communities. A new mobile smoking machine has been developed featuring an inner clay pot chamber and two primary components: an external smoke generator and a clay-based smoking chamber reinforced with a food-grade stainless steel (SS) box. The smoke generator includes a 0.5 kW heater to burn sawdust or saw chips, and a blower fan ensures efficient smoke transfer to the chamber via a galvanized pipe. The clay smoking chamber houses three heating elements (1.0 kW each), capable of reaching a maximum temperature of 200°C. It contains two meat trays, each with a 5 kg capacity, and is equipped with a fan on the lid to ensure uniform heat and smoke distribution. Reinforced clay

offers a sustainable and eco-friendly material alternative, reducing reliance on costly industrial equipment. The mobile design enhances usability and portability, supporting small-scale producers and vendors in rural and urban areas.



### Mobile Reinforced Clay-pot Smoker

Dimensions:	
Height	910.0 mm
Breadth	700.0 mm
Weight of the machine	120.0 kg
Capacity	10.0 kg / batch
Max. temperature	200°C
Energy Consumption	5 unit/ hr
Cost	Rs. 85,000.00/ unit

#### ❖ PDKV Wet Red Chilli Seed Extractor (PDKV, Akola)

A wet red chilli seed extractor was developed to simplify seed extraction from wet red chillies, reducing the labor of traditional methods for dry chillies. The machine operates at an optimal feed rate of **300 kg/h** and a shaft speed of **850 rpm**, achieving **97.51% extraction efficiency**, minimal seed loss (**0.24%**), and high germination rates (**94.78%**). Its fully enclosed design prevents irritation and sneezing while preserving seed quality. Key components include a mild steel frame, feed hopper, seed extraction drums, perforated sieve, seed outlets, and a husk outlet. Wet chillies are crushed in the upper drum, and seeds pass through a sieve, while remaining husk and seeds are processed in the lower drum for complete extraction.



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## AICRP on PEASEM

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### ❖ Standardization of aeroponics system for high value herbs and flowers

It takes three years to produce Lilium Bulbs in the open. If these bulblets are grown under aeroponics conditions, the bulb production period will be shortened to one and a half years. So the trial has been planned, and eighteen aeroponics units have been fabricated in-house at the Demonstration Farm under the Department of Soil and Water Engineering, PAU Ludhiana. The structure of each unit is built using 6.35 mm thick angle iron (1.5" x 1.5"). Four pipes of one-inch diameter and 45" length is fixed vertically and a profile is fixed on each pipe to hold the insect net and to give support to the plants. The growing chamber is made from a 2-inch-thick Styrofoam sheet, measuring 47" in length, 21" in width, and 40" in height. The chamber on the top is covered with a Styrofoam sheet having 21 holes with 3-inch openings to accommodate net pots that support the plants. Each unit is covered with a 40-mesh insect-proof net. Three nozzles are installed in each unit for nutrient supply to the plants, each with a discharge rate of 0.32 l/min. A 0.5 hp pump is used to supply the nutrient solution through these nozzles as a mist at an operating pressure of 3.0 kg/cm<sup>2</sup>. A 100-litre rectangular tank stores the nutrient solution, and gravity collects the excess nutrient solution back into this tank.



### ❖ Dual purpose Renewable Energy-Based Fodder Dryer and Winter Protection Shelter for goats (ICAR-CIRG, Makhdoom)

The Renewable Energy-Based Fodder Dryer and Winter Protection Shelter for goats, developed by ICAR-CIRG in Makhdoom, offers an innovative solution for housing goat kids during winter, addressing their susceptibility to pneumonia. This structure is also useful for drying fodder, particularly during the monsoon season when fodder is plentiful but drying rates are low due to high humidity. Notably, the structure harnesses renewable energy to power its drying system, reducing reliance on conventional system i.e. open drying. The structure measures 22 x 11 feet, the shelter can accommodate up to 40 goat kids aged 6-9 months. It is equipped with plastic panels that provide thermal insulation, making it a cost-effective option for both shelter and fodder drying. A trial was conducted to assess the drying efficiency

of green biomass (*Cenchrus* spp.), which initially had a moisture content of 83.46% and a dry matter content of 16.54% (wet basis). The performance of the polyhouse solar dryer (S1) was compared to open sun drying (S2) and shade drying (S3). The polyhouse solar dryer achieved a maximum air temperature increase of 17°C above ambient levels. After 59 hours of drying, the moisture content of the biomass in the polyhouse solar dryer (S1) was reduced to 9%, while open sun drying (S2) and shade drying (S3) resulted in moisture contents of 26.5% and 24%, respectively. This integration of renewable energy not only enhances efficiency but also promotes sustainable agricultural practices.



#### ❖ Portable solar-powered irrigation system

A portable solar-powered irrigation system was developed ICAR-VPKAS, Almora and tested at the Hawalbagh experimental farm in Uttarakhand. Solar energy-based irrigation systems offer a sustainable solution for terrace cultivation in hilly regions. This system helps to minimize electricity use for pumping water to higher terraces, ensuring efficient water distribution, especially in fields above storage ponds. The movable nature of the system allows it to be shifted between different terraces, providing flexibility in water application depending on seasonal needs. Multiple stakeholders can use a single system, optimizing water extraction points and reducing costs. Additionally, the mobile design reduces the risk of theft and vandalism of solar panels and pumps. Overall, solar-powered irrigation systems promote sustainable agricultural growth, contributing to a greener, more resilient future for hill farming.

The study focused on investigating the effects of solar panel tilt angle (ranging from 0° to 75°) and solar irradiance (690 to 730 W/m<sup>2</sup>) on pump discharge. The highest pump flow was observed at tilt angles between 43° and 45°. Data were continuously recorded using digital devices, and hourly solar radiation was monitored throughout September 2024, with peak irradiance reaching 1027 W/m<sup>2</sup> at 1:35 PM. The pump flow rate varied between 6 to 12 lpm, with higher flow rates during periods of stronger solar

irradiance. The system having total weight is 22 kg.

These findings highlight the significant impact of solar radiation on the system's performance, demonstrating that the portable solar-powered irrigation system can offer a viable and flexible solution for water pumping in remote, electricity-deprived areas, particularly in hilly terrains where conventional irrigation systems are not feasible.



## Publications

## Research Articles

- Attri N, Kaur S, Aggarwal P, Kaur N, Kasana RC (2024) Phytonutrient-rich guava date fruit confection: Formulation, quality analysis and shelf-life studies. *Journal of Food Measurement and Characterization*. 18, 10157–10165.
- Bidyalakshmi T, Kotwaliwale N, and Visvanathan R (2024). Evaluation of Commercially Available Plant-based Food Serving Disposable Crockery for Quality Standards. *Journal of Agricultural Engineering*. 61(4). <https://doi.org/10.52151/jae2024614.1866>.
- Bidyalakshmi T, Jyoti B, Mansuri SM, Srivastava A, Mohapatra D, Kalnar YB, Narsaiah K, and Indore N (2024). Application of Artificial Intelligence in Food Processing: Current Status and Future Prospects. *Food Engineering Reviews*, 1-28. <https://doi.org/10.1007/s12393-024-09386-2>.
- Dubey A, Mani I, Chandni, Nebapure, SM, Paray RA, Rudra SG, and Routray W (2024). Evaluating the effectiveness of insecticides on storage bag surfaces for managing *Callosobruchus maculatus* (Fabricius) (Coleoptera: Bruchidae). *Journal of Stored Products Research*, 109, 102446. <https://doi.org/10.1016/j.jspr.2024.102446>.
- Rana S, Kapoor S, Bala M, Surasani VK, Agarwal A, and Thakur M (2024). Optimization and characterization of tomato seed protein isolate: a sustainable source of functional protein. *Biomass Conversion and Biorefinery*. 17:1-8. <https://doi.org/10.1007/s13399-024-06224-7>
- Kapoor K, Bala M, Choudhary P, Mridula Dand Singh RK (2024). Development of Method for Detection

of Rhodamine B Dye in Chilli Powder (*Capsicum annuum* L.). *Asian journal of Dairy and Food Research* 43 (3): 539-543. doi: 10.18805/ajdfr.DR-1733.

- Mridula D, Arora S, Sonmati R K, Bala M, Vishwakarma RK, and Goswami D (2024). Ultrasound Assisted Extraction of Bioactive Compounds Rich Extract from Immature Dropped Kinnow Fruit. *Journal of Agricultural Engineering*, 61(4): 539-551.
- Sharma K, Patel S, Mridula D, and Vishwakarma RK (2024). Effect of Packaging Material and Storage Period on Popping Behaviour of Roasted Makhana Seeds. *Journal of Agricultural Engineering* (India), 61(4), 525-538. <https://doi.org/10.52151/jae2024614.1870>

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### Training manuals

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- Guru PN, and Urhe SB (2024). Training manual on Engineering and technological interventions for safe storage of food grains. Organized under SCSP scheme (GoI) by ICAR-Central Institute of Post Harvest Engineering and Technology (CIPHET), Ludhiana-141004 during 24-26 September, 2024, Pg 103.|

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### Popular Articles

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- Dubey A (2024). Non-destructive estimation of tender coconut water volume: Challenges, methods, and future perspectives. *The Agriculture Magazine*, 4(2), 465–469.
- Dubey A, Rout AS, Chandni, Nishani S, and Urhe SB (2024). Improving the quality and shelf life of flowers through modified atmospheric packaging (MAP). *The Agriculture Times*, 4(2), October. E-ISSN: 2583-1755.
- Guru PN and Urhe SB (2024). Scheduled Caste Sub Plan (SCSP) training/ skill development programme on ‘Engineering and technological interventions for safe storage of food grains’ for Ludhiana district of Punjab, India. In Training manual: Engineering and technological interventions for safe storage of food grains. Pp.7-11. ICAR-CIPHET.
- Guru PN and Urhe SB (2024). Scientific and safe storage of food grains. In Training manual: Engineering and technological interventions for safe storage of food grains. Pp.25-30. ICAR-CIPHET.
- Guru PN, Urhe SB, Sharma M, Zalpouri R, and Shekhon AS (2024). Pest management in commodity storage. In Training manual: Engineering and technological interventions for safe storage of food grains. Pp.31-41. ICAR-CIPHET.
- Bhardwaj M, Sharma M, Zalpouri R, Palkar NB, Urhe SB, and Guru PN (2024). Innovative Precooling Techniques to Preserve the Quality of Fruits and Vegetables. *The Planta*, Vol.-5, Issue-2.
- Palkar NB, Zalpouri R, Sharma M, Bhardwaj M, Urhe SB & Guru PN (2024). From Farm to Fork: Improving Fresh Fruit and Vegetable Transport to Minimize Losses. *Chronicle of Aquatic Science*, 2(3), Pp.1-7.
- Maan S, Prakash R, Singh L (2024). Transforming Animal Housing through IoT and AI. Conference Paper presented in 58th ISAE Annual Convention and International Symposium held at VNMKU, Parbhani, Maharashtra (India).

- Selvan SS, Samota MK, Kaur R, Bhabhria V and Varinda (2024). Role of Entrepreneurship Development in Protected Cultivation of Agricultural Commodities. Trends in Agriculture 3(09): 2205-2209
- सुमितभाऊसाहेबउरहे, सूर्यातुषीरएवंमंजूबाला. (2024) बायोसेंसर :परिचय, प्रकारऔरखाद्यगुणवत्तामेंउपयोग. प्रसंस्करणप्रगति—अर्धवार्षिकराजभाषापत्रिका (जनवरी—जू) (वर्ष8, अंक1, पृष्ठसं 44-49.
- सृष्टिजोशी, शिखामहाजन, सोनिकाशर्माएवंसूर्यातुषीर)2024) कलौंजी:सेहत, स्वादऔरओषधीयगुणोंकासंगमा) (जून-जनवरी)2024) वर्ष8, अंक1|प्रसंस्करणप्रगति.अर्धवार्षिकराजभाषापत्रिकापृष्ठसं-20-25।
- सौम्यामहापात्रा, सुमितभाऊसाहेबउरहे एवंरेणुबालाकृष्णन. (2024) कृषिविकासमेंकिसानउत्पादकसंगठनों एफपीओ (कीभूमिकाओरकिसानोंकोलाभ. प्रसंस्करणप्रगति—अर्धवार्षिकराजभाषापत्रिका) जनवरी—जून (वर्ष8, अंक1, पृष्ठसं 100-108.

### E-articles

- Bala M(2024). Millet and millet based product basket. In technical manual “Capacity Building on Post-Harvest Technology of Fruits, Vegetables and Millets” (Eds. Nachiket Kotwaliwale, R. K. Vishwakarma, Navnath Indore & Thongam Sunita),for international participants from ASEAN member states, namely Brunei Darussalam, Burma, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam held during 26 November to 5 December 2024 at ICAR-CIPHET, Ludhiana. Pp.119-144.
- Panwar S, Swati S and Urhe SB (2024). Hurdle technology, in Food Tech Today e-magazine vol 1, Issue 5.
- Kasana RC (2024). Non-Thermal and bio Technologies in Processing of FVM published in Compendium of “Capacity Building on Post-Harvest Technology of Fruits, Vegetables and Millets” for participants from ASEAN member states organized at ICAR- CIPHET, Ludhiana during 26 November to 5 December 2024 (editors: Kotwaliwale N.,Vishwakarma RK., Indore N. Thongam Sunita. pp no. 218-230.
- Tayeng G and Bembem K (2024) Nourish Your Sleep: How Nutrition Influences Rest Quality. FoodTech Today e-Magazine: Volume 1, Issue 4 (November, 2024), (ISSN: 3048-8249) pp: 34-36
- अंकितकुमार; राहुलकुमारराउत; रितुकुकडे ; रविप्रकाश(2024). लीचीकेभंडारणअवधिकेविस्तारकेलिएरणनीतियाँ, आईसीएआर- संट्रलइंस्टीट्यूटऑफोपोस्टहार्बेस्टइंजीनियरिंगएंडटेक्नोलॉजी, लुधियाना, पंजाब, प्रसंस्करणप्रगति, अर्धवार्षिकराजभाषापत्रिका, वर्ष8 , अंक1, pp: 1-8

### Books

**Magazine :**निचेतकोतवालीवाले (2024)सूर्यातुषीरएवंविकासकुमार ,लीनाकुमारी ,दीपिकागोस्वामी ,प्रसंस्करणप्रगति-जनवरी)अर्धवार्षिकराजभाषापत्रिका - ,(जूनवर्ष ,8अंक ,1पृष्ठसं126-1 :

### Book Chapters

- Bala M, Shivani and Seerat Bhinder (2024). Physiology and Biochemistry of Fruit Ripening. In Post-harvest Management of Fruits and Plantation Crops (Volume 1: Basic Concepts) (Ed. W.S. Dhillon) pp.41-61. NIPA® GENX ELECTRONIC RESOURCES & SOLUTIONS P. LTD. New Delhi. **ISBN:** 9789358876826.
- Sangha MK, Singla D and Bala M. (2024). Lectins: Antinutrients or Nutrients—Unveiling Their Dual Role. In Biofortification for Nutrient-Rich Crops (Eds. Monika Garg, Saloni Sharma, Apoorv Tiwari) pp. 249-258. CRC Press, Taylor and Francis Group, eBook ISBN9781032690636. <https://doi.org/10.1201/9781032690636>
- Sharma S, Rani H, Shivani, Gupta M, Bala M, Kaur G and Kaur G (2024). Glucosinolates in Brassicas: Manipulating Content and Composition. In Biofortification for Nutrient-Rich Crops, 235-248. CRC Press, Taylor and Francis Group, eBook ISBN9781032690636. <https://doi.org/10.1201/9781032690636>
- संदीपीदवंगे, के. बेमबेम, संदीपमान (2024) श्रीअनन्केमूल्यवर्धनकेलिएकृषीप्रसंस्करणकेंद्रकीअवधारणा. प्रसंस्करणप्रगति (जनवरी-जून) वर्ष 8, अंक 1, पृष्ठ 31-43

**ICAR-CIPHET Intellectual Property Rights**

**Patents**

S.No.	Title	Application No	Inventors	Date of grant/ filing	Patent no.
1.	MAKHANA SEED COLLECTIO N SYSTEM	202411071081	Dr. R.K. Vishwakarma Er. Sukhwinder Singh Sekhon Dr. Guru P.N. Dr. Nachiket Kotwaliwale	Sept 20, 2024	-

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S. No.	Title	Diary No.	Date of application/grant	Authors

1	Near infrared spectral dataset for detection and quantification of maize flour adulteration in chickpea flour	31680/2024-CO/L	Oct 10, 2024	Manju Bala Swati Sethi Sanjula Sharma Mridula D. Gurpreet Kaur Dhritiman Saha Nachiket Kotwaliwale
2.	Stereo Depth Based Detection and Localization Module for Apples	36556/2024-CO/SW	Nov 21, 2024	Er. Shagaf Kaukab, Er. Yogesh B. Kalnar, Dr. K. Narsaiah & Dr. Bhupendra M. Ghodki
3.	Makhana Processing Technologies by ICAR-CIPHET	26129/2024 -CO/CF	Nov 22, 2024	Deep Narayan Yadav Guru P.N. Indu Shekhar Singh Khwairakpam Bembem Mridula Devi Nachiket Kotwaliwale RK Vishwakarma Ranjeet Singh Renu Balakrishnan Shyam Narayan Jha

### Extension Activities

#### Technology demonstrations/FLDs/OFTs

S. No.	Technologies	Demonstrated at	Date	Occasion
1.	Hawaijar maker	CIPHET-IIFA 2024	03-05 Oct, 2024	Mela on CIPHET Foundation Day
2.	Facilities of Non-destructive quality evaluation Lab and Microencapsulation technology	ICAR-CIPHET	Oct 09, 2024	Student trainee from different institutes
3.	Field day on Maize In collaboration with IIMR	BazidpurKattianwali	Nov 11, 2024	Field Day
4.	Demonstration on plant	ICAR-CIPHET,	Dec 12, 2024	Ten days course

	and machinery for millet processing	Ludhiana		“Capacity Building on Post-Harvest Technology of Fruits, Vegetables and Millets” for around 20 international participants from ASEAN member states held during 26 November to 5 December 2024 at ICAR-CIPHET, Ludhiana.
5.	Millet Processing Centre	ICAR-CIPHET, Ludhiana	Dec 12, 2024	Ten days course “Capacity Building on Post-Harvest Technology of Fruits, Vegetables and Millets” for around 20 international participants from ASEAN member states held during 26 November to 5 December 2024 at ICAR-CIPHET, Ludhiana.

### Awareness Programmes

S. No.	Programme title	Venue	Duration	Number of beneficiaries
1.	Awareness campaign on 'Access to Health Facilities & Services to ensure better quality of life for SafaiMitr/Sanitation workers and their dependents' under 'SWACHH BHARAT ABHIYAN (SBA)	ICAR-CIPHET Ludhiana	Sept 27, 2024	20
2.	Awareness programme on food loss and waste management for employees of Vardhman Textiles Ltd, Ludhiana	ICAR-CIPHET, Ludhiana	Sept 28, 2024	

3.	Awareness Program on Crop Residue Management	Mallokpur	Sept 26, 2024	40
4.	School level Awareness Program on CRM at GSSS School	MahuanaBodla	Oct 21, 2024	200
5.	School level Awareness Program at GSSS School	Abohar	Oct 23, 2024	205
6.	College Level awareness Program on CRM at DAV College	Abohar	Oct 28, 2024	210
7.	Celebration of Vigilance awareness Week	Abohar	Oct 28, 2024	252
8.	Celebration of Vigilance awareness Week	Fazilka	Oct 29, 2024	147
9.	District Level awareness Program on CRM	Fazilka	Oct 29, 2024	178
10.	Block Level awareness Program on CRM	Ailana	Nov 4, 2024	103

### Stakeholder/officer/farmer/exposure visits

S.No.	Address of visitors	Number of visitors	Date
1.	KRIBHCO Co-operative Farmers Meetings in Collaboration with KVK Fazilka (Abohar)	45	Sep 24, 2024
2.	B.Sc Horticulture Students from YSPUHF, Solan	25	Oct 22, 2024
3.	Mr. Ajit Balaji Joshi, IAS, Secretary Agriculture, Punjab	1	Nov 12, 2024
4.	KVK Fazilka, Abohar	36	16 Oct to 15 Nov, 2024
5.	Exposure visits for 25 women farmers of Muzaffarpur about Makhana Processing, organized by PRAYATNA NGO.	25	Dec 3, 2024
6.	Exposure visits for 40 farmers of Sitamarhi, Madhubani, Darbhanga & Motihari Districts about Makhana Production & Processing, organized by MGFRI, Motihari, Funded by BAMETI, Patna	40	Nov 21, 2024
7.	Exposure visits for MSc & PhD students, Deptt FST, PAU, Ludhiana	9	Nov 28, 2024

8.	B.Sc Agri students, MPKV Rahuri, Maharashtra	45	Dec 03, 2024
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### Mela/ exhibitions

S No.	Programme title	Venue	Duration
1.	National Seminar-cum-Exhibition on Makhana & Allied Crops 2024 (NRCM-NASMAC 2024)	ICAR-NRC for Makhana, Darbhanga	Oct 17, 2024

### Human Resource Development and Capacity Building

#### Human Resource Development

S.No.	Title	Venue	Participants	Duration
1.	Nursery Management under protected structures	ICAR-CIPHET, RS, Abohar	20	02 days
2.	In-plant training programme for the B.Tech. students of College of Agricultural Engineering Dr. RPCAU, PUSA (Samastipur) -848125, Bihar	ICAR-CIPHET	6	1 month (Sept 16-Oct 16, 2024)
3.	5 Days Vocational Training on Organic Farming and Certification	DAV College, Abohar	90	17-21 Sept, 2024
4.	Training on Nursery Management under SCSP Scheme	CIPHET Premises	19	25-26 Sept, 2024
5.	3 days EDP on 'Millet based bakery products' during for three participants.	ICAR-CIPHET, Ludhiana	3	02 days (27-29 Sept, 2024)
6.	One Day Training Program on Use of Soil Testing Kit	KVK Premises	28	7 Oct, 2024
7.	One Day Training On Vermicompost	Aliana	25	8 Oct, 2024
8.	In-plant training programme for 4 M. Tech (Agril. Engg.) and 01 Ph.D (Agril. Engg.) student from Acharya N.G. Ranga Agricultural University, Dr. NTR College of	ICAR-CIPHET	5	29 days (03-31 Oct, 2024)

	Agricultural Engineering, Bapatala-522101			
9.	Low cost balance diet for children	CIPHET Premises	30	21-22 Oct, 2024
10.	Training on Rabi Crop Production Technology	Toot Wala	33	22 Oct, 2024
11.	Value addition of Millets	CIPHET Premises	30	23-24 Oct, 2024
12.	Value addition of Citrus	Jhand Wala Hanwanta	30	28 Oct, 2024
13.	In-plant training programme for the B. Tech. students of the College of Agricultural Engineering, Bihar Agricultural University, Bhojpur	ICAR-CIPHET	12	1-30 Nov, 2024
14.	Training for UG B. Tech. (Agri. Engg.) of college of Agricultural Engineering, ARA, Bhojpur, Bihar	ICAR-CIPHET	12	7-12 Nov, 2024
15.	'Advanced Makhana Production Technology' (Organized by Dr. I.S. Singh, Dr. SM Raut &Dr. SB Tar ate)	ICAR-NRCM, Darbhanga	27	3 days (26-28 Nov,2024)
16.	Training on crop residue management Ecofriendly Paddy straw management techniques	Aliana	25	9-13 Dec, 2024
17.	Training cum demonstration program on crop residue management	CIPHET, Abohar	25	20-24 Dec, 2024

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### Skill Development

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Sr. No	Staff name	Title of the programme	Venue	Duration (days)
1.	Guru P N and Urhe S. B.	Organized a Training program on 'Engineering and technological interventions for safe storage of food grains' under Scheduled Caste Sub Plan to Farmers	Alampur/Chapra Village of Ludhiana District	3 Days

2.	Dr. Poonam	10 days training on Hands-on Training Program on Genome Editing Technologies in Crops	Indian Institute of Rice research, Hyderabad.	10 Days
3.	Dr. Ramesh Chand Kasana	Leadership Development Programme for Scientists' Sponsored by Department of Science and Technology	Administrative Staff College of India, Hyderabad	05 Days
4.	Dr. Ravi Prakash	IP-awareness Training Program (Online)	Online	01 Day

### Lectures delivered

Name	Title of the lecture	Programme	Venue	Date
Urhe Sumit Bhausaheb	Processing and value addition of food grains	Training programme organized by KVK-Phek, Nagaland	Online	Sept 16, 2024
Soumya Mohapatra	Regression methods including dummy variables and limited dependent variables	Workshop on "Data to Decisions: A training on Impact Assessment and Quantitative Analysis"	ICAR-CIAH, Bikaner (hybrid mode)	Oct 15, 2024
Dr. Arvind Kumar Ahlawat	Crop residue management	District level Programme on CRM conducted by state deptt. Of agri.	Fazilka	22 Oct, 2024
Dr. Manju Bala	Conducted Interactive session and exposure Visit at ICAR-CIPHET, Ludhia for the eight trainee.	on "Exploring Scope and Opportunities in Maize Value Addition" on 8th November, during training on Entrepreneurship development through Value Addition in Maize	Organized by IIMR, Ludhiana	7-9 Nov,2024

		for Livelihood Security		
Dr. Sandeep Mann	Transforming Animal Housing through IoT and AI	58th ISAE Annual Convention on Engineering Innovations for next gen Digital Agriculture & International Symposium on Agricultural Engineering education for aspiring youth in transforming agriculture"	VNMKV, Parbhani	12-14 Nov, 2024
Thingujam Bidyalakshmi	Demonstration of X-ray, Visible, IR and NIR technology	CIPHET-ASEAN Training on "Capacity Building on Post-Harvest Technology of Fruits, Vegetables, and Millets"	ICAR-CIPHET	Nov 28, 2024
Dr. Manju Bala	Millets and millet based product basket	ASEAN Training during 26 November to 5 December 2024 at ICAR-CIPHET, Ludhiana	ICAR-CIPHET, Ludhiana	Dec 02, 2024
Dr. Chandan Solanki	Millets: Issues related to Processing and Storage	ASEAN Training during 26 November to 5 December 2024 at ICAR-CIPHET, Ludhiana	ICAR-CIPHET, Ludhiana	Dec 02, 2024
Dr. Abhinav Dubey	lab demonstration to participants of ASEAN countries	CIPHET-ASEAN Training on "Capacity Building on Post-Harvest Technology of Fruits, Vegetables, and Millets"	ICAR-CIPHET	Dec 3, 2024
Dr. Ramesh Chand Kasana	"Non-Thermal and bio Technologies in Processing of FVM"	CIPHET-ASEAN Training on "Capacity Building on post-harvest Technology of	ICAR-CIPHET	Dec 4, 2024

		Fruits, Vegetables, and Millets”		
Dr. K. Bembem.	Post Harvest Processing and value addition of groundnut and green chilli	Farmer training from Gaya, Bihar	ICAR-CIPHET, Ludhiana	Dec 15, 2024

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**Participation in conference/seminar/symposia/workshop/meetings,etc.**

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Name of the official	Title of the programme	Organized by	Date
Dr. Arvind Kumar Ahlawat	Annual Zonal Workshop KVK	ATARI ZONE, Ldh.	18-20 Sept, 2024
Dr. Abhinav Dubey	One day workshop on development of National Agricultural Code	NITS, Noida, organized by Bureau of Indian Standards, India	Sept 24, 2024
Dr. Nachiket Kotwaliwale & Soumya Mohapatra	ICAR-IFPRI Workplan Review Meeting 2025-2030		Sept 25, 2024
Chandan Solanki	National Consultation on Food Systems for Sustainability and Profitability of Millets	Rani Lakshmi Bai Central Agricultural University, Jhansi	05-06 Oct, 2024
All Scientists & Technical Staff	National Seminar-cum-Exhibition on Makhana & Allied Crops 2024 (NRCM-NASMAC 2024)	ICAR-NRC for Makhana, Darbhanga with CIPHET, Ludhiana & DCE, Darbhanga	Oct 17, 2024
Dr. Manju Bala, Dr. Surya Tushir, Dr. Deepika Goswami, Dr. Swati Sethi and Dr. Gurucrops P.N	National Seminar-cum-Exhibition on makhana and allied aquatic crops (NRCM-NASMAC 2024)	ICAR-NRCM, Darbhanga	Oct 17, 2024
Dr. Manju Bala	Annual Workshop of CRP on SA and presented research achievements of project entitled “Extraction of Bioactive Compounds and Value Addition to By-products of Farms and Agro-processing Industries	ICAR-NRCM, Darbhanga	Oct 18, 2024

Dr. Arvind kumar Ahlawat, Dr. Rupender Kaur and Dr. Kishan Kumar Patel	Annual Workshop on CRM	ATARI Zone-1, Ludhiana	Oct 18, 2024
Er Urhe Sumit Bhausaheb	International Nutri Cereal Convention INCC 6.0	ICAR-IIMR Hyderabad	17-19 Oct, 2024
Dr. Arvind kumar Ahlawat and Dr. Kishan Kumar Patel	National Dialogue on CRM	CSSRI, Karnal	Oct 26, 2024
Dr. Sandeep Dawange	International Conference on Climate Smart Nutri Sensitive Integrated Farming System for Gender equitable Sustainable Agriculture: Prospects and Challenges	ICAR-CIWA, Bhubaneswar	06-08 Nov 2024
Er Ritu kukde	Attended International conference (Online) and gave oral presentation on “Role of Automation and Sensor Technology in Smart Grading of Tropical Fruits: A Technical Review”.	ICAR- CIWA Bhubaneshwar	06-08 Nov 2024
Members of SAC meeting and All KV, ICAR- CIPHET Staff Members	7 <sup>th</sup> SAC Meeting	CIPHET Premises	Nov 08, 2024
Er Urhe Sumit Bhausaheb, Chandan Solanki, Dr. Poonam, Dr. Shrikrishna Nishani, Dr. Th. Bidyalakshmi Devi, Dr. Ravi Prakash	58th Annual Convention of ISAE on Engineering Innovations for next gen digital agriculture and international symposium on agricultural engineering education for aspiring youth in transforming agriculture	Online	12-14 Nov, 2024
Dr. Amit Nath and Dr. Shilpa S Selvan	58 <sup>th</sup> Annual Convention of ISAE	ISAE	12-14 Nov, 2024
Dr. Chandan Solanki	58th ISAE Annual Convention on “Engineering Innovations for Next-gen Digital Agriculture” and International Symposium on “Agricultural Engineering Education for Aspiring Youth in	ISAE and VNMKV, Parbhani	12-14 Nov, 2024

	Transforming Agriculture" at Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani		
Dr. Abhinav Dubey	National Workshop	ICAR-IVRI, Pune	Nov 18, 2024
Dr. Amith Nath & Dr. Shilpa S Selvan	40th Annual workshop of AICRP on PHET	AICRP on PHET	20-22 Nov, 2024
Dr. Sandeep Mann	40 <sup>th</sup> Annual Workshop on Post-Harvest Engineering and Technology, held at AAU, Jorhat	ICAR-AICRP on PHET.	20-22 Nov, 2024
Dr. Ravi Prakash	40 <sup>th</sup> Annual Workshop on Post-Harvest Engineering and Technology, held at AAU, Jorhat	ICAR-AICRP on PHET.	20-22 Nov, 2024
Er Urhe Sumit Bhausaheb	ICAR AICRP-PHET 40 <sup>th</sup> annual Workshop organized by AAU, Jorhat	AAU Jorhat, Assam	20-22 Nov, 2024
Dr. Ramesh Chand Kasana	National Conference	Jai Narain Vyas University, Jodhpur, Rajasthan	27-29 Nov, 2024
Dr. Arvind Kumar Ahlawat	Monthly meeting of KVK	ICAR- ATARI, Zone-1 Ludhiana	Dec 2, 2024
Dr. Arvind Kumar Ahlawat Dr. Rupinder Kaur, Dr.Kishan Kumar Patel	Online CRM Meeting	ICAR- ATARI, Zone-1 Ludhiana	Dec 9, 2024
Dr. Thingujam Bidyalakshmi	National Workshop	NINFET, Kolkata	Dec09, 2024
Dr. Abhinav Dubey	National Workshop	NINFET, Kolkata	Dec 09, 2024
Dr. Amith Nath & Dr. Shilpa S Selvan	FRP Fabrication & Testing	AICRP on PEASEM	10-12 Dec, 2024

Dr. Deepika Goswami	29th Meeting of Foodgrains, Allied Products & Other Agricultural Produce Sectional Committee, FAD 16	ICAR-CIPHET, Ludhiana	Dec 12, 2024
Dr. Arvind Kumar Ahlawat	Meeting with DC Fazilka	Dept. of Agriculture & Farmers welfare, Fazilka	Dec 13, 2024

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### Awards/Recognition

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Name of Awardee	Name of Award	Awarded by	Name of Awardee
Dr. Guru P.N.	Best Scientist Award 2024	ICAR-CIPHET, Ludhiana	Dr. Guru P.N.
Dr Chandan Solanki	Best Poster Presentation Award	Rani Lakshmi Bai Central Agricultural University, Jhansi	Dr Chandan Solanki
Dr. Shilpa S Selvan	Best Ph. D. Thesis	Pragati International Scientific Research Foundation	Dr. Shilpa S Selvan
Shivani, Manju Bala*, Deepika Goswami and Surya Tushir	Poster Award	ICAR-NRCM, Darbhanga during National Seminar-cum-Exhibition on makhana and allied aquatic crops (NRCM-NASMAC 2024), 17 October 2024.	Shivani, Manju Bala*, Deepika Goswami and Surya Tushir
Dr Guru P.N	Poster Award	ICAR-NRCM, Darbhanga during National Seminar-cum-Exhibition on makhana and allied aquatic crops (NRCM-NASMAC 2024), 17 October 2024.	Dr Guru P.N
Dr Swati Sethi	Oral Award	ICAR-NRCM, Darbhanga during National Seminar-cum-	Dr Swati Sethi

		Exhibition on makhana and allied aquatic crops (NRCM-NASMAC 2024), 17 October 2024.	
Er Ritu kukde	Participated in the ICAR-Inter Zonal Sports Tournament	Participated in the ICAR-Inter Zonal Sports Tournament at ICAR-CAZRI Jodhpur from 14 Oct 2024 to 18 Oct 2024, won gold, silver medals in high jump, 100 m race, 200 m race and long jump and also “Best Women Athlete Award” at the event.	Er Ritu kukde


**Personalia**
**❖ Promotion and new joining**

- Sh. Rahul Kumar Assistant Joined on 09.09.2024
- Sh. Lakshay Assistant Joined on 13.09.2024
- Sh. Anuj Chhabra Joined on 04.10.2024
- Er. Saurajyoti Baishya joined as Asstt Research Engineer on 30.10.2024

**❖ Transfer:**

- Mrs. Pragya singh, Sr Tech. Asstt. Has been relieved from ICAR-CIPHET, Ludhiana on 13.09.2024 to join at ICAR-NBSS& LUP, Regional Station, Bengaluru, Karnataka.

**❖ Training:**

- Orientation Training of Sh. Rahul Kumar and Sh. Lakshay w.e.f. 30.09.2024 to 04.10.2024 at ICAR-ATARI, Ludhiana and ICAR-IIMR, Ludhiana

**Important Events****IIFA-2024**

ICAR-CIPHET, Ludhiana has organised **ICAR-CIPHET Industry Interface Fair on Agro Processing (IIFA-2024)** to commemorate the 36<sup>th</sup> Foundation Day of our institute during **3-5 October, 2024** at ICAR-CIPHET, PAU Campus, Ludhiana. The event's key attractions included the Kisan Mela, Kisan Goshti, and two Industry Interface Meets focusing on rice milling and fiber processing. Other activities included a workshop on opportunities for FPOs (Farmer Producer Organizations) in the food processing sector and a hackathon for students. These initiatives provided valuable opportunities for knowledge sharing, networking, and exploring business prospects in the agricultural processing space. During the valedictory function, awards were presented to top exhibitors, entrepreneurs, and the winners of the Techno-Food Hackathon Version 1.0. The fair attracted approximately 5,000 attendees, including students, researchers, farmers, and entrepreneurs.

The Techno-Food Hackathon 2024, held from 3rd to 5th October 2024 at ICAR-CIPHET, Ludhiana, successfully showcased a wide range of innovative solutions focused on post-harvest processing of agricultural products and precision agriculture. The hackathon aligned with six Sustainable Development Goal (SDG) themes of the United Nations and attracted participation from across Punjab and neighbouring states. A total of 32 teams registered for the event, with 19 teams actively participating, including five from schools and the rest from various colleges. The ideas and concepts presented by the teams were assessed by a distinguished jury panel composed of experts from PAU, Ludhiana, and SLIET, Longowal. The evaluation was based on key criteria such as innovation, technical feasibility, and the potential to significantly impact the food processing sector. After comprehensive deliberation, the final results were announced, reflecting the outstanding efforts of the participants. Indian Institute of Technology, Ropar, Chitkara University, Dayanand Model Sr. Secondary School, Dayanand Nagar, Jalandhar, Bal Bharti Public School, Dugri, Ludhiana emerged winners.

On the second day of the Industry Interface Fair on Agro-processing & Food Processing (IIFA-2024), organized by ICAR-CIPHET from October 3 to 5, 2024, two significant industry interface meetings and a workshop were conducted. The first session focused on "FCI-Rice Milling Industry-Research Institution Synergy for Innovations in Rice Milling," chaired by Mr. Mrityunjay Kumar, AGM, QC, FCI, Bhatinda, and co-chaired by Mr. M.L. Meena, AGM, FCI, Ludhiana, along with Mr. Ashwani Bansal from the Rice Millers Association. The session featured discussions on practical challenges faced by the rice milling industry and highlighted areas for further research, including the quick evaluation of paddy quality parameters and non-destructive methods for assessing rice age. Opportunities for by-product utilization in the rice industry were also explored. The second session, centered on "ICAR Technologies for Textile Industry - Cotton & Other Natural Fibers," was chaired by Mr. Sunil Kumar Khamb, Director of Raw Material at Vardhaman Group, and co-chaired by Mr. Amit Jain, AVP of Projects, Logistics & CSR, Vardhaman Group. The discussion emphasized advancements in cotton, jute, hemp and other natural fibre processing and the need for vocational training in the textile sector. Industry leaders encouraged greater collaboration between research institutions and the textile industry to enhance productivity and innovation. A workshop on strengthening post-harvest management, focusing on Farmer Producer Organizations (FPOs) as catalysts for agri-sustainability, was also held. Sh. Bal Mukund Sharma,

Chairman, Punjab State Food Commission, stressed the potential of promoting local Punjabi foods in international markets. He further emphasized importance of new age technologies in optimizing agricultural aggregation, processing, storage, and marketing for farmers, entrepreneurs, and FPO members.



#### ❖ हिन्दी पखवाड़ा- 2024

विगत वर्षों की भांति इस वर्ष भी संस्थान में हिन्दी पखवाड़े का आयोजन 14-28 सितम्बर, 2024 तक किया गया। हिन्दी पखवाड़े का समापन समारोह दिनांक 01.10.2024 को इस संस्थान के सभा कक्ष में हुआ जिसमें श्री महेश कुमार मीणा, स्नातकोत्तर शिक्षक हिंदी, केंद्रीयविद्यालय, बहोबाल छावनी, लुधियाना बतौर मुख्य अतिथि शामिल हुए। इस वर्ष संस्थान में हिन्दी पखवाड़े के दौरान अलग-अलग 14 प्रतियोगिताओं का आयोजन किया गया। हिन्दी पखवाड़े के दौरान कावाई गई प्रतियोगिताओं के विजेताओं को मुख्य अतिथि तथा डॉ. नव्यिकेत कोतवाली वाले, निदेशक, भा.कृ.अनु.प-सीफेट, लुधियाना द्वारा प्रशस्ति पत्र वितरित किए गए। डॉ. दीपिका गोस्वामी, वरिष्ठ वैज्ञानिक एवं अध्यक्ष, हिन्दी पखवाड़ा समिति ने हिन्दी पखवाड़े के अंतर्गत हुई प्रतियोगिताओं का विवरण दिया। समापन समारोह में मुख्य अतिथि ने संस्थान के अधिकारियों एवं कर्मचारियों द्वारा राजभाषा के प्रति अतिउत्साह दिखाने के लिए प्रसन्नता व्यक्त की एवं सभी को हिन्दी भाषा को बढ़ावा देने के लिए कहा। संस्थान के निदेशक ने कहा कि इस संस्थान के वैज्ञानिकों एवं तकनीकी अधिकारियों को भी हिन्दी में कार्य करना चाहिए ताकि वे भी नकद पुरस्कार प्राप्त कर सकें।

निष्कर्ष: -हिन्दी पखवाड़ा बहुत ही अच्छे ढंग से सम्पन्न हुआ। संयोजकों द्वारा सभी प्रतियोगिताओं को बहुत ही बढ़िया ढंग से करवाया गया। इस वर्ष ज्यादातर प्रतियोगिताओं में इस संस्थान के अधिकारियों एवं कर्मचारियों ने बढ़ चढ़ कर भाग लिया। समापन समारोह भी बहुत अच्छे ढंग से संपूर्ण हुआ।

❖ National Seminar-cum-Exhibition on Makhana and Allied Aquatic Crops was organized on 17<sup>th</sup> October, 2024 at Institute in collaboration with ICAR-CIPHET, Ludhiana and Darbhanga College of Engineering, Darbhanga. The event witnessed participation of around 500 farmers, 125 Scientists and researchers and 30 exhibitors from across the country.



- ❖ Foundation stone of the Agri-Incubation Centre cum Engineering workshop was laid on 17<sup>th</sup> of October by the honourable MP, Darbhanga Dr. Gopal Ji Thakur, honourable MP, Rajya Sabha Dr. Dharmshela Gupta, BC & EBC Welfare Minister, GoB, Shri Hari Sahni, Hon'ble DDG, Agri. Engineering, ICAR, New Delhi, Dr. S.N. Jha and the Hon'ble Director, Dr. Nachiket Kotwaliwale.
- ❖ Annual Workshop of CRP on Secondary Agriculture was held on 18<sup>th</sup> October, 2024 at conference hall of the institute with participation of more than 30 Scientists & experts.
- ❖ A meeting of the ICAR-NRCM Scientists and technical staff with the Hon'ble DDG, ICAR, New Delhi Dr. S.N. Jha and the Hon'ble Director, ICAR-NRC for Makhana Dr. Nachiket Kotwaliwale was held on 18<sup>th</sup> of October 2024 to deliberate upon the activities and expectations from the institute staff. Responsibilities were assigned to various Scientists and technical staff for overall improvement of the research and other institution building activities at the institute.
- ❖ The ten-day international training programme titled “Capacity Building on Post-Harvest Technology of Fruits, Vegetables, and Millets” concluded successfully at ICAR-CIPHET,

Ludhiana. The program, inaugurated on November 26, 2024, was attended by 16 participants representing ASEAN member states, including Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, and Thailand. This initiative, a collaborative effort between the Government of India and the Association of Southeast Asian Nations (ASEAN), aimed to enhance the capacity of agricultural professionals in post-harvest technologies. The participants, who represented various departments under the agricultural ministries of their respective countries, gained in-depth knowledge and skills through theoretical, demonstration and industrial visit sessions. Dr. Nachiket Kotwaliwale, Director of ICAR-CIPHET, Ludhiana, presented a report on the 10 days of the ASEAN training program. The program's sessions, led by experts in the field, focused on innovations and best practices in post-harvest technology to reduce losses and add value to agricultural produce. He called for collaboration among the ASEAN member countries and India in transfer of technology, trade of appropriate machines, training of extension functionaries and development of product standards. During the valedictory session, the participants shared their feedback, highlighting the program's relevance and its potential to foster stronger collaborations in agricultural post-harvest management across the ASEAN region. Certificates were distributed to all participants, recognizing their active engagement and successful completion of the training. Dr. Parvender Sheoran, Director, ATTARI-Zone-I explained the agriculture extension network in India and encouraged the participant to take lessons from Indian system. Dr. S B Singh, PS, ICARIIMR, Ludhiana explained the research activities of his institute. The event concluded with remarks from distinguished guests, including the Chief Guest, Dr. K. Alagusundaram, Ex-DDG (Agricultural Engineering & Natural Resource Management), ICAR, who emphasized the importance of knowledge-sharing and global partnerships in addressing common challenges in agriculture. He emphasized that extraction of high value compounds from agri residues yield more value than traditional processing of agricultural produce. He also advised to pay attention to specialized horticultural products of their respective countries to process into high value industrial products. The program was praised as a step forward in strengthening ties between India and ASEAN countries in agricultural research and development.



- ❖ **World Soil Day** is celebrated by Team KVK Fazilka and Collaboration with KRIBHCO on **December 5<sup>th</sup> at Kallar Khera village.** to raise awareness about the importance of soil in sustaining life on Earth. The day emphasizes the critical role that healthy soil plays in food





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